

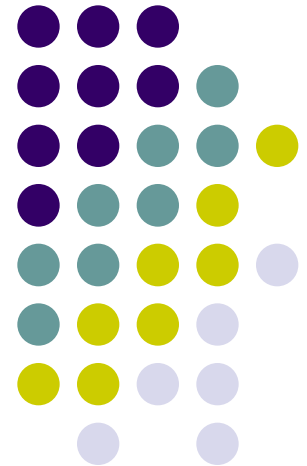
Scottsdale Green Building Trends



City of Scottsdale Green Building Program

January 2013

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City of Scottsdale
Office of Environmental Initiatives



Scottsdale Environmental Initiatives

1. Indian Bend Multi-Use Wash
2. Environmentally Sensitive Lands Ord.
3. Natural Area Open Space
4. McDowell Mountain Preserve
5. Sensitive Design Principles
6. Green Building Program



SCOTTSDALE





Green Building Program

- Established in 1998 as a voluntary program for private sector development
 - staff and citizen initiative
- Rating criteria
 - residential and commercial projects
- Verification Process
 - integration with building plan review, permits and inspections
- Green Building Advisory Committee
 - program input, policy development and outreach



Green Building Program Incentives

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



Lectures and Workshops

SCOTTSDALE



GREEN BUILDING PROGRAM

2011-2012 Green Building Lecture Series

at **Granite Reef Senior Center**

1700 N. Granite Reef Northwest corner of McDowell & Granite Reef

Free Admission

Sept 1, 2011 - 7:00 to 8:30 pm
What Happens When Green Becomes Code?
Scottsdale City Council recently adopted the International Green Construction Code (IgCC) as the core of the city's voluntary Commercial Green Building Program. Learn about the IgCC and how it will make it easier for developers of commercial and multi-family housing to "go green."

Oct 6, 2011 - 7:00 to 8:30 pm
Energy Efficiency Technologies
Can advances in technologies reduce or even reverse negative impacts on our natural resources and environment? Hear about new and cutting-edge technologies that reduce our energy consumption, curtail our reliance on external energy sources and lower our energy bills.

Nov 3, 2011 - 7:00 to 8:30 pm
Sustainable Cities
Can cities exist in balance with our Sonoran desert ecosystem? Scottsdale planning staff will discuss on-going efforts to protect our desert ecology, mitigate the urban heat island effect, increase pedestrian connectivity, enhance bicycle mobility, support urban compact development, and minimize nighttime light pollution.

Dec 1, 2011 - 7:00 to 8:30 pm
Rainwater and Graywater
Is there enough annual rainfall in the desert to collect and reuse? Is rainwater the same as stormwater? What is graywater and what can we do with it? Learn about successful rainwater harvesting and graywater projects and what you can do to reduce demand on the desert's most precious resource.

Feb 2, 2012 - 7:00 to 8:30 pm
Green Neighborhoods
Green isn't just about buildings. Hear about efforts to create compact, walkable, mixed-use neighborhoods and spaces that encourage social interaction. Explore community gardens that promote a sense of community and physical activity while providing access to fresh, locally grown produce.

Mar 1, 2012 - 7:00 to 8:30 pm
Cooling and Heating Options for Your Home
Did you know that 43% of all electricity consumed in Phoenix metro area homes is used for air conditioning? How can you improve the comfort of your home and reduce the energy required to cool and heat? Find out about new and alternative cooling and heating systems. Learn how to improve your existing system.

Apr 5, 2012 - 7:00 to 8:30 pm
Water Saving Technologies
Did you know that 70% of city-supplied potable water is used primarily for landscape irrigation and 30% of the remainder is used for flushing toilets? Learn about EPA's WaterSense plumbing products and irrigation technologies that can reduce your water consumption by 20-30%. Obtain landscaping tips to reduce irrigation needs while providing a healthy and beautiful environment.

May 3, 2012 - 7:00 to 8:30 pm
Indoor Environmental Quality and Healthy Homes
Air pollutant levels inside an energy efficient tightly-sealed home can be six times higher than outdoor levels. Learn strategies to improve indoor environmental quality and well-being, including tips on material selection, green labeling, fresh air ventilation, filtration and daylighting.

