



# High-Performance Buildings Powered by Renewable Energy

11<sup>th</sup> Annual North American Passive House Conference  
Philadelphia, PA  
“Policy, Codes & Incentives”  
September 24, 2016

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# *Environmental and Energy Study Institute*

- Independent, not-for-profit organization founded in 1984
- Mission to help create a sustainable and resilient economy with energy efficiency and renewable energy
- EESI Board of Directors: Addressing climate change is a moral imperative
- Policy/Program areas:
  - Energy and Climate
  - Transportation
  - Sustainable Biomass
  - **Buildings and Communities**

# Approach

- Inform and educate policymakers and stakeholders
  - Congressional briefings to showcase state/local examples of projects, programs, policies; disseminate and give “additional legs” to key reports
  - One-on-one meetings;
  - Fact sheets, issue briefs, articles
- Build coalitions and consensus
- Develop and promote policy solutions

# The Building Sector: A Big Part of the PROBLEM

## **Major energy consumer**

~ 40% of U.S. total for building operation

~ 70% electricity

**~ 40% of greenhouse gas emissions**

**Vulnerability to multiple hazards**

New Opportunities to Push  
Agencies to Adopt  
High-Performance Building  
Standards such as Passive  
House

# Threats to/Impacts from Buildings

- GHG emissions and climate change
- Flooding, wind damage, wildfires, earthquakes
- Dependence on, and depletion of, non-renewable energy resources
- Degradation and loss of ecosystems, habitat, biodiversity
- Volatile energy markets
- Manmade hazards (pollution, fuel/chemical spills, fires, cyber attacks, physical attacks, biohazards)
- Age and disrepair of buildings, electric grid and other infrastructure

# Other Challenges

- Affordable housing crisis
- Crumbling infrastructure
- Aging population (“silver tsunami”)
- Internet-connected Haves and Have-Nots
- Government policy uncertainties

# What Should Policymakers Address First?

- Climate change
- Natural/manmade hazards
- Health care
- Affordable housing
- Infrastructure needs
- Job creation
- Other



All of the Above!

# Performance Goals: What Should the Building “Do”?

**For Example:**

**Provide an Optimum Learning Environment**

- Acoustic Comfort
- Safety and Security
- Superior Indoor Air Quality
- Thermal Comfort
- Visual Comfort
- Inspiration

... in addition to meeting energy performance and other goals!

[www.wbdg.org](http://www.wbdg.org)

Whole Building Design Guide

**Heritage Middle School**  
*Innovative Design*  
*Raleigh, North Carolina*  
**([www.innovativedesign.net](http://www.innovativedesign.net))**



# Statutory Definition of High-Performance Building

Energy Independence & Security Act of 2007, Title IV,  
Energy Savings in Buildings and Industry, Section 401  
(U.S. Public Law 110-140):

A high-performance building is—

*A building that integrates and optimizes on a life cycle basis all major high performance attributes, including energy conservation, environment, safety, security, durability, accessibility, cost-benefit, productivity, sustainability, functionality, and operational considerations.*

# Attributes of High Performance

- Accessibility
- Aesthetics
- Cost Effectiveness
- Functionality
- Historic Preservation
- Productivity
- Resiliency
- Security/Safety
- Sustainability

## **Future Attributes:**

How will buildings and communities evolve?

What will societies demand?

# The Multiple Benefits of High-Performance Buildings

- For occupants: Improved comfort, health, safety, cash flow... well-being
- For insurers (and government): Risk management
- For owners and investors: O&M cost savings, long-term value
- For the environment on which we all depend: Resource conservation, reduced pollution and greenhouse gas emissions, ecosystem protection/restoration
- For communities: Prosperity and resiliency (if benefits apply to all)

***Economic, Environmental, Social Sustainability  
(The “Triple Bottom Line”)***

# Policies and Other Drivers of High-Performance Building

## International

- Paris Climate Agreement
- Health impacts of emissions and pollution
- Phase-out of HFCs (Montreal Protocol)
- U.S. Department of Defense initiatives
- Sustainable development – Leap-frog industrial age?

## Domestic

- Extreme weather in GAO High Risk Reports (gov't fiscal exposure)
- Tax credits/deductions for developers, businesses, consumers
- President's Executive Orders for federal agencies
- DOE programs (such as **Zero Energy Ready Homes**)
- USDA loans for EE upgrades
- Grid modernization
- New bi-partisan Congressional caucuses, resolutions

# Policies and Other Drivers of High-Performance Building

- Affordable housing development incentives such as PA Housing Finance Agency's extra points for Passive House
- State programs/incentives for Passive House such as NYSERDA
- Evolving energy sector – PV prices; distributed generation and storage; Internet of Things (grid-connected controls and sensors, thermostats, appliances)
- Financing products
- Innovators & entrepreneurs
- Congressional action?? (agency funding, comprehensive energy bill, tax credits)

# Not Helpful

- Directives for federal agencies to choose a specific “comprehensive” green building certification system
- Large and confusing array of “green” building programs and labels, codes and standards
- Contract and procurement officials who do not understand how to differentiate
- Special interest lobbying against 3-year code update/adoption
- Inadequate incentives for high performance and/or resources for code enforcement



# How to Push the Pace?

- Integrated, holistic planning for sustainable neighborhoods, communities
- Building codes
- Tax credits/deductions, other incentives
- Government-industry R&D (and demonstration)
- Market education/incentives (consumers, developers, lenders, appraisers, insurers)
- Technical training for building professionals
- Clean Power Plan Implementation
- Carbon Pricing?

**“Zero/Positive Energy” Buildings  
Can be a Big Part of the SOLUTION**

Climate Change Mitigation + Adaptation  
=  
Sustainability + Resiliency

**“Path to Zero”**

## PASSIVE HOUSE AND YOU ARE...

- transforming the building sector from being a big part of the problem to being a big part of the *SOLUTION*.

## WE CAN...

- turn building-related threats and challenges into **OPPORTUNITIES** to enhance environmental, economic and social sustainability and resilience.

# THANK YOU

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