Session:
Opportunities for Existing Building Stock

Presenters:
Kelly Kirkland, O'Brien & Company
Aaron Adelstein, Built Green

Date:
May 5, 2010

King County GreenTools Powered by the Solid Waste Division

CASCADIA REGION GREEN BUILDING COUNCIL

Opportunities for Existing Building Stock

LEED-EB: O&M

Kelly M. Kirkland, LEED AP O+M
O'Brien & Company

O'brien & company

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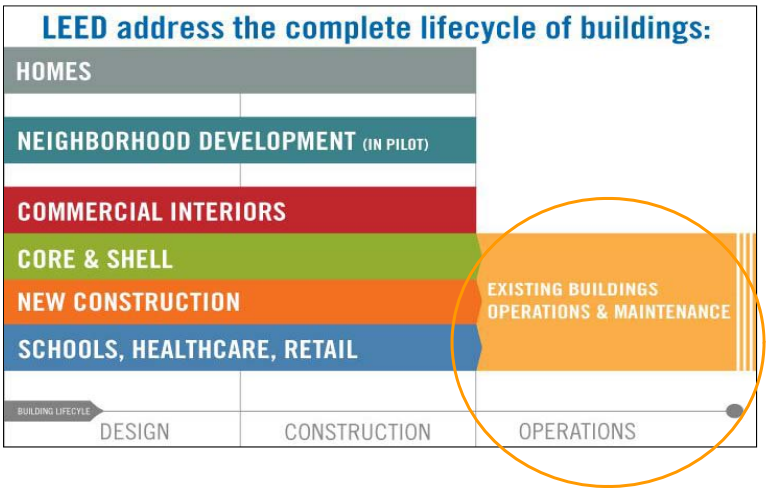
Why do we care about rating systems?

