

ENERGY STAR Homes Northwest Program

Market Progress Evaluation Report #5

PREPARED BY
ECONorthwest

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ENERGY STAR Homes Northwest Program Fifth Market Progress Evaluation Report

A Report to the
Northwest Energy
Efficiency Alliance

ECONorthwest

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EXECUTIVE SUMMARY

This is the fifth Market Progress Evaluation Report (MPER) of the ENERGY STAR Homes Northwest program. This report presents evaluation findings based on in-depth interviews with participating builders, verifiers, state energy officers, realtors, utility representatives, and representatives of other “green” homebuilding programs. The report also includes current data on the new home market in the Northwest as well as an update on progress towards program goals.

Market Share Attainment

Within the program territory, there were 58,289 new single-family homes constructed in 2007, a decrease of 22 percent from the prior year. New home construction for 2008 is forecasted to decrease an additional 13 percent before rebounding in 2009.

Despite the regional housing construction downturn, there were 2,658 certified ENERGY STAR homes built in 2007, which represents a market share of 4.6 percent. This is a significant increase over 2006 when market share was 3 percent. Market share growth was particularly strong in Washington, where it increased from 2.1 percent to 4.7 percent between 2006 and 2007. This is important since the program’s overall performance relies heavily on Washington, where about half of all 2007 homes were built.

Progress Towards Market Transformation

Although the program did not reach its annual market share goal, it made strong progress towards market transformation in the new homes market and the prospects for 2008 are encouraging.¹ In particular, the ENERGY STAR Homes Program was influential in getting the State of Oregon to adopt more stringent energy codes for new home construction. Starting in July 2008, new homes in Oregon will essentially have to meet the program’s technical requirements, until new requirements take affect in 2009.

There is growing interest in green building from consumers, and builders are increasingly using the ENERGY STAR brand and other green program brands to differentiate their product in the market.² In 2007 the program recruited 327 new builders, compared to 288 in 2006. Most of the new builders we spoke with viewed the ENERGY STAR brand name as an effective marketing tool to target appropriate clients and were planning to specialize further in ENERGY STAR in 2008. Utility representatives said they are getting more builder inquiries about green and energy efficient home programs, and that ENERGY STAR construction is mostly occurring in the higher-end, custom homes market, since these homes have difficulty competing with low-cost, standard homes where there is currently excess supply. Federal tax credits are helping to address the

¹ For 2007 the market share goal was 7 percent.

² Two major multiple listing services in Washington and Oregon began recognizing ENERGY STAR homes in 2007.

higher initial costs of ENERGY STAR homes construction. Importantly, starting in July 2008, all new Earth Advantage homes must also meet the full requirements for ENERGY STAR homes. This gives the program an increasingly popular strategic partner with whom to promote the ENERGY STAR brand in 2008 and beyond. Going forward, proactive collaboration and integration with green building programs is likely to become increasingly important in meeting the program's market share goals.

Overall consumer awareness and understanding of ENERGY STAR homes, however, is still inadequate to generate robust demand. Many of the market actors we spoke with said that the program has focused on builders long enough, and that going forward the program has to dedicate significant advertising resources to increase homebuyer demand and clarify distinctions with ENERGY STAR appliances. In particular, the messaging needs to make homebuyers clearly understand how long term energy cost savings will exceed higher upfront costs.

Process Evaluation/Program Delivery Findings

Regarding the program's delivery, several utility program managers and verifiers (who ensure that the requirements for ENERGY STAR homes are met) said they highly value the marketing assistance they receive from their Market Development Leads (MDLs). MDLs are the program's designated experts that work closely with key stakeholders such as "champion" builders, existing and new verifier companies, and engaged utilities to promote the program, answer technical questions, and forge self-sustaining relationships among key actors.³ Participating utilities also prefer the new "marketing focused" delivery approach by Fluid Market Strategies (Fluid). In particular, they claimed that maintaining close relationships with utilities and builders through weak and strong markets will serve the program well in the long run. While there is high satisfaction with the overall program delivery, however, budget and staff constraints are perceived to limit the aggressive attention that may still be needed in smaller, less urban markets.

Verifiers and utility program managers also value the new Mistake Proof Verification training and Tech Tips materials. The verifiers we spoke with are applying their new technical and marketing knowledge where possible, have developed new relationships with builders, and generally felt they would obtain more business in 2008. In addition, utility managers in smaller markets like to distribute these materials to a wide range of market actors to generate program interest and proactively increase the quality of construction.

In 2007, 59 new verifiers joined the program, compared to 40 in 2006. There is still a shortage of verifiers in some markets, however, and in other markets verifiers do not have enough work or may not be aggressively pursuing business that may be available. The

³ "Champion" builders are long-time program participants and/or are very active program advocates.

presence of a local verifier was identified as a critical factor for utilities that recently started up ENERGY STAR homes programs, and another utility that would like to do so. Going forward the program needs to stay abreast of these situations in order to provide additional training and assistance, direct builders to other verifiers, or develop regional coverage strategies.

Lastly, the new ENERGY STAR homes training for realtors also received positive reviews. Newly trained realtors are using the information they received to promote ENERGY STAR homes, although it has had little impact on their sales success in Idaho, due to a slow market and a glut of unsold low-cost homes. The training is giving realtors a thorough understanding of ENERGY STAR homes, however, and should be expanded to the other states where different market conditions may yield stronger sales results.

