Better Buildings Case Competition

2014 Building Technologies Office Peer Review

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Elena Alschuler,
Elena.Alschuler@ee.Doe.Gov
Department of Energy

Project Summary

Timeline:

Start date: 2012

Planned end date: Annual event

Key Milestones

9/23/13 - Student Team Registration Opened

11/11/13– Cases distributed

2/17/13 – Solution proposals due

3/14/14 – Solution proposals presented at US DOE, winners selected by industry and expert judges

April 2014 – solutions posted

Budget:

Total DOE $ to date: $225,000

Total future DOE $: $75,000-$90,000 per year

Target Market/Audience:

- Building owners and managers facing real-world efficiency barriers
- Students & researchers with innovative ideas to overcome them

Project Goal:

The U.S. Department of Energy's (DOE) annual Better Buildings Case Competition engages the next generation of engineers, entrepreneurs and policy makers to develop creative solutions to real-world energy efficiency problems for businesses and other organizations across the marketplace.

2014 Case Partners:

LendLease	McDonalds	City of San Francisco
YUM! Brands	EPA	State of Delaware
City of Knoxville	CA Energy Coalition	Southface Energy Inst.
GSA	HUD	Clean Energy Solutions
DC PACE	NYSERDA	Federal Practice Group
Energize NY	A&R Companies	Waypoint
Stewards for Affordable Housing	CT Clean Energy Finance & Investment Authority	National Restaurant Association
CA PUC	Enfinity Solar	Xcel Energy
NIH	NARUC	LBNL
PACE Now	Center on Env. Quality	

Purpose and Objectives

Problem Statement: It is not always easy for businesses and organizations to take advantage of cost-effective technologies due to a variety of ***implementation problems*** such as difficulty accessing energy data, challenges engaging building occupants, barriers associated with high first cost, split incentives, etc.

Target Market and Audience: BBCC works with ***building owners*** to describe these problems in a case, and challenges ***interdisciplinary student teams*** to come up with innovative and replicable solutions.

Impact of Project: *BBCC develops **real-world solutions** to help building owners achieve the Better Buildings 20% energy savings goal, and helps prepare the **next generation of leaders** for careers in clean energy and energy efficiency.*

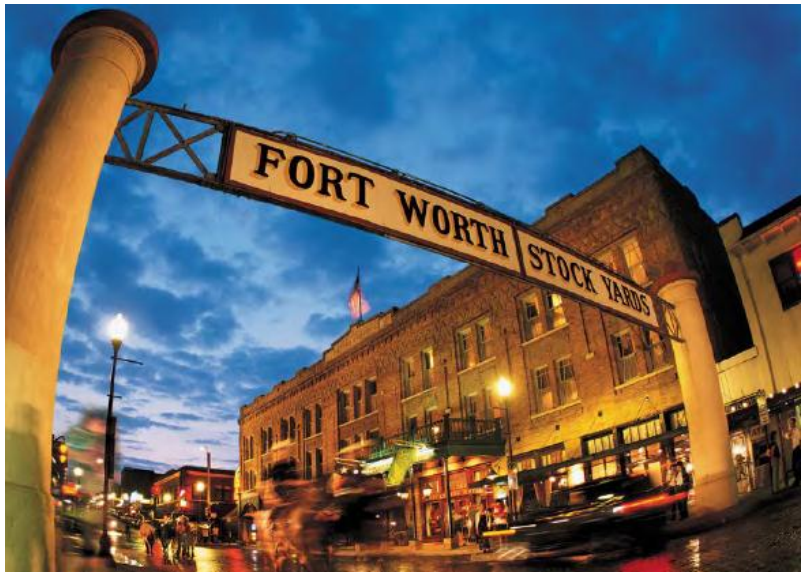
Approach

- **Approach to the Case Competition:**
  - The Competition assigns students a short case, developed in cooperation with industry, that describes a challenge or barrier endemic to industry.
  - Interdisciplinary student teams propose and present solutions to these barriers; winners are selected by a panel of industry and federal judges.
- **Why this Approach?**
  - Low-cost, high-value way to identify solutions to persistent barriers
  - Engages federal and industry partners in Better Buildings work, advancing our deployment mission
  - Valued by students: experience, career opportunities
  - Valued by judges: recruitment tool, source of new and fresh solutions

Winner Example from 2013

City of Fort Worth Case

- Students developed strategies to help the City, local utilities and industry work together to achieve the Better Building Challenge goal to make commercial and industrial buildings 20% more energy efficient
- Winner: MIT Team Efficient Sea
- Follow-on result: City working to operationalize recommendations



"Thanks so much to our DOE partners for the great shared-experience of our Better Buildings Case Competition... we're working to incorporate the finer points [of the students proposal] to ensure the success of our Fort Worth Better Buildings Challenge. What an effective partnership!"

