

# School As Tool

## R“School as a Tool” Protocol

- Establish a Green Team
- Conduct a School Environment Survey
- Integrate Environmental Literacy into Existing School Curriculum
- Inform and involve the Community
- Monitor and Evaluate Progress
- Apply to the Green Ribbon Schools Program





Image of Providence Center & Technical Academy courtesy of UMass

**NE-CHPS  
NEW CONSTRUCTION AND  
MAJOR RENOVATIONS**  
Version 2.0, October 2009

Prepared by:  
ERS, Inc.  
13 Railroad Square, Suite 504  
Haverhill, MA 01832-5716

For:  
High Performance Schools Exchange  
Northeast Energy Efficiency Partnerships  
5 Militia Drive  
Lexington, MA 02421



## **Policy Prerequisite 8: Utilize the Facility as a Teaching Tool Required**

PO P 8. Develop and implement a plan to utilize the facility as a teaching tool for environmental quality, energy efficiency, and renewable energy. The plan must include annual training of all staff in the educational and environmental benefits of the facility, and an informational kiosk or other display that presents the educational and environmental benefits associated with the CHPS school.

# School as a Teaching Tool





Image of Providence Center & Technical Academy courtesy of UMass

## NE-CHPS NEW CONSTRUCTION AND MAJOR RENOVATIONS Version 2.0, October 2009

Prepared by:  
ERS, Inc.  
13 Railroad Square, Suite 504  
Haverhill, MA 01832-5716

For:  
High Performance Schools Exchange  
Northeast Energy Efficiency Partnerships  
5 Militia Drive  
Lexington, MA 02421



## Policy Prerequisite 8: Utilize the Facility as a Teaching Tool Required

A high performance school offers an excellent opportunity to serve as a teaching tool for students, staff, and the public. A plan that fulfills this requirement will include at least the following elements:

- ❑ At least one annual workshop for staff that covers the educational and environmental benefits of the facility
- ❑ A plan to incorporate education regarding the high performance aspects of the school in science and vocational curricula, as appropriate depending on grade level taught
- ❑ An informational kiosk, or other display, in a public area of the school that presents the educational and environmental benefits of the CHPS project

### Documentation for Policy Prerequisite 8

Submit a detailed plan as outlined above, including schematic for the kiosk and curricula outline.

# School as a Teaching Tool

# Developing Environmental Citizens - Greening the Curriculum

## School as a Tool: Implementing the Sustainable School Protocol

**1) Establishing a green team** consisting of at least students, parents, community stakeholders, teachers, and staff that will be responsible for:

- Coordinating and integrating the sustainable schools elements such as environmental (built and natural) curriculum including recycling, EPA's "Tools for Schools"
- Organizing and directing activities at the school such as creating a kiosk, contributing to a website about sustainable schools and facilitating communication among the whole school community

**2) Adopt an Environmental Vision Statement**

**3) Conduct a School Environmental Survey**

**4) Create a Green School Action Plan**

**5) Monitor and Evaluate Progress**

**6) Integrate Greening into the Curriculum**

Integrate greening activities into science, art, math, language arts and electives

Use the school as a hands on laboratory which offers opportunities for real-world problem solving

Allow students to undertake study of themes such as energy, water, forest, toxic pollution, and waste.

Involve the entire school in initiatives such as saving water, recycling and saving energy


Promote outdoor education and time spent in nature (school yard, park or field trip)


**7) Inform, Involve and Celebrate** – Recognize achievements and partner with external organizations

## RI School as a Teaching Tool



# Operator & Occupant Engagement

 monitor energy consumption wirelessly.



© eMetric Deperro/Velzy 2009

 be rewarded for efficient energy habits.



© eMetric Deperro/Velzy 2009

 control outlets and compare to others.



set timers & powerdown min/max

set goals, chart progress, & compare with coworkers

© eMetric Deperro/Velzy 2009

eMetric by Jason Deperro

2016 Prop 39 ZNE School Retrofit Workshops

# Using the School as a Teaching Tool

## Educational Display

### Intent

*Raise the community's knowledge about the basics and benefits of high performance schools.*

Using the **school as** a learning tool, students, staff, and the community can benefit by having an educational display to illustrate the healthy, efficient, environmentally sustainable features of the school.