1. INTRODUCTION

1.1 EVALUATION OVERVIEW

This report is the first of three Market Progress Evaluation Reports (MPERs) of the Northwest Energy Efficiency Alliance's (NEEA's) ENERGY STAR Homes Northwest program for the 2007-2009 funding period, and the fifth MPER since the program started.⁴ The ENERGY STAR Homes Northwest program promotes the construction and sale of new homes built to the ENERGY STAR Homes Northwest specification, which was designed specifically for the states of Washington, Oregon, Idaho, and Montana. Homes built to this specification are at least 15 percent more energy efficient than Washington and Oregon State energy codes. These ENERGY STAR homes also include high efficiency lighting, windows, appliances, water heaters, insulation, and heating and cooling equipment. As a result, these new homes are designed to save an average of 1,000 to 1,500 kWh per year for gas-heated homes and 3,700 kWh annually for electrically heated homes. Appendix B provides more detailed information about the program's design and history and also past evaluation activities that have been conducted.

This evaluation report presents the findings of an evaluation conducted on NEEA's ENERGY STAR Homes Northwest program for the period through December 31, 2007. In January 2007 Fluid Market Strategies (Fluid) became the program management contractor (PMC) in charge of implementing the program, and several program delivery changes were introduced. Following are some of the key changes and initiatives implemented in 2007:

- New Mistake Proof Verification training (also referred to as Critical Details or Tech Tips) was offered to existing and new verifier companies. This training provides information on how to add value for builders by systematically integrating quality assurance processes, and also presents potential business strategies (e.g., how to market to builders, how to operate a business). A primary goal of this initiative is to develop verifier companies that can effectively recruit builders to the ENERGY STAR Homes program and support them in the long-term. In 2007 72 verifiers received the new training.
- Market Development Leads (MDLs) are the program's designated experts that serve each of the program's submarkets (e.g., Puget Sound, eastern Idaho). MDLs work closely with key stakeholders such as "champion" builders, existing and new verifier companies, and engaged utilities to help promote the program, answer technical questions, and forge self-sustaining relationships among key actors.⁵

⁴ Four MPERs were completed during the 2004-2006 funding period.

⁵ "Champion" builders are long-time program participants and/or are very active program advocates.

- In 2006, builder outreach was done primarily by fully funded Builder Outreach Specialists (BOSs). Individuals in this role were responsible for recruiting builders to the ENERGY STAR Homes program and ensuring that builders, once signed, were able to get their homes certified. In 2006 there were between eight and nine full time BOSs operating in the four states. Starting in 2007, builder outreach is now done by a variety of program staff including MDLs, utility coordinators, and for-profit verifiers.⁶
- Realtor training on ENERGY STAR homes was offered in Idaho and Washington and 186 realtors attended the classes. While other home building programs may give realtors a brief overview of ENERGY STAR homes, this new half-day class focuses exclusively on ENERGY STAR homes and attendees receive three continuing education credits. The program plans to offer this training in Oregon and Montana in the future.

A listing of the new Mistake Proof Verification and Realtor training classes offered in 2007 is provided in Appendix H. Other program changes and initiatives (e.g., program sponsorship by suppliers of ENERGY STAR compliant building components) are planned for 2008 and 2009 and will be documented in future MPERs as they actually occur.

This MPER also includes information about the Lighting Fixtures Pilot program being conducted by ICF International, for which NEEA is a sponsor.⁷ This program is conducting four modest pilot initiatives that are collectively designed to test different approaches to increasing market understanding and installations of energy efficient lighting fixtures, including in ENERGY STAR homes. Appendix E has more information about this program.

1.2 MARKET PROGRESS INDICATORS

Progress indicators identified at the outset of the program reflect the focus of the program on all facets of the residential new construction market and are designed to address key market barriers and opportunities (see Appendix B for more details).

Short-term and long-term indicators include:

Short-term Indicators

- Builders use the ENERGY STAR label to differentiate themselves in the marketplace;

⁶ BOSs continue to serve builders in Oregon at the direction of Energy Trust of Oregon and its program implementer, Conservation Services Group (CSG).

⁷ Sponsoring utilities are Puget Sound Energy, Seattle City Light, and Tacoma Power.

- Consumers, builders, and other market actors link ENERGY STAR homes and home quality/value;
- Builders are convinced of the long-term cost savings from reductions in call-backs that should result from performance testing and quality assurance practices;
- Increased awareness by builders and subcontractors of key efficiency and quality issues;
- Other market actors and trade allies are spending their own resources marketing ENERGY STAR homes and matching NEEA investments;
- Builders and their subcontractors have expanded knowledge and skills necessary to treat key energy efficiency and quality issues, particularly performance testing of HVAC ducts and equipment; and
- Increasing recognition of the ENERGY STAR label and understanding what it means for new homes.

