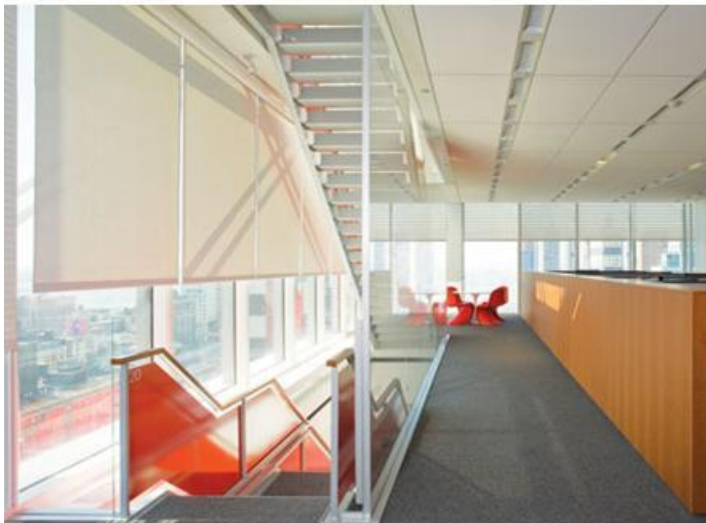


Commercial Buildings Integration

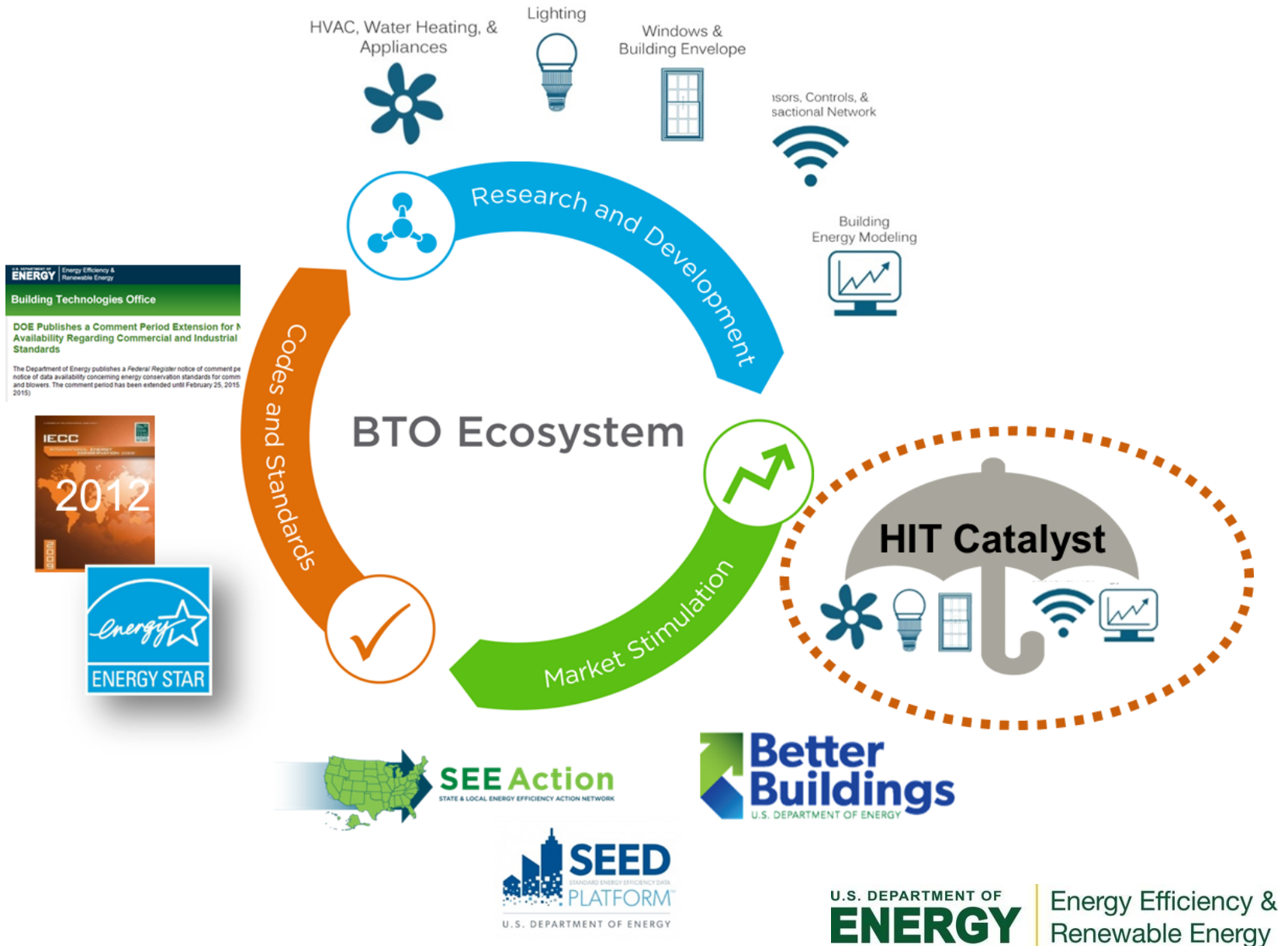


Images courtesy CREE, True Manufacturing, A.O. Smith, Bernstein Associates, Cambridge Engineering, Alliance Laundry Systems, NREL

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

Strategic Fit within Building Technologies Office



