

# Green Building Workshop Series Eco-City Alexandria Initiative

Workshop #4

**GREEN + HISTORIC PRESERVATION = THE  
BEST OF BOTH!**

June 4, 2011



Eco-CITY  ALEXANDRIA



# Our Speakers Today

- **Al Cox**, FAIA, LEED AP, Historic Preservation Manager, Planning & Zoning
- **Stephanie Sample**, Historic Preservation Planner, Planning & Zoning
- **Kimberly Kooles**, Program Associate, State and Local Partnerships and Policy, National Trust for Historic Preservation
- **William Cromley**, Builder/Developer, Parker-Gray Historic District Homeowner





# Workshop Overview

1. Eco-City Alexandria
2. Historic Preservation and Environmental Sustainability: Dispelling Myths
3. National Role of Preservation in the Green Building Movement
4. Alexandria Case Studies: Green + Historic
5. Local information and useful resources
6. Q&A with Presenters and door prizes
7. Meet and Greet with Contractors and Building Product Representatives



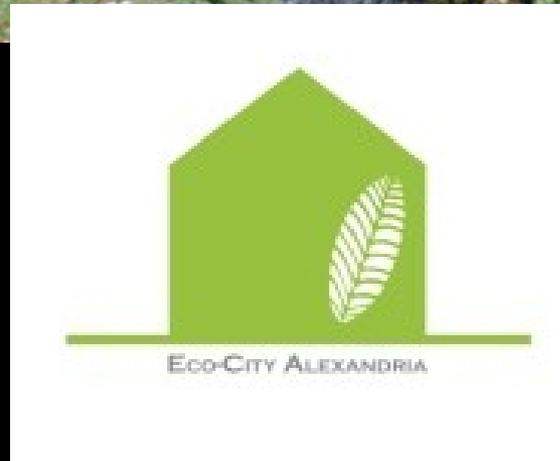
# Eco-City Alexandria

## Eco-City Charter Principles

- Land Use and Open Space
  - Water Resources
    - Air Quality
  - Transportation
    - Energy
  - Building Green
    - Solid Waste
  - Environmental Health
- Emerging Threats & Climate Change
  - Implementation

## Environmental Action Plan





# **Historic Preservation and Environmental Sustainability: Dispelling Myths**



Earthships, Taos, New Mexico





# MYTHBUSTERS



$$\text{Pascal} = \text{N}$$

## Take Advantage of a Historic Home's Original Energy Saving Features



Townhouse design  
limits exposed wall  
area

Masonry construction  
adds thermal mass

Street trees &  
shutters shade  
house

Storm windows &  
doors save energy  
and protect historic  
fabric





Existing buildings  
contain embodied  
energy

Trees & porches &  
awnings can provide  
shade

Large bay windows  
increase natural light  
& ventilation

Roof vents reduce  
attic temperature

“Green preservation is all about invisible sustainability”

[www.historichometeam.com/blog](http://www.historichometeam.com/blog)





Existing buildings  
contain embodied  
energy

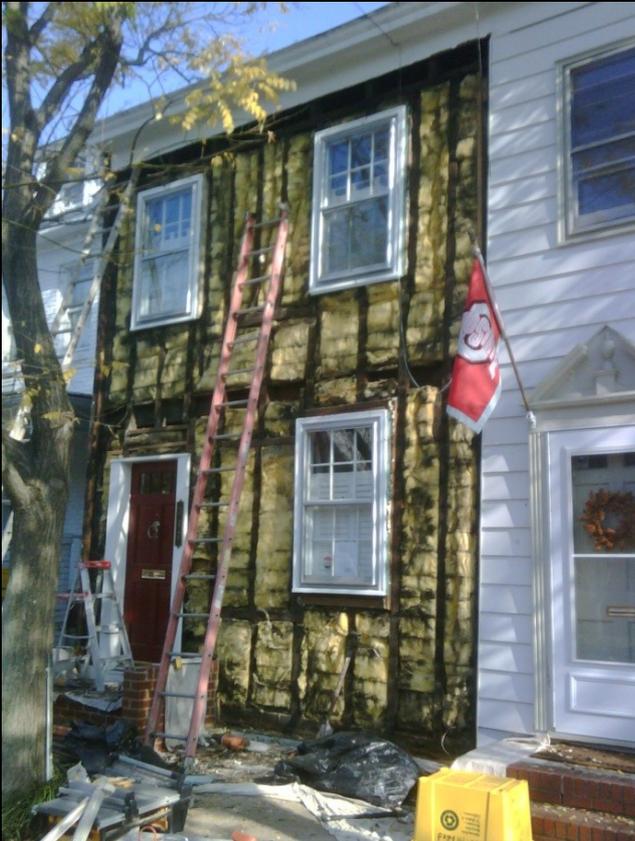
Trees, porches and  
deep eaves can  
provide shade

Ventilation through  
open windows and  
ceiling fans





# Top 10 Ways to Green *your* Historic Home



1. Assess the existing conditions
2. Reduce air infiltration
3. Insulate
4. Open your home's windows
5. Assess HVAC system
6. Improve window efficiency
7. Upgrade lighting
8. Lighten up
9. Reduce water consumption
10. Upgrade appliances

# 1. Assess Existing Conditions

DIY Energy Assessment

or

Professional Energy Audit

- Shows where you are losing energy
- Helps to evaluate and prioritize ways to make your home more energy efficient, lower utility bills and increase comfort

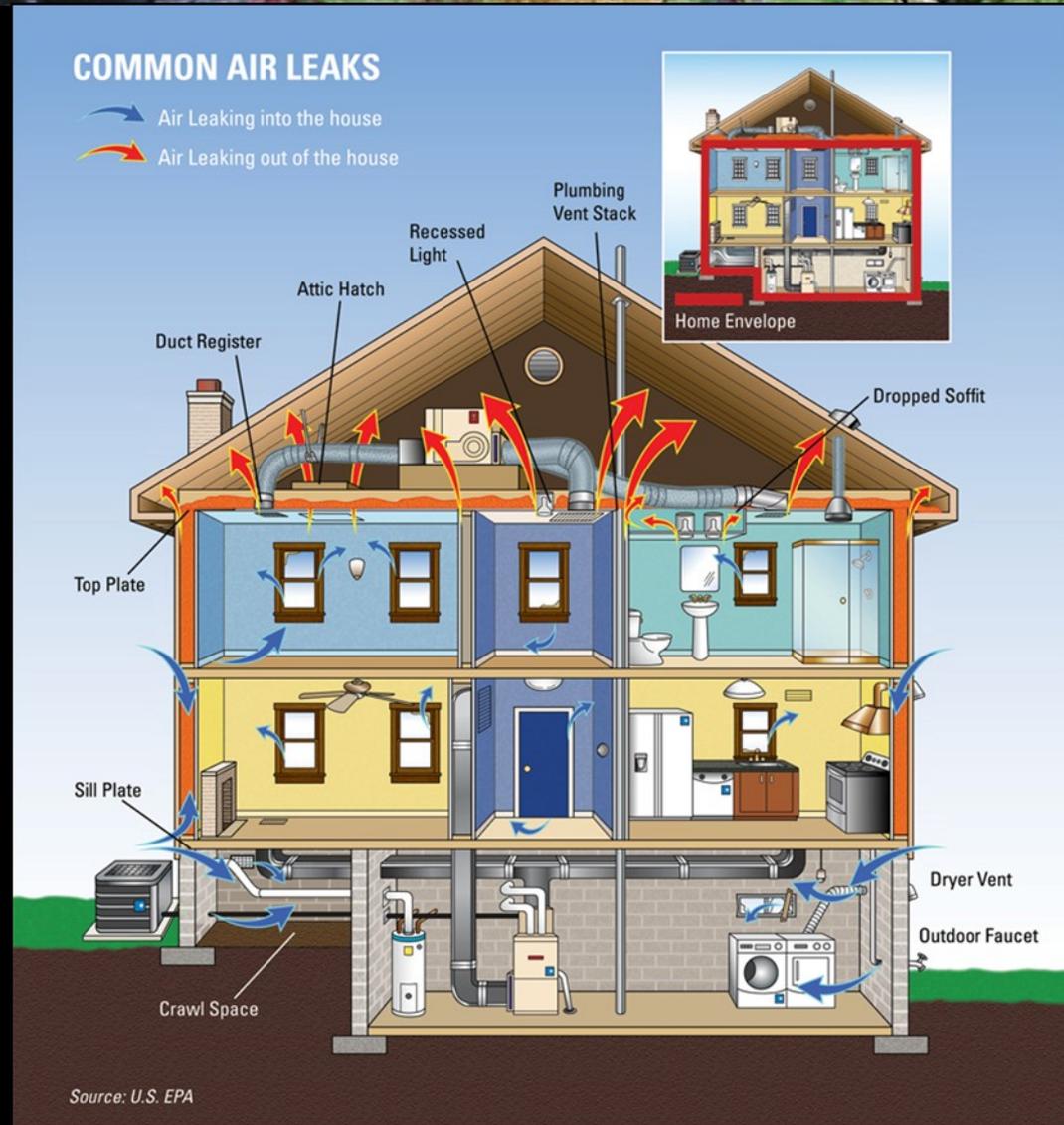
The screenshot shows the 'HOME ENERGY SAVER™' website. At the top, there is a navigation bar with 'START', 'DESCRIBE', 'COMPARE', 'UPGRADE', and 'LEARN'. Below this is a banner with the slogan 'Save money. live better. help the earth!' and 'Over 6 million visits!'. The main content area features an 'ENERGY CALCULATOR' form with fields for 'Enter your zip code, or' and 'Enter previous session #', a 'GO' button, and a link 'Look up zip code'. To the right of the form is a 3D bar chart with green and yellow bars, and a group of people standing on a floor plan. Below the calculator are sections for 'Case Studies' and 'Energy NewsWire' with several links. On the far right, there is a section titled 'Are YOU set to save' with a washing machine icon and a small text prompt.

