



The Price Premium of ENERGY STAR Certified® Homes:

A Maryland Analysis

2016 ENERGY STAR Certified Homes Stakeholder Meeting
New Orleans, Louisiana
10/25-10/27/2016

EmPOWER Maryland

EmPOWER Maryland Act of 2008:

Original goal to reduce energy consumption 15% by the end of 2015

Renewed in 2015



Maryland utilities help implement cost effective energy efficiency programs and created portfolio of programs.

EmPOWER Maryland (2008-2014)



Reduced consumption by **2,000,000** MWh.

This is equivalent to:



80,000 homes

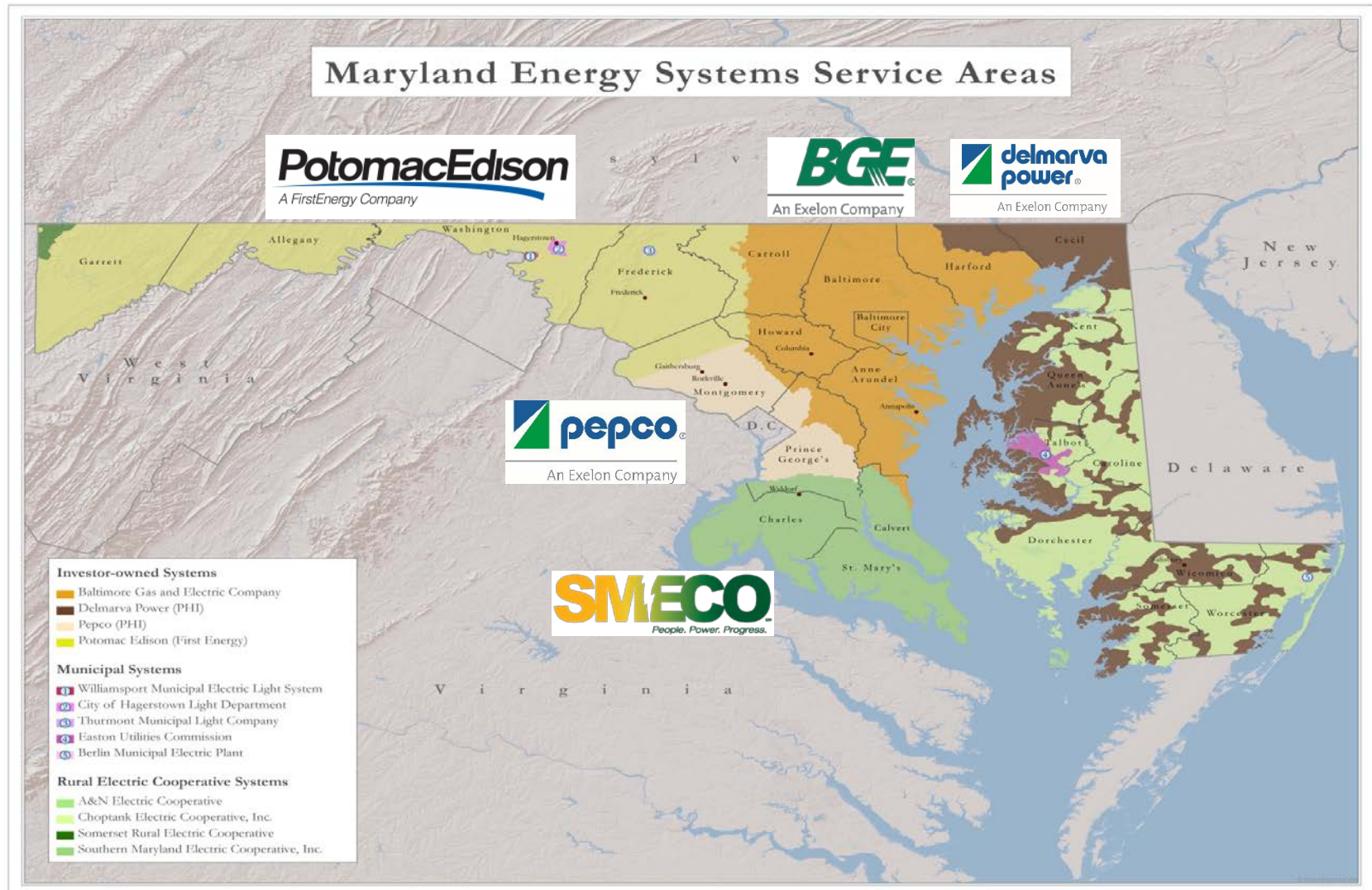


25% of Baltimore City's consumption

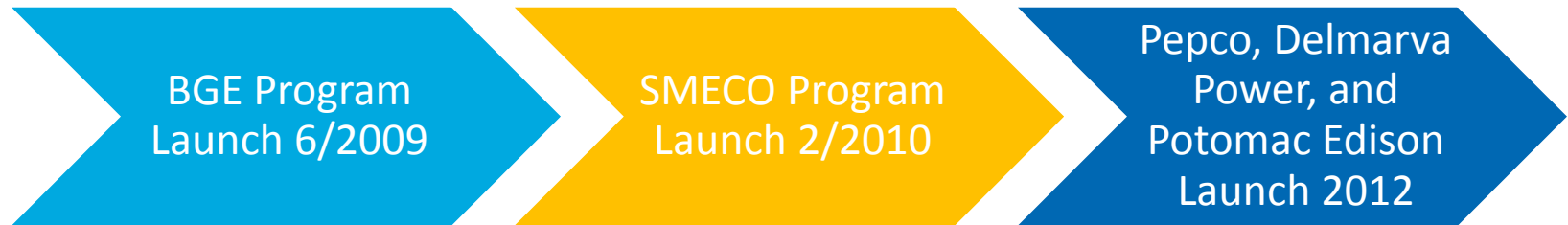


2 medium sized power plants

EmPOWER Maryland Utilities



Maryland ENERGY STAR New Homes Program



- 2008:
 - ENERGY STAR New Homes comprised $\approx 6\%$ of the Maryland new homes market
 - Market penetration was 42nd in the nation
- Today:
 - ENERGY STAR New Homes now make up $\approx 40\%$ of new homes built in Maryland in past 3 yrs
 - Now 2nd in nation for market penetration

Maryland ENERGY STAR New Homes Program Results

- 2015:
 - Incentivized 4,373 homes
 - Paid close to \$6 million in incentives
 - Saved \approx 7,516 MWh
- Program Lifetime:
 - \approx 21,000 ENERGY STAR New Homes
 - \$27 million in incentives
 - 30,000+ MWh saved

Evolution of Program

- Program Launch:
 - Tiered incentive structure based on HERS Scores
