Commercial Buildings Integration



Images courtesy CREE, True Manufacturing, A.O. Smith, Bernstein Associates, Cambridge Engineering, Alliance Laundry Systems, NREL



Strategic Fit within Building Technologies Office



How can we **Catalyze** the adoption of **high impact** commercial building technologies?

Owners

Designers Engineers

Occupants

Financial Institutions

Stakeholder Engagement & Partnerships Government

Utilities

Manufacturers Scientists Dealers Suppliers

We look at a variety of factors... for example, RTUs

In the U.S., packaged units:

ENERGY FOOTPRINT

- condition 40 billion square feet of the commercial building floor space
- consume 2,100 trillion Btu of primary energy annually

STATE OF THE MARKET

Many RTUs are past their typical life span, functioning at much lower efficiency levels than new units, and are **ready to be replaced**.

TECHNICAL SAVINGS OPPORTUNITY

Current market conditions indicate more than **200-300 trillion Btu/year** at high penetration.

NEED: DRIVE RTU EFFICIENCY

DOE developed the **RTU Challenge Specification** to drive new efficiencies and launched the **Advanced RTU Campaign** to increase adoption of existing efficiencies.



Energy Efficiency & Renewable Energy

HIT Catalyst Step 1: Identify and Evaluate

Identify HITs through a rigorous prioritization process; characterize HITs based on their stage in the product life cycle; develop appropriate resources; evaluate and implement the most effective deployment activities.





HIT Catalyst Step 2: Define the Game Plan

Select the most effective market stimulation activities based on current work by others, market conditions and the largest barriers to adoption.





HIT Catalyst Step 2: Market Stimulation Activities

Technology Challenge

Theory of Impact: Building owners need more

CBI efficient or cost-effective products; and DOE can convene stakeholders to ET Challenge for Innovation.

Technology Demos

Theory of Impact: Building owners are uncertain

about the performance of new technologies and are risk adverse; real building performance information will make them more likely to adopt.

Technology Procurement

Theory of Impact: Template language that outlines the

performance characteristics of proven and cost effective HITs streamlines purchasing, enables "apples to apples comparisons potentially lowering overall cost of adoption.

Technology Campaign

Theory of Impact: Once a company has

successfully piloted a new technology through a campaign, they will replicate that technology throughout their building portfolio. Manufacturing Specification

Metric: New Technology

Case Studies

Metric: Number of case studies Published

Specifications

Metric: Number of technical specs produced

Installations

Metric: Number of sites/sf/orgs committed

Key Outcomes

Answer unmet market needs (leading to availability of more energy savings)

Greater organic adoption of HITs (leading to greater energy savings)

HITs incorporated into voluntary programs (leading to greater adoption and energy savings)

HIT data considered in Codes/Standards analyses (leading to higher efficiency candidate levels and energy savings)



Energy Efficiency & Renewable Energy

HIT Catalyst Step 3: Stimulate the Market (Example)

Screen	Plan & Develop	Implement	Track Market	Reduce Energy
			Uptake	Consumption (BTO goal)
CBI DEPLOYMENT STRATEGY	Direct resource development and demonstration	Market stimulation via leading organizations	Deployment thr <mark>ougn</mark> leaders' portfolios and consideration for voluntary standards	Data influences cost reductions and wrap up via efficiency programs
ACTIVITIES	FY11-12: Produced parking light SPECIFICATION via BBA. FY12: Conducted DEMONSTRATION via CALIPER program.	FY13-15: Campaign for uptake through the Lighting Energy Efficiency in Parking (LEEP) CAMPAIGN with market partners and BBA.	FY14-15: Utilities, REOs and OEMs reference specs to deploy efficiency levels broadly through voluntary programs and/or certification.	FY15: Participation in the LEEP Campaign provides information, access and tools to help owners reduce energy costs.
IMPACTS	Measurement from demos prove average savings and reduce risk for owners; case studies help make the business case. By end of 2012, 10 BBA members representing <5% of US parking space were using spec.	Campaign quantifies actual energy savings, market uptake trajectory, and adoption by market leaders. If 100% of parking lots and structures nationwide switched to spec-level lighting, we would save over .85 quads and \$4 billion/year.	 Measure penetration rates with market leaders Confirm tech penetration via market research Demonstrate sufficient uptake for codes and standards consideration U.S. DEPARTMENT OF ENERGY 	460 million sq. ft. representing 1.4 million parking spots SAVINGS: 120 Million KWh/yr \$10 Million annually Energy Efficiency & Renewable Energy

+200 members from the private sector

Representing +10 billion square feet of commercial building space

Working together through 4 Sector Groups and 8 Technology Solutions Teams





Making commercial buildings

20% more efficient by 2020



Energy Efficiency & Renewable Energy

Strategic Partners: Federal Technology Programs





Commercial Buildings Integration Technology Framework

The High Impact Technology Catalyst

Accelerating the voluntary adoption of cost-effective, high-impact technologies.

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