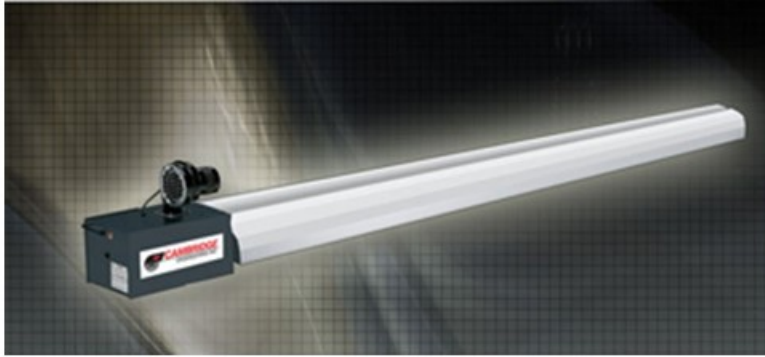


Commercial Buildings High Impact Technology (HIT) Catalyst



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

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

Building Energy

- \$410 billion/year
- 75% of the nation's electricity
- Contributes 40% of greenhouse gas emissions



Building efficiency products represent \$60 billion in U.S. revenue; up 43% over the last 4 years.

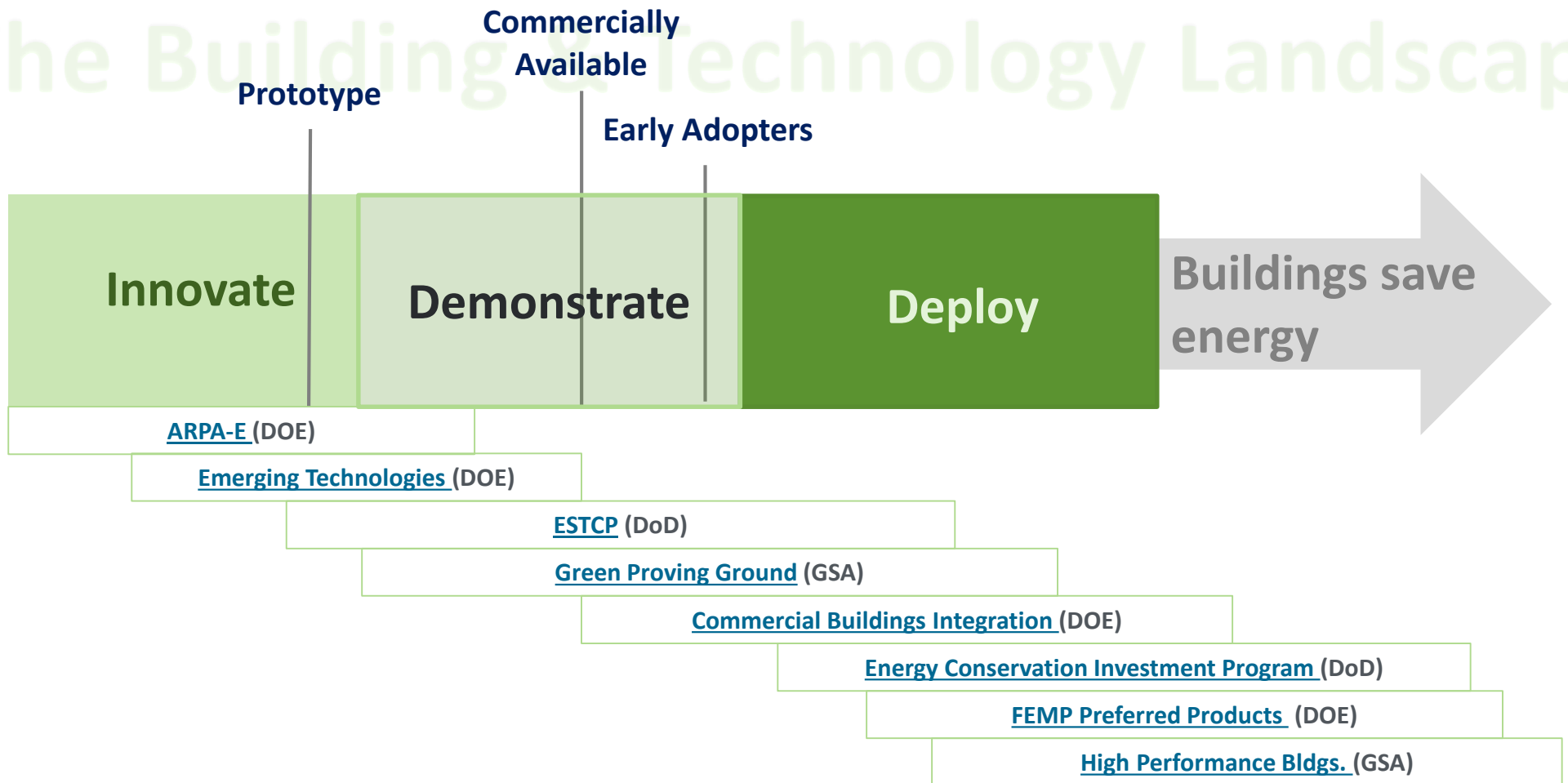
Efficiency through High Impact Technology

