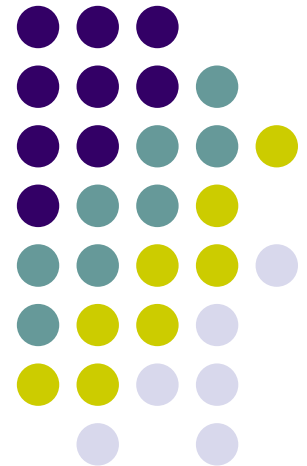


# City of Scottsdale Green Building Progress Report - 2008

August 2, 2008



# Table of Contents

- Program Overview and History
- Program Operation
  - Project Qualification, Plan Review and Inspections
  - Incentives and mandates
- Program Measures
  - Building Permit Activity and Valuations
  - Solar Permit Activity
  - Environmental Measures
  - Outreach
  - Evaluation

# Local Leaders in Sustainability



*A Study of  
Green Building Programs  
in Our Nation's Communities*

The American Institute of Architects



## 2007 Study of Green Building Programs

- Examines growth and effectiveness of Green Building Policies in cities

# Local and State Governmental Programs

- Arkansas
- Arizona
- California
- Colorado
- Florida
- Georgia
- Hawaii
- Illinois
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Missouri
- Nevada
- New Jersey
- New Mexico
- New York
- North Carolina
- Ohio
- Oregon
- Pennsylvania
- Tennessee
- Texas
- Utah
- Vermont
- Virginia
- Washington
- Washington, DC
- Wisconsin

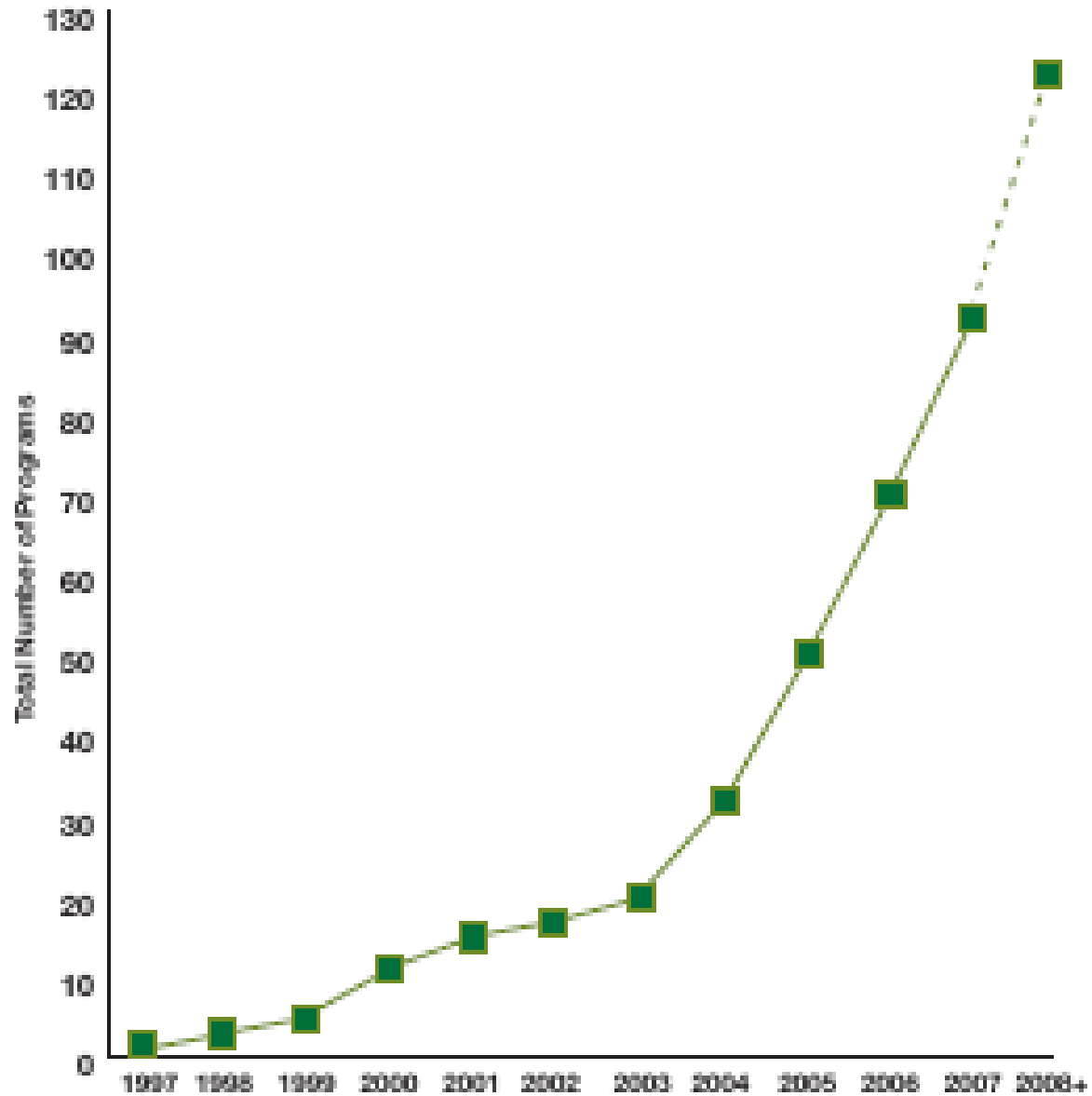


## 2007 Study of Green Building Programs

- Ninety-two cities have green building programs, or 14 percent of all cities with a population greater than 50,000
- Thirty-nine percent or about 42 million Americans live in cities with green building programs

