



# Energizing Sustainable Communities

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# Agenda

Introductions and Background

CAPEE Overview

High Performance Schools

Benchmarking

ACE Project

Other Resources



# Northeast Energy Efficiency Partnerships



*“Assist the Northeast and Mid-Atlantic region to reduce building sector energy consumption 3% per year and carbon emissions 40% by 2030 (relative to 2001)”*

## Mission

We seek to accelerate regional collaboration to promote advanced energy efficiency and related solutions in homes, buildings, industry, and communities.

## Vision

We envision the region's homes, buildings, and communities transformed into efficient, affordable, low-carbon, resilient places to live, work, and play.

## Approach

Drive market transformation regionally by fostering collaboration and innovation, developing tools, and disseminating knowledge



# Thanks to our Allies Network



# Group Introductions

1

- Name

2

- Affiliation

3

- Biggest challenge



# Today's Presentation...

## Goals

- Discover **Strategies & Resources** for Communities
- Discuss **Challenges and Opportunities** in WV
- Gain Insights & Data Needed to Achieve **Stakeholder Buy-In**

## Format

Topic

Overview &  
Discussion

Resources

Stats &  
Figures



# Introducing CAPEE

A comprehensive tool for your community's needs

# Community Action Planning for Energy Efficiency

## CAPEE



**Focus:** Small-Mid Size, Rural Communities



**Objective:** Reduce energy usage and carbon emissions



**How:** Interactive online platform with resources for any community, regardless of current status



**Task Force:** Community level stakeholders informed the project along the way



# How Does it Work?



## Getting Started

- Energy Committee
- Benchmarking & Turning Data into Action

## Next Steps

- LED Street Lighting
- Operations and Maintenance
- High Performance Buildings

## Planning Ahead

- Energy Master Planning
- Energy Codes
- Green Building Policies

# Example Fact Sheet



## CAPEE Fact Sheet: Benchmarking

Community Action Planning for Energy Efficiency

### WHAT IS BENCHMARKING?

Benchmarking is the practice of comparing the measured performance of a building to itself, its peers, or established norms. A commitment to tracking and evaluating the outcomes of action items to ensure an effective and efficient path forward is critical to the success of state or community goals. Benchmarking is useful for state and local government property owners and facility operators, managers, and designers to inform and motivate improvements in performance. Energy benchmarking in buildings allows owners and occupants to understand their building's relative energy performance, helps identify opportunities to cut energy waste, and allows building owners to remain competitive. Benchmarking is highly correlated with energy efficiency improvements and cost savings. Learn more about building energy use benchmarking on the U.S. DOE website.<sup>1</sup>

### WHAT ARE THE BENEFITS?

Collecting, reporting, and sharing benchmarking data regularly helps public and private building owners:

- Make smarter investment decisions;
- Reward efficiency;
- Develop continuous energy management strategies;
- Assess effectiveness of operations and maintenance procedures;
- Verify pre- and post-project energy use, GHG emissions, and energy costs;
- Identify under-performing facilities and set investment priorities;
- Detect and respond to ongoing issues;
- Identify billing errors.

Read more about the range of benchmarking benefits in the Institute for Market Transformation's fact sheet.<sup>2</sup>

<sup>1</sup> <http://bit.ly/CAPEE-1>

<sup>2</sup> <http://bit.ly/CAPEE-2>

## Example Sections:

- What is it?
- Why is it important?
- What are key things to know about the topic?
- What resources are out there?
- How do you make the business case for this initiative?



# Diving into CAPEE



# Benchmarking Overview



- Benchmarking is...
  - The tracking of building energy/water use
  - A way to compare building performance
- Benchmarking helps...
  - Plan and justify energy improvement projects
  - Track trends and verify pre/post energy use

Measure



Plan



Act

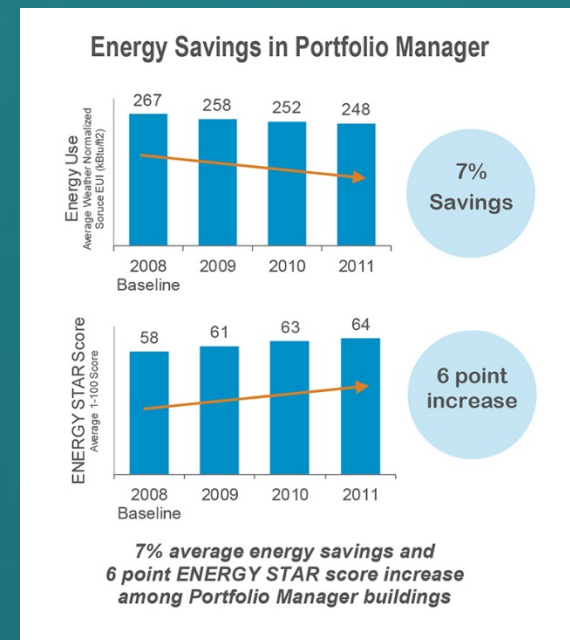


# Benefits of Benchmarking



★ 70% of FMs have used Energy Star Portfolio Manager to guide efficiency upgrade plans and 67% have used it to just an energy efficiency project [\[Source\]](#)

