

DOCKETED

Docket Number:	17-EPIC-01
Project Title:	Development of the California Energy Commission Electric Program Investment Charge 2018-2020 Triennial Investment Plan
TN #:	218273
Document Title:	Presentation - Incorporating Community Focused Equity in Research Funding
Description:	Staff Workshop, March 20, 2017
Filer:	Doris Yamamoto
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	6/13/2017 2:36:06 PM
Docketed Date:	6/13/2017



CALIFORNIA ENERGY COMMISSION

RESEARCH & DEVELOPMENT DIVISION



Incorporating Community Focused Equity in Research Funding

Staff Workshop | Fresno | March 20, 2017



Housekeeping

- Facilities
- Parking Validation
- Workshop broadcast and recording
- Public comment protocol
- Today's presentation will be posted at:
<http://www.energy.ca.gov/research/epic/17-EPIC-01/documents/>



Opening Remarks

Kevin Barker

Senior Advisor to Chair Robert Weisenmiller
California Energy Commission

Rhetta deMesa

Senior Advisor to Commissioner Janea Scott
California Energy Commission



Workshop Agenda

10:15am	Introduction
10:30am	Case Study: Methods for Engaged Community Driven Research & Technology
10:50am	Panel Discussion: Equity and Community Driven Energy Research
11:50am	Electricity Research: What is EPIC Funding and How Does it Relate to Community Focused Equity?
12:15pm	LUNCH BREAK
1:15pm	Big Picture – Various State Initiatives to Support Equity
2:00pm	Collaboration Activity
2:25pm	Panel Discussion: What's Worked? Challenges & Solutions for Overcoming Issues with Split Incentives and Retrofitting Multi-Family Housing
3:45pm	EPIC Research Investments (Overview of upcoming research opportunities)
4:00pm	Public Comments
4:30pm*	Optional Presentation on How to Apply for EPIC Opportunities
4:30pm*	Networking



Purpose of Workshop

- Familiarize attendees with the:
 - California Energy Commission
 - EPIC Program
 - 2018 – 2020 EPIC Triennial Investment Plan
- Seek input on how to:
 - Remove some of the barriers to community adoption
 - Build future funding opportunities that prioritize community engagement in project design and



Panel Discussion: Equity and Community Driven Energy Research

Moderator: Sonya Ziaja, California Energy Commission

Panelists:

- Sekita Grant, Greenlining
- Ms. Margaret Gordon, Resilient Communities Initiative
- Abigail Ramirez, Leadership Counsel
- Rey Leon, Mayor of Huron

