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California Energy Commission

Integrated Energy Policy Report Workshop - Building Decarbonization

Virginia Lew, Manager, Energy Efficiency Research Office

May 25, 2021

California's Investment in Clean Energy Innovation



Entrepreneurial Ecosystem



Building Decarbonization



Grid & Natural Gas System Decarbonization



Industrial & Agriculture Innovation



Resiliency & Safety



Low Emission Transportation



Energy R&D Funding Programs



Core mission: strategically invest funds to catalyze change and accelerate achievement of policy goals

- Electric Program Investment Charge (EPIC),
\$133 million annually
- Natural Gas Research, Development and Demonstration Program,
\$24 million annually

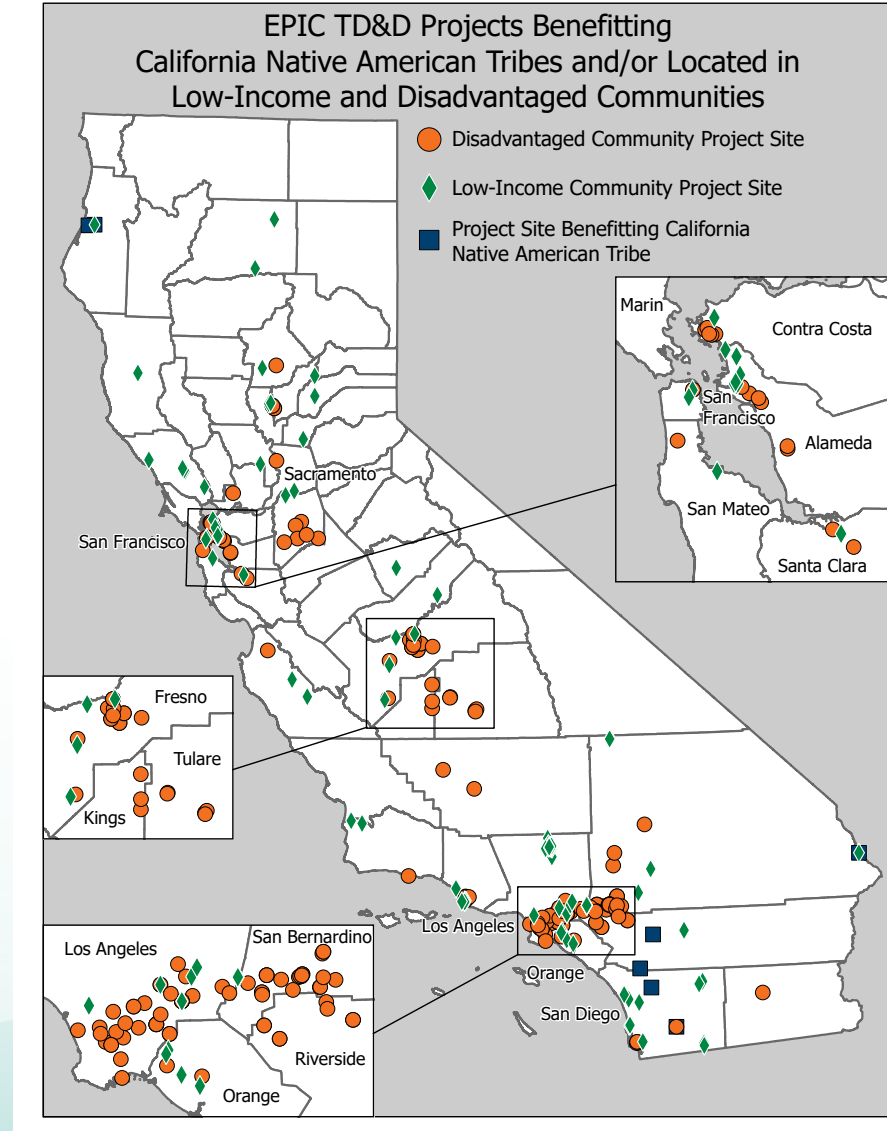
<https://www.energy.ca.gov/programs-and-topics/programs/electric-program-investment-charge-epic-program>
<https://www.energy.ca.gov/programs-and-topics/programs/natural-gas-program>