EPA Study: Over a three year period, buildings the benchmarked their buildings saved an average of 2.4% annually. [\[Source\]](#)

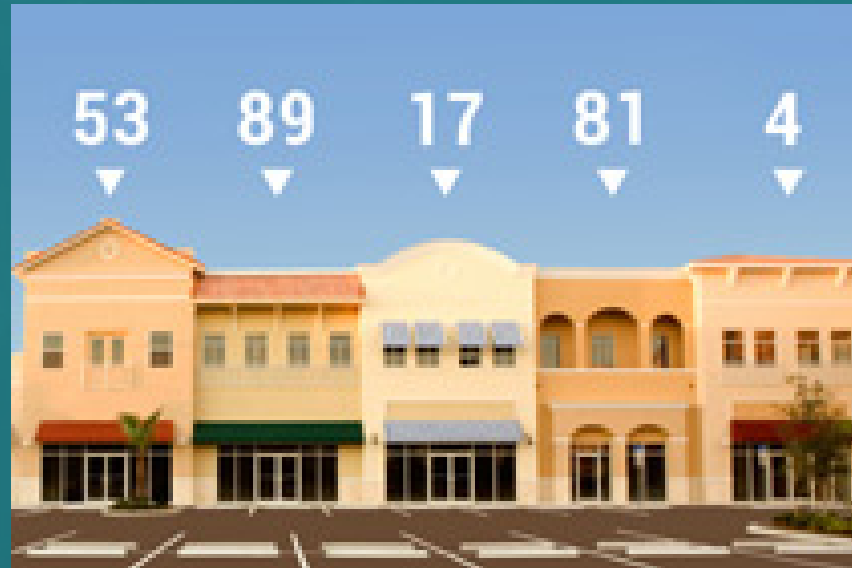


Related Resource: [LBNL Evaluation of Energy Benchmarking Programs](#)

# Benchmarking Pathways

There are options...

- Lead By Example
- Voluntary
- Mandatory





**Schools are the Center**



**Of Our Communities**

# A High Performance School is...

Safe

Clean

**ENERGY  
EFFICIENT**

Easy to  
maintain



**HEALTHY**

Cost  
Effective

Educationally  
effective

**SUSTAINABLE**



# Why Focus on Schools?

More than a place for instruction

Students spend more time in schools

Reduced costs and better outcomes



# Community-Wide Impacts



- Significantly reduce energy consumption
- Lower utility bills
- Improve occupant health and comfort
- Improve educational outcomes
- Use the school as a teaching tool
- Reduce environmental impact



Energy is the second highest expenditure in K-12 Schools, only behind personnel costs.

# Discussion

- Is anyone building or renovating a school?
- What are your current challenges around schools?
  - O&M? New Construction? Renovations? Existing Buildings?



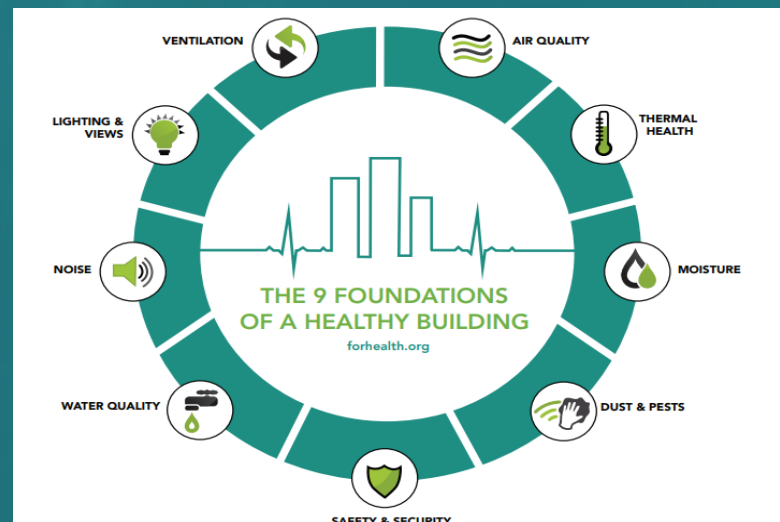
# High Performance Schools

## *The Comprehensive Benefits*

**Energy:** Utility Costs in N. Providence fell by ~49% from 2010 to 2013 ([source](#))

**Acoustics:** Exposure to noise negatively correlates with children's learning outcomes and cognitive performance ([source](#))