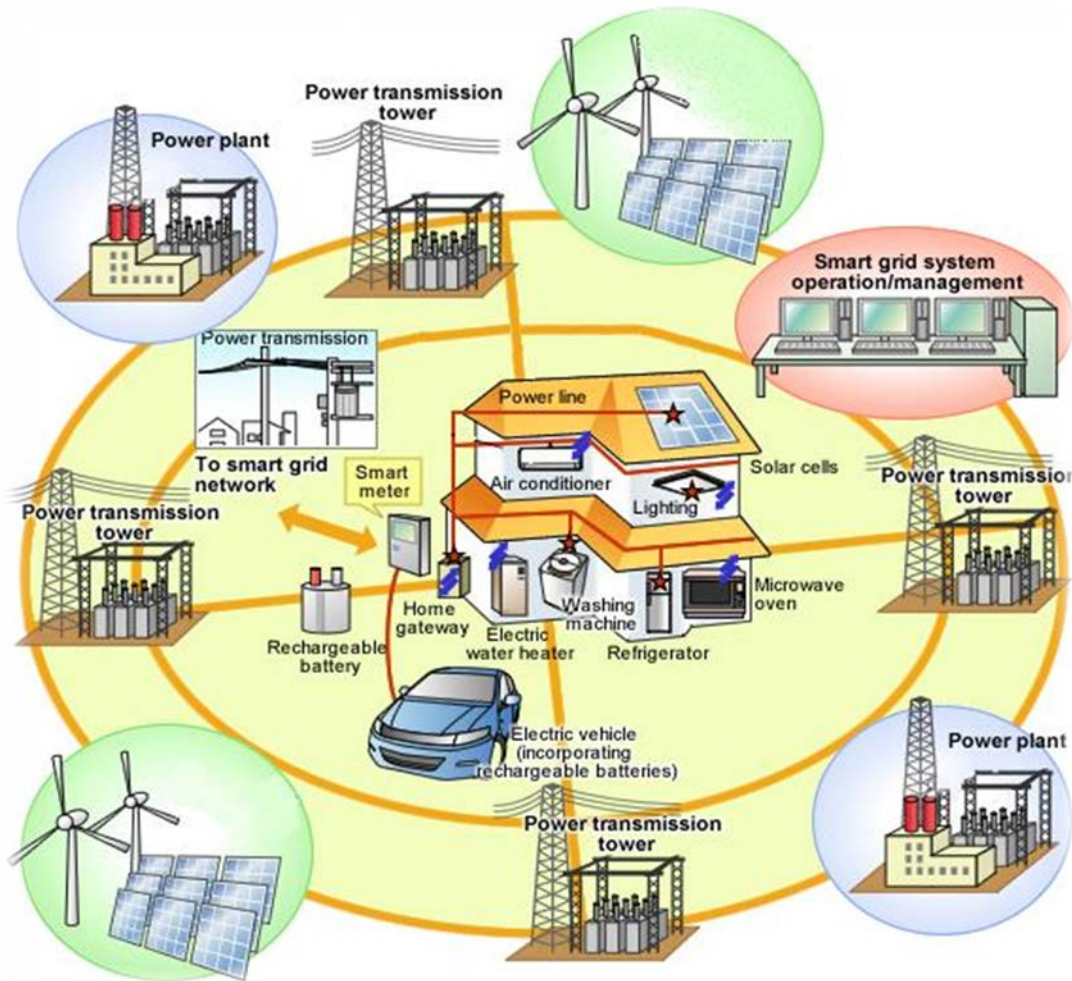


Overview of EPIC Program

- The Electric Program Investment Charge (EPIC) program is California's R&D investment in the 21st century electric power system.
- All EPIC research initiatives must:
 - Address the state's pioneering energy priorities.
 - Accelerate technology innovations and tools.
 - Provide benefits to California ratepayers.
- Transforming our state's electric power system is a significant undertaking that requires multi-dimensional solutions.

Policy Drives Innovation

- Increase RPS to 50% by 2030
- Reduce GHG to 80% below 1990 by 2050
- 1.3 GW of storage by 2020



- Double energy efficiency savings by 50%
- 1.5 million ZEV's by 2025
- Increase access to clean energy in disadvantaged communities



Policy Guidance

SB 96 provides additional direction to the Energy Commission in its administration of EPIC

EPIC should award, “funds to projects that may lead to technological advancement and breakthroughs to overcome barriers that prevent the achievement of the state’s statutory energy goals and that may result in a portfolio of projects that is strategically focused and sufficiently narrow to make advancement on the most significant technological challenges.”

The Energy Commission shall, “use a sealed competitive bid as the preferred method to solicit project applications and award funds pursuant to the EPIC program.”



EPIC Innovation: Providing Solutions

Addressing
California's
Susceptibility
to Drought



Innovative
Solutions
to Address
Tree
Mortality



Adapting to
Climate
Risks to
the Electricity
System





EPIC Innovation: Engaging Customers

Increasing Energy Savings for Multi-Family Dwellings



Creating Zero or Near Zero Net Energy Buildings



Building the Advanced Energy Community of the Future





Examples of Building Energy Efficiency Research Projects Aimed at Benefiting Low Income or Disadvantaged Communities

Adel Suleiman
Energy Research and Development Division
California Energy Commission
March 20, 2017



Sample Solicitation Process

- Grant awards made through competitive solicitations
- Many building efficiency R&D solicitations, extra points for projects in Disadvantaged Communities (DACs) and providing benefits
- Example Purpose: Identify and demonstrate an integrated package of emerging energy efficiency measures that can reduce on-site energy use in residential and/or commercial buildings
 - Cost within 10% of standard equipment/construction
 - Exceed current building efficiency standards
 - Analyze costs and benefits over a 12 month period
 - Consideration of occupant behavior to sustain energy savings
 - Inclusion of multiple market players



How Were Proposals Evaluated?

