

Building Energy Codes and Beyond-Code Standards for Arizona Local Governments

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Southwest Energy Efficiency Project (SWEEP)



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Southwest Energy Efficiency Project (SWEEP)

- Public interest initiative promoting greater energy efficiency in AZ and southwest states
- Founded in 2001
- Board of Directors includes utility, state government, national laboratory, and private sector representatives
- Funding provided by the Energy Foundation, Hewlett Foundation, U.S. Department of Energy, and the U.S. Environmental Protection Agency

www.swenergy.org

Energy efficiency...

- Is the lowest cost energy resource – only 2 to 3 cents per kWh saved
- Can reduce customers' energy bills by 10% to 50%
- Would create over 12,000 new jobs in Arizona by 2025
- Would keep more of the energy economy in Arizona (currently, \$9.9 billion of the \$14.5 billion that Arizona businesses and consumers spend on energy leaves the state each year)
- Makes homes more affordable (and mortgages secure) when total housing costs are considered

SWEEP Recommendations

- Design and implement cost-effective energy efficiency programs in the utility sector
- Adopt energy efficiency goals and funding mechanisms to support utility sector energy efficiency programs
- Update building codes, support code implementation
- Adopt appliance/equipment standards
- Promote highly efficient new buildings (high performance, zero-net energy) and beyond-code building standards
- Adopt “best practices” in public sector energy management to lead by example
- Adopt utility rate, pricing, and market reforms
- Incorporate EE in air pollution reduction strategies

SWEEP's Report (Dec. 2008)



Going Beyond Code:

**A Guide to Creating Energy Efficient and Sustainable Buildings
in the Southwest**

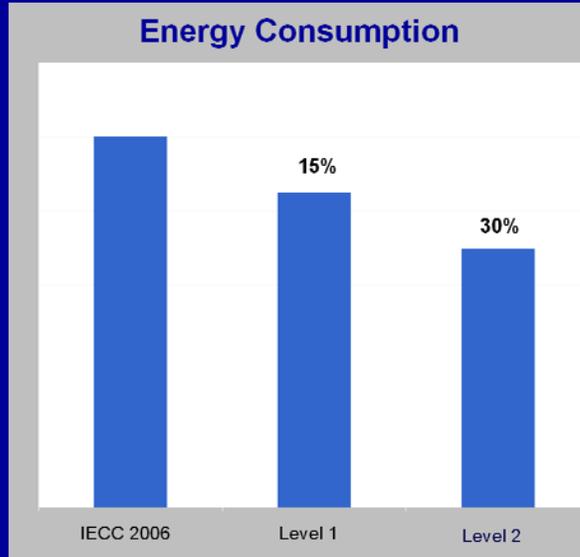
<http://www.swenergy.org/buildingefficiency/codes/beyondcode/index.html>

New Homes – Three Part Approach

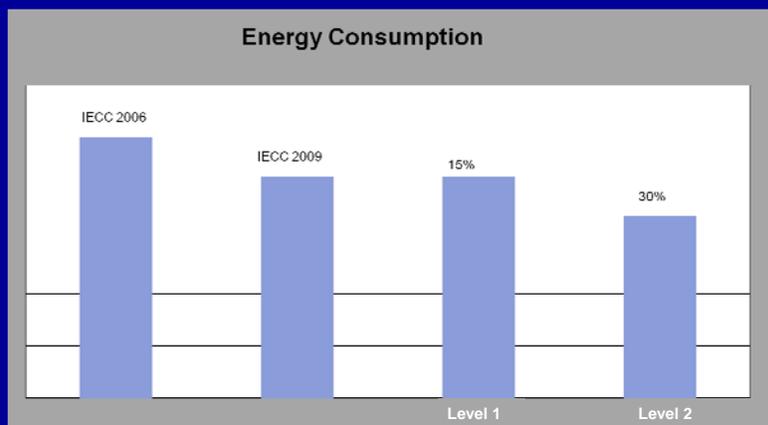
1. Push the envelope/high performance
 - “Zero-net energy” and high performance homes (at least 30% more energy efficient)
 - Coordinated/integrated with on-site renewables
2. Mainstream/mass market
 - Energy Star homes (15% more efficient)
3. Raise the bottom/building energy codes
 - Building energy codes and standards (IECC 2006), with code support and training
 - 2009 IECC will be roughly 15% more efficient

Energy Use in New Homes

- Level 1 programs include:
 - Scottsdale, Pima County and Buckeye Green Building Programs
 - Energy Star
 - 15% more energy efficient
- Level 2 programs include:
 - High performance beyond-code (at least 30% more energy efficient than 2006 IECC)



