

ET Summit 2022

Presented by



Integrating Office Building DERs Using Price Responsive Controls

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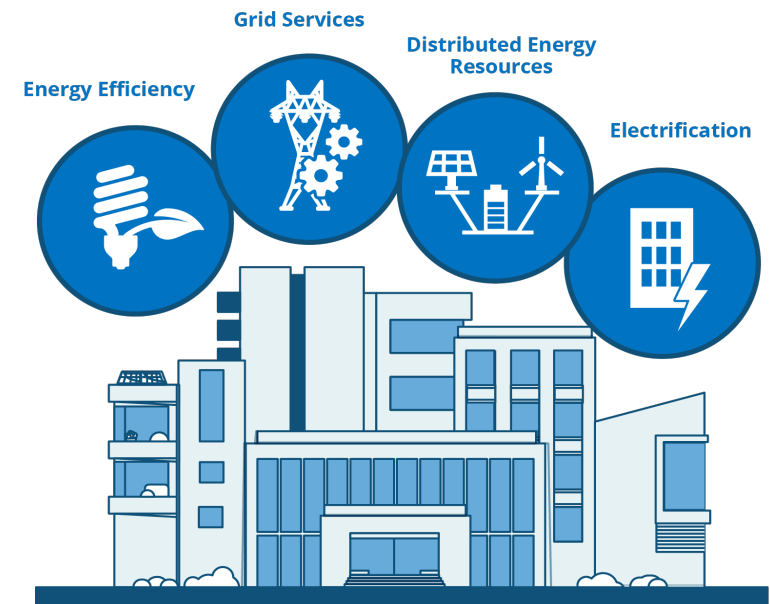
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CalFlexHub

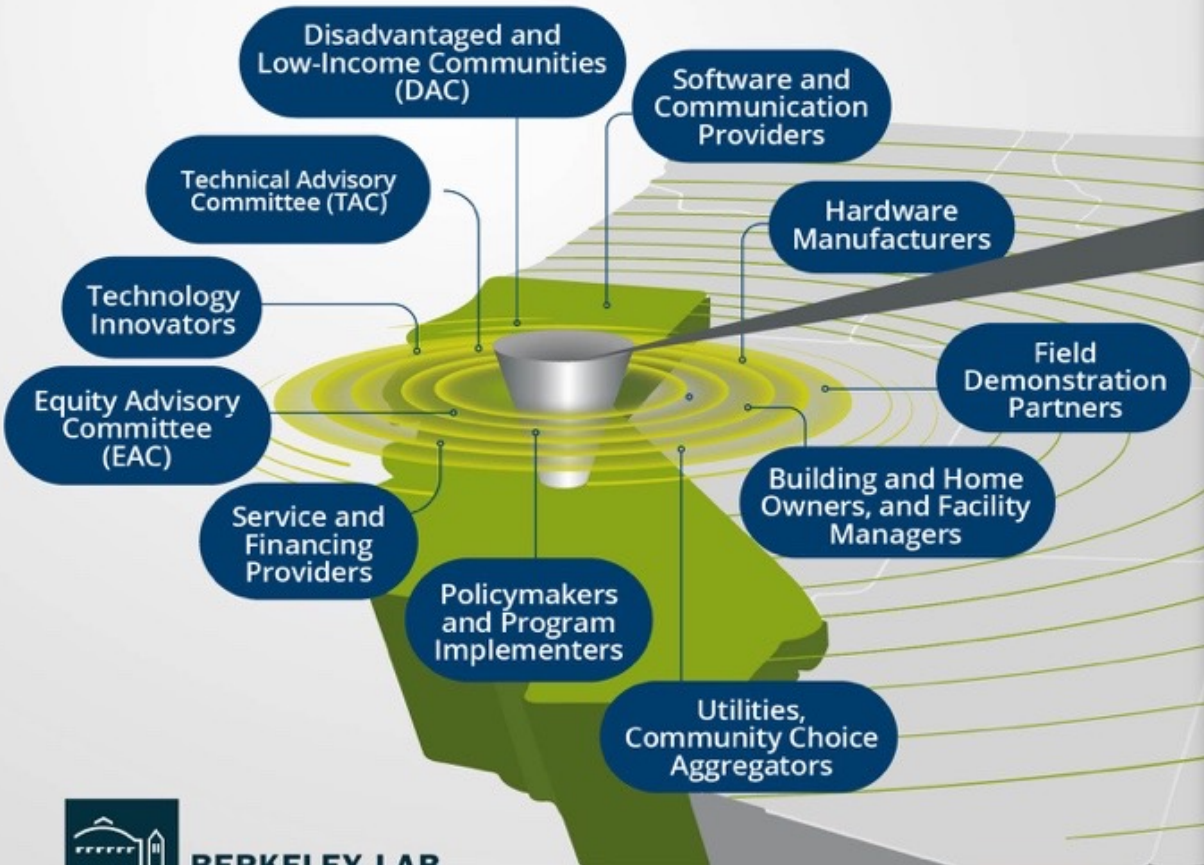
Office Buildings can Support a Decarbonized Grid

