

Nashville Habitat ENERGY STAR Case Study

Introduction

In Nashville Tennessee, the Nashville Area Habitat for Humanity has adopted Energy Star guidelines for all of its projects. The organization was awarded the 2008 ENERGY STAR Award for Excellence in Energy-Efficient Affordable Housing by the U.S. Environmental Protection Agency (EPA) and the Department of Housing and Urban Development (HUD) in recognition of its efforts to provide energy-efficient housing for low-income residents. Since the program was founded in 1985, Nashville Habitat has constructed 373 homes for more than 1,300 family members. In 2006, the program began promoting the use of Energy Star products and, by the end of 2008, had constructed 118 homes that were Energy Star certified. Nashville Habitat is making an ongoing effort to expand the use of Energy Star in their housing program.

Construction Details

Energy efficiency measures that are included in Nashville Habitat's Energy Star requirements include R-38 attic insulation, 2x6 wall construction with R-19 insulation, R-5 foam board insulation for slab on grade, and radiant barrier roof decking. Windows are Energy Star rated with low-e glazing and a U-value of 0.37 and a SHGC of 0.31. Nashville Habitat also installs tank-type electric water heaters with a thermal efficiency of 98%. For interior spaces, lighting is provided by Energy Star labeled compact fluorescent light (CFL) bulbs that significantly reduce energy consumption compared to traditional lighting strategies. High efficiency heating and AC equipment with 13 SEER is used along with Energy Star rated appliances.

Costs

The units constructed by Nashville Habitat are two bedroom units that range in size between 1,100 and 1,500 square feet. The cost to build a typical home is \$60,000, while the added costs to achieve Energy Star certification is about \$600, or 1% of the total cost of materials.

Project Funding

Funding sources for Nashville Habitat's projects include the Whirlpool Corporation, which supplies Energy Star certified refrigerators via a partnership with Habitat for Humanity International, rebates from the Nashville Electric Service (NES) and Tennessee Valley Authority (TVA), and also from individual home sponsorships. Individual home sponsorships come from corporate, foundational, and faith-based sponsors that contribute the \$60,000 toward building material costs for each home and provide volunteer labor to help construct the home. The rebate received from NES is exactly \$600, which is enough to completely cover the added cost of implementing Energy Star.

The program is aimed at low income individuals that are below the 50 percent HUD median income level and 40 percent of participating families come from Section 8 housing. Typical Nashville Habitat partner families are headed by a single parent with 2.3 children and an average annual income of \$21,846. Families are all first-time homeowners with stable employment, a housing need, and have a willingness to participate in the program. These families purchase their homes, priced below market value, by signing a 20–30 year, 0% interest mortgage. Mortgage payments average between \$350 and \$550 monthly, which is about 44% less than Fair Market Rent (\$678 for a 2-bedroom unit) in Nashville.

Benefits

Many benefits, both monetary and non-monetary, are achieved by building Energy Star certified affordable housing. The Energy Star certified homes built by Nashville Habitat save each homeowner an average of \$835 per year for a total savings of \$98,525 per year for all 118 houses. Energy consumption was reduced by 46% compared to non-Energy Star homes. Greenhouse gas emissions are also significantly reduced by building Energy Star. Each year, the 118 Habitat Energy Star homes will produce approximately 676,258 kilograms of carbon dioxide compared to 1,167,020 produced by 118 non-Energy Star Habitat homes. The money saved each year from reduced utility bills homes increases the amount of discretionary funds that are available for necessities such as food, medical attention, education supplies for their children, and childcare.

Total Construction Cost	Added Cost for E*	% Cost Increase	Annual Savings	Payback (yrs)
\$ 60,000	\$ 600	1%	\$ 835	0.7

By implementing Energy Star guidelines along with accessibility and visitability standards, and universal design, partner families are more comfortable and more likely to feel safe and familiar within their communities. The Habitat program also empowers low-income residents to successfully own a home by teaching them about educational advancement, savings accounts, planning for retirement, and basic investments.

By using Energy Star guidelines, Nashville Habitat is able to pursue more competitive funding opportunities with HUD financed building projects through the local housing authority, MDHA (Metropolitan Development and Housing Agency) and Habitat for Humanity International. HUD projects ask bidders to incorporate a variety of programmatic outcomes into their proposal including utilizing ENERGY STAR guidelines where possible. Local area for-profit builders have become aware of Nashville Habitat (and its participation in Energy Star) and are investigating the benefits to include in their programs.

Challenges

One of the problems encountered by the Nashville Habitat is that not all vendors provide the energy efficient products that Nashville Habitat requires. Nashville Habitat has had to change purchasing and procurement policies to reflect selectiveness in buying from vendors that utilize Energy Star guidelines.

Rater Involvement

The rating process is instrumental to Nashville Habitat in several ways. The rating provides a quantifiable measurement of the energy efficiency of the affordable housing units and gives Nashville Habitat and its prospective families the piece of mind in knowing that each house is built and certified to meet the high energy efficiency standards of Energy Star. During the rating process, the HERS rater performs a blower door test, duct pressure test, foundation inspection, insulation inspection, and final inspection of all equipment installations. A rating typically takes half a day per house and has a cost of around \$400.

Training

A variety of training courses are offered to homeowners and children of participating families. Nashville Habitat offers HomeWORKS classes that are designed to educate homeowners about the various aspects of homeownership since most of the families in the program have never owned a home before. Courses

are designed to teach homeowners about the cost of owning a home and the importance of investing in ongoing maintenance to reduce costs and carbon footprints, as well as the operations, proper use, and maintenance of all systems in their Habitat home.

Green Initiatives

One of the ways Nashville Habitat helps the community is by constantly challenging itself to reduce waste by updating its construction practices and procedures. The organization has committed itself to becoming more sustainable and more conscious of waste in every aspect of their operation. They have also pledged to build 100% of their projects to become Energy Star certified.

Contact Information

For more information on the Nashville Area Habitat for Humanity, contact [Gary Bigelow](#), at (615) 254-4663, ext. 233.