The screenshot shows the 'CITY OF Alexandria VIRGINIA' website. The header includes the city logo and 'ALEXANDRIA.VA.GOV'. A navigation menu at the top right lists 'Home', 'Residents', 'Visitors', 'Business', and 'City Dept'. Below the header is a breadcrumb trail: 'Home > Green Building Resource Center > Green Building Resources'. The date 'Wednesday, June 1' is displayed. The main content area features a large banner for the 'GREEN BUILDING RESOURCE CENTER' at 'Eco-CITY ALEXANDRIA', with a green house icon and a leaf. At the bottom, there is a red navigation bar with icons and labels for 'Main', 'Residential', 'Business', 'Government', and 'Resources'.

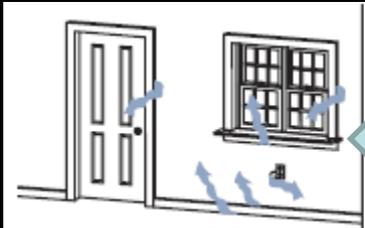
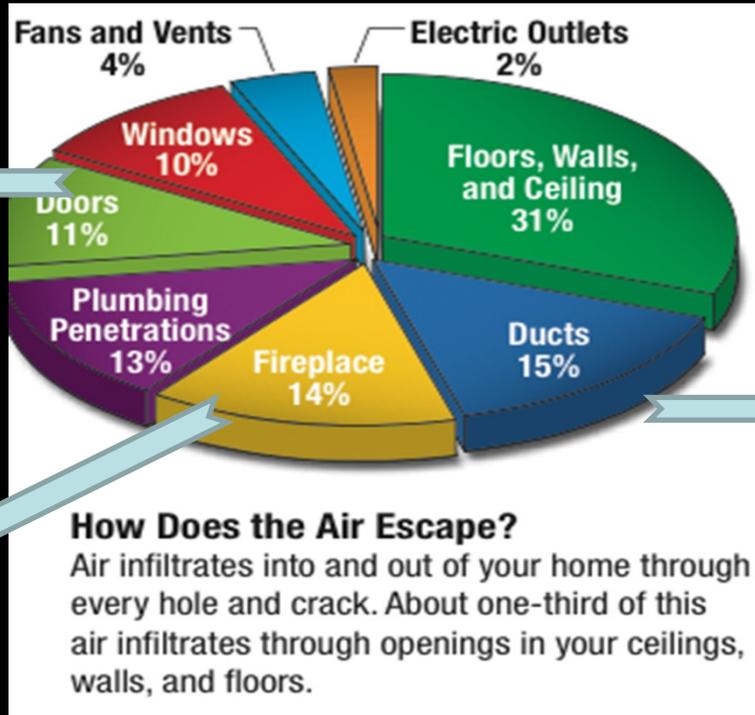
## 2. Reduce Air Infiltration

Only 20% of homes built before 1980 are well insulated.

Tightly constructed homes have .25 to .35 Air Changes per Hour (ACH). Older homes may have an ACH of 2.5 or higher.