	Load Impact	Example Measure
Efficiency		Building has an insulated, tight envelope and an efficient HVAC system to reduce heating/cooling energy needs
Shed Load		Building dims lighting system by a preset amount in response to grid signals while maintaining occupant visual comfort levels
Shift Load		Connected water heaters pre-heat water during off-peak periods in response to grid signals
Modulate		Batteries and inverters autonomously modulate power draw to help maintain grid frequency or control system voltage
Generate		Rooftop solar PV dispatches electricity to the grid

Shift energy use to times of day when electrons are cleanest; shed load to reduce peak demand



CalFlexHub Ecosystem



Hub Portfolio Management

Technology Assessment and Prioritization
Identify, analyze, and screen innovations

Research and Development
Develop and validate early-stage innovations

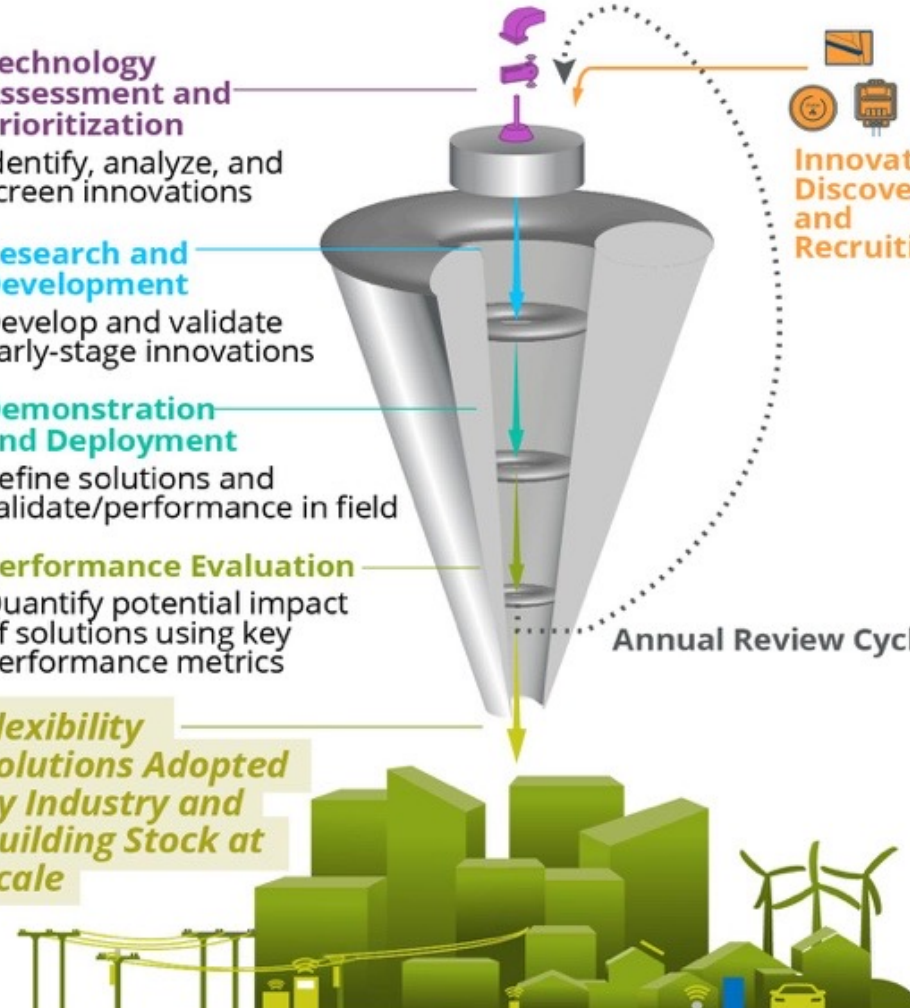
Demonstration and Deployment
Refine solutions and validate performance in field

Performance Evaluation
Quantify potential impact of solutions using key performance metrics

Flexibility Solutions Adopted by Industry and Building Stock at Scale

Innovation Discovery and Recruiting

Annual Review Cycle



CalFlexHub seeks to

Advance the capability of buildings to provide a flexible electricity load for the State of California.

