

Best Practice Strategies in Implementing a New Home Program: Growing a Program in a Down Market

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ABSTRACT

In a state with the nation's highest unemployment and new home construction down 85 percent from its peak, NV Energy's Energy Plus New Homes (EPNH) program was created to promote construction of new homes that were 30 percent more efficient than code which is double the efficiency improvement compared to an ENERGY STAR[®] v2.0 home. This paper discusses the difficulties that were encountered and how they were used to create opportunities in implementing this successful new homes efficiency program.

The program started in 2008 in the midst of a housing crash that saw southern Nevada lose over 58 percent of its builders. Despite these difficult conditions, the Energy Plus New Homes program has grown steadily from one builder the first year to 14 builders in 2010. The program more than doubled its goals in 2010.

Some of the elements that lead to success for NV Energy apply broadly to any market and others are unique to Southern Nevada. Utilities in other markets can learn the key elements that helped EPNH thrive and apply these lessons to creating a successful new home program of their own.

Introduction

In 2008 NV Energy established the Energy Plus New Homes (EPNH) program to significantly increase energy efficiency in new home construction in southern Nevada. In the first year of operation only one builder participated. The market is dominated by large production builders with a large percentage already participating in the ENERGY STAR program. The goal of this program is to increase energy efficiency of new homes well beyond the ENERGY STAR new homes requirements. The program provides technical assistance and incentives to builders that construct homes that exceed ENERGY STAR[®] New Home energy savings by at least 15%, which is 30% more efficient than the HERS model reference code in REM/Rate. The program is designed to transform the housing market by incorporating energy efficient materials and techniques into the production home construction process, yielding more energy efficient homes that over time become a standard consumer expectation.

The program was aided by some unique positive market factors and leveraged some negative market factors to create a successful program. The housing market experienced a dramatic downturn with sales decreasing 71% from 2006 to 2008. ENERGY STAR penetration in Southern Nevada was above 60% before program inception so ENERGY STAR as a goal itself was not viewed as promoting greater efficiency.

These market challenges were used to create opportunities for the program. The housing market downturn created a disproportionate volume of distressed resale homes. Builders needed differentiators to compete against the high volume of distressed resale homes and EPNH was positioned to meet this need. High ENERGY STAR penetration created a market that did not allow ENERGY STAR to be used as a goal but primed the market with builders who already had relationships with energy raters and consultants who could create additional opportunities for themselves by promoting the program. The program was able to use both of these conditions to create strong momentum for success.

The utility's goals were combined with goals beneficial to builders, raters and homeowners to create the EPNH program. The outcome provides insight into the excellent results a program can accomplish when incentives, motivations, cooperation and competition align to meet the needs of the market.

Market Factors

The EPNH program is available to builders in NV Energy's southern Nevada territory. There are some unique market factors that should be considered in viewing how the program was conceived and implemented. Additionally these factors should be considered when evaluating the relevance or applicability in using similar tactics for different markets or conditions.

Depressed Housing Market

The Las Vegas real estate market is a challenge for the program. Unemployment rates that peaked over 15% in Las Vegas are the highest in the nation. Home sales in 2008 at the launch of the program were down 71% from the peak two years earlier. Sales in 2009 were only 15% of what they were at the peak and median price declined 35%. Roughly three out of four resale home transactions in 2010 were bank owned or short sales. The high number of distressed sales put tremendous pressure on new home builders. The negative impact of distressed sales:

- Weaken pricing
- Distressed homes used for appraisal comparisons
- Affects buyer psychology

The program leveraged the poor market conditions to help builders use energy efficiency as a key differentiator between EPNH homes and resale homes. This strategy has been successful with the exception of some lower priced homes where builders removed efficiency measures to reach specific price points.

Table 1: New Home Sales¹

Year	Homes	% Change	Median Price	% Change	ENERGY STAR Homes	% ES
2004	29,248		\$ 290,287		13,513	46%
2005	30,750	5.10%	\$ 345,130	18.89%	15,666	51%
2006	36,051	17.20%	\$ 330,094	-4.36%	18,954	53%
2007	19,670	-45.40%	\$ 280,085	-15.15%	8,098	41%
2008	10,464	-46.80%	\$ 245,000	-12.53%	4,455	43%
2009	5,271	-49.60%	\$ 216,854	-11.49%	3,547	67%
2010	5,341	1.30%	\$ 218,080	0.57%	3,514	66%

High ENERGY STAR Penetration

ENERGY STAR penetration in Southern Nevada exceeded 60% in 2008. Subsequently the program was unable to use ENERGY STAR as a goal for the program. Instead EPNH used ENERGY STAR as the baseline for savings calculations. This higher baseline reduced savings used for calculating

¹ Source: Southern Nevada Home Builders Association.