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

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:

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

ENERGY FOOTPRINT

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

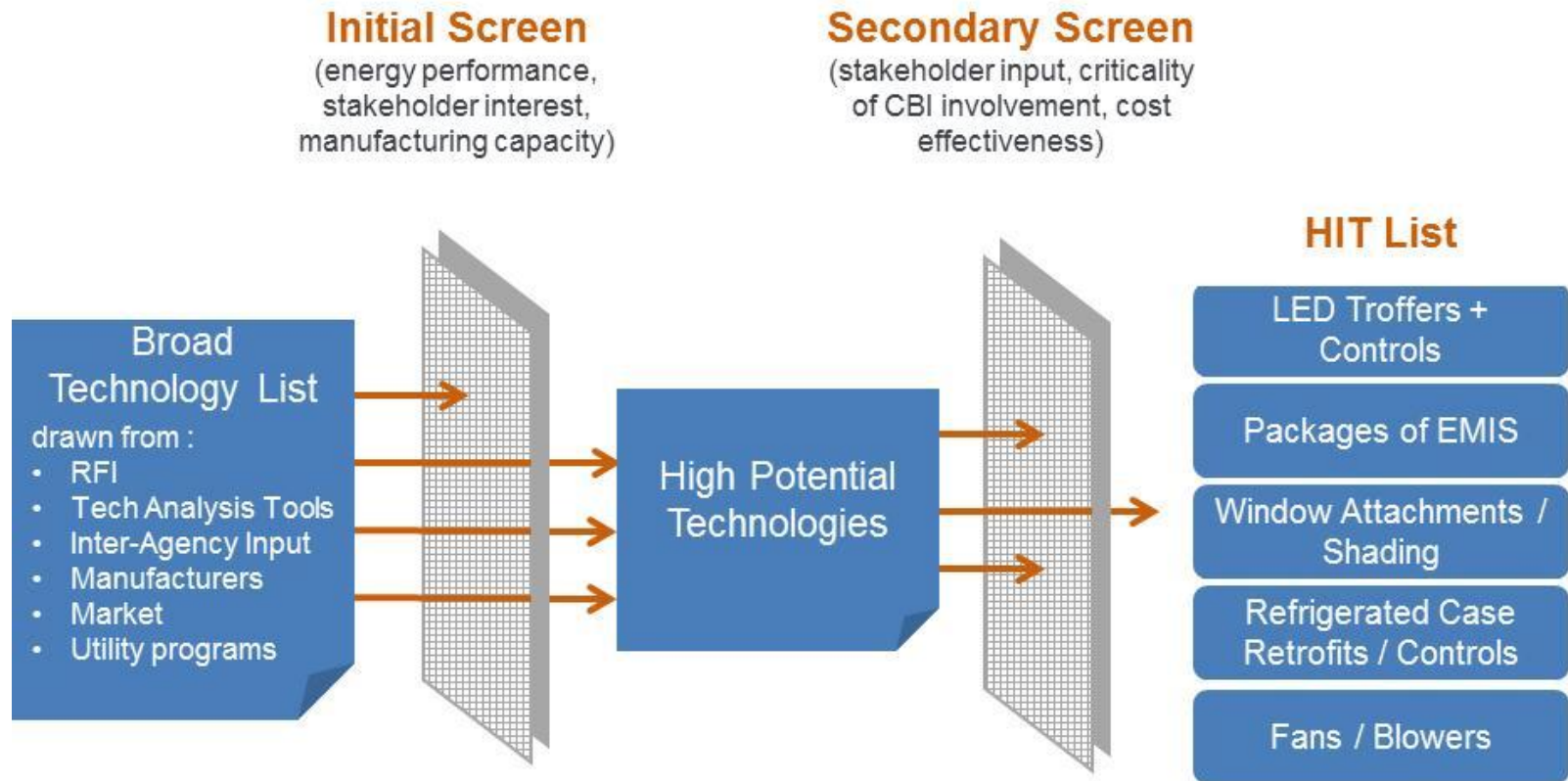
Current market conditions indicate more than **200-300 trillion Btu/year** at high penetration.

