Better Buildings®
SUMMIT

AUGUST 21-23, 2018 • CLEVELAND, OHIO

Look Who's Talking: Buildings and The Grid Roundtable

Wednesday, August 22, 2018

10:30am - Noon

Energy Exchange | Better Buildings SUMMIT

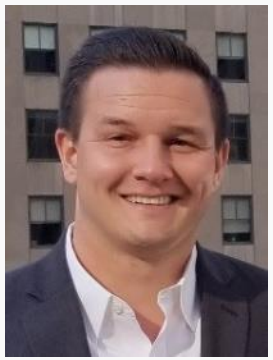
Look Who's Talking: Buildings and The Grid Roundtable

Panelists:

Asim Haque
Chairman,
Public Utilities
Commission of Ohio

Janice Berman
Pacific Gas & Electric

Douglas Rath
Marriott
International



Gregg Fischer
Tishman Speyer

Moderator:

Clay Nesler
Johnson Controls

David Nemtzow
U.S. Department
of Energy

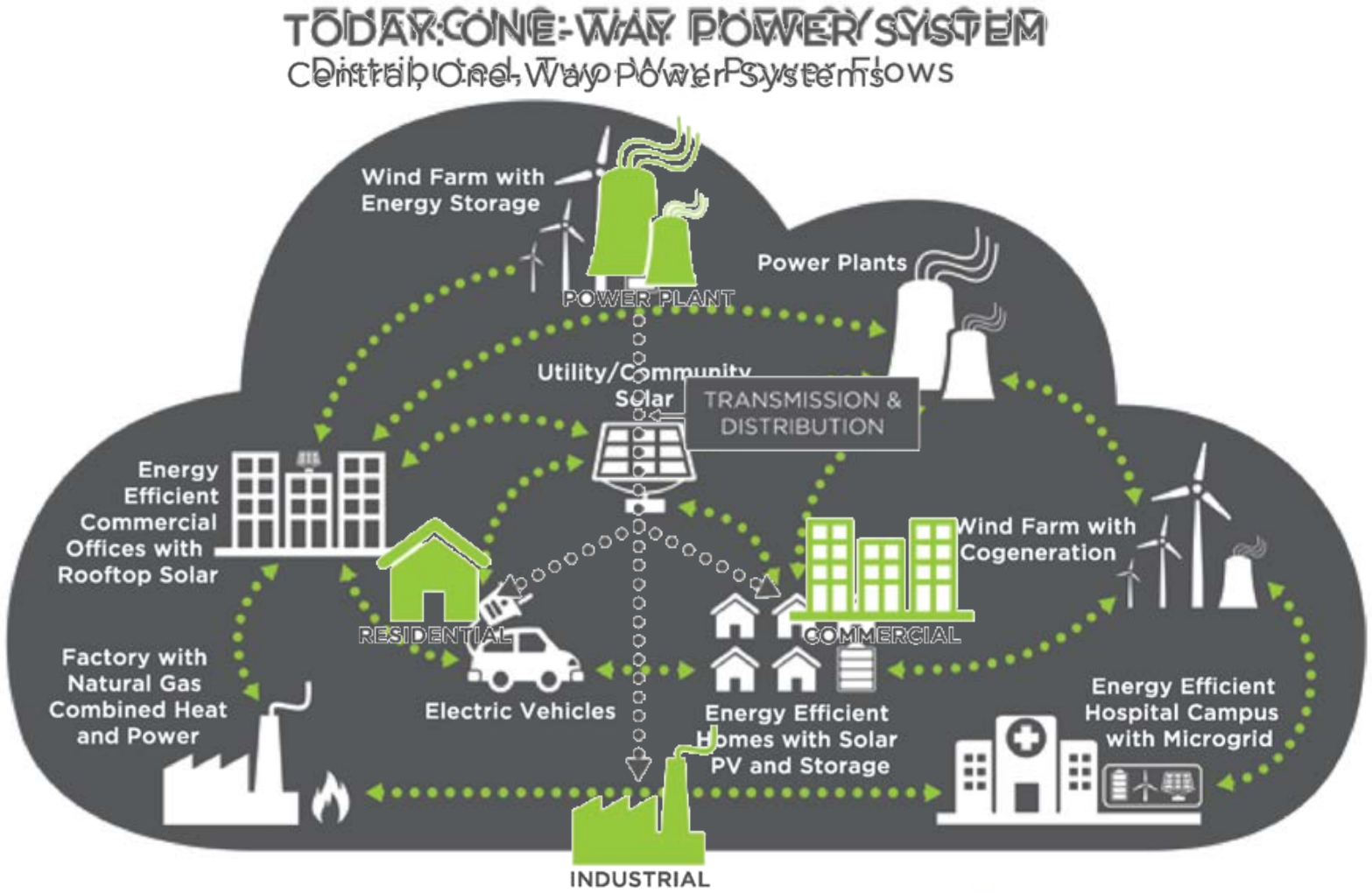
Energy Exchange | Better Buildings SUMMIT

David Nemtzow

US DOE Building Technologies Office

Energy Exchange | Better Buildings SUMMIT

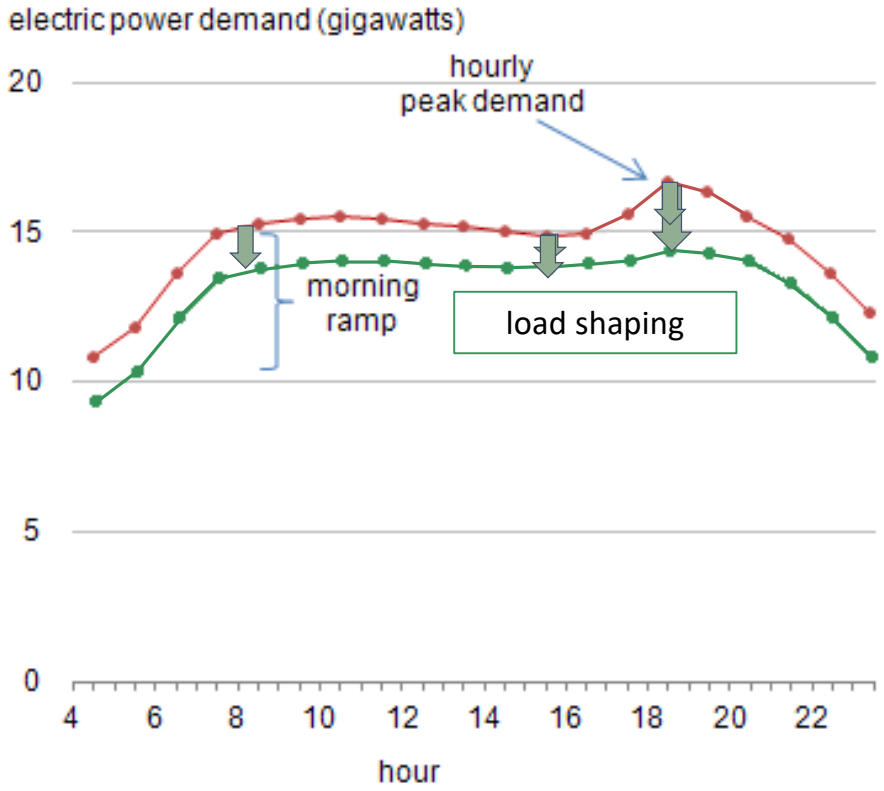
Moving Towards the Grid of the Future



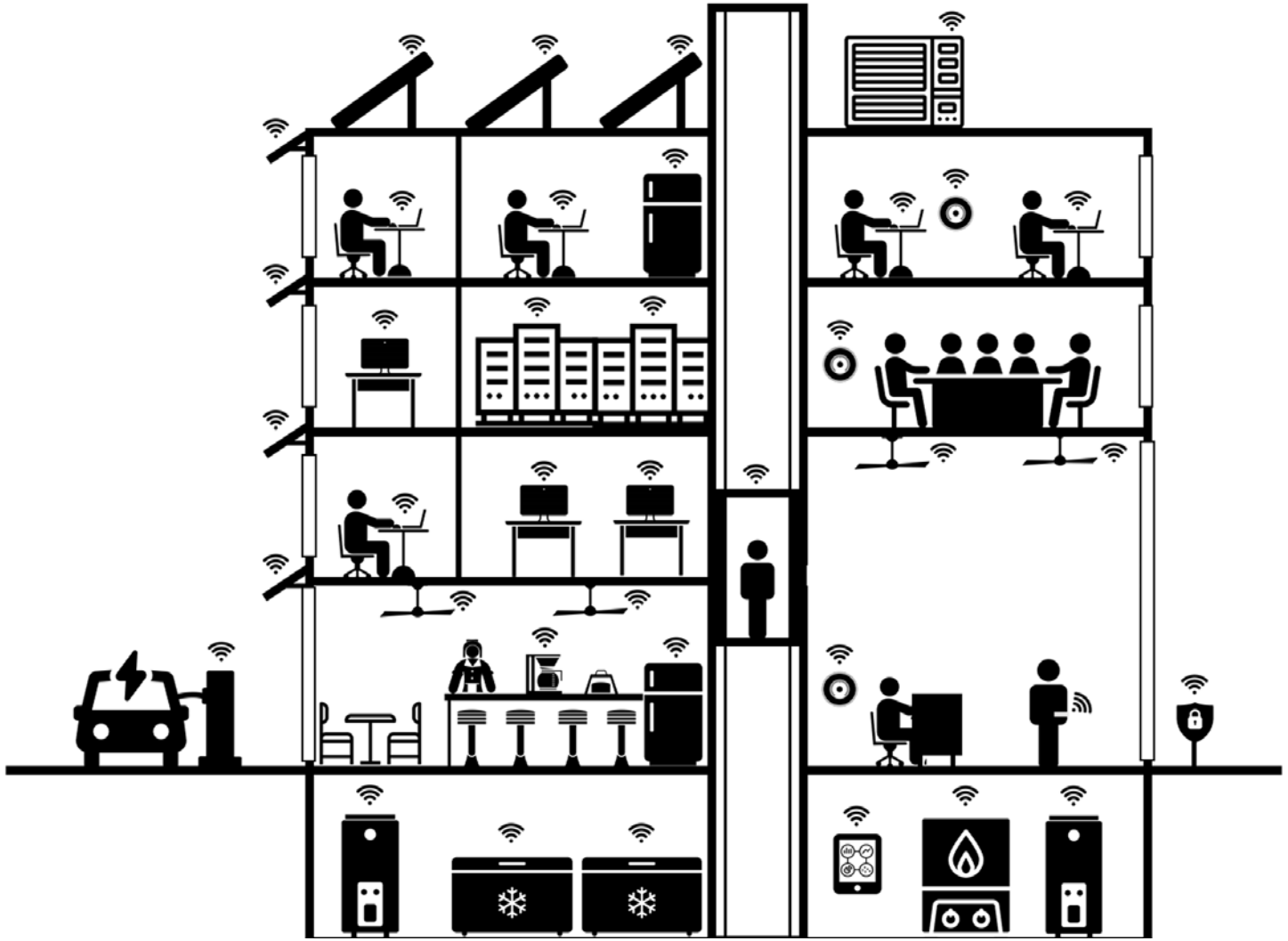
Energy Efficiency can be a Key Responsive Grid Resource