Jun 7, 2012 - 7:00 to 8:30 pm
Innovative Green Projects in the Valley
Are you ready for the future? Explore innovative and trendsetting projects that excel in energy efficiency, material resources, water reuse, and unique building design solutions.

For more information on the Green Building Lecture series
Please call 480-312-3111
To receive a reminder about these and other Green Building Events, Subscribe at:
<https://eservices.scottsdaleaz.gov/listserve/>

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



Scottsdale Building Trends 1998 – 2012

● Energy Efficiency

- Cathedralized attics (insulation at roof deck)
- All buildings constructed from 2006 to 2012 are 15% or more efficient than national energy code (2006 IECC)
- Adopted 2012 Energy Code is 30% more efficient

● Heat Island Mitigation

- Shaded building entrances, courtyards, outdoor living spaces and limited hardscape surfaces

● Water Efficiency

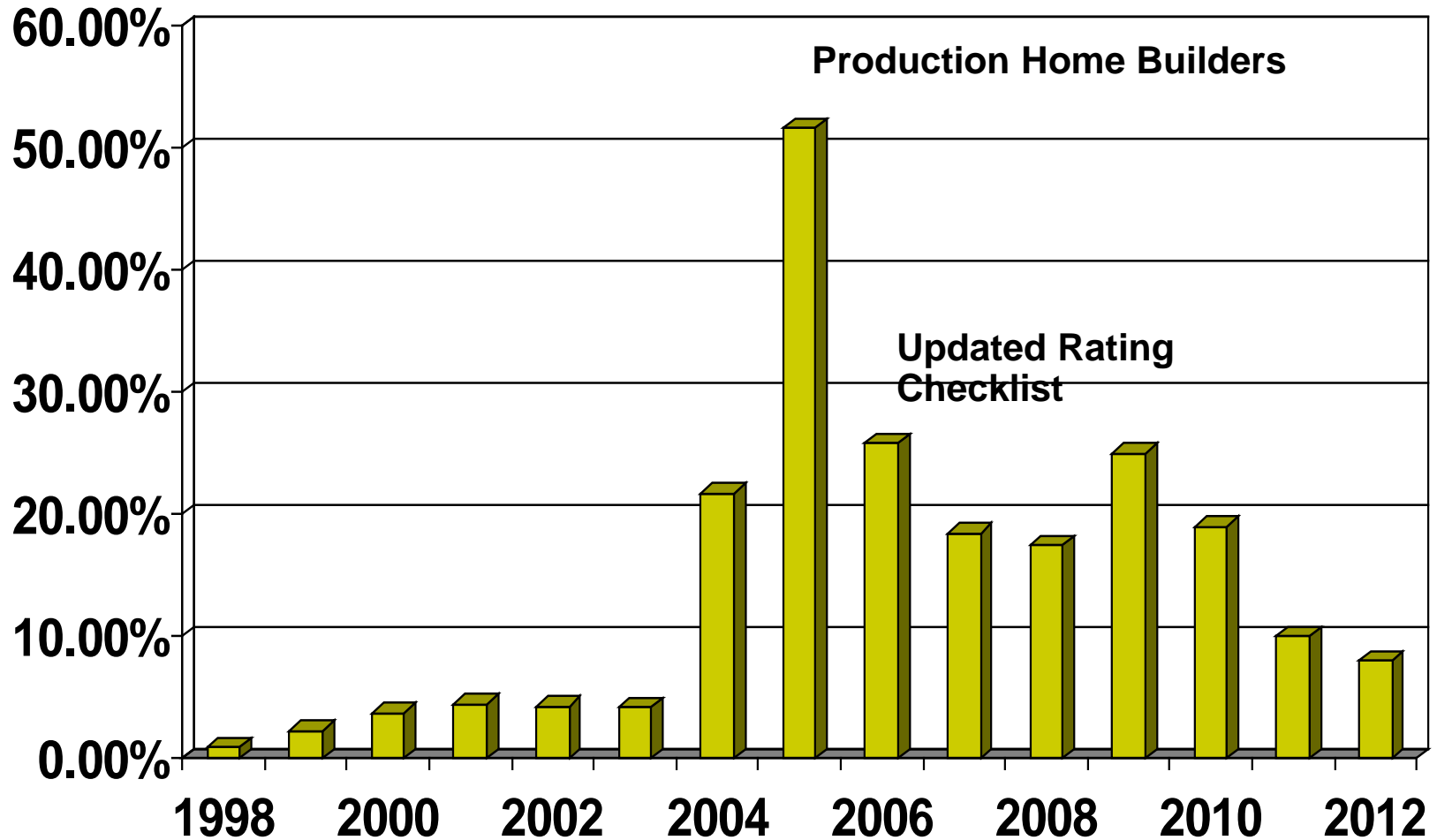
- Xeriscaping and efficient irrigation systems
- High efficiency plumbing fixtures
- Hot water circulation systems



