



# An Introduction to Green Building

City of Sacramento

Lunch and Learn

July 20<sup>th</sup>, 2007

# “Getting Our Customers to Success”

---

- Sponsored by the City of Sacramento, Development Services Department
- Purpose: To continually provide our customers with the tools to get them to success!
- When: The last Thursday of every month  
12:00pm-1:30pm
- Where: City of Sacramento  
North Permit Center  
2101 Arena Boulevard  
Sacramento, CA 95834  
(2<sup>nd</sup> Floor Training Room)



# How it Works!

---

You bring your brown bag lunch

We provide the topic, refreshments, and cookies

Please DO ask questions as they arise

Please DO NOT feel like you are interrupting, interaction is important

General questions are strongly encouraged. However, if you have specific project questions please hold them for after the meeting!

Please turn off cell phone or put on “silent”

If you need to use the restroom, please step quietly as this session is being recorded



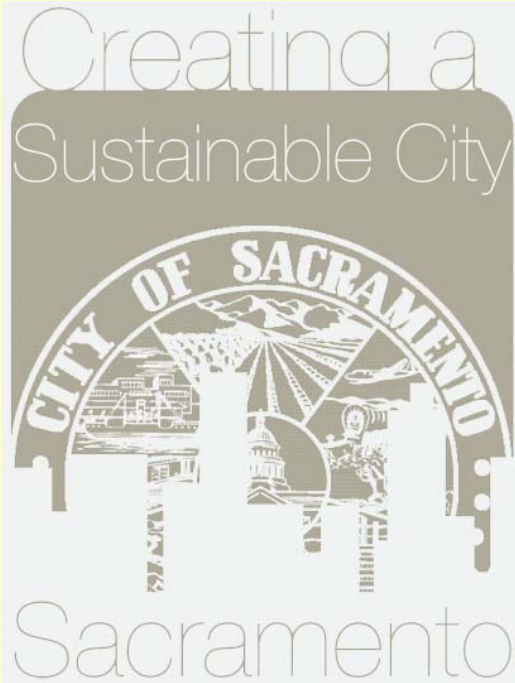
# Topics We will discuss today:

---

- Overview of the City's Sustainability Agenda
- Definition & Principles of Green Building
- The City's involvement with Green Building



# Sustainability Agenda



## *Definition:*

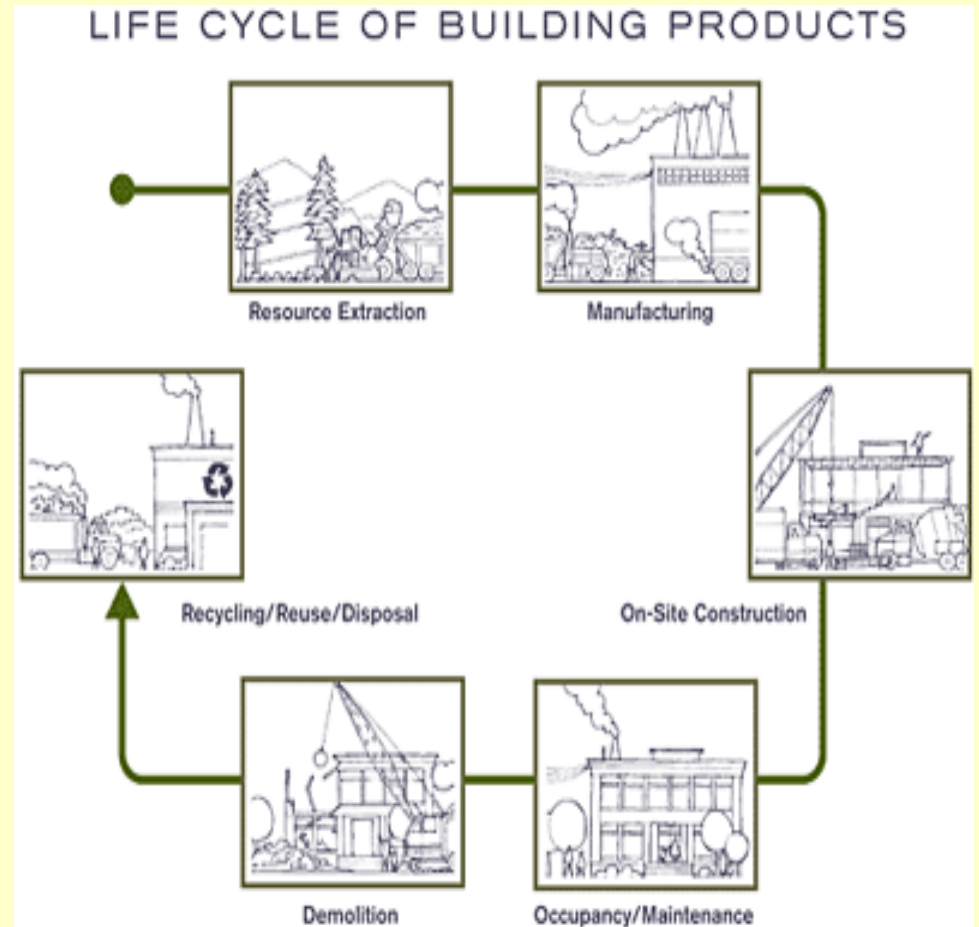
*"Sustainability meets the needs of the present without compromising the ability of future generations to meet their own needs."*