EE removes loads from the grid, reducing energy supply required

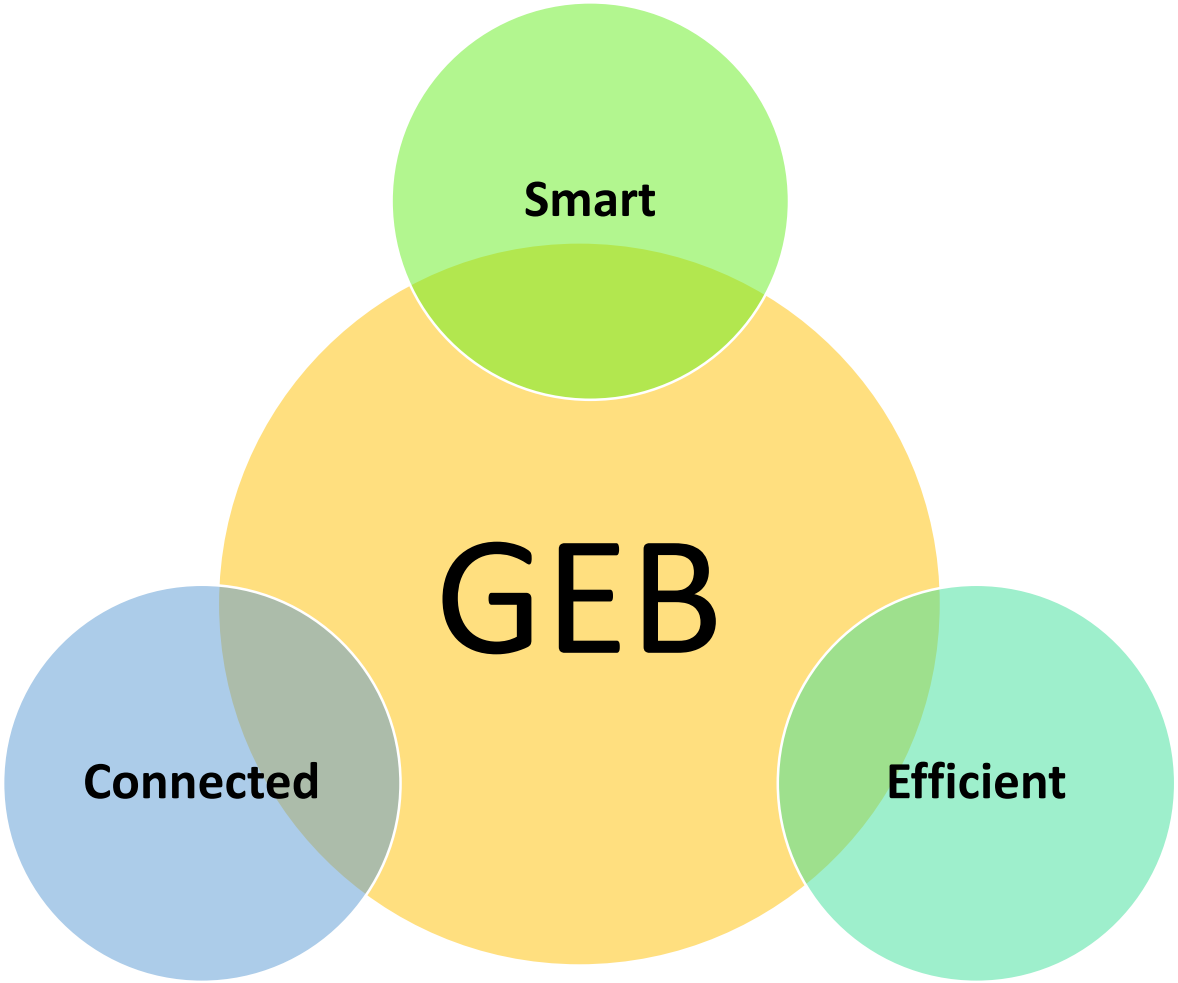
- Defers or reduces investments in new electric generation capacity or the T&D system
- Reduces peak demand and the strain placed on existing T&D infrastructure



The Modern – and thus Connected – Building

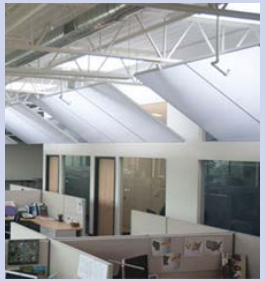


Grid-interactive Efficient Buildings (GEBs)



- ✓*Lowers* total electricity demand
- ✓*Flattens* peak demand
- ✓*Flexibly* aligns with variable renewables (considers load *net* of renewables)

Examples of grid-interactive efficient technologies

	Passive	Active	Connected	Performance
Lighting	Daylighting 	LED Lighting 	Lighting Controls 	***Optimized Lighting:*** • Minimized Energy Consumption • High Occupant Comfort • *Low* Ability to Provide Grid Services
Storage/ storage-like	Phase Change Materials 	H_2O-Based Thermal Storage 	Controllable Multi-Speed HVAC 	***Optimized Comfort:*** • Minimized Energy Consumption • High Occupant Comfort • *High* Ability to Provide Grid Services