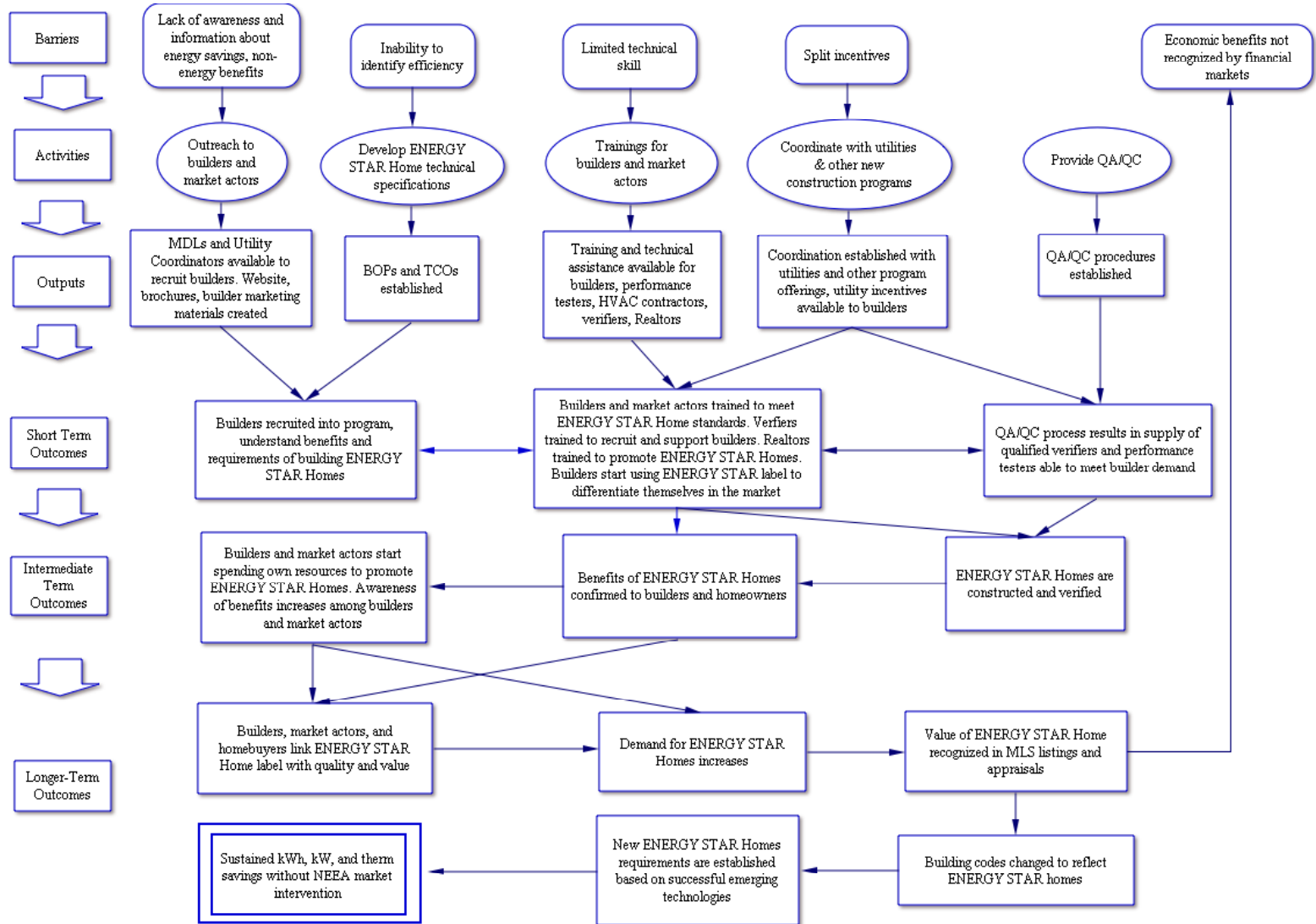
Long-term Indicators

- Multiple Listing Services include whether a home is certified ENERGY STAR in their listings;
- The value of efficiency upgrades is automatically included in the appraisal process;
- Private sector market actors replace NEEA as providers of program services;
- Residential energy codes are upgraded to incorporate some or all of the current ENERGY STAR requirements; and
- A new level of efficiency for ENERGY STAR is adopted based on successful demonstration of new and emerging technologies.

The short and long term indicators reflect the various activity-outcome linkages in the program logic, which is presented in Figure 1.

Key findings pertaining to some of these indicators are described in the following sections of this MPER and are summarized in the Conclusions and Recommendations section. For this MPER, the evaluation focused mainly on issues relating to program design and delivery rather than on broader market awareness issues. The next evaluation report scheduled for 2009 will include quantitative, survey-based findings that pertain to other market indicators (e.g., if builders associate the ENERGY STAR label with reduced call-backs, homebuyer perceptions of the label).

Figure 1: ENERGY STAR Homes Northwest Logic Model



2. EVALUATION METHODOLOGY

This evaluation report focuses on the process evaluation of the ENERGY STAR Homes Northwest program. This includes in-depth interviews with many of the major entities that are involved in implementing the ENERGY STAR Homes program. In addition, current market data on new home construction and program progress towards goals is presented to provide context for the process evaluation results. Finally, a review of NEEA's cost effectiveness modeling and underlying model assumptions was also conducted.

2.1 MARKET CHARACTERIZATION AND PROGRESS

One of the primary tasks of the evaluation is to characterize the current new home construction market in the region. In particular, the objectives of the market characterization are to:

- Characterize the overall market for new homes in the region and the number of homebuilders so that the potential for the ENERGY STAR homes market can be assessed.
- Show current progress toward program goals, including the number of ENERGY STAR homes certified (and initiated) and the number of builders and verifiers participating in the program.

These tasks were addressed by utilizing secondary data sources such as the building industry publication *Construction Monitor* for information on new homes and the number of homebuilders in the region. Current participation data were obtained from the program tracking database maintained by Fluid.

2.2 IN-DEPTH INTERVIEWS

The market actor interviews are designed to provide an additional perspective on key ENERGY STAR home components. These interviews were conducted by phone and involved extended conversations with builders, verifiers, and realtors that are involved in the program. We also interviewed participating builders that were officially enrolled in the program but had not yet constructed an ENERGY STAR Home.⁸ Interviews were also conducted with utilities that have and do not have ENERGY STAR homes programs, and staff for each state's State Certification Office (SCO) and their Quality Assurance (QA) specialists. All interviews focused on program implementation issues and were designed to elicit suggestions for improving the current program.

