



Sustainability Program Overview

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Why Should Preservationists Care about Sustainability?

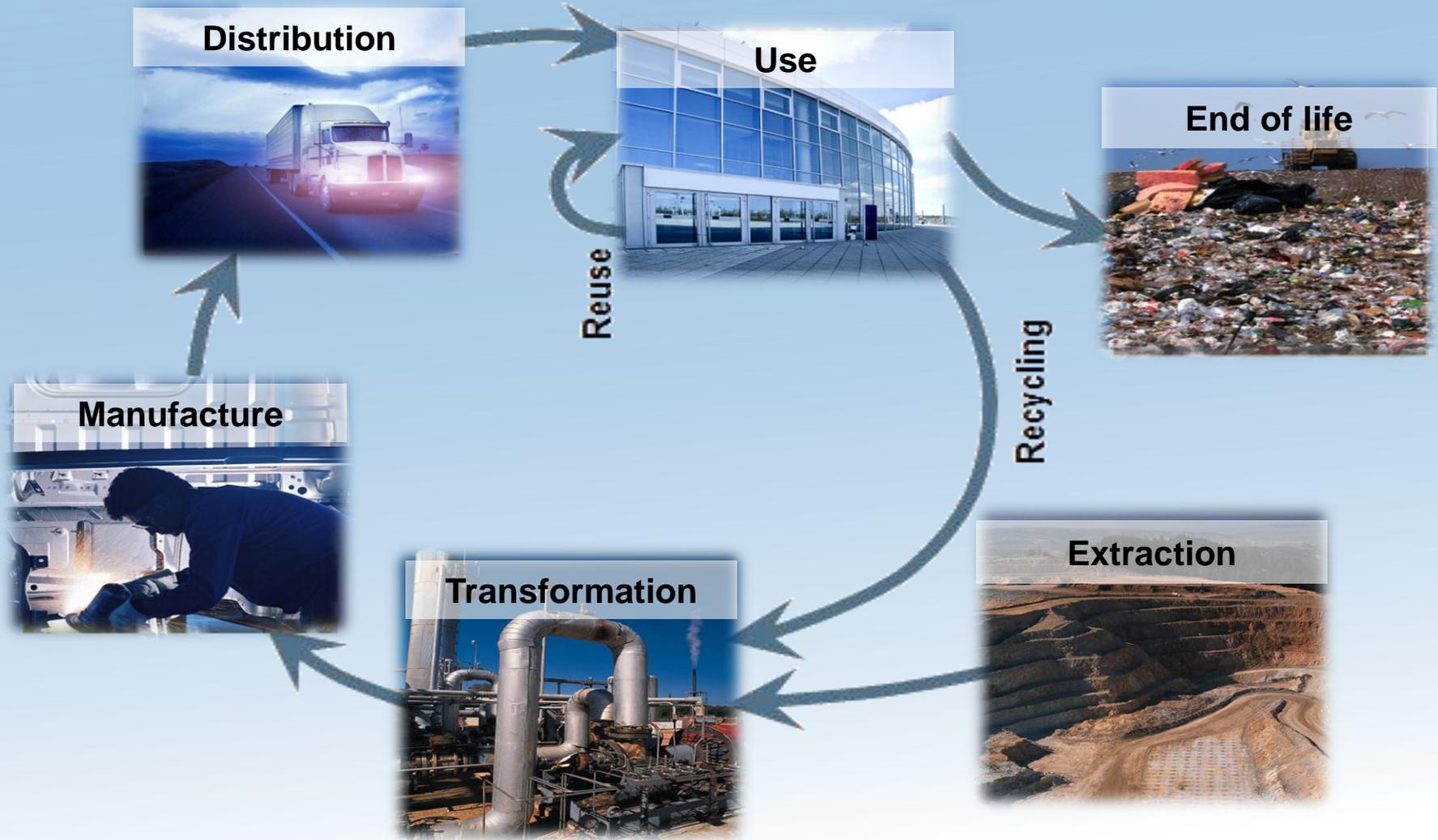
- Buildings account for +/- 40% of all carbon dioxide emissions in U.S.
- Sustainability Concerns are Changing Landscape for Preservation Work
 - Increasing energy efficiency requirements
 - Potential increase in demolition pressures