IECC 2009 Comparison



IECC 2009

- The proposals adopted by the ICC represent the most significant improvement in the energy efficiency code requirements, including the first requirement for energy efficient lighting, and performance testing and inspection requirements for the thermal envelope and ductwork. The additional energy efficiency measures that are in the 2009 IECC include:
 - Increased insulation in basements, floors and walls;
 - Improved window efficiency;
 - Reductions in wasted energy from leaky heating & cooling ducts;
 - Reductions in tradeoffs that fail to capture energy savings from efficient heating & cooling equipment;
 - High-efficiency lighting (50% of lamps must be high efficacy); and
 - Improved air sealing within the building envelope.

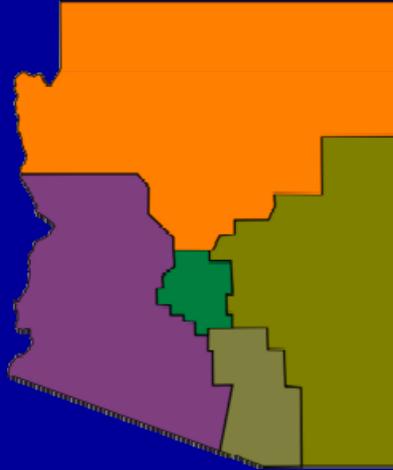


Beyond Code Leadership

- States and local jurisdictions in the Southwest region are leaders in developing programs and policies to promote energy efficient building practices, building energy codes, and green building initiatives and criteria.
- Based on the successful experience of these “early adopters,” there are many local jurisdictions in the Southwest that are either actively developing beyond code requirements, or are interested in incorporating elements of voluntary programs into mandatory codes.
- Factors driving this interest include the region’s rapid growth rate, local and regional interest in advancing “green building” practices, heightened concern about climate change, and rising energy costs.

Best Approach?

- Building energy code, beyond-code standard, both?
- Statewide, local, or coordinated?
- Voluntary, mandatory, or hybrid?
- Energy-focused or broader “green” or LEED requirements?
- When?



SWEEP Recommendations

- Building energy code
 - Early/timely adoption of 2009 IECC
 - Statewide, local, or coordinated adoption?
- Beyond-code building standard
 - At least 30% more energy efficient than 2006 IECC (since 2009 IECC is 15% more efficient)
 - Uniform or consistent minimum requirements across jurisdictions
 - Coordinated adoption

High Performance Homes are More Affordable

**Table 16 – Potential Annual Cost Savings to Homeowner in Phoenix, Arizona:
30% above the IECC**

Estimated incremental first cost, relative to standard practice	\$3,200
Annual amortized cost, 7%, 30-year mortgage	\$210
Estimated annual utility bill savings	\$760
Net annual savings	\$550

Net cost savings and lower monthly costs (mortgage + utilities) compared to a typical conventional new home, from day one

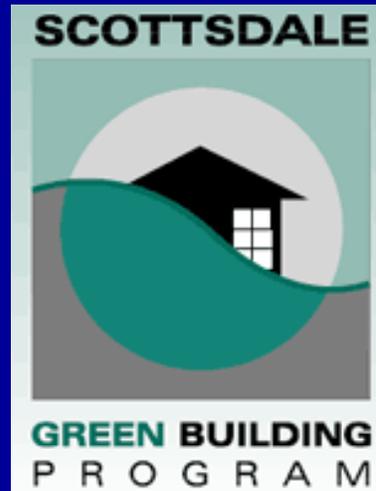
Complying with the 2009 IECC at the Lowest First Cost

- Efficient thermal envelope
- Reduced infiltration
- Reduced duct loss
- Reduction in cooling/heating system sizing
- Reduced duct sizing
- Plan to run ducts in conditioned space
- Further reduction in cooling/heating system sizing
- Lower first cost, lower operating cost



Keys to an Effective Beyond Code Program

- Stakeholders involved in the process
- Established goals, leadership/support from policy makers
- Implementation, integration and staffing
- Incentives to go beyond code
- Communication, partnerships and education



Federal EE Proposals

- EE as part of the Economic Stimulus
 - EE provides more jobs per million \$ invested
 - EE programs are “shovel ready” and can be ramped up quickly
 - Proposals range from \$10B to \$50B for EE
 - Matching funds for state EE programs and block grants through state energy offices
- Energy Efficiency Resource Standard (EERS) – 10% or 15% by 2020
- Energy Bill (policies and funding)
- Climate Change Bill (effective in 2012?)

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