LET'S TAKE A CLOSER LOOK AT…
THE STATE OF VERMONT

- **Goal:** All new buildings to be net-zero design by 2030
- Efficiency VT leading the way
- Stretch energy codes
- Funding mechanisms
  - Over 2 billion BTU's saved since 2004 due to SRMRF
- City of Montpelier

2030 Our goal is to become the first state capital to produce or offset all of its energy needs from renewable energy sources by 2030.

Credit: netzeromontpelier.org

LET'S TAKE A CLOSER LOOK AT…
THE CITY OF CAMBRIDGE

Net Zero Task Force Convened in 2013

Adopted BEUDO in 2014

- First year report now available

The Getting to Net Zero Framework – 2015

- Contains set of strategies organized into 5 key areas

Planning for Zero and CHPS

Planning for ZNE – Be Inclusive

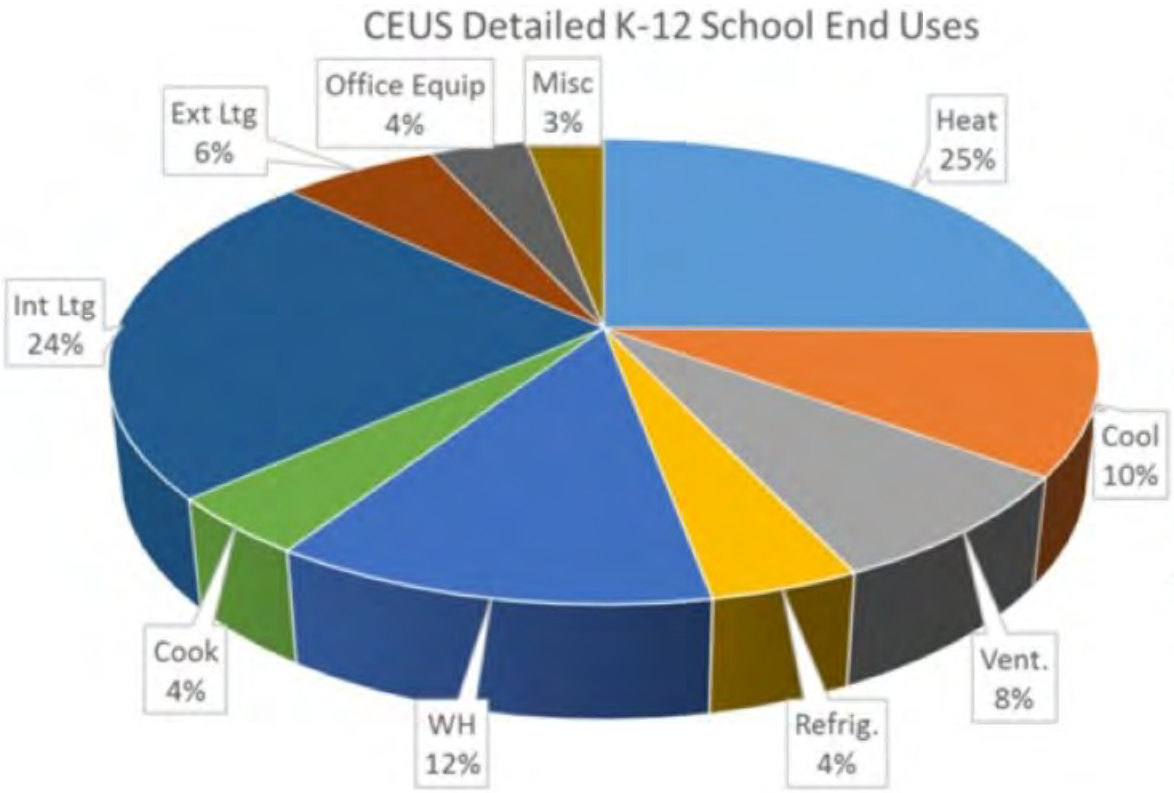
Representatives from:
Design and Construction Teams

Don't Forget:

