

## **Commercial Real Estate Energy Alliance (CREEA) Executive Roundtable**

April 9, 2009

7 World Trade Center, 45<sup>th</sup> Floor  
250 Greenwich Street • New York, NY 10007

***Hosted by Silverstein Properties***

### **EXECUTIVE SUMMARY**

On April 9, 2009, the Department of Energy's (DOE) Building Technologies Program (BTP) convened a roundtable to launch the Commercial Real Estate Energy Alliance (CREEA) to improve energy efficiency and reduce the greenhouse gas emissions of commercial real estate buildings. CREEA will be a national forum for commercial real estate owners and operators in which best practices in energy efficiency are continually documented and publicized, DOE research and knowledge of emerging technologies can be offered, and peers can share practical experiences and insights.

Hosted by Silverstein Properties and attended by commercial real estate industry leaders, the goal of the meeting was to bring together charter members to discuss how their organizations are currently managing energy use, challenges that are specific to the commercial real estate industry, and how CREEA members can work with one another and with DOE to lead the industry in energy-efficient initiatives.

### **Scott Hine, Acting Program Manager, U.S. Department of Energy, Building Technologies Program**

U.S. buildings account for 9% of the world's carbon dioxide emissions, greater than Japan, France, and the UK combined. U.S. buildings consume 75% of U.S. electricity and 34% of natural gas. Our goal is to enable net-zero energy buildings by 2025. The Commercial Building Energy Alliances are a vital part of moving high-performance technologies that will transform tomorrow's buildings. Thank you for partnering with government to help solve the problems confronting us as a nation. Together, we can achieve net zero energy commercial buildings by 2025. Leadership, collaboration, and communication are keys to success.

### **Dick Purtell, Grubb & Ellis, representing BOMA**

I applaud DOE and all the alliance partners for providing their time and expertise to transform energy efficiency across the commercial building stock. As part of our 100<sup>th</sup> anniversary in July 2007, BOMA had issued a challenge to the industry to achieve 50% energy savings by 2012 versus today's ENERGY STAR building. We have trained 20,000 people and introduced tools to move the industry forward, including the Green Lease and EPC templates. We have strong working relationships with USGBC, Green Building Initiative, ENERGY STAR, ASHRAE, Clinton Climate Initiative, and other leading organizations. DOE is to be complemented for reaching out to the private sector as we combine resources to achieve an environment of continuous improvement and to accomplish great things together.

### **Lynn Bellinger, Treasurer ASHRAE**

With the energy challenges facing us, we are poised as never before to be able to make a difference. Daily, we compete for clients and tenants. But today we are here to work together to share best practices. ASHRAE will be launching a building labeling program later this year. Such uniform metrics can help us know where we are and challenge ourselves to do better. I also would like to thank DOE for their wonderful support in funding and cosponsoring the Advanced Energy Design Guides series; to date we have seen 155,000 downloads, which are helping architects and owners develop high performance buildings.

**Bill Hanley, IES**

Lighting is our area of expertise, but we are also concerned about integrated building design and are committed to working with our colleagues in ASHRAE, BOMA, USGBC, and DOE in changing how we design, construct, and operate our buildings in the future. Our focus is fostering the application of new and emerging technologies. Sharing experiences of what has worked and what hasn't will be keys to success. We hope you will participate in the Lighting Supply Summit May 4 and will participate in idea sharing with lighting manufacturing and suppliers. CREEA is important to all of us; let's make the most of it.

**Dru Crawley, Lead of the Commercial Buildings Program at the Department of Energy**

CREEA is about the industry itself driving change—CREEA members represent 20% of the marketplace. It is a way to exert leadership in the industry to lower greenhouse gases and operating costs. The industry can benefit from technology procurement activities. For example, the Retailer Energy Alliance, a sister alliance, is currently developing specifications for LED parking lot lighting and contemplating a large purchasing activity. They are developing the business case for LED lighting, taking into account better lighting distribution, improved security, and lower operations and maintenance. Similarly, the Hospital Energy Alliance is interested in a supplier summit on medical equipment, getting manufacturers geared up to meet their defined needs. National laboratories are supporting these efforts, doing independent technology evaluations based on inputs from the alliances and developing specifications and test procedures. Access to DOE's national lab resources provides an unbiased view of what works and doesn't.