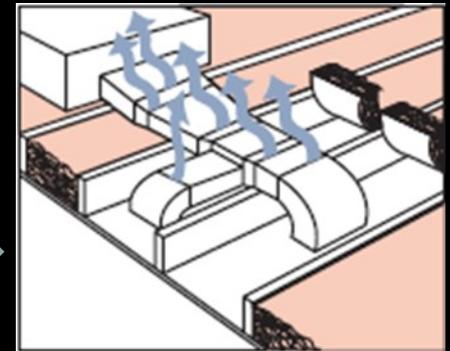
## 2. Reduce Air Infiltration



Solution: caulk & weatherstrip doors, windows and electrical outlets



Solution: exterior flue damper



Solution: seal and insulate ducts in the attic and crawl space

### 3. Insulate, Insulate, Insulate !



Key locations for insulation

Prioritize: Heat Rises

- 1) Attic (between R-30 and R-60)
- 2) Basement
- 3) Walls
- 4) Floors



Batt insulation is easily reversible

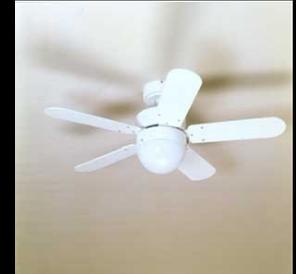


## 4. Utilize Natural Ventilation

Transoms –  
interior and  
exterior



Fans – inside  
and out



Cupolas provide a  
thermal chimney

Open the  
windows &  
use both  
sash





## 5. Assess HVAC system



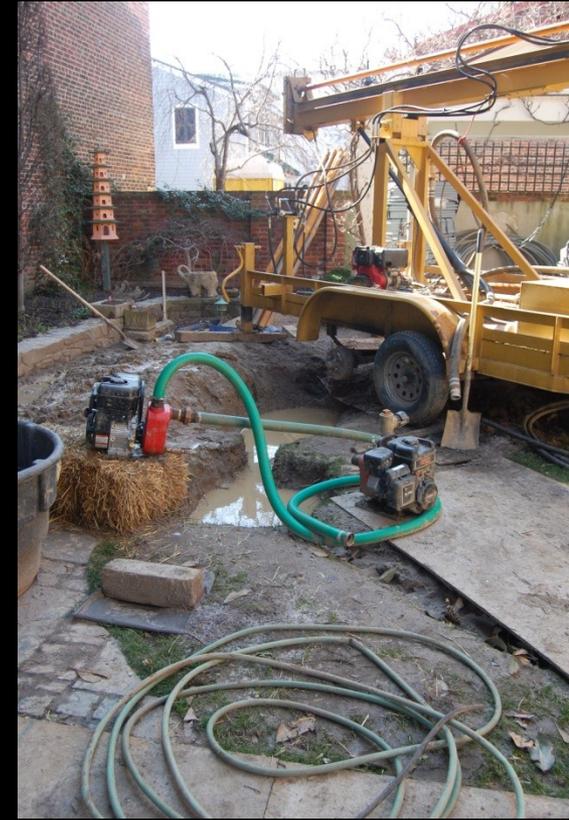
Zoned mini-split system



Cost savings with high SEER condensers



Programmable thermostats



Ground Source Heat Pump





## 7. Upgrade Lighting

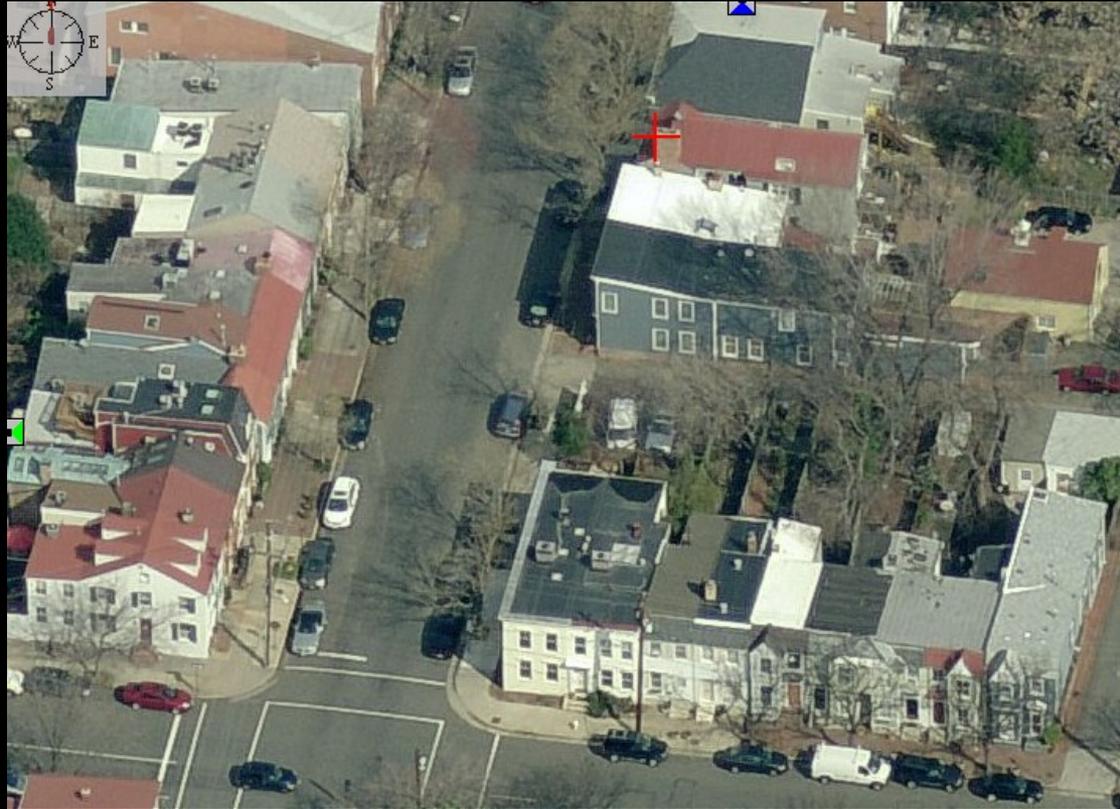
LED light bulbs



Compact fluorescent light bulbs (CFLs)

Average payback = less than a year

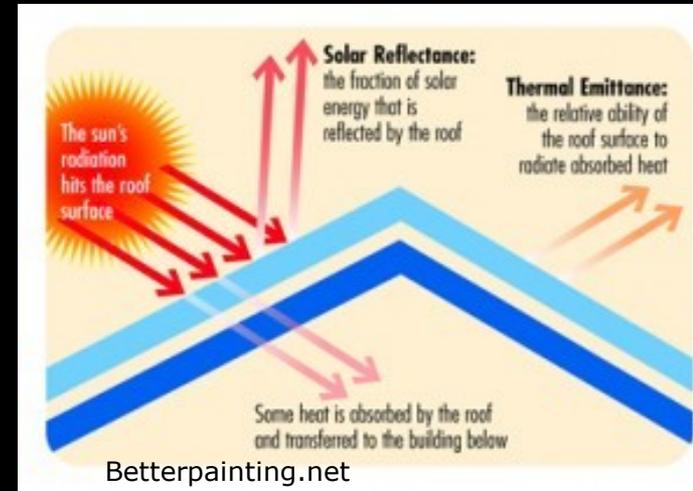
# 8. Lighten Up Your Roof



Install light colored roofing



Vegetative roof

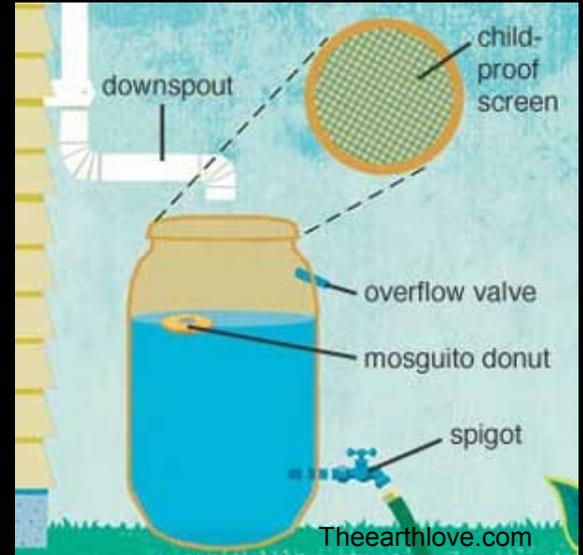


## 9. Reduce Water Consumption

Inside.....and outside.



- Toilets
- Faucets
- Shower heads



- Rain barrels
- Soaker hoses



Apartmenttherapy.com



## 10. When Replacing, Upgrade Your Appliances





## The BARs & Sustainable Design



Modern & Sustainable Materials Work Group  
Three new policies over the past year  
Roof Materials Policy  
Windows Policy  
Minor Architectural Elements Policy





Questions?....Who ya gonna call?



BAR Staff



# The National Role of Historic Preservation in the Green Building Movement

**Kimberly Kooles  
National Trust for  
Historic Preservation**

P R E S E R V A T I O N :

Reusing America's Energy

Preservation Week May 11-17, 1980



**It takes energy to construct a new building.  
It saves energy to preserve an old one.**

It takes the energy equivalent of one gallon of gasoline to make, deliver and install eight bricks. Preserving eight old bricks instead of throwing them away and making new ones means that the energy of a gallon of gasoline can be used to meet other needs. Reusing old buildings saves the energy required to demolish and replace them with new buildings. And properly rehabilitated old buildings use no

more energy, on the average, than brand new buildings for operation. Save energy—save a building! Join the National Trust for Historic Preservation and the U.S. Department of Energy in observing Preservation Week 1980. For details, write to Preservation Week, National Trust, 176 Massachusetts Ave., N.W., Washington, D.C. 20036. Or contact your local preservation organization.

