Better Buildings
U.S. DEPARTMENT OF ENERGY

A National Initiative Driving Greater Energy Efficiency in US Buildings

March 2015

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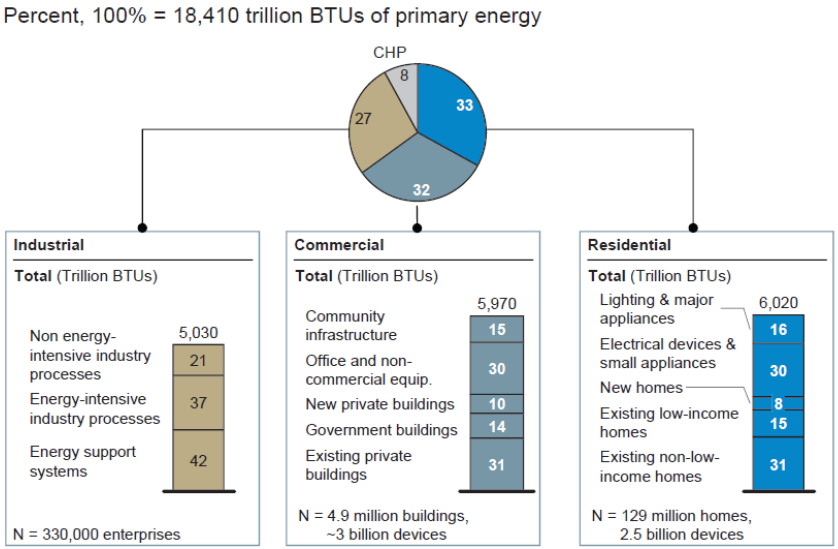
Today

- Better Buildings and Better Buildings Challenge
- Success to Date
- Partner Innovations
- Challenges, and opportunities, moving forward

Cost effective opportunities for energy efficiency



Source: EIA AEO 2008, McKinsey analysis

U.S. spends $600 billion each year to power homes, plants, & buildings

- Great opportunities in residential, commercial and industrial sectors
- 20% + savings is average
- Other benefits: Jobs, Environment, Competitiveness

BUT persistent barriers exist….

- Efficiency not included as corporate decision making; not integrated into business planning
- Lack of senior management buy-in
- Lack of information; need unbiased information
- High hurdle rates
- No ability to engage in ESCO financing
- Split incentives /tenant-employee behaviors at odds with efficiency goals
- Not enough/qualified workforce

Better Buildings Initiative

Broad strategies to overcome persistent barriers

Developing Innovative, Replicable Solutions with Market Leaders

Better Buildings Challenge
Better Buildings Accelerators
Better Buildings Alliance
Better Buildings, Better Plants
Better Buildings Case Competition
Better Buildings Neighborhood program

Developing a Skilled Clean Energy Workforce

Workforce Guidelines
Pilot program with NIST: Training and education programs on building retuning

Making Energy Efficiency Investment Easier through Better Information

Asset Rating
Buildings Performance Database
Green Button
Data Access Map
MOU with the Appraisal Foundation

Improving Effectiveness of Federal Incentives

Federal Leadership by Example

Better Buildings Challenge

Launched December 2011

Goals:

- Make commercial, industrial buildings & multifamily housing 20%+ more efficient in 10 years
- Save more than $80B+ for US organizations
- Create American jobs; improve energy security
- Mitigate impacts of climate change

How:

- ✓ Leadership
- ✓ Results
- ✓ Transparency
- ✓ Best Practice Models
- ✓ Recognition
- ✓ Catalyzing Action

Launched 2011, Now 200+ Partners

Commercial, Industrial, Public, Private

Represent:

3+ Billion Square Feet

$5 Billion Private Financing

600+ Manufacturing plants

$2 B Federal Commitment

Better Buildings Challenge Partners and Allies

Partners represent diverse sectors

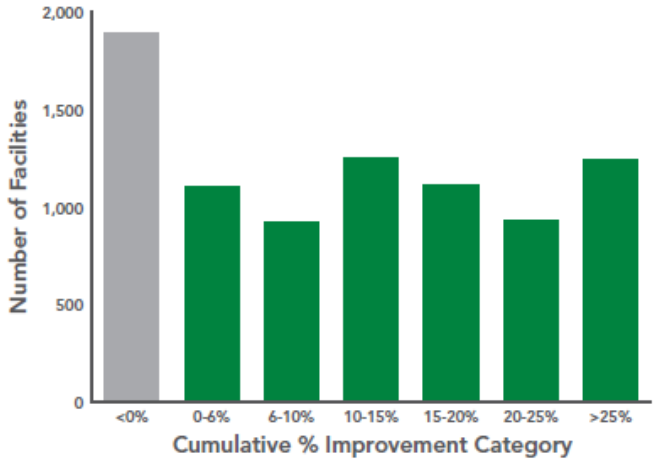
Range of Portfolio Commitment by Market Sector

Smallest	Sector	Largest
5 million sq. ft.	Commercial Real Estate	100 million sq. ft.
13 million sq. ft.	Retail and Food Service	850 million sq. ft.
8 million sq. ft.	Healthcare	35 million sq. ft.
10 million sq. ft.	Hospitality	79 million sq. ft.
1.3 million sq. ft.	Higher Education	20 million sq. ft.
704,000 sq. ft.	K-12 School	24 million sq. ft.
120,000 sq. ft.	State and Local	123 million sq. ft.
22,000 sq. ft.	Multifamily	50 million sq. ft.
1 plant	Industrial	159 plants

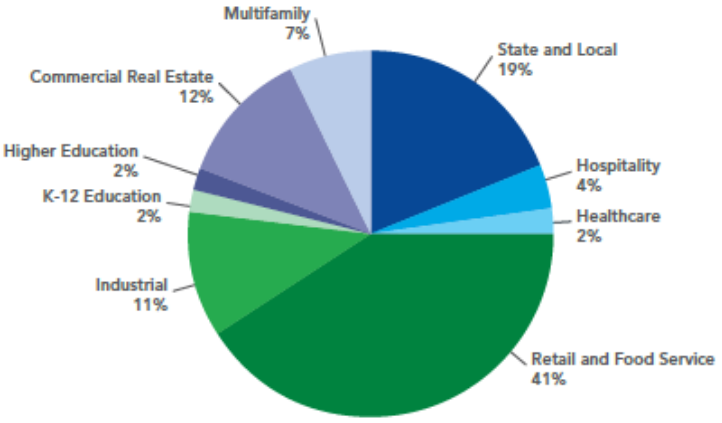
Results to Date: Better Buildings Challenge

- **Partners on track to meet goals**
  - 2.5% average annual improvement in energy intensity
  - $300 million in savings since 2011
  - Goal achievers: Partners & Allies
- **More than 120 solutions** (70 showcase projects, 50+ implementation models)
- **30 New Partners:** Walmart, Hilton, San Diego, General Mills, General Motors, Penn State, Jonathan Rose, etc
- **Water Saving Pilot, Data Centers**
- **New Better Buildings Accelerator**

Facility-level Percent Improvements
(Figure 2)



Percent of Floor Area by Market Sector
(Figure 4)



Partner solutions

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Playbooks and Showcase Projects

70+ showcase projects

- Large and small buildings
- All sectors
- Specific building types such as schools, hospitals, hotels, grocery stores, universities, civic centers, libraries, offices and labs

50+ implementation models (playbooks)

- Overcome barriers: finance, data, energy management, staff training, community and customer outreach, and more
- Multi-faceted and applicable across sectors

Partner Playbooks

✓ FINANCE

- Facilities Infrastructure Pool
- Update Internal Purchasing Systems To Facilitate A Portfolio-Wide Energy Upgrade With Maintenance Funds
- Energy Finance Strategy
- Building Upgrade Value Calculator
- On-Balance Sheet, Off-Debt Capacity Performance Contracting
- Internal Green Revolving Fund
- Capital Set Aside Fund
- Green Initiatives Trust Fund
- Utility Savings Initiative
- ESA in BAE Facilities Nationwide
- Commercial PACE Financing at Pier 1
- On-Bill Financing

✓ DATA/ENERGY MANAGEMENT

- Energy Looking Glass Dashboard
- Real-Time Energy Monitoring And Weekly Engagement With Field Staff
- Accessing Tenant Utility Data in Triple-Net Leased Buildings
- Data Update and Certification Scorecard
- Centralized Energy Management And Capital Set-Aside Fund
- Submetering Initiative and Energy Dashboards
- Uniform Methodology To Measure Energy Efficiency Improvement
- Inventory and Tracking Process
- Designing A Comprehensive Energy Plan
- Mass Benchmarking
- Energy Benchmarking Program