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rebates. Builders who were not building to that standard would have to improve their homes 15 HERS points beyond ENERGY STAR but their rebates are calculated as if they were improved from ENERGY STAR levels.

High ENERGY STAR penetration also meant that most of the builders who would participate in the EPNH program were already working with an energy rater. This allowed the program to leverage the rater community for support of the program. Additionally all of the ENERGY STAR homes were modeled in REM/Rate and inspected using ENERGY STAR protocol. This allowed the program to calculate savings and validate program compliance with minimal additional administrative burdens for builders to participate.

Concentrated Base of Energy Raters

Builders participating in the program are predominantly served by two rater companies. Over 97% of the program submissions were submitted by two companies. Builders almost exclusively use a rater as their interface with the program for submissions. This creates an additional revenue opportunity for raters which motivate them to promote the program without EPNH providing a direct incentive. The program views raters as a valuable resource in marketing and encouraging builders to participate in the program. The program includes raters in program issue roundtables where appropriate and carefully considers how our program decisions will impact the program's and builder's relationship with the raters. Funneling submissions through a few raters minimizes training for the submission process and improves the consistency of submissions.

Fewer raters in the program can also create a risk for adverse impact on the program. If a difficulty arises with one of the predominant raters it would hinder a high proportion of submission.

Compact Geographic Area

The program is available in NV Energy's Southern Nevada service area. This 600 square mile area contains the highest concentration of people in the state. All of the construction typically happens within a 20 mile radius from the center of the valley. The dense concentration of activity creates efficiency for raters and program administration. The small market area also impacts the homogeneity of construction type due to similar climate, topography and competitors building near each other.

Climate Zone

The entire service area for EPNH is in climate zone 3. The climate zone enables production builders to meet energy code and ENERGY STAR minimums easier than in the higher climate zones. Higher climate zones generally require more stringent measures which are more expensive and often require implementation at the design phase. These measures include items such as slab edge insulation, wall insulation, ceiling insulation and higher furnace efficiencies that all add to the cost and complexity to meeting code and ENERGY STAR requirements in the higher climate zones. Consequently exceeding these codes is easier to achieve in an economical manner that maintains a reasonable cost of homes at a level where the benefits of the improvements are a value compared to a base code home. Communicating with builders about the most effective efficiency measures and training for the program are also simplified with only one climate zone in the program eligibility area.

Market Dominated by Large Production Builders

In 2010 there were 32 builders in Southern Nevada². The top ten builders construct over 80% of the homes in Southern Nevada. Seven of the top ten builders are national builders. Dominance by large production builders creates a less fragmented market with size and scope that creates economies of scale in production and marketing. The high number of national builders in such a small area creates a very competitive environment. In 2010 five of the top ten builders participated in the EPNH program with a total of 14 builders participating. In 2011 the program increased participation to nine of the top ten builders.

Program Design

The overall goal in designing the EPNH program is to produce a transformation in housing by encouraging builders to incorporate more energy efficient materials and techniques in production home construction processes. When these materials and techniques become expected by new home buyers, rebates will not be necessary for builders to continue building efficient homes. Program success is measured with kWh savings, participation rates and cost effectiveness.

To meet these goals EPNH designed a whole house efficiency program that empowers builders to choose their preferred paths to meet the efficiency goals required by the program. As builders achieve program goals using different techniques and materials, best practices are identified and shared among the participating builders. Several program design and implementation strategies were instrumental in achieving success.

Qualification Requirements

The objective of the qualification requirements is to motivate builders to achieve the program efficiency goals and provide reliable reporting of kWh savings. Homes must meet the following requirements to qualify for the program.

- Builders must employ a RESNET certified third-party rater to verify energy performance and features of homes.
- Homes must be modeled with REM/Rate and submit a Home Energy Rating Certificate showing it achieves a HERS 70 or better.
- Submit an ENERGY STAR Fuel Summary report from REM/Rate showing the difference in annual end use kWh consumption between the reference home and the home as built. Beginning July 1, 2011, savings are calculated and reported using a custom report in REM/Rate that was created for the program³.
- Builder's HERS rater must be in good standing with RESNET and the EPNHP.
- Document completion of home with a certificate of occupancy dated within the program year.