LEED Family of Rating Systems

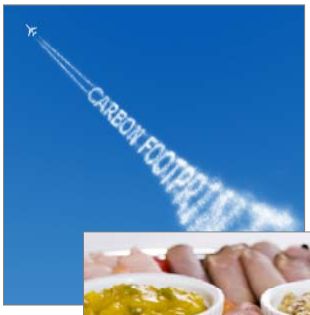


Credit Types

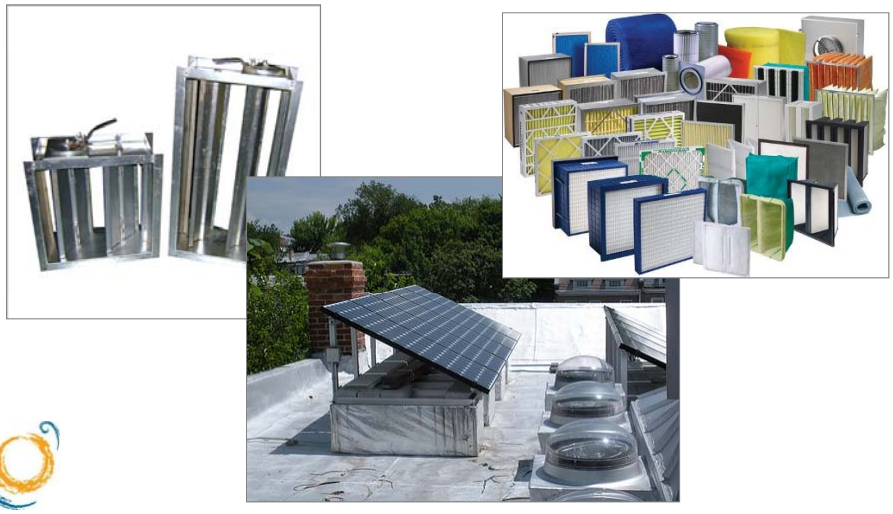
Plans & Policy Credits

Calculation Credits

Tracking Credits



Retrofit Credits

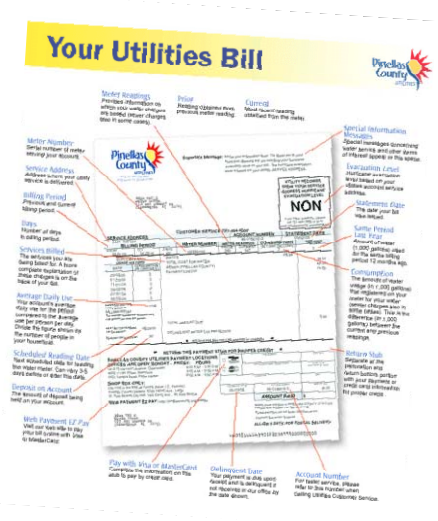


Audit & Survey Credits

Getting Certified

Eligibility

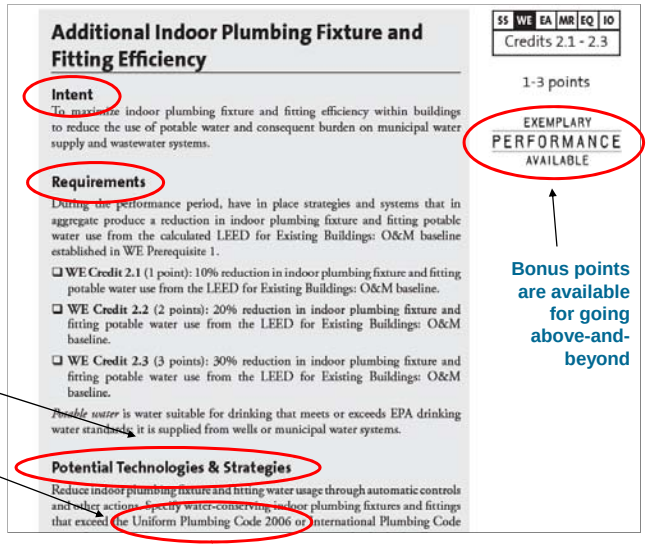
- **Compliance** with environmental laws
- **12 months** of energy use data (electricity, gas, oil, etc.)
- Typical physical occupancy (minimum of **50%**)



Categories and Credits

Category	Prereq.	Credits	Points
Sustainable Sites	0	8	26
Water Efficiency	1	4	14
Energy & Atmosphere	3	6	33
Materials & Resources	2	9	12
Indoor Environmental Quality	3	3	15
Innovation in Operations / Regional Priority Credits	0	3	10
TOTAL 9 prerequisites – 33 credits – 110 points			

LEED Credit Format & Structure



Sustainable Purchasing Policy

- Develop a policy that addresses, at minimum, purchases of ongoing consumables

Solid Waste Management Policy

- Develop a solid waste management policy that addresses:
  - ongoing consumables,
  - durable goods,
  - facility alterations and additions and
  - recycling of all mercury-containing lamps.

Green Cleaning Policy

- Develop a Green Cleaning Policy which addresses:
  - Purchase of sustainable cleaning equipment and products
  - Standard operating procedures for methods of cleaning different building surfaces

Energy Efficiency Best Management Practices

- Develop/Update the following documents:
  - Sequence of Operations
  - Building Operating Plan
  - Systems Narrative
  - Preventative Maintenance Plan
- Conduct an ASHRAE Level 1 Energy Audit.

Environmental Tobacco Smoke (ETS) Control

- Prohibit smoking in the building and designate smoking areas at least 25 feet from building entries

OR

- Designate smoking rooms in the building and design to effectively contain, capture, and remove ETS from the building.

Minimum Indoor Plumbing Fixture/Fitting Efficiency

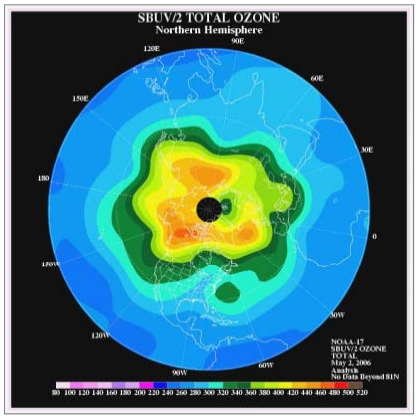
- Based on the date of installation of your water fixtures, beat the *custom* LEED baseline for your building.

