K-12 Breakout Session

Monday, May 9th from 2:00 - 5:00 PM
Room: Oak Lawn
Agenda

- **2:00**
  - Welcome, Introductions, Program Overview
- **2:15**
  - PART 1: Advancing K-12 Energy Efficiency Strategies
- **3:30**
  - Break
- **3:45**
  - PART 2: K-12 School District Peer Exchange
- **5:00**
  - Adjourn
Program Overview
### Better Buildings Challenge Snapshot, 2015

<table>
<thead>
<tr>
<th>Partnership</th>
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<tbody>
<tr>
<td>Number of Partners and Allies</td>
<td>310+</td>
</tr>
<tr>
<td>Square Feet Represented</td>
<td>4.2 billion</td>
</tr>
<tr>
<td>New Partners in the past year</td>
<td>60+</td>
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<table>
<thead>
<tr>
<th>Solutions</th>
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<tbody>
<tr>
<td>Partner Solutions Available for Replication</td>
<td>400+</td>
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<table>
<thead>
<tr>
<th>Results</th>
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<tbody>
<tr>
<td>Energy Saved (Btus)</td>
<td>161 trillion</td>
</tr>
<tr>
<td>Dollars Saved</td>
<td>$1.3 billion</td>
</tr>
<tr>
<td>Avoided CO2 emissions (tons)</td>
<td>10.1 million</td>
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<tr>
<td>Funding Committed/Placed</td>
<td>$5.5 billion / $5.4 billion</td>
</tr>
<tr>
<td>Water Savings (gallons)</td>
<td>2.1 billion</td>
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### K-12 Snapshot

- **20** partners
- **80 million** square feet
- **400+** buildings
- **10** Showcase Projects
- **3** Implementation Models
K-12 BBC Partners
General Program Updates

- BBC 2016 Progress Report
  - Link

- New BBC Implementation Models
  - Douglas County School District - A Lesson Plan in Financing K-12 Energy Efficiency
  - Portland Public School District - Hybrid Funding Approach
  - Camas School District - Energy Resource Management Program

- BBC SWAP
  - Whole Foods Market and Hilton Worldwide
Sector: K-12 School Districts

Energy is an expense schools can reduce to free up educational resources. Energy efficiency offers the potential to redirect significant savings back to educating students, as K-12 schools and higher education institutions respectively spend $8 billion and $6.5 billion annually on energy. Energy-efficient schools establish a safe, healthy, and productive environment for learning, offering a unique opportunity to serve as a living laboratory for students to understand and benefit from new technologies first-hand.

Visit our Beat Blog
Better Buildings Challenge SWAP
Better Buildings Summit
Summit Sessions of Interest

- Overcoming Barriers: Deploying High Efficiency Outdoor Lighting
- Workshop - Part 1: Energy Efficiency Finance
- Workshop - Part 2: Energy Efficiency Finance
- Evaluation, Measurement and Verification of Energy Efficiency Programs
- Mobilizing Benchmarking Data to Create New Outcomes
- Building the Infrastructure for Energy Savings Performance Contracting
- Are You Forgetting About Your Rooftop Units? Efficiency for Packaged HVAC
TONIGHT! Sector Networking Event

Monday, May 9th at 5:30pm
The Front Page
1333 New Hampshire Ave NW
Washington, DC 20036
PART 1: Advancing K-12 Energy Efficiency Strategies
Presenters

- Crystal McDonald (DOE) – Moderator
- Rois Langner (NREL) – Plug Loads
- Abdul Majid (Anne Arundel County Public Schools) – Workforce Retention
- Jensen Adams (Kansas City Public Schools) – ESPCs
- Cody Taylor (DOE) – ZEB for Schools
Rois Langner

- Rois Langner is an architectural engineer and building scientist in the Commercial Buildings Research Group at the National Renewable Energy Laboratory (NREL), located in Golden, Colorado.
- Rois has worked at NREL since 2010 on various research projects focused on energy efficiency in commercial buildings, utilizing OpenStudio software to analyze and optimize building design and performance.
- More recently, she has supported the U.S. Department of Energy's Better Buildings Alliance leading the Plug and Process Load technical solutions team, and also leads efforts to support the small commercial building sector in overcoming barriers that inhibit the adoption of energy efficiency solutions.
Abdul Majid