Chairman Haque

Public Utilities Commission of Ohio

Energy Exchange | Better Buildings SUMMIT

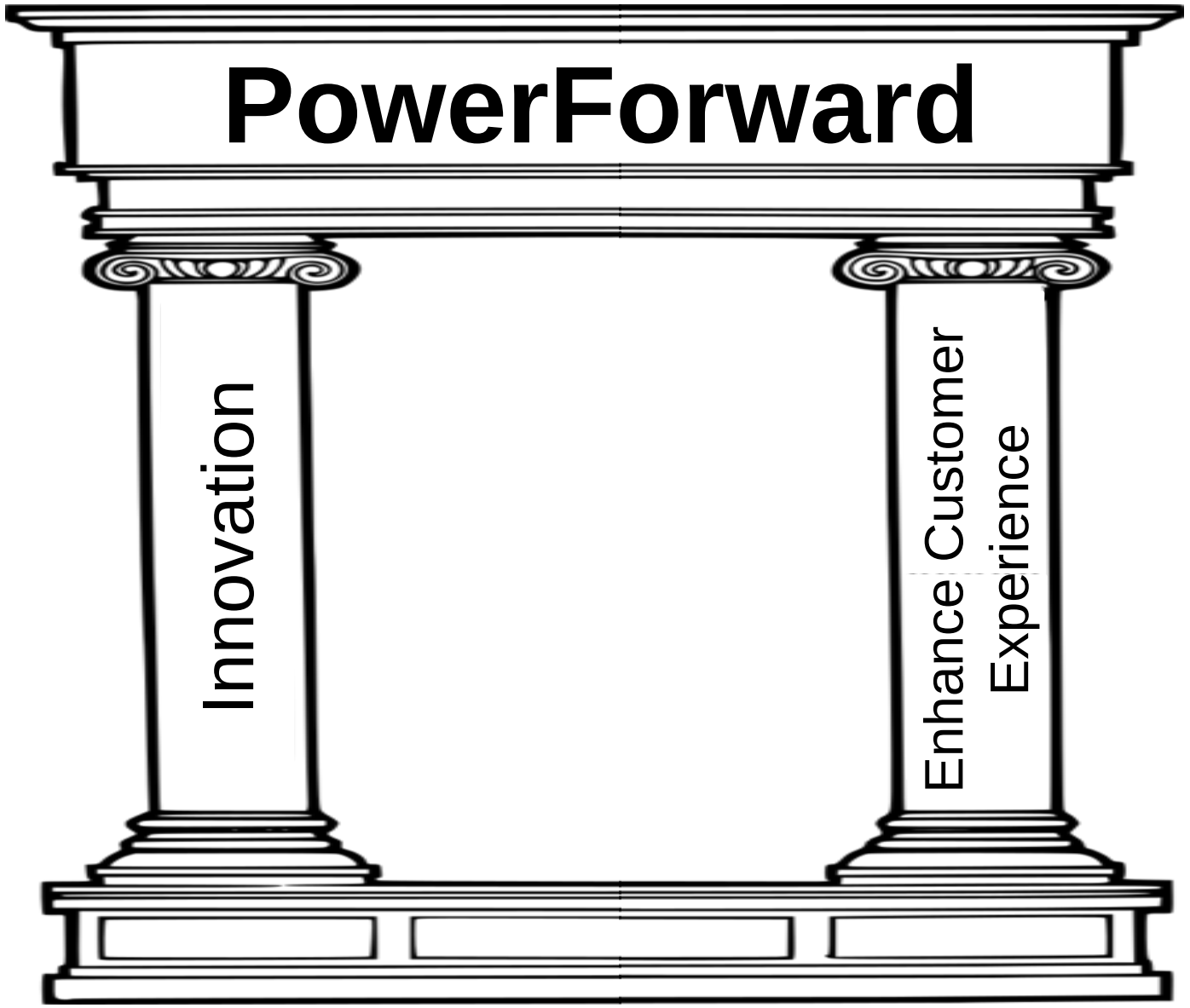
Ohio | Public Utilities Commission

PowerForward:
Ohio's Grid Modernization Initiative

August 22nd, 2018

Asim Z. Haque, Chairman

Public Utilities Commission of Ohio

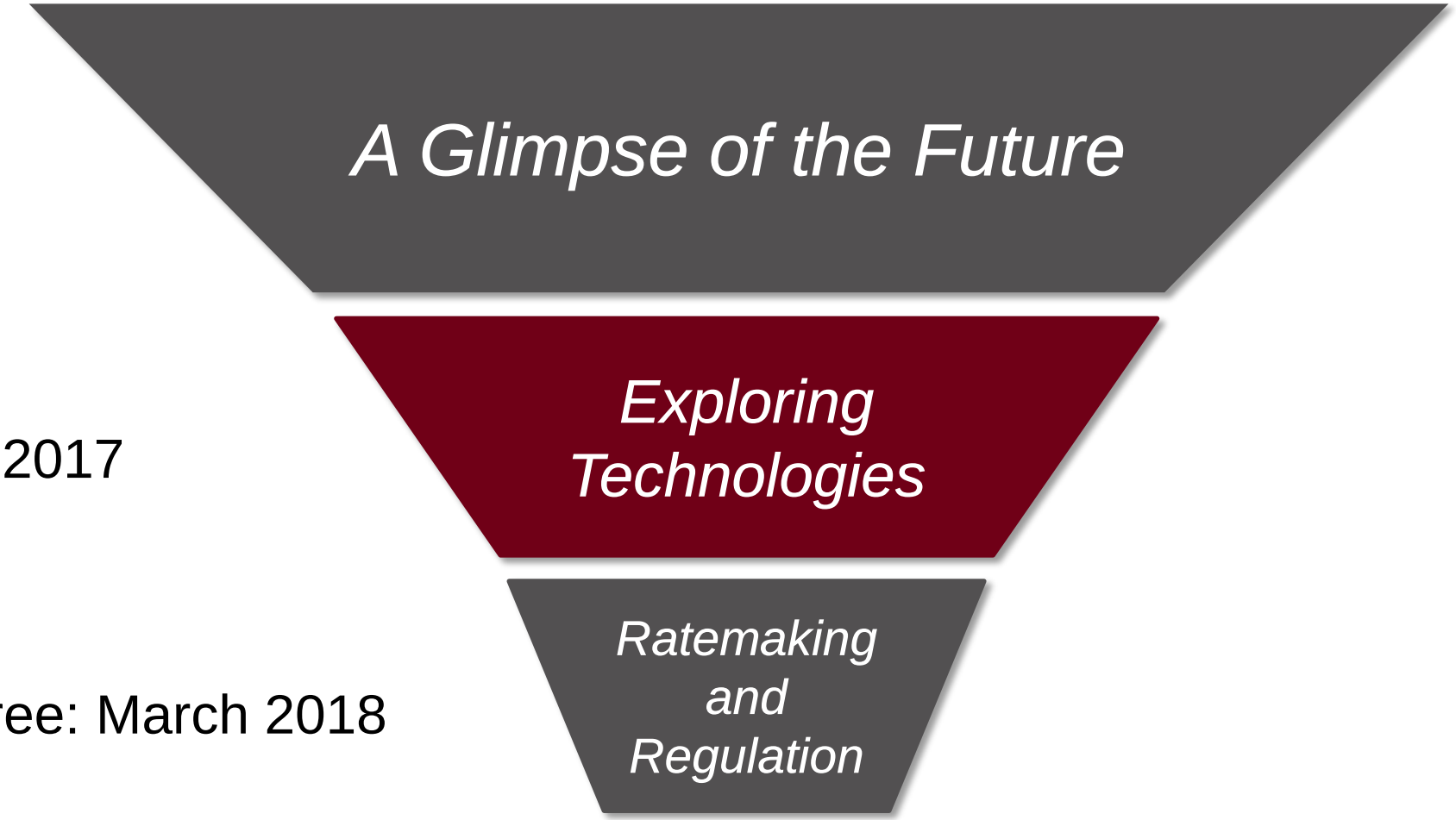

PowerForward
Innovation
Enhance Customer Experience

Collaborative Process

Phase One: April 2017

Phase Two: July 2017

Phase Three: March 2018



Janice Berman

Pacific Gas & Electric

Energy Exchange | Better Buildings SUMMIT

Better Buildings *August 22, 2018*

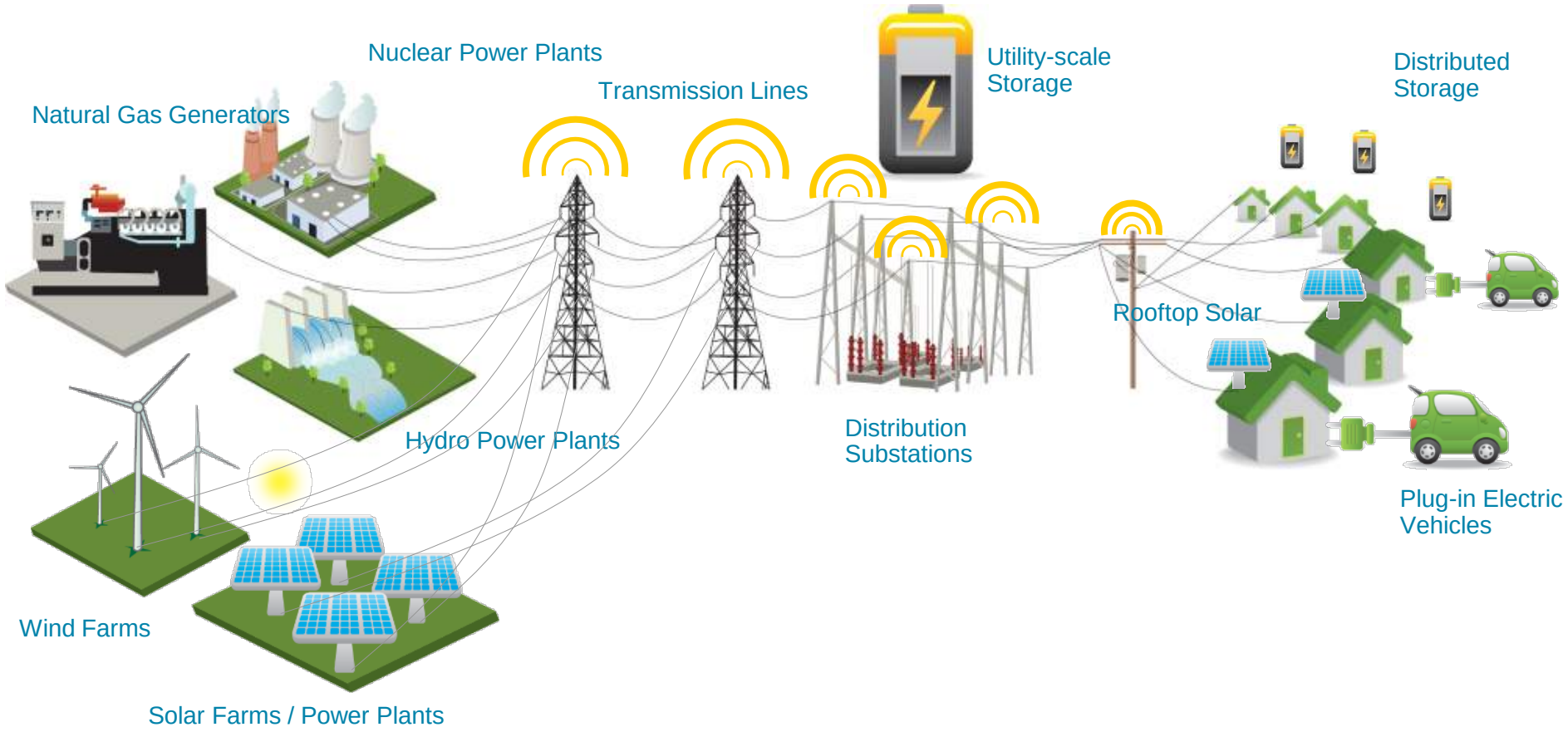
PG&E's Grid Integration and Innovation Mission

Design, test, and integrate innovative solutions to accelerate PG&E's transition to the sustainable grid of the future