✓ EMPLOYEE /CUSTOMER ENGAGEMENT

- Engaging Clinicians To Reduce Resource Use In Operating Rooms
- Chasing Quarters With Energy Set-Points
- Innovation Hotel
- Student Fellowships To Kickstart In-House Energy Programs
- Eco-Treasure Hunts at Fulfillment Centers
- Leveraging Green Leases To Reduce Energy And Water Use
- Wyndham Vacation Ownership Green Certification Program
- Leverage Student-Faculty Research
- Linking Energy Efficiency to Performance-based Compensation
- Energy Champion Program
- Operations Management Leadership Program
- Energy Champions at All Plants
- Rethink Energy
- Public-Private Partnership
- Community Engagement
- Employee Behavioral Change
- Community Outreach
- County V. County Energy Challenge
- Public-Private Partnership
- Energy Leader Partnership

✓ OVERCOMING ORGANIZATIONAL HURDLES

- Enterprise-wide Coordination
- Good, Better…BEST Standards of Sustainability
- Developing an Integrated “Smart Lab” Program
- Integrated Model For Long Term Campus Energy Planning
- Creating a Culture of Energy Efficiency
- Streamlined Tri-resource Efficiency Programs

Real Results: Macy's

Sidewalk view to the main entrance

METRO CENTER

Showcase Project: Macy's

LOCATION
Washington, D.C.

PROJECT SIZE
272,000 Square Feet

FINANCIAL OVERVIEW
Project Cost $210,000

Annual Energy Use (Source EUI)

Baseline (2011)	157 kBtu/sq. ft.
Actual	110 kBtu/sq.ft.

Energy Savings: 30%

Annual Energy Cost

Baseline (2011)	$604,300
Actual	$380,850

Cost Savings: $223,450

Real Results: Whole Foods Market

BROOKLYN THIRD AND 3RD

Showcase Project: Whole Foods Market

LOCATION
Brooklyn, NY

PROJECT SIZE
55,000 Square Feet

Annual Energy Use (Source EUI)

Baseline (ASHRAE STANDARD)	309 kBtu/sq. ft.
Expected (2015)	123 kBtu/sq. ft.
Actual	COMING IN 2015

Expected Energy Savings: 60%

Annual Energy Cost

Baseline (ASHRAE STANDARD)	$620,000
Expected (2015)	$495,000
Actual	COMING IN 2015

Expected Savings: $125,000

Real Results: Ascension Health

ASCENSION HEALTH - DELL CHILDREN'S MEDICAL CENTER OF CENTRAL TEXAS

Showcase Project: Ascension Health

LOCATION	PROJECT SIZE	FINANCIAL OVERVIEW
Austin, TX	590,000 Square Feet	Project Cost $300,000

Annual Energy Use (Source EUI)

Baseline (2008)	523 kBtu/sq. ft.
Actual (2013)	392 kBtu/sq. ft.

Energy Savings: 25%

Annual Energy Cost

Baseline (2008)	$2,691,000
Actual (2013)	$2,818,000

Cost Savings: $-127,000

**Negative savings occurred because both energy rates and the facility square footage have increased significantly.*

Real Results: Nissan


Workers polish the roof of a new Nissan vehicle

NEW PAINT PLANT

Showcase Project: Nissan

LOCATION
Smyrna, TN

PROJECT SIZE
250,000 Square Feet Footprint

FINANCIAL OVERVIEW
Project Cost: $200 Million

Annual Energy Use (Source EUI)

Baseline (2010)	7.9 MMBTU/Vehicle
Expected (2013)	5.5 MMBTU/Vehicle
Actual	COMING SOON

Expected Energy Savings: **30%**

Annual Energy Cost

Baseline (2010)	100%
Expected (2013)	70%
Actual	COMING SOON

Expected Savings: **30%**

Implementation Model: Kohl's

Energy Finance Strategy

Kohl's embedded members of the Finance Department into the Energy team to expedite communication of financial benefits & approval of energy efficiency projects.

