

## **Energy Star Case Study on Blue Hills**

### **Introduction**

Blue Hills Community Services (BHCS), a not-for-profit community development corporation, has been a catalyst for neighborhood development for over 34 years. Founded in 1974, BHCS set out to battle social and economic challenges faced by residents of the Blue Hills and surrounding neighborhoods in Kansas City, Missouri. Using a block by block strategy to focus neighborhood revitalization with new and renovated single family homes, multi-family development and home repair services to owner occupants, BHCS ensures neighborhood development is comprehensive and sustainable in creating healthy urban communities.

BHCS has successfully completed Olive Street Homes, five Energy Star certified single family houses in Kansas City. BHCS also continues to manage two home repair programs to assist low-income homeowners in making necessary home repairs and improving energy performance of the homes along the way. This case study will discuss these two efforts, Olive Street Homes and the home repair programs in detail in regards to construction details, motivating factors, funding, costs, benefits, the Energy Star rating process, training and overall green initiatives.

### **Background**

Olive Street Homes, constructed by BHCS and Energy Star certified, represents Kansas City's newest urban home choice in the Blue Hills neighborhood and consists of five new single family homes located between 49<sup>th</sup> and 50<sup>th</sup> streets on Olive Street in Kansas City, Missouri. A once vacant and overgrown block, this development offers affordable homes and the benefits of a historic and thriving community.

Since 2004, BHCS has been utilizing Energy Star<sup>®</sup> labeled HVAC, windows and appliances in new single family construction and renovation, providing energy savings for nearly 20 households. Over the next year, BHCS is planning on completing at least one substantial home renovation under the Home Performance with Energy Star<sup>®</sup> for certification.

Two home repair programs administered by BHCS assist existing low income (mostly elderly) homeowners with structural and mechanical repairs to preserve a home and maintain the health and safety of the residents. These programs offer services as a grant provided to the homeowner which requires that they remain in their home for five years. Under these home repair programs, BHCS provides Energy Star<sup>®</sup> rated windows, furnaces and air conditioners. Of the 70 clients who have received home repairs, 24 have received products with an Energy Star<sup>®</sup> rating.

### **Construction Details**

Olive Street Homes consists of three-bedrooms, two- or two-and-a-half bathrooms, and are 1,540 to 1,569 square feet. Prior to implementing Energy Star, BHCS's new construction projects were built with energy efficient features with similar insulation levels, energy analyses, and plan reviews. Kansas City adopted the 2006 IRC, which requires R-13 walls, R-38 attics, R-19 floors, and R-10/13 crawlspaces for Climate Zone 4. BHCS used R-21 insulation for walls at Olive Street Homes as compared to R-19 for previous projects, which was achieved by using a high density blown fiberglass with a netting. R-41 blown cellulose insulation for ceilings below attics and R-38 vaulted ceiling were used as compared to previous R-values around R-38. Olive Street Homes have full basements, two of which are unconditioned and use R-30 rolled fiberglass batt insulation in the floor cavities between the basement and the conditioned floors. Rolled fiberglass batt insulation was also used for below grade walls.

Rheem 40 gallon electric water heaters with an energy factor of 0.92 were installed and windows were double pane low-e double hung vinyl windows with a U-value of 0.36 and a SHGC of 0.32. They use low-e windows for all of their replacement windows in the home repair program.

For air sealing, silicone caulk was used which required minimal additional work as compared to their typical construction practices. Aluminum duct tape was used, and one home tested had 0% duct leakage and a HERS rating of 60. Duct work is located in the basement areas and in interior walls.

For appliances and lighting, the range hoods and bathroom exhaust fans were installed to vent directly outdoors. CFLs are used throughout, which were donated through the Kansas City Million Light Initiative. Natural gas furnaces with 92 AFUE and 3-ton 13 SEER air conditioners were installed for each home. Refrigerators, washers and dryers were not supplied, however electric ranges and Energy Star dishwashers were provided in each home.

### **Motivating Factors**

BHCS toured several local Kansas Energy Star homes in 2007 and realized it would take only a little more effort and investment to build their homes to be Energy Star certified. The added amenities and advantages of building and living with Energy Star were considered to be worth the cost when taking into account the savings that are passed on to the most economically sensitive population. The increase in overall affordability, tighter construction, improved indoor air quality, and reduction in local energy consumption are all reasons BHCS promotes Energy Star products and practices.