**NATIONAL TRUST FOR HISTORIC PRESERVATION**

PHOTO © 1980 NATIONAL TRUST FOR HISTORIC PRESERVATION



14<sup>th</sup> & P St NW , Washington DC

# THE NATIONAL ROLE OF PRESERVATION IN THE GREEN BUILDING MOVEMENT

CITY OF ALEXANDRIA WORKSHOP #4

JUNE 4, 2011

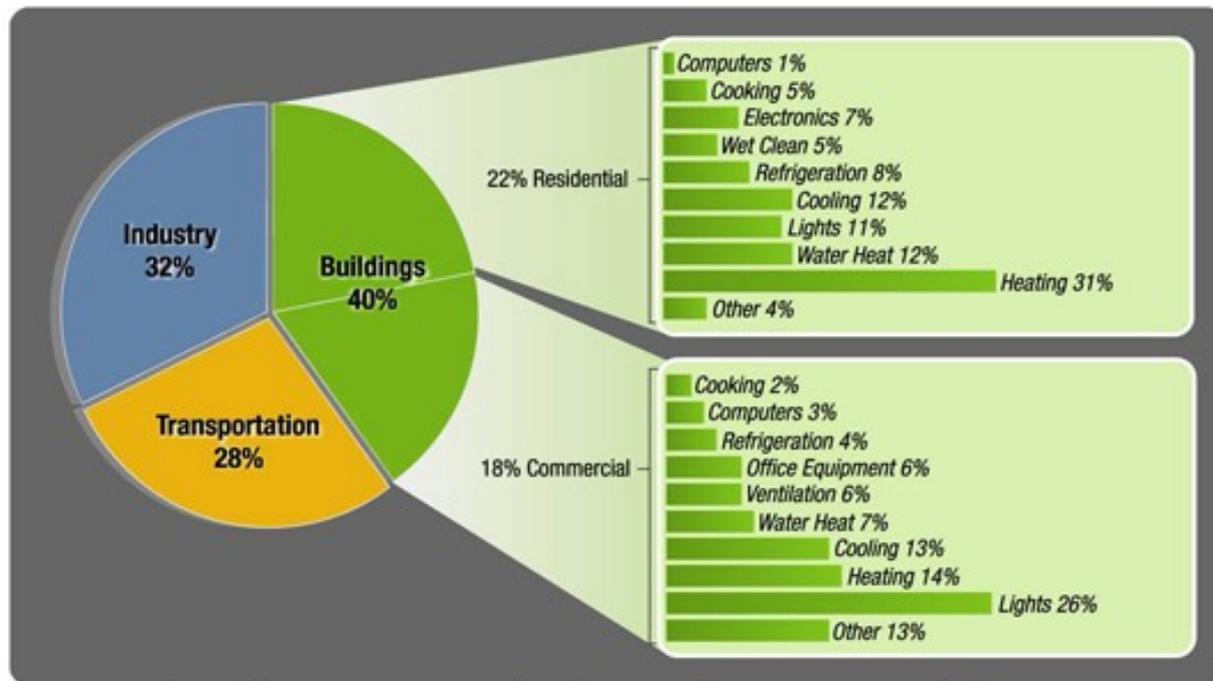
KIMBERLY KOOLIS, NTHP

## GOALS OF THIS SESSION

---

- UNDERSTAND THE ENVIRONMENTAL VALUE OF REUSING BUILDINGS
- EXPLORE PERFORMANCE OF OLDER AND HISTORIC BUILDINGS
- LEARN ABOUT RESOURCES ON RETROFITS
- EXPLORE INNOVATION IN APPROACHES TO RETROFITS
- PRESERVATION AND SUSTAINABILITY WORK ON THE NATIONAL LEVEL

# BUILDINGS GREENHOUSE GAS EMISSIONS



The Buildings Sector accounts for about 40% of U.S. Energy, 72% of Electricity, and 34% of Natural Gas use. Building energy costs totaled \$390 billion in 2006.

Source: Buildings Energy Data Book, Sept. 2008, Tables 1.1.3 1.1.6, 3.1.1, 3.3.1, 4.1.5, 5.1.2, 5.3.1

Source: The National Energy Technology Laboratory – [netl.doe.gov](http://netl.doe.gov)

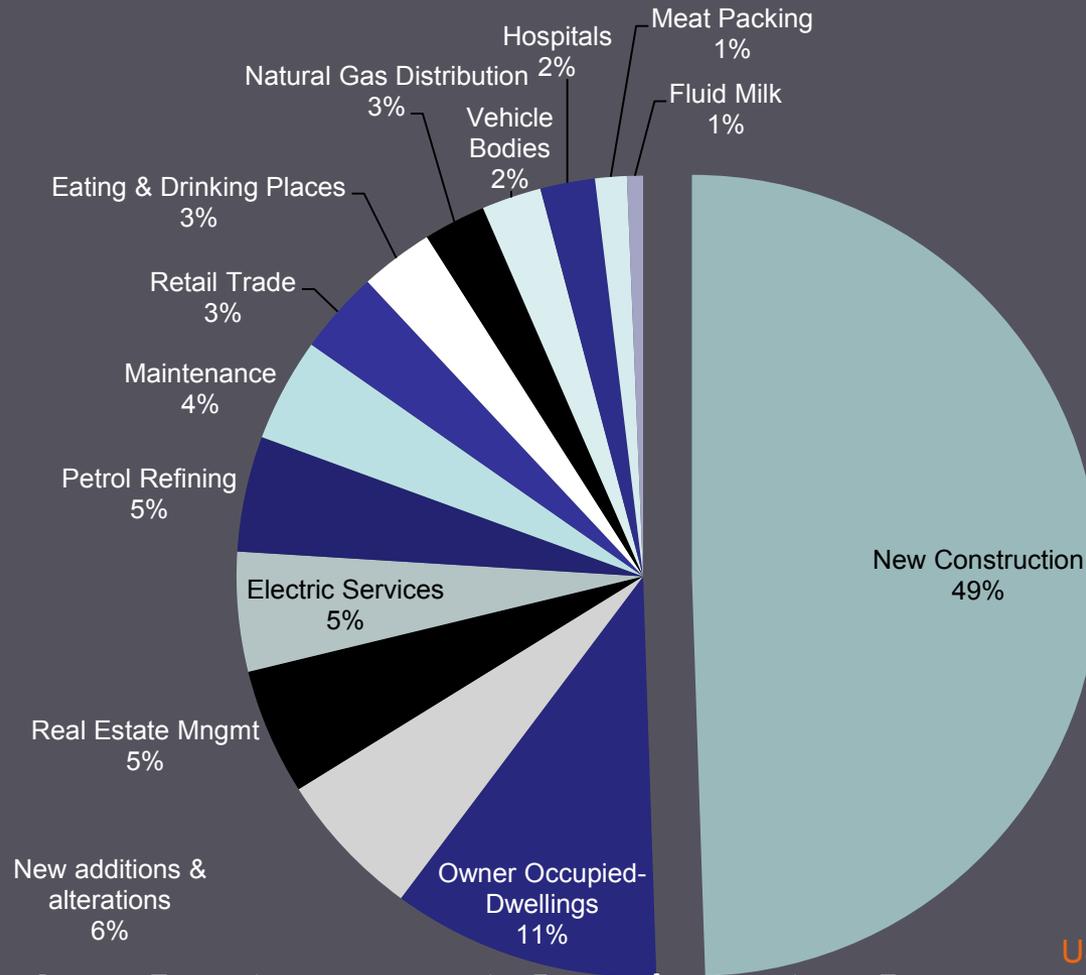
# THE IMPACT OF BUILDINGS: MACRO VIEW

---

Roughly 42% of U.S. Greenhouse Gas Inventory Emissions are associated with materials extraction and harvesting, the production, transportation and disposal of goods in the U.S. – in part due to the energy needed for these processes.

**Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices – EPA September 2009**

# RESOURCE USE – UNITED STATES



Materials, Products and Services by Resource Use

US EPA – Sustainable Materials Management: The Road Ahead (June 2009)

# EMBODIED ENERGY/ CARBON



## New Tricks with Old Bricks

How reusing old buildings can cut carbon emissions



It takes between 35-50 years for a new, green Home to recover the carbon expended during the Construction process

-- Empty Homes Agency

# EMBODIED ENERGY/ CARBON

Environment > What's the carbon footprint of ... ?

## GREENLIVING BLOG



Previous Blog home

### What's the carbon footprint of ... building a house

New homes require far less energy to run than older properties, but building them generates plenty of CO2

- More carbon footprints: the internet, cycling a mile, others
- Understand more about carbon footprints