⁸ We also attempted to interview builders that had been recruited by the program in 2007, but which declined to participate. Much of the builder recruiting is now done by private market verifiers, however, and there is no formal program tracking mechanism to know which builders they are approaching. Due to a limited sample of non-participating builders and low initial response rates, these interviews were canceled.

The sample sizes for each interview group are shown in Table 1. All interviews were conducted by phone from January to April of 2008.

Table 1: In-Depth Interview Samples

Interview Group	Sample Size
Participating Builders	10
Other Homes Programs	2
Verifiers	8
Realtors	6
Utilities	22
SCO / QA Specialists	5
Total	53

3. MARKET CHARACTERIZATION

This section provides an overview of the residential construction market for Washington, Oregon, Idaho, and Montana through 2007 using the most current data available. Builder participation, program goals, and ENERGY STAR home construction data are also presented and provide a context for the interview results presented in the following chapters.

3.1 RESIDENTIAL NEW CONSTRUCTION MARKET OVERVIEW

Table 2 shows the number of new homes built by each state since 1998. Single-family home construction activity has been strong throughout the region during recent years, but the decline that began in 2006 worsened in 2007. New housing decreased by 14.8 percent in 2006 relative to 2005 and then declined by 22 percent in 2007 relative to 2006.

Table 2: Single Family New Construction by State – Census Data

Year	Washington	Oregon	Idaho	Montana	Total	Change from Prior Year
1998	28,644	16,936	10,277	1,485	57,342	
1999	28,111	16,595	10,497	1,607	56,810	-0.9%
2000	25,471	15,619	9,681	1,565	52,336	-7.9%
2001	26,736	16,323	9,738	1,790	54,587	4.3%
2002	30,239	17,413	10,845	2,050	60,547	10.9%
2003	33,091	17,875	12,601	2,340	65,907	8.9%
2004	36,153	20,728	15,106	3,423	75,410	14.4%
2005	41,407	23,840	19,172	3,459	87,878	16.4%
2006	35,020	20,486	15,627	3,636	74,769	-14.8%
2007	28,485	15,825	10,622	3,357	58,289	-22.0%
Change From 2006 to 2007	-18.7%	-22.8%	-32.0%	-7.7%		

Source: US Census, Housing Units Authorized by Building Permits Report

Table 3 shows the number of builders in regions defined by the Construction Monitor, which provides information on construction activity based on building permits. The data do not cover all of the NEEA program territory but do provide key information about building permits that is not obtainable from other sources. According to these data, all five regions experienced decreases in the numbers of builders issued permits. The smallest decreases in the number of permits issued from 2006 to 2007 were in the Portland/Vancouver/Salem region and the Puget Sound region (both three percent), while the largest decrease was in the Western Montana region (20 percent).

Table 3: Number of Builders Issued Permits by Region (2007)

Area Name	2006	2007	Percent Change
Inland Empire (Eastern WA, Northern ID)	713	612	-14%
Portland / Vancouver / Salem	1,645	1,592	-3%
Puget Sound	1,946	1,890	-3%
Southern Idaho	1,771	1,461	-18%
Western Montana	1,289	1,027	-20%
Total	7,364	6,582	-11%

Source: *Construction Monitor*.

Table 4 shows the distribution of builders based on home volume throughout the region. The vast majority of builders (83 percent) are small builders constructing four or fewer homes a year. These builders accounted for 27 percent of the total homes built. In contrast, there are just 34 large builders (constructing 100 homes or more) in the program area, which comprise less than one percent of the overall builder population. This small group, however, accounted for 25 percent of the total homes built.

Table 4: Builders by Region and Volume (2007)

Region	Number of Units Built Annually					Total
	1-4	5-9	10-24	25-99	> 100	
Inland Empire	529	48	18	15	2	612
Portland/ Vancouver/ Salem	1,276	168	83	52	13	1,592
Puget Sound	1,523	172	117	62	16	1,890
Southern Idaho	1,233	141	66	18	3	1,461
Western Montana	906	80	28	13	0	1,027
Total	5,467	609	312	160	34	6,582
Percentage of Grand Total	83%	9%	5%	2%	<1%	

Source: *Construction Monitor*.

3.2 PROGRESS ASSESSMENT

Table 5 shows the number of new builders that contractually agreed to participate in the ENERGY STAR Homes Northwest program in 2007 and also the cumulative number of participating builders since program inception. Results are shown by state and builder volume. Builder recruitment was active during 2007, with 55 percent of the total cumulative participating builders in all four states combined joining the program during this time. In 2007, 327 new builders joined the program, compared to 288 in 2006.

Table 5: Participating Builders – New and Cumulative⁹

State	2007 New Participating Builders		Cumulative Total of Participating Builders		2007 Participating Builders as a Percentage of Cumulative Total
	Small-Volume Builders (<100 homes)	Large-Volume Builders (100+ homes)	Small-Volume Builders (<100 homes)	Large-Volume Builders (100+ homes)	
WA	101	0	171	8	56%
OR	132	0	226	2	58%
ID	78	0	154	2	50%
MT	16	0	37	0	43%
Total	327	0	588	12	55%

Source: ENERGY STAR Database. Data as of February 22, 2008.