The custom report utilizes the same methodology to calculate savings as the previous fuel summary report. The custom report was needed because REM/Rate didn't have a suitable baseline reference home

² Source: Southern Nevada Home Builders Association. (homebuilders who pulled 5 or more permits)

³ The custom report was created by Architectural Energy Corporation the producers of REM/Rate.

that would allow the program to maintain the calculation methodology it had been using. The different baseline was needed to reflect changes in minimum code requirements within the program area. The report also consolidated information the program received from two reports in to one so the submission process is more streamlined.

Incentive Structure

Initially the program considered a flat rate incentive structure. The program instead chose a rebate connected directly to the demonstrated savings of each home submitted. Rebates are paid at \$0.30 per kWh saved based on savings identified in the Fuel Summary report. Although a flat rate incentive is easier to administrate, paying rebates based on kWh savings provides incentive to builders in proportion to the efficiency of their home. Builders have an incentive to push the boundary of efficiency based on what is cost effective. This incentive structure harnesses the creativity and motivation of each builder to maximize their rebate. As evidence of market transformation, the program consistently raised the savings calculation baseline over time while increasing participation among builders. Builders must continue to increase the efficiency of their homes or their rebate will decrease each time the program raises the baseline.

REM/Rate energy modeling

Consistent modeling and reporting of participating home performance is essential but can be an administrative burden for builders and raters. EPNH reviewed ENERGY STAR requirements and tailored the documentation needs of the program with inspection and reporting requirements most builders were already completing to qualify for ENERGY STAR. By mirroring ENERGY STAR requirements EPNH streamlines the reporting process for builders and lends credibility to EPNH.

Quality Assurance / Quality Control

The program established a substantial QA/QC protocol. Quality control activities benefit the program beyond verifying the quality and reliability of homes submitted for rebate. Quality activities provide an opportunity for the program to be actively involved with builders at a deeper level. Builder interactions at this level identify operational details that are used to improve program design and our understanding of the client. Annual sessions are held to present lessons learned during quality control activities. An example of an issue identified during QC testing was the need for baffles on roof vents to prevent loose attic insulation from being blown out of place by the wind. This item was presented in the lessons learned session with builders and is now a program best practice.

The program performs on-site audits on at least one home per builder and not less than 1% of homes submitted per year. Additionally desk reviews, which validate the energy model from the architectural plans, are performed on 5% of plans submitted for rebate. Increased validations are performed if discrepancies are found. Homes that fail to qualify upon inspection are disqualified and homes with significant deviations which still qualify receive a reduced rebate. The program has very few disqualifications or reductions. An example of a situation where the program made an adjustment was when a builder used metal windows in a community they bought from a builder who left the market. The standard in the rest of their communities was a vinyl window which was used in modeling the homes with metal windows. By testing one home and finding metal windows, the program identified a total of 5 models that were affected. One model was disqualified and the other models still qualified but had their savings adjusted. These models were less than two percent of the builder's homes.

Marketing

This program was designed for new homes in a market that is currently focused on distressed resale homes which are often much older homes. To meet this challenge, the EPNH program has developed a strategy to position itself as an opportunity to help builders survive the difficult market. The program markets itself to builders with four key benefits which are rebates, differentiation, training and marketing assistance. Rebates help the builder defray some of the cost they incur in their efforts to build more energy efficient homes. The current home market makes it difficult to recover the full cost of energy efficiency measures installed in the sales price of the homes. Builders must receive other benefits such as reduced costs in other areas or an easier sale if they cannot recover the full cost of efficiency measures, or long term they will not continue building energy efficient homes.

Differentiation through energy efficiency is effective because upgrading an older existing home is more difficult to accomplish compared to other differentiators such as paint or countertops. Although some builders are using energy efficiency to differentiate themselves from other builders, the most important differentiation is in comparison to resale homes on the market. In 2010 there were more than 10 resale homes sold for every new home sold. New homes typically sell at a slight premium to resale homes, however in the current market price differences between new homes and a distressed home in the same neighborhood can be as much as \$20,000 to \$40,000. Energy efficient homes provide a suite of benefits beyond utility savings such as quality, safety, and comfort. Builders use the cumulative impact of these differences to close the value gap and sell a new home.

The second prong of EPNH marketing is helping builder sales agents understand and sell the non-savings benefits which often have more impact on selling homes than the financial benefits of utility savings at today's costs.

EPNH focuses most of its marketing effort on helping new home sales agents communicate our message to buyers at the point of contact. This is the most efficient manner to educate our target market. Marketing to the general public through television, radio print or billboards is prohibitively expensive and not conducive to communicating the full benefits of energy efficiency to homebuyers. Current homebuyers are a relatively small percentage of the population so the program decided that the most effective way to focus marketing resources on home buyers is to utilize new home salespeople at the point of sale.