Fundamental Refrigerant Management

- Do not use CFC-based refrigerants in HVAC&R base building systems (unless it is not economically feasible)

OR

- Demonstrate that a phase-out plan is in place



Outdoor Air Introduction and Exhaust Systems

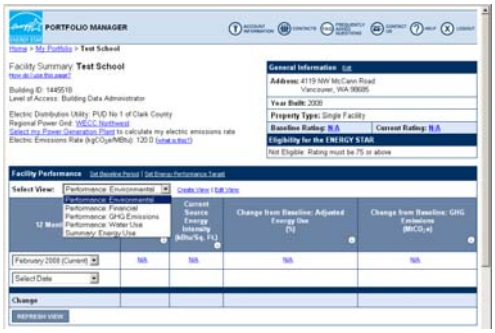
- Supply air ventilation rate to meet ASHRAE 62.1-2007

OR

- At least 10 cubic feet per minute (cfm) of outdoor air per person.

Minimum Energy Efficiency Performance

- Earn a minimum score of 69 in Energy Star Portfolio Manager.



Other compliance pathways are available, but are more difficult to document.

ENERGY STAR Portfolio Manager

PORTFOLIO MANAGER

Home > My Portfolio > **Sample Facility**

Facility Summary: **Sample Facility**
How do I use this page?

Building ID: 1445518
Level of Access: Building Data Administrator

Electric Distribution Utility: Puget Sound Energy Inc (change)
Regional Power Grid: WECC Northwest
Select my Power Generation Plant to calculate my electric emissions rate
Electric Emissions Rate ($kgCO_2e/MBtu$): 120.6 (what is this?)

Generate a Statement of Energy Performance for uses other than applying for the ENERGY STAR.

ENERGY STAR Portfolio Manager

PORTFOLIO MANAGER

Current Space Attribute Values What is this?

Space Attribute	Space Attribute Value (Temporary values should only be used if an Actual value is not currently known) What is this?
Gross Floor Area (required for benchmarking)	105000
Weekly operating hours (required for benchmarking)	40
Workers on Main Shift (required for benchmarking)	500
Number of PCs (required for benchmarking)	500
What percent of this space is air-conditioned? (required for benchmarking)	Not Air Conditioned
What percent of this space is heated? (required for benchmarking)	50% or more

Select a Space Type
- Select a Space Type
- Bank/Financial Institution
- Courthouse
- Hotel
- House of Worship
- K-12 School
- Medical Office
- Office
- Residence Hall/Dormitory
- Retail
- Supermarket/Grocery
- Warehouse
- Computer Data Center
- Multifamily Housing
- Other
- Parking
- Swimming Pool

ENERGY STAR Portfolio Manager

PORTFOLIO MANAGER

Edit Energy Use:

Add Meter Entries

Remove Entry	Start Date (MM/DD/YYYY)	End Date (MM/DD/YYYY)	Energy Use (kWh (thousand Watt-hours))	Cost - US Dollars (optional)
☐	08/01/2009	08/31/2009	121100.00	$
☐	07/01/2009	07/31/2009	101100.00	$
☐	06/01/2009	06/30/2009	100100.00	$
☐	05/01/2009	05/31/2009	201100.00	$
☐	04/01/2009	04/30/2009	211100.00	$
☐	03/01/2009	03/31/2009	201100.00	$

ENERGY STAR Portfolio Manager

General Information Edit	
Address: 4119 NW McCann Road , Seattle, WA 98104	
Year Built: 2006	
Property Type: Single Facility	
Baseline Rating: N/A	**Current Rating:** 80
View Period Ending Dates	
Water Period Ending Dates Current: N/A Baseline: N/A	**Energy Period Ending Dates** Current: August 2009 Baseline: N/A
Eligibility for the ENERGY STAR	
Not Eligible: Current period ending over 120 days	

Key Considerations for LEED-EB Certification

Major Players

Have Substantial Responsibility for Prerequisites and Credits

- Facility Manager/ Owner
- Building Engineer

Additional Participants

- Tenants
- Custodial staff
- Groundskeeper
- AEC Team (for renovations and additions)

Occupant Involvement

- Prerequisites are all within the control of the building owners and operators – but the actions of **building users** are critical to earning some points

How many buildings?

- EB was designed to certify individually-metered, single building.
- However, campus or multiple building certifications appear to be in the works

Building Type

- Specifically applicable to commercial, institutional, and multi-family residential

Timeline

- If the project team decides to pursue LEED-EB, what are the other major milestones that effect the certification and performance periods?

