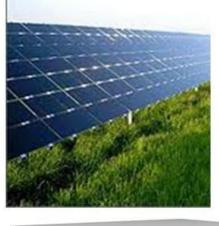
### **Commercial Buildings Integration**













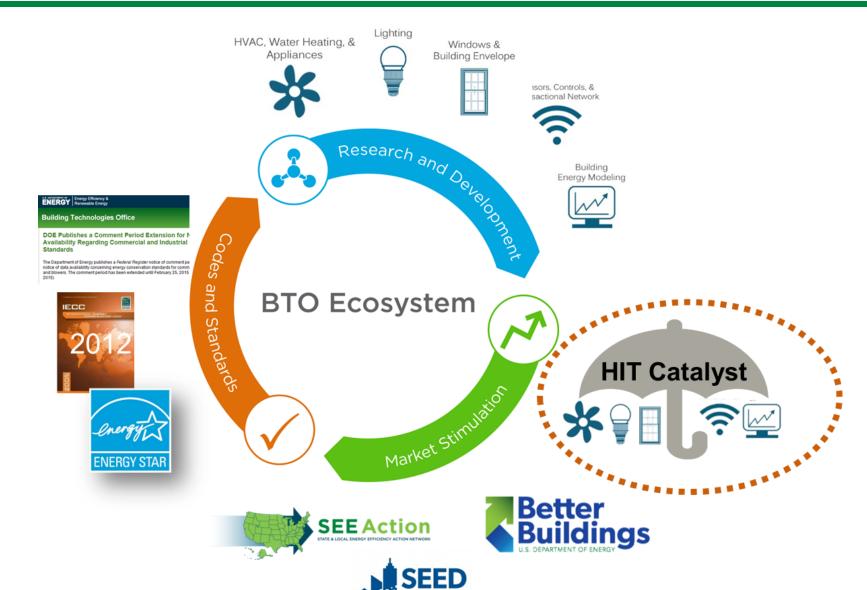


Images courtesy CREE, True Manufacturing, A.O. Smith, Bernstein Associates, Cambridge Engineering, Alliance Laundry Systems, NREL



Energy Efficiency & Renewable Energy

## Strategic Fit within Building Technologies Office



U.S. DEPARTMENT OF ENERGY





**Owners** 

Designers Engineers

Managers

Occupants

Financial Institutions

Stakeholder Engagement & Partnerships Government

**Utilities** 

Manufacturers
Dealers
Suppliers

**Scientists** 

### 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

Renewable Energy

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.