**Air Quality:** Increased ventilation rates result in higher test scores in elementary schools ([source](#))



Source: Harvard TH Chan School of Public Health

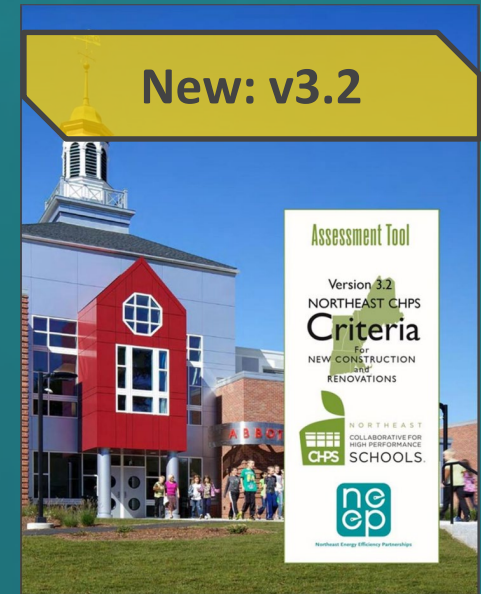


- **NE-CHPS**

- A **complete building criteria** that provides students with **premium educational environments**

**Prioritizes:**

- IEQ
- Energy Efficiency
- Occupant comfort – thermal, acoustical and visual
- Ease of O & M



# Why is NE-CHPS Different?



Developed with input from **regional stakeholders**

Reflects the climate, building codes, and educational **priorities of the Northeast**

Emphasizes best practices for **ongoing building operation and maintenance**

Stresses **Indoor Environmental Quality** and **Energy Efficient Design**

# What's in the Criteria?



## The Seven Sections of NE-CHPS

Category	Example
1. Integrated Design Process	Design team consults with occupants (facility manager)
2. Operations and Metrics	Benchmarking, Training, etc.
3. Indoor Environmental Quality	Walk-off mats, Acoustics
4. Energy	Commissioning, Lighting Controls, etc.
5. Water	Low-flow Toilets, Irrigation, etc.
6. Sites	Minimize site disturbance, central location, near public transit, etc.
7. Materials and Waste Management	Locally produced materials, waste diverted from landfills, etc.



# Why It Matters





# Outcomes

## Concord School District



### Abbot Downing Elementary

NE – CHPS Verified



### Features:

- Visible HVAC, lighting, and structural systems
- Locally sourced materials contain little to no VOCs
- Low flow fixtures reduce potable water usage by 52%



**\$50,032**

*Estimated energy cost savings per year*

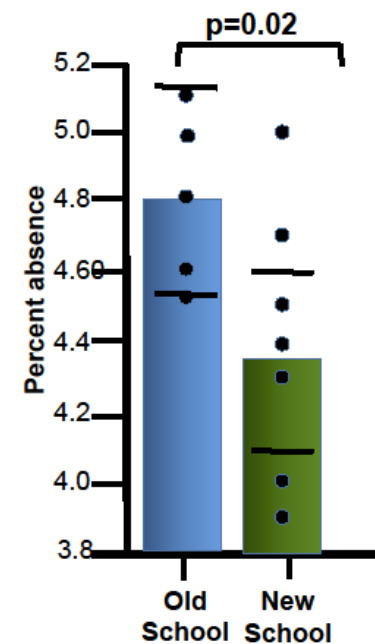
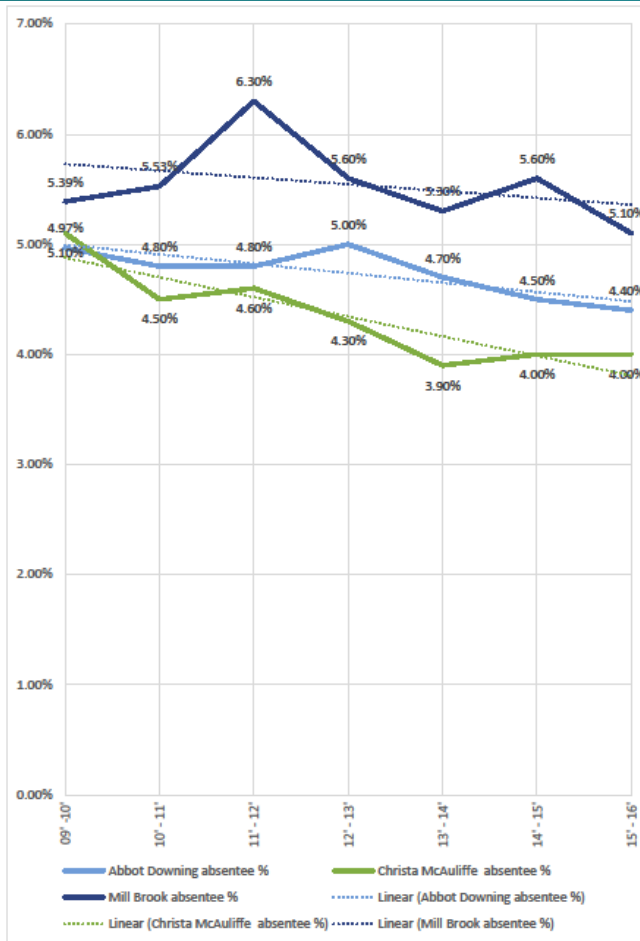
# Inside Look at a NH Elementary School