- **Facilities**
- **Operations & Maintenance**
- **School Staff – Teachers, Administrators, School Board**
- **Students**
- **Local Government Officials**
- **Community Groups**

k6216745 fotosearch.com ©

Planning for ZNE – Benchmark



Heating, Cooling, Ventilation
= **Envelope & HVAC Equip.**

Lighting, Plugs, Cooking, Refrig.
= **Interior Equipment**

All Usage
= **Controls & Occupants**

Planning for ZNE – Reduce Use

Reduced Environmental Impact and Costs

Improved Health and Wellness

Effective Environmental and Sustainability Education

High Performance and ZNE

Planning for ZNE – Healthy and High Performance

High Performance (aka Green Building)

Planning for ZNE – Common Technologies for Reduced Energy Use Are Technologies for Healthy, High Performance Schools

- Ventilation: Natural, Dedicated Outdoor Air Systems (DOAS), Demand Control Ventilation (DCV)
- Highly Efficient Thermal Envelope
- Building Orientation & Glazing ratio
- Solar Control - shading
- Daylighting Access and Controls
- Energy Management Systems
- Building Dashboards
- Radiant Heating/Cooling & Chilled Beams
- Plug load Reductions
- Energy Recovery Systems

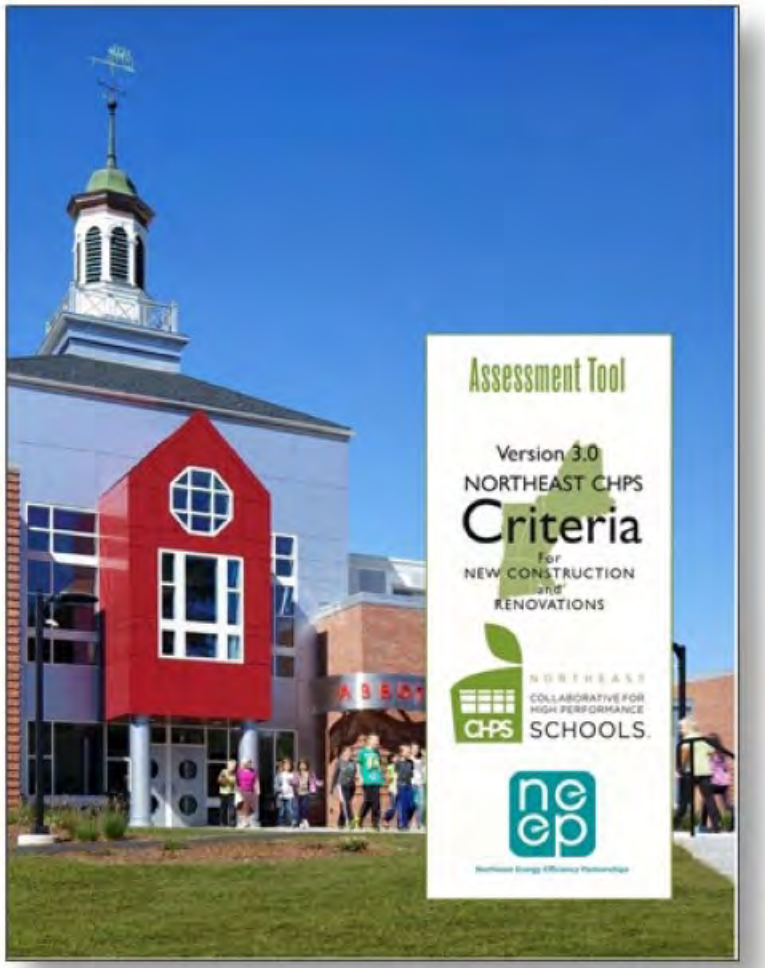
Redding School for the Arts, CA

Courtesy : Trilogy Architecture Steve Whittaker Photography

NE-CHPS v3.1 CRITERIA

Categories:

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



CHPS CRITERIA: ENERGY

Design Toward Zero Net Energy (ZNE)

- Energy Prerequisite
- Superior Energy Performance
- ZNE Bonus
  - ZNE Ready
  - ZNE Capable
  - ZNE (Innovation)
- Commissioning
- Energy Management Systems