Alterations and Additions

- Maximum limit for renovations is 50% of floor space/occupants relocated
- Maximum limit for additions is no more than 50% increase in floor area

Regional Priority Credits (Cascadia)

- 25% of site area in open space
- Stormwater quantity control
- Sustainable purchasing of food
- Waste stream audit
- Energy Star Score of 95+
- Renewable energy (12% on-site, 100% off-site)

Recertification

- Recertification is available every 1-5 years

Benefits

Certification Benefits

- **Third party validation** of achievement
- LEED certification **plaque** to mount on building
- Qualify **incentives** and anticipate **mandates**
- Be recognized as a **regional leader**

Certified EB O&M Buildings (WA)

1111 Third Avenue		Seattle
City Center Bellevue	Beacon Capital Partners, LLC	Bellevue
Columbia Center		Seattle
IBM Building	Unico Properties	Seattle
Key Center	Beacon Capital Partners	Bellevue
Lincoln Executive Center Bldg. 3	Beacon Capital Partners	Bellevue
Plaza Center	Beacon Capital Partners	Bellevue
Plaza East	Beacon Capital Partners	Bellevue
Puget Sound Plaza	Unico Properties	Seattle
Skyline Tower	Beacon Capital Partners	Bellevue
Sunset North Building #3		Bellevue
Sunset North Building #4		Bellevue
Sunset North Building #5		Bellevue
The Dexter Horton Building		Seattle
The Skinner Building		Seattle
US Bank Plaza	Beacon Capital Partners	Belleuve
Wells Fargo Center		Seattle

Take Home Messages

- Performance, performance, performance
- Involve the right people
- Start small and grow

Resources

- **USGBC**
  http://www.usgbc.org/LEED/eb
  Download the free LEED-EB “Rating System”
- **Portfolio Manager**
  https://www.energystar.gov/istar/pmpam/
  Create a free account, enter data for your building
- **BOMA Killowatt Crackdown**
  http://kilowattcrackdown.betterbricks.com/
  Highlights local buildings efforts to reduce energy use, includes energy efficiency resources

Thank You!

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Built Green™ and the Green Building Market

Aaron Adelstein
Built Green Director
builtgreen@mbaks.com

Cascadia Government Summit,
Bellevue, WA 5-5-2010

BUILT GREEN

Built Green Program History

- Founded in 1999
- Multiple stakeholder organization:
  - Master Builders Association
  - King County
  - Snohomish County
  - Other Invested Groups:
    - City of Seattle
    - 1000 Friends of Washington
    - Sierra Club
    - Multiple green architects, builders and developers

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Built Green Washington

- Cooperative of all 9 Built Green programs in State

WEBSITE:

- Classes and Events Calendar
- Links to all local green building programs
- Educational resource for builders, designers, associates, and the public

www.builtgreenwashington.org

BUILT GREEN

What is Built Green™?

- Built Green is a residential green building **certification program**. It provides a framework by which to measure the level of 'green' in a home through the use of a Built Green checklist.
- An **educational program** on green building for builders, designers and consumers.
- An **association** of builders, designers, realtors, vendors, utilities, and municipalities. Built Green provides opportunities for networking among industry leaders.
- 501c(3) non-profit

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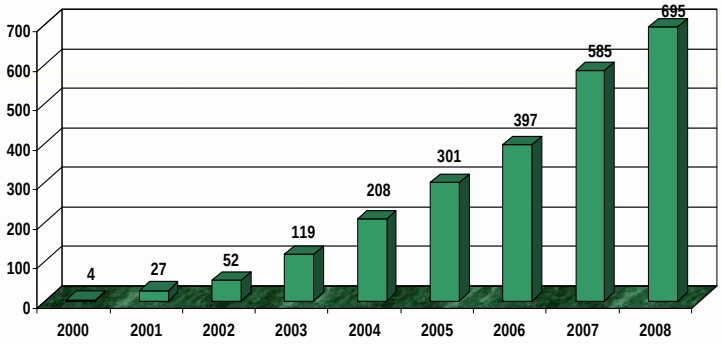
Built Green Membership Growth