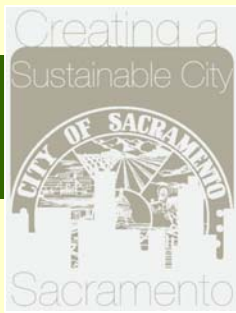
-United Nations World Commission  
on Environment & Development



# Sustainability Agenda

When a process is sustainable, it can be carried out over and over without depleting our natural resources.





# Sustainability Agenda

## 9 Target Areas

- Energy Independence
- Climate Protection
- Air Quality
- Material Resources
- Public Health and Nutrition
- Parks, Open Space and Habitat Conservation
- Water Resources and Flood Protection
- Public Involvement and Personal Responsibility
- Urban Design, Land Use, Green Building and Transportation



# Sustainability Agenda

## Next Steps

- City Operations
- Land Use Decisions
- Promoter & Educator
- Community Outreach
- Return in Fall 2007 to City Council with final Sustainability Master Plan & Recommended first phase implementation



# What is Green Building?

A “Whole-Systems” approach for designing and constructing buildings that:

- are integrated into the building site
- consume less energy and water
- are durable and easier to maintain
- use resources and materials efficiently
- are healthier, safer, and more comfortable

# Why is Green Building Important?

- Reduces maintenance & cost of home ownership
- Increases property value
- Protects human health & the environment



# Reduced Cost of Home Ownership

Average homeowner spends between \$1,000 and \$1,500/year on utilities

## Breakdown of costs:

- Air conditioning 14%
- Space Heating 12%
- Water Heating 10%
- Refrigerators 14%
- Appliances/Lighting 50%

- *Home Energy Magazine*



# Increased Property Value

Energy efficiency retrofits:

for every \$1 reduction in annual utility cost, the market value of a home increases by \$20.

- *Appraisal Journal*

## Case Study I: Village Homes, Davis

- Market value \$11 more per sq.ft than nearby homes
- Individual lots in Village Homes are smaller than the average home lot in Davis



# Case Study II: Fallen Leaf at Riverbend in South Natomas

## *The latest in Energy Conservation and Technology...*

Treasure Homes is pleased to offer the latest in energy conservation and technology at Fallen Leaf. As a discriminating homebuyer, you know the value of these features will increase as energy costs escalate. Integrated solutions provide benefits, with minimal maintenance, to fit your active lifestyle, and provide your family with the very best in conservation. It's a way to do your part, a decision to feel good about.

Please visit our website at [www.treasurehomes.com](http://www.treasurehomes.com) to learn more.

### **COST EFFICIENT APPLIANCES**

Our stainless steel GE appliances are extremely efficient. We've selected Energy Star rated components as available, and the range features a high-performance gas oven.

