



Realizing Potential Energy Savings from System Optimization through Intelligent Efficiency

Presented to:

EPA-ITI Workshop on Enabling Energy Efficient Systems

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ACEEE

The American Council for an Energy-Efficient Economy (ACEEE)

- ACEEE is a 501(c)(3) nonprofit that acts as a catalyst to advance energy efficiency policies, programs, technologies, investments, & behaviors
- 50 staff; headquarters in Washington, D.C.
- Focus on end-use efficiency in industry, buildings, & transportation
- Other research in economic analysis; behavior; energy efficiency programs; & national, state, & local policy
- Funding:
 - Foundation Grants (52%)
 - Contract Work & Gov't. Grants (20%)
 - Conferences & Publications (20%)
 - Contributions & Other (8%)



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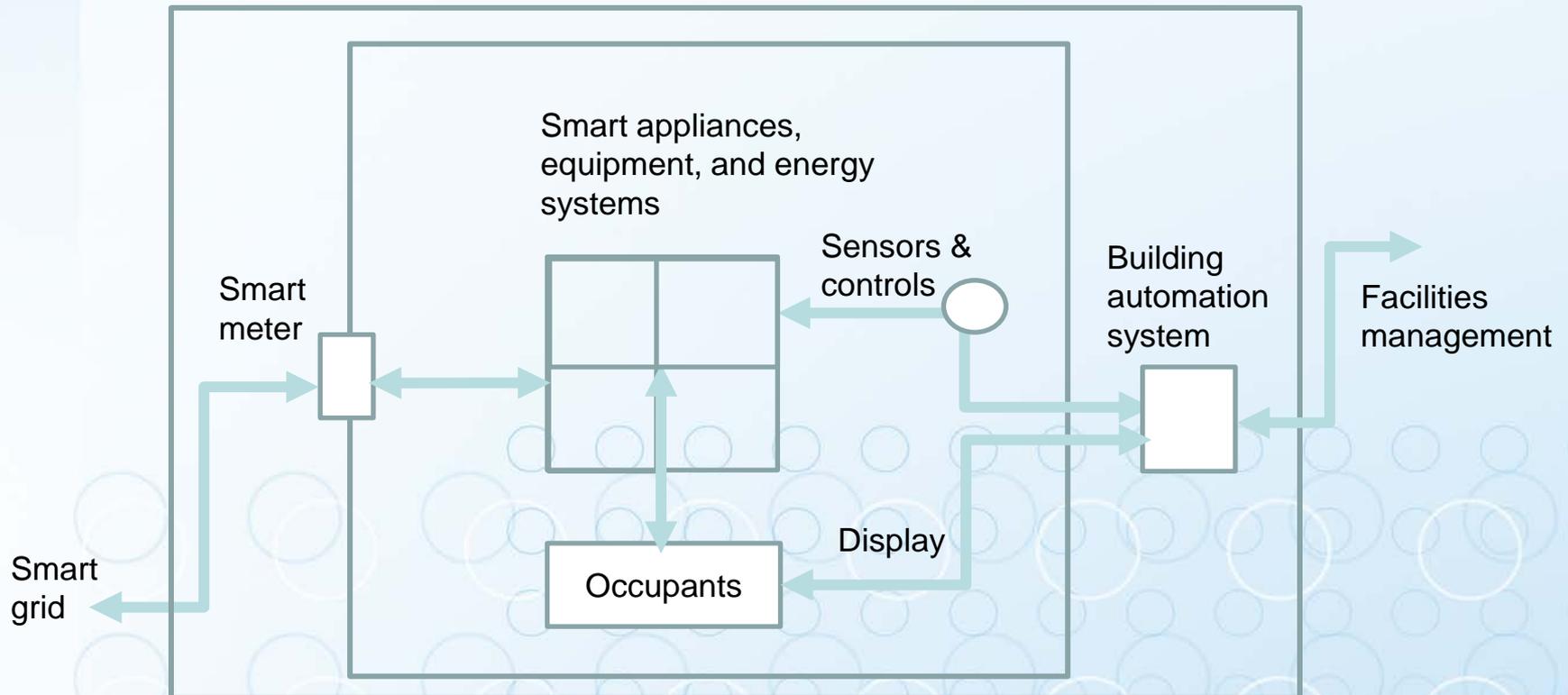
“Smart” vs. “Intelligent”

ACEEE defines *intelligent efficiency* as “a systems-based, holistic approach to energy savings, enabled by information and communication technology and user access to real-time information. Intelligent efficiency differs from component energy efficiency in that it is adaptive, anticipatory, and networked.”

Smart is used for equipment, appliances, or networks that have the ability to communicate digitally

Intelligent Efficiency implies an approach where interconnected devices can be used to harmonize their operations to achieve system-wide energy savings.