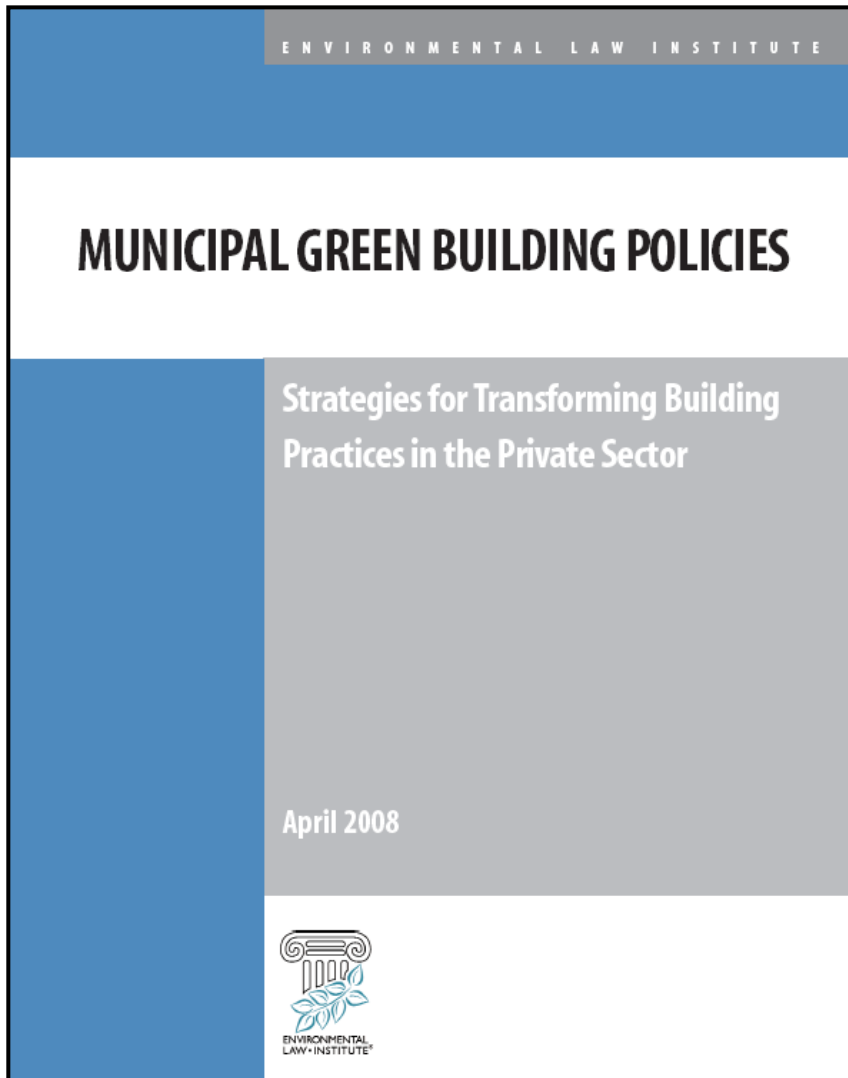


Green Building Programs in Cities with a Population over 50,000



U.S. Cities with Green Building Programs

# Strategies for Transforming Building Practices in the Private Sector



- Policies that Establish Green Building Requirements
- Policies that Provide Expedited Review for Green Building Projects
- Policies that Provide Direct Financial Incentives for Green Building Projects:
  - Grants, Fee Waivers, Tax Breaks and Bonus Development

Environmental Law Institute



# Local and State Ordinances

- Public Facilities

- mandate to meet LEED or equivalent green building rating benchmark
- lead by example

- Private Development

- incentives and mandates

# Local Government Sustainability Programs

- Sustainable Practice Categories
  - Environmentally Preferable Purchasing
  - Planning and Transportation
  - Landscape Management
  - Building Practices
  - Waste Management

SCOTTSDALE



GREEN BUILDING  
PROGRAM

# Green Building Program

## Sustainable Building in the Sonoran Desert

- Climatic and geographic characteristics are unique to the region.
- Utilization of local resources such as solar for energy and daylighting.
- Regional materials.



SCOTTSDALE



GREEN BUILDING  
PROGRAM

# Green Building Program

- Voluntary participation
- Qualification criteria
- Oversight by Green Building Advisory Committee
  - program criteria, education, outreach

SCOTTSDALE



GREEN BUILDING  
PROGRAM

# Integration with Development Process

- Planning and Development
  - Development Review Process
  - Plan Review and Inspections
- Building and Energy Codes
  - IBC, IRC, IECC



# Incentives

- Expedited review & process assistance
- Market differentiation for builders & designers (directory and signs)
- Promotion material, education & public events

# Green Project Process

- 1 Project Qualification
- 2 Plan Review & Permitting
- 3 Inspections
- 4 Certificate of Occupancy



# Rating Checklist

- Mandatory Items (28 requirements)
- Rating Options
  - 135 total options with 270 max. possible points
- Rating Levels
  - Entry Level – 50 to 100 points
  - Advanced Level – 100 to 200 points



## Green Building Rating Checklist

Residential – New Construction, Major Remodels & Additions

Sept. 1, 2006 - Update



Plan Check # \_\_\_\_\_ Building Permit # \_\_\_\_\_ GB Total Points \_\_\_\_\_

Project or Owner's Name - \_\_\_\_\_

Project Address - \_\_\_\_\_

Designer Name - \_\_\_\_\_

Builder Name - \_\_\_\_\_

Use this rating worksheet to qualify projects under the Green Building Program for one- and two-family dwellings and multiple single-family dwellings (townhouses and condominiums) not more than three stories in height with a separate means of egress (International Residential Code - IRC Section R101.2).

All building system components, materials, and equipment must be installed per code and manufacturer's instructions.