## Facilitation questions and answers

### 1. Describe the energy efficiency activities your company has engaged in.

<p>The key has been getting the right knowledge, motivation, and tools in the hands of people at the operations level. That is where we are focused—using the BOMA program and EPA's ENERGY STAR. It is also important to provide local champions who building people can go to as resources.</p>
<p>Two dimensions: in our own operations, we are moving toward LEED certification for our facilities via the Facilities Review Committee. Second, we did the first MOU from commercial real estate with EPA to agree to certain goals in supporting our clients' initiatives. Each time I meet with clients we are talking about their plans and how to move forward. We believe that without certification we are not going to be competitive in attracting and retaining tenants.</p>
<p>For our 7,000 hotels, we are redefining our franchise model to realign quality assurance standards, in everything from budget to full-service hotels. We are realigning property improvement standards for greening and sustainable features and doing that as affordably as possible, outlining the ROI. We have developed lots of tools and training around that. Certification aligned with ENERGY STAR or a building rating system would accelerate the urgency of owners to go for that.</p>
<p>Our Global Sustainability Board launched a global employee engagement initiative with education and training for all. All project and development individuals will be LEED certified over next two years. Services to our clients to impact GHG will be even more impactful. Still far more to do.</p>
<p>Two years ago we created a sustainability task force and hired a VP of sustainability. Our Greengenuity program started with corporate facilities. We've held LEED and sustainability training across U.S. construction and investment teams. We are committed to LEED construction ramping up to 60% in 2010.</p>
<p>We've been involved with ENERGY STAR for nine years; it's the basis for most of what we do. Signed up with USGBC for a volume program to certify about 100 assets around the country. We defined the energy services process for managed offices as well as client-owned real estate. First efficiency is priority vs. first cost. We are working to take LEED practices and make them commonplace over time.</p>
<p>There is a property and facility management effort on training building personnel using ENERGY STAR portfolio manager. We are involved in the USGBC pilot portfolio program for volume certification, and we partner with individual clients to get LEED certification. We are defining operational cost savings and deriving efficiencies and resulting greenhouse gases and launching programs for managed properties on standard green operating and maintenance procedures.</p>
<p>We use NYSERDA grants to retrofit mechanical and lighting. We're now doing cogen with NYSERDA at One Penn Plaza with another coming. We're focusing on establishing a plan for LEED-EB certification with five targeted for this year, five for next. Also, we're developing policies for construction and demolition for our NY portfolio. We're looking at key mechanical systems at buildings that are not ENERGY STAR rated yet. We are training on LEED and sustainability in general.</p>
<p>Next step will be tenant piece, which is critical. We will be benchmarking so tenants know where their use stands and providing tenants with tools to become more efficient. Energy density statement or energy utility index would allow tenants to rank among their peers on KWH per square foot. High users will have the ability to look at hourly use through a web-based system for near real time use.</p>
<p>We've focused on environmental protection since 1971. We've reduced CO<sub>2</sub> by 44% since 1990. We've developed expertise in reconditioning practices and enterprise energy management systems. Our 20 highest energy-using sites see energy use at 15-minute intervals, resulting in \$30M in savings just last year.</p>

We've found that free air cooling – opening windows – saves 50% of energy costs. For clients in China and Japan (e.g., St. Regis Shanghai) reduced energy costs to revenue from 8% to 5%. Now we're seeing how to leverage around the world. Property Performance Management System measures energy and water use so can manage. Also worked with PNNL on Smart Grid to Smart Building work that reduces capital asset requirements of utilities, bringing peak load down from 15% to 50%.