Table 6 shows the distribution of participating ENERGY STAR builders based on how many ENERGY STAR homes they had completed through 2007. Overall, 35 percent of the builders in the four states combined have yet to complete an ENERGY STAR home. This is in large part due to the large number of builders who joined the program in 2007, and who have not had sufficient time to get fully integrated in the program and complete a project. Exacerbating this delay is the slow housing market in which there is an abundance of unsold existing homes and increasingly stringent mortgage requirements. Builders who have completed an ENERGY STAR home have predominantly built between one and four ENERGY STAR homes.

⁹ For purposes of this analysis, “participating” builders were defined as builders that either joined the program in 2007 or later, or had joined earlier and had at least one home certified in 2007 or later. This definition is generally consistent with EPA requirements that participating builders should have constructed an ENERGY STAR home in the last five quarters.

Table 6: Cumulative Number of Participating Builders by State and Number of Completed ENERGY STAR Homes

State	Number of Total ENERGY STAR Units Completed						Total Number of Builders
	0	1 to 4	5 to 9	10 to 24	25 to 99	100 or more	
WA	65	67	12	16	11	8	179
OR	94	92	18	14	8	2	228
ID	44	77	16	13	4	2	156
MT	8	23	4	1	1	0	37
Total	211	259	50	44	24	12	600

Source: ENERGY STAR Database. Data as of February 22, 2008.

Table 7 shows the cumulative number of completed ENERGY STAR homes by builder volume group. This table highlights the importance of getting large builders (builders who have built 100 or more homes) to participate. Builders that have completed at least 100 ENERGY STAR homes account for 56 percent of the total completed ENERGY STAR homes.

Table 7: Cumulative Number of ENERGY STAR Homes Completed by Builder Volume

Number of ENERGY STAR Homes Completed	Cumulative Completed Homes	Percent of Total
1 to 4	666	10%
5 to 9	370	6%
10 to 24	680	11%
25 to 99	1,111	17%
100 or more	3,596	56%
Total	6,423	100%

Source: ENERGY STAR Database. Data as of February 22, 2008.

Table 8 shows the construction activity achieved through the ENERGY STAR Homes program for 2007. “Certified” homes refer to those that have been constructed and certified as ENERGY STAR-compliant by the program. “Initiated” homes are those that have started construction but are not yet completed, and have their status in the ENERGY STAR Northwest Homes Database listed as pending.¹⁰ Based on the 2,658 certified homes completed in 2007, the program was able to achieve a 4.6 percent market share, which is a significant increase over the 3 percent market share for 2006.¹¹

Importantly, the program’s overall performance relies heavily on Washington, where about half of all 2007 homes were built. Washington achieved a market share of 4.7 percent in 2007, which is a strong improvement over 2006 when market share was 2.1 percent. Similarly, Montana improved its market share from less than one percent to 2 percent between 2006 and 2007. The market shares of Oregon, which continues to lead among the states (5.8 percent), and Idaho remained relatively stable between 2006 and 2007.

Table 8: 2007 ENERGY STAR Home Construction Status

State	ENERGY STAR Homes Certified	ENERGY STAR Homes Initiated	2007 New Homes	Market Share of ENERGY STAR Certified Homes
WA	1,347	386	28,485	4.7%
OR	920	420	15,825	5.8%
ID	324	229	10,622	3.1%
MT	67	12	3,357	2.0%
Total	2,658	1,047	58,289	4.6%

Source: ENERGY STAR Database. Data as of February 22, 2008.

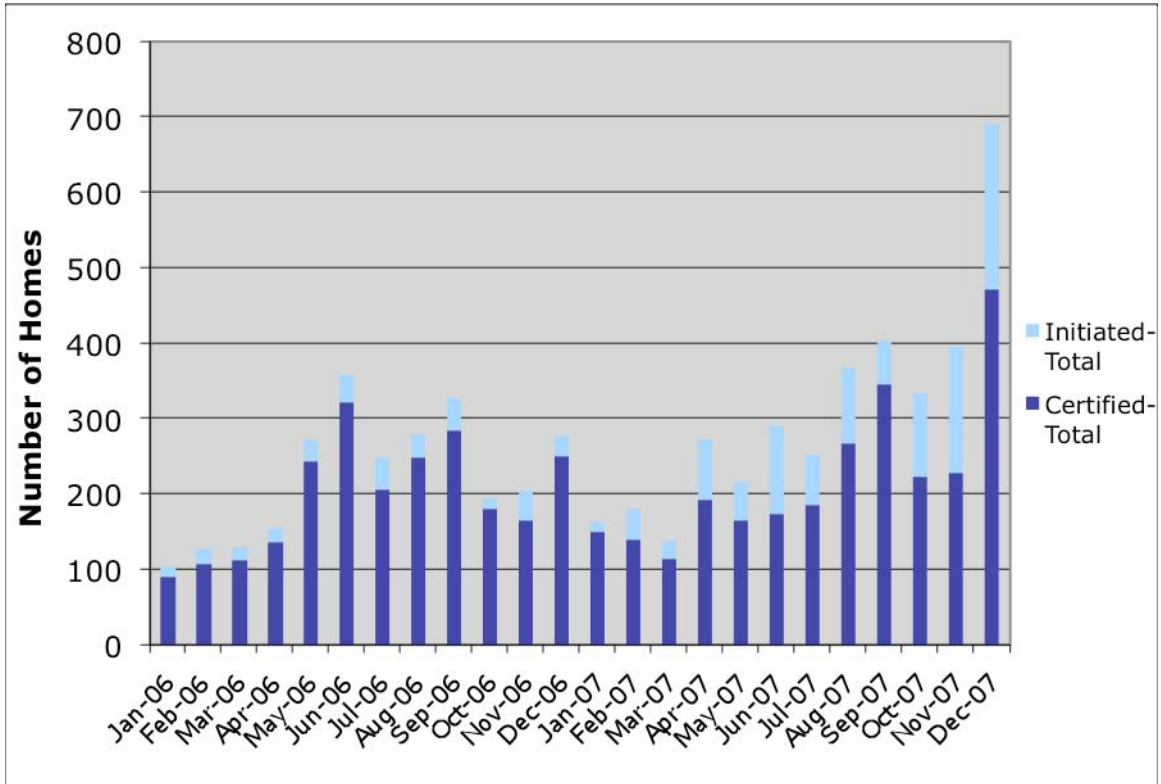
Figure 2 shows the monthly totals of homes that were initiated and certified from January 2006 through December 2007. In 2006, the number of certified homes steadily increased until activity peaked in June, and then activity decreased, on average, until another upsurge occurred in December. Construction in the first quarter of 2007 dropped significantly from December 2006 and then began to gradually increase through September 2007. As was the case for 2006, activity then decreased somewhat in the fall before a large spike occurred in December 2007. The number of initiated homes also