### **Project Funding**

The Kansas City Dream Program has reserved \$20,000 in down payment assistance per home for eligible first time homebuyers. Home buyers would need to finance \$122,000 to \$128,000 with the KC Dream program and \$142,000 to \$148,000 if purchased without down payment assistance.

BHCS and M&I Bank partnered with an \$825,000 loan for the Olive Street Homes development. The loan originated from M&I Bank's receipt of \$75 million in New Market Tax Credits (NMTC), and represents the first use of the NMTC program in Kansas City. This development engaged multiple partners and leveraged financial resources from Missouri Department of Economic Development's Neighborhood Preservation Tax Credit Program, the City of Kansas City, Missouri, the U.S. Department of Housing and Urban Development and Greater Kansas City Local Initiatives Support Corporation's NeighborhoodsNOW and development incentive grant program.

### **Costs**

The cost to upgrade to Energy Star rated products was about \$2,500-\$5,000 per home for new construction including costs for the HERS rating. The cost premium for the two homes with unconditioned basements was toward the lower end of the range, about \$2,500 per home. Total home construction costs including all hard costs and administrative costs, consultant, etc. were \$160,000 per home. The cost for the plan review was \$500 per home and costs for the post-construction HERS rating was another \$500 per home. The cost premiums associated with Energy Star were offset by HOME funds, a development incentive grant, New Market Tax Credits, and multiple other sources of funding for Olive Street Homes.

Usually, for a few hundred dollars (\$300-\$600), the home repair program can upgrade a furnace from 80% to 92% AFUE or an AC unit from 13 to 14 SEER.

## **Benefits**

Energy Star has revolutionized the standards BHCS uses in regards to durability, health and affordability in urban housing developments. Lower utility costs and a healthy home environment translate into improved quality of life and personal wealth and investment. BHCS expects Olive Street Homes to be more sustainable and the products used to be more durable. An added benefit of Energy Star is the improved thermal comfort. Air conditioning was not installed until the home was sold, and construction crews were comfortable sitting inside the homes without air conditioning due to the increased insulation and use of ceiling fans.

Olive Street Homes achieved Five Star Plus ratings and HERS scores between 60 and 70, making these units 30-40% more efficient than a home built to the 2006 IECC. Estimated utility expenses are only \$1,400 per year for each home compared to a home without Energy Star which would cost an additional \$500 per year in utility expenses. The added cost of improvements to reach Energy Star certification will be realized in less than five years. Residents have already seen approximately \$50 savings per month in utility bills.

Total Construction Cost	Added Cost for E*	% Cost Increase	Annual Savings	Payback (yrs)
\$ 160,000	\$ 2,500	1.6%	\$ 500	5.0

BHCS received encouragement and positive recognition from the City and the community with each new implementation of energy resource planning and conservation evidenced by the Olive Street Homes being selected for several awards on both the local and national level. This project has generated public and civic interest locally in Energy Star and will help move the learning curve on the advantages of buildings with Energy Star certification forward.

Olive Street Homes, with its leverage of Federal housing dollars, inspired Kansas City to adopt Ordinance No. 080543 on June 12, 2008, directing the City's housing programs to apply Energy Star New Homes guidelines to all new and gut rehabilitation residential construction projects, and to the extent possible, implement Energy Star strategies in existing owner-occupied homes receiving services through home repair programs, thereby reducing the burden of energy cost on low and moderate income homeowners.

## **Rater Involvement**

The rater acted as part of the design/development team and participated in weekly meetings, was available for direction during construction, provided interim inspections and final inspections, and was beneficial to have for plan reviews. Each home rating only took a few hours per home, and some homes had to be tested twice, but all five home ratings were done in one day.

## **Training**

BHCS co-sponsored an Energy Star "Train the Trainer" workshop to educate agencies working with homeowners of the benefits of energy efficient practices and a Quality of Life Information Session: Living an Energy Efficient Lifestyle for home owners. Hathmore Technology facilitated the training session with the Metropolitan Energy Center and BHCS attended the training. The training taught attendees how to train the end user, and BHCS will provide subsequent training for residents of Olive Street Homes.

## **Green Initiatives**

The BHCS Board of Directors has approved a policy requiring Energy Star standards for all new construction, and rehabilitation and home repair services when possible. To support this commitment, BHCS's Director of Planning and Development received a NAHB certified Green Building Professional designation and has attended multiple green initiative trainings and events.

## **Contact Information**

For more information on Olive Street Homes and BHCS, contact Cliff Pouppirt, Senior Development Specialist, at (816) 333-7870 ext. 206.

### *Olive Street Homes*