The educational display may have further connections in II 6.1 – Educational Integration.

**II 5.0 – Educational Display**

**II 5.1 – Demonstration Area**

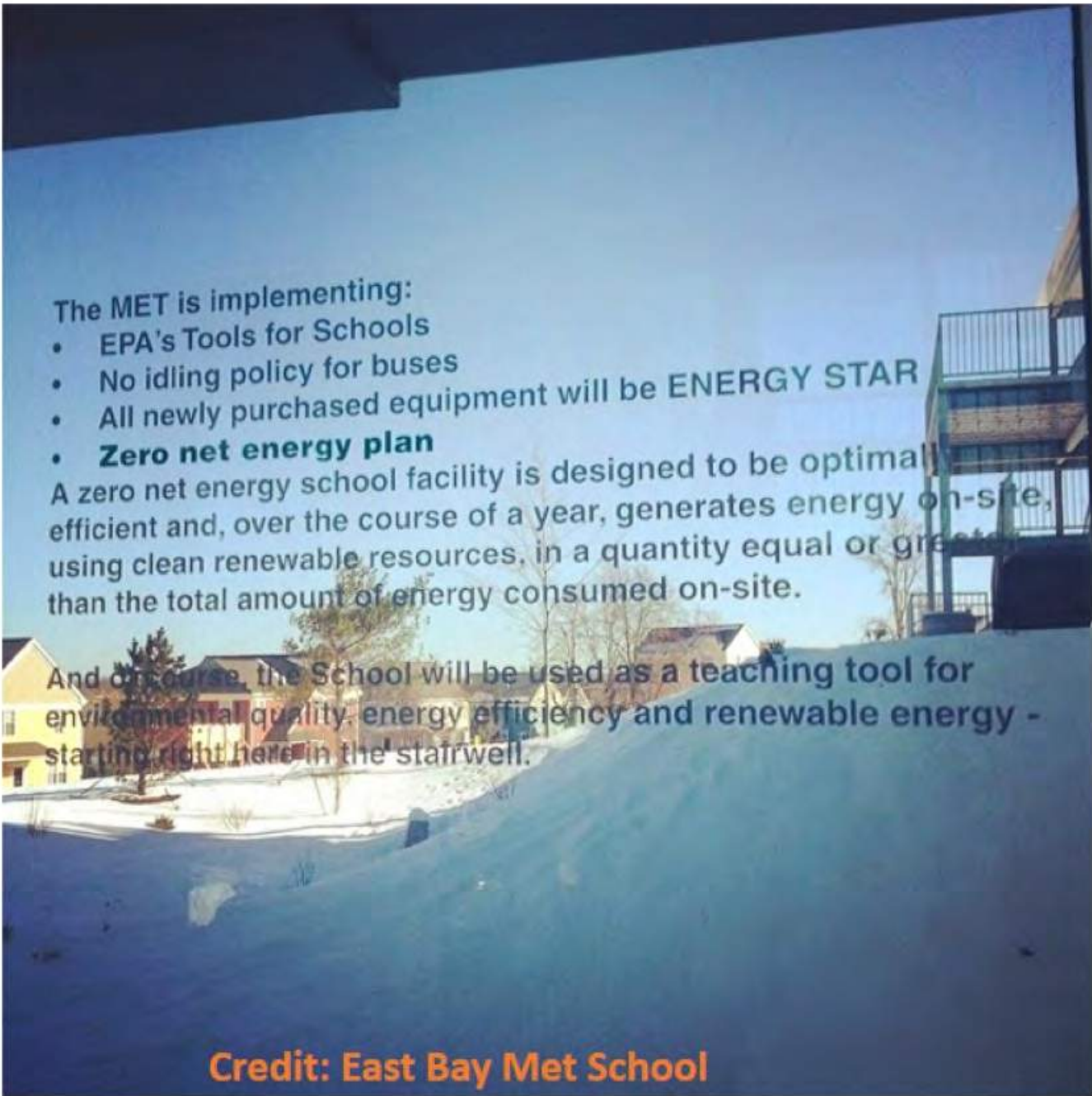
<b>II 5.0 – Educational Display</b>		<b>Prerequisite</b>	
		<b>1 point</b>	
<b>Applicability</b>	<b>Verification Required</b>		
All projects.	Design Review	Construction Review	Performance Review



- 
- The East Bay MET School's **solar thermal energy** system provides more than 20% of the building's domestic hot water heating consumption.