Underresourced Communities

Affordability & Equity

- Lower energy burden
- Support vulnerable communities
- Address challenges
- Reduce costs
- Increase access to clean energy technologies
- 68% of tech demonstration investments in underresourced communities





Residential HVAC Advancements



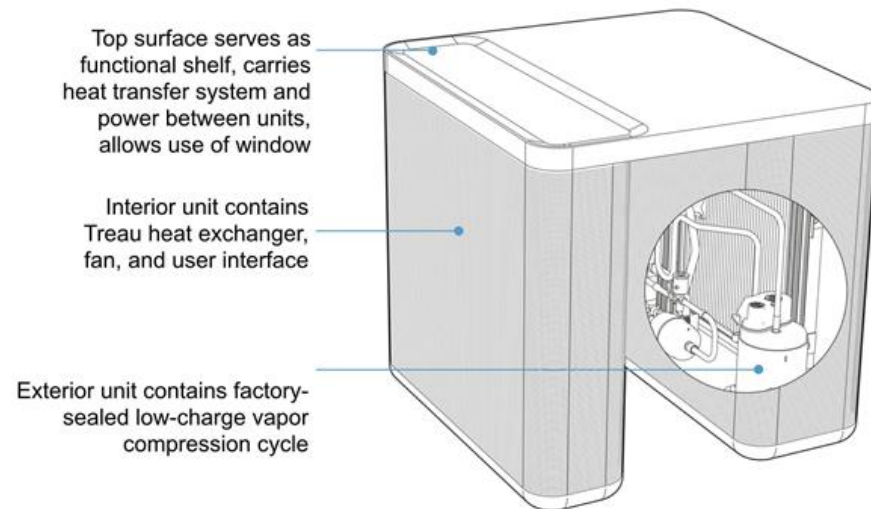
Advanced Heat Pumps (EPRI)

- Reduce cooling energy by 22-32%
- Provide over 90% annual heating load



Mechanical Modules (Rocky Mountain Institute)

- Integrated HVAC and hot water heater, controls and real time energy monitoring
- Designed for mass production & installation



Low GWP Heat Pumps (Treau)

- Low cost polymer heat exchanger
- Easy to install
- 30% reduction in energy use
- Reduce greenhouse gas emissions by 50%

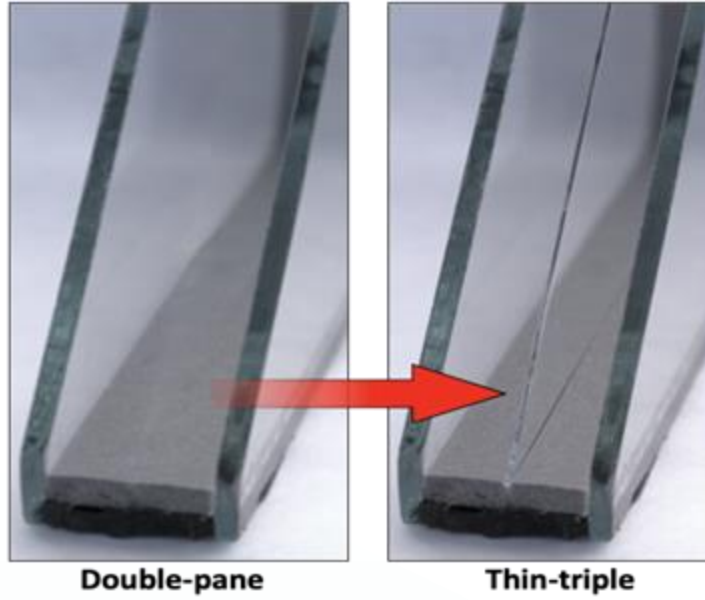


Envelope Improvements



Streamlined Retrofits (Rocky Mountain Institute)

