



Summary of Major Energy Efficiency Codes and Standards April 8, 2007

International Energy Conservation Code (IECC): This standard replaced the Federal Model Energy Code (MEC). It was adopted by the International Code Council in 1998 for the Universal Building Code (UBC). The UBC replaced and unified the three building code organizations that used to cover the country. The IECC is the basic energy building code for the U.S. and covers overall building energy performance. IECC-2003 is the starting point for **Energy Star** and **ASHRAE 90.1**.

Home Energy Rating System (HERS): HERS is the method of scoring the relative energy efficiency of a dwelling unit. Under the “old” system using the MEC, a HERS score of 100 meant the unit used no energy. When the standard shifted to the IECC, HERS changed its rating system to the HERS index, in which a score of 0 meant the unit used no energy.

HERS, like the IECC, looks at the ceiling, floor and wall insulation, the thermal and shading value of windows, air infiltration, mechanical equipment, duct insulation and leakage, and now lighting and appliances to arrive at its index. It is the rating system that is the basis for **Energy Star**.

Energy Star: This is the standard developed by the federal Environmental Protection Agency and Department of Energy to indicate a better-than-code energy efficient home in single family and low-rise buildings (up to three stories). Energy Star generally requires that the HERS index be 85 (15 percent better than the 2003 IECC) to qualify as an Energy Star home. In very cold areas of the country, Energy Star requires a more stringent HERS index of 80. The Energy Star program also treats California and the Pacific Northwest differently based on local energy codes, typically requiring a 15 percent increase in efficiency (see **Title 24** below).

Energy Star is the standard for energy efficiency for the **Green Communities Criteria** (single family and low-rise), **LEED for Homes**, Earthcraft (a leading standard developed by Southface Energy Institute) and a number of other national, regional and local standards.

Energy Star is pilot testing a high-rise multifamily program using the **ASHRAE 90.1-2004** standard plus 20 percent increased efficiency as its basis, as well as an Energy Star Indoor Air Package (IAP) which relies heavily on another ASHRAE standard for ventilation (ASHRAE 62.2).

American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE):

This organization creates a number of standards for building engineers and generally applies to commercial, institutional and large residential buildings. For energy efficiency, ASHRAE developed standard 90.1, which initially was pegged to the MEC (1989) but has now shifted to the IECC. This standard basically equates to the IECC. In other words, better-than-code energy efficiency standards require increased efficiency over ASHRAE 90.1-2004—for example, 20 percent better for the Energy Star multifamily pilot program mentioned previously. There have been revisions to 90.1 in 2001 and 2004 to keep up with changes in the IECC. A 2007 revision is expected.

ASHRAE also has a ventilation standards 62.1 and 62.2, for low-rise and high-rise residential buildings, respectively. This sets standards for bath, kitchen and whole unit ventilation. It is the basis for part of Energy Star's Indoor Air Package and is referenced in the **Green Communities Criteria**.

Title 24: This is California's energy efficiency standard. The current version is Title 24-2004. Energy Star for California calls for 15 percent greater efficiency than Title 24-2004.

Green Communities Criteria: This is the holistic national framework for sustainable affordable housing, developed by Enterprise and a number of partners in 2004. The Green Communities Criteria apply to new construction as well as rehabilitation of single family and multifamily buildings of all sizes. For energy efficiency, the Green Communities Criteria requires compliance with Energy Star for single family and low-rise residential buildings and ASHRAE 90.1-1999 plus 30 percent or ASHRAE 90.1-2004 plus 20 percent for high rise buildings (the new Energy Star multifamily standard). A more flexible standard based on a 10-year payback of costs applies to rehabilitation projects. The Green Communities Criteria will be revised in 2007 to reflect the more recent standards.

LEED for Homes: The U.S. Green Building Council is finalizing a national rating system for homes under its Leadership in Energy and Environmental Design (LEED) framework. This is the residential version of the developed by the US Green Building Coalition (USGBC) which initially targeted commercial and institutional buildings. LEED for Homes is completing a pilot phase and expected to be finalized in 2007. The program has adopted Energy Star as its standard. It does not apply to high-rise residential. LEED for Homes covers much of the same territory as GC but uses a different scoring process.

2030 Challenge: This initiative is concerned primarily with carbon emissions, which is relative to the amount of energy required to operate a unit. It is spearheaded by Ed Mazria, an architect, and a group of climate scientists that have developed a model relating carbon in the atmosphere to global warming and climate change. This program is pushing for all new and rehabilitated building to reduce energy usage to 50 percent of the local average immediately and to further reduce that amount incrementally every five years to achieve "carbon neutral" buildings by 2030. The group predicts dire consequences for the climate including a substantial rise in sea level if these targets are not achieved.