The school's on-site renewable energy can be monitored on the school's website and a renewable energy educational display was installed in the building.

**Credit: RGB Architects**



The MET is implementing:

- EPA's Tools for Schools
- No idling policy for buses
- All newly purchased equipment will be ENERGY STAR
- **Zero net energy plan**

A zero net energy school facility is designed to be optimally efficient and, over the course of a year, generates energy on-site, using clean renewable resources, in a quantity equal or greater than the total amount of energy consumed on-site.

And of course, the School will be used as a teaching tool for environmental quality, energy efficiency and renewable energy - starting right here in the stairwell.

**Credit: East Bay Met School**



# ALTERNATIVE TRANSPORTATION

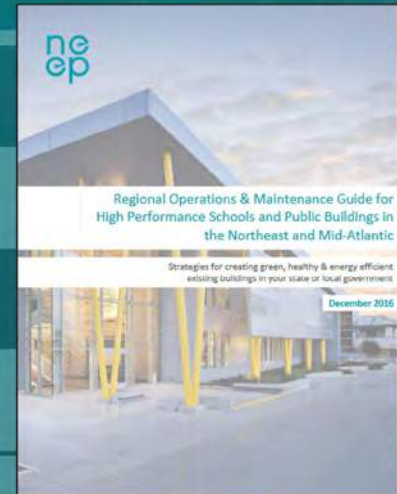
Green schools have benefits that extend beyond the actual building. Alternative transportation options Alternate fuel buses reduce CO2 emissions and reduce smog and ground level ozone. Bike racks, safe bike paths and sidewalks encourage an active lifestyle and decrease emissions.



# SOURCES



- NE-CHPS
- NEEP's Regional Operations and Maintenance Guide
- Roadmap to Zero Energy Buildings: Progress Report
- Building Energy Rating and Disclosure Policies; Lessons from the Field
- LED Street Lighting Assessment
- Streamlining Data Access Report
- School Exemplars

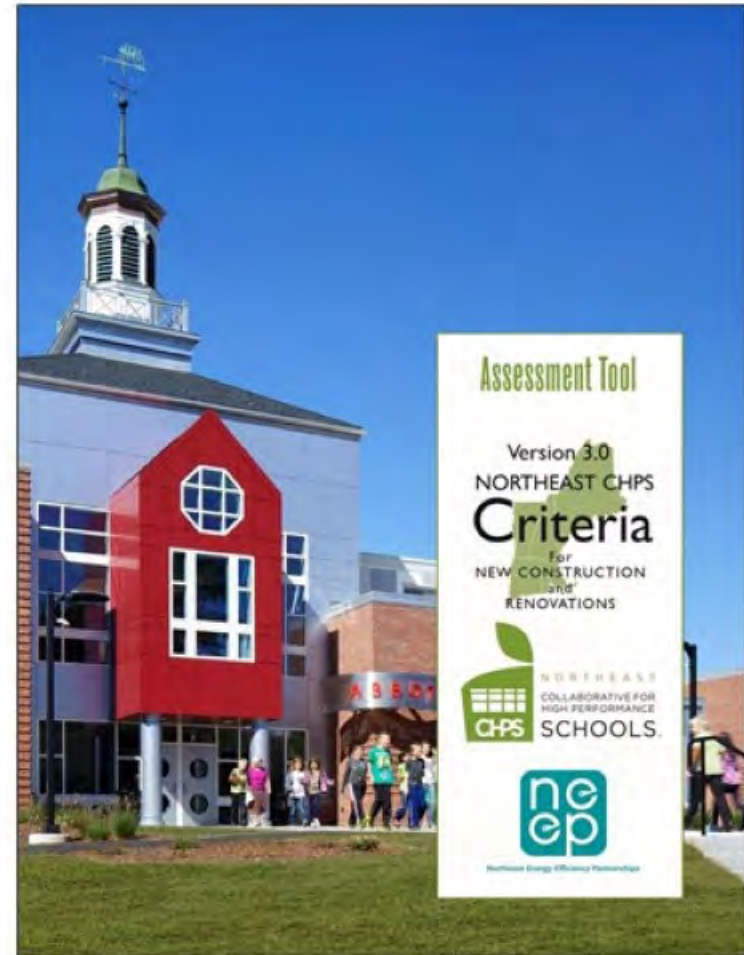




# NE-CHPS v3.1 CRITERIA

## Categories:

- *Integration & Innovation*
- *Indoor Environmental Quality*
- **Energy**
- **Water**
- *Site*
- **Materials & Waste Management**
- *Operations & Metrics*