Goal: The High Impact Technology (HIT) Catalyst is designed to help identify and prioritize cost-effective, underutilized, energy-efficient technologies so that DOE can focus resource development and deployment activities.

Strategic Emphasis: Accelerate underutilized technologies into the market through pre-identified and pre-defined pathways (Innovation Challenge, Technology Demonstration, Technical Resource development, Adoption Campaign). The focus at all stages is on collaboration across applicable stakeholder groups.

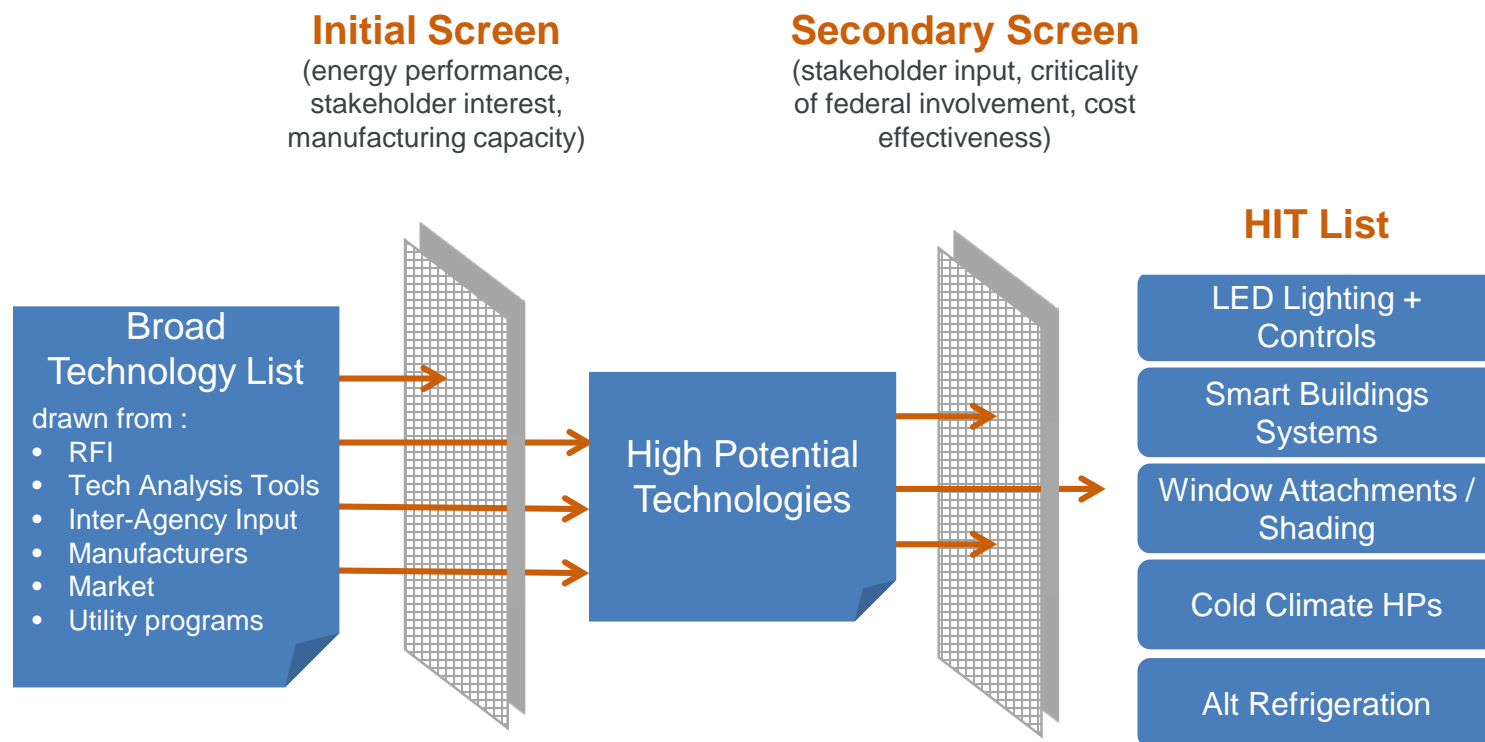


With a Little Help From Our Friends



Identify, Evaluate, Prioritize Building Technologies

Deployment prioritization enables partners to focus on market-ready, high potential technologies in a shifting landscape with multiple, complicated choices.

