

City of Houston Pleasantville Weatherization Program Overview and Progress Report



The City of Houston has many neighborhoods with small, older homes that lack modern energy efficient features. To combat this, the City has initiated a weatherization program as part of its neighborhood revitalization campaign. The most effective long-term strategy for reducing energy bills is to invest wisely in more efficient energy use. The weatherization program will improve the energy efficiency of homes in an inner city 1950's neighborhood known as Pleasantville. The City's goal was to have over five

hundred homes weatherized by the end of the summer of 2006, which was surpassed.



The City of Houston's partner in this program is CenterPoint Energy. Per Texas State law, utility providers are required to provide low-income assistance in targeted energy efficiency programs. As such, the City has worked with CenterPoint Energy to provide this service free of charge to Pleasantville residents. The City has also engaged the Houston Advanced Research Center to provide program management and to execute the science, data collection, and data analysis for the program.

This program is free to all residents, regardless of income, in the Pleasantville community. The project was initiated on January 23, 2006.

Program Implementation

Energy Efficiency at both the residential and commercial institutional building level is the most critical component of our nations energy opportunities. Energy efficiency is also at the heart of our region's health. This program seeks to apply best practices to work for residents to reduce energy utilization and increase the area's air quality.

The weatherization program's scope of work may address many components of residential homes, which will provide reduced energy expenditures for the resident and

improved energy efficiency for the community. The possible scope of work includes the following:

- **Installing weather stripping on windows and doors** – (Hot or cool air can escape through doors and/or windows that do not have weather stripping, causing an increase in energy usage by heating or cooling a home more often.)
- **Caulking windows** – (for similar reasons as mentioned above.)
- **Replacing incandescent lamps with compact fluorescent lamps** – (you can dramatically cut your lighting costs and energy consumption by replacing just 2 bulbs in high-traffic areas with compact-fluorescent bulbs. Appliances and lighting accounts for 10 to 30% of the energy used in residential homes.)
- **Installing insulation in the attic** – (making sure there is enough insulation in the attic, or anywhere there is a barrier between the home and the outside, is one of the most important ways to make a home energy efficient. Heat can easily escape non-insulated attics requiring more heat, or air conditioning in the home. Un-insulated spaces account for 50 to 70% of the energy used in residential homes.)
- **Installing insulation on exposed hot water piping** – (water cools faster on exposed pipes and is therefore re-heated more often, which requires the use of more energy.)
- **Insulating water heaters with blankets** – (water-heating accounts for up to 14% of home energy use - the largest single energy expense in your home. Covering water heaters with water heater blankets cuts down the amount of times your heater must re-heat the water.)

The Pleasantville neighborhood includes approximately 1400 single family homes, most around 1,000 to 1,300 square feet, that were 40 to 60 years in age. All of the homeowners were contacted and offered the opportunity to have their homes weatherized with – among other things – caulking, weather-stripping and attic insulation of 9 inches. Approximately half of the homes, 641, accepted the offer. The work was performed by contractors and was completed in time for the summer months, when electricity usage is at its height in Houston because of air conditioning costs.

These energy efficient measures are not only beneficial to the City's neighborhoods and surrounding communities but are sound mitigation tools with respect to the possible consequences of global warming.

Houston's weatherization program has great potential for saving energy and lowering utility bills – which will be demonstrated below – not to mention reducing greenhouse gas emissions from power plants. By reducing the amount of energy used in residential neighborhoods, this program helps to reduce air emissions from power plants in the

Houston area. The reduction of emissions improves the air quality indoors and out, resulting in better human and ecosystem health.

The Pleasantville home energy conservation program is a cornerstone of the City's energy and environmental programs. The program demonstrates the City's involvement and commitment to the people of Houston. The City requires that quantitative and qualitative measurement of utility data – emissions, energy and cost savings – created by the weatherization program be collected, analyzed and published.

The City of Houston wants to ensure improved quality of life for all residents through residential home weatherization. Houston plans to replicate the program in other communities throughout the City based upon the outcome of the Pleasantville pilot program.

Program Costs

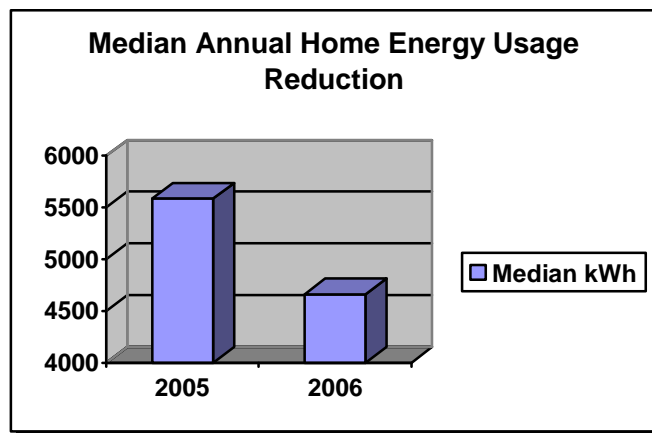
The Weatherization program costs an average of \$1,000 per home. These costs were funded by CenterPoint Energy, which collects and disburses wire charges dedicated to energy efficiency.

Current Status

Currently there are a total of 641 participating residents improving energy efficiency and even reducing some energy costs. Household energy usage reductions of participating residents are equal to a total savings of \$68,541. Median savings are \$160 per household, per year, assuming that all residents are on the "Price to Beat" rate (0.16/kilowatt hour). Net energy reduction totaled 428,382 kWh between 2005 and 2006.

Energy consumption was documented for the summer months of June through August 2005 and 2006. Analysis of this data was based on a sample of 427 homes, which participated in the program. Outlying data points were eliminated if year over year consumption differentials indicated vacancy or would suggest inaccurate information.

The total energy consumption in 2005 for the 427 homes measured 2,475,854-kilowatt hours (kWh) and in 2006 measured 2,047,472kWh. Median household consumption decreased from 5585kWh to 4661kWh, with median savings being 810kWh or 14.5%. Weatherized structures consuming greater than 8,000 kWh (73 observations) showed an average consumption savings greater than 20%.



Costs vs. Benefits

Based on the above information provided, the average cost of the program is \$1,000 per home. The average savings of the program is \$160 per year, per home. Hence, in the seventh year after program implementation, the benefits begin to outweigh the actual costs of the program. In addition there are numerous intrinsic benefits that are produced through the weatherization program. Among these are benefits to individual homeowners and society at large.

Homeowners benefit from increased property values, decreased energy bills, and improved comfort. Society benefits from reduced energy consumption, which means – in most instances – less consumption of fossil fuels and, consequently, less emission of air and water pollutants.

In addition, it has been found that weatherization programs generate local jobs, and reducing expenditures on energy also helps to keep money in the community, thereby providing additional local economic benefits.

Hence, under this analysis, the benefits of this program outweigh the costs, thereby achieving successful results.

Summary/Next Steps

Because of the projects success, it has been expanded to include the Lindale and Scott Terrace neighborhoods within the City of Houston, where an additional 1,000 homes will see energy efficient improvements such as those benefits seen by Pleasantville residents. Both neighborhoods will begin their home weatherization programs in January 2007.

As energy efficiency has improved dramatically in recent years in new home construction, in communities such as the Pleasantville community – where homes were built in the 1950s – weatherization is one of the best ways to produce immediate energy savings. We believe weatherizing the older homes throughout the Houston area will result in significant energy efficiency and lower gas and electric bills for Houstonians.