

Green Building in the Pacific Northwest: Next Steps for an Emerging Trend

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Objectives

- ◆ 1) Why do we care about buildings?
- ◆ 2) What do we know about green building?
- ◆ 3) How did we gather the data?
- ◆ 4) What did we learn?
- ◆ 5) What are the next steps?



Why do we care?

Table1: Overview U.S. Emissions of Greenhouse Gases, Preliminary 2007

Greenhouse Gas and Source	Million Metric Tons of Carbon Dioxide Equivalent
Carbon Dioxide	6,021.8
Methane	699.9
Nitrous Oxide	383.9
HFCs, PFCs, and SF6	176.9
Total	7,282.4



Source: Energy Information Administration <http://www.eia.doe.gov/oiaf/1605/ggrpt/index.html>



Why talk about Buildings and Climate Change?



Table 2: Distribution of Greenhouse Gases by End User Sector for Carbon Dioxide, 2007

Greenhouse Gas and Source	Sector				Total
	Residential	Commercial	Industrial	Transportation	
Carbon Dioxide	Million Metric Tons of Carbon Dioxide Equivalent				
Energy Related	1261.3	1097.7	1655.2	1902.5	5916.7
Industrial Processes			105.1		105.1
Total CO₂	1261.3	1097.7	1760.3	1902.5	6021.8

Source: Energy Information Administration <http://www.eia.doe.gov/oiaf/1605/>



What is a Metric Ton Anyway?



Source:
http://www.energyrace.com/commentary/what_does_a_ton_of_co2_look_like/



Or Another way to Think about it...



1 gallon of gas = 19.4 lbs of CO₂

If the average car gets
19-20 miles per gallon
then you do get about

1 lb of CO₂ per mile!

In a year that would be
1.5 metric tons of CO₂





What do we know about Green Building?

◆ Cons:

- Costs
- Developers do not realize benefits
- Significant learning curve
- Benefits not well marketed
- High attrition rates for LEED certification



◆ Pros:

- Building performance – long-term savings
- Institutional owners stand to realize large gains
- Expertise lowers cost
- Boost human performance and productivity



The Impact of Building Characteristics on Productivity

- ◆ **Good day lighting may increase:**
 - Productivity by up to 13%
 - Retail sales by up to 4%
 - School test scores by up to 5%
- ◆ **Increased ventilation may increase productivity by 4 to 17%**
- ◆ **Better quality ventilation can reduce sickness by 9 to 50%**
- ◆ **Increased ventilation control may increase productivity from 0.5 to 11%**



Gathering the Data

- ◆ Interviews
- ◆ Focus Groups
- ◆ Survey:
 - 396 cities in Idaho, Oregon, Utah and Washington: Cities response rate 51%, Counties; response rate 38% top 101 MSA; response rate 45%.
 - 484 construction industry professional; Response rate 19%





Focus Group Findings: Overall Factors

City Professionals



1. Codes and ordinances
2. Cost/benefit data
3. Lower life-cycle cost
4. Marketability and public outreach

Construction Industry Professionals



1. Consumer demand
2. Energy savings
3. Actual ROI
4. Adding customer value



Focus Group Findings: Incentives and Information

City Professionals



1. Fast-tracking and approval
2. Density bonuses
3. Recognition
4. Social responsibility
5. Increase ROI

Construction Industry Professionals



1. Reduced permits and fees
2. Historical data showing local ROI
3. Social responsibility
4. Product information and trending
5. Interagency coordination and cooperation



Focus Group Findings: Specific Barriers

City Professionals



1. Upfront costs
2. Bad economy
3. Fear of the unknown
4. Political mindset
5. Resistance to change

Construction Industry Professionals



1. Certification costs
2. Lack of education
3. Misconceptions
4. Skepticism of value added
5. Perceived costs



Focus Group Findings: Tools or Support

City Professionals



1. Education for all parties
2. Education resources and support
3. Political will
4. Support for local codes, ordinances, and regulations
5. Trained staff

Construction Industry Professionals



1. Consumer education
2. Financial supports
 - Impact fees,
 - expedited review,
 - and tax incentives
3. Certified materials resource database



