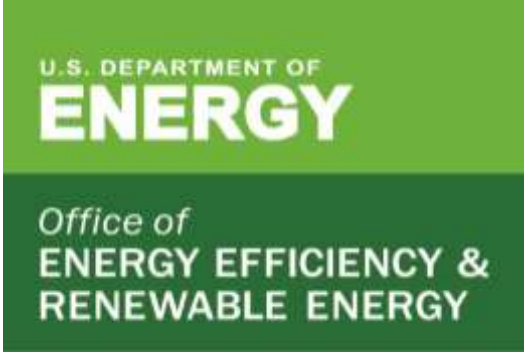


FRAMEWORK FOR THE FUTURE

Sue Coakley, NEEP, moderator & presenter

Doug Smith – ISO – New England

Michael Li – US Department of Energy

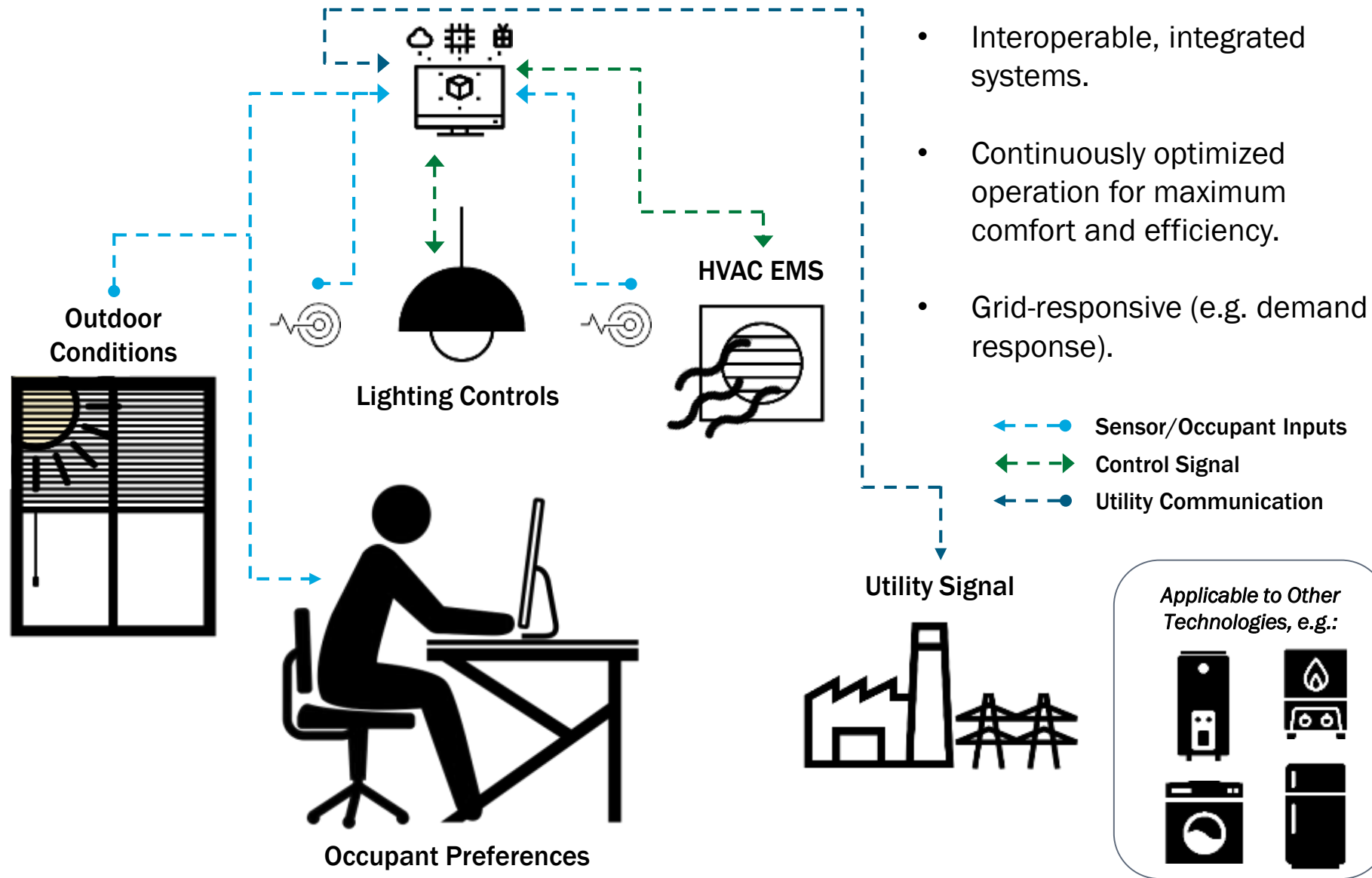


Grid-interactive Efficient Buildings

Michael Li
November 7, 2018



Technology enabling flexible building loads



Potential benefits of flexible building loads



Energy affordability



Improved reliability



Reduced grid congestion



Enhanced services



Environmental benefits



Customer choice

Grid services that can be provided by buildings

Grid Service	Building Load Change	Size of Market Addressable by Buildings
Generation Services		
Reduce Generation Capacity Costs	Building reduces or shifts demand during the generation balancing area's annual peak demand period(s)	Large
Reduce Generation Operating Costs	Building reduces or shifts demand to reduce electricity needs during high-cost periods and improve utilization of low-cost generation	Large
Provide Contingency Reserves	Building reduces its power demand within approximately 10-30 minutes of a signal from the grid operator to make up for a shortfall in electricity supply	Moderate
Delivery Services		
Reduce Transmission Capacity Costs	Building reduces or shifts demand at a time that reduces local transmission delivery constraints	Moderate
Reduce Distribution Capacity Costs	Building reduces or shifts demand at a time that reduces local distribution delivery constraints	Moderate

**Other grid services such as frequency regulation and voltage support can be provided by buildings but have a smaller potential given size of market and competing technology options*

BTO's grid-interactive efficient buildings portfolio

VALUATION ANALYSIS

Key Question: How do time & the interaction of flexibility options impact value / improve affordability?



Outcome: Identify values to stakeholders, quantification of national value.

OPTIMIZATION

Key Question: How to optimize for flexibility while maintaining or improving building operation / occupant comfort / productivity?



Outcome: Solutions that meet grid operator & building occupant needs.

TECHNOLOGY OPTIONS

Key Question: Which end use technologies provide solutions to specific grid needs?



Outcome: Prioritize technologies / solutions based on grid services.

VALIDATION

Key Question: Do technologies perform as predicted / meet grid operator & building occupant needs?



Outcome: Verification of technologies / strategies, increasing confidence in the value of energy flexibility.

Questions?

Michael Li: michael.li@ee.doe.gov

Monica Neukomm: monica.neukomm@ee.doe.gov

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