- First, proposals are administratively screened for completeness
- Next, a detailed technical review to determine merit and need (advancements, uniqueness and relevance), technical approach to performing the work, impacts and benefits to California IOU ratepayers, team qualifications, budget reasonableness, and amount of EPIC funds spent in California.
 - Proposals must attain a minimum score of 70% of the total points to proceed
- Those meeting the minimum could get additional points for providing match funding and for projects in and benefiting DACs
 - This resulted in several projects targeting disadvantaged communities.
- High ranked projects were recommended for funding



Examples of Research Projects Benefiting Low Income/DACs

- Beechwood Multifamily Complex, Lancaster, CA
- Developed cost-effective packages of cutting edge energy efficiency measures
 - Demonstrate technical and financial value to property owners and occupants
- Retrofitted 30 apartments



- CEC funding: ~\$1.3 million
- Match Funding ~\$1.1 million (SCE, SoCal Gas, LINC Housing, BIRAenergy)
- Additional funding from HUD (renewables) and the Federal Home Loan Bank (internet)



Project Approach

Baseline Analysis

- Physical audits and modeling
- Utility bill data

Develop Technology Packages

- Develop whole building EE packages using models
- Technical analysis for energy and cost to select measures

Contract and construct

- Develop scopes of work, identify construction manager and bid construction contracts
- Install energy measures and extensive data acquisition systems to monitor post installation performance

Impact analysis and financial Models

- Evaluate energy impact installed technologies/measures
- Develop scaling scenarios with utility On Bill Financing, low interest loans and tax credits



Baseline Data: Visit, Inspect, Document





Emerging Technologies – Analyzed and Evaluated

Common Area

- 99% Gas Condensing Tankless for laundry
- High Efficiency roof top unit with fault detection and diagnostics (FDD)
- Economizer Retrofit
- **Foam roof insulation, cool roof and insulated ducts**
- **Aerosol envelope sealing**
- Ozone retrofit kits
- Moisture sensing retrofit for dryers
- **LED lighting indoor**
- **LED outdoor lighting**
- HVAC FDD
- **Smart Thermostats**

Tenant Units (30)

- **Solar thermal water heating**
- T-stats with energy efficiency and demand response capability
- **Boxing and ducts in semi-insulated spaces**
- **Air sealing**
- Home Energy Management Systems
- **Insulated underground piping**
- Messaging for behavioral change
- Post-installation surveys
- Non-intrusive load monitoring systems
- **Weather stripping**
- **Refrigerator replacements**
- **Outdoor LED lighting**
- **Indoor LED lighting**