2013 BBCC Case Partner Samuel Steele
Administrator of Sustainability Programs, City of Fort Worth, Texas

Distinctive Features of the 2014 Competition

- **Better, broader cases**. Feedback from previous years suggests that cases were a bit too narrow, impeding replication. This year's cases were specific enough to be challenging, but broad enough to result in widely-deployable solutions.
- **More teams.** In previous years, students from community and liberal arts colleges had a difficult time designing interdisciplinary teams that are necessary to create robust solutions. This year students could team up with students from other universities, increasing opportunities for participation.
- **DOE Campus**. For the first time, the competition was held at DOE instead of on the White House campus, allowing greater participation due to larger facilities.
- **Career connections**. DOE hosted a resume and internship exchange, allowing students and judges to share information on the Case Competition site.

2014 Cases

Welcome Home to Savings: Distributed Generation in Multifamily Housing
Develop a replicable strategy to expand energy efficiency and distributed generation at federally assisted housing complexes.

Picking up PACE: Taking Commercial PACE Financing to Scale
Develop a program structure and a business plan that states can use to effectively implement PACE financing and achieve scale.

Electri-City: Energy Management in Public Buildings
Recommend a scalable, sustainable, and replicable data acquisition and management strategy for publicly owned buildings

Experimenting with Efficiency: Greening the Grant Process for Research Institutions
Develop the business case and implementation strategy for universities to promote energy efficiency in all projects funded with external grant funds, considering every perspective (research facility, grant management, and researcher).

Here Comes the Sun: Satisfying RPS with Solar
Develop a cost effective solar incentive program strategy for utility companies charged with RPS satisfaction, including a solar carve out.

A Side of Savings: Energy Efficiency in the Restaurant Franchise Model
Develop a strategy for franchises to promote efficiency in franchisee locations, including consideration of the complicated ownership, investment, and management structures.

Welcome Home to Savings: “Most Innovative” Winner

Team Xenergy - University of California, Santa Barbara

S H E D

Specialized HUD Energy D i s t r i c t

- Community Building
- Minimize Transaction Costs
- Provide Replicable Solution
- Remove Capital Stack Barrier
- Avoid the Incentive Gap
- Keep Community Money Local

Progress and Accomplishments: 2012-2014

Goal 1: Develop innovative solutions

- **14 cases**
- **60 case partner organizations**
- **>100 solutions developed**

Goal 2: clean energy careers

- **>350 students participating**
- **58 participating universities**
- **65 resumes posted (2014 only)**

Evidence of Market Impact:

- Participants have gone on to work at the DOE, ICF, DC Energy, Apex Wind Energy, Navigant, CT Energy Finance and Investment Authority, Chevron Energy Solutions, PG&E, LBNL, Clinton Global Initiative, and many others

"The BBCC was an incredible learning and professional development experience. Participating in the competition also helped launch me into a position at the Connecticut Clean Energy Finance and Investment Authority, the nation's first green bank, where I'm helping apply insights from our team's case proposals."

-John D'Agostino Yale Team, 2013

2014 Closing Keynote

"…This competition provides the next generation of entrepreneurs and policymakers with an opportunity to tackle real-world problems. It's inspiring to see students devise innovative solutions to building efficiency challenges that can be replicated by families, businesses and organizations across the country."