KOHL'S

BARRIER

Getting and defending sustained corporate funding for energy efficiency projects

SOLUTION

Create a partnership between the Finance and the Energy teams

By integrating Finance Associates within the energy department to prioritize projects and investments Kohl's can test and validate results and provide the momentum and with financial savings history roll out the project at additional locations.

OUTCOME

Today, Kohl's has more than 700 ENERGY STAR labeled stores. Since 2008, Kohl's has improved the energy performance of more than 1,100 buildings by 12%.

Implementation Model: Alcoa

Linking Energy Efficiency to Performance-Based Compensation

Energy efficiency is one of the metrics influencing variable compensation of the company's business leaders.

BARRIER
Energy performance improvement crowded out by other business priorities

SOLUTION
Business units determine which energy efficiency performance contribute to incentive pay of employees within that business.

For example, Alcoa Recycling may choose to make energy efficiency count towards 3% of employee incentive pay, whereas Alcoa Building and Construction Systems may make it 5%.

OUTCOME
Alcoa businesses are increasing their focus on energy efficiency to meet long-term sustainability goals

Up to 20% of Alcoa's variable compensation was tied to sustainability targets, including safety, workforce diversity, and reductions in carbon dioxide emissions due to process improvements and improved energy efficiency.

Implementation Model: 3M

Capital Set-Aside Fund

3M established a capital set aside fund dedicated to energy efficiency projects.

BARRIER
Inability to access internal capital for energy efficiency projects

SOLUTION
Establishment of a capital set aside fund dedicated specifically for energy efficiency projects

OUTCOME
Rapid implementation of energy efficiency projects that would not have occurred otherwise.

$1.5 million dedicated to 69 projects – representing $580,000 and 56 billion Btus of annual energy savings

What are we learning?
How can others benefit?

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Lessons from Better Buildings Challenge partners

1. Know the goal.

Organizations that have set portfolio-wide goals and have met them, or are well on their way, include **University of California, Irvine, Legrand, Cummins, and Best Buy.**

2. Data matters.

If you can't measure it, you can't manage it. **Macy's, TIAA CREF, Schneider Electric, the City of Columbia, Missouri, the State of Delaware and the City of Beaverton, Oregon.**

3. Look beyond technology.

Successful projects combine technology advances with organizational changes and commitment. **3M, the City of Arlington, Virginia, Delaware State University, the states of North Carolina and Minnesota, the Commonwealth of Massachusetts, Kohl's and Alcoa.**

4. It takes an (energy) champion – and a team.

Saint-Gobain, the City of Hillsboro, Oregon, the State of Maryland, Cleveland Clinic, the City of El Paso, Texas and Cummins are just a few of the organizations with a successful champion. **Staples and New York Presbyterian Hospital** are great demos of why people power matters.

5. Learn, teach and evolve.

Successful businesses and organizations are constantly evolving to succeed and meet their customers' needs. These leaders also recognize that how they use their buildings must evolve too. They seek out best practices from others and share their learnings with peers. **City of Atlanta, Georgia and the City of Gillette, Wyoming implemented just such programs, as did Partners such as Legrand, Ford and HEI Hotels & Resorts.**

What's next?

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President's Climate Action Plan Expanded Better Buildings

- Better Buildings Challenge for Multifamily Residential Sector
  - In Partnership with HUD
  - Now working with 80+ private and affordable building owners and public housing agencies
  - Addressing market rate, affordable housing, public housing authorities

- Better Buildings Accelerators
  - Designed to demonstrate specific innovative approaches, which upon successful demonstration will accelerate investment in energy efficiency
  - Four focus areas
    - ✓ Energy Data Accelerator
    - ✓ Performance Contracting Accelerator
    - ✓ Strategic Energy Management Accelerator
    - ✓ High Performance Outdoor Lighting
    - ✓ Data Centers

- Data Centers

Challenges and Opportunities

- Specific sectors (i.e., food service, grocery stores, market rate multifamily, enclosed malls; energy intensive manufacturing)

- Financing: overcome internal, institutional hurdles even if upgrades pencil out

- Nothing sells like success … but need to tell successful stories in compelling way and deliver in the right channels

Story is bigger than energy efficiency; agility of an organization to recognize and act on an opportunity.

THANK YOU!

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