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.

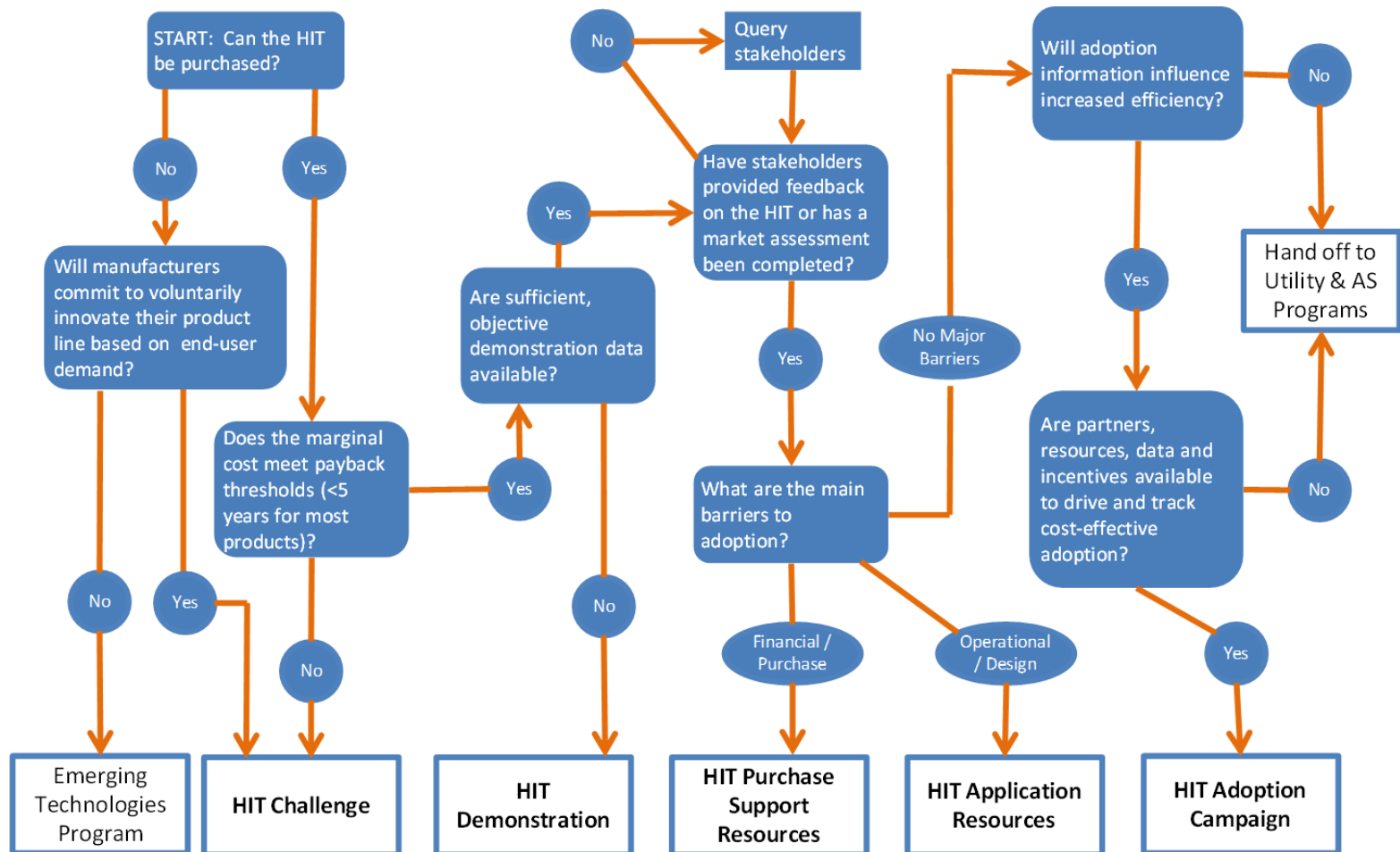
HIT Catalyst Step 1: Identify and Evaluate

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.