<u>Entry Level</u>	<u>Advanced Level</u>
<ul style="list-style-type: none"> <li>• Meet all mandatory measures and adjust rating for house size (p. 2 – 7).</li> <li>• Accumulate <u>50 - 99 points</u> from the rating checklist (p. 8 –26).</li> </ul>	<ul style="list-style-type: none"> <li>• Meet all mandatory measures and adjust rating for house size (p. 2 – 7).</li> <li>• Accumulate <u>100 or more points</u> from the rating checklist (p. 8 – 26).</li> </ul>

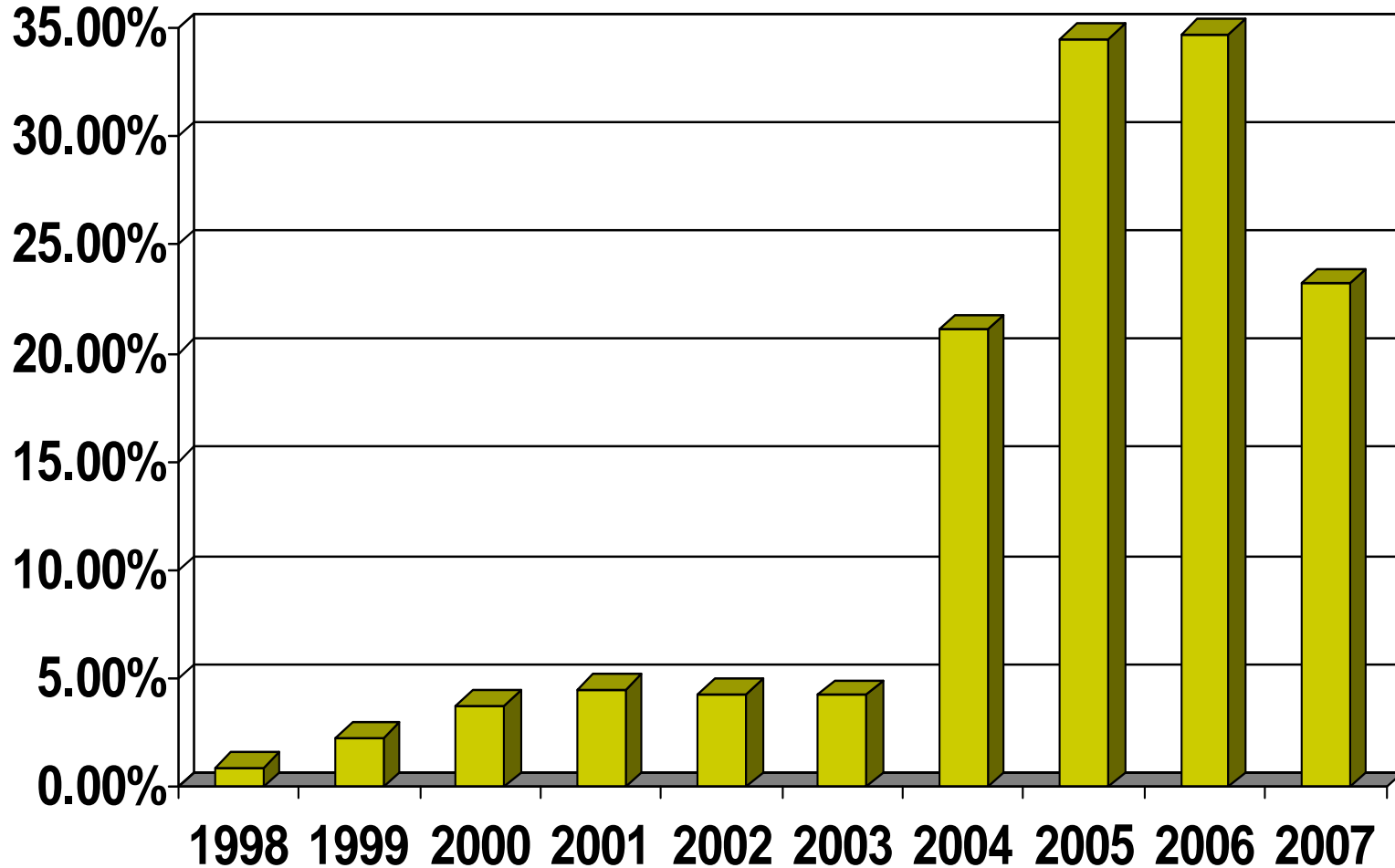
<u>Summary of Rating Categories</u>		
1. Site	6. Electrical Power, Lighting, Appliances	11. Interior Doors, Cabinetry, Trim
2. Structural Elements	7. Plumbing System	12. Flooring
3. Energy Rating/Performance	8. Roofing	13. Solid Waste
4. Thermal Envelope	9. Exterior Finishes	14. Innovative Design
5. Heating, Ventilation, & Air Conditioning	10. Interior Finishes	

# Green Home Permit Activity

<b>Year</b>	<b>Total Permits</b>	<b>Green Permits</b>	<b>Percentage of Total Permits</b>
<b>1998</b>	2172	20	0.92%
<b>1999</b>	1554	36	2.32%
<b>2000</b>	1076	41	3.81%
<b>2001</b>	843	38	4.51%
<b>2002</b>	768	33	4.30%
<b>2003</b>	896	38	4.24%
<b>2004</b>	1083	231	21.1%
<b>2005</b>	1263	436	34.5%
<b>2006</b>	1069	371	34.7%
<b>2007</b>	891	207	23.2%



