

Emerging Energy Efficiency Technologies

Jeffrey Harris
Alliance to Save Energy

**National Action Plan
Sector Collaborative on Energy Efficiency**

**Summer Workshop
June 28, 2007
Washington, DC**



**ALLIANCE TO
SAVE ENERGY**
Creating an Energy-Efficient World



ALLIANCE TO
SAVE ENERGY
Creating an Energy-Efficient World



ALLIANCE TO
SAVE ENERGY

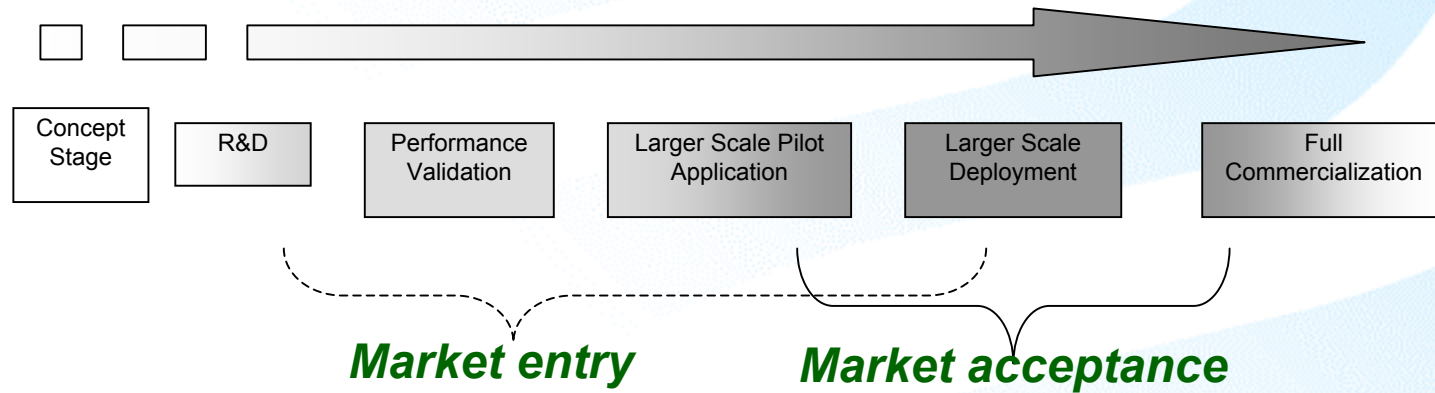
The Alliance to Save Energy promotes energy efficiency worldwide to achieve a healthier economy, a cleaner environment, and greater energy security.

Hosting global energy efficiency forum and conference November, 2007 for more information go to:

<http://www.eeglobalforum.com>



What is an Emerging Technology?



- **Technology status: Available but not yet established**
 - proprietary or multiple suppliers?
 - barriers to wider use?
- **Applicability**
- **Energy savings**
- **Cost-effectiveness**
 - current technology
 - future cost and performance
- **Non-energy benefits** (safety, comfort, productivity, etc.)

Significance of ETs to the Sector Collaboratives



ALLIANCE TO
SAVE ENERGY

- Energy retrofits: “Deeper” savings
- New construction & renovation: Avoid lost opportunities
- Competitive edge
- Anticipate emerging policies: carbon emissions, utility portfolio standards
- Market leadership

Technology Example: Addressable Dimming Fluorescent Ballasts

Dimmable ballasts make up ~4 percent of current sales

Market transformation vision: “Every ballast dimmable and addressable in 10 years.”

Multiple savings: daylight + occupancy control, demand-response, occupant-preferred light levels, avoid overlighting for lumen depreciation, etc.

Technology near a “tipping point?”

NY Times HQ Building – goals:

- no premium for a dimmable system
- self-commissioning controls

“Whoever can do this will own the market!”

Result: \$30-50/ballast (vs \$75-120)



Graphic source: GE Lighting

Technology Example: Daylight Collection Devices



ALLIANCE TO
SAVE ENERGY

Integrated lighting system

- passive DL harvester
- efficient tube and diffuser
- high-output fluorescent
- dimming ballasts & controls
- remote data logging

Applications (“high-bay” space)

- recreation centers
- warehouses
- maintenance bays
- manufacturing
- mail sorting



Image source: TubularSkylight.com

Technology Example: Automated fault Detection for Rooftop AC



ALLIANCE TO
SAVE ENERGY

Poor maintenance of rooftop AC leads to:

- higher energy use
- shortened equipment life
- comfort complaints

Specify on-board sensing & diagnostics for original or replacement equipment



Image source: Pacific Northwest National Laboratory

Technology and Beyond: Transforming the Commercial Sector



- Define **performance and cost benchmarks** for buildings & systems
 - Building type, size, and climate
- Develop **design strategies** to meet benchmarks
- Create **integrated building systems solutions**
 - Training, tools, and technical support
- **Demonstrate** solutions that work
- Support advances in **construction, commissioning, and operating** practices
- Performance monitoring and **real-time feedback**
- **Make building performance visible** to owners and occupants
 - EU Energy Performance of Buildings Directive

Zero-Energy Commercial Buildings Initiative (ZECBI)



ALLIANCE TO
SAVE ENERGY

■ Goals

- Create & deploy technology/practices for transition to zero-net-energy (carbon-neutral) commercial buildings by ~2030
- Maintain or enhance comfort, health, and amenity

■ Industry-led multi-year collaborative

- Founders: AIA, ASHRAE, ASE, LBNL, USGBC, WBCSD
- Others: Designers, developers, owners, manufacturers, finance & RE, utilities, state/federal agencies, Labs, universities, NGOs

■ Status:

- Authorization in Senate and House energy bills
- FY08 appropriations – House
- DOE support for initial planning phase

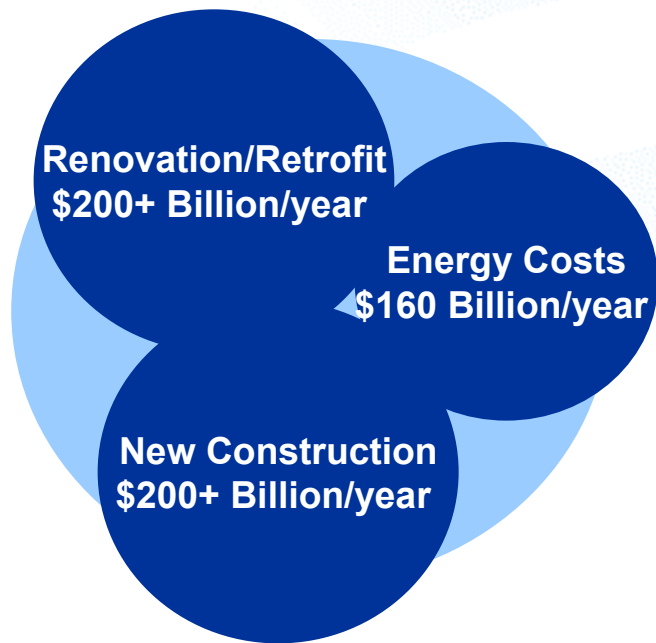


World Business Council for
Sustainable Development

CBI Program Investment in Context



ALLIANCE TO
SAVE ENERGY



Deployment
Programs
\$2 Billion/yr

National
ZECBI Program
\$200 Million/yr

\$200 M/year federal program will *leverage*:

- \$2 B/year utility and state DSM programs
- \$160 B/year energy costs
- \$400 B/year construction & renovation



ALLIANCE TO
SAVE ENERGY

For More Information

- Federal Energy Management Program – *New Technologies*
http://www1.eere.energy.gov/femp/new_technology/index.html
- California Emerging Technologies Coordinating Council - <http://www.etcc-ca.com/>
- Oak Ridge National Laboratory -
<http://www.ornl.gov/sci/eere/buildings/emerging.htm>
- National Renewable Energy Laboratory -
http://www.nrel.gov/buildings/technology_research.html
- Pacific Northwest National Laboratory - http://eere.pnl.gov/building-technologies/emerging_tech.stm
- Lawrence Berkeley National Laboratory - <http://www.lbl.gov/Tech-Transfer/techs/index.html#Energy>
- Bonneville Power Administration – *Energy Efficiency Technology Roadmap*
http://www.bpa.gov/corporate/business/innovation/docs/2006/RM-06_EnergyEfficiency-Final.pdf
- e-Source - <http://www.esource.com/>
- ACEEE ET reports - Emerging Energy-Savings Technologies and Practices for the Buildings Sector, (<http://www.aceee.org/pubsmeetings/index.htm>)
- ACEEE ET conference - <http://www.aceee.org/conf/06et/06etwrap.htm>
- “Emerging Technologies: Next Big Ideas 2007” Symposium presentations at
<http://www.aceee.org/conf/mt07/mt07program.pdf>

THANK YOU!



ALLIANCE TO
SAVE ENERGY

Jeffrey Harris, Vice President for Programs

jharris@ase.org, 202 530 2243

Alliance home page: www.ase.org

International Conference – November 2007

<http://www.eeglobalforum.com>