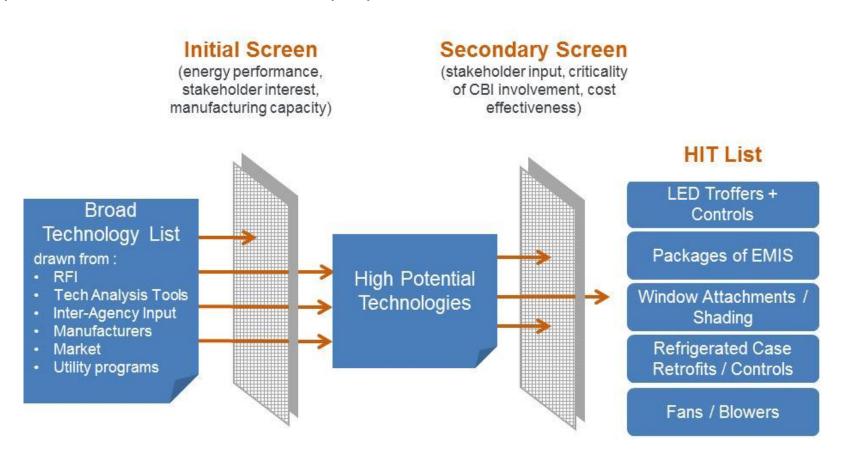
### **NEED: DRIVE RTU EFFICIENCY**

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

U.S. DEPARTMENT OF Energy Efficiency &

### HIT Catalyst Step 1: Identify and Evaluate

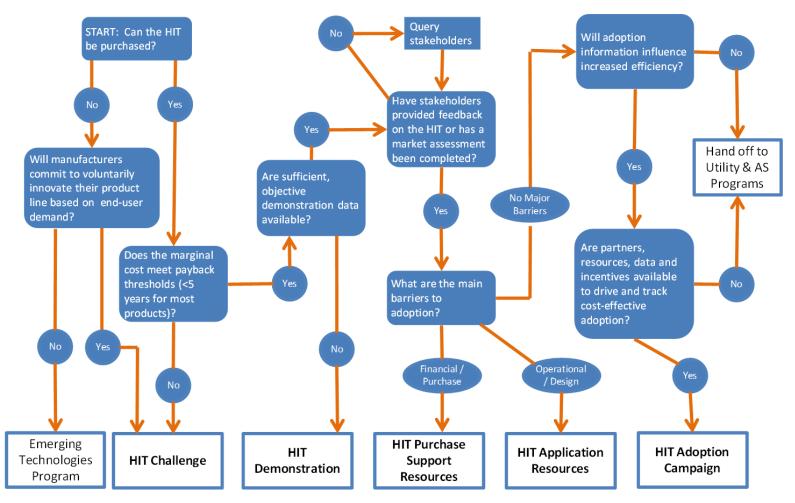
Identify HITs through a rigorous prioritization process; characterize HITs based on their stage in the product life cycle; develop appropriate resources; evaluate and implement the most effective deployment activities.





### 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

and

Theory of Impact: Building owners need more

efficient or cost-effective products; 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)



# HIT Catalyst Step 3: Stimulate the Market (Example)

| HIT Catalyst Step 3: Stimulate the Warket (Example) |  |   |  |   |
|---|--|---|--|---|
| Screen  | Plan & Develop   | Implement   | Track Market<br>Uptake   | Reduce Energy Consumption (BTO goal)  |
| CBI<br>DEPLOYMENT<br>STRATEGY                       | Direct resource<br>development and<br>demonstration  | Market stimulation via leading organizations  | Deployment througn<br>leaders' portfolios and<br>consideration for<br>voluntary standards  | Data influences cost<br>reductions and wrap up<br>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.                                 |
| <b>IMPACTS</b>                                      | 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. | <ul> <li>Measure penetration rates with market leaders</li> <li>Confirm tech penetration via market research</li> <li>Demonstrate sufficient uptake for codes and standards consideration</li> </ul> | 460 million sq. ft. representing 1.4 million parking spots  SAVINGS: 120 Million KWh/yr \$10 Million annually  Energy Efficiency & Renewable Energy |

### Strategic Partners: Better Buildings Alliance!

+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** 



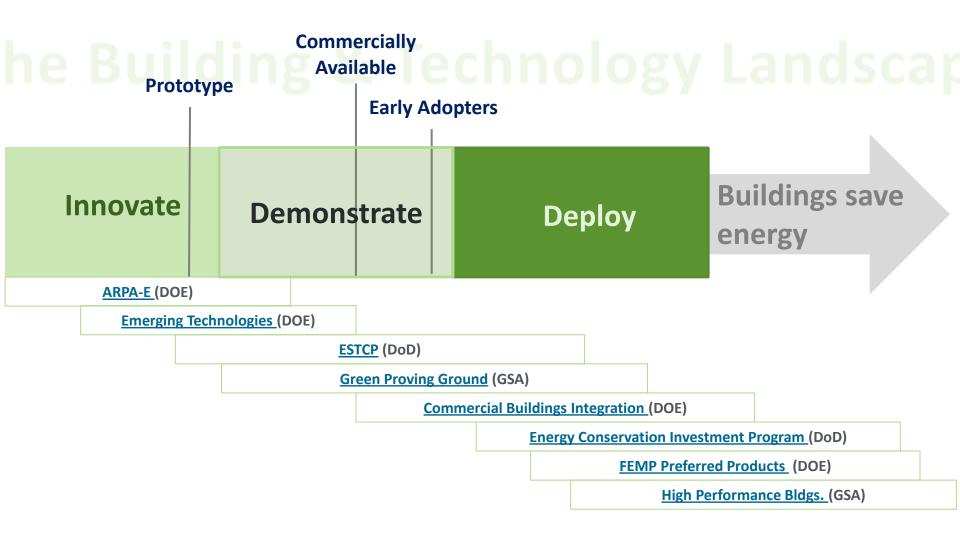
Making commercial buildings

20% more efficient by 2020





### **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.

Amy Jiron, amy.jiron@ee.doe.gov