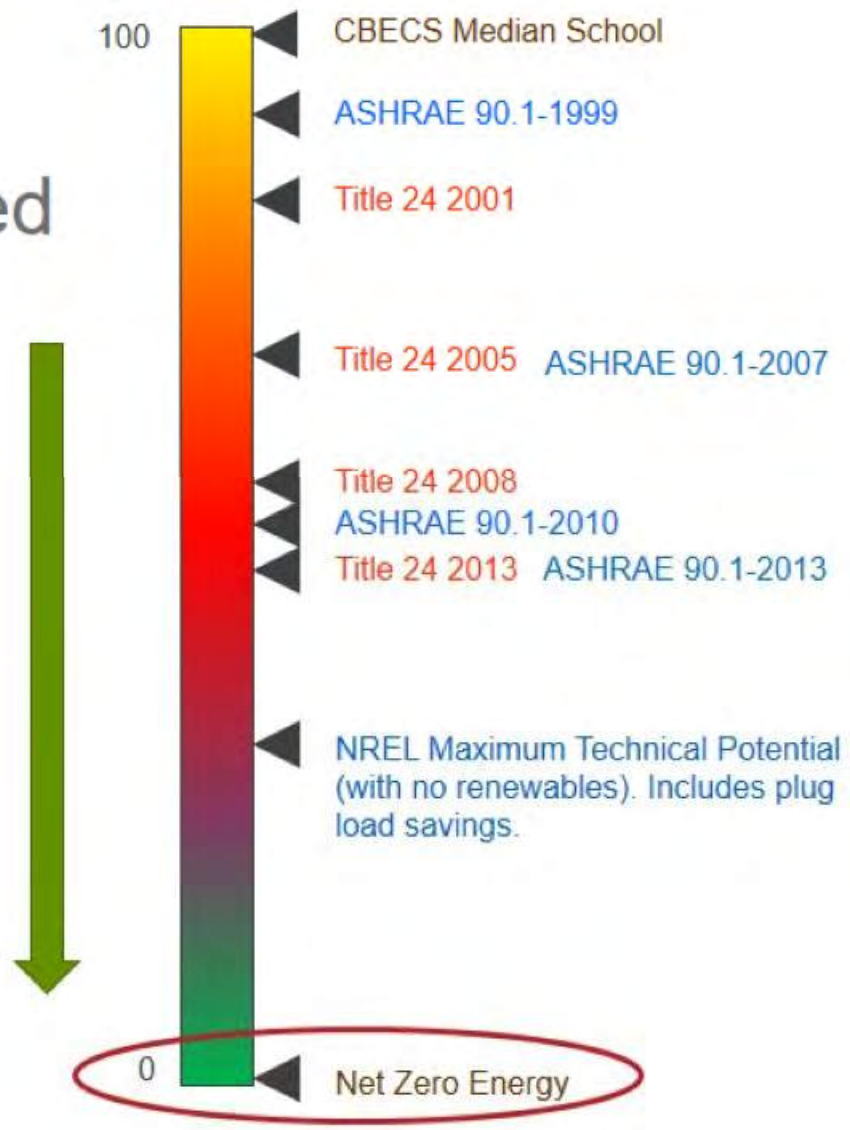
East Bay Met, Newport, RI

DESIGN TOWARD ZNE

zEPI Scale

Moving down the scale can be achieved by:

- Code compliance
- More efficient
  - Windows
  - HVAC
  - Lighting
- Integrated design
  - Daylighting
  - Natural ventilation
- Plug load reductions
- Renewables