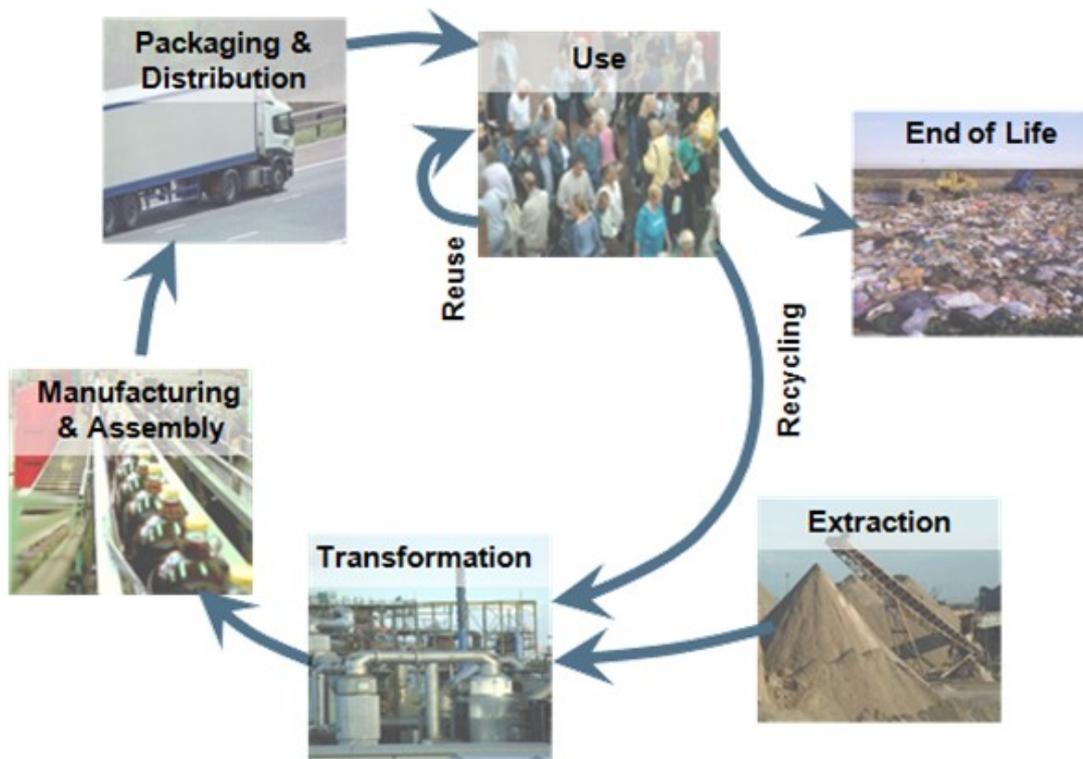
Posted by Mike Berners-Lee  
Thursday 14 October 2010 07:00 BST  
guardian.co.uk

larger | smaller

It takes 15-20 years for a new, green home to recover carbon expended during Construction

-Historic Scotland

# LIFE CYCLE ASSESSMENT



An evaluation of the environmental and human health impacts of a product, process, or service over its lifetime.

# LCA SCENARIOS

- Single family residential
- K-12 school
- Urban village/mixed-use (10K sf)
- Commercial office (50k sf)
- Urban warehouse (75 sf)



# RETROFIT GREEN

Many historic buildings are already energy efficient

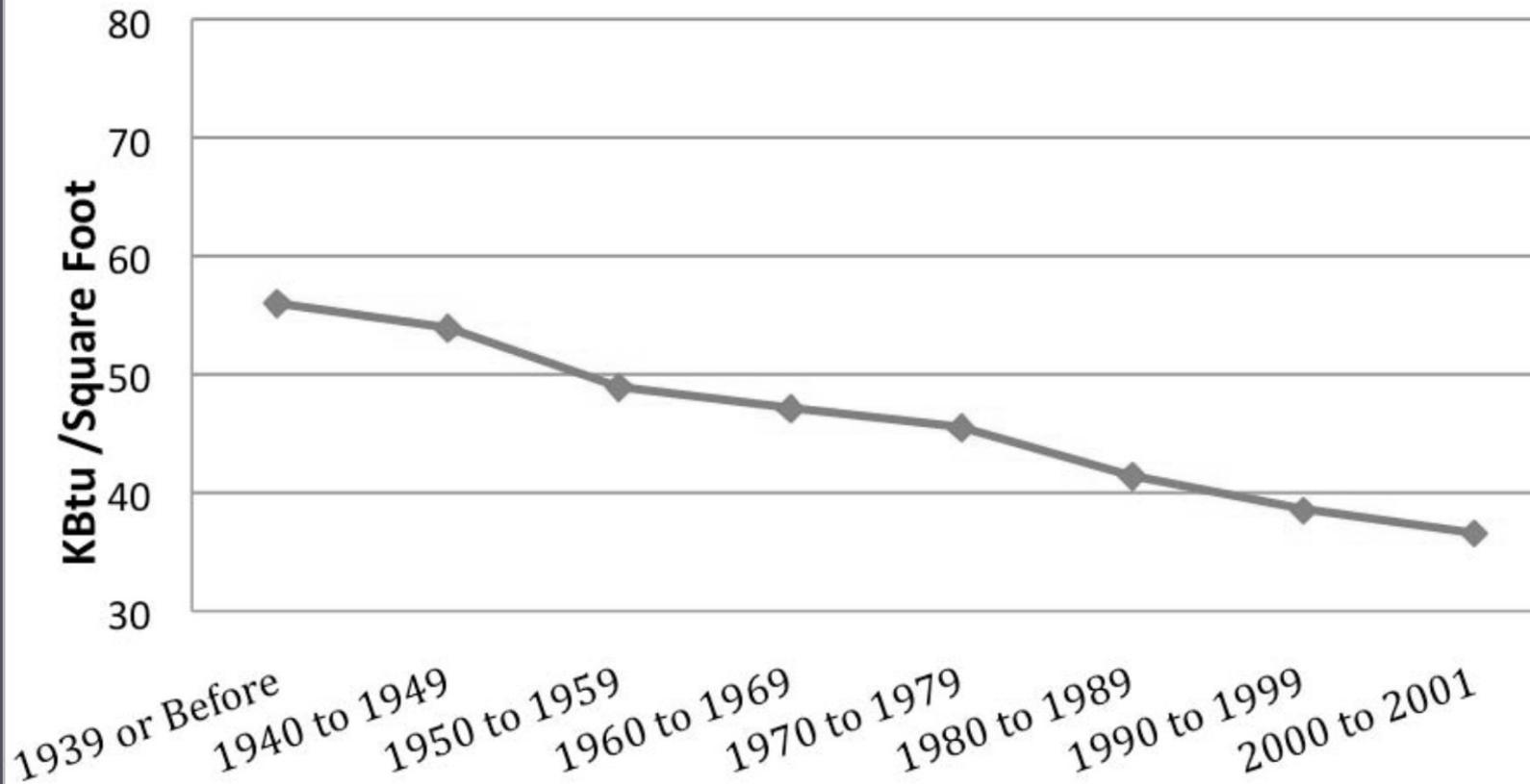
Commercial Buildings (non malls):

Date Built	Btu/sq. ft
<b>Before 1920</b>	<b>80,127</b>
1920 – 1945	90,234
1946 – 1959	80,198
1960 – 1969	90,976
1970 – 1979	94,968
1980 – 1989	100,077
1990 – 1999	88,834
<b>2000 – 2003</b>	<b>79,703</b>

Source: U.S. Energy Information Administration, *2003 Commercial Building Energy Consumption Survey*

# RETROFIT GREEN

Energy Intensity of Household by  
Construction Vintage, 2001



Source: U.S. Energy Information Administration, 2005 Residential Energy Consumption Survey

# Weatherization

NATIONAL  
TRUST  
FOR  
HISTORIC  
PRESERVATION®

Helping people protect, enhance and enjoy the places that matter to them. ✦

[Register](#) | [Login](#)

[ABOUT US](#) | [RESOURCES](#) | [TAKE ACTION](#) | [ISSUES](#) | [TRAVEL & SITES](#) | [SUPPORT US](#)

## WEATHERIZATION GUIDE FOR OLDER & HISTORIC BUILDINGS



### The Big Chill

Record lows are gripping the nation. Is your home ready?

[READ MORE](#)

[WEATHERIZATION: WHAT'S AT STAKE?](#)

[Learn More](#) ▶

Not since the days of the oil crisis in the 1970's have Americans been so focused on energy consumption, and the resulting weatherization. Just as the cost of heating and cooling has risen, so has the awareness of first



## JOIN TODAY!

Help us save the places that matter to you.

LOVE YOUR WINDOWS



# Historic Wooden Windows

NATIONAL  
TRUST  
FOR  
HISTORIC  
PRESERVATION

## HISTORIC WOOD WINDOWS

A tip sheet from the National Trust for Historic Preservation

### National Trust for Historic Preservation

1785 Massachusetts Ave, NW  
Washington, DC 20036  
(202) 588-6000  
(202) 588-6462 (fax)  
Info@nthp.org  
[www.PreservationNation.com](http://www.PreservationNation.com)

This tip sheet on historic wood windows was developed as part of the National Trust for Historic Preservation's [Sustainability Initiative](#).

#### About the Initiative:

Historic preservation can and should be an important component of any effort to promote sustainable development. The conservation and improvement of our existing built resources, including reuse of historic and older buildings, greening the existing building stock, and reinvestment in older and historic communities, is crucial to combating climate change.