### **MOISTURE CONTROL**

Treasure Homes' industry leading exterior moisture control system won't be found in other new home developments.

### **SELF DEFENSE FOR WOOD**

The wood frame is treated with Bora-Care to provide long-term protection from insect damage. Made from borate, this effective mineral-based product is a "green alternative" to petroleum-based insecticides.

### **TANKLESS WATER HEATER**

Electronically controlled high-efficiency gas appliance by Noritz, provides an endless supply of hot water with no pilot light!



### **SOLAR ELECTRIC POWER**

The photovoltaic panels come with a 25 year limited warranty, with proper installation verified by SMUD. The Xantrex inverter system actually allows your electric meter to run backwards!

### **SMART VENT SYSTEM**

This high-tech product makes whole-house fans obsolete! Using your HVAC system ductwork, Smart Vent circulates fresh, cool, filtered outside air throughout the house.

### **WOOD PRODUCTS**

Specially engineered wood products and upgraded construction materials make your home a "solid" investment, from the Radiant Heat Barrier roof sheathing to the Azek garage door trim.

Please ask your sales representative for the informative brochure that provides all the details on the technology being offered at Fallen Leaf.



FALLEN LEAF at RIVERBEND



FALLEN LEAF at RIVERBEND





# Protection of Human Health

Indoor air pollutants are 2-5x higher than outside air

- On average, we spend over 90% of our time indoors
- 6 out of 10 homes are “sick” due to poor indoor air quality
- Over 30% of all commercial buildings have poor indoor air quality
- Prevalence of asthma has doubled since 1976 (20 million people, including 6.3 million children)

- *Environmental Protection Agency*

# Principles of Green Building

- Site Design
- Water Efficiency
- Energy & Atmosphere Efficiency
- Materials & Resource Conservation
- Indoor Environmental Quality



# Site Design

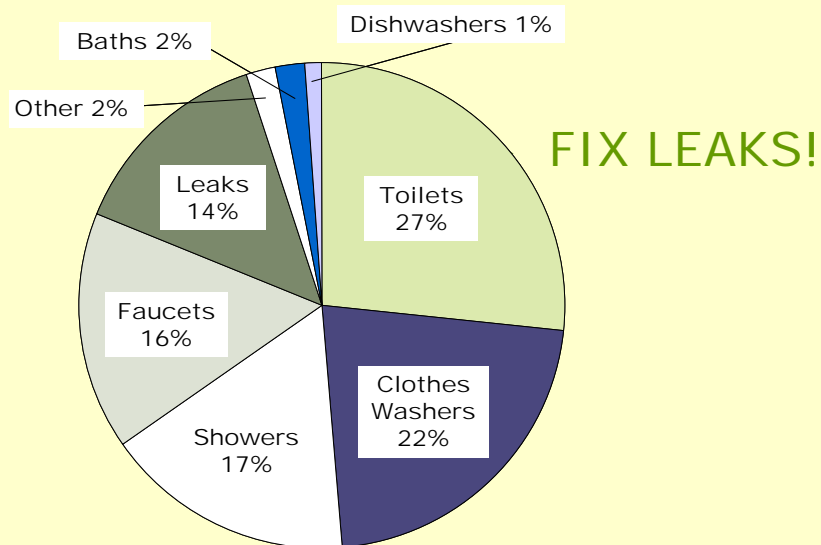
- Urban infill or transit oriented
- Clustered; higher density; smaller size
- Brownfield Redevelopment
- Site Selection: wildlife habitat, farmland, wetland
- Pedestrian friendly
- Designed for safety & social gathering
- Accessible & adaptable



# Water Efficiency

## Interior

- Water conserving toilets, clothes & dishwashers
- Aerators on faucets
- Low-flow showerheads
- Hot AND cold water pipe insulation