Electric Grid Evolution

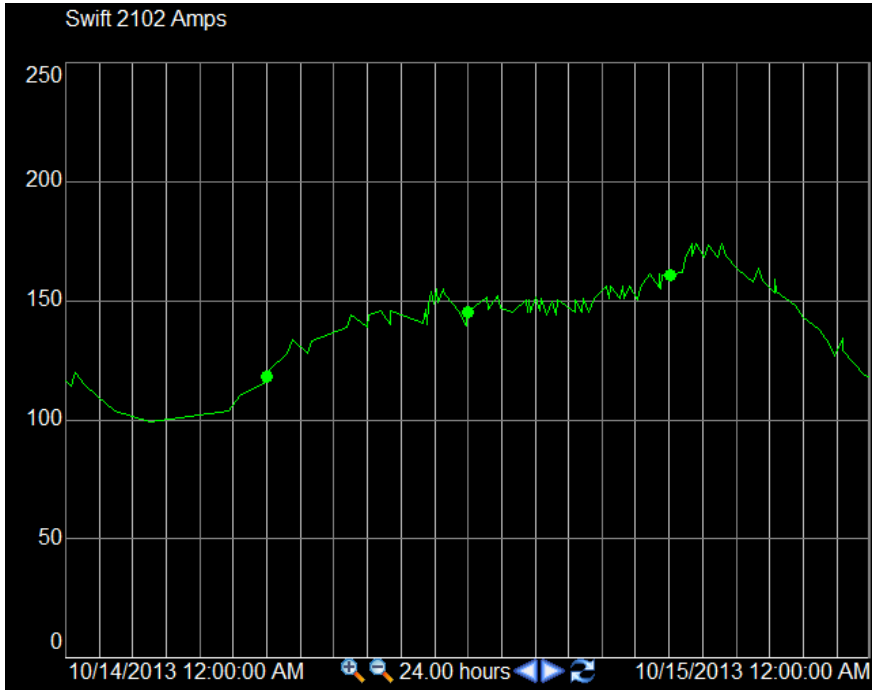
The grid has operated by transporting electricity in one direction, from generation through transmission and distribution lines to customers. Times are changing.