PRESERVATION GREEN LAB

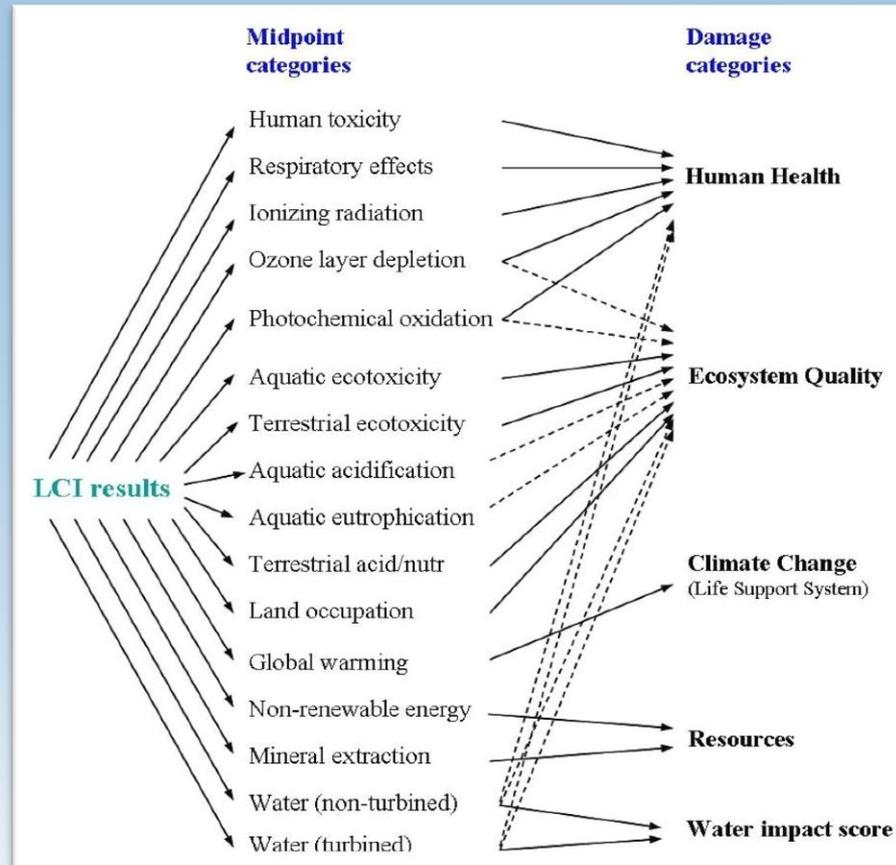
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NTHP Life Cycle Assessment Study



Life cycle impact assessment (LCIA)

IMPACT2002+ (Joliet et al. 2003)



Joliet, O., M. Margni, R. Charles, S. Humbert, J. Payet, G. Rebitzer, and R. Rosenbaum. 2003. Impact 2002+: A New Life Cycle Impact Assessment Methodology. *International Journal of Life Cycle Assessment* 8, no. 6: 324-330.

Scenario Selection: Residential



Emery Residence
Portland, OR
Constructed 2011



2373 NW Pettygrove
Portland, OR
Constructed 1896

Scenario Selection: Commercial



818 Stewart
Built 2008
Seattle, WA
14 Story



Joseph Vance Building
Built 1929; Renovated 2007
Seattle, WA
14 Story

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

**Financial
Solutions**



**Technical
Solutions**

**Regulatory
Solutions**

OUTCOME BASED ENERGY CODES

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Objective: To create an alternate, more flexible, building energy efficiency code framework for existing and historic buildings

OUTCOME-BASED CODE FRAMEWORK

Benefits for existing buildings:

1. based on accountability for achieving **performance outcomes** rather than following a mandated path
2. allows for **flexibility** in how to achieve targeted outcomes without compromising architectural integrity
3. drives **technical innovation** to develop solutions beyond those called out in current codes
4. capitalizes on the **inherent design strengths** and unique opportunities for improving each building
5. captures the impacts of **operations, plug loads and behavior**
6. allows owners and ESCos to follow an **optimized investment strategy to maximize ROI** for each building
7. allows for a community's **aggregate private and public investment** to focus on the most leveraged investments across a portfolio (or district) of buildings

DEMONSTRATION PROJECTS



DEMONSTRATION PROJECTS

Pacific Science Center

- McKinstry

Pacific Science Center



DEMONSTRATION PROJECTS

Frye Apartments

- LIHI
- Rushing Co.