## Exterior

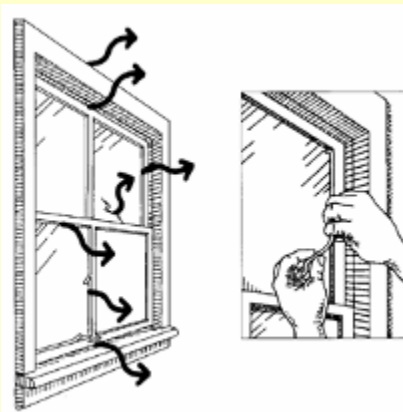
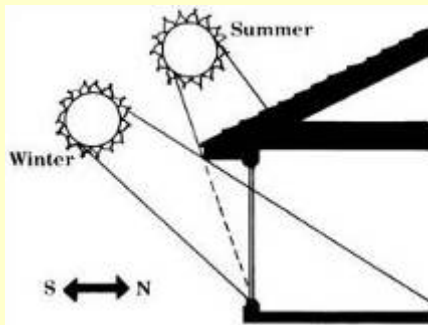
- Minimized turf
- Native and drought-resistant vegetation
- Pervious Pavements
- Hydrozoning (plants grouped by water needs)
- Greenroofs
- Dry landscaping & Highly efficiency Irrigation Systems



# Energy & Atmosphere Efficiency

- Passive solar design
- Structural system
- Increased insulation
- Air sealing
- Dual-pane, low-emissivity (low-E) windows

- Efficient lighting
- Energy Star appliances
- HVAC design, installation & testing
- Renewable energy





# Resource & Material Conservation

## Resourceful use of materials

- Efficient design
- Smart construction  
ie: Advanced Framing

## Construction & Demolition waste diversion



## Material choice

- Reused & salvaged
- Recycled content
- Rapidly renewable
- Forest Stewardship Council (FSC) Certified wood

## Life cycle considerations

- Manufacturing
- Durability
- Recyclability

# Indoor Environmental Quality

## Materials & Finishes:

- No- or Low-Volatile Organic Compounds (VOC) paint & finishes
- Low-formaldehyde pressed wood products (cabinets, stair treads, shelving etc)



## Combustion gas safety Ventilation & moisture management:

- “build it tight & ventilate right”
- bathroom & kitchen fans
- crawlspace vapor barrier
- Nightbreeze or smart fans systems



# City's Involvement

- Design of Green Building program
- Education & Outreach
- Partnerships



# Green Building Program

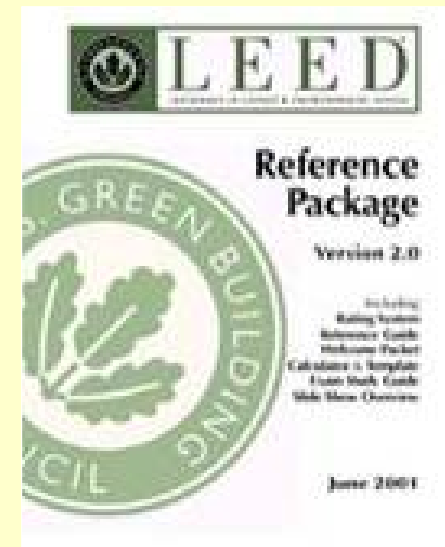
## Incorporating Green Building Guidelines & Rating Checklists

➤ Build It Green

➤ Leadership in Energy & Environmental Design (LEED)



[www.BuildItGreen.org](http://www.BuildItGreen.org),  
[www.stopwaste.org](http://www.stopwaste.org)



U.S. Green Building Council,  
[www.usgbc.org](http://www.usgbc.org)



# Leadership in Energy & Environmental Design (LEED)

## LEED Rating System Product Portfolio

### New Construction

For building owners and design teams that address the new building design and construction or major renovations process. Also referred to as LEED 2.0

### Existing Buildings

For building owners and service providers that address the building operations and on-going upgrades and performance improvements.

### Commercial Interiors

For building owners, tenants and design teams that address commercial interiors design and installation process.

### Core and Shell

For developers and design teams that address the new building design and construction process for buildings where the interior is not part of the initial design.

### Home (PILOT)

For residential building owners, developers and design teams that address the new residential building design and construction process.

### Neighborhood Development (PILOT)

For developers, design teams, and agency staff integrating the principles of smart growth urbanism, neighborhood design and green building.