Did checklist on LEED for new construction. Now focusing on existing buildings, implementing sustainable operating procedures and benchmarking for all properties. Going beyond LEED is important -- not always the best answer for our buildings. Depends on whether owner operator, multi or single tenant, etc. – on a case-by-case basis. One issue is aligning incentives to get tenants and owners on the same page. We were involved in the concept of a green lease. We will start with energy audits for our tenants. So far, we're only incentivizing owner and property manager.

NYSERDA incentivizes meaningful energy reductions. ENERGY STAR also has the same difficulties of incentivizing owners vs. tenants.

We provide third-party management of 1.1B sq ft. Our chairman has declared we will be carbon neutral by 2010. We're doing our own internal facilities first, with some stumbling. We don't own anything, so we are living the life of a tenant occupant as well as third-party manager. We did not want to invent anything. We all think we are clever, but we are all doing the same things. We rely on things like ENERGY STAR that are already out there. Every building we manage will be benchmarked and registered with EPA. It is a flawed system that can be gamed but it is a good place to begin. Also did an agreement with BOMA International two years ago to adapt their training. About 1500 managers and engineers are now trained. We're also making it available to our corporate people and doing the same with USGBC training.

We gave a standard of sustainability for all of our buildings that is broader than energy. Engaging with tenants is key – recycling, temperature set, etc. It takes outreach ... and doing it all for free. Our tenants are not willing to spend money to do it. We hope we may be able to market it as we go forward.

When tenant demands it, we get there. International companies with carbon neutrality commitments are driving it. Gazelle tenants also doing it to get Gen X and Y employees. But the great mass in the middle lacks incentive to care or to spend money on it.

We are doing all the traditional things in our DC portfolio: ENERGY STAR and LEED. A unique asset in DC is our centralized Energy Management Center, which monitors 60 properties 24/7 with huge benefits of real time load shedding, start up and shut down protocols, etc. Utilities now are coming to pay us for the ability to do on-demand load shedding for them. We're struggling with GSA – we've been mandated to meet carbon requirements yet their leases specify high-foot candles. DOE could help us with that.

## **2. What have been your major lessons learned to date?**

I wish NYSERDA were here. Their programs incentivizing retrofits are great – makes a 9-year payback a 3-year payback. But the struggle is that they are changing the baseline measurement, which penalizes me for past improvements. Companies that have effectively reduced their energy usage and carbon emissions should not be held to the same goals of 30% improvement, which are more appropriate for companies who have not done any energy efficiency work. If you can still get 30%, you missed something in the past.

We are not looking at LEED or ENERGY STAR because they don't fit multi-tenant malls, although new developments are proposed to be LEED. Our focus has been energy efficiency. There is a lot of opportunity. Most of our portfolio is in California and utility incentive programs are similar to what NYSERDA is doing. Central plant retrofits have yielded 30% to 50% energy reduction with 1- to 4-year paybacks after utility incentives of 20% to 30%. There are great new technologies for central plants. LED lighting is starting to come into its own – bulbs with same

plugs and great life. We are doing energy audits and carbon footprints for our total portfolio through an energy services company. We're combining all moves to get one ROI calculation; it gets the most bang for the buck versus having each operations manager do their own individual things. Now we have a handle on what we are gaining from these investments. Centralizing, looking at each property holistically, setting up with energy management and monitoring to continually commission the property.

We are starting to see tenants wanting to save money but with no capital outlay. The capital and operating budgets don't come together, which is putting the brakes on critical mass of tenants to spend money now. Clients want a real ROI model.

We are seeing 20% to 40% percent IRRs and a little lower ROIs. Those are attractive returns that get the investments done.

In the late 1970s we did all kinds of things with properties. Then at the end of the energy crunch, it was no longer important. The 1990s also had a cost-cutting cycle. Now we are going through that again. We need to forget about cycles and keep going when leases are back up to \$120 a square foot.