Power Plants	Electric Grid	Customers

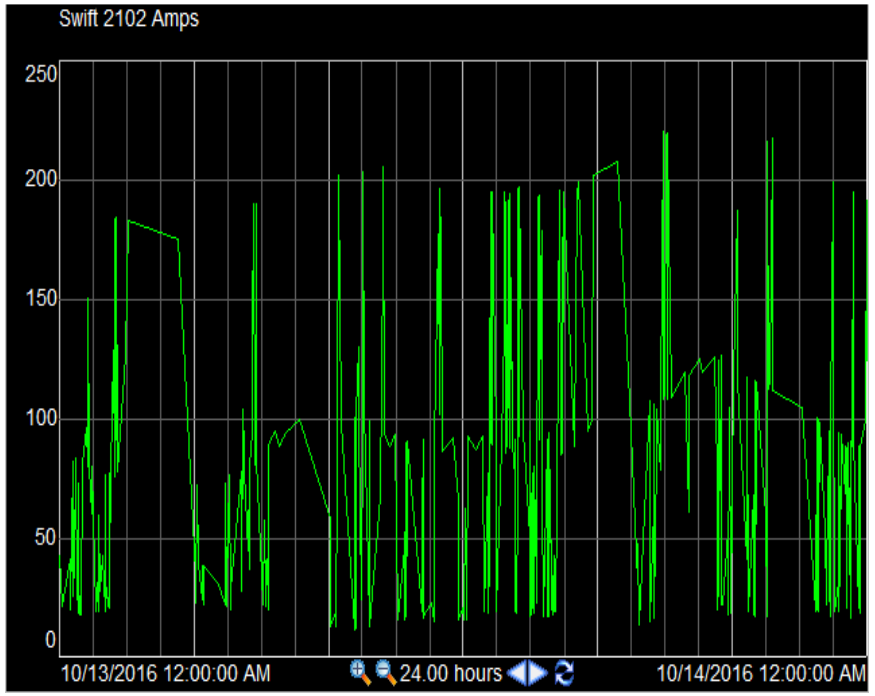


Distributed Energy Resources are Changing Grid Operations

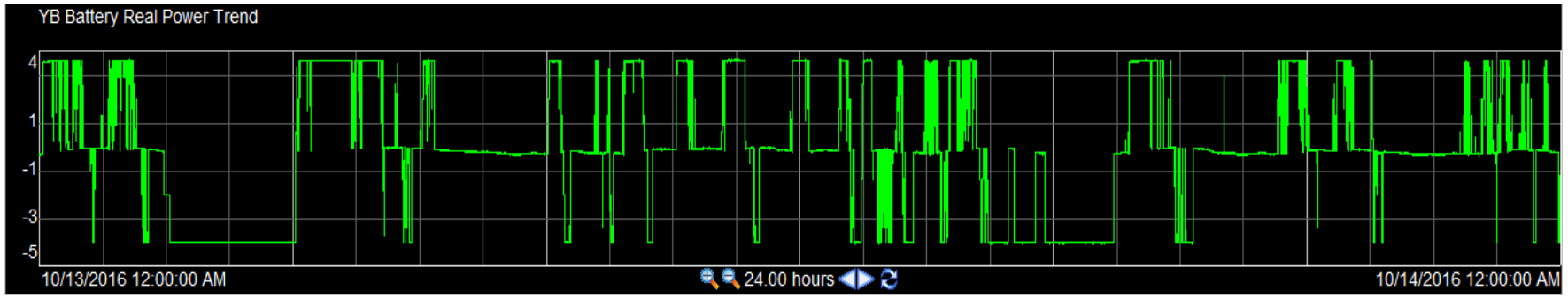
October 2013



October 2016

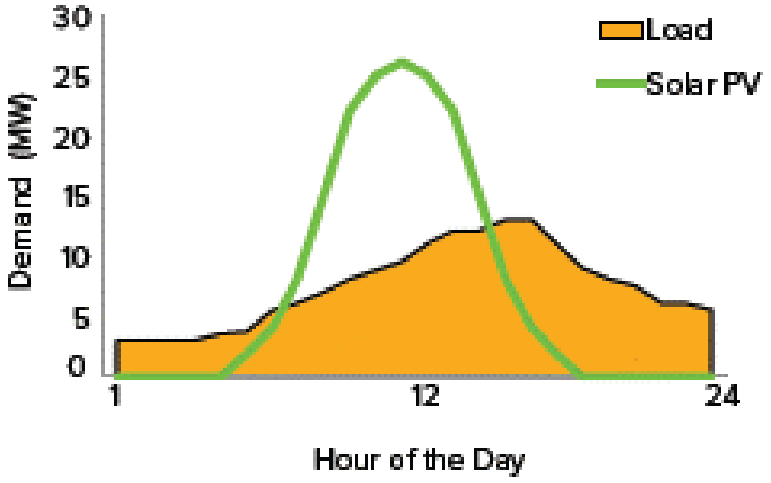


4MW Battery Output October 2016

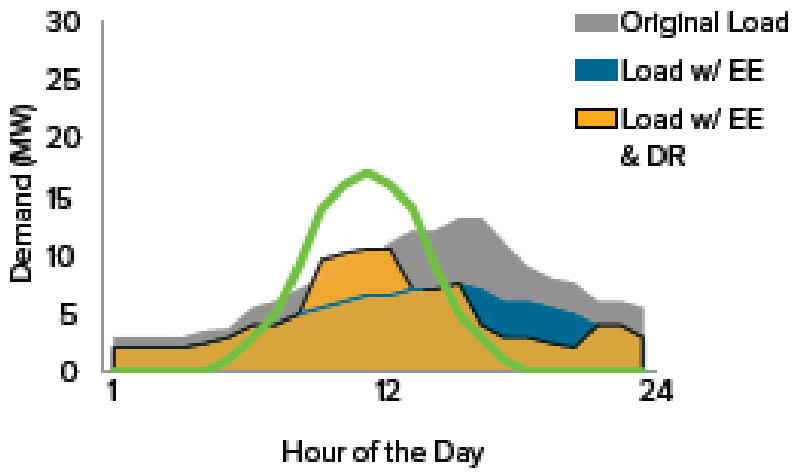


A Tale of 2 Buildings

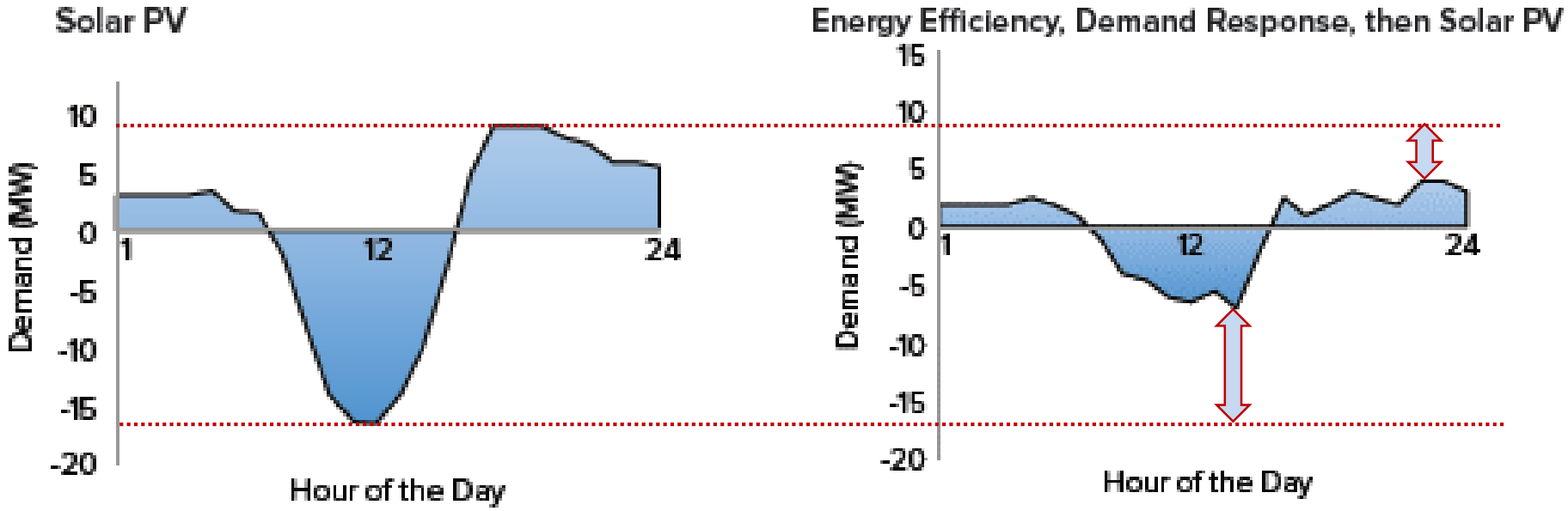
Solar PV



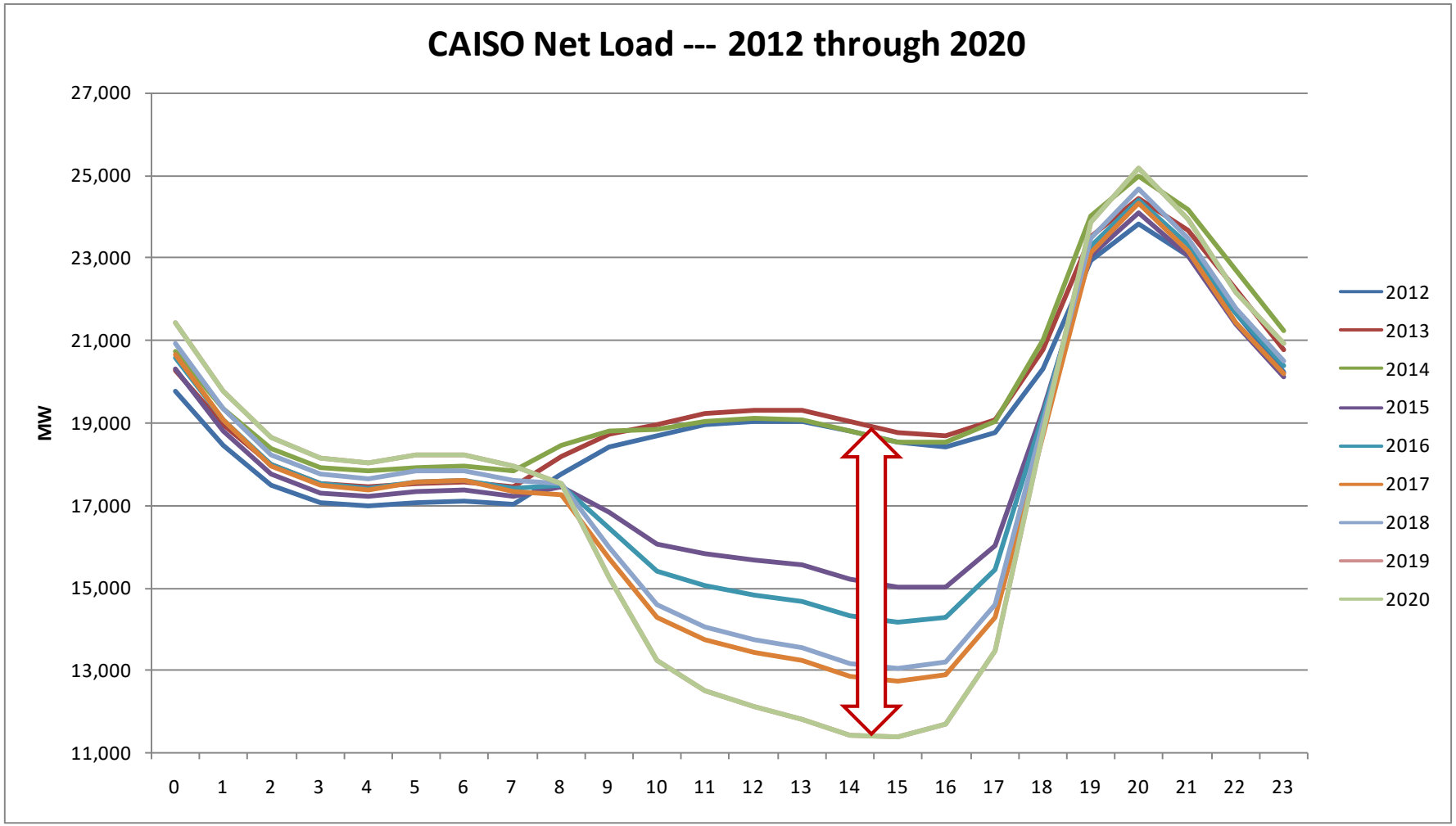
Energy Efficiency, Demand Response, then Solar PV