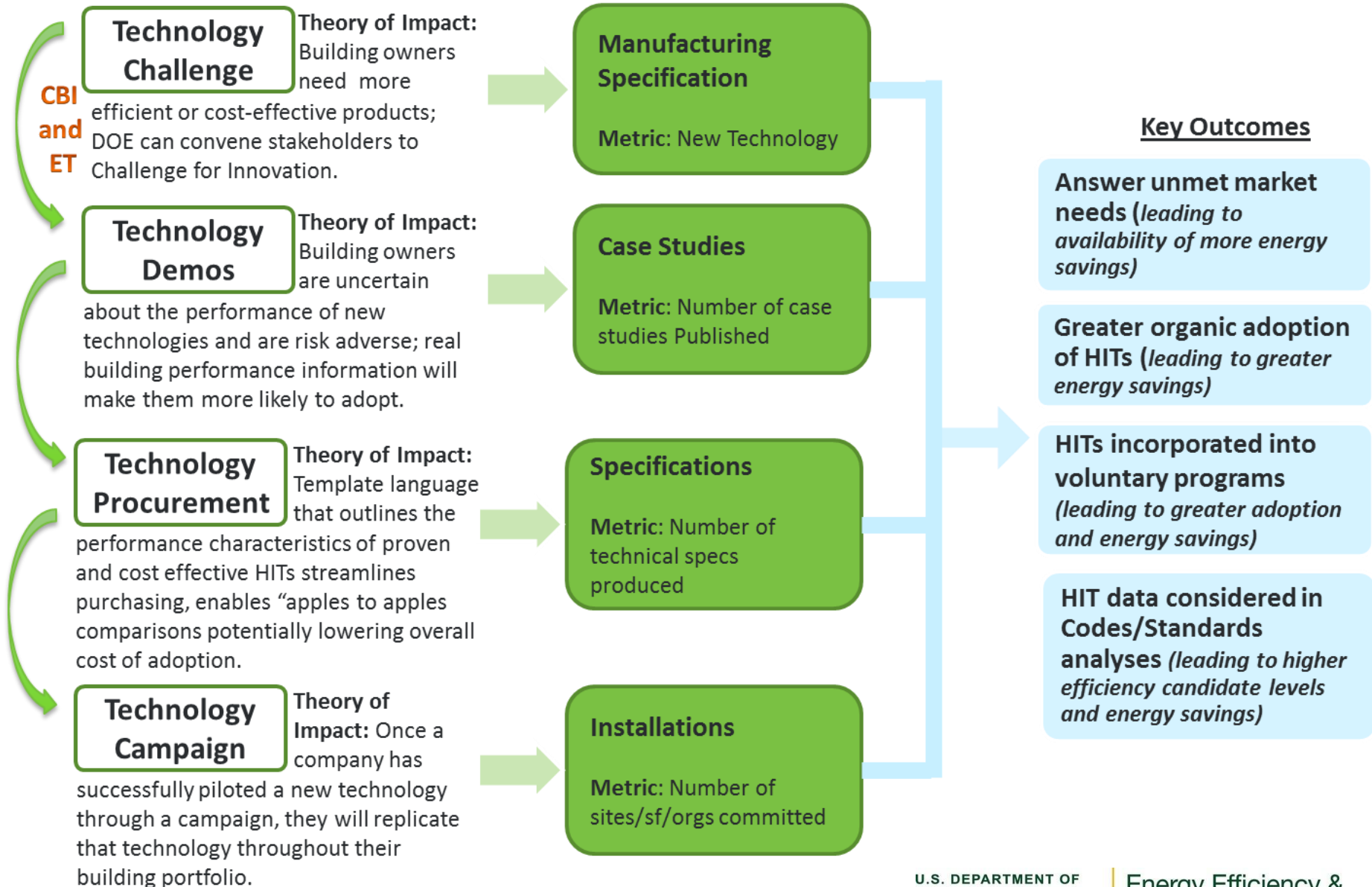


HIT Catalyst Step 2: Define the Game Plan

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



HIT Catalyst Step 3: Stimulate the Market (Example)

Screen

Plan & Develop

Implement

Track Market Uptake

Reduce Energy Consumption (BTO goal)

CBI DEPLOYMENT STRATEGY	Direct resource development and demonstration	Market stimulation via leading organizations	Deployment through 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	<p>Measurement from demos prove average savings and reduce risk for owners; case studies help make the business case.</p> <p>By end of 2012, 10 BBA members representing <5% of US parking space were using spec.</p>	<p>Campaign quantifies actual energy savings, market uptake trajectory, and adoption by market leaders.</p> <p>If 100% of parking lots and structures nationwide switched to spec-level lighting, we would save over .85 quads and \$4 billion/year.</p>	<ul style="list-style-type: none"> - Measure penetration rates with market leaders - Confirm tech penetration via market research - Demonstrate sufficient uptake for codes and standards consideration <p style="text-align: right;"><small>U.S. DEPARTMENT OF</small> ENERGY</p>	<p>460 million sq. ft. representing 1.4 million parking spots</p> <p>SAVINGS: 120 Million KWh/yr \$10 Million annually</p> <p style="text-align: right;"><small>Energy Efficiency & Renewable Energy</small></p>