● Active Solar Systems

- Significant increase in permits for photovoltaic (solar electric) and solar hot water system

Green Single Family Permit Activity



Source: Scottsdale CDS records

Green Single Family Permit Activity (1998 - 2012)

Year	Total Permits	Green Permits	Percentage of Total Permits
1998	2172	20	1%
1999	1554	36	2%
2000	1076	41	4%
2001	843	38	5%
2002	768	33	4%
2003	896	38	4%
2004	1137	247	22%
2005	852	439	52%
2006	685	177	26%
2007	573	106	19%
2008	200	35	18%
2009	121	30	25%
2010	149	28	19%
2011	155	15	10%
2012	265	21	8%
Total	11,446	1,304	11%

Source: Scottsdale CDS records



2012 Quarterly Green Single Family Permits

2012 Quarter	Total SF Permits	Green SF Permits	Percentage of Total Permits	YTD Percentage
1 st	63	6	10%	10%
2 nd	63	2	3%	6%
3 rd	59	8	14%	9%
4 th	80	5	6%	8%
TOTAL	265	21	8%	8%

Source: Scottsdale CDS permit records

Energy Performance of Scottsdale Green Homes

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

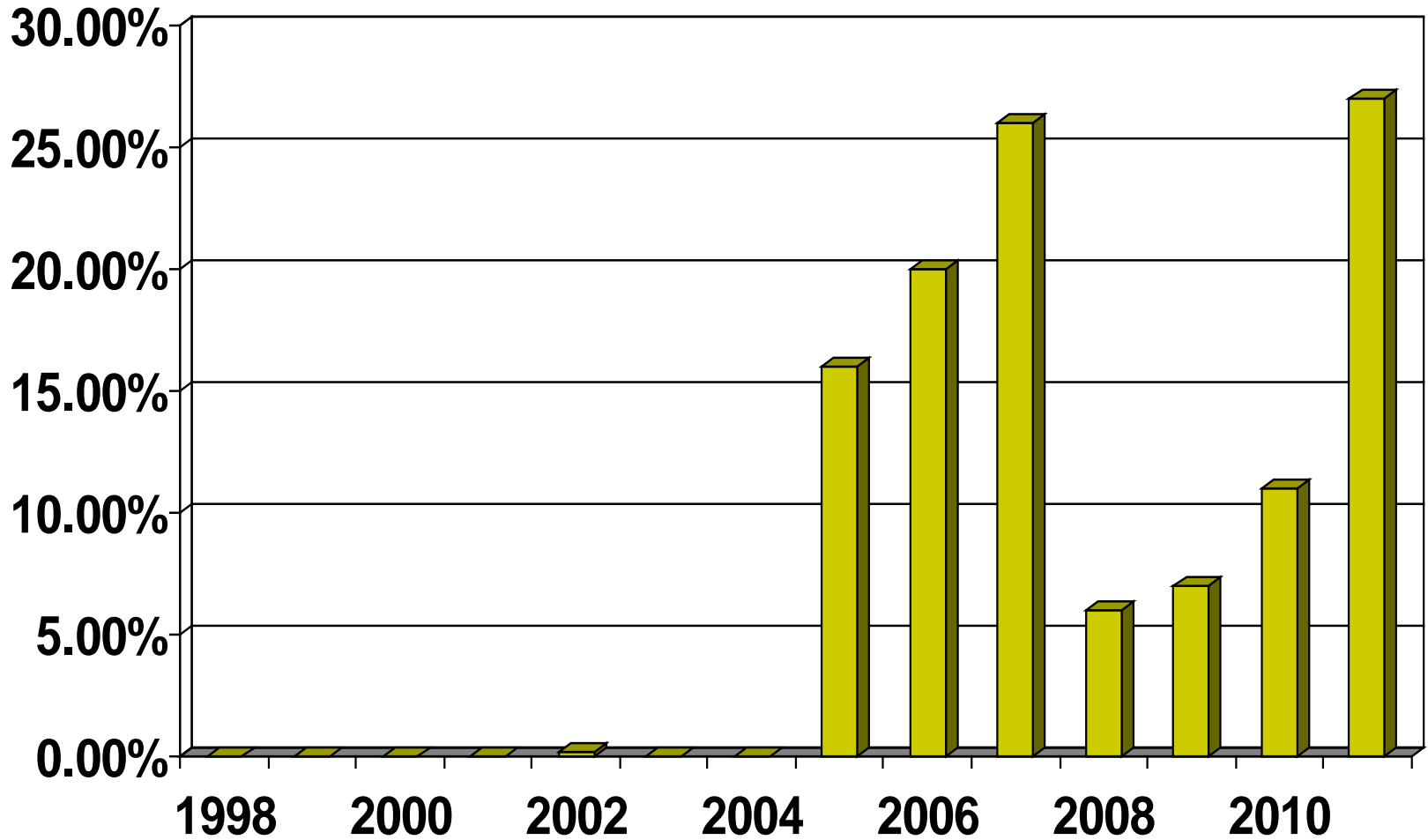
Green Home Energy Measures	Savings and Pollution Reduction	
	1998 to 2012	
	Per Home	Annual Savings for 1,304 homes as of 2012
Small Custom Home Size (based on 2009 energy performance study)	2,700 square feet	
Average Annual Energy Reduction	14,390 Kilowatt hours (kWh) per year	18,764,560 Kilowatt hours (kWh)
Average Annual Energy Savings	\$526 per year	\$ 685,904
Annual Greenhouse Gas Reduction	3 tons of carbon dioxide (CO ₂)	3,912 tons of carbon dioxide (CO ₂) avoided
Equivalent Cars removed from Street	36% of annual emission of average car (8.25 tons/year)	469 cars