- Prefabricated exterior envelope panels
- Less than one week to seal and insulate
- More than 20% reduction in HVAC energy use



Thin Triple Pane Windows (LBNL)

- Same size and weight as double pane windows
- Same thermal performance as traditional triple pane windows
- \$450-\$650/window installed

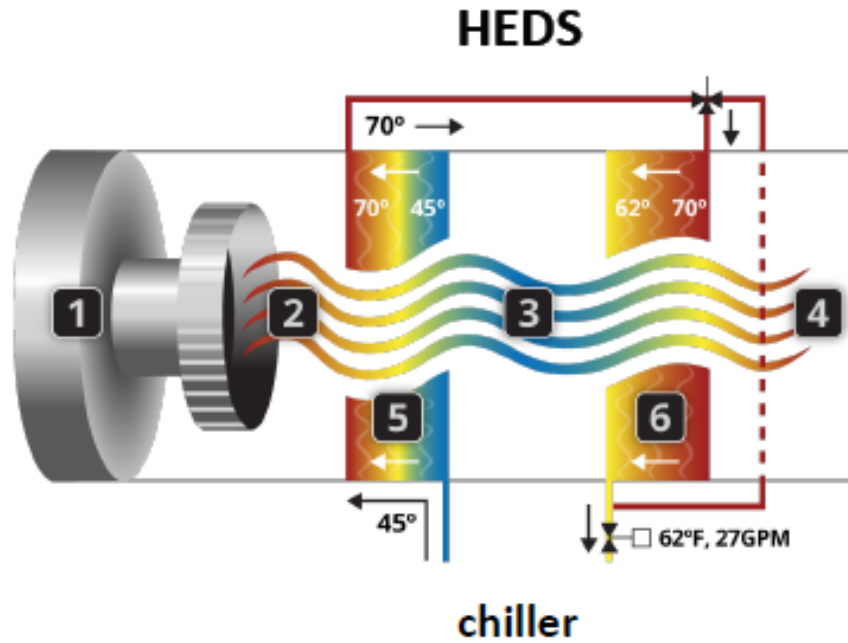


PV Embedded in Windows (Ubiquitous Energy)

- PV absorbs UV and IR radiation to generate energy
- Visible light to pass
- Reduce solar heat gain



Commercial Buildings



Decarbonizing Healthcare Guidebook

- Demonstrate a cost-effective novel dehumidification process,
- **Reduce or eliminate the need for reheat**
- Goal of 24% reduction on cooling load

- Identifies emerging energy efficiency equipment, systems, and improvements
- Provides a clear path to decarbonizing the healthcare industry
- **Interactive online platform**
website: <https://decarbhealthcare.com/>



Los Angeles disadvantaged community to host the largest advanced energy community built on blockchain