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

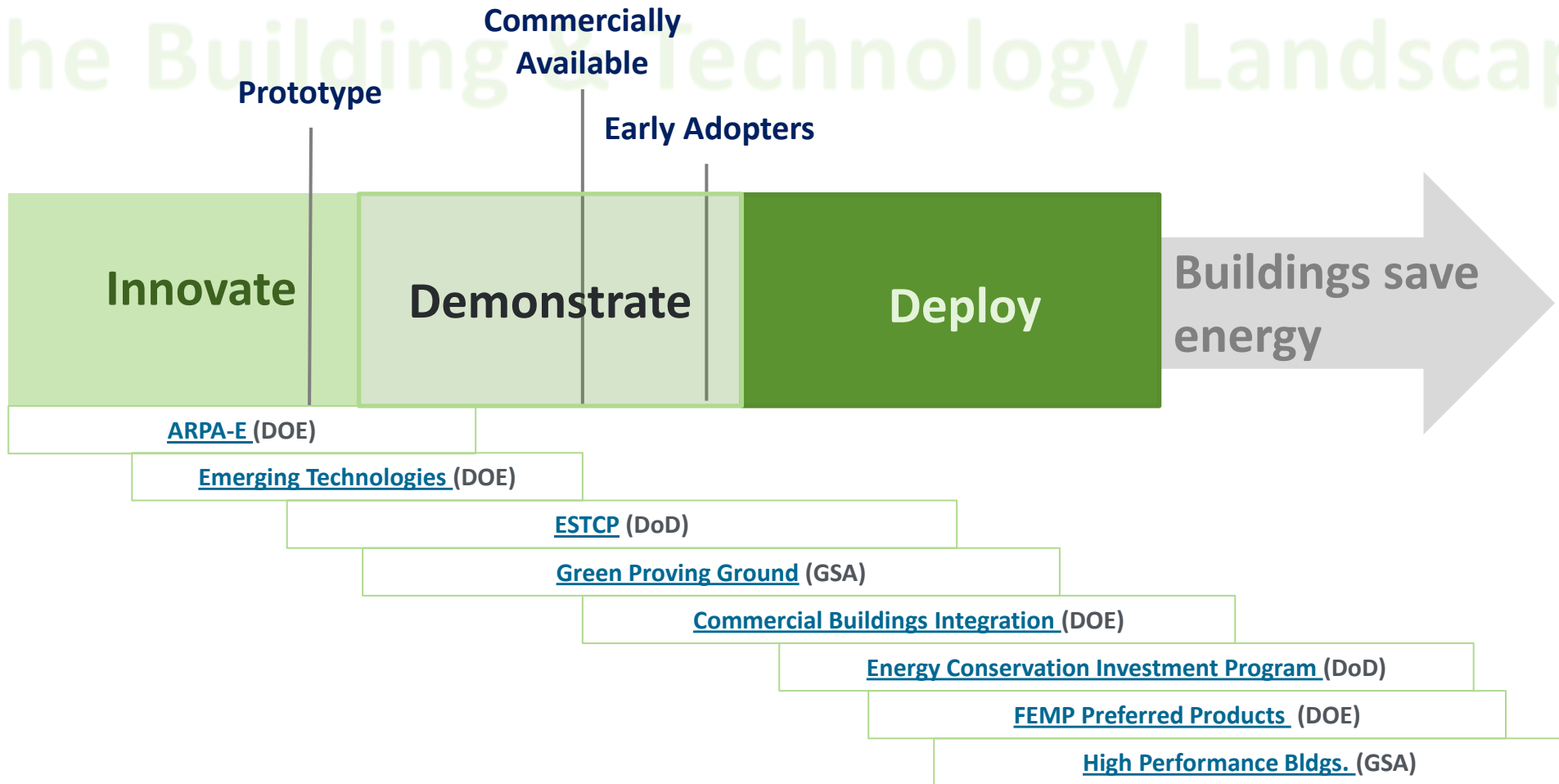


Making commercial buildings

20% more efficient by 2020

Strategic Partners: Federal Technology Programs

The Building & Technology Landscape



Commercial Buildings Integration Technology Framework

The High Impact Technology Catalyst

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

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