 - Introduced 90% CFL minimum in 2014
 - Simplified tiered structure in 2015
 - Shift away from HERS Scores to Home Type in 2015

2009-2011 ES v 2	2012-2014 ES v 3 with 2012 Code	2015	After April 1, 2015 ES v 3.1	
HERS 85-81 \$400	HERS 75-71 \$1000	HERS 70-66 \$1000	Multifamily	\$400
HERS 80-76 \$800	HERS 70-66 \$1300	HERS 65-61 \$1300	2-on-2 Condo	\$550
HERS 75- Below \$1000	HERS 65-61 \$1600	HERS 60 - Below \$1600	Townhome	\$750
			Single Family	\$1250

Program Benefits



 **ENERGY STAR® Certified Home Features**
Energy efficiency guidelines set by the U.S. Environmental Protection Agency (EPA)

COMPLETE THERMAL ENCLOSURE SYSTEM



You want your home to be comfortable no matter what room you're in or what the weather is outside. Comprehensive air sealing, properly installed insulation, and high-performance windows work together in an ENERGY STAR certified home to deliver better comfort, better durability, reduced maintenance costs, and lower monthly utility bills. During construction, ENERGY STAR builder partners must meet all of the requirements of EPA's comprehensive thermal enclosure system inspection to ensure that—

- Your new home is tightly sealed to reduce leaks and drafts; and thermal bridging across walls is minimized.
- Correct levels of insulation are selected to provide whole-house comfort.
- Insulation is installed properly to deliver the best performance.