Learn more about Preservation and Sustainability on the web: [www.preservation.org/issues/sustainability](http://www.preservation.org/issues/sustainability).

For more information, contact:

**Patrice Frey, Director of Sustainability Research**  
(202) 588-6255  
Patrice\_Frey@nthp.org

**Barbara A. Campagna, AIA, LEED AP, Graham Gund Architect**  
(202) 588-6291  
Barbara\_Campagna@nthp.org

**Rebecca Williams (author of this publication), Field Representative, Northeast Office**  
(617) 523-0885  
Rebecca\_Williams@nthp.org

### Introduction

There is an epidemic spreading across the country. In the name of energy efficiency and environmental responsibility, replacement window manufacturers are convincing people to replace their historic wood windows. The result is the rapid erosion of a building's character, the waste of a historic resource, and a potential net loss in energy conservation. Typically replacement windows are vinyl, aluminum, or a composite with wood, and none will last as long as the original window. Repairing, rather than replacing, wood windows is most likely to be the "greener option" and a more sustainable building practice.

Research shows that most traditionally designed wood-frame buildings lose more heat through the roof and un-insulated walls than through the windows.<sup>1</sup> A historic wood window, properly maintained and fitted with a storm window, can be just as energy efficient as a new window.<sup>2</sup> Replacing a historic single-pane window also may not save you much money in the long run. While the exact figure will vary depending on the type of window installed and whether or not a storm window is used, studies have found that it could take 100 years or more for a replacement window to pay for itself in energy savings.<sup>3</sup> According to information published in a recent *Old House Journal* article, it could take 240 years to recoup the cost of replacing a single-pane window-storm window combination with a low-e glass double-pane thermal replacement window.<sup>4</sup> Also, a historic wood window can easily last more than 100 years, while a new window may not last 25.

Not every wood window can be repaired and there are situations where replacement is appropriate. However, many historic wood windows can and should be repaired, especially if the windows were manufactured before about 1940. Wood windows made before this



Historic windows are among the most important elements of a building. Simple repairs and routine maintenance coupled with storm windows make for energy efficiency that in most cases matches, if not exceeds, the efficiency of replacement windows. Workshops throughout the region have taught building owners easy ways to care for their historic windows. At the Woodlawn Museum in Ellsworth, ME, a grant from the National Trust for Historic Preservation helped fund a window repair workshop. Photo courtesy of the Woodlawn Museum.

time were constructed with individual parts, each of which can be repaired or replaced. The wood itself is denser and of higher quality than what is grown today, and it is generally more rot- and warp-resistant than modern wood.

These are just some of the practical reasons to repair rather than replace historic wood windows. In addition, repairing the historic window helps maintain a building's authenticity. Once original material is removed from a building, it is gone forever. There are many more benefits to repairing your wood windows, so keep reading.

1. Rypkema (2006); James et al (1996); Kiems (2002). 2. James et al (1996); Kiems (2002). 3. Sedovic (2005); e.g. research by Keith Heberlein, calculations available at [www.historichomeworks.com/hhw/education/windowshandout/windowenergyanalysis.pdf](http://www.historichomeworks.com/hhw/education/windowshandout/windowenergyanalysis.pdf). 4. "Let the Numbers Convince You: Do the Math." *Old House Journal*, no. 5 (September/October 2007).

# RENEWABLE ENERGY TECHNOLOGY

[Home](#) > [Issues](#) > [Sustainability](#) > [Solar Panels](#) > Solar Panels and Historic Preservation

[Email](#) [Share](#) [Print](#) [RSS](#) Font: A / A+ / A++

## Solar Panels and Historic Preservation

### The National Trust's Position on Solar Panels

Sustainable environmental practices are something nearly all Americans can support, increasingly through modifications to enhance the energy efficiency of homes and businesses. Much like the oil crisis of the 1970s, people are turning to solar power as a means to save on energy consumption. Solar technology is improving and solar panels are becoming more affordable. Preservationists and advocates of solar power across the country are now asking questions about when and how solar panels should be installed on historic buildings, all while also preserving historic integrity and causing no harm. There are no easy answers, and often it is a case-by-case issue. However, we are finding more and more examples showing how historic sites and structures can be preserved while accommodating the need for solar access. The National Trust for Historic Preservation fully supports efforts to expand our nation's renewable energy portfolio, and encourages communities to engage in thoughtful discussions on this topic and how to establish policies and guidance for greening historic buildings and, in some cases, entire neighborhoods.



Solar panels on a historic home in Cambridge, Massachusetts.

*Credit: Adrian Scott Fine*

### Sustainability and Historic Preservation

- [Go Green at Home](#)
- [Position Statements](#)
- [Sustainability Research](#)
- [Preservation Green Lab](#)
- [Reuse It!](#)



Become the newest member of the Green Preservation Movement.

[Join Today](#)

# Energy Advice for Historic and Older Homes

NATIONAL  
TRUST  
FOR  
HISTORIC  
PRESERVATION



## Energy Advice for Historic and Older Homes

Was your home built before 1950? Are you wondering how to lower your energy bills and feel more comfortable without losing features that make your house so charming? Concerned about how your decisions might affect the long-term maintenance or condition of your home? Then this guide is for you! It is meant to be a first step in mapping out a plan for how to be a good steward of both your historic home and the planet.



Why do historic and older homes need special consideration? One reason is that historic and older homes were constructed using different techniques and materials than most modern structures. For example, if your home dates to the 1850s or earlier, there is a good chance that is has post and beam construction rather

than balloon framing. This is an important consideration if you're thinking about adding insulation in the walls (more on this later).

One key difference between older homes and their modern counterparts is the way in which historic buildings regulate temperature and moisture levels. For example, most historic buildings were not constructed with much insulation or with many mechanical devices but instead relied on their more passive and manual energy-regulating features such as operable windows, interior and/or exterior shutters, vents, porches, wide eaves, or siting to block north winds. These elements allowed the occupant of a historic home to moderate temperature without using an HVAC system. And without modern vapor barriers and insulation, air and moisture in the house moved freely between inside and outside. Adding insulation to the wall cavities without understanding how the house functions as a system and without establishing new ways to move air through the home can cause moisture to accumulate. High moisture levels can result in mold and rot, creating serious problems for the home-owner as well as unnecessary expense. This does not mean that older homes cannot be made more energy efficient. They can. They simply need to be treated with a thoughtful, whole-house approach.

As the owner of an older or historic home, you can feel good about living in a building that has served well for 50, 100, or 200 years or more. As part of a "green" ethic, it is your responsibility to make sure that home can continue to serve future generations.

This guide is designed to help you make decisions about how to increase your



## Developing Sustainability Guidelines for Historic Districts

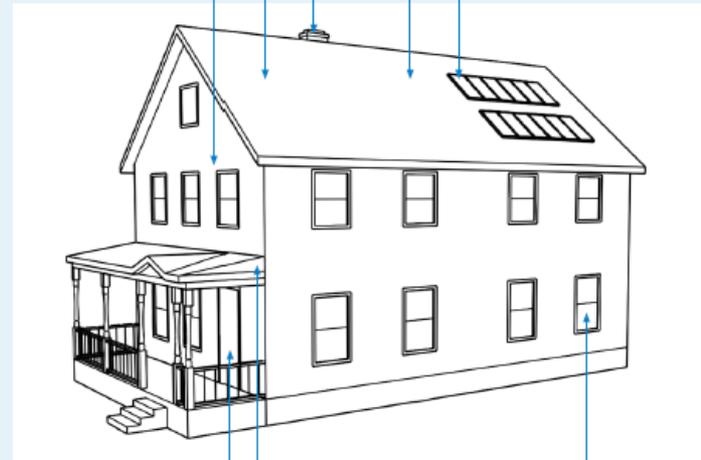
By Noré V. Winter

NATIONAL  
TRUST  
FOR  
HISTORIC  
PRESERVATION®

### RESIDENTIAL BUILDING ENERGY-EFFICIENCY DIAGRAM

This diagram summarizes the principal guidelines for energy efficiency and energy collection. These measures will enhance energy efficiency while retaining the integrity of the historic structure.