¹⁰ Homes outside of the Energy Trust of Oregon territory are not required to be registered in the database before completion, though many are. As a result, the actual number of initiated homes may be larger than what is reported in the table.

¹¹ For 2007 the program’s market share goal was 7 percent of the four-state market. In 2006 the goal was 4.1 percent.

increased dramatically in December 2007, which bodes well for the program’s performance in early 2008. Monthly program activity by state is provided in Appendix G.

Figure 2. Certified and Initiated Homes (Monthly Totals)



Source: ENERGY STAR Database. Data as of February 22, 2008.

Table 9 shows the number of verifiers and performance testers participating in the program during 2007. Although the ENERGY STAR program does not have a goal for the number of participating verifiers and performance testers, an increased number of market actors indicates that more businesses are viewing the program as a business opportunity. The number of verifiers and performance testers that joined the program in 2007 represent 34 percent and 17 percent of the cumulative totals, respectively, which is consistent with the program’s focus on recruiting new verifiers in particular. Overall, 59 new verifiers joined the program in 2007 compared to 40 in 2006. Of the four states, Oregon saw the largest growth of participating verifiers during 2007, with Washington following close behind. In both states, new verifiers in 2007 were generally added to a growing pool of active verifiers. In Idaho and Montana, however, new verifiers represent a greater share of total verifiers, reflecting higher turnover in those states. Oregon also had the largest increase in performance testers during 2007, with Washington not far behind. Montana also showed significant improvement in participation for 2007.

Table 9: 2007 Participating Verifiers and Performance Testers

State	Verifiers		Performance Testers	
	New 2007	Cumulative	New 2007	Cumulative
WA	18	67	28	213
OR	24	78	35	197
ID	6	13	1	37
MT	11	15	18	38
Total	59	173	82	485

Source: ENERGY STAR Database. Data as of February 22, 2008.

4. FINDINGS

4.1 OTHER HOMES PROGRAMS INTERVIEWS

This section summarizes the results of interviews with representatives of green building programs that operate in the same territory as ENERGY STAR Homes: Built Green in Washington and Earth Advantage in Oregon (see Appendix I for more detailed interview results). A key goal of these interviews was to better understand the relationships and differences between the homes programs and how they fit into the regional new homes market.

In Washington, Built Green homes attain ratings of 3 to 5 stars, depending on how many green features they incorporate across six categories (e.g., water use). Only 4 and 5 star homes require full ENERGY STAR certification. Through Oregon's Earth Advantage program, homes attain one of four certifications (standard, silver, gold, platinum) depending on how many points they earn across four broad categories (indoor air quality, energy efficiency, environmental responsibility, resource efficiency). Starting in July 2008, however, all new Earth Advantage homes must also meet the full requirements for ENERGY STAR homes.

The two interviewees had varying perceptions of how their building programs interacted with ENERGY STAR Homes and local utilities. The Built Green representative said that while the ENERGY STAR Homes program complements his program, "...in reality there is some program competition to attract builders, who have to decide which certification to choose." Alternatively, the Earth Advantage representative said that Earth Advantage does not compete with ENERGY STAR Homes, but instead attracts builders who want to adhere to more comprehensive green building requirements. He also said that Oregon's utilities are fairly neutral regarding which of the two programs they promote. The Built Green representative said that his area utilities support the ENERGY STAR Homes program "over all other programs" and that Built Green's funding is increasingly contingent on promoting ENERGY STAR. When asked about customer preferences, both interviewees said that homebuyers do not distinguish carefully between various brands of environmentally friendly homes. The Earth Advantage representative said that this ambiguity emanates, in part, from confusing ENERGY STAR Homes messaging.

Both interviewees were asked to identify the main challenges to the ENERGY STAR Homes program. The Built Green representative said that he was not sure why the program was "not hitting its numbers goals" and speculated that the ENERGY STAR Homes program may not have sufficiently strong relationships with key homebuilder associations to facilitate growth. The Earth Advantage representative identified the following program challenges: inadequate funding, poor synchronization with Energy Trust initiatives, an ineffective verifier-as-recruiter model, varied population densities and building codes in the program territory, and a perceived "command and control" approach to program design that can alienate existing and potential allies.