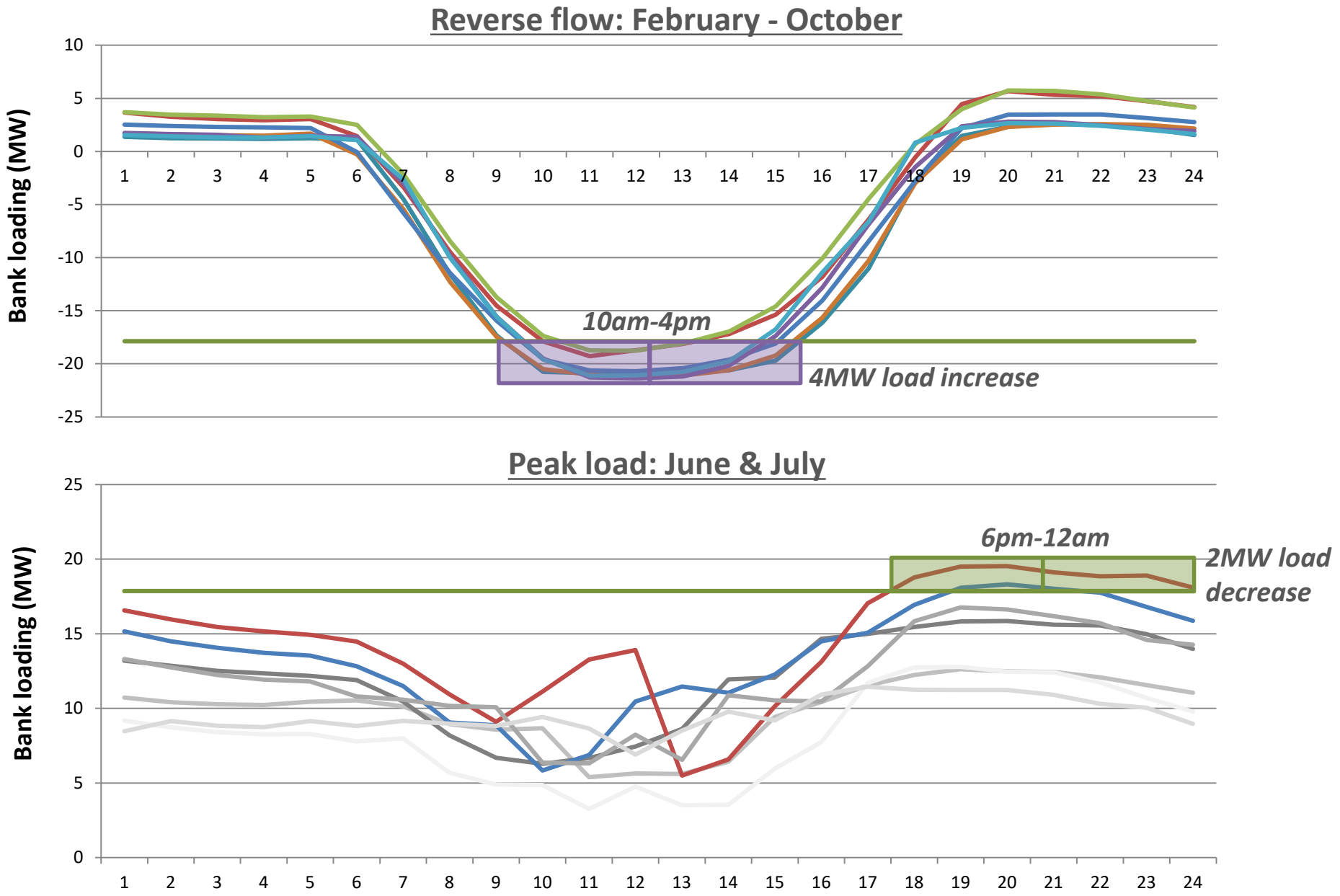
A Tale of 2 Buildings



The Changing Grid



PG&E's Huron Substation



Douglas Rath

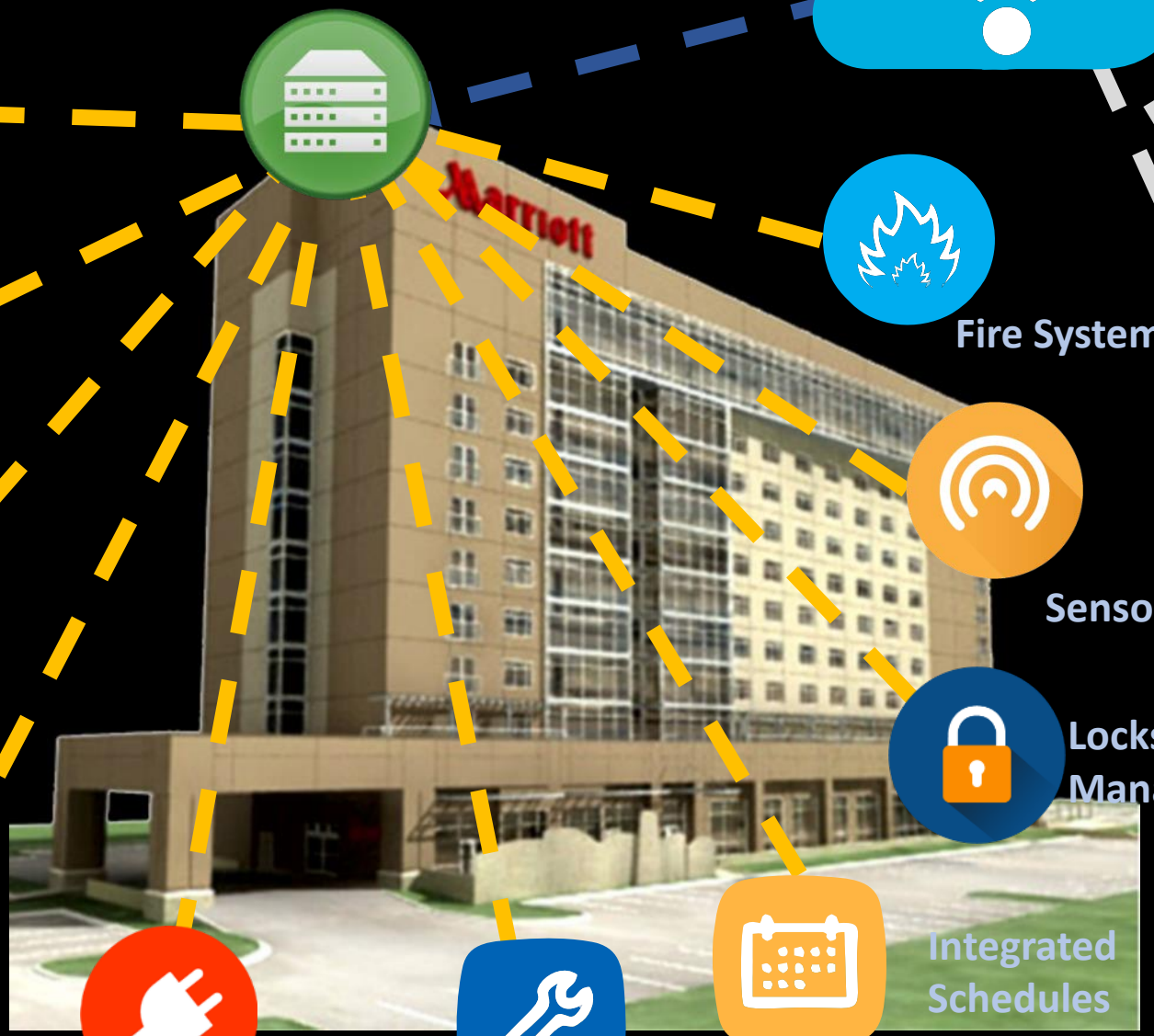
Marriott International

Energy Exchange | Better Buildings SUMMIT

Marriott
AMERICAS
ENERGY GROUP

Smart Hotels and the Grid

Smart Hotels Technologies Integration



HVAC

Advanced Lighting Controls

Water Submeters

Smart Thermostats

Plug Load Management

PM systems

Integrated Schedules

Fire System

Sensors

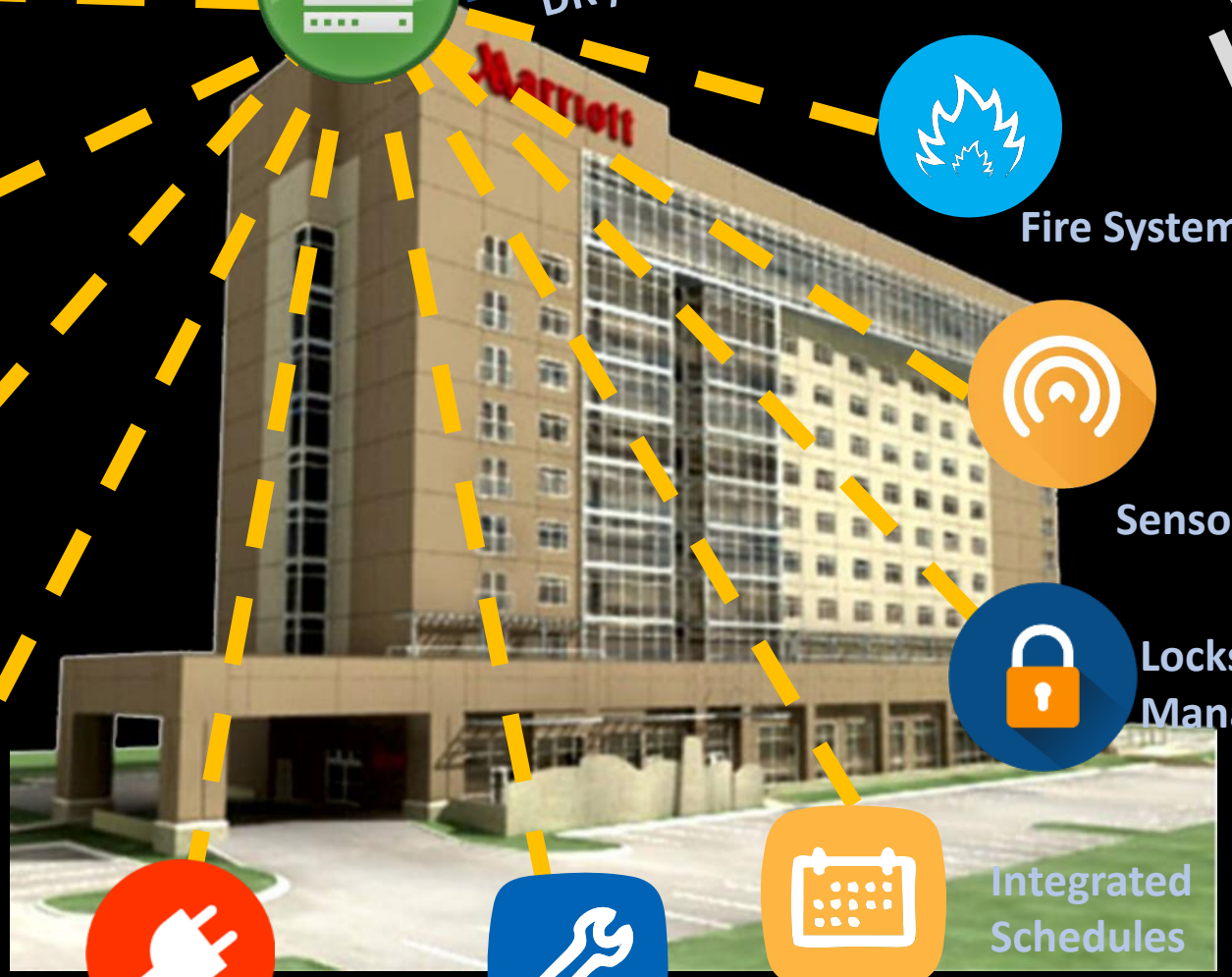
Locks and Key Management

User Interface

CCx monitoring

Marriott AMERICAS ENERGY GROUP

Smart Hotels & Smart Grid- **Desired State**



HVAC

Advanced Lighting Controls

Water Submeters

Smart Thermostats

Plug Load Management

PM systems

Integrated Schedules

Locks and Key Management

Sensors

Fire System

R.T. Pricing Signals

DR / Peak signals

Smart Meters

Renewable Generation

Microgrids

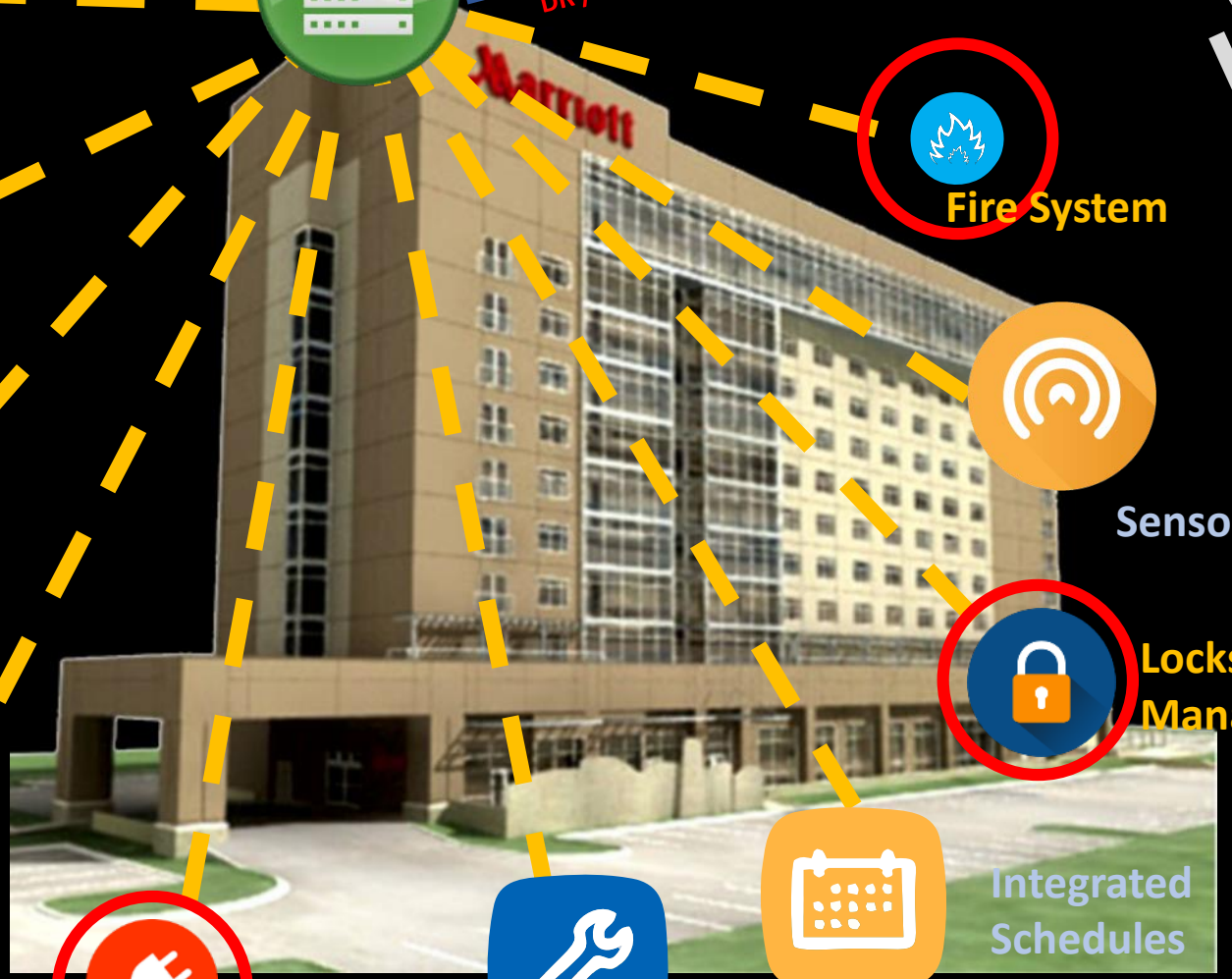
CHP

User Interface

CCx monitoring