[www.chps.net/resources](http://www.chps.net/resources)

# DOE Zero Energy Schools Accelerator Program

## Key Objective

School Districts (cities and counties) and states develop a replicable and map that identifies barriers and demonstrates processes to achieve cost-effective zero energy K-12 schools



# Accelerator Structure for the Program

## National Partners

*Eg: Non-profit organizations, utilities*

*Main role: Help recruit partners, outreach, industry education*

## Implementing Partners

*States/ School districts*

**Accelerate  
construction of  
K-12 Zero  
Energy  
Schools**

Develop  
state/district level  
(roadmap for ZE)

Identify schools  
with ZE goal

Implement  
roadmap

*Resources  
Recognition  
BBA*

**Greening Schools** – A joint project between Illinois EPA and the Waste Management Resource Center. [www.greeningschools.org/resources/curricula/cfm](http://www.greeningschools.org/resources/curricula/cfm)

**National Wildlife Federation** – Resources about greening school grounds, facilities, and curriculum.  
<http://www.nwf.org/Get-Outside/Be-Out-There/Educators/Resources.aspx>

**Michigan State University** – Integrated Pest Management curriculum  
[http://www.ipm.msu.edu/community\\_and\\_home/community\\_and\\_schools/school\\_ipm\\_and\\_curriculum](http://www.ipm.msu.edu/community_and_home/community_and_schools/school_ipm_and_curriculum)

**US Department of Energy** – Energy Kids  
<http://www.eia.gov/kids/>

**US Environmental Education Agency** – Curriculum and activities for teachers  
[http://www.epa.gov/osw/education/teach\\_curric.htm](http://www.epa.gov/osw/education/teach_curric.htm)

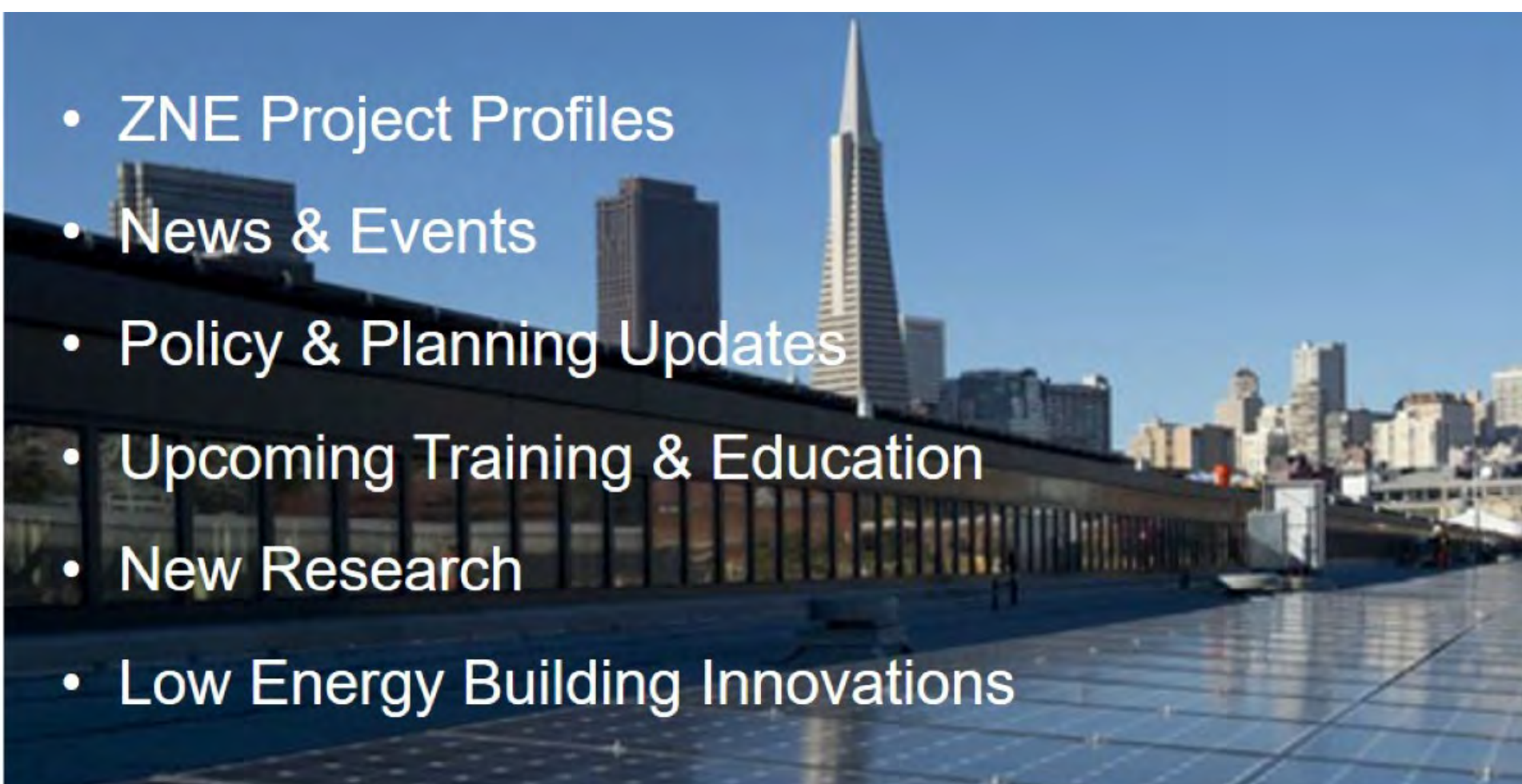
**Edible School Yard** – K-12 Edible education curriculum.  
<http://edibleschoolyard.org/resources-tools>