Energy Performance of Scottsdale Green Homes

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

Green Home Energy Measures	Savings and Pollution Reduction	
	1998 to 2012	
	Per Home	Annual Savings for 1,304 homes as of 2012
Average Custom Home Size (based on 2009 energy performance study)	5,500 square feet	
Average Annual Energy Reduction	34,670 Kilowatt hours (kWh) per year	45,209,680 Kilowatt hours (kWh)
Average Annual Energy Savings	\$1,598 per year	\$2,083,792
Annual Greenhouse Gas Reduction	7 tons of carbon dioxide (CO ₂)	9,128 tons of carbon dioxide (CO ₂) avoided
Equivalent Cars removed from Street	85% of annual emission of average car (8.25 tons/year)	1,108 cars

Green Tenant Improvement Permits



Source: Scottsdale CDS records

Green TI and Condo Unit Build-outs (1998 - 2011)

Year	Total Permits	Green Permits	Percentage of Total Permits
1998	1732	0	0
1990	1789	0	0
2000	1366	1	0.07
2001	1003	0	0
2002	832	2	0.2
2003	1149	0	0
2004	982	0	0
2005	1121	181	16%
2006	1328	264	20%
2007	1019	265	26%
2008	638	41	6%
2009	193	13	7%
2010	354	37	11%
2011	227	61	27%
Total		865	

