A District Energy Policy Framework for Existing Neighborhoods

February 4, 2011

New Partners for Smart Growth Annual Conference

Patrice Frey, Director of Sustainability, NTHP
THE FOUR “R”s

Reuse
Reinvest
Retrofit
Respect
Why reuse?

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
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.
RESOURCE USE - UNITED STATES

Materials, Products and Services by Resource Use

US EPA – Sustainable Materials Management: The Road Ahead (June 2009)
THE DISPOSABILITY OF BUILDINGS

- **300 Billion** square feet of existing building space

- **82 Billion** will be demolished or replaced by 2030

Demolition Projections: 2005-2030

<table>
<thead>
<tr>
<th>Retained</th>
<th>73%</th>
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<tbody>
<tr>
<td>Demolished</td>
<td>27%</td>
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Source: Brookings Institution
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
Major Fuel Consumption Intensities (Btu/sq. ft.) By Building Vintage
[2003 CBECIS Data, Malls Included]
NEW SOLUTIONS NEEDED FOR SMALLER, OLDER BUILDINGS

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


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
NEW SOLUTIONS NEEDED FOR SMALLER, OLDER BUILDINGS

Architectural character = economic value
ECO-DISTRICT INITIATIVES IN EXISTING NEIGHBORHOODS

14th and U Street, NW – Washington DC
STATE OF IOWA

Dubuque Millwork District. Image Credit: City of Dubuque
The Role of District Energy In Greening Existing Neighborhoods

A PRIMER FOR POLICY MAKERS AND LOCAL GOVERNMENT OFFICIALS

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 environment. This paper explores the vital role that low-carbon district energy systems (i.e., neighborhood-scale utilities that provide 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 can play in supporting the development of district energy systems. This primer is intended as a primer for communities that are beginning to consider district energy as a possible strategy for reducing their energy consumption 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.

Image Credit: West Union, Iowa Chamber of Commerce
MONTPELIER, VERMONT

Images: Vermont Perspectives - Linda Baird-White
ECO-DISTRICT INITIATIVES IN EXISTING NEIGHBORHOODS

LCB Denver. Image Credit: Living City Block

Oberlin Arts District. Photo Credit: BNIM
SEATTLE, WA

Retooling existing downtown steam system; exploring expansion into adjacent existing and historic neighborhoods

Smith Tower, Seattle
AUSTIN, TEXAS

Austin Energy
(district cooling)

Image Credits: Andy, ATMTX
For more information…

www.preservationnation.org/green
http://blogs.nationaltrust.org/preservationnation/

Patrice Frey
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The Four “R”s

Reuse
Reinvest
Retrofit
Respect

+ Adapt!

Image: Abby Martin
End Use (Major Fuels, thousand Btu/sq. ft.) and Building Vintage [2003 CBECs, malls included]
ECO-DISTRICT INITIATIVES IN EXISTING NEIGHBORHOODS

EcoDistricts Road Map
(What does implementation look like?)

EcoDistricts Framework

Engagement and Governance

- Buildings
  - Energy Services
  - Building Retrofits

- Infrastructure
  - Transportation
  - District Utilities
  - Smart Grid
  - Green Streets

Assessment and Strategy

- Community Engagement
- Demand Management
- Social Marketing
- Culture of Sustainability

Policy and Finance

Hardware (Projects)

Software (Projects)

Image Credit: PoSI
Intensity of Energy Use of All Major Fuels for Commercial Buildings Less Than 10,000 sq. ft.
[2003 CBECS data, non-mall]

Intensity of Energy Use of All Major Fuels for Commercial Buildings Less Than 25,000 sq. ft.
[2003 CBECS data, non-mall]