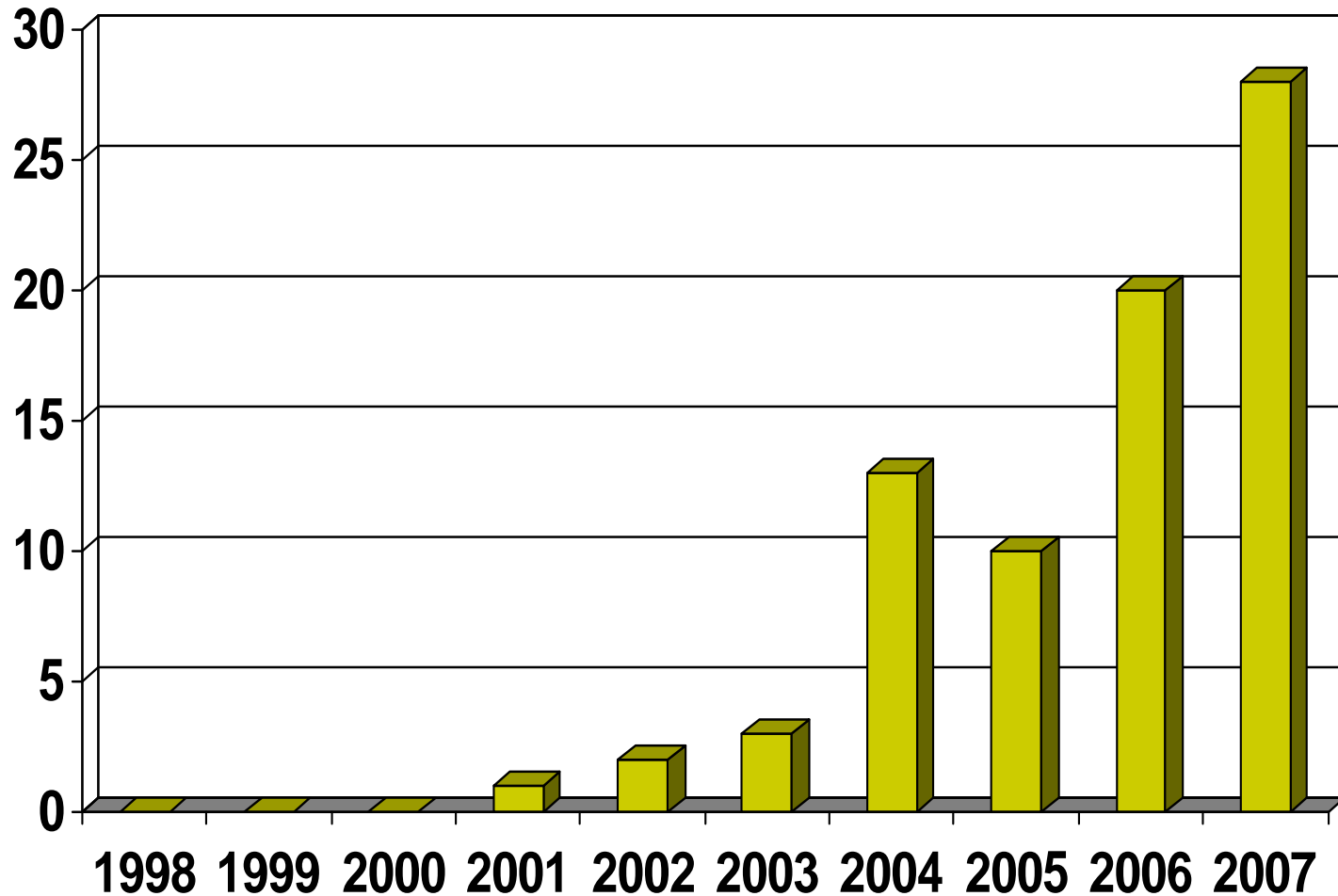
# Green Home Permit Activity



# Solar Electric (PV) Permits

<b>Year</b>	2001	2002	2003	2004	2005	2006	2007
<b>Number of Permits</b>	1	2	3	13	10	20	28