Marriott AMERICAS ENERGY GROUP

Smart Hotels & Smart Grid- **Actual State**



R.T. Pricing Signals

DR / Peak signals

HVAC

Advanced Lighting Controls

Water Submeters

Smart Thermostats

Plug Load Management

Fire System

Sensors

Locks and Key Management

Integrated Schedules

PM systems

Smart Meters

Renewable Generation

Microgrids

CHP

User Interface

CCx monitoring

Marriott AMERICAS ENERGY GROUP

Gregg Fischer

Tishman Speyer

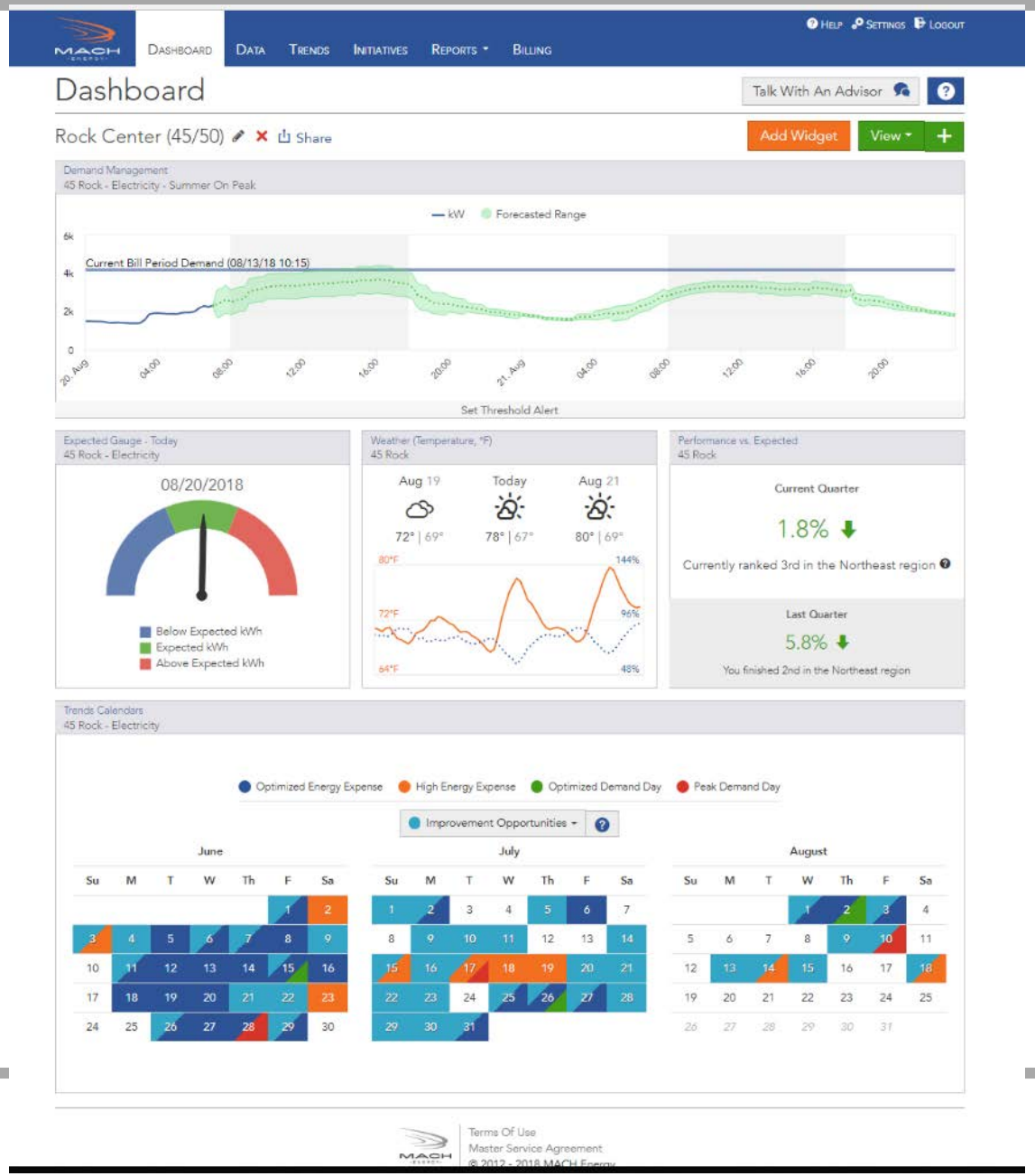
Energy Exchange | Better Buildings SUMMIT


TISHMANSPEYER

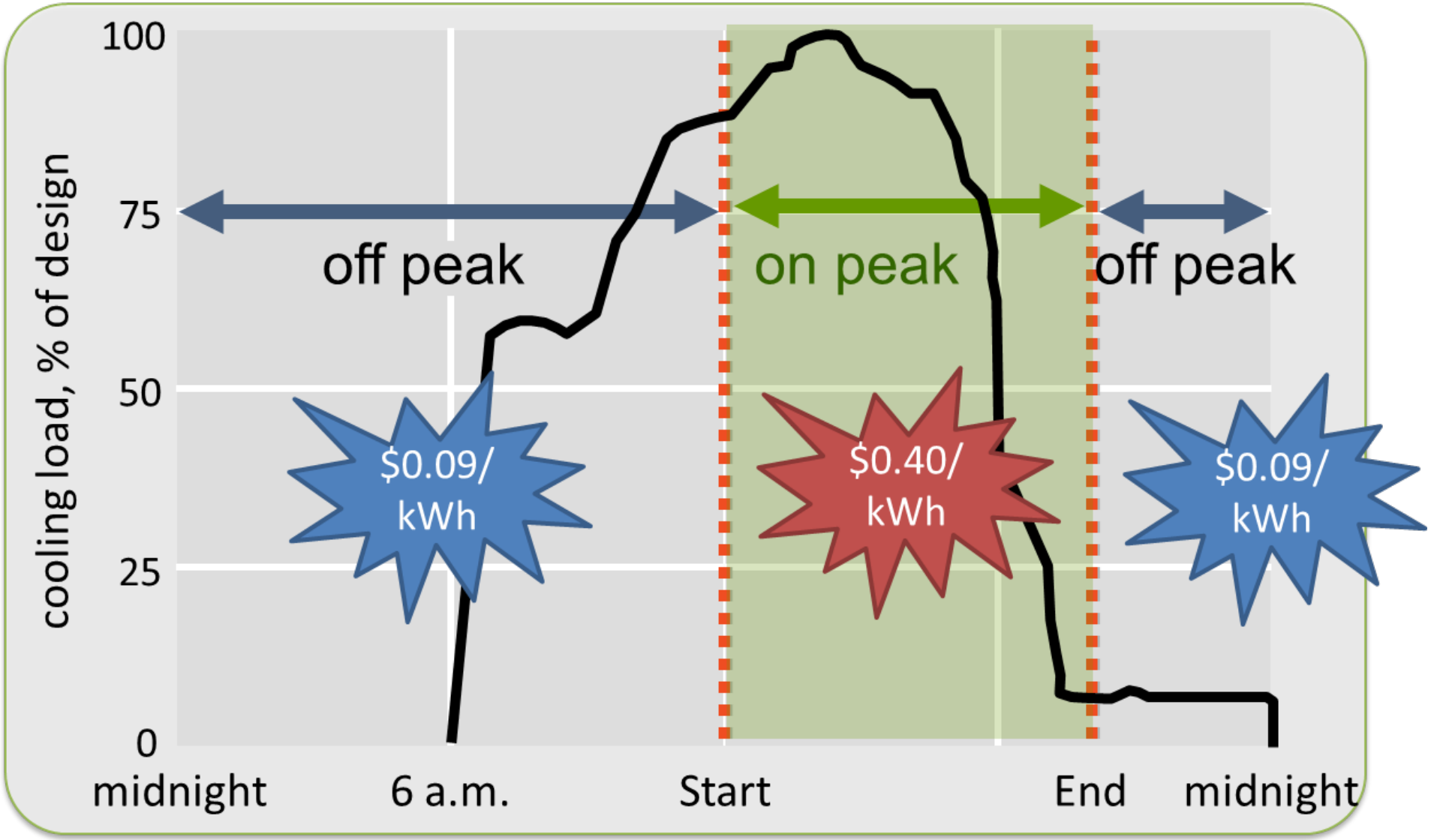
Tishman Speyer: Gregg Fischer, PE

- Director of Energy Systems
- Sustainability + Utilities @ Tishman Speyer
- Oversee building and energy systems for the US portfolio (55,000,000 sqft)
- Based out of Rockefeller Center in NYC (global HQ)
- Focus:
  - Building Automation
  - Energy Monitoring/Management
  - Fire Alarm
  - Security/Card Access
  - Lighting Controls
  - Energy Supply Contracts
  - Tenant Billing Systems