To achieve maximum results selling the benefits of energy efficiency, EPNH developed a sales training program designed to provide "Selling Energy Efficiency" curriculum to builder sales managers for use in their regular sales meetings. The training is broken into five modules of 10 to 20 minutes each. They are designed to be used as guided and self-guide training. The curriculum provides some building science knowledge for context but focuses on getting to know the customer. Sales agents should not expect to motivate buyers by reciting a list of features and benefits hoping to hit a hot button that causes them to buy. The most common homeowner benefits are better comfort, higher quality, increased safety, environmental benefits and better value. Most people probably want all of these however comfort, quality, safety and environment have different meanings to each person. The EPNH training program helps salespeople discover what is important to their clients and present the right benefits from the buyer's perspective.

The program also provides customized one page marketing flyers for builders to use in their model homes. The program creates the flyer and prints a quantity for each builder. EPNH also provides an electronic copy of the flyer they can use to print more themselves. See the example of one of these model home flyers below.



Energy Plus New Homes Program

Better Built. Better Performing.

What does an Energy Plus New Home have that an average home doesn't?

- Lower energy bills, often by more than 50 percent compared to homes built five to 10 years ago.
- Energy efficient windows that let sun in while keeping heat out.
- Better insulation to keep you and your family cool in the summer and warm in the winter.
- Better air sealing to maintain clean, comfortable air.
- Sealed heating, ventilation and air conditioning (HVAC) ducts to minimize hot and cold attic air loss.
- Efficient air conditioning systems that create a more comfortable environment inside your home.
- Less energy use than even ENERGY STAR® rated homes, reducing your carbon footprint.

There's never been a better time to purchase an energy efficient home.



Contact us for more information:

Phone: (888) 779-7773

Email: energyplus@nvenergy.com

Website: Click on the Energy Plus

New Homes link at

nvenergy.com/energyplus



Results

The EPNH program has steadily increased all important metrics each year. Builder participation, number of homes submitted and total kWh savings show solid increases each year. Builder interest and participation is important because it is the foundation for growing and maximizing the impact of the program. In 2010 the program captured 75% of the homes built by participating builders. This capture rate is a good indication that the program is providing value to the market but not providing excessive compensation to builders. The average 2010 rebate was \$776. Methods used by the program to calculate and document savings were validated by the M&V report at the end of the year with a 101% gross realization rate. TRC for the program is above 1.6. Table 2 shows some annual results from years 2008 to 2010. 2008 average kWh saving was skewed because the largest participant in the program that year was on the leading edge of the program. This builder is still achieving similar results but the averages are brought down in subsequent years by higher participation from builders at a lower qualification level.

Table 2: EPNH Actual Results

	2008	2009	2010
Units (homes)	419	1,023	1,554
Demand Savings (kW)	721	919	2,232
Average kWh per Home	3,659	1,996	2,609
Energy Savings (kWh)	1,533,258	2,041,407	4,054,597

Table 3: EPNH Market Penetration

Year	New Homes	Participating Homes	Share
2008	10,464	419	4%
2009	5,271	1,056	20%
2010	5,341	1,554	29%
Proj. 2011	3,800	1,750	46%

Table 4: Participating Builders

Year	Builders
2008	1
2009	7
2010	14
Proj. 2011	19

Conclusion

EPNH utilized a builder focused approach to creating the program. Builders are the customer and raters are interested third parties that are essential for driving interest and participation from the builders. The program creates an opportunity for builders who focus on energy efficiency to receive monetary, marketing and technical support from the program. The qualification and submission requirements enable NV Energy to effectively achieve the program's goals without creating unnecessary burdens on the builders.

Reaching home buyers with an appropriate message about the benefits they will enjoy as the owner of a participating home is difficult to accomplish economically. EPNH will continue to work with builders to communicate the appropriate message to home buyers in model homes.

In spite of the housing market and ENERGY STAR challenges that initially appeared dire to the program in the beginning, the positive market factors and the challenges themselves were used to create positive momentum and success for the program. Some of the avenues the program took such as a rebate based on kWh savings and the reliance on raters may have broad application but careful consideration should be used when implementing an approach in a situation that may be different.

In conclusion the EPNH program demonstrates that builders are willing to build homes significantly more efficient than minimum requirement if demand, incentives and competition support the decision. With success in transformation of the market, every day brings a new challenge in how to align the goals of the program with the goals of the builders and continue to give them a reason to build energy efficient homes.