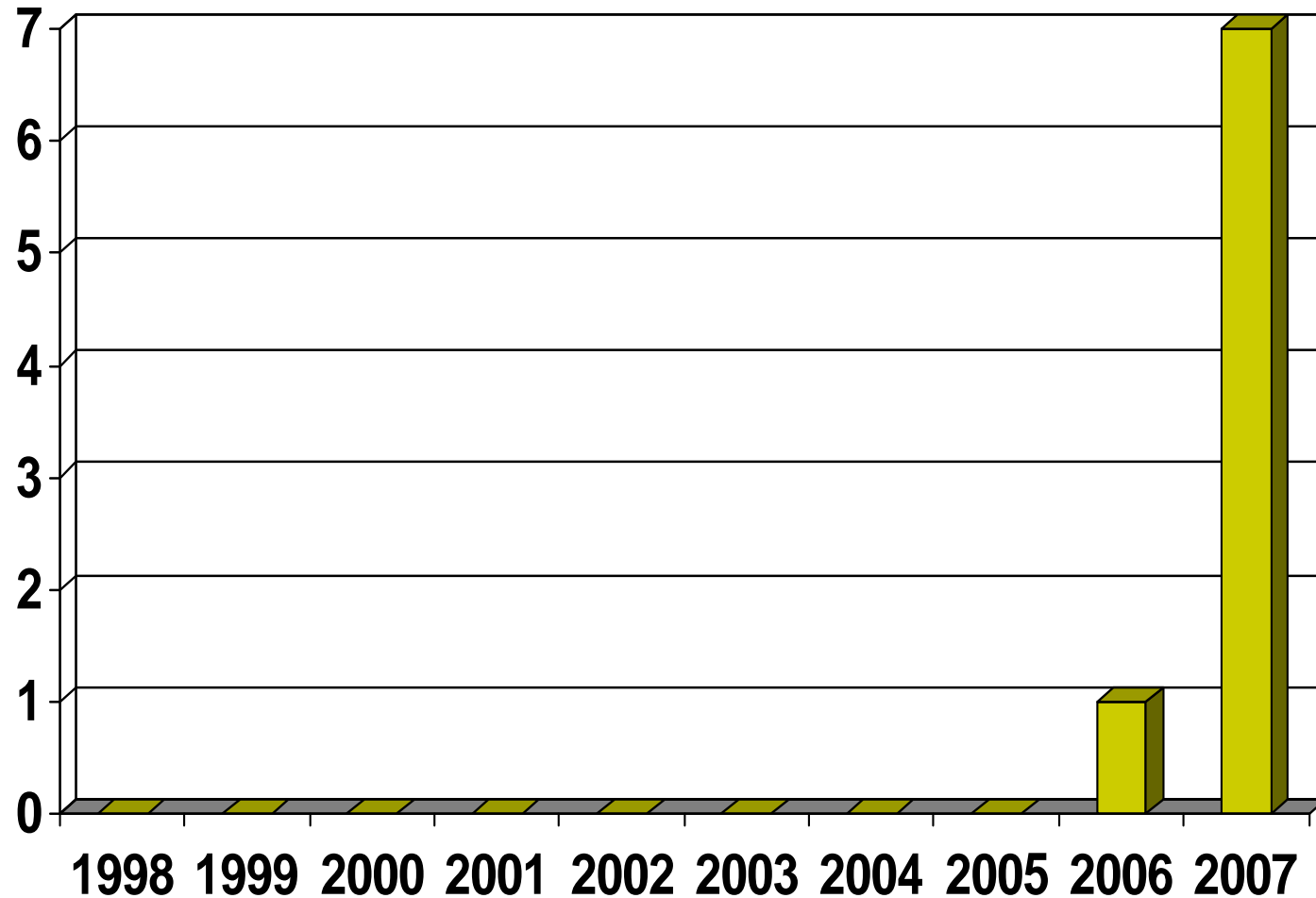
# Solar Electric (PV) Permits



# Solar Hot Water Permits

<b>Year</b>	2001	2002	2003	2004	2005	2006	2007
<b>Number of Permits</b>	TBD	TBD	TBD	TBD	0	1	7