**IDEO** – Investigative learning curriculum  
<http://www.ideo.com/work/investigative-learning-curriculum/>

**Project H** – [www.projecthdesign.org](http://www.projecthdesign.org)

## School as Teaching Tool - Resources



- 
- ZNE Project Profiles
  - News & Events
  - Policy & Planning Updates
  - Upcoming Training & Education
  - New Research
  - Low Energy Building Innovations

# ZNE ACTION BULLETIN

*Progress Towards Zero Net Energy Buildings*

Contact [connie@newbuildings.org](mailto:connie@newbuildings.org) to subscribe

# Existing ZNE & Ultra-Low Energy Case Studies

UC Case Study Briefs & NBI ZNE Case Studies

<http://newbuildings.org/case-studies-zne-projects>

&E Case Studies

<http://energydesignresources.com/resources/publications/case-studies/case-studies-zne-non-residential-buildings.aspx>

Registry <http://newbuildings.org/share>

Getting to Zero Database

<http://newbuildings.org/getting-to-zero-buildings-database>



### Zero Net Energy Project Profile

Small Office Retrofit

#### OVERVIEW

**Site Details**

- Building Size:** 4,500 SF
- Location:** San Diego, California
- Construction Type:** Retrofit
- Construction Year:** 1955, 2009
- Building Type:** Small Office
- CA Climate Zone:** 7

**Measured Energy Stats**

<b>13</b>	<b>-</b>	<b>22</b>	<b>=</b>	<b>-9</b>
BUILDING'S TOTAL EUI		RENEWABLE PRODUCTION EUI		BUILDING'S NET EUI

**Site Energy Use Index (EUI) kWh/SF/year**

The Energy Equation: **the building energy use minus the renewable production equals the net energy of the building.** Buildings may be "getting to zero" and have a net EUI

#### BACON STREET OFFICES

The Bacon Street Office project is a 4,500 SF retrofit of a single-story, 1950s auto repair shop into a high performance office for the firm ARCHITECTS has gabriel wells. Through creative design strategies, renewable energy generation and with support from local utilities, including the Savings by Design program, the project has achieved zero net energy goals. In fact, this project is so energy efficient it returns power to the grid.