The greenhouse gas emissions issue will be the factor that is different from the past. Wasteful energy must be gotten rid of. I do see the need for some federal mandates on tenants to make it happen.

We need to acknowledge that buildings are not one size and shape. Financing solutions depend on utilization and tenants and ownership structure. Buildings need to be looked at as asset classes based on ownership and occupancy to develop the right solutions. Then we can communicate replicable solutions. We launched Empire State retrofit with Johnson Controls and ENERGY STAR and other resources, all working together to figure out an optimal retrofit that is advantageous to the investors. Retrofits come from an integrated design process and need an integrated team. We achieved significant savings by making sure our incentives and perspectives were aligned across the team and that each party had something to gain.

As we come together and communicate our limitations as an industry, we can come up with solution sets with the other parties involved. Then DOE can help us and we can also create policy recommendations on incentives.

### **3. Are there particular technologies that you have field tested?**

- LED lighting, 85% to 90% more efficient than incandescent
- Fiber optics replacing fluorescents – 50% more efficient
- Variable-frequency drives (VFDs) –12-18 month payback
- Peak shaving
- Thermal storage
- Smart meters, metering in general – feed a dashboard of data and property performance management systems
- CFD (computational fluid dynamics) – engineering tools
- Ventilation using ASHRAE 62 – 18-month to 2-year return
- LEED eBOM – average waste recycling in a building is just 20%; water savings in 25-30% range can be achieved inexpensively; there is embedded energy in all of that
- ASHRAE 62 – finding buildings are over-ventilated and operating hours not synched with outdoor air hours; need to adjust for occupancy density; can be 50% over-ventilated
- CO<sub>2</sub> sensors
- Light harvesting
- Glazing films – effective in some parts of the country

The jury is out on EPA and LEED, but that is what we've got. Taking LEED as a baseline to drive industry change will impact energy as a whole.

### **4. How can DOE work with you to spur solutions?**

- Provide independent research and protocols and standards that take us out of firing range of determining good vs. bad products – using a reliable third party to vet products and practices will speed them to market.
- Work together to develop “LEEP” – going beyond LEED to assess before and after performance.
- Take unique abilities of each lab and create pilots on cities; extend residential metering work at PNNL to commercial metering.
- Provide comparative analyses of products.
- Explore regional differences in how to achieve high performance.
- Get pilot cases out as quickly as possible (e.g., LEDs for parking garages).
- Test market program with DOE and CREEA by region with hospitality.
- Provide access to transparent info – companies can easily access and test themselves.
- Promote solar for heating – simple applications like pool heating.
- Leverage buys with Walmart and larger retailers.
- Rooftop unit – knowing what a 15-year-old unit’s efficiency is is challenging. After you’re replaced it, it’s a pleasant surprise at what you save. Knowing that on the front end is key to getting the investment.
- Pressure on manufacturers gets them focused on the needs.
- Education is still a must – covering the basics for clients; need training building operators and managers, info on incentives, etc.
  - ASHRAE, IES, and BOMA can help with training and education – also doing Advanced Energy Design Guides including business case for existing buildings. Two more coming – one on technical aspects for new systems in existing buildings, plus one on O&M issues.