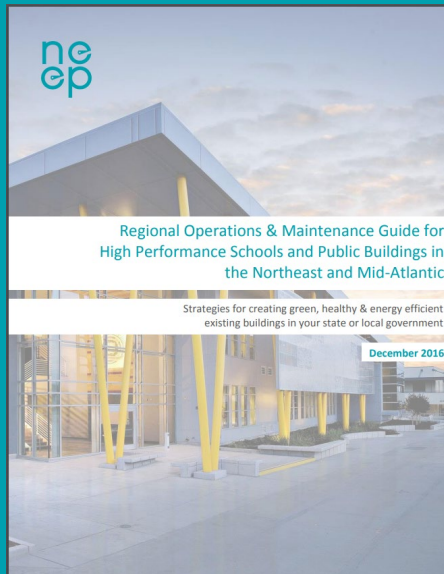
# Outcomes

## Concord School District



# Other Free NEEP Resources


(click an image below to be redirected to the webpage)





## CAPEE

COMMUNITY ACTION PLANNING  
FOR ENERGY EFFICIENCY




Step 1

Complete  
Short Questionnaire



Step 2

Receive  
Recommendations



Step 3

Download Custom  
Action Plan

TRY IT OUT

[www.neep.org/capee](http://www.neep.org/capee)

QUESTIONS?

[capee@neep.org](mailto:capee@neep.org)



### Christa McAuliffe Elementary School

Concord, NH

#### GENERAL INFORMATION

**Location:** 17 North Spring Street, Concord, NH 03301  
**Project Cost:** \$16,545,834  
**Scope:** 71,485 sq ft  
**Completion:** September 2012  
**Enrollment:** 484 students grades K-5  
**Architect:** HMFH Architects, Inc.  
**Engineers:** Rist-Frost-Shumway Engineering  
**Funding/Grant:** N/A  
NE-CHPS

#### PROJECT OVERVIEW

Christa McAuliffe Elementary School is one of a trio of high performance schools that opened in September 2012 in Concord, NH. The other two are Abbot-Dwelling Elementary School and Mill Brook Primary School.

The new K-5 school honors its predecessor's character by reusing design element from the former school, like the ornate granite entryway. Inside, Christa McAuliffe's Learning Corridor functions as the heart of the school and supports various methods of teaching and learning. Throughout the interior, exposed HVAC, lighting, and structural components are used as teaching tools to bring energy efficiency and building structure into the curriculum.

Community members were involved throughout the planning and design process, and their input and goals led to the creation of a neighborhood school with accessible walking and bicycle paths leading to the welcoming facade.

Student health was also a priority and was reflected in a variety of design choices. To maximize student wellbeing, the design team ensured that interior spaces received natural light, which improves overall health and circadian rhythm. High-reflectance white paint on many of the walls increases the efficiency of lighting while direct sunlight diffused with color panels and the school's north-south orientation minimizes glare. Exterior lighting features full cut-off ability, illuminating only the area below the fixture, which preserves the darkness of night sky.

The school's HVAC system also supports student health; the units use the same technology as units in medical operating rooms, featuring special diffusers that improve air quality and minimize the amount of airborne dust particles.

Acoustics were carefully incorporated into the new school, which fully meets ANSI Standard 12.60, the highest standard for classroom acoustics. Wall panels and ceiling tiles prevent background noise and reverberation and minimize noise and distractions. The impact of these changes shows through the new building's significant decline in absenteeism, which saw a 15-20 percent drop-off since McAuliffe's opening.



Air Source Heat Pumps – Renters Checklist – Home Energy Management Systems  
NEEP Blog – Strategic Electrification – Building Energy Labeling

Visit us at [NEEP.org](http://NEEP.org) for these resources and more

# Questions or Comments?



## *Thank You!*



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