Lastly, the interviewees were solicited for suggestions to improve the program. The Built Green representative proposed new joint advertising of 4 and 5 star homes with the

ENERGY STAR Homes program. The Earth Advantage representative recommended having a credible and well-established green building program deliver the ENERGY STAR Homes program, rather than rely on numerous verifiers (with varying expertise) to recruit builders to the program. He also said that NEEA could do a better job informing builders of new, more stringent regulations, instead of leaving Earth Advantage “in the difficult spot of being the messenger.”

4.2 PARTICIPATING BUILDER INTERVIEWS

In-depth interviews were conducted with 10 active ENERGY STAR builders Oregon, Washington, Montana, and Idaho. The interview questions probed a variety of topics, including motivations for joining the program, marketing methods used, challenges in meeting program requirement, satisfaction with the duct testing and the verification processes, and suggestions for program improvement.

The interview sample was selected to get feedback from many of the larger program sub-markets, with additional emphasis on Puget Sound since this important sub-market has struggled to attain market share goals in the past. The selection also focused on new 2007 builders, since slow start-up by newly recruited builders has been a problem in the past.

Table 10 shows how the builders were distributed across the states. Nine of the 10 builders had initiated or completed an ENERGY STAR home in 2007, while one had not started building until 2008. Seven of these builders had joined the ENERGY STAR homes program in 2007, and three had joined prior to 2007. As shown in Table 11, the interview sample contained primarily smaller builders who constructed 10 or less homes in 2007.

Table 10: Interviewed Builders by State

State	Sample
Oregon <i>(NW-1, South-1, Central-1)</i>	3
Washington <i>(Puget Sound-2, Tri-Cities-1, Central-1)</i>	4
Montana <i>(West-1, East-1)</i>	2
Idaho <i>(Boise)</i>	1
Total	10

Table 11: Interviewed Builders by Number of 2007 Homes Completed

Homes Completed	Sample
0-10	7
11-20	1
21-100	2
101+	0
Total	10

Benefits of Joining the Program

Interviewed builders were asked why they joined the ENERGY STAR program. Most builders pursued the program themselves, and were not recruited by an MDL or verifier. The most common reasons mentioned are listed below:

- Perception of growing customer demand for green building
- To distinguish company in the marketplace
- Already building to ENERGY STAR standards and want recognition
- Personal responsibility to protect the environment

One unique case is the builder who did not start construction on an ENERGY STAR home until 2008, and joined the program specifically for a house he would be building in 2008 to meet Built Green standards. His Built Green verifier suggested that he join the ENERGY STAR Homes program because he would already be exceeding the ENERGY STAR homes requirements.

Two of the 10 builders built only ENERGY STAR homes in 2007, and six others plan to build only ENERGY STAR homes in 2008.

Name recognition is the most commonly cited advantage of building an ENERGY STAR home among the builders interviewed. Specifically, ENERGY STAR brand recognition is considered an effective marketing tool to attract clients who want to purchase energy efficient homes. Several respondents also said that for them the credibility provided by third party verification is the biggest advantage of participation. One respondent thought that there has been a proliferation of disreputable green builders and viewed the ENERGY STAR verification process as a guarantee to his homebuyers that the home is built properly. Moreover, one builder saw the ENERGY STAR program as providing an advantage in the slower housing market in Southern Oregon. He said that lower-end sales are not occurring now, and using ENERGY STAR to market to the upper-end provides an advantage.

Builders were also asked what type of program support they found most valuable. Four respondents said that the ENERGY STAR marketing support was the most valuable. Specifically, respondents mentioned reimbursement for marketing activities and program-provided marketing collateral such as the placards, stickers inside the house, and reproduction of the ENERGY STAR logo on their company websites. Other respondents also mentioned verification support, builder training, and contractor training. The builder who had not started an ENERGY STAR home until 2008 said that he did not have any experience with the program's support services, as was not far enough along into the construction process (one month in). He had no concerns about the ENERGY STAR requirements, however, because the Built Green requirements were more stringent.

Meeting Program Requirements

Seven of the 10 builders said it was “easy” to find information on program requirements, either through the ENERGY STAR website, a local utility website, the ENERGY STAR field manual, a verifier, contractors, or a local ENERGY STAR representative. However, one builder said that he wished that the Builder Option Package (BOP) information sheet was more detailed and that he would like someone to explain the perimeter slab insulation requirement on BOP#1. He said that currently there is no local ENERGY STAR representative in the area (Missoula, MT) for him to contact for information.

Notably, two respondents were not aware that there are different BOP options. Those that were aware primarily used just BOP#1 and only sought other options to accommodate custom homes or other specific homebuyer requests.

In general, the interviewed builders agreed that none of the BOP requirements were particularly difficult to meet after they were understood. For their first ENERGY STAR homes projects, one respondent initially failed the insulation requirement because his wood was too wet and another respondent said the HVAC duct-testing requirement was challenging initially, because it is hard to correct problems after they are discovered. However, no builder identified any persistent technical challenges, and the two that experienced problems initially were able to pass the verification stages in their subsequent projects.

Two respondents said that the lighting requirement was the most difficult requirement to meet. When asked specifically about the lighting requirements, almost all of the builders said that it was challenging to work with the limited equipment options. Five builders commented on the limited selection of hardwired fixtures that meet ENERGY STAR requirements, and for this reason, four of these respondents said that less than 20 percent of the lighting in their ENERGY STAR homes are fixtures, as opposed to CFL bulbs. Two respondents said the narrow selection of ENERGY STAR lighting fixtures can be particularly challenging for clients who want designer styles. Three builders said that Light Emitting Diode or LED lighting could mitigate this problem in the future, but currently this technology has limited market penetration and is prohibitively expensive.