Construction Photos

Stripped roof for foaming



New duct joints



Old and new ductwork



Old
crumpled
ducts

Duct boots sealed





Construction Photos



New Outdoor Lighting



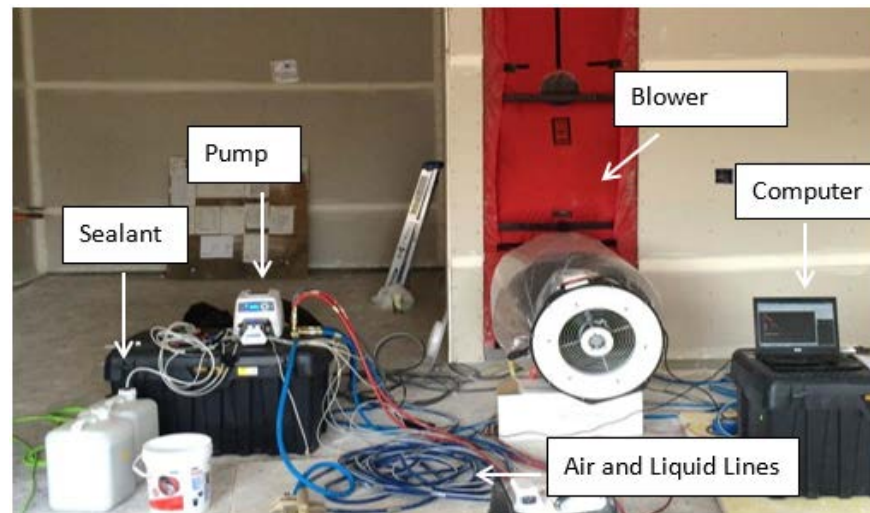
HVAC Data Monitoring
Wireless enabled



Solar Thermal on Roof



Solar Thermal Heat
Exchanger Piping



Aerosol Envelope Sealing in Common Areas



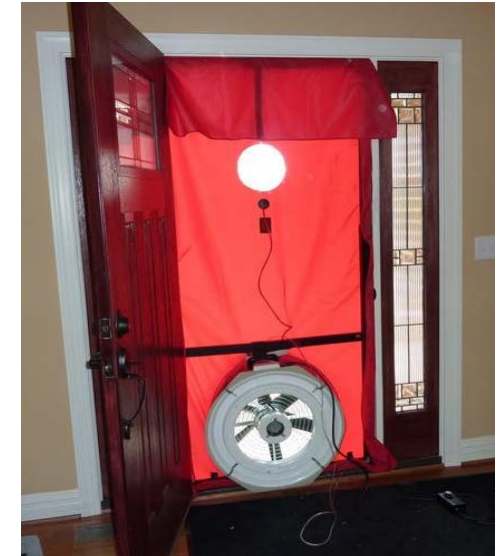
Commissioning and Performance Tests



Test Smart Thermostat



Measure HVAC Air Leakage,
Air Flow



Measure Envelope Leakage



Test District Heating



Test Solar Thermal System



Test Foam Insulation



Preliminary Project Results

Measure	Unit	Average Measured Savings
Envelope Improvement Package – duct replacements, insulation and conditioned attic, air sealing (electric)	kWh	22% (based on RTU operation)
Envelope Improvement Package – duct replacements, insulation and conditioned attic, air sealing (gas)	Therms	34% (based on RTU usage)
Smart Thermostats – average (electric)	kWh	14% (estimated)
Smart Thermostats – average (gas)	Therms	14% (estimated)
WH Improvements – Solar Thermal	Therms	70% savings (100 Therms/unit)
WH improvements – distribution improvement	Therms	
LED lighting	kWh	Under calculation
Spray Foam Roof Insulation	kWh	17%

*Project team estimates the retrofit packages will reduce annual electricity use by about 22% and natural gas use by 50% (results and final report still being finalized - expected by March 2017)



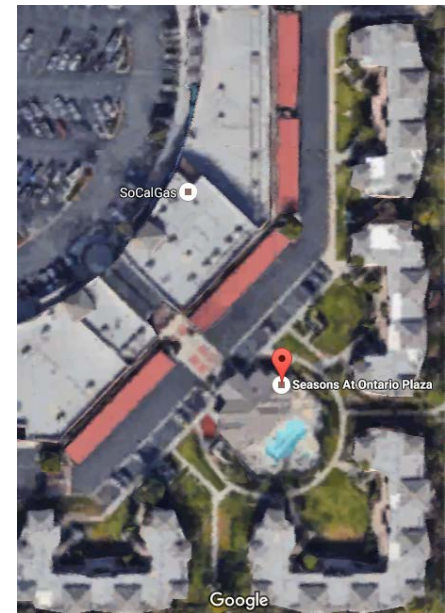
Lessons Learned

- Many barriers continue to exist to achieve widespread adoption of large scale retrofits in low income properties, including costs, cost/benefit, and split incentives
- Incorporate building vintage as a consideration since it could lead to unexpected costs (e.g., asbestos abatement)
- Incorporate customer acceptance as a consideration (customers more involved in selection of technologies)
- Hassle factor with energy efficiency measures and customer inconvenience leads to solar as an easier retrofit option (less coordination helps reduce costs)