Source: Scottsdale CDS records



Solar Permits - 2012

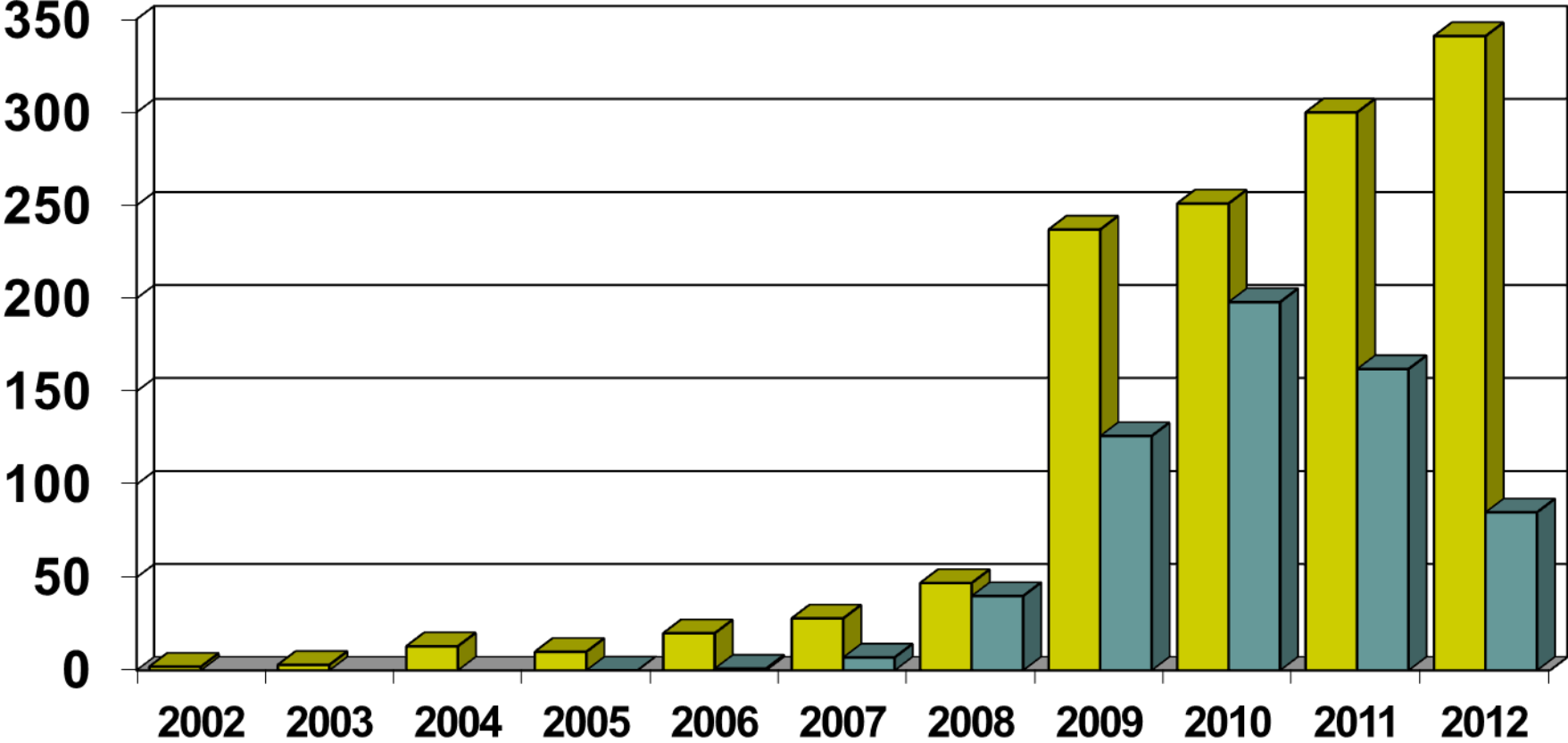
Solar Demand Continues to Grow

2012 Quarter	Solar Electric PV Permits	Solar Hot Water Permits	Total Permits
1st	77	25	102
2nd	95	17	112
3rd	81	22	103
4th	88	21	109
Total	341	85	426

Source: Scottsdale CDS permit records

Solar Permits 2002 to 2012

Solar Demand Continues to Grow



Source: Scottsdale CDS permit records

Solar Permits 2001 to 2011

Solar Demand Continue to Grows

Solar Electric (PV)

1,253 solar PV permits issued

Year	01	02	03	04	05	06	07	08	09	2010	2011	2012
No. of Permits	1	2	3	13	10	20	28	47	237	251	300	341

Solar Hot Water

619 solar hot water permits issued

Year	01	02	03	04	05	06	07	08	09	2010	2011	2012
No. of Permits	-	-	-	-	0	1	7	40	126	198	162	85

Source: Scottsdale CDS permit records