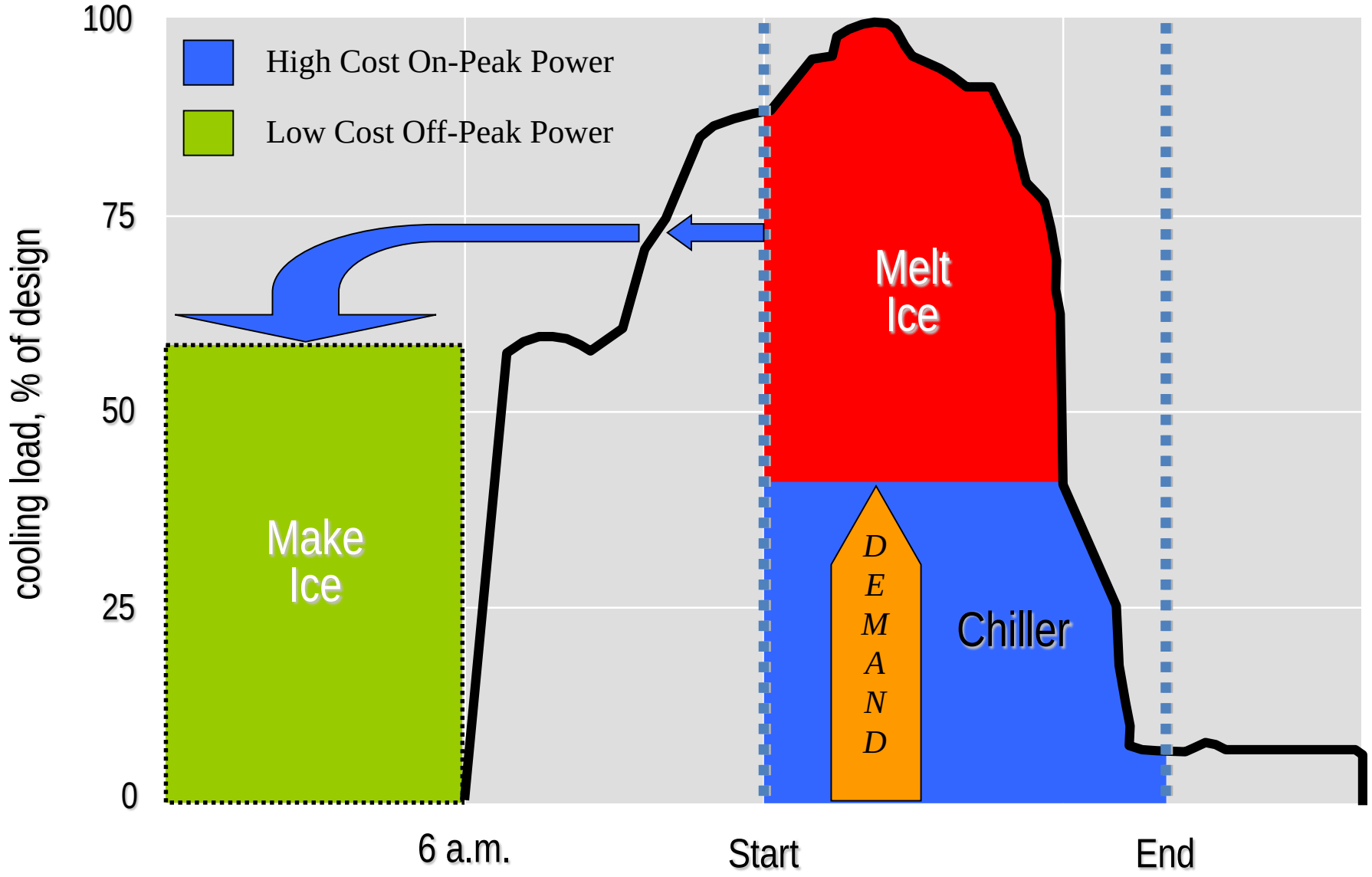
Real-Time Energy Monitoring by Owner



Time of Use/Day Delivery Pricing



Storage Relief Tariff?



Clay Nesler

Johnson Controls

Look Who's Talking:
Buildings and the Grid Roundtable

Clay Nesler

Johnson Controls

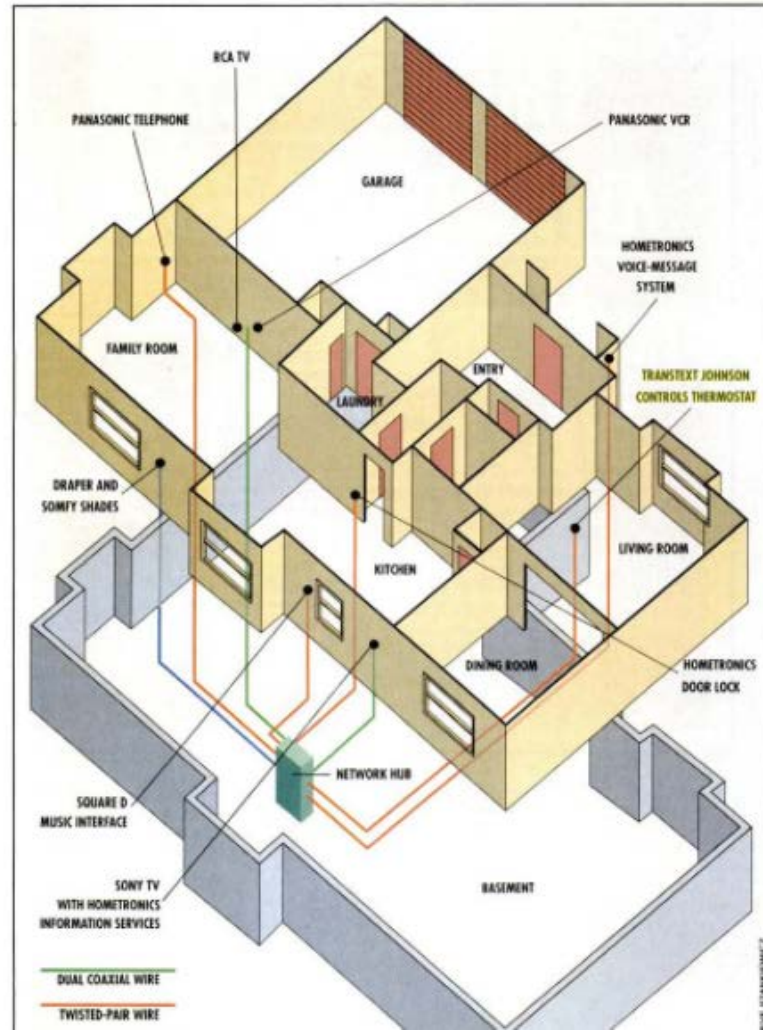
Popular Science

THE WHAT'S NEW MAGAZINE

JULY 1991
Founded in 1872/Vol. 239, No. 1

Home Newsfront

Edited by MARIETTE DiCHRISTINA



Demonstrating smarts

With the Bright Home, the Consumer Electronics Bus (CEBus) effort advances a notch toward reality. The home, opened at the recent Energy Efficient Building Association conference in Indianapolis, is the first to demonstrate prototype CEBus technology to the public.

CEBus is a homeowner's version of the bus technology that allows computers to be networked. In this scheme, however, it's home appliances that communicate and work with one another to provide greater conveniences. With a remote-control unit and a TV-screen menu, a homeowner can program his thermostat as well as his door locks, stereo, and many other switches and settings—without leaving the sofa.

As a standards-setting body, the Electronics Industries Association has worked to develop CEBus. When the standard is completed this summer, however, it will be up to industry to adopt it for use in various products. CEBus is one of two major U.S. efforts to achieve integrated home automation; the other is Smart House, a spinoff of the National Association of Home Builders ["The Integrated, Automated, Educated House," June '90; "The World's Smartest Houses," Sept. '90].

In contrast to Smart House, which requires special new wiring, the CEBus shown in the Bright Home, sponsored by Indianapolis Power & Light Co. (IPL) and PSI Energy, lets you install conventional wiring today to accommodate "smart" products tomorrow. "All you have to do is run the twisted-pair, power, and dual coaxial wires from each outlet to the same place, a panel in the basement," says Mike Coffey,


KENT STATE
Power Plant

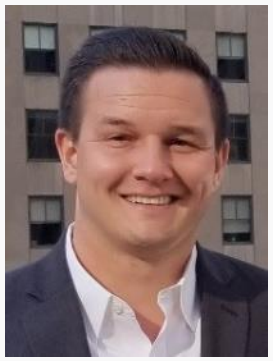
Look Who's Talking: Buildings and The Grid Roundtable

Panelists:

Asim Haque
Chairman,
Public Utilities
Commission of Ohio

Janice Berman
Pacific Gas & Electric

Douglas Rath
Marriott
International



Gregg Fischer
Tishman Speyer

Moderator:

Clay Nesler
Johnson Controls

David Nemtzow
U.S. Department
of Energy

Energy Exchange | Better Buildings SUMMIT