# Solar Hot Water Permits

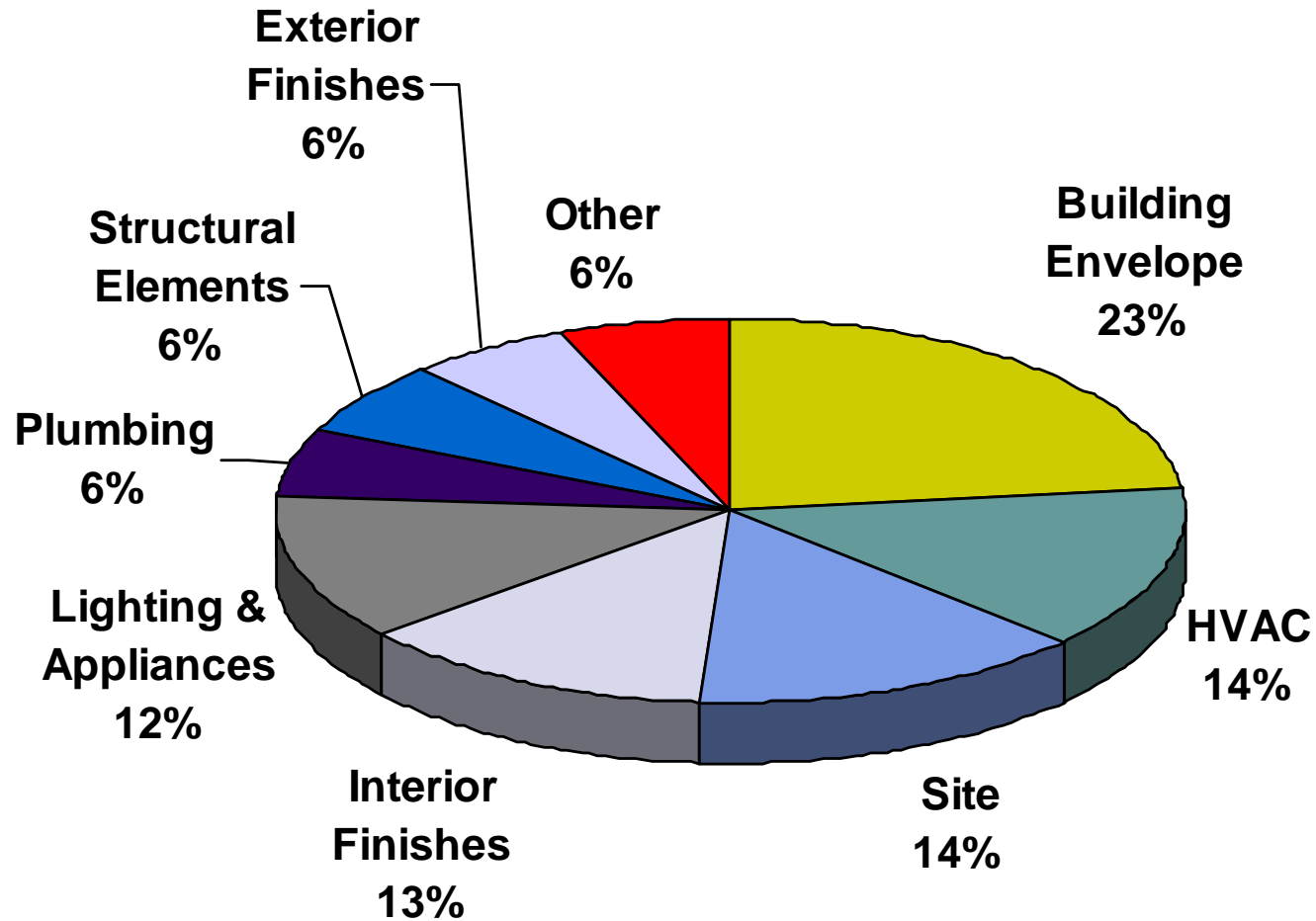


# Scottsdale Green Builder Choices 2005 - 2006

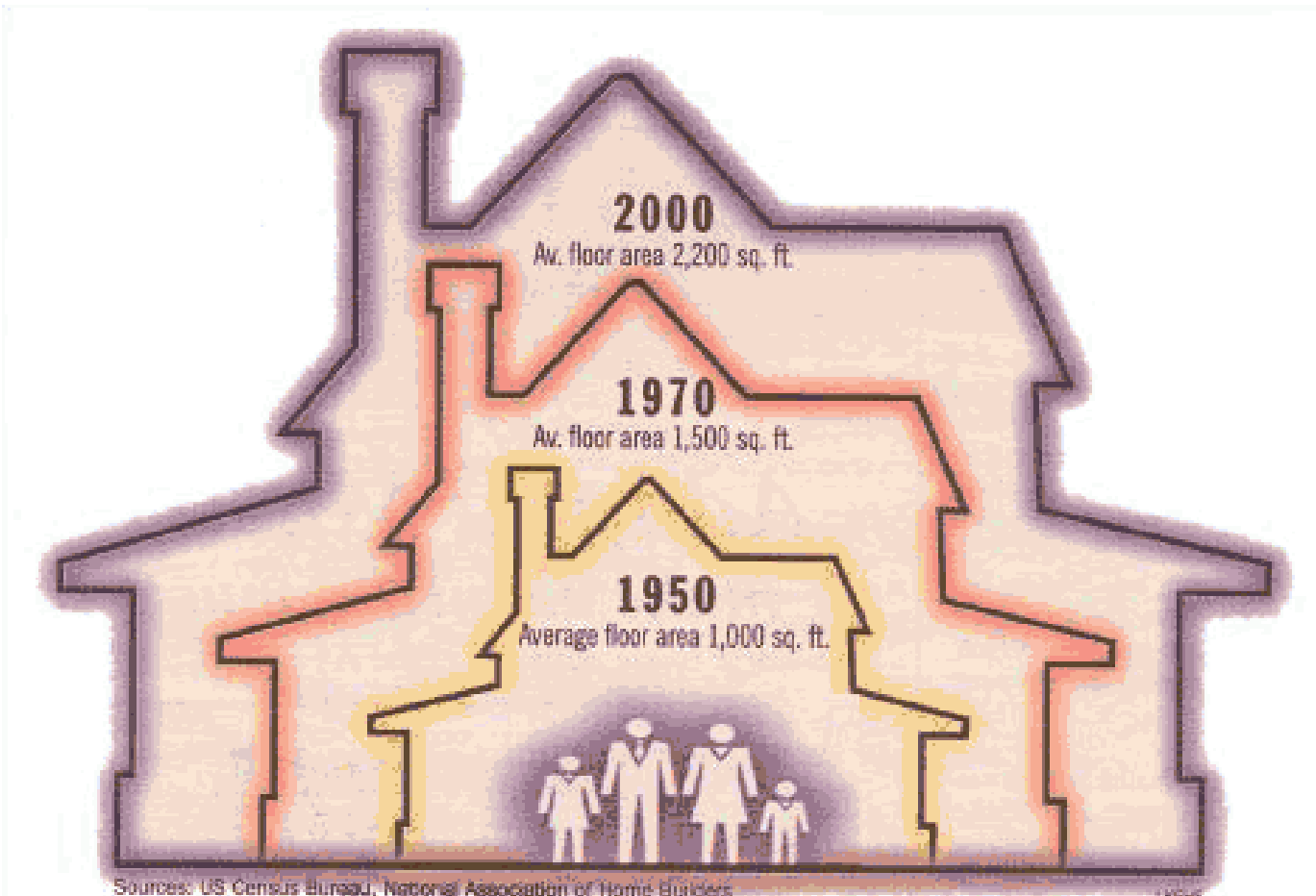
- Building envelope – 23%
- Heating, ventilation & cooling – 14%
- Sustainable site – 14%
- Interior Finishes – 13%
- Green power, lighting, appliances – 12%
- Plumbing systems – 6%
- Structural elements – 6%
- Roofing – 3%
- Exterior finishes – 3%
- Other – 6%