- **Education:**
  - Masters in Mechanical Engineering from University of Maryland, College Park
- **Member:**
  - ASME (Association of Mechanical Engineers)
- **Certification:**
  - EEP (Energy Efficiency Professional)
- **Work Experience:**
  - State of Maryland, DHMH, Sr. Mechanical Engineer, 1986-2006
  - Anne Arundel County Public Schools, Utility Systems Program Manager, 2006-2016
Jensen Adams

- Energy & Sustainability Manager, Kansas City Public Schools
- Appointed by Kansas City Mayor to serve on Environmental Management Commission
- Served on Advisory Committee to City Manager for NRDC and IMT’s City Energy Project with Kansas City University of Missouri Extension Council
- Worked for decade as program implementer for efficiency programs with utilities and governments
- Ongoing graduate studies at University of Missouri-Kansas City for Executive Master of Public Administration
Cody Taylor

- Cody Taylor is a Team Lead for Commercial Building Integration in DOE's Building Technology Office.
- He leads the Commercial Market Transformation portfolio, helping markets to more effectively deliver energy efficiency.
PART 2: K-12 School District Peer Exchange
Sector Priorities - Financing

- **Tools**
  - Financing Energy Upgrades for K-12 School Districts
  - Better Buildings Financing Market Solutions Team
  - Better Buildings Financial Allies
  - Financing Navigator – coming soon

- **Best Practices**
  - Douglas County School District - Financing K-12 Energy Efficiency
  - Portland Public School District - Hybrid Funding Approach
  - Douglas County School District - Gardnerville Elementary School Modernization
  - Alachua County Public Schools is leasing rooftop space (revenue for school district) for solar PV (funded by investors) to generate power that is sold back to the utility
Sector Priorities– Data Management

- **Tools**
  - Better Buildings Data Access Market Solutions Team
  - Energy Data Collection and Tracking Webinar
  - Benchmarking Data Cleansing Webinar
Sector Priorities - Public Engagement

- **Tools**
- **Best Practices**
  - *Poudre School District - Strategic Communications and Outreach Campaign*
Sector Priorities - Facilities Planning/O&M

- **Tools**
  - Smart Energy Analytics Campaign – coming soon

- **Best Practices**
  - [Evergreen Public Schools - Mill Plain Elementary School HVAC Upgrade Project](#)
Sector Priorities - Resource Conservation Policies/Programs

- **Tools**
  - [Education Initiatives](#)

- **Best Practices**
  - [Camas School District - Energy Resource Management Program](#)
Sector Priorities - Workforce Training

- **Tools**
  - Better Buildings Workforce Guidelines
  - Buildings Re-tuning Training

- **Best Practices**
Sector Priorities - Student Learning and Healthy Environments

- **Tools**
- **Best Practices**
  - Houston Independent School District - Farias Early Childhood Center Retrocommissioning
  - Indian River Central School District - Indian River Middle School
  - Camas School District - J.D. Zellerbach Administration Headquarters
  - Dysart Unified School District - Kingswood Elementary School
WHY THIS REPORT, AND WHY NOW?

Public school facilities data, information and analysis is lacking.

Few facilities standards exist to guide communities and school leaders.

Responsibilities are mounting for this generation of children and the next.
WHERE WE LEARN MATTERS.

50 million students
6 million adults

100,000 buildings

7.5 billion GSF
2 million acres
K-12 FACILITIES ACCOUNT FOR NEARLY ONE-FOURTH OF STATE AND LOCAL INFRASTRUCTURE INVESTMENTS
WHAT’S AT STAKE?

- Improved student achievement
- Reduced truancy, suspensions
- Better health
- Improved staff satisfaction, retention
- Higher property values
THREE KEY QUESTIONS

1. Do states and districts have adequate operating funds for cleaning, maintenance, and repairs to ensure buildings and grounds are healthy and safe?

2. Are districts and states investing the capital funds necessary to ensure that their public schools are educationally appropriate, energy efficient, and environmentally responsible?