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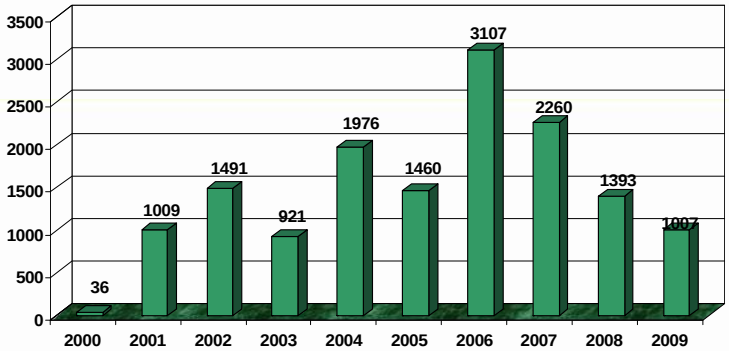
Built Green Projects Certified



14,251
Total Projects Certified

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Program at a Glance

Built Green Program
14,251 certifications since 2000

Single Family

Remodeler

Multifamily

Green Communities

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Checklist Overview

- Minimum Requirements
  - Four Sections:
  - **Site and Water**
  - **Energy Efficiency**
  - **Indoor Air Quality**
  - **Materials Efficiency**
  - Four Star Levels:
  - **2-Star: Remodel and Multi-Family entry level**
  - **3-Star: Single Family entry level; points vary by checklist**
  - **4-Star: Additional requirements; 5-Star: more rigorous requirements and point totals**

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Site & Water

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Energy Efficiency

ENERGY STAR

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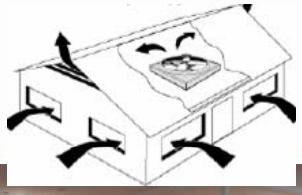
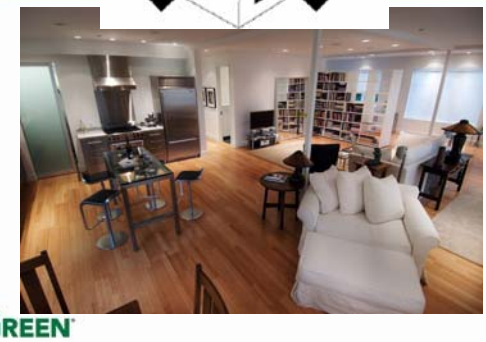
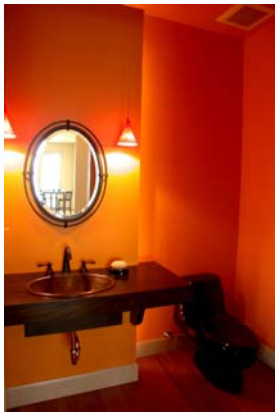
Health & Indoor Air Quality







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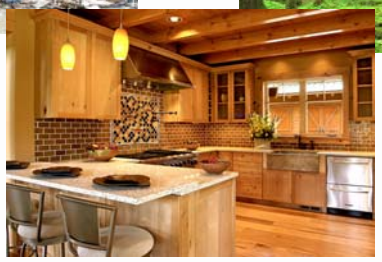
Materials Efficiency



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Checklist Overview

- **2-Star Requirements:**
- Builder educational requirement
- Homeowner education
- 80-200 points total
- Minimum of 15-30 points per section
- Remodel must use Energy Retrofit Worksheet
- 3rd party verification required starting in 2010

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Built Green Retrofit Checklist - 2-Star Level Only

Measures	Avg. Annual kWh Savings	Points Available	Points
Required Measures			
Air Seal Home to a minimum of 10 ACH@50 Pascals (blower door test required)	0.28 per ACH reducation (sq. ft. floor area)	Required	
If home is air sealed to 7ACH@50 Pascals - the house must meet current Washington State ventilation code requirements		Required	
Insulate Entire Accessible Attic to R-44 or better	2.6 per sq. ft. attic area	Required	
Higher Cost Measures (+$5,000)			
Windows	17.7 per sq. ft. window area	6	
Hydronic Floor or Wall	--	4	
If re-siding: Rigid foam on exterior	--	3	
Fuel Switch: Oil-Gas/Heat Pump	--	5	
Fuel Switch: Elec-Gas	--	4	
Fuel Switch: Elec-Heat Pump	--	5	
Upgrade Furnace to	2600-2725 (90%-95%)	4	
Medium Cost Measures ($1000-$5000)			
Install Tankless Water Heater	2200	4	
Insulate Floor	2.4 per sq. ft. floor area	4	
Insulate Walls to R-13	1.9 per sq. ft. wall area	6	
Appliances: Clothes Washer	104 per clothes washer	1	
Appliances: Refrigerator (pre-1993)	54 per refrigerator	1	
Lower Cost Measures (-$1000)			
Seal Ducts - unconditioned (insulate ducts?)	1056 per house	4	
Programmable thermostats	--	1	
CFL's or LED's (50%) minimum	33 per bulb	1	
Showerheads (3 locations)	75 per showerhead replaced	1	
Insulate pipes	20 per house	1	
Insulate water heater	--	1	