When builders meet these rigorous requirements, you get a home with a complete thermal enclosure system—a better approach to building a better home.

SEALING

A typical home contains a half-mile of cracks and gaps in walls and around windows and doors, along with ends of holes for pipes, vents, ducts, lighting, and wiring. Filling these openings with a comprehensive air sealing package helps to significantly reduce drafts, moisture, dust, air, pests, and noise. The best time to seal these is during construction process because access to critical areas is limited once the house is completed.

ENERGY STAR builder partners seal the holes using caulks, foam, and other techniques—paying particular attention to the areas between the conditioned (heated or cooled) and unconditioned space of your home. One great example of this is around windows, where ENERGY STAR certified homes feature caulk or foam to seal the space between the window frame and the adjacent wall framing. This is a detail that is commonly missing in many other homes and can have a real impact on your comfort and utility bills.

The energy savings from comprehensive air sealing can quickly add up when you consider all the places hot or cool

air can enter or escape from your home. Having a well-sealed home also means better air quality because dirt, pollen, pests, and moisture can't get in as easily. In addition, good sealing practices help protect your home against mold and moisture damage that can be caused by condensation.

REDUCED THERMAL BRIDGING

Walls in homes are typically built with wood studs, which support the weight of the floors and roof above, help the home stand up to wind, and generally act as the structural "bones" of the home. While these components are critical to making a durable home, they often have a very low R-value (resistance to heat flow) and create thermal "bridges"—uninsulated pathways that compromise the comfort and efficiency of the home. ENERGY STAR builder partners select one of five strategies, such as adding a continuous layer of rigid foam or minimizing excess wood studs, to minimize thermal bridging in walls.

- Marketing support
- Website listing
- Sales training
- Technical training
- QA/QC
- Research: Baseline and price premium studies

Price Premium Study

- Collaboration between the Maryland utilities to quantify the impact of ENERGY STAR Certification on home prices



- Evaluated Maryland home prices between 2010-2016
- Included sample of 2,723 ENERGY STAR homes and 13,065 non-certified homes
- Regression model used to isolate impact of ENERGY STAR Certification on home value (hedonic regression model)

Main Objectives of Study

- Utility Perspective
 - First steps to capture non-energy benefits
- Builder Perspective
 - Concrete answer of what is ENERGY STAR Certified New Home worth
- Homeowner Perspective
 - Non-energy benefits are at times more important in driving energy efficiency program for end consumers



Methodology

Characteristics Based On:

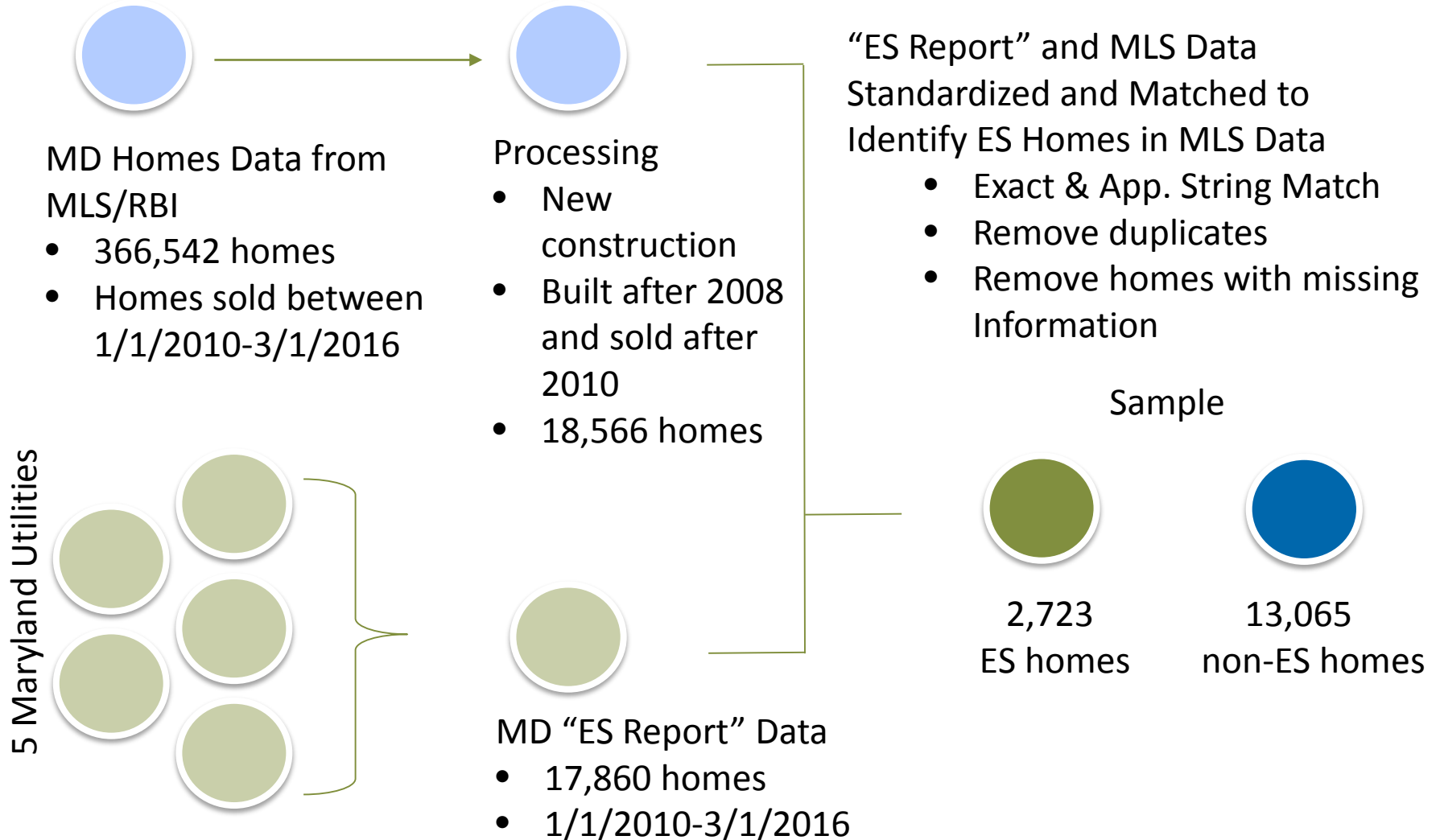
- Impact on Home Value
- Availability of Information
- Feasibility of Analysis

Some of the Home Characteristics Include:

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



Methodology



Exploring the Data

54% single family homes



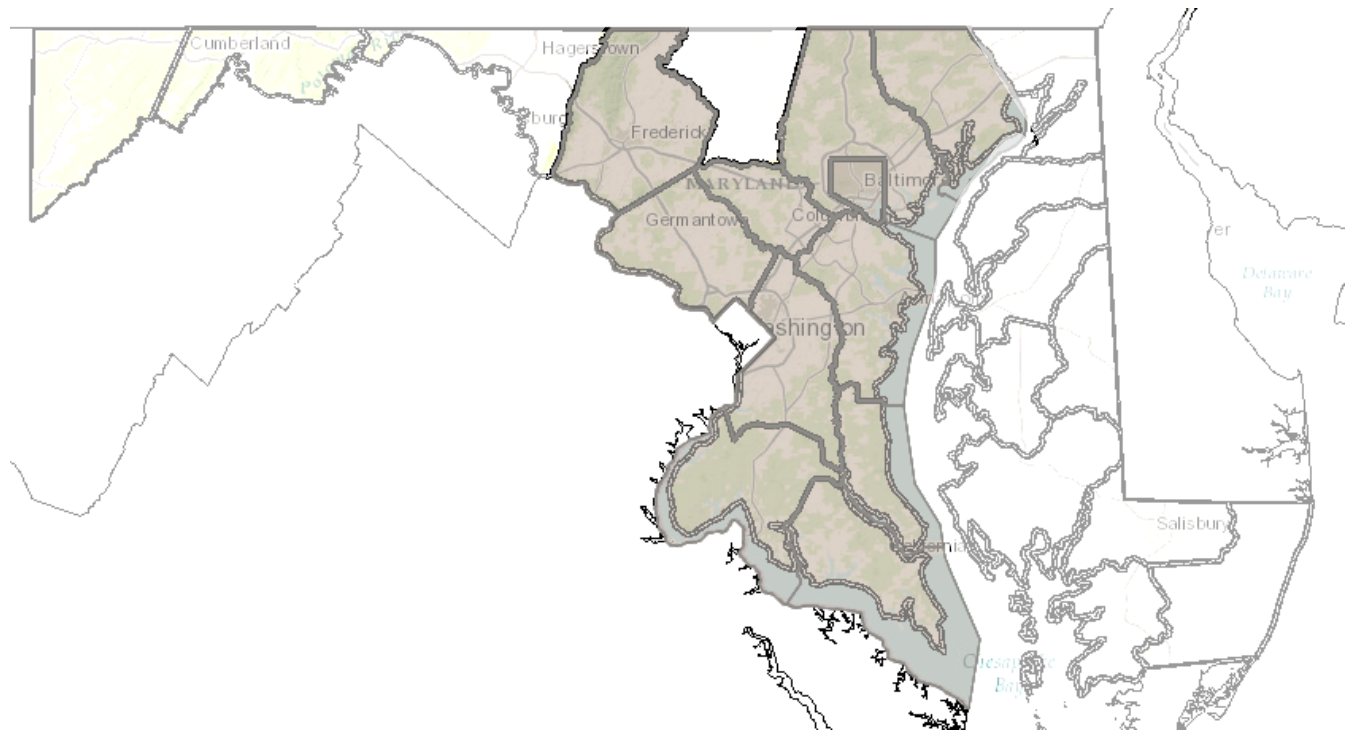
43% townhomes



Most homes (99.5%) were sold in standard sales

Exploratory Data Analysis and Missing Data

Top 10 counties with highest number of new homes accounted for 92.2% of the sample



What's in the data and what does that mean?

Large percentage of data missing for total living area (55%) and lot size (11%)

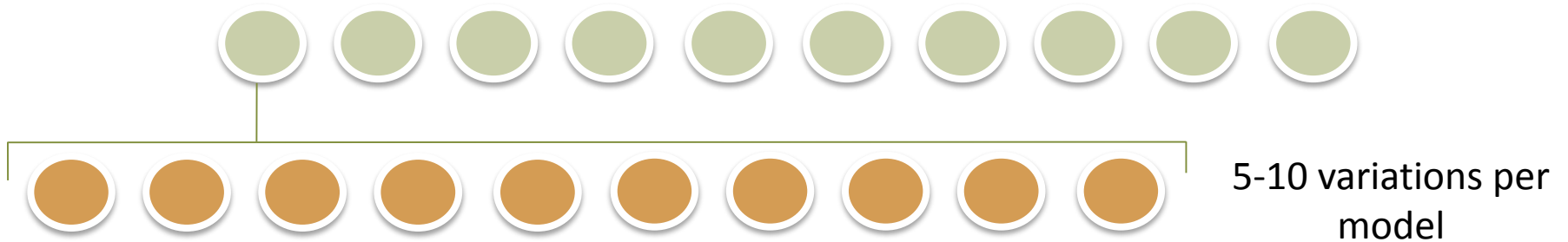
ENERGY STAR Homes and non-ENERGY STAR Homes included in the data were comparable

However, ENERGY STAR Homes sold faster than non-ENERGY STAR Homes!