Frye Apartments



DEMONSTRATION PROJECTS

Washington Athletic Club

Washington Athletic Club

- MacDonald Miller



CASE STUDIES

King Street Station

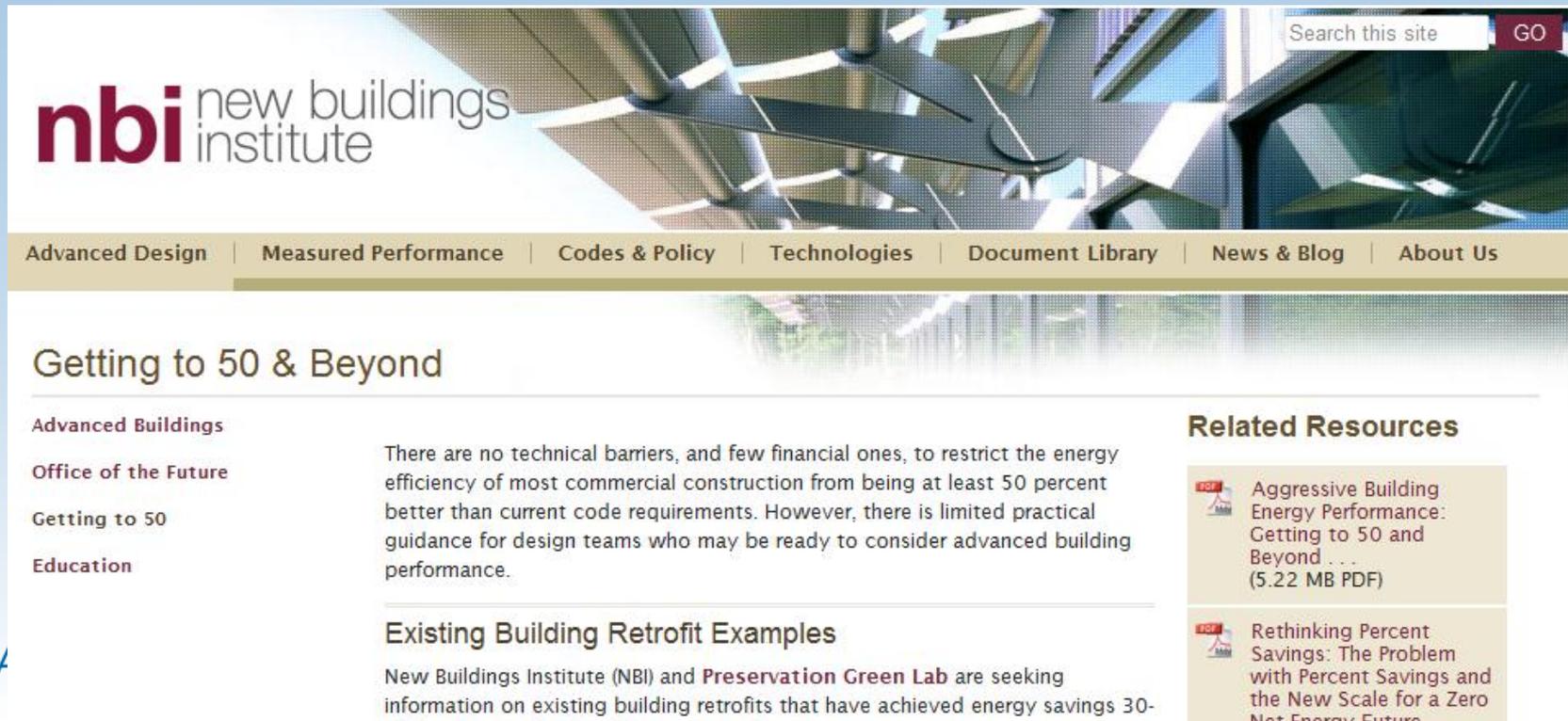
- SDOT
- Arup

King Street Station, Seattle
Department of Transportation



MARKET DRIVEN SOLUTIONS: 'GETTING TO 50' MULTI MEASURE TOOL

NBI/PGL partnership, funded by the Doris Duke and Kresge Foundations, will create a suite of software tools that will provide customized retrofit strategies for individual buildings, within a number of existing building typologies



The screenshot shows the NBI website header with the logo 'nbi new buildings institute' and a search bar. The navigation menu includes: Advanced Design | Measured Performance | Codes & Policy | Technologies | Document Library | News & Blog | About Us. The main content area is titled 'Getting to 50 & Beyond' and features a sidebar with links: Advanced Buildings, Office of the Future, Getting to 50, and Education. The main text states: 'There are no technical barriers, and few financial ones, to restrict the energy efficiency of most commercial construction from being at least 50 percent better than current code requirements. However, there is limited practical guidance for design teams who may be ready to consider advanced building performance.' Below this is a section for 'Existing Building Retrofit Examples' with the text: 'New Buildings Institute (NBI) and Preservation Green Lab are seeking information on existing building retrofits that have achieved energy savings 30-'. To the right, a 'Related Resources' section lists two PDF documents: 'Aggressive Building Energy Performance: Getting to 50 and Beyond ... (5.22 MB PDF)' and 'Rethinking Percent Savings: The Problem with Percent Savings and the New Scale for a Zero Net Energy Future'.