Min. Points Required: 15 **Total Points:** **0**

*Other energy retrofit measures (i.e. solar hot water) may be applicable for credit at the discretion of the Built Green Director

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Checklist Overview

- **3-Star Requirements:**
- Builder and Homeowner education requirement
- 150-180 points total
- Minimum of 20 points per section
- Remodels, must be brought up to WA State New Construction energy code, excluding walls

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Checklist Overview

- **4-Star Requirements:**
- 3rd party verifier
- Certified Energy-Star or equivalent ~ 15% above current Washington State new construction energy code
- Low-VOC paint
- Drought tolerant plants
- Low Flow faucets and showerheads
- Use of recycled content materials, jobsite recycling plans
- 250-80 points minimum; 25 points in each section

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Single-family Checklist Overview

- **5-Star Requirements:**
- All 3 and 4-Star requirements
- Reduce existing turf grass by 50%
- Use of pervious materials for 1/3 of all driveways, walkways and patios
- Retain 30% of trees on-site
- Home energy use 30% better than current WA energy code
- No use of urea-formaldehyde products
- Minimum 70% recycling rate
- 400-430 points minimum; 40 points in each section

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Market overview

30% Of U.S. Market makes purchasing decisions based on moral and ethical values.

= $76.47 Billion

Over 50% of Contractors say they incorporate green building techniques and products into their projects

- Consumer market is beginning to understand green building and the market differentiation

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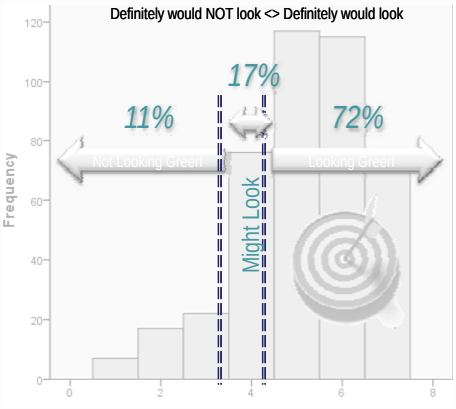
Who is Looking Green?

- 430 Puget Sound home owners
- Median income $80k
- 74% college or more
- 55% female
- 75% married
- Median age 50



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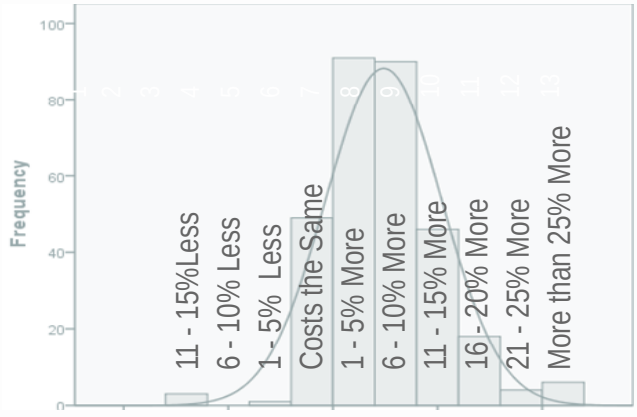
Looking Greens are willing to pay 6-10% more



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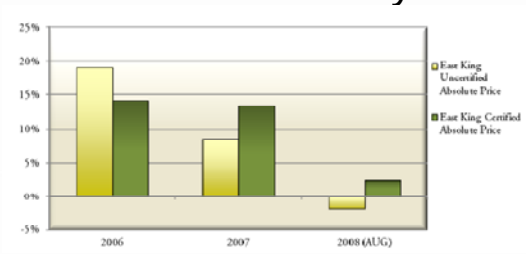
Built Green Value Analysis



GreenWorks Realty December 2009 E-Cert Report

	Non Certified	Certified Homes	% Diff
# of homes sold	5,611	1,878	25.1%
Median Square Ft	2,379	1,800	-24.3%
Median Sold Price	$ 442,950	$ 464,975	5.0%
Median Days on Mrkt	60	56	-6.7%
Price/SF	$ 186	$ 258	38.7%