Next Steps

- Information learned from this project will be considered in the development of a new EPIC-funded project that focuses on “customer centric” approaches
- 2 multifamily properties located in disadvantaged communities: Fresno and Ontario
 - Master-metered for both electric and natural gas-owner pays the utility bills
 - Evaluate opportunities for electric vehicle infrastructure, distributed energy resource integration
 - Evaluate Indoor Air Quality





Other Example Projects

- Renovation of mixed use low income property in San Francisco consisting of single occupant residences and businesses.
 - Project involves installing advanced energy efficiency measures to keep housing affordable by lowering operating costs.
- Demonstrate automatically controlled, learning ceiling fans with SMART thermostats in several multifamily buildings in DACs in Madera, Fresno, El Monte and San Diego
 - Goal: provide energy efficiency, improved comfort and lower energy bills (common areas/dwelling units).





Current Projects Supporting Disadvantaged and Low-Income Communities

- Integrated Community Resource Marketplace (Local Government Commission) [Downtown Fresno]:
<http://innovation.energy.ca.gov/SearchResultProject.aspx?p=31037&tk=636251178026109536>
- Zero-Net-Energy Farms (Biodico) [Fresno County]:
<http://innovation.energy.ca.gov/SearchResultProject.aspx?p=31051&tk=636251163262180108>
- Customer-Centric Approach to Scaling IDSM Retrofits [Fresno and Ontario]
<http://innovation.energy.ca.gov/SearchResultProject.aspx?p=30924&tk=636255715941378349>
- Measure Results from Affordable Zero Net Energy Homes [Stockton]
<http://innovation.energy.ca.gov/SearchResultProject.aspx?p=31098&tk=636255706966983043>
- Innovative Net Zero: First ZNE Demonstration in Existing Low-Income Mixed-Use Housing (Prospect Silicon Valley):
<http://innovation.energy.ca.gov/SearchResultProject.aspx?p=30927&tk=636251172984630808>



Current Projects Supporting Disadvantaged and Low-Income Communities

- Richmond Advanced Energy Community Project (ZNE Alliance):
<http://innovation.energy.ca.gov/SearchResultProject.aspx?p=31020&tk=636251179506199584>
- The Charge Bliss Advanced Renewable Energy Community for a Disadvantaged Southern California Community (Charge Bliss):
<http://innovation.energy.ca.gov/SearchResultProject.aspx?p=31021&tk=636251173538728600>
- Developing an Advanced Energy Master Plan for the Encanto Neighborhood in San Diego (Groundwork San Diego-Chollas Creek):
<http://innovation.energy.ca.gov/SearchResultProject.aspx?p=31023&tk=636251174590453632>
- Huntington Beach Advanced Energy Community Blueprint (UC Irvine):
<http://innovation.energy.ca.gov/SearchResultProject.aspx?p=31052&tk=636251177466551884>



Collaboration Activity

Questions to spur ideas for collaboration and research

1. What do you see as the major unmet needs for your community (or one in which you do business)? Include any needs that touch on electricity generation, clean energy, energy efficiency, and electric vehicles (including infrastructure).
2. What type of project would you be interested in collaborating on to help address these needs?
3. Who did you meet that could be helpful in collaborating with you on this project?
4. How could the Energy Commission be helpful in addressing these needs?