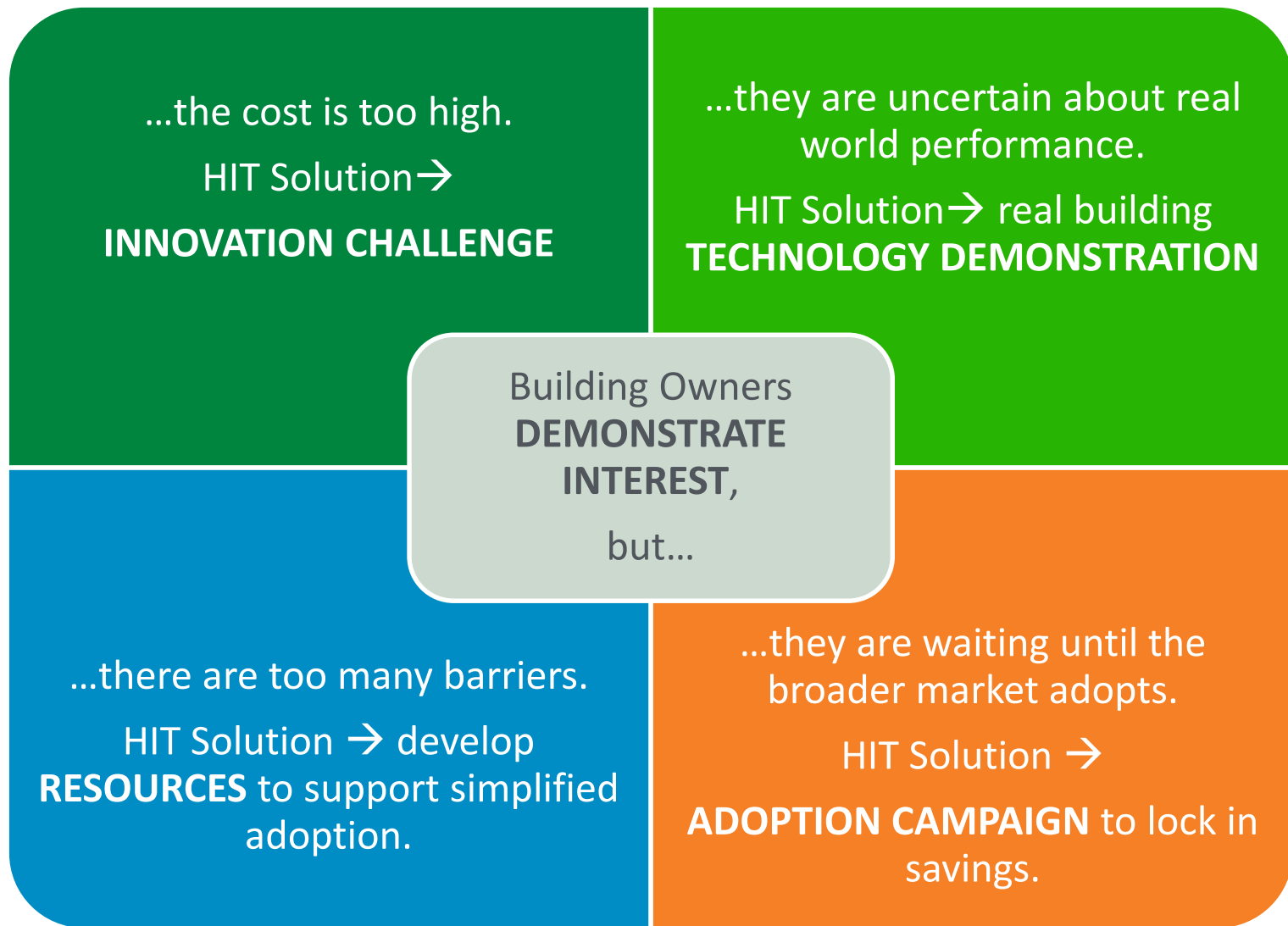


Prioritization: Major Takeaways from Workshops

- Remain aware of the need for **technology groupings, applications and packages** rather than specific technology types; address the synergies between technologies
- **Controls** in general – across all load types – are an area where much work needs to be done. There are many competing platforms, protocols, etc. and many different ways to implement the control systems (individual fixture/load level, building level, etc.). **End users are confused by the choices, afraid of technology obsolescence, and need guidance in this space.**
- Don't always assume that a pure technology solution is the answer. In some cases, **best practice or operational solutions can yield the same results at much lower costs.**
- Data on “real use” and end user behavior is extremely important in weighing the benefits of a technology, as the **gap between “real use” and “ideal use”** can be large.
- There is value in **enabling technologies** such as smart metering, though it may be difficult to quantify independently.
- Generally speaking, **there can never be too much independent, third-party demonstration data.**



Core Activities Support National Impact



High Impact Technology: The Results

The HIT (High Impact Technologies) Catalyst initiative has successfully engaged with more than **500 leading stakeholders** from private industry who have demonstrated a commitment to work with DOE to accelerate underutilized technologies into the market. Today, the HIT Catalyst is responsible for driving the retrofit or replacement of **56,600 packaged heating/cooling units, 330,000 troffer lights and 500 million sq. ft. of parking space lights** through 2 innovation challenges, 20 ongoing and completed real building demonstrations and 3 adoption campaigns. The energy savings from these activities is equivalent to:



38,000
homes



340,000
acres



960,000
barrels of oil

Because of the success of these strategic deployment strategies, HIT Catalyst is not only saving energy but is helping businesses save money and reduce carbon emissions. The total energy savings from HIT Catalyst activities are the equivalent of **\$57 million saved** and **590 million pounds of avoided greenhouse gases**.

New in 2016