- Dr. Dave Danielson

Assistant Secretary of Energy Efficiency and Renewable Energy, DOE

Participating Partners

2012 (4)

City of Houston

District of Columbia

Cassidy Turley

HEI Hotels

2013 (17)

The City of Fort Worth, TX

Oncor Electric Delivery

Atmos Energy

Staples

Kohl's

Target

ASHRAE

Maryland Energy Administration

General Services Administration

Institute for Market Transformation

Montgomery County, PA

ACEEE

Alliance to Save Energy

Energy Efficient Buildings Hub

Virginia Department of Mines, Minerals and Energy

Real Estate Roundtable

Senate and House Staff

2014 (38)

Lend Lease

McDonalds

National Restaurant Association

YUM! Brands

Environmental Protection Agency

The State of Delaware

The City of Denver, Colorado

The City of Knoxville, Tennessee

California Energy Coalition

Southface Energy Institute

The General Services Administration

The Department of Housing and Urban Development

Clean Energy Solutions

HR&A Advisors

NYSERDA

Federal Practice Group

Stewards for Affordable Housing for the Future

A&R Companies

Weatherization and Intergovernmental Program

Waypoint

Solar Energy Technologies Program

Energize NY

Connecticut Clean Energy Finance and Investment Authority

The City of San Francisco

DC PACE Program

Enfinity Solar

Xcel Energy

EPA Green Power Partnership

The California Public Utilities Commission

The National Association of Regulatory Utility Commissioners

The Lawrence Berkeley National Laboratory

Stanford University

The University of Colorado

UC Berkeley

The National Institute of Health

The Center on Environmental Quality

PACENow

Universities Participating

2012 (19)

- Columbia University
- Duke University
- Carnegie Mellon University
- University of California, Berkeley
- University of Southern California
- University of California, Irvine
- University of Colorado, Denver
- University of Michigan, Ann Arbor
- Vanderbilt University
- Texas A&M University
- Georgetown University
- The George Washington University
- Georgia Institute of Technology
- Tufts University
- Harvard University
- Babson College
- Massachusetts Institute of Technology
- Dartmouth College
- Yale University

2013 (14)

- Babson College
- Carnegie Mellon University
- Columbia University
- Cornell University
- Dartmouth College
- Tufts University
- Univ. of Michigan Ann Arbor
- University of Chicago
- University of Pennsylvania
- Yale University
- George Washington University
- University of California
- Irvine
- Univ. of California Santa Barbara
- Mass. Institute of Technology

2014 (25)

- Princeton
- Howard University
- Stanford University
- Georgetown University
- Yale University
- Columbia University
- Rutgers University
- University of Iowa
- University of Guam
- Mass. Institute of Technology
- Tufts University
- University of California, Santa Barbara
- University of California, San Diego
- University of Michigan
- Georgia Tech
- UC Berkeley
- Babson College
- Mississippi State University
- UC Irvine
- University of Maryland
- University of Utah
- Harvard University
- Carnegie Mellon University
- University of Chicago
- George Washington University

12

Project Integration and Collaboration

Subcontractors:

- Energetics role included project management, judge and case partner management, ICF coordination, staffing day-of, and wrap-up
- ICF role included case writing, student engagement management, and general logistics

Communication: Plans to promote solutions via Better Buildings web site, webinars, summit, speaking engagements, etc.

Next Steps and Future Plans

Impact tracking

- **Near-term (1yr after presentations):** Ask judges to report which solutions they are planning to implement; interview students about career plans & job offers
- **Intermediate-term (2-3yrs after presentations):** Ask judges to report which solutions they did implement; track student career paths
- **Long-term (3yrs+ after presentations):** Ask judges what the energy savings results were after implementing solutions; track student career paths

Next Steps and Future Plans

Potential Changes - Feedback welcome:

- Tactical challenges: staff time for planning and logistics; day-of security
- As the competition grows, how to cap the number of teams or students, while also reducing drop out rate (currently ~25%)
- New ways to solicit case ideas and develop cases
- Additional ways to encourage interactions between case partners and students – before, during and after the competition day
- Additional ways to promote the solutions

REFERENCE SLIDES

Project Budget

FY 14 Project Budget: $75,000
Variances: $5,000 more spent in FY 14 due to greater than anticipated student participation
Cost to Date: 107%

Budget History					
FY2013 (past)		FY2014 (current)		FY2015 – Forward (planned)	
DOE	Cost-share	DOE	Cost-share	DOE	Cost-share
$75,000	$50,000*	$80,000	$100,000*	$90,000 per year	$100,000*

*estimated value of in-kind contributions including labor hours for case sponsors and judges and non-reimbursed travel expenses

Project Plan and Schedule