Using Smart Components to Build an Intelligent System



The Technology behind *Intelligent Efficiency*

Evolution of Components

- Dumb & inefficient
- Dumb & efficient
- Informative & efficient
- **Interactive & efficient**

Evolution of Controls

- Simple (on/off)
- Reactive
- Programmable
- Variable response
- **Adaptive & predictive**

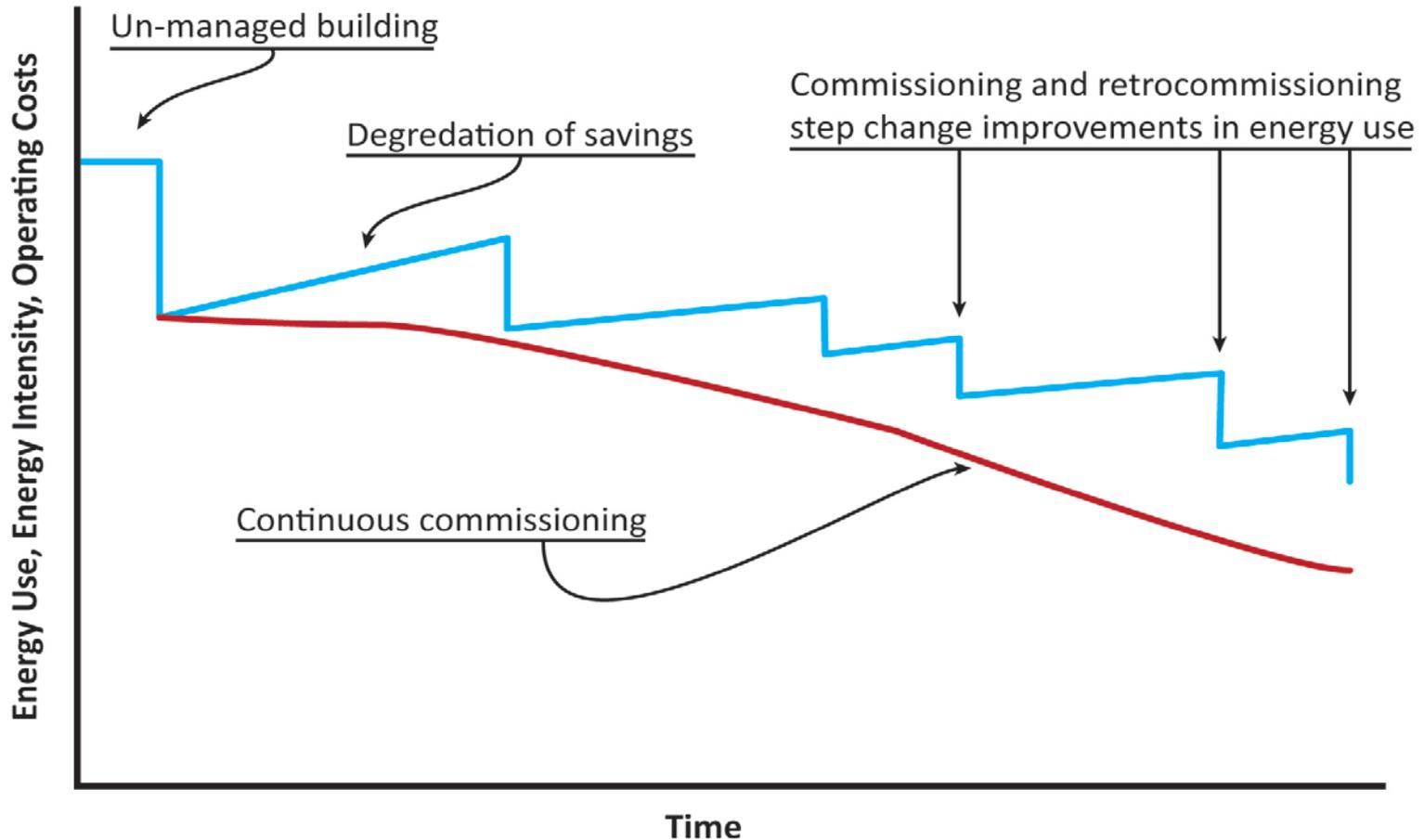


intelligent efficiency

How Intelligent Efficiency Saves

- System optimization
 - Parts working better as a whole
 - The whole working towards the goal
- Eliminating the degradation of savings
 - Early fault detection
 - Continual optimization
- Substitution of technology
 - Technological evolution

Savings Trends Over Time



Potential for Intelligent Efficiency

- Energy savings from “enabling” technologies
 - 12-22% (GeSI)
- Savings from systems effects
 - 40-60% (ACEEE)
 - \$50 billion/year energy cost savings
- Efficiency & productivity creates jobs
 - Internet job creation rate 2.6:1 (McKinsey)

Mainstreaming Intelligent Efficiency

- Bringing Intelligent Efficiency to scale will require new approach
- The market requires collaboration among energy efficiency, ICT & user communities
- Communities currently distinct—need opportunities to interact & common language
- The value exists, but we need partnerships to realize the opportunity

ACEEE Intelligent Efficiency Conference

November 16 - 18, 2014
Hyatt Regency
San Francisco, CA



Who Should Attend:

- Energy efficiency program developers and administrators
- Energy service providers
- Investors & Entrepreneurs
- Hardware & software developers
- ICT solution providers
- Building automation providers
- Smart manufacturing & smart transportation thought leaders

Conclusions

- Intelligent efficiency will bring about step-change in energy efficiency
- Intelligent efficiency saves through:
 - Optimizing systems
 - Identifying problems early
 - Anticipation of markets
- Real-time information & simulation is key
- Provision of real-time M&V data should enable program focus on system instead of components
- Significant energy savings potential warrants inclusion in company & utility resource plans

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