- Chimney** — Install draft stopper
- Attic** — Insulate internally
- Walls** — Insulate internally
- Roof Material** — Retain and repair
- Solar Panels** — Set back from primary facade



- Doors**
  - Retain and repair original doors
  - Weatherstrip

**Shutters, Awnings, and Porches**  
Restore porches and awnings

- Windows**
  - Retain and repair original or early windows
  - Retain original glass
  - Enhance thermal and acoustic efficiency with storm windows (preferably interior)
  - Weatherstrip

This illustration helps homeowners visualize the energy-related actions that are addressed in the guidelines.  
Draft guidelines prepared for the City of Deadwood, S.D., by Winter & Company.



# PRESERVATION GREEN LAB

NATIONAL  
TRUST  
FOR  
HISTORIC  
PRESERVATION®

# OUTCOME-BASED CODE PILOT PROJECT

## A NEW MODEL ENERGY CODE FOR EXISTING BUILDINGS

**Preservation  
Green Lab**

NATIONAL TRUST FOR  
HISTORIC PRESERVATION

**nbi**

new buildings

INSTITUTE

 SEATTLE.GOV



The PGL, NBI and the City of Seattle are piloting an alternate, voluntary, more flexible energy code for existing and historic buildings

# OUTCOME-BASED CODE PILOT PROJECT

## Current energy codes are not tuned to these challenges

Each existing building presents a unique (and fixed) set of strengths and opportunities:

- Thermal mass, daylighting, siting, shading, adjacencies, passive features

Prescriptive codes focus investment on measures that may not yield the highest ROI (in terms of carbon impacts or \$\$ savings)



1510 Melrose Avenue, Seattle  
Image: Graham Baba  
Architects

# NEW SOLUTIONS NEEDED FOR SMALLER, OLDER BUILDINGS

73% of our existing commercial buildings are less than 10,000 square feet

US Energy Information Agency, 2003

Small older buildings are uniquely challenged – both physically and financially - to meet aggressive carbon reduction goals



Buildings in Denver's Historic District. Image Credit: Wally Gobetz

# DISTRICT ENERGY

## The Role of District Energy in Greening Existing Neighborhoods

A PRIMER FOR POLICY MAKERS AND LOCAL GOVERNMENT OFFICIALS

Preservation Green Lab, National Trust for Historic Preservation  
Center for Sustainable Business Practices, University of Oregon

EXECUTIVE SUMMARY | SEPTEMBER 2010

AS CITIES LOOK FOR INNOVATIVE MEANS of reducing carbon emissions from the operation of their existing buildings, it is increasingly clear that the most effective way to achieve high levels of energy performance rests with district-level approaches to the built environment. This paper explores the vital role that low-carbon district energy systems (i.e., neighborhood-scale utilities that deliver thermal energy for heating, cooling, and hot water) can play in enabling existing buildings and established urban neighborhoods to meet aggressive emission reduction targets in a cost-effective way. It also highlights the essential role local governments must play in supporting the development of district energy systems, and is intended as a primer for communities that are beginning to look at district energy as a possible strategy for reducing their emissions and dependence on non-renewable energy sources. Many communities face common barriers, capacity constraints, and learning curves, and this publication identifies the policies and programs needed to foster district energy system development.

**Preservation  
Green Lab**  
NATIONAL TRUST FOR  
HISTORIC PRESERVATION



## WEST UNION, IOWA



# WEST UNION, IOWA

Piggybacking a DOE- and state-funded district energy system onto their 'complete streets' project

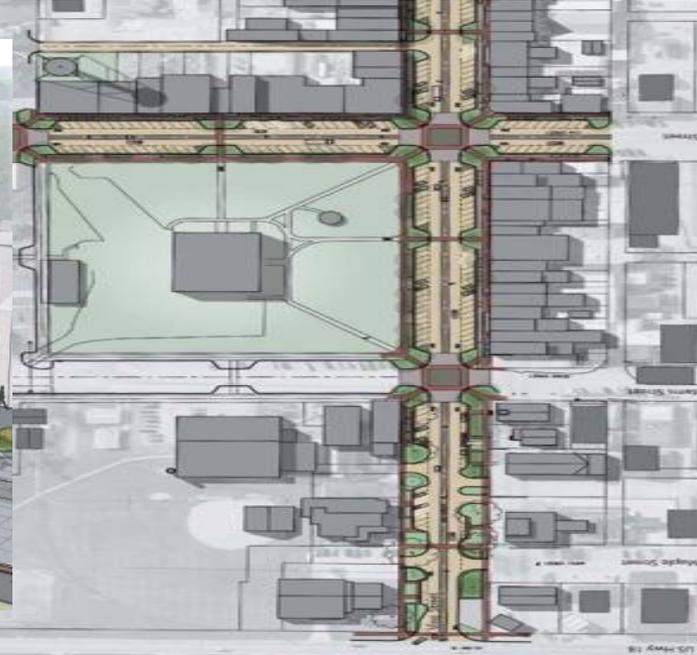


Image Credit: Conservation Design Forum

# ECO-DISTRICT INITIATIVES IN EXISTING NEIGHBORHOODS



Building the future one block at a time.

**Living City D.C.**  
14th & U

[WHAT WE ARE DOING IN DC](#)

[WORKSHOP](#)

[OUR PARTNERS](#)

[SUPPORT OUR WORK](#)

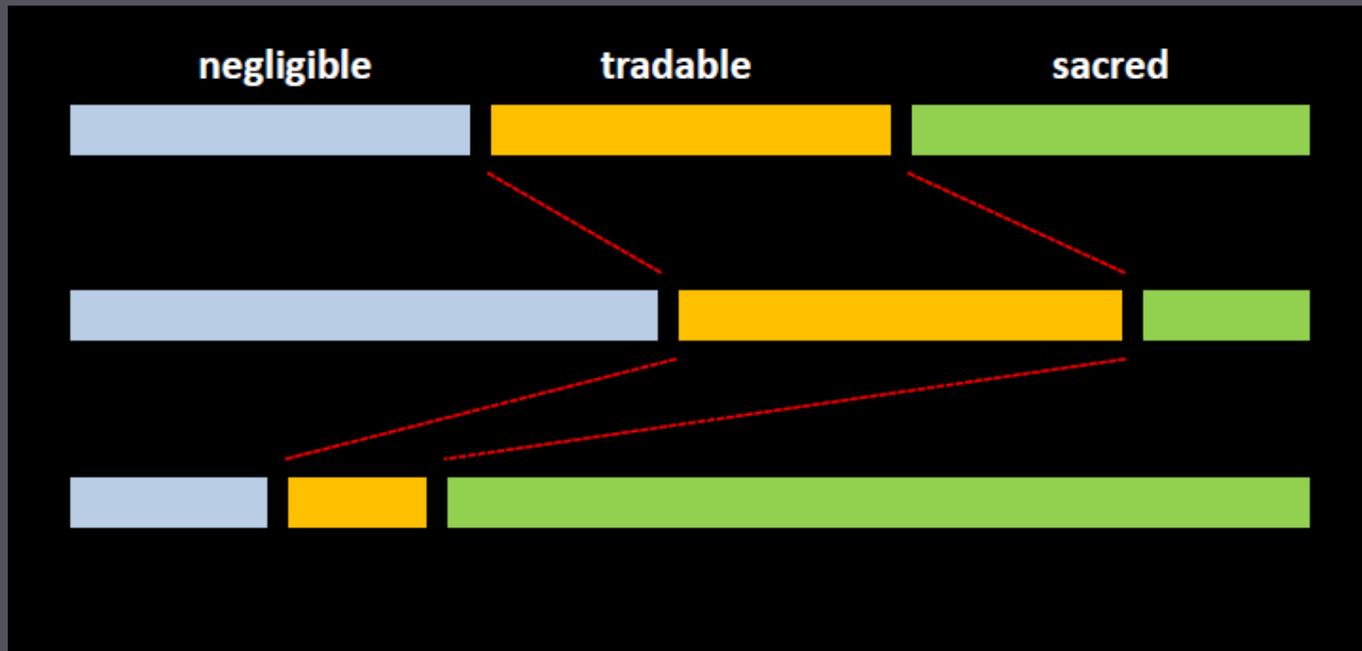
[REGISTRATION](#)