# Scottsdale Green Builder Choices 2005 - 2006



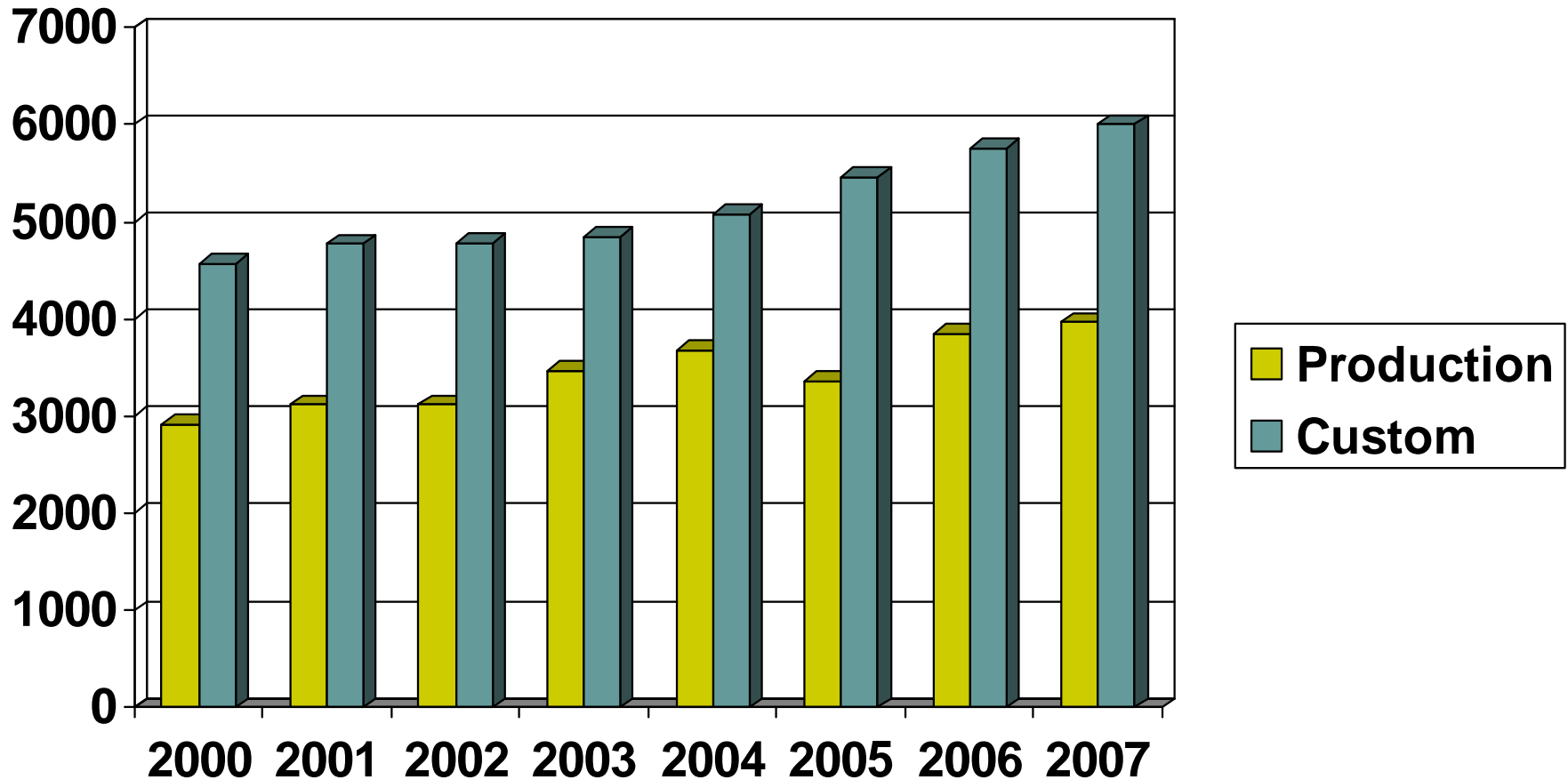
# National House Size Growth



1950 3.37 people per household - 297 s.f. per person  
1970 3.14 people per household - 478 s.f. per person  
2000 2.62 people per household - 840 s.f. per person

# Scottsdale House Trends

## House Size



# Scottsdale House Trends

- Energy Efficiency
  - Cathedralized attics
  - At least 15% better than baseline energy code
  - Half of green homes are 25% or better
- Passive design
  - Shaded building entrances
  - Courtyards
  - Shaded patios and outdoor living spaces
- Water Efficiency
  - Demand controlled hot water recirculation pumps

# 2007 Accomplishments

- Updated Green Home Rating Process
- Green Multi-Family Rating Checklist
- Green Tenant Improvement Rating Checklist
- Energy code and green building related amendments as part of 2006 I-Code adoption process
- Granite Reef Senior Center Dedication as the city's first LEED Gold certified public facility
  - Tours conducted throughout year



# Granite Reef Senior Center



Gabor Lorant Architects

**Scottsdale's 1<sup>st</sup> LEED Gold certified city facility – April 2007**



## **Scottsdale Senior Center at Granite Reef**

Partnership with SRP electric utility company to provide solar electric (PV) shade canopy using transparent solar panels and roof mounted solar electric (PV) panels.



**Lost Dog Wash Trailhead Building -**  
McDowell Sonoran Preserve





## **Scottsdale Fire Station No. 602**

Completed July 2008

Solar, cool tower, graywater, rainwater harvesting, pervious paving

# 2007 Accomplishments

- **Green Building Expo – Oct. 5th and 6th**
  - 10,000 attendees over the course of two days
  - 120 exhibitors
  - 24 educational sessions along with a concurrent Sustainable Film Festival
  - Demonstrations including the solar energy, Segway personal transport vehicle and the latest in electric and alternative fuel cars



# **Green Building Expo**

## **Scottsdale Center for the Performing Arts**

**Exhibits, Demonstration  
and Speakers**



## Green Building Expo Scottsdale Center for the Performing Arts

Solar Cook Off Competition

# 2007 Accomplishments

- **Valley Forward Environmental Excellence Award**
  - GB Expo Committee and collaborative of the cities of Scottsdale, Phoenix and Tempe



# Lectures and Workshops



City of Scottsdale  
**Green Building  
Lecture Series**

Exploring a systems approach to design & construction, including: energy / resource efficiency, healthy & environmentally responsible building practices and much more.