#### Planning & Design Approach

The project demonstrates the difference between typical projects and ZNE projects. The following steps were critical to success:

- Start early and use an integrated design process
- Outline goals and benefits
- Structure fees to provide more research and design iterations
- Stay flexible and inclusive with the design process

#### Energy Efficiency Strategies and Features

**Daylighting:** A wall of windows along the public street side of the building provides daylight and views of a new landscaped parking court with native vegetation and canopy trees. This light is balanced with toplighting from diff skylights at the back of the space. Illumination walls, ceiling, and balconies



# 5 GREAT NEW TOOLS FOR ZNE BUILDINGS

**1 ZNE Message Platform**  
Key messages for target audiences on the what and why of ZNE.

**2 "Intro to ZNE" Presentation**  
Customizable powerpoint presentation provides an overview of California's goals and policies for ZNE, key strategies, and case study examples.

**3 ZNE Companion Guide/Fact Sheets**  
Collection of FAQs, resources, design strategies, and key messages for designers, commercial building owners, policymakers, and decisionmakers of schools and public buildings.

**4 Case Studies: ZNE & Ultra-Low Energy Buildings**  
Read about ZNE and ultra-low energy building examples, including design strategies, costs, and lessons learned.

**5 ZNE Action Bulletin**  
Sign up for our quarterly e-newsletter for updates on ZNE news, events, trainings, case studies, planning, policy, and research. To sign up, or to get more info about the toolkit, email [heather@newbuilding.org](mailto:heather@newbuilding.org).

# ZNE Communications Toolkit



# Fact Sheets & ZNE Companion Guide

ZNE for Schools

ZNE Design Fundamentals

ZNE for Architecture & Engineering

ZNE for Developers & Real Estate Professionals

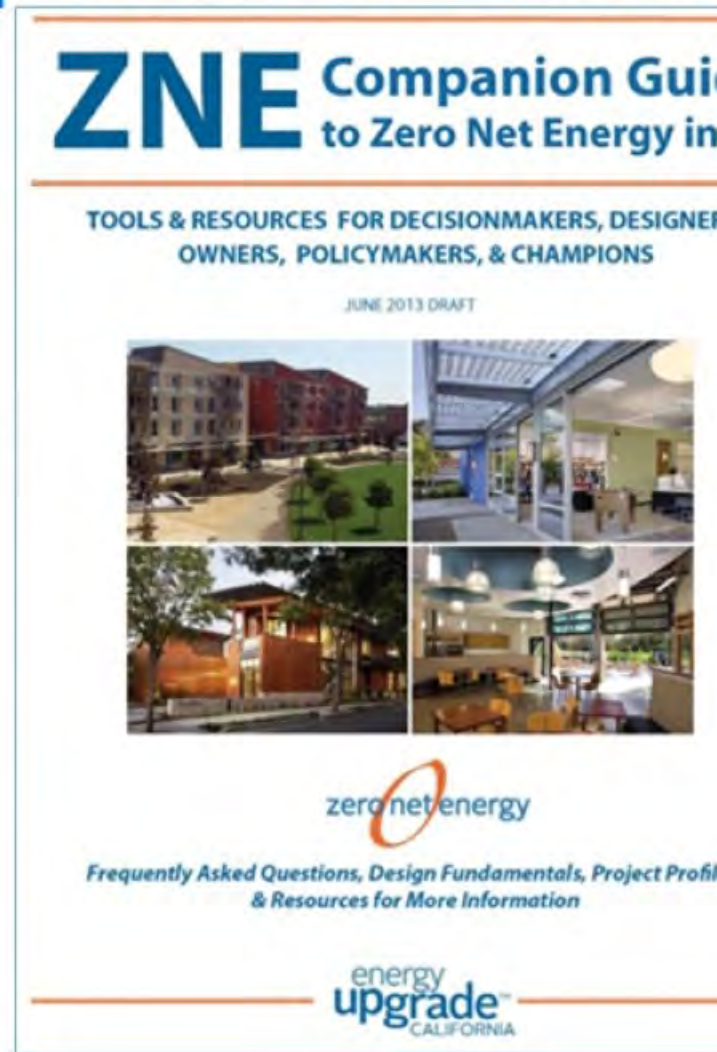
ZNE for Homeowners & Homebuyers

ZNE for Lender's Appraisers & Investors

ZNE for Buildings Owners & Operators

ZNE for Policymakers & Local Governments

ZNE FAQ's





# Technology Guides & Resources