HIT HQ: access point for owners, utilities/implementers, and technology providers.

- Demonstration host site opportunities
- Results from both Green Proving Ground and CBI
- M&V Templates/Plans
- Engagement with DOE (P-Tool Input Form, RFIs, FOAs)

Joint GSA-DOE RFI

One request from both agencies, one response by technology providers

Joint federal and commercial evaluation by National Labs (3rd parties)

Verification in federal and commercial buildings

Discussion of New Metrics for Priority Evaluation:

Water savings

Global warming potential

Packages or phased strategic retrofits

Core Activity: Technology Demonstrations

Need Verification of Performance to Lower Perception of Risk = Real Building Demonstration.

Match HITs and Partners and National Laboratories:

- Evaluate Sites (as applicable)
- 3rd party measurement and verification.

Demonstration generates performance data and market information.

Cultivate the path to market through dissemination of information and resources to enable adoption by partners.

Proving Performance to Overcome Risk (Demonstrations)



Successful technologies:

1. Reduce energy or water use
2. Decrease reliance on non-renewable energies
3. Decrease operational costs
4. Improve tenant satisfaction
5. Have the potential to transform markets through broad deployment

2013-2015

- 15 technology demonstrations
- 19 host site partners
- Quads of energy savings opportunity

Considerations for Technology Demonstrations

About the Technology/Technologies:

- target market, current market demand, specific barriers
- manufacturing capacity and product availability
- technical energy savings potential and additional benefit streams
- market potential taking into account the applicable building sector

Innovation and Impacts:

- current state of the market for the applicable technology area,
- anticipated impact of the proposed technology demonstration,
- advantages of proposed technology over other current technologies,
- opportunity for broad deployment

Feasibility:

- barriers to field demonstrations as well as larger deployment efforts
- investment barriers within the target market

Cost, Payback, Return on Investment!!!

- Capital/investment cost, anticipated energy savings, installation and commissioning,
- operations and maintenance, warranty, training requirements and other anticipated costs