

A nighttime aerial view of a city skyline, likely San Francisco, with numerous skyscrapers illuminated against a dark blue sky. The lights from the buildings create a vibrant, glowing effect.

# Introduction to the California Load Flexibility Research and Deployment Hub

Presentation to the EPIC Annual Symposium  
***Session - Developing and Testing Innovative Load Flexible Technologies and Strategies for Grid Support***

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**Mary Ann Piette**

*Division Director, Building Technology and Urban Systems*

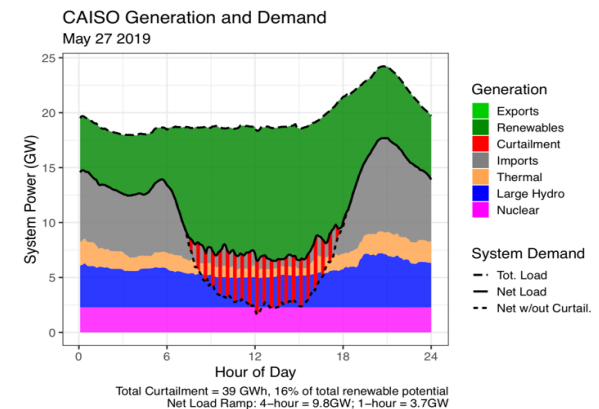


ENERGY TECHNOLOGIES AREA

# The California Load Flexibility Research and Deployment Hub 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 will also evaluate Supply-Side DR



# The Solution:

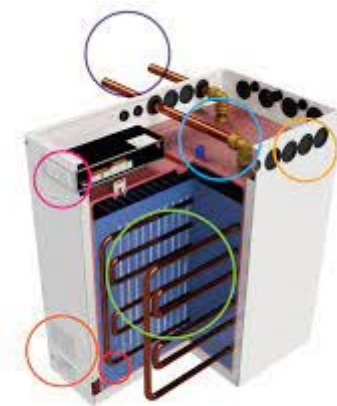
## Prices To Devices

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A future where building loads receive continuous price information and adjust their electricity consumption automatically for maximum affordability, reduced carbon content, or a mixture of both.

Signals will include Watt Time green house gas signals.

Assume the future will include grid-informed tariffs: TOU, CPP, RTO



# Technologies Required in CalFlexHub Spread Across 12 Projects

		Sector*	HP water heaters	Refrigeration	HVAC controls	Ductless HP	Pool and spa	EV charging	Plug load	Electric batteries	Thermal storage	HEMS
<b>Applied Research and Development (ARD) Projects</b>												
A1	Residential Smart Fan with Integrated Thermostat	SF, SC, MF			X							
A2	Dynamic Heat Pump Design and Control for Residential Space Heat and DHW	SF, MF	X		X							
A3	Dynamic Heat Pump Design and Control for Small Commercial HVAC	SC			X	X						
A4	Integrated Heat Pump and Cold Storage for Small Commercial HVAC	LC			X						X	
A5	Model Predictive Control for Dynamic Large Commercial and District Energy Systems	LC, CC			X			X	X		X	
A6	Home Energy Management System to Maximize Electrical Panels with Electric Storage	SF										X
<b>Technology Demonstration and Deployment (TDD) Projects</b>												
T7	Integrated Small Commercial Energy Management with DERs	SC			X					X		
T8	Integrated Heat Pump with Storage for DHW and Space Conditioning	SF	X		X	X						
T9	Residential HVAC and Hot Water Using Integrated Storage	SF	X		X	X					X	
T10	Household Flexible EV Charging	SF						X				
T11	Bi-Directional EV Charging	SF, LC						X				
T12	Control and Coordination of Distributed Flexible Loads	SF, SC, LC, MF	X	X	X		X	X		X	X	

\*Sectors: SF - Single Family, MF - Multi-Family, SC - Small Commercial, LC - Large Commercial, CC- Connected Community