Survey Findings

City Professionals

Takeaways

- ◆ Mayoral Support High
- ◆ Developers using practices
- ◆ LEED Certified Materials
- ◆ Promoting Green Building
- ◆ Non-LEED buildings
- ◆ Green building goals and policies
- ◆ City capacity (e.g., Lead office, staff, LEED AP)





What we know about Economic Tools to Promote Green Building

Frequently used (33%)

- ◆ Permitting assistance
- ◆ Codes that require green building
- ◆ Publicity, praise, or recognition
- ◆ Providing educational materials
- ◆ Partnering to conduct demonstration projects





What we know about Economic Tools to Promote Green Building

Somewhat used (10%)

- ◆ Fee reduction
- ◆ Infrastructure improvement
- ◆ Zoning
- ◆ Provide training





What we know about Economic Tools to Promote Green Building

Never or minimally used (70% +)

- ◆ Tax credits
- ◆ Grants
- ◆ Low cost loans
- ◆ Provide financial awards for green building
- ◆ Provide reward to obtain LEED certification





Survey Findings

Construction Professionals

Takeaways

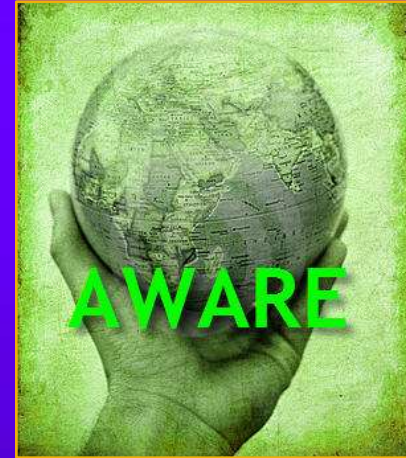
- ◆ Demographically open to adopting green building
- ◆ Healthier and more socially responsible buildings
- ◆ LEED certification not yet proven to offset costs
- ◆ Split on whether Green building provides financial and environmental benefits
- ◆ Need targeted demonstration and training
- ◆ Don't reject things merely because they are new





Comparing the Outcomes

Discrepancy in belief about awareness of green building



Mismatched Incentives for Green building



Survey Findings Incentives

City Professionals



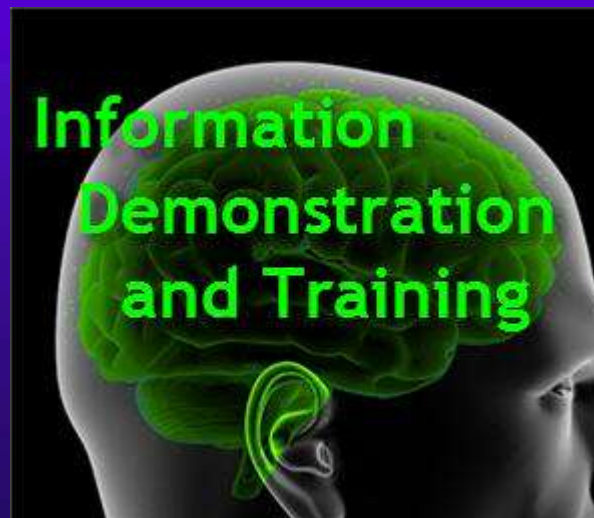
1. Financial payback
2. Citizen's interest
3. Codes that encourage green building
4. Political vision
5. Marketability

Construction Industry Professionals



1. Healthier buildings
2. Social Responsibility
3. Marketability of green buildings
4. Lower life-cycle costs
5. Financial payback

Next Steps





- ◆ To graduate students Catherine Dickinson, Kevin Taylor, Michael Rogers, and Jackie Throngard who so aptly assisted with the research
- ◆ Our research colleague Rebecca Mirsky, PhD, PE, LEED AP
- ◆ Boise State University's Public Policy Center
- ◆ Boise State University's Office of Sustainability
- ◆ Boise State University's Energy Policy Institute
- ◆ For the financial support provided for this research by:
 - Avista
 - Capital City Development Corporation
 - City of Boise Planning and Development Services
 - City of Boise Public Works
 - Idaho Power
 - The Urban Land Institute Idaho District.



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