Search this site GO

nbi new buildings institute

Advanced Design | Measured Performance | Codes & Policy | Technologies | Document Library | News & Blog | About Us

Getting to 50 & Beyond

Advanced Buildings

Office of the Future

Getting to 50

Education

There are no technical barriers, and few financial ones, to restrict the energy efficiency of most commercial construction from being at least 50 percent better than current code requirements. However, there is limited practical guidance for design teams who may be ready to consider advanced building performance.

Existing Building Retrofit Examples

New Buildings Institute (NBI) and **Preservation Green Lab** are seeking information on existing building retrofits that have achieved energy savings 30-

Related Resources

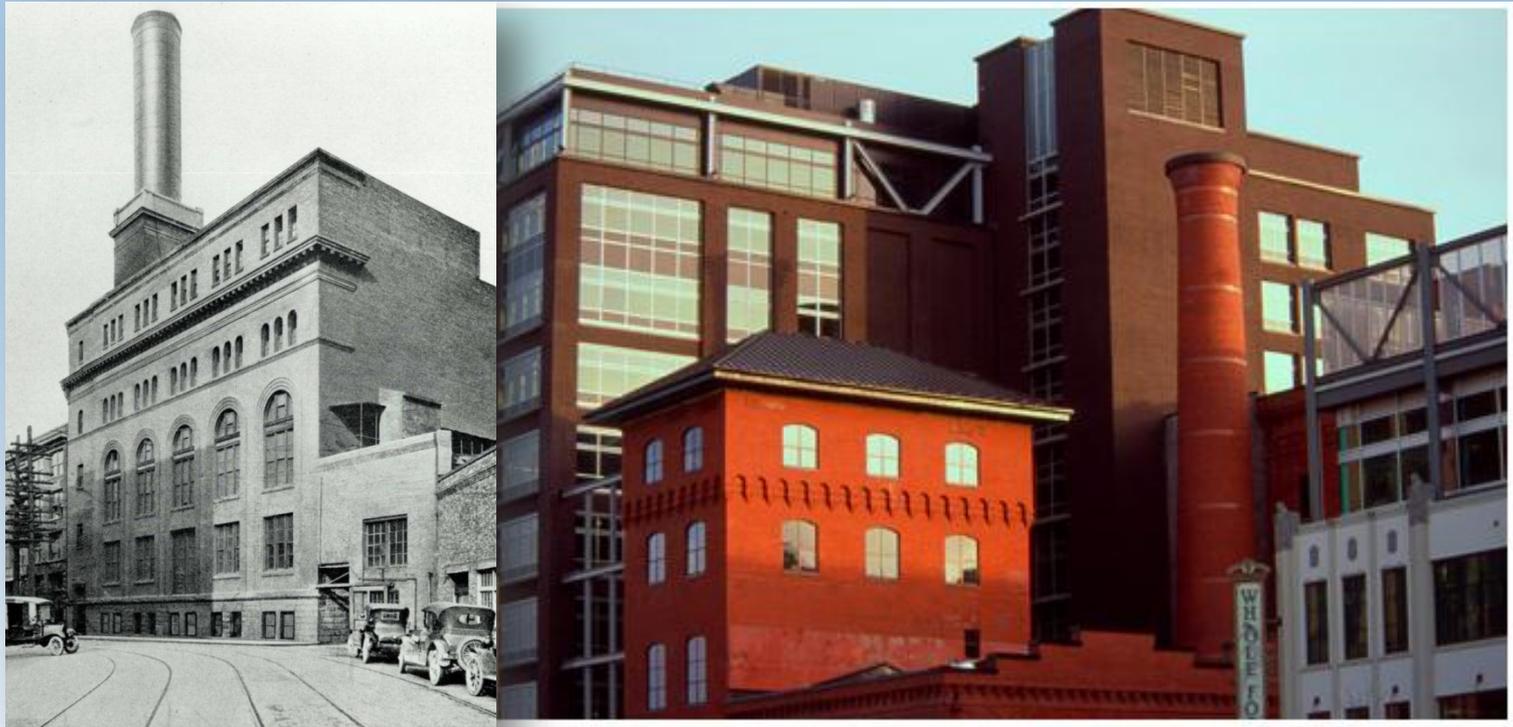
 **Aggressive Building Energy Performance: Getting to 50 and Beyond ... (5.22 MB PDF)**