LIVING CITY DC

WELCOME TO LIVING CITY DC

# How Can We Accommodate a Range of Values?



# CONCORD, NEW HAMPSHIRE

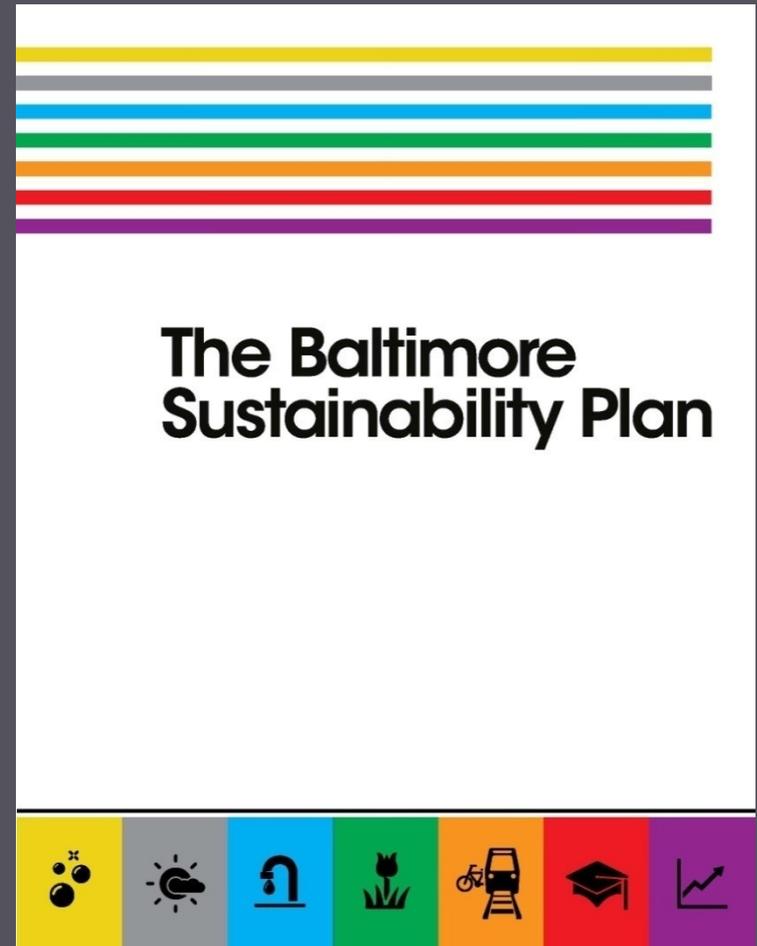
---



- Identify options for addressing known barriers to sustainable redevelopment of historic communities
- Identify incentives and tools to facilitate sustainable redevelopment

# BALTIMORE, MARYLAND

- Seven Theme Chapters
  - Cleanliness
  - Pollution Prevention
  - Resource Conservation
  - Greening
  - Transportation
  - Education & Awareness
  - Green Economy



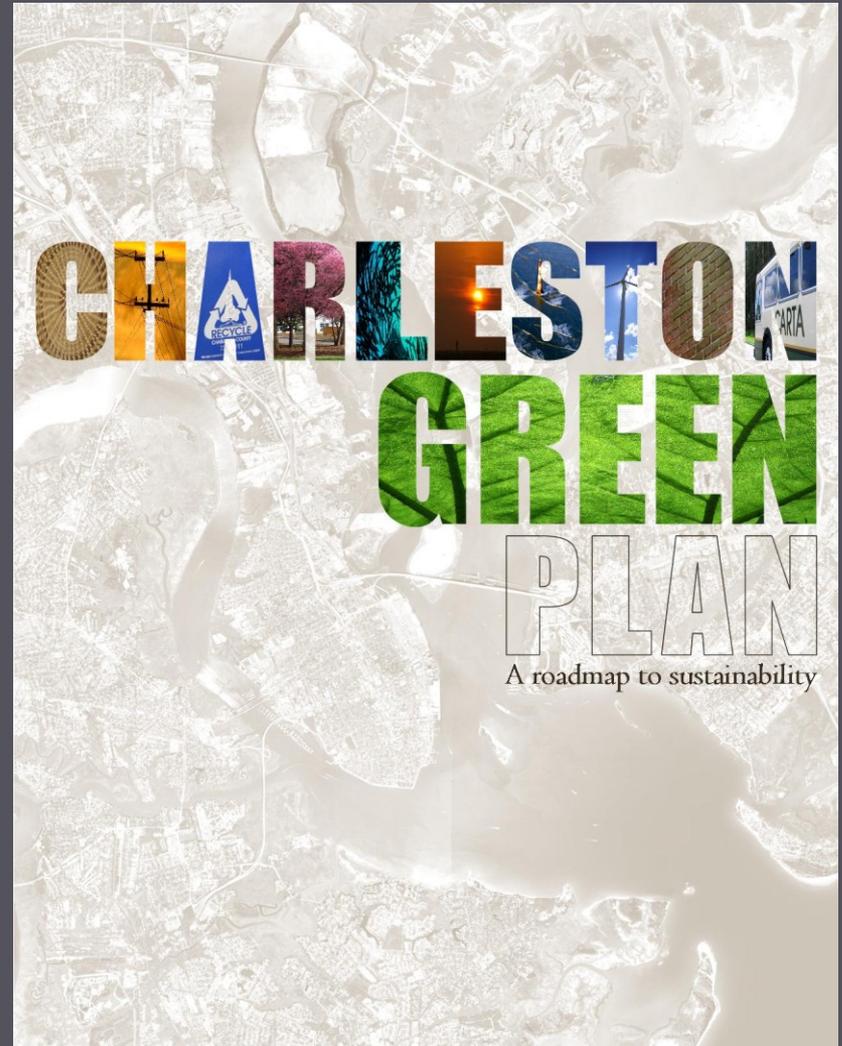
## Chapter 6 – Resource Conservation

- Premise
  - The current rate of natural and manufactured material consumption is unsustainable and must be promptly addressed
- Solution
  - Preserve, reuse and recycle existing buildings and related materials



# CHARLESTON, SOUTH CAROLINA

- Charleston Green Committee (the “CGC”) to create the Plan for Climate Protection and Sustainability for the City of Charleston



# CHARLESTON, SOUTH CAROLINA

---

1. Require new City-owned buildings and renovations to non-historic existing city owned buildings to be sustainable
2. Require modification to historic City-owned to follow current best practices with regard to integrating historic preservation with modern sustainable practices
3. Encourage private sector to adopt voluntary sustainable building practices
4. Encourage disclosure of utility data and building performance
5. Develop a weatherization program
6. Help increase financing options
7. Focus on public outreach

**FOR MORE INFORMATION...**

---

**[www.preservationnation.org](http://www.preservationnation.org)**

**<http://blogs.nationaltrust.org/preservationnation/>**

**Kimberly Kooles**

**Program Associate**

**State and Local Partnerships and Policy**

**[kim\\_kooles@nthp.org](mailto:kim_kooles@nthp.org)**



# Green Building Workshop Series: Workshop 4

**BREAK**





# Alexandria Case Studies: Green + Historic

**William Cromley**  
**Builder/Developer**

**Parker-Gray Historic District homeowner**





Cromley Lofts  
1210 Queen Street  
Former Alexandria Laundry building  
Constructed in 1910





1<sup>st</sup> Certified LEED Gold condo in Virginia  
Multiple low impact approaches to green





Vegetative  
(green) roof  
and "stairs"





Abundant natural light  
Sustainable materials  
Recycled materials  
Water saving fixtures





214 A N Pitt St  
Former carriage house  
c. 1850s





Geothermal heating and cooling  
plus radiant flooring and hot water





Recycled materials

Radiant heat floor

Efficient windows





# Green Building Workshop Series

***Next Workshops, Save the Dates NOW!***

Renewable Energy Systems and Green Power – September 24, 2011

Green Operations for Retail, Restaurants, and Small Offices – TBD

Workshop series funded by EECBG

Visit the Green Building Resource Center for more information at

<http://www.alexandriava.gov/gbrc>





# Additional Resources Q&A





# Green Building Workshop Series: Workshop 4

Door Prizes!