Lead by Example

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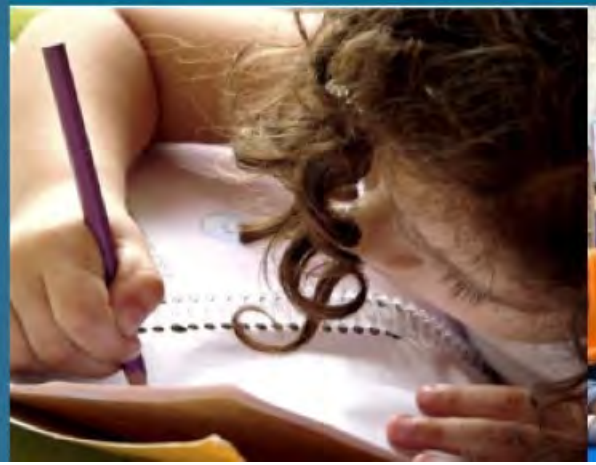
RI School Building Authority

Rhode Island Department of Elementary and Secondary Education

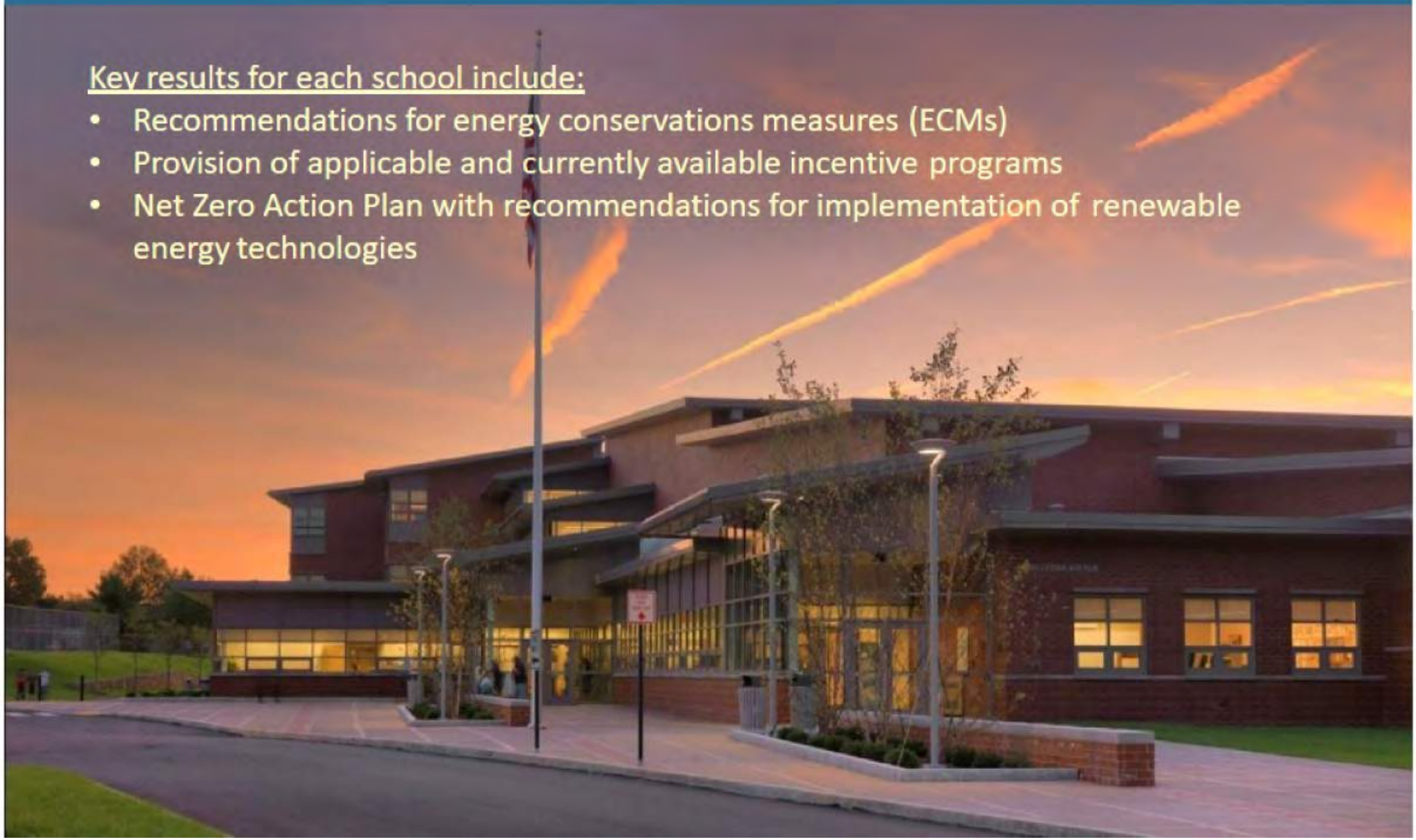
Energy Schoolhouse Assessment

Key information analyzed for 300 plus schools:

- Stated energy cost assumptions
- RIDE uniform chart of accounts (available data)
- Key utility cost and consumption benchmarks from 2011 - 2014
- Energy use index – determination of each school's Energy Use Index (BTU/FT2/year)
- Peer comparison – comparison of each school's EUI to the RIDE average
- Evaluation of the energy efficiency of existing systems



Energy Schoolhouse Assessment (cont'd)



Key results for each school include:

- Recommendations for energy conservations measures (ECMs)
- Provision of applicable and currently available incentive programs
- Net Zero Action Plan with recommendations for implementation of renewable energy technologies

Zero Net Energy Action Plan

The **Zero Net Energy Action Plan** outlines:

- primary components of the plan,
- approach for implementation,
- actions to reduce energy consumption, potential for on-site renewable energy sources.

Zero Net Energy Action Plan

- Express Core Values by Example
- Integrate with Master Plans
- Energy Efficiency / Optimization Projects
  - Building Automation Systems
  - Solar Hot Water Heaters
  - Energy Recovery Ventilation (ERVs)
- Installation of Solar Photovoltaics
- Migrate to Ground Source Heat Pumps
- Public Private Partnerships
- Reduce Utilities Cost to Zero
- Curriculum Integration of Net Zero

Schoolhouse 0_{net} Energy Plan

Conserve

"School as a tool"

NRG Efficiency

Renewables

Exercise:
Define key stakeholders for planning to get to zero

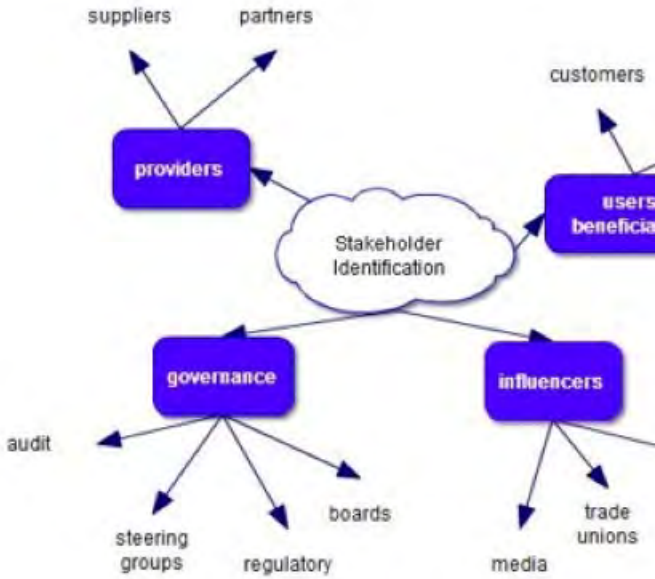
Stakeholder Mapping Exercise

List key goals and overarching messages

Map internal and external stakeholders and support network

Identify key audiences, and decisionmakers

Map spheres of influence, and process for engagement – formal & informal activities