 **Rethinking Percent Savings: The Problem with Percent Savings and the New Scale for a Zero Net Energy Future**

SCALING UP: DISTRICT ENERGY

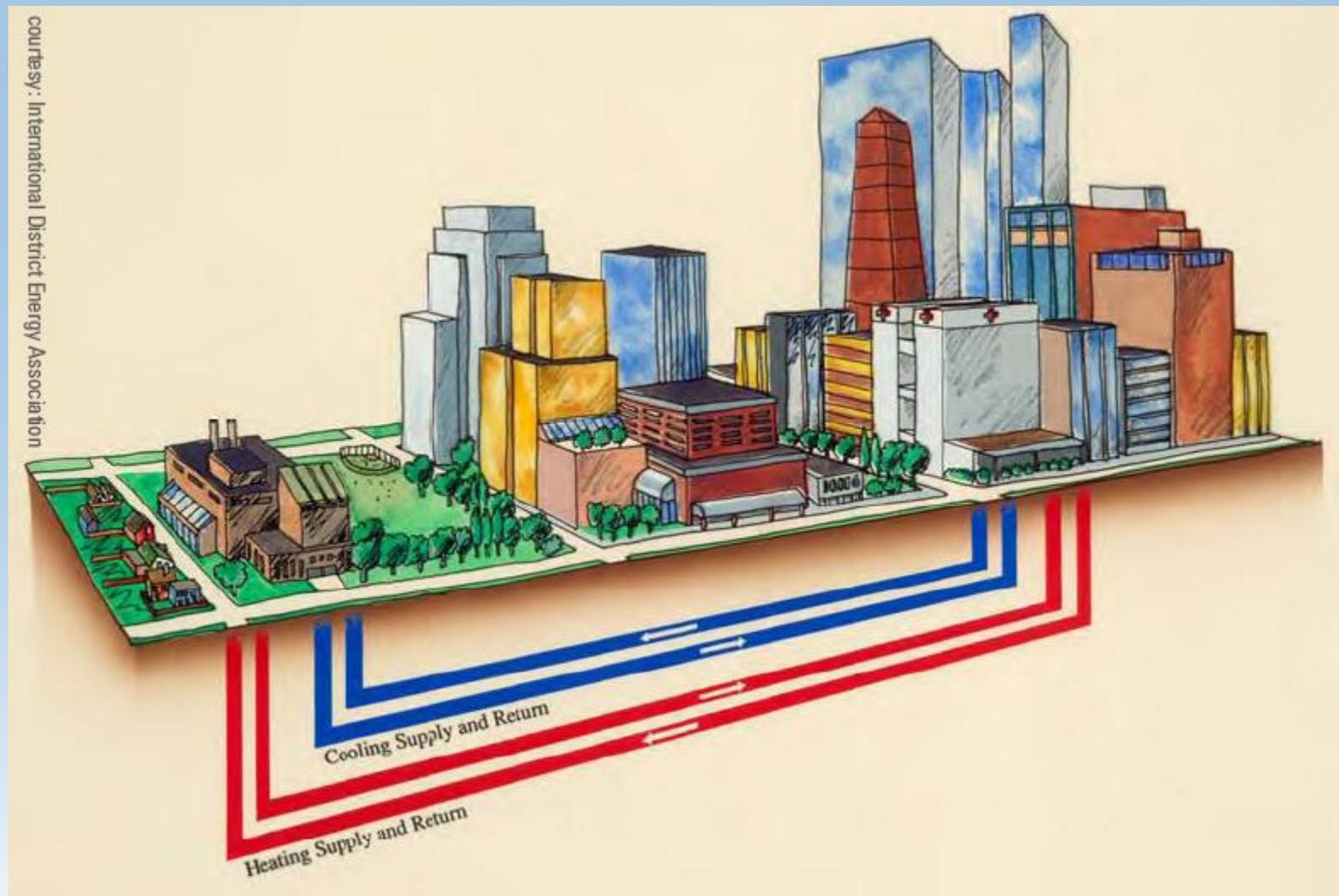
“In a green era, an old idea gains steam”

- Boston Globe, April 4th, 2011



Seattle Steam

DISTRICT ENERGY: HOW IT WORKS



WEST UNION, IOWA

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**
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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](#)

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WELCOME TO LIVING CITY DC

DENSITY AND HISTORIC PRESERVATION

Benefits of density:

- Preventing sprawl
- Providing 'critical mass' of support for public transit and other infrastructure, and local retailers and services
- Bringing these services within walking distance
- Reducing vehicle miles travelled
- 'Agglomerating' creative and intellectual capital



Columbia Heights, Washington DC

For More Information...

www.preservationnation.org/green

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

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