Data Analysis and Model Selection

10 Models with Different Dependent Variables



- Dependent Variable: Log of sale price
- Primary Independent Variable: ENERGY STAR Certification
- Model fitted separately to each year
- Include 2,811 parameters
 - Parameters only created for terms that are statistically significant at the 5% significance level for 2+ out of 5 years

Results

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	0.9649	0.3359

- Model is a good fit and there is statistically significant price premium for ENERGY STAR New Homes for years 2012-2015 at 1% level
- Not significant for 2011 and 2016 due to insufficient data
- Price premium of 2.1-5.2% for 2012-2015

What this means:

Year	Price Premium
2012	\$24,953
2013	\$15,645
2014	\$12,978
2015	\$10,077

- \$10,077-\$24,953 price premium is attributed to ENERGY STAR New Homes certification per home
- The Maryland ENERGY STAR New Homes Program has delivered 21,000 homes since 2010: \$211,617,000 - \$524,013,000 additional value generated for builders
- Study is first step, imagine quantifying other economic/market impact related to \$211-524 million dollars (job growth, regional impact, etc)

Reception



An ENERGY STAR® New Home helps reduce energy use up to 30% on utility bills and increases **your property value by 2-5%**.



The ENERGY STAR Difference

The ENERGY STAR label on your Craftmark Home means your new home meets strict efficiency guidelines set by the Environmental Protection Agency (EPA) and is third party verified. This verification ensures your home uses less electricity to provide better comfort.

Savings and Home Value

Beyond providing increased savings on your utility bill, ENERGY STAR Certified homes offer a price premium. In a Maryland wide study based on 15,000+ homes, ENERGY STAR Certified Homes were compared to similar non-certified homes and found to sell for 2-5% more. This price premium would mean a difference of \$10,077-\$24,953 based on the average house which costs \$478,913.

CraftmarkHomes.com

Using Less Energy for More Value.

The ENERGY STAR® Difference

The ENERGY STAR label means your new home meets strict efficiency guidelines set by the Environmental Protection Agency (EPA) and is third party verified. This verification ensures your home uses less electricity to increase your utility savings and provide better comfort by:

- Reducing Leaks and Drafts**
All ENERGY STAR homes feature comprehensive air sealing, quality-installed insulation, and high performance windows and doors which help minimize warm and cold spots in the home.
- Maintaining Consistent Temperatures**
High efficiency heating and cooling systems, designed for optimal performance, ensure consistent temperatures in every room and prevents things such as the unnecessary cycling on and off of oversized systems.
- Improving Indoor Air**
A fresh-air system provides a controlled amount of outdoor air. Combined with a high performance filter which reduces dust, pollen, and allergens.
- Ensuring Better Durability**
A comprehensive water management system, including flashing, moisture barriers, and heavy duty membranes, protects roofs, walls and foundations from moisture damage.
- Providing Peace of Mind**
Trained professionals perform independent inspections and testing in the certification process, so you can sleep well knowing things were done right.

www.EastofMarketApts.com



An ENERGY STAR Certified Ryan home helps reduce energy use up to 30% on utility bills and increases **your property value by 2-5%**.



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RyanHomes.com



Each ENERGY STAR label represents a home that meets or exceeds the U.S. Green Building Council's (USGBC) energy efficient building standard set by the 2009 International Energy Conservation Code (IECC). An ENERGY STAR label indicates that a home's energy efficiency performance is at least 10% better than the average home in the area. Energy Star is a registered trademark of the U.S. Green Building Council. ©2013 USGBC. All rights reserved.