Getting your Organization to Zero

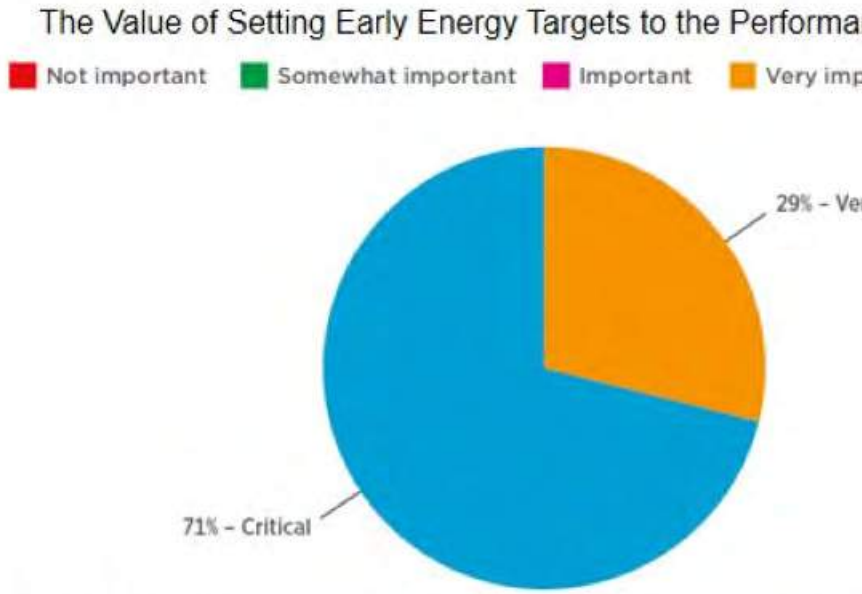
1. Convene your leadership, set your goals
2. Empower your team
3. Gather tools and resources
4. Pilot your approach and share lessons learned
5. Iterate for continuous improvement

www.integralgrou

Convene your Leadership and Set your Goals

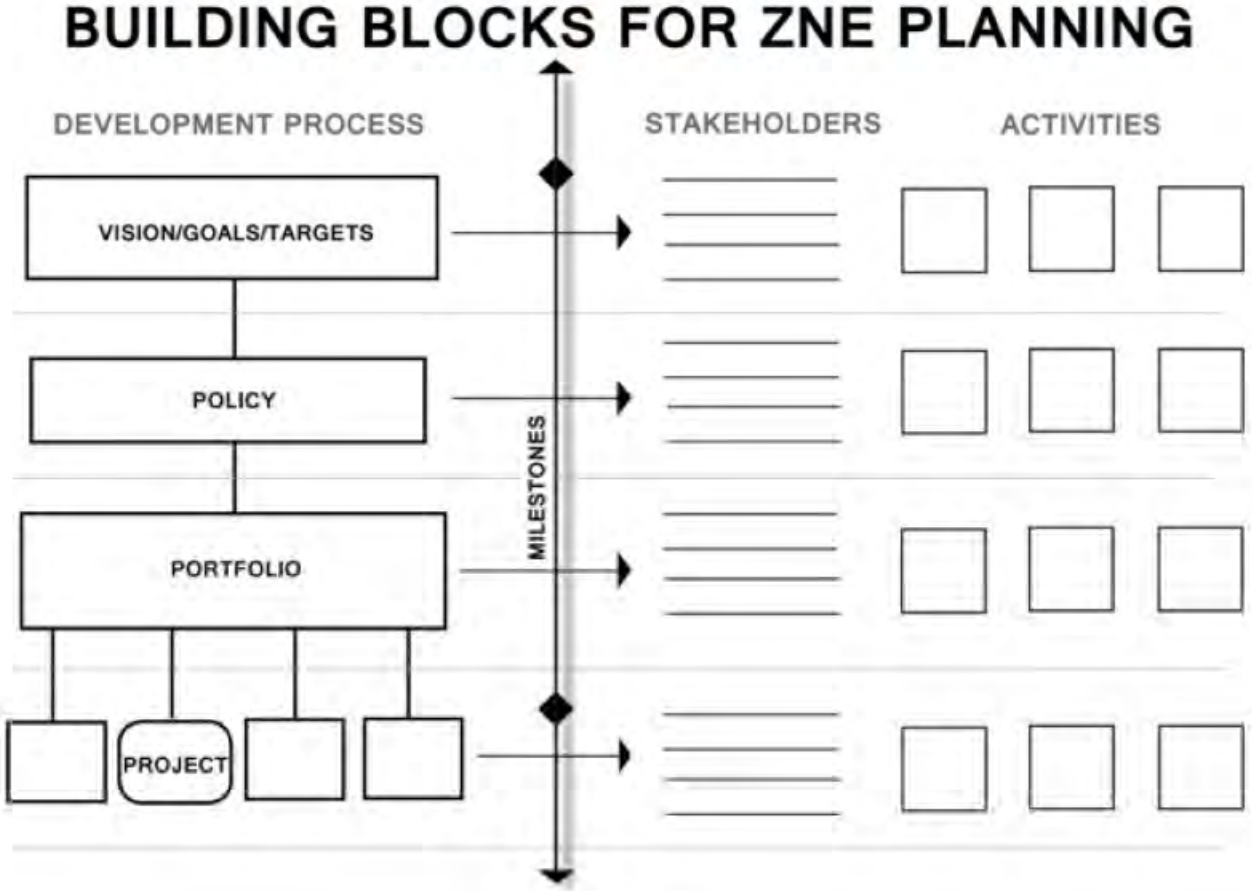
ork with your leadership team to fine your organization's zero net als and KPIs