## **ATTACHMENT A: ATTENDEES**

### *Industry Attendees (alphabetically by organization)*

Lynn Bellenger, ASHRAE  
Henry Chamberlain, BOMA  
Karen Penafiel, BOMA  
Dick Purtell, BOMA  
Tom Damsell, Brookfield  
Dave Pogue, CB Richard Ellis  
Deborah Romano, CB Richard Ellis  
Frank A. Freda, Cushman & Wakefield  
Louis J. Mantia, Cushman & Wakefield  
Eleni Reed, Cushman & Wakefield  
John C. Santora, Cushman & Wakefield  
John Scott, Cushman & Wakefield  
Gregg Edelstein, Edens & Avant  
Mike Groppi, Grubb & Ellis  
John McGinley, Grubb & Ellis  
Joseph Swingle, Grubb & Ellis  
Geraldine Walsh, Grubb & Ellis  
Mark Chenoweth, Hines  
Florence Hudson, IBM  
Kent Jeffries, ICSC  
William Hanley, IES  
Rita Harrold, IES  
Chris Drazba, Intercontinental  
Jean Savitsky, Jones Lang Lasalle  
Diane Vrkic, Jones Lang Lasalle  
Fred Dougherty, Liberty Property Trust  
Marilyn Davenport, Real Estate Board of New York  
James Kleeman, Related Companies  
Lee Zucchi, Related Companies  
Josh Feur, Tishman Speyer  
Jon Hettinger, Tishman Speyer  
Steve Latargia, Tishman Speyer  
Tom Scarola, Tishman Speyer  
Steve Harding, Transwestern  
Allen Skodowski, Transwestern  
Tony Campbell, Vornado  
Sukanya Chandrasekar, Vornado  
William Dunlap, Vornado  
Carlos Lopez, Vornado  
Gaston Silva, Vornado  
Patrick Tyrrell, Vornado  
James Darrish, Westfield  
Faith Taylor, Wyndham

### *Commercial Building Initiative*

Dru Crawley, U.S. Department of Energy, Building Technologies Program  
Jerry Dion, U.S. Department of Energy, Building Technologies Program  
Scott Hine, Acting Program Manager, U.S. Department of Energy, Building Technologies  
Nancy Wallace, Lawrence Berkeley National Laboratory  
Paul Torcellini, National Renewable Energy Laboratory  
Carol Jones, Pacific Northwest National Laboratory  
Linda Sandahl, Pacific Northwest National Laboratory  
Patrick Finch, Booz Allen Hamilton

Sucheta Puranik, Booz Allen Hamilton

# Pathway to Zero Energy Buildings

Scott Hine, Acting Program Manager  
Building Technologies Program  
U.S. Department of Energy



Energy Efficiency and Renewable Energy

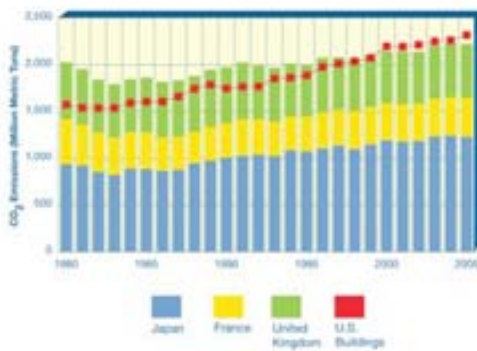
## Building Technologies Meet Society's Needs



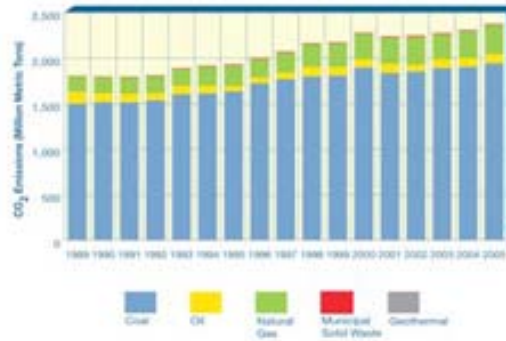
## Today's Challenge: Minimize Buildings' Energy, Carbon, and Environmental Footprint

- U.S. Buildings contribute 9% of world's carbon dioxide emissions

CO<sub>2</sub> Emissions of U.S. Buildings Relative to Japan, France, and the United Kingdom