Panel Discussion: What's worked? Challenges and Solutions for Overcoming Issues with Split Incentives and Retrofitting Multi-family Housing

Moderator: Andrew Brooks, Association for Energy Affordability

Panelists:

- Neil Matouka, Local Government Commission
- Nathan Magsig, Fresno County Supervisor, District 5
- Jose Gonzalez, City of Fresno



Tentative Schedule for Developing 2018-2020 EPIC Investment Plan

Activity	Time Frame
Energy Commission Post Draft Funding Initiatives	March 10, 2017
Energy Commission Hosted Workshop on Draft Funding Initiatives; Sacramento, CA	March 14, 2017
Comments due https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=17-EPIC-01	March 29, 2017
Energy Commission Post Draft Investment Plan	March 30, 2017
Energy Commission Post Final Investment Plan	April 17, 2017
Energy Commission Business Meeting to Approve Investment Plan	April 27, 2017
Submit to CPUC	May 1, 2017



Upcoming Workshops for Developing 2018-2020 EPIC Investment Plan

Activity	Time Frame
Community Focused Equity in Research Funding; Los Angeles, CA	March 27, 2017
IOU EPIC Workshop; Westminster, CA	March 24, 2017



2018 – 2020 EPIC Investment Plan Draft Funding Initiatives



Theme 1: Advance Technology Solutions for Deep Energy Savings in Buildings and Facilities

- S1.1 Accelerate Product Development and Market Acceptance of Solid-state Lighting Technologies and Designs
- S1.2 Develop Advanced Building Envelope Materials and Designs for Healthy, Comfortable and Highly-Efficient Buildings
- S1.3 Drive Technical- and Cost-Performance Improvements in High-Efficiency Heating, Ventilation and Air Conditioning Systems
- S1.4 Enable Integration of Building and Equipment Controls and Automation
- S1.5 Increase the Energy Efficiency of Plug Loads and Consumer Electronics Devices
- S1.6 Accelerate the Transition to Direct Current Powered Buildings and Facilities
- S1.7 Develop Technologies that can Assist in Decarbonizing Key California Industries



Theme 2: Accelerate Widespread Customer Adoption of Distributed Energy Resources

- S2.1 Increase the Cost-effectiveness of Zero Net Energy Buildings and Communities
- S2.2 Push Low-Carbon Microgrids Closer to Commercial Viability
- S2.3 Improve the Business Proposition of Integrated Distributed Storage
- S2.4 Incentivize DER Adoption through Innovative Strategies at the Local Level



Theme 3: Increase System Flexibility from Low-Carbon Resources

- S3.1 Accelerate Broad Adoption of Automated Demand Response Capabilities that Provide the Grid Flexible Response Services
- S3.2 Enable Electric Vehicle-Based Grid Services
- S3.3 Increase the Value of Distributed Energy Resources and Renewables to the Transmission and Distribution System
- S3.4 Define and Demonstrate the Locational Benefits and Optimal Configurations of Grid-level Storage as the California Grid Transitions to More Distributed Energy Resources



Theme 4: Increase the Cost-Competitiveness of Renewable Generation

- S4.1 Advance Emerging Thin-Film PV Technologies for High Value Applications
- S4.2 Develop Technologies that Enable Increased Wind Capacity in California
- S4.3 Increase the Strategic Value of Flexible CSP and Geothermal to the Electricity System
- S4.4 Improve the Value Proposition of Bioenergy



Theme 5: Create a Statewide Ecosystem for Incubating New Energy Innovations

- S5.1 Shorten the Timeframe of New Energy Technologies from Idea to Investment
- S5.2 Accelerate the Most Promising Energy Technologies from Prototype to Market Entry



Theme 6: Maximize Synergies in the Water-Energy-Food Nexus

- S6.1 Reduce the Energy Intensity Required to Supply and Treat Water
- S6.2 Increase the Energy and Water Efficiency of California's Food and Agricultural Sector
- S6.3 Optimize Management Practices Associated with the Water-Energy Nexus



Theme 7: Develop Tools and Analysis to Inform Energy Policy and Planning Decisions

S7.1 Identify Pathways for Achieving California's Energy and Climate Goals

**S7.2 Increase the Resiliency of the Electricity System to Climate Change and
Extreme Weather Events**

**S7.3 Evaluate Strategies to Understand and Mitigate Impacts of the Electricity
System on the Environment and Public Health and Safety**