- Begin with the end in mind
- Define what "success" looks like
- Determine timeframe and key stages and ates
- Take the first step…



Source: *Zero Net Energy Building Controls Characteristics, Energ an*

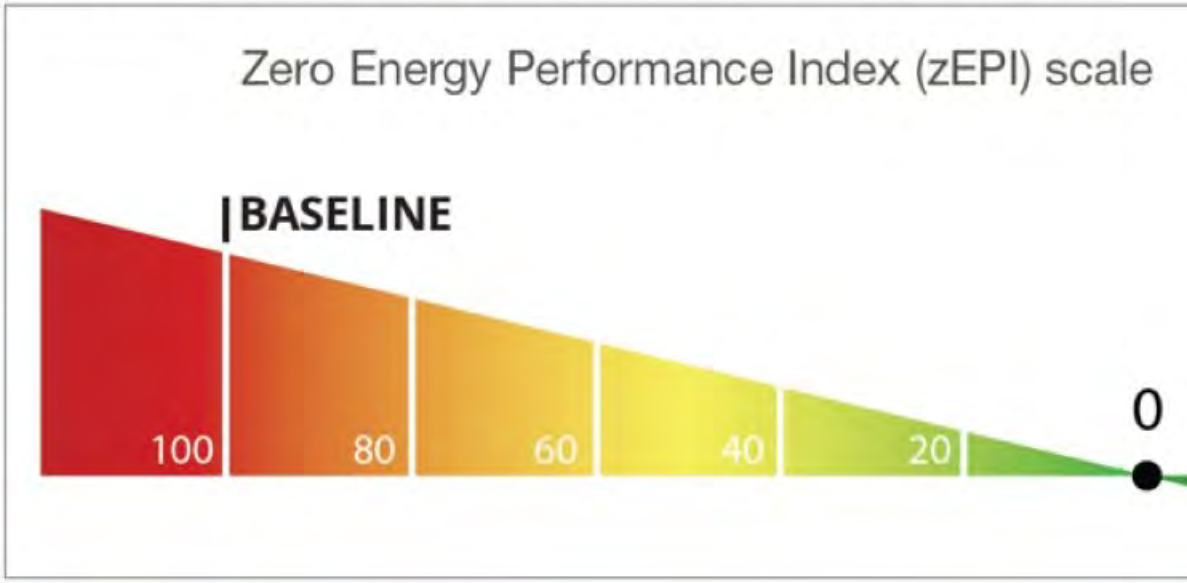
Convene your Leadership and Set your Goals



Convene your Leadership and Set your Goals

e appropriate metrics to communicate goals and measure ccess

- Existing Policy Goals
- Energy, Cost, GHG emissions
- Percent improvement versus
- bsolute goal
- Consider non-energy benefits



newbuildings.org/code

Empower your Team

ovide team building and training opportunities

- Bring your team together to communicate your goals and milestones
- dentify gaps in skills and capabilities
- dentify your internal and external key stakeholders
- Develop an ongoing engagement and training approach