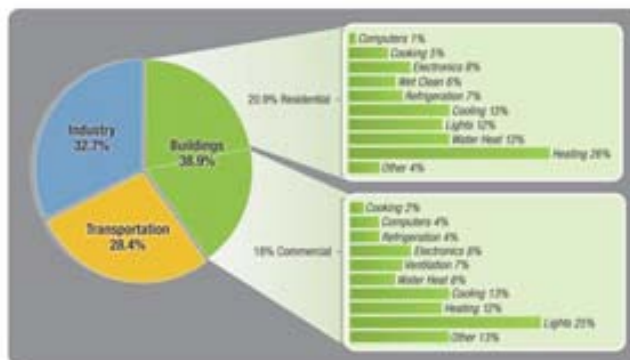
Contributors to Electricity CO<sub>2</sub> Emissions



## Buildings' Energy Share

- Combined residential and commercial buildings sector is the largest energy consumer in the U.S.

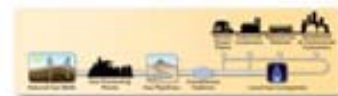
40% of U.S. Primary Energy Consumption



73% of U.S. Electricity



34% of direct U.S. Natural Gas



Source: Buildings Energy Data Book 2008, <http://buildingsdatabook.eere.energy.gov/Default.aspx>. Tables 1.1.3, 1.1.9, 1.1.10.

## Why is the Federal Government Involved?

- Because net-zero energy buildings mean:
  - Dramatic reductions in the nation's carbon footprint, in ways that support a healthy economy
  - Lower operating costs for building owners and tenants, leading to more competitive U.S. businesses
  - More sustainable communities, less strain on power grids, delayed need for new power generation infrastructure
  - Plentiful domestic energy from a clean new source: buildings that generate power back to the grid

## Net-Zero Energy Commercial Building Initiative

### *Transforming the Built Environment*

- Public-private partnerships created to achieve and promote continuous technology improvement and commercialization of advanced building technologies at an accelerated pace
- Enable market-ready net-zero energy commercial buildings no later than 2025 in all climate zones

## Commercial Building Energy Alliances

**Critical collaborations to accelerate innovation and market adoption in the field of high-performance buildings.**

- Retailer Energy Alliance
  - General merchandise, grocery store, restaurant, warehousing/distribution
- Commercial Real Estate Energy Alliance
  - Office, shopping center, hospitality, medical office, GSA
- Institutional Energy Alliances
  - Federal/state/local government, hospitals (Hospital Energy Alliance launching April 2009), colleges/universities/K-12 schools

## Summary

- Commercial Buildings' energy use represents an ever-increasing share of U.S. energy consumption.
- High-performance buildings are necessary to ensure competitiveness and improve national security.
- To get to zero, it will take improvements in technologies, cost reductions, and supporting policies.
- The energy alliances, such as CREEA, are a vital component to accomplishing net-zero energy buildings.

**Thanks!**

Scott Hine, Acting Program Manager  
Building Technologies Program  
Office of Energy Efficiency and Renewable Energy  
Department of Energy

Email: [Scott.Hine@ee.doe.gov](mailto:Scott.Hine@ee.doe.gov)

Phone: 202-586-9744

[buildings.energy.gov](http://buildings.energy.gov)



## Commercial Real Estate Energy Alliance

### Net-Zero Energy Commercial Building Initiative

Dru Crawley  
Team Lead – Commercial Buildings  
U.S. Department of Energy

### Commercial Buildings' Share

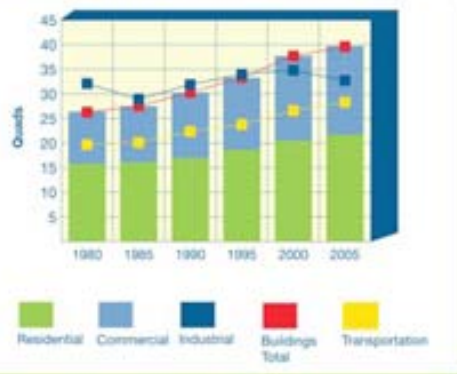
- 18% of U.S. energy
- 18% of U.S. greenhouse gas emissions
- 4% of world greenhouse gas emissions—equal to the emissions of India



## Fastest Growing Energy Sector

- Energy consumption by commercial buildings sector rose 70% between 1980 and 2005.

