White Paper

ENERGY STAR New Homes and the Impact of Certification on Maryland Home Prices

By Michelle Yuan, and Jonathan Cohen, ICF

Key Takeaways

1. The recent study discussed in this white paper used statistical analysis to quantify the impact of the ENERGY STAR Certification on home prices. The study found a statistically significant price premium ranging from 2.1%-5.2% for ENERGY STAR Homes sold in the state of Maryland from 2012 to 2015.
2. Importance for Utilities:
    a. Non-energy benefits from energy efficiency programs must be both communicated and demonstrated. This is important from the program participant (builder/raters) and program evaluation perspectives as non-energy benefits become more widely discussed.
    b. Participant recruitment and retention is crucial to a successful new homes program and is largely dependent on non-energy benefits. The study results discussed in this white paper provides a clear value proposition and a quantified price premium of the ENERGY STAR Certification for participating builders, raters, and homebuyers.
3. Importance for Builders, Raters, and Real Estate Professionals
    a. Non-energy benefits are as important if not more important from the homebuyer's perspective. Non-energy benefits like home property value, utility savings, and health benefits are strong motivators and easier to identify with for less environmentally oriented consumers.
    b. The price premium found in this study provides a concrete number to use internally, for pricing, planning, and analysis.

Background

Maryland's ENERGY STAR New Homes Program started in 2009 with BGE's program launch and grew with SMECO's program launched in 2010, followed by Delmarva Power, Pepco, and Potomac Edison's program launches in 2012. The Maryland ENERGY STAR New Homes Program has helped to transform the Maryland market. Prior to the start of these programs, the Maryland market had an ENERGY STAR New Homes market penetration rate of approximately 6% and was ranked 42nd in the nation. Since the start of the Maryland ENERGY STAR New Homes Program, the market penetration rate has increased 36% and currently ranks 2nd in the nation. To date, the Maryland New Homes Program has incentivize over 21,000 homes and provided approximately $27 million in incentives to program participants. The efforts of the Maryland utilities and the 30,000+ MWh saved through the Maryland ENERGY STAR New Homes Program has also contributed to the success of EmPOWER Maryland and a progressive energy reduction goal set by the Maryland general assembly.

As the Maryland ENERGY STAR New Homes Program continues to grow, program benefits and metrics should also continue to develop in order to fully reflect the value of the program whether to participants like homebuilders, homeowners, or to program evaluators. The price premium study was a collaborative effort by the Maryland utilities to address this need. Additionally, despite the well documented benefits of above code certification programs like the ENERGY STAR® Certified New Homes Program, the question remains for many home builders, buyers, and appraisers of how these benefits translate to economic benefits. This white paper will examine a recent study that uses statistical analysis to quantify the impact of ENERGY STAR Certification on home prices.

Study Overview

The study evaluated Maryland home prices and sales data for 13,065 non-certified homes and 2,723 ENERGY STAR Homes sold between 2010 and 2016. This sample was created from cross referencing a larger dataset of 366,542 homes from the regional MLS and 18,566 homes from the Maryland utilities' internal data. A regression model was used to isolate the impact of the ENERGY STAR Certification on the home value and control for a wide range of home characteristics such as:

- Location
- Home Type
- Date of Sale
- Sale Price
- Number of Levels
- Year Built
- New Construction
- Number of Bedrooms, Bathrooms, Fireplaces
- Lot Size Square footage
- Living Area Aquare Footage
- Basement, Attic, Swimming Pool
- Parking
- Water Oriented, View, or Access

The inclusion of these characteristics are important in order to ensure the results are attributed to the ENERGY STAR Certification and not another feature.

Study Methods

The sample used in this study were mainly homes sold in standard sales (99.5%) with less than 1% sold in foreclosures and short sales, which is important since these types of sales can impact home sale price. The ENERGY STAR Certified Homes and non-certified homes included in the sample also had comparable summary statistics such as number of bedrooms, bathrooms, levels, etc. The only exception to this is the statistically significant estimates for listing time, which can be interpreted to mean that ENERGY STAR New Homes sold faster than its non-certified counterparts.

Ten models were created to estimate the relationship between the independent and dependent variable, which can be thought of as the cause and effect. Each of the models used a different dependent variable and had an additional 5-10 variations per model which differed in the inclusion of independent variables and the treatment of years. The model that best accommodate the data used the log of sale price as the dependent variable and whether or not it was an ENERGY STAR Home as the primary independent variable. The model evaluates if the certification status of the home will impact the home sales price in terms of percentages. Similar to the other models, this model also includes a basket of other secondary independent variables such as lot size and the previously listed home characteristics. The final model was also evaluated the impact of each independent variables separately for each year so it is able to accommodate for changing consumer demands, market trends, etc. Due to the inclusion of all of these variables and the separate treatment of years, the final model created a total of 2,811 parameters for this study.

Results and Impact

ENERGY STAR Certified homes were found to have a statistically significant price premium for 2012-2015 at the 1% level. The study results found a price premium of 2.1% to 5.2% for ENERGY STAR Certified Homes when compared to non-certified homes. The results for 2011[1] and 2016[2] were not statistically significant due to having insignificant data.

Model 2G2				
Year	**Estimate**	**StdErr**	**tValue (T-statistic)**	**Probt (P-Value)**
2011	0.0575	0.0647	0.8892	0.3740
2012	0.0521	0.0166	3.1322	0.0018
2013	0.0327	0.0092	3.5451	0.0004
2014	0.0271	0.0079	3.4375	0.0006
2015	0.0210	0.0078	2.6945	0.0071
2016	0.0351	0.0364	0.9646	0.3359

[1] Maryland ENERGY STAR New Homes Program launched an online application platform in 2012. This platform has streamlined the application review process and has created a centralized database of applications that has made this study possible. There are few applications and data readily available prior to the launch of this online application platform system.

[2] The study was conducted at the beginning of 2016.

Based on the average listing price ($478,913) of a new non-certified home sold in Maryland between 2010 and 2016, these price premiums would translate to an additional $10,077 to $24,953 on the list price of an average home in the state of Maryland.

Year	Price Premium[3]
2011	$27,533
2012	$24,953
2013	$15,645
2014	$12,978
2015	$10,077
2016	$16,818

Over 21,000 homes have been incentivized since the inception of the Maryland ENERGY STAR New Homes Program in 2009. Based on the price premium study results, this would translate to an additional 211 million to 524 million dollars' worth of additional value generated by the program beyond direct utility incentives. This additional value to the region should be accurately reflected in the communication to potential homebuyers, builders, program evaluators, and in real estate valuations.

[3] Price premium calculation based on the average listing price (refer to summary statistic chart).

About ICF

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