- Identify, evaluate, develop, and demonstrate pre-commercial, load-flexible pre-commercial technologies
- Standardize the signals used to communicate dynamic price and GHG information to these technologies
- Emphasis is Load Shaping DR but CalFlexHub may also evaluate supply-side DR



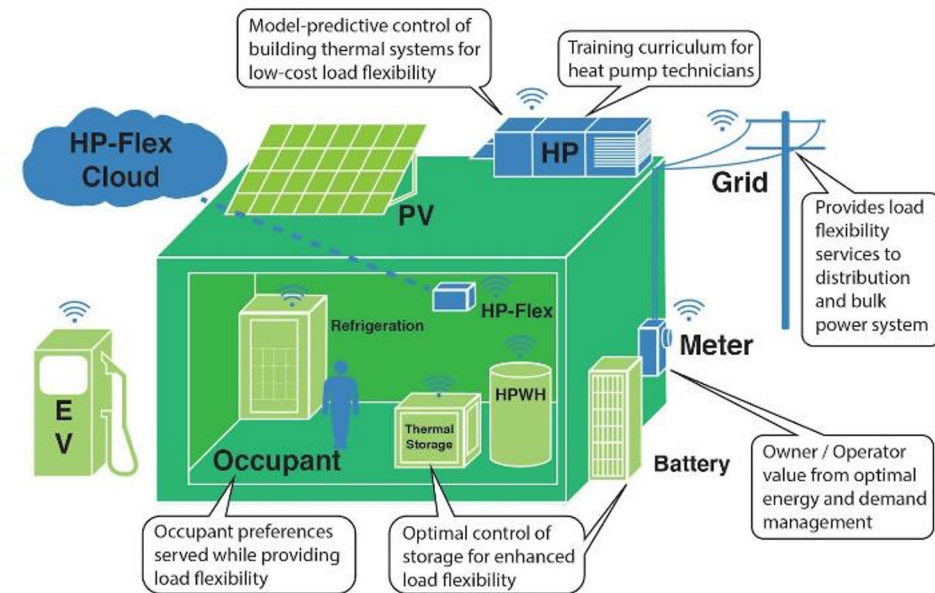
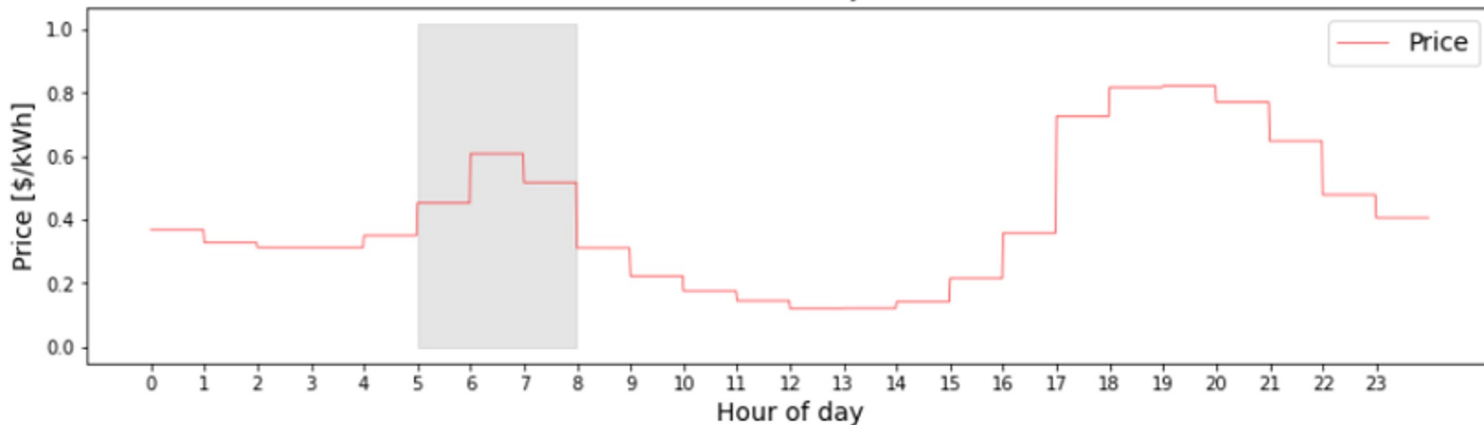
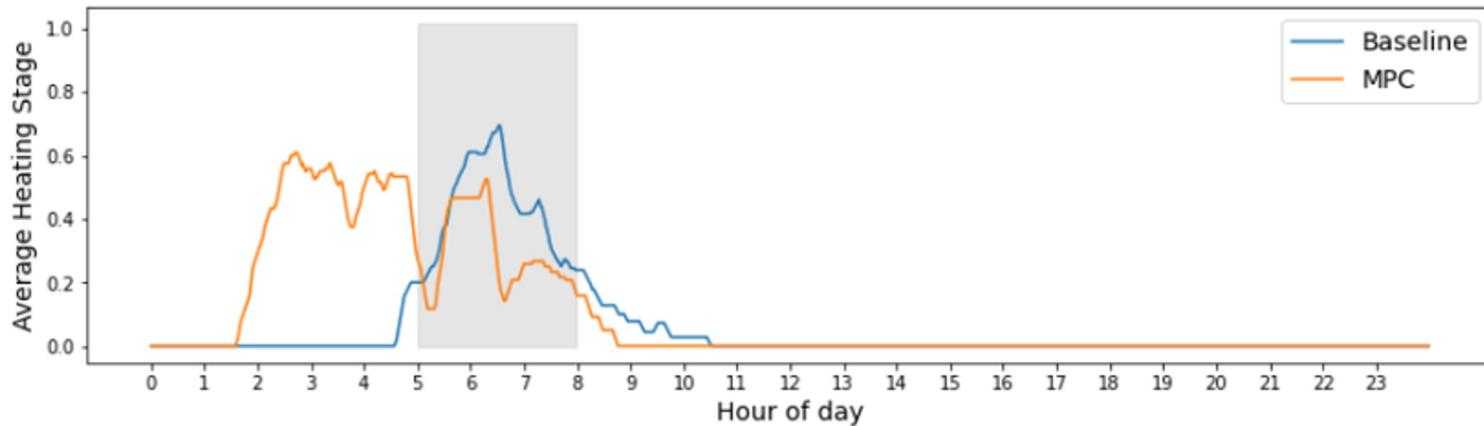
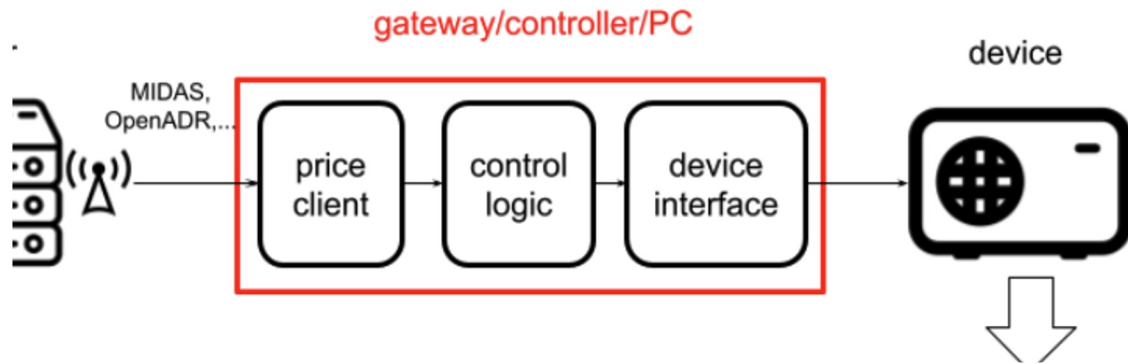
5000 ton chiller plant, 2 M gallon TES



4 MW solar farm



Example of R&D, Dynamic Heat Pump Control for Small Commercial HVAC



Final Thoughts

- California is leading the country developing and demonstrating technology to decarbonize buildings, integrate with grid, and provide value to owners.
- California is making RDD&D investment in using dynamic prices to incentivize demand flexibility and DERS.
- Researchers and practitioners need to share data on what works, new business models, and integrating controls and communication systems.
- Equity opportunities are important considering disadvantaged communities and small businesses, plus workforce development.

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The project web site can be found at CalFlexHub.lbl.gov.