Theme 8: Catalyze Clean Energy Investment in California's Disadvantaged Communities

- SB350 takes steps to ensure California's clean energy transformation benefits all Californian's, especially those in the most vulnerable communities
- The SB350 Barriers Study identifies several recommendations – including recommendations for RD&D – to ensure disadvantaged and underserved communities have access to clean and affordable energy services
- The initiatives described in this theme seek to increase investment, deployment, and adoption of clean energy innovations in low-income and disadvantaged communities by:
 - Reducing knowledge gaps among decision makers looking to advance technology deployment in these communities
 - Demonstrating energy innovations and technologies that lead to sustained investments for low-income and disadvantaged communities
 - Developing new financial and business models that can mobilize private-sector energy investments



Theme 8: Catalyze Clean Energy Investment in California's Disadvantaged Communities

- S8.1 Inform Policy Efforts to Bring Low-Carbon Energy Solutions and Their Benefits to Low-Income Customers and Disadvantaged Communities
- S8.2 Demonstrate Emerging Clean Energy Technology Solutions in Disadvantaged Communities
- S8.3 Develop Innovative Strategies to Increase Clean Energy Investment in Disadvantaged Communities



S8.1 Inform Policy Efforts to Bring Low-Carbon Energy Solutions and Their Benefits to Low-Income Customers and Disadvantaged Communities

S8.1.1 Advancing the Information Infrastructure for California's Low-income and Disadvantaged Communities

- There is a lack of information on energy-usage in low-income and disadvantaged communities
- This lack of information limits decision makers' understanding of how to advance technology development in these communities
- This initiative will support continued public data and information collection as well as increase the state's analytical capacity to determine the most pressing market gaps for clean energy in low-income and disadvantaged communities



S8.2 Demonstrate Emerging Clean Energy Technology Solutions in Disadvantaged Communities

S8.2.1 Scaling ZNE and Building California's Resilient Neighborhoods in Low-income and Disadvantaged Communities

- One of the largest hurdles for expanding clean energy in low-income and disadvantaged communities is the lack of examples of successful clean energy demonstrations to serve as models for would-be adopters
- Insufficient means to design, finance, and implement clean energy technologies, especially for retrofitting projects or community-scale projects, further impedes wide-spread customer adoption in these communities
- This initiative will demonstrate flexible and adaptive ZNE, or near ZNE, design packages in low-income and disadvantaged communities that include energy efficiency, renewable energy, demand response, and energy storage applications



S8.3 Develop Innovative Strategies to Increase Clean Energy Investment in Disadvantaged Communities

S8.3.1 The Inclusive Development through Equitable Adoption (IDEA) Challenge

- Driving California's clean energy economy will require innovative solutions to the financial barriers burdening low-income and disadvantaged communities
- The immature clean energy markets for low-income and disadvantaged communities raise a host of financing concerns that must be de-risked in order to bring in capital
- This initiative will launch a new Prize-based Competition that will challenge project teams to design innovative and inclusive financial models providing for more flexible, sustainable flows of capital to help overcome barriers to clean energy adoption and deployment in low-income and disadvantaged communities



Public Comments

Questions for Theme 8

- 1. What clean energy technologies do you feel would bring the most benefits to your community?**
- 2. For demonstration projects where a system will be installed and tested, how would community members like to participate in the project (design to implementation)?**
- 3. What are the best ways to get information to your community about upcoming projects and opportunities?**



Submitting Written Comments

Submit written comments via the e-Comment system for Docket 17-EPIC-01:
<https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=17-EPIC-01>

Draft Funding Initiatives and Today's Presentation can be found here:
<http://www.energy.ca.gov/research/epic/17-EPIC-01/documents/>

Submit Comments by 5:00pm on March 29, 2017.

For more information, e-mail Anthony Ng at: anthony.ng@energy.ca.gov