By Joseph Ronson - May 15, 2020 854 0

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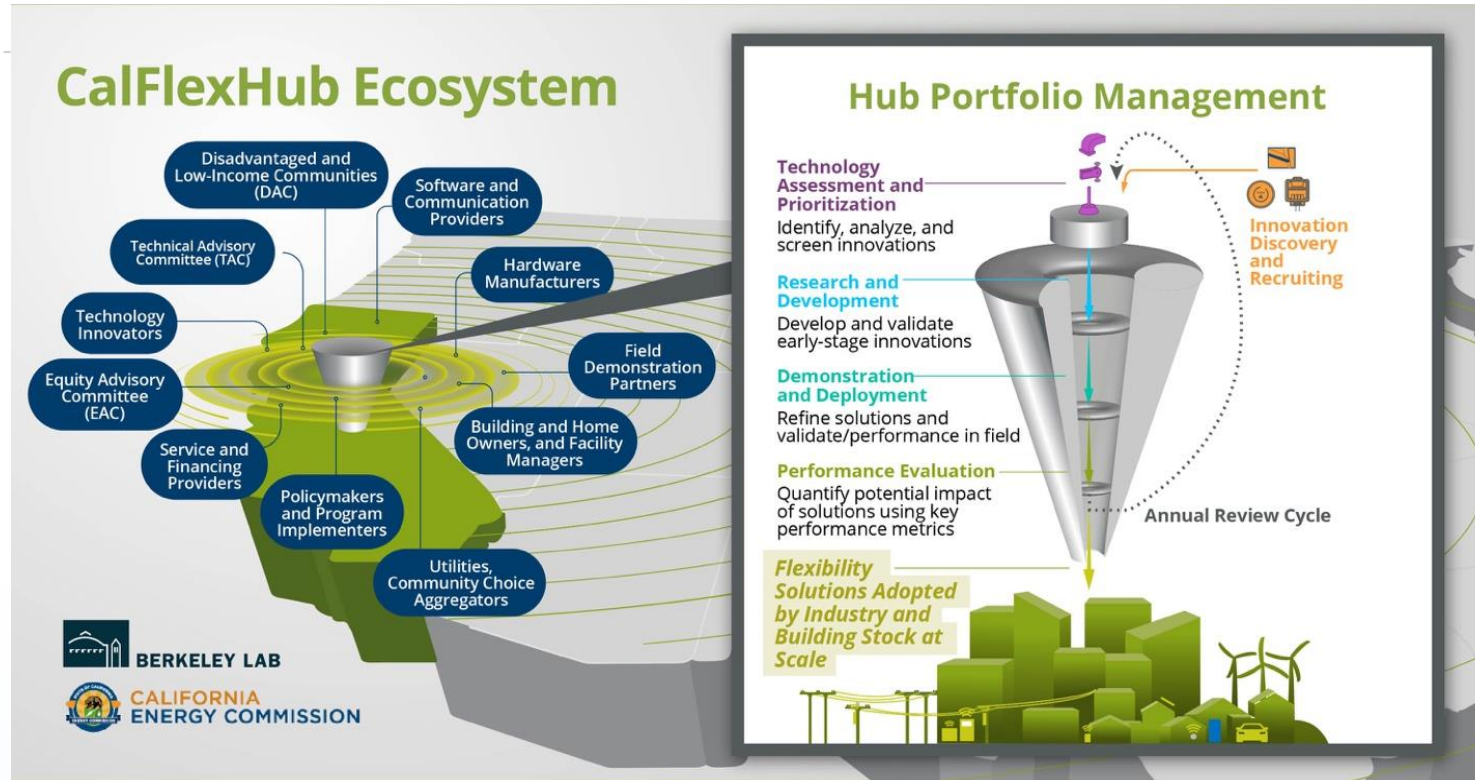


Richmond Advanced Energy Community Project Partners -- led by the Richmond Community Foundation, ZNE Alliance, the City of Richmond, Energy Solutions, and Mechanics Bank -- celebrate the construction of a Zero Net Energy Home

Basset-Avocado Heights and Richmond



California Load Flexibility Hub



Objectives:

- Create price and GHG signal communication system
- Develop technology solutions
- Engage industry stakeholders
- Conduct an annual review
- Define solutions and how to scale deployment

Initial Projects:

- Combined HVAC (HP) and HPWH
- Energy storage
- Energy management systems
- VGI
- Integrated solutions



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Over 30% of prime or subcontractor recipients are women, minority, disabled veteran, or LGBT owned



Ideas for Building Decarbonization Research?

- Electric Program Investment Charge program
 - Developing 4-year investment plan
 - Upcoming workshops planned for June and July to obtain stakeholder input on potential technology gaps that could be addressed with research. Potential topics:
 - Hydrogen roadmap
 - Load flexibility and distributed energy resources
 - Building and industrial decarbonization
 - Offshore Wind
 - Energy Storage
 - Entrepreneurial Ecosystem
 - Sign up for notifications at: [Electric Program Investment Charge Program - EPIC | California Energy Commission](#)



Thank You!