**Presented By:**  
City of Scottsdale Green Building Program

**1st Thursday each Month  
7-9 PM**

**Location:**  
Granite Reef Senior Center  
1700 N. Granite Reef Rd.  
Scottsdale, AZ

**Information:**  
Scottsdale Green Building Program  
(480) 312-2245

**Website:**  
[www.scottsdaleaz.gov/greenbuilding](http://www.scottsdaleaz.gov/greenbuilding)

**Subscribe to:**  
Green Building Events  
Go to  
[www.scottsdaleaz.gov/listserve](http://www.scottsdaleaz.gov/listserve)

## Green Building

### Lecture Series Schedule

FALL / WINTER 2007-2008

#### Free Monthly Lecture Series

Date	Topic
September 6	<b>Intro To Green Home Building Standards</b> An overview of the green building standards including incentives, benefits, strategies, and materials compatible with our Sonoran Desert Environment
October 5 & 6	<b>Green Building Expo</b> (Location Change: Scottsdale Center for the Performing Arts) Please visit the website for lecture schedules and details. <a href="http://www.greenbuildingexpo.com">www.greenbuildingexpo.com</a>
November 1	<b>Natural &amp; Reclaimed Building Materials</b> Regional materials that are compatible with our harsh desert environment, abundant, rapidly renewable, and support the local economy. Learn about opportunities to reuse quality materials and divert waste from our landfills.
December 6	<b>Alternative Materials: Green Pioneers</b> New building products and techniques for Green Building showing innovative entrepreneurial pioneers making Green a reality. **Includes a Building Materials Showcase** Presented by Rick Johnson, Inventor of IMSI Reinforced Insulated Masonry
January 3	<b>Home Improvements &amp; Green Remodeling</b> Green is everywhere. We will discuss how you make practical and healthy decisions for your home in the current sea of green. The presentation includes examples and an opportunity to get professional feedback on your specific questions & concerns. Presented by Anne Bertino of Bertino-Baumann Design Group & Mick Dalrymple of a.k.a. Green.
February 7	<b>Building Science: The Systems Approach to Energy Efficiency</b> Learn about the principles of heat flow to create an energy efficient, safe, comfortable and healthy home. Hear about diagnostic tests used to evaluate energy performance problems and their possible solutions.
March 6	<b>Indoor Environmental Quality</b> Indoor air pollutants can be six times higher than outdoor air. This lecture will address strategies for minimizing indoor pollutants including material selection, ventilation and filtration.
April 3	<b>Water Efficiency in the Sonoran Desert</b> An overview of water conservation practices, including indoor plumbing fixtures, xeriscape, gray water & rainwater harvesting
May 1	<b>Innovative Green Built Projects (in the Phoenix / Scottsdale Area)</b> See innovative local projects that excel from the synergistic benefits of energy efficiency, renewable resources, water efficiency, and climate responsive design.
June 5	<b>Green Feng Shui</b> This lecture will highlight new design strategies blending the eastern practice of Feng Shui and the basics of green design for greater harmony & health.

- **Green Building Lectures**
  - 1<sup>st</sup> Thursday of each month
  - avg. attendance is 45
  
- **Solar Lectures**
  - 3<sup>rd</sup> Thursday of each month
  - avg. attendance is 25

# Design Day & Info Fair

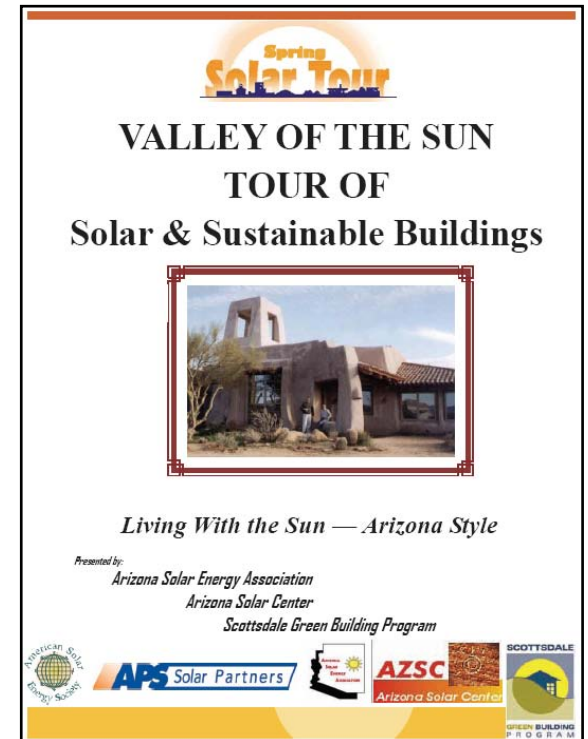


Volunteer Design  
Professionals

- Co-sponsored by the Citizen & Neighborhood Resources Dept.
- Free design consultation for South Scottsdale residents
- Held in at local High School
- Remodeling information tables & exhibits

# Tours and Outreach

- Green Building Tours
- Green Building Newsletter
- Presentations and exhibits at community & association events
- Collaboration with other cities, state/county agencies, utilities, associations and educational institutions





# 2007 Accomplishments

- ICC video on Scottsdale's green building initiatives
- Green Building/Sustainability chapter
  - 2007 edition of the Building Department Administration book
- Spring and Fall Green Building Class at AZ ICC Education Institute
- Scottsdale Green Building presentation made to MAG Building Codes Committee

# 2007 Accomplishments

- City representation on US Green Building Council's Building Codes Committee
- City representation on NAHB/ICC Green Standard Development Committee
- City representation on LEED for Homes pilot program

# Scottsdale's Energy Performance

Estimated energy savings and equivalent greenhouse gas reduction resulting from houses completed under the Green Building Program.

Energy Measures	Savings	
	1998 to 2007	
	Per Home	Annual Cumulative Savings for 1,150 homes
Average Home Size	3,800 square feet	
Average Annual Energy Reduction	2,830 Kilowatt hours (kWh) per year	3,254,500 Kilowatt hours (kWh)
Average Annual Energy Savings	\$283 per year	\$325,450
Annual Greenhouse Gas Reduction	2,700 pounds of carbon dioxide (CO <sub>2</sub> )	3,105,000 pounds of carbon dioxide (CO <sub>2</sub> ) avoided
Equivalent Cars removed from Street	1/5 the annual emission of an average car	annual emission of 239 average cars