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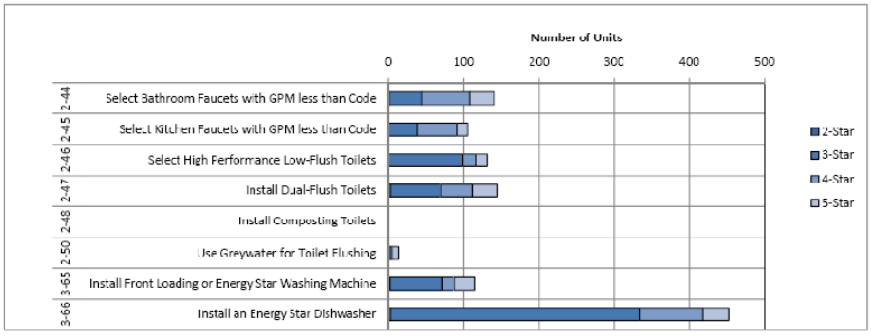
Is this really working?



Indoor Plumbing Fixtures Water Savings

Annual Percent Water Savings	15%
Annual Water Savings	2,586,300 gallons per year

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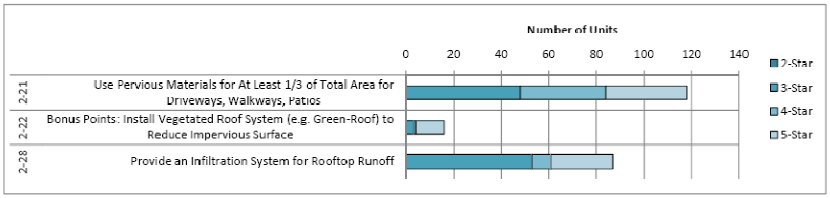
Is this really working?



Total Stormwater Runoff Savings

Percent Savings to Baseline	37%
Annual Stormwater Savings	1,319,011 gallons per year

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Is this really working?

Construction Waste Recyled

Unit Diverting Waste to 50% Recycling Facility (5-24)	93 units
Unit Diverting Waste to 75% Recycling Facility (5-25)	101 units
Unit Diverting Waste to 85% Recycling Facility (5-26)	53 units

Construction Waste Recyled

Square Footage of Units Diverting Waste to 50% Recycling Facility (5-24)	145,640 Sq Ft
Square Footage of Units Diverting Waste to 75% Recycling Facility (5-25)	185,287 Sq Ft
Square Footage of Units Diverting Waste to 85% Recycling Facility (5-26)	99,178 Sq Ft

Actual Construction Waste to Landfill *	402 Tons

Total Waste Diverted from Land Fill and Recycled

From 50% Recycling (5-24)	140 Tons
From 75% Recycling (5-25)	266 Tons
From 85% Recycling (5-26)	162 Tons
Total	568 Tons

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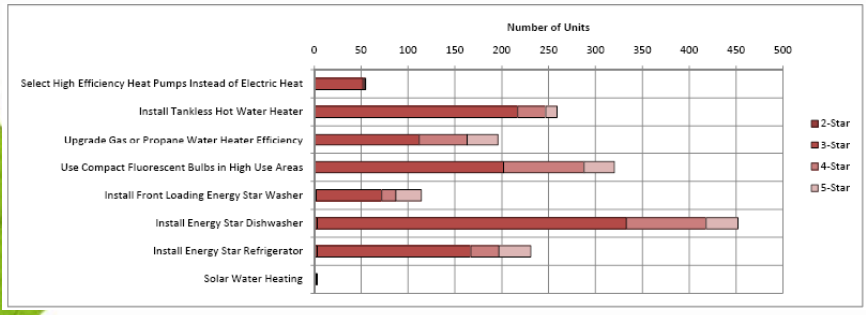
Is this really working?



Estimated Total Energy Savings (4 & 5 Star Units Total Energy Savings + Lowest 2-Star & 3-Star Units Estimated Energy Savings from Individual Credits)	4572.5 MBTU per year

Seattle total: 1,340,199 kwh

King and Snohomish Counties: 5,360,796 kwh

= 3,232.5 Metric Tons of CO2 reduction

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