# Green Building Program

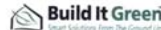
## Checklists

- Residential
- Small Commercial

- Large Commercial
- Institutional

### Single Family GreenPoint Checklist

date: \_\_\_\_\_



The GreenPoint checklist tracks green features incorporated into the home. The recommended minimum requirements for a green home are: Earn a total of 50 points or more; obtain the following minimum points per category: Energy (11), Indoor Air Quality/Health (5), Resources (6), and Water (3); and meet the prerequisites A.3.a (50% construction waste diversion) and N.1 (incorporate Green Points checklist in blueprints).

The green building practices listed below are described in the New Home Construction Green Building Practices, available at [www.builditgreen.org](http://www.builditgreen.org).

#### ENTER PROJECT NAME

	Community	Energy	IAQ/Health	Resources	Water
<b>A. SITE</b>					
Possible Points					
1. Protect Native Soil and Minimize Disruption of Existing Plants & Trees					
<input type="checkbox"/>					
2. Deconstruct Instead of Demolishing Existing Buildings On Site					
<input type="checkbox"/>					
3. Recycle Job-Site Construction Waste (Including Green Waste)					
<input type="checkbox"/>					
4. Use Recycled Content Aggregate (Minimum 25%)					
<input type="checkbox"/>					
<b>B. LANDSCAPING</b>					
Possible Points					
1. Construct Resource-Efficient Landscapes					
<input type="checkbox"/>					
2. Use Fire-Safe Landscaping Techniques					
<input type="checkbox"/>					
3. Plant Shade Trees					
<input type="checkbox"/>					
4. Install High-Efficiency Irrigation Systems					
<input type="checkbox"/>					
5. Reduce Light Pollution by Shielding Fixtures and/or Directing Light Downward					
<input type="checkbox"/>					
<b>C. FOUNDATION</b>					
Possible Points					
1. Integrate Recycled Flyash in Concrete					
<input type="checkbox"/>					
2. Use Frost-Protected Shallow Foundation in Cold Areas (C.E.C. Climate Zone 16)					
<input type="checkbox"/>					
3. Use Radon Resistant Construction (In At-Risk Locations Only)					
<input type="checkbox"/>					
<b>D. STRUCTURAL FRAME &amp; BUILDING ENVELOPE</b>					
Possible Points					
1. Apply Optimal Value Engineering					
<input type="checkbox"/>					
2. Use Only Jack and Cripple Studs Required for Load					
<input type="checkbox"/>					