3. Are states and the federal government doing enough to ensure equity in education, so that all students have access to healthy and safe school facilities that support learning?
DATA & METHODOLOGY

U.S. Census of Governments and National Center for Education Statistics
Fiscal data reported by school districts (FY 1994-2013)

State officials
Building inventory & state capital funding for school facilities

Dodge Data & Analytics
Hard costs of public school construction
1994-2013
A GENERATION OF FACILITIES CHANGE

- 4.8 million students added
- 13,000 schools added
- New health and safety standards
- Increased environmental responsibility
- Smaller class sizes, more labs
- Serving special needs students
- Expanded early education
- More technology
- Increased safety and security
- Grounds as a community asset
20 YEARS OF FACILITIES
SPENDING & INVESTMENT
ANNUAL AVERAGE

$99 BILLION

CAPITAL CONSTRUCTION
PER YEAR (1994-2013)

$49 BILLION

MAINTENANCE & OPERATIONS
PER YEAR (2011-2013)

$50 BILLION
CAPITAL CONSTRUCTION: $973 BILLION

CAPITAL CONSTRUCTION SPEND PER STUDENT
Total FY1994-2013 (in 2014$)
MAINTENANCE & OPERATIONS: $925 BILLION

TOTAL M&O SPENDING, 1994-2013 (2014$)
MAINTENANCE & OPERATIONS SPEND PER STUDENT
FY2011-2013 Annual Average (in 2014$)
MAINTENANCE & OPERATIONS SPEND PER GSF
FY2011-2013 Annual Average (in 2014$)
AN INEQUITABLE FUNDING SYSTEM

Local communities pay 45% of M&O and 82% of capital construction outlay

M&O COSTS
- Local Share 45%
- State Share 45%
- Federal Share 10%

CAPITAL COSTS
- Local Share 82%
- State Share 18%
- Federal Share 0%

Because local wealth varies greatly, some communities have modern, high-quality schools, while others do not.
12 STATES PAY ZERO CONSTRUCTION COSTS

STATE SHARE OF FUNDING FOR CAPITAL OUTLAY, FY 1995–2013

- **0%**: Idaho, Indiana, Louisiana, Michigan, Missouri, Nebraska, Nevada
- **1–9%**: Oregon, South Dakota, Tennessee, Wisconsin
- **10–25%**: Oklahoma
- **26–49%**: Alaska, Arizona
- **Over 50%**: Hawaii
CURRENT REPLACEMENT VALUE FOR K-12 PUBLIC SCHOOLS

NEW CONSTRUCTION COST
AVERAGE COST PER GROSS SQUARE FOOT $256

×

FACILITIES
TOTAL GROSS SQUARE FOOTAGE 7.5 BILLION

= CURRENT REPLACEMENT VALUE $1.937 TRILLION
MODERN STANDARDS FOR K-12 FACILITIES

- **Annual M&O (3% of CRV)**
  Such as cleaning, grounds keeping, routine and preventive maintenance, minor repairs, utilities and security

- **Periodic Renewals (2% of CRV)**
  Such as replacing key components that wear out, roofs, windows, doors, boilers, etc.

- **As-Needed Alterations (1% of CRV)**
  Such as adding space for smaller classes, expanding early childhood, addressing environmental concerns, integrating technology, and improving safety and security

- **Systematic reduction of deferred maintenance (1% of CRV)**
  Making up for delayed M&O, renewals, and alterations
ON AVERAGE, STATES SPENDING ONLY 68% OF MODERN STANDARDS

Percentage of standard met by historic M&O spending and capital investment, FY2015
### NATIONALLY, PROJECTED GAP IN ANNUAL SPENDING WILL BE $46 BILLION

<table>
<thead>
<tr>
<th>TOTAL K-12 FACILITIES</th>
<th>Modern Standards</th>
<th>Historic Spending</th>
<th>Projected Annual Gap</th>
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<tbody>
<tr>
<td>Maintenance &amp; Operations @ 3% CRV</td>
<td>$58 billion</td>
<td>$50 billion</td>
<td>$8 billion</td>
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<tr>
<td>Capital Construction @ 4% CRV</td>
<td>$77 billion</td>
<td>$49 billion</td>
<td>$28 billion</td>
</tr>
<tr>
<td>New Facilities for 2.7 million new seats</td>
<td>$10 billion</td>
<td></td>
<td>$10 billion</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$145 billion</strong></td>
<td><strong>$99 billion</strong></td>
<td><strong>$46 billion</strong></td>
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CALL TO ACTION

PROVIDE HEALTHY, SAFE, EDUCATIONALLY INSPIRING, AND ENVIRONMENTALLY SUSTAINABLE FACILITIES FOR ALL COMMUNITIES

1. Understand your community’s public school facilities.
2. Engage in education facilities planning.
4. Leverage public and private resources.
stateofourschools.org

Join the conversation on Twitter using #StateofOurSchools

State of Our Schools: America’s K-12 Facilities is under embargo until 3:00 AM on Wednesday, March 23.
Questions and Answers
Thank You

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Crystal.McDonald@ee.doe.gov