Growth in Buildings Energy Use Relative to Other Sectors



## 2030 Commercial Buildings Projection for “Business as Usual”

- 1,210 square miles of new commercial floor space to add 580 million metric tons of CO<sub>2</sub>
- Commercial buildings to use additional 7 quads of energy use, 90% of it electricity
- Commercial buildings to contribute 53% of total growth in electricity usage or 100 GW

## DOE's Alternative to "Business as Usual"

- Turn tomorrow's buildings into domestic energy assets
- Construct energy-efficient, high-performance buildings that expeditiously and cost-effectively achieve sustainable carbon reductions
- Enable, through energy-efficient buildings, higher ROIs for building owners and occupants as well as for economy as a whole

## Commercial Building Initiative: EISA Authorizations

### Energy Independence and Security Act of 2007

- Calls for development of Net-Zero Energy Commercial Building Initiative [EISA Section 422]:
  - Commercial buildings newly constructed by 2030;
  - 50% of commercial building stock by 2040;
  - All commercial buildings by 2050.
- Authorizes DOE to collaborate with national labs, private sector, other federal agencies, non-governmental organizations to advance high-performance commercial buildings.
- Directs DOE to recognize High-Performance Green Building Partnership Consortia and competitively select Consortium.

# Net-Zero Energy Commercial Building Initiative

## Transforming the Built Environment

- Public-private partnerships created to achieve and promote continuous technology improvement and commercialization of advanced building technologies at an accelerated pace
- Enable market-ready net-zero energy commercial buildings no later than 2025 in all climate zones

# Commercial Building Energy Alliances

Informal associations of building owners and operators who want to reduce energy consumption

- CBEAs launched:
  - Retailer Energy Alliance
    - General merchandise, grocery store, restaurant, warehousing/distribution
  - Commercial Real Estate Energy Alliance
    - Office, shopping center, hospitality, medical office, GSA
- CBEAs to be launched:
  - Institutional Energy Alliances
    - Federal/state/local government, hospitals colleges/universities/ K-12 schools
    - Hospital Energy Alliance (launching April 29<sup>th</sup>)

## CREEA Market Share

CREEA Market Penetration (Million Sq. Ft.)



**Assumptions:**

- Includes projects that are owned and/or managed
- Numbers do not include self-storage, multi-family, education, healthcare, justice, order and safety, and vacant properties
- CREEA numbers do not include trade associations
- Market sq. footage figures drawn from U.S. Department of Energy 2008 Buildings Energy Data Book  
[http://www.eere.energy.gov/buildings/data\\_handlers/buildings\\_data\\_book\\_2008/](http://www.eere.energy.gov/buildings/data_handlers/buildings_data_book_2008/)

## CREEA Mission

- *To use member insight and DOE technical expertise to investigate, objectively evaluate, and broadly deploy technologies that make more significant energy efficiency gains possible in the commercial real estate sector.*
- *The goal of CREEA is to reduce energy consumption and greenhouse gas emissions while lowering operating cost and increasing owner and tenant satisfaction.*

## Benefits of CREEA Membership

- **Technology Procurement**

- Specifications to standardize equipment and create price consistency
- REA developed parking lot LED procurement specs; working on Rooftop HVAC

- **Supplier Summits**

- Dialogues between alliance members and vendors on how to overcome barriers to cost-effective, energy-efficient strategies

- **Technology Evaluation**

- Lab expertise to vet unproven technologies
- Provide input on technologies to be reviewed
- REA closed first round of screening in February

- **Efficiency Standardization and Tools**

- Commercial Technology Solutions
  - Commercial Lighting Solutions launching in early May
  - Commercial Unitary HVAC Solutions/Central HVAC Solutions under development
- Test Procedures for 'plug loads' equipment (refrigeration, medical, other)