### LEED-NC Version 2.1 Registered Project Checklist

Yes	?	No			
<input checked="" type="checkbox"/>			1	<b>Sustainable Sites</b>	14 Points
<input checked="" type="checkbox"/>				Prereq 1	<b>Erosion &amp; Sedimentation Control</b> Required
<input checked="" type="checkbox"/>				Credit 1	<b>Site Selection</b> 1
<input checked="" type="checkbox"/>				Credit 2	<b>Development Density</b> 1
<input checked="" type="checkbox"/>				Credit 3	<b>Brownfield Redevelopment</b> 1
<input checked="" type="checkbox"/>				Credit 4.1	<b>Alternative Transportation, Public Transportation Access</b> 1
<input checked="" type="checkbox"/>				Credit 4.2	<b>Alternative Transportation, Bicycle Storage &amp; Changing Rooms</b> 1
<input checked="" type="checkbox"/>				Credit 4.3	<b>Alternative Transportation, Alternative Fuel Vehicles</b> 1
<input checked="" type="checkbox"/>				Credit 4.4	<b>Alternative Transportation, Parking Capacity and Carpooling</b> 1
<input checked="" type="checkbox"/>				Credit 5.1	<b>Reduced Site Disturbance, Protect or Restore Open Space</b> 1
<input checked="" type="checkbox"/>				Credit 5.2	<b>Reduced Site Disturbance, Development Footprint</b> 1
<input checked="" type="checkbox"/>				Credit 6.1	<b>Stormwater Management, Rate and Quantity</b> 1
<input checked="" type="checkbox"/>				Credit 6.2	<b>Stormwater Management, Treatment</b> 1
<input checked="" type="checkbox"/>				Credit 7.1	<b>Landscape &amp; Exterior Design to Reduce Heat Islands, Non-Roof</b> 1
<input checked="" type="checkbox"/>				Credit 7.2	<b>Landscape &amp; Exterior Design to Reduce Heat Islands, Roof</b> 1
<input checked="" type="checkbox"/>				Credit 8	<b>Light Pollution Reduction</b> 1
Yes	?	No		<b>Water Efficiency</b>	5 Points
<input checked="" type="checkbox"/>				Credit 1.1	<b>Water Efficient Landscaping, Reduce by 50%</b> 1
<input checked="" type="checkbox"/>				Credit 1.2	<b>Water Efficient Landscaping, No Potable Use or No Irrigation</b> 1
<input checked="" type="checkbox"/>				Credit 2	<b>Innovative Wastewater Technologies</b> 1
<input checked="" type="checkbox"/>				Credit 3.1	<b>Water Use Reduction, 20% Reduction</b> 1
<input checked="" type="checkbox"/>				Credit 3.2	<b>Water Use Reduction, 30% Reduction</b> 1
Yes	?	No		<b>Energy &amp; Atmosphere</b>	17 Points
<input checked="" type="checkbox"/>				Prereq 1	<b>Fundamental Building Systems Commissioning</b> Required
<input checked="" type="checkbox"/>				Prereq 2	<b>Minimum Energy Performance</b> Required
<input checked="" type="checkbox"/>				Prereq 3	<b>CFC Reduction in HVAC&amp;R Equipment</b> Required
<input checked="" type="checkbox"/>				Credit 1	<b>Optimize Energy Performance</b> 1 to 10
<input checked="" type="checkbox"/>				Credit 2.1	<b>Renewable Energy, 5%</b> 1
<input checked="" type="checkbox"/>				Credit 2.2	<b>Renewable Energy, 10%</b> 1
<input checked="" type="checkbox"/>				Credit 2.3	<b>Renewable Energy, 20%</b> 1
<input checked="" type="checkbox"/>				Credit 3	<b>Additional Commissioning</b> 1
<input checked="" type="checkbox"/>				Credit 4	<b>Ozone Depletion</b> 1
<input checked="" type="checkbox"/>				Credit 5	<b>Measurement &amp; Verification</b> 1
<input checked="" type="checkbox"/>				Credit 6	<b>Green Power</b> 1

continued...



# Green Building Program

- Develop Building Incentives & Rebates
- Identify Zoning or Building Ordinance changes
- Target New Green Building Policies
- Return to City Council in Fall 2007 for Review & Comment



# Education & Public Outreach

- Staff Trainings
  - LEED Accredited Staff
  - Green Building Professionals
- GreenRater Trainings
- Stakeholder Focus Groups
- Information & Resources development (website, brochures, events)



# Partnerships

- United States Green Building Council (USGBC)
- SMUD
- Build It Green Public Agency Council (BIGPAC)
- SACOG
- Regional Governments
- UC Davis & CSUS
- Urban Land Institute (ULI)



# What you can do!

- Join a focus group
- Design & build green
- Let us know if you have a green building project in the works

# Contact:

---

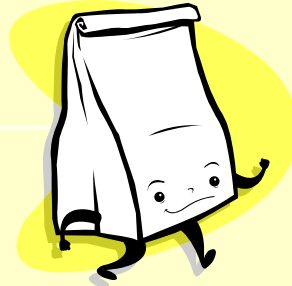
Jamie Cutlip, Assistant Planner  
Green Building Coordinator  
Ph: (916) 808-8684  
Email: [jcutlip@cityofsacramento.org](mailto:jcutlip@cityofsacramento.org)

Bob Chase, Chief Building Official  
LEED Accredited Professional  
Ph: 916-808-8024  
Email: [bchase@cityofsacramento.org](mailto:bchase@cityofsacramento.org)

Development Services website:  
<http://www.cityofsacramento.org/dsd/>

Development Services Helpdesk  
Ph: 916-808-5656





*Thank you for attending!*  
*Please complete the evaluation form!*

