Buildings Play A Critical Role in America’s Infrastructure and Economy
• Savings return of $43.4 billion by 2030, payback before 2020
• $20.3 billion investment equivalent to 162,000 job-years
• Approximately $10 billion of cost-effective investment potential available

Federal Building Energy Return on Investment*

*(FY16 figures subject to change)*
Federal Building Energy & Water Cost Avoidance

Cost Avoided from Reduced Energy and Water Use in Buildings (2016$)

- Water Cost Avoided
- Energy Cost Avoided
- Cumulative Energy and Water Cost Avoided

- $0.0M
- $11.8M
- $15.1M
- $17.0M
- $26.6M
- $56.9M
- $93.7M
- $177.0M
- $217.0M
- $315.1M
- $325.8M
- $389.0M
- $907.0M
- $1,747.3M
- $2,520.6M
- $3,320.6M
- $4,007.7M
- $4,934.3M

Years: 2007 to 2016
U.S. Energy and Electricity Consumption by Sector

**Energy Use**
- Transportation: 27 quads
- Residential: 21 quads
- Commercial: 18 quads
- Industrial: 31 quads

**Electricity Use**
- Residential: 37.2%
- Commercial: 35.5%
- Other Industrial: 22.4%
- Industrial HVAC & Lighting: 4.9%

*Industrial HVAC and lighting data based on 2006 MECS

Buildings Energy Use: **40%** of U.S. total
Buildings Electricity Use: **75%** of U.S. total
U.S. Building Energy Bill: ~**$380 billion** per year
The Energy Efficiency Economy is Full of Opportunity

- Energy efficiency supports **2.2 million jobs** across the country
- Over **130,000** energy efficiency jobs – *predominately in construction* – were added in 2016
- Almost **290,000** manufacturing jobs produce Energy Star products and energy efficient building materials
- Approximately **21% of construction workers** in the US support the construction or installation of energy efficiency technologies

**U.S. ENERGY EFFICIENCY EMPLOYMENT**

- Traditional HVAC: 24%
- Advanced and Recycled Building Materials: 21%
- Energy Star Appliances, Including High Efficiency HVAC: 25%
- Renewable Heating and Cooling: 5%
- LED, CFL, and Other Efficient Lighting: 15%
- Other: 10%
- Renewable Heating and Cooling: 5%

U.S. DEPARTMENT OF ENERGY

Energy Efficiency & Renewable Energy

High Performance Building Week 2017
Making an Impact: BTO Approach

Promotes Economic Competitiveness

Creates Jobs

Lowers Utility Bills, Saving Money

Improves Occupant Productivity, Health, & Comfort
DOE Research Has Moved the Needle on Energy Savings

### Past

- $1200 purchase
- $200/year to operate
- 18 cubic feet
- $8/year
- 60 Watts
- 1000 hour life
- Single-pane
- High heat loss

### Present

- $550 purchase
- $50/year to operate
- 22 cubic feet
- $2.00/year
- 15 Watts (or less)
- Up to 25,000 hours
- Double-pane & low-e
- Low heat loss
- 3x more efficient

A typical household saves about $320 per year off their energy bills today, and as people replace their appliances with newer models, they can expect to save more than $450 annually by 2030.
Brave New World?

TODAY: ONE-WAY POWER SYSTEM
Central, One-Way Power Systems

EMERGING: THE ENERGY CLOUD
Distributed, Two-Way Power Flows

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Benchmarking/Disclosure Policy Coverage

Floor space covered by benchmarking or disclosure requirements (million sq ft)

Percent of total US commercial sector floor space covered by these requirements

- Pittsburgh (PA)
- Boulder (CO)
- Portland (OR)
- Atlanta (GA)
- Berkeley (CA)
- Cambridge (MA)
- Montgomery County (MD)
- Chicago (IL)
- Boston (MA)
- Minneapolis (MN)
- Philadelphia (PA)
- San Francisco (SF)
- Seattle (WA)
- New York City (NY)
- Washington State
- Austin (TX)
- Washington DC
- California

• Percent covered
Issues/Opportunities/Challenges include

- Scoring, Benchmarking
- Valuation of advanced/smart/connected building characteristics
- Measurement & Verification, including M&V 2.0, pay-for-performance
- Big data & Big analysis, incl. cybersecurity, privacy
- Buildings-to-Grid
- Non-Energy Benefits incl. environmental, resilience, jobs/competitiveness
- Advanced technologies, processes and practices
Sometimes combining doesn’t work

And sometimes it does!
Brave New World!

Questions and Comments?

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AIA Build America Summit
Public Opinion Poll Results

November, 2016
Summary

Schools are a consistent area where the public wants investment and is deeply attached.

A majority of Americans believe public buildings should be funded with a mix of government, public, and private monies.

A majority of Americans believe that the condition of community buildings can lead to notable benefits, particularly higher property values and quality education.
Topline findings—part 1

**Investment**: On average, Americans feel about one third (34%) of public funds budgeted for community features should be allocated to public buildings and/or spaces. Of the remaining money, they would allocate 37% to transportation and 29% to public housing.

**Consistent funding**: Almost seven in ten Americans believe schools are among the most important community feature to receive a consistent level of public funding. This is second only to roads/streets, reported by 75%.

**Must-have features**: Close to three quarters of Americans (73%) consider schools in good condition a “must have” in the community in which they live.

**Frequency of use**: Roughly two in five Americans (41%) utilize their community libraries at least once a month.