Notably, one luxury home builder in the Puget Sound region said that a representative from Northwest ENERGY STAR came out to a house site to help find a way to fulfill the lighting requirement in a way that could meet high-end customer demands (dimmable CFLs, highlighting art pieces, layered light). The builder indicated that he was satisfied with the assistance and final lighting result.

In addition, some builders were concerned about the performance of ENERGY STAR qualified lighting. Two builders said that CFL flood lights take a long time to warm up. These two builders also said that many customers are unhappy with the light produced by CFL bulbs and that some customers probably switch to incandescents once they move in. One of these builders said he tries to deter this practice by mixing CFLs with incandescent light bulbs in the same fixture in order to produce a more pleasing light quality. Another respondent said she was worried about how her customers discard the CFLs and suggested that there should be more education for homebuyers about proper disposal techniques.

Four builders bought their lighting at big box stores such as Home Depot, Lowes, Fred Meyer, Seattle Lighting, Lamps Plus, or Costco. Two purchased their lighting from small specialty lighting stores. An additional two builders relied on both large and small stores and the remaining two did not know where their lights come from because their contractors handled these purchases.

Marketing ENERGY STAR

Seven respondents sell their homes through real estate agents and the largest builder has a designated sales representative. Two builders also serve a dual role as their company real estate agent. Furthermore, two builders said that their real estate agents have been to a formal ENERGY STAR training seminar and offered positive reviews of the seminars. One builder who had been building ENERGY STAR homes since 2002 said that while all of her realtors have been through the training, some kind of refresher for them would be helpful, such as an e-mail reiterating the benefits and requirements of the program. Three builders had trained their real estate agents themselves and all respondents said that their real estate agents are knowledgeable about the program.

The respondents were asked what they thought the biggest marketing challenges are (to the builder) to selling ENERGY STAR homes. Responses are listed below:

- People have heard of ENERGY STAR but do not know how it is different from standard building codes
- People know about ENERGY STAR appliances but not ENERGY STAR homes
- The limited availability of lighting products that can be used to meet ENERGY STAR requirements
- The realtor community in general does not know enough about what ENERGY STAR homes offer

- The builder is never sure if potential buyers will care about energy efficient building practices
- Advertising in a way that makes customers want to pay for the initial upfront cost of ENERGY STAR homes

All respondents emphasized the need for the ENERGY STAR Homes program to work to educate the general public about the advantages of buying an ENERGY STAR home.

Over half of the interviewed builders said that they did not feel well informed by the program regarding marketing opportunities. One builder who had been constructing ENERGY STAR homes since 2002 said that the communication about marketing opportunities “trickles down,” and is inconsistent. She often finds out about new marketing strategies six months after they have been in effect.

The builders use a variety of marketing materials to advertise the ENERGY STAR Homes program. Eight of the 10 builders promote the ENERGY STAR Homes program, while the other two market Built Green instead. Most frequently, builders use their websites to promote the ENERGY STAR program—six of the 10 builders said that they advertise on their company websites. Three builders use ENERGY STAR plaques, stickers, and banners at the house site and three advertise through brochures and fliers. Two builders had advertised through local newspapers and two label their homes as ENERGY STAR certified on the Regional Multiple Listing Service.

Duct Testing

Eight respondents said that their HVAC contractors had been trained on the program requirements, and two builders had heard complaints from their contractors about duct testing. One builder said that his HVAC contractor “hates doing the test because it takes so much time.” Another said that the training was a “painful process for [the contractor]” because of the expensive equipment he had to buy and the information he had to learn. The remaining builders had not heard of any problems or frustrations from their HVAC contractors, although one mentioned that his HVAC contractor has really limited knowledge on ERV and HRV systems.

Four respondents had HVAC contractors who also performed the duct tests. None of the respondents had a significant problem locating a duct tester. However, one builder mentioned that it was difficult to get a verifier to come in at the appropriate times in the construction process.

Six of the interviewed builders did not perceive any benefits of duct testing to the builder, while the remaining four viewed the duct testing as an important quality assurance tool that indicates that everything is done correctly. One respondent said that the duct testing gave her “peace of mind,” and another said that he liked to tell his HVAC subcontractors that they will be checked. All respondents said that there were benefits of duct testing to the homeowner, such as a quieter and more comfortable system and savings on energy bills. Two of the builders educate their homebuyers on these benefits and the other eight

said that they did not think their homebuyers are aware of the benefits. The builders said that the disadvantages of duct testing were time and money. Four said that the duct testing is well worth the cost, and the remaining six were unsure.

Only one respondent said that he had failed a duct test at one point (forgot a cap), and it was quickly remedied.

Verification Process

Five of the builders had had homes verified, while the remaining five had not reached that stage yet. Only one builder reported failing any of the verification stages at any point. He was a new ENERGY STAR builder in 2007 and had three houses that did not pass the moisture percentage requirement in the wood (as mentioned previously), but all of the homes passed when the verifier returned a week later. He also had two homes that failed because the plumber installed water heaters with insufficient EF ratings. This respondent said that he has not had any other problems with this requirement now that “he knows what he’s doing,” and that each verification is a learning experience.

None of the builders had experienced major delays in construction due to the verification process or perceived any significant disadvantages. One builder said that it would be helpful to have an on-line verification system like LEED. The most veteran builder (began in 2002) said that in the last year, the amount of paperwork involved with the verification process had increased, as well as the costs.

Three builders mentioned that verifiers were in short supply in their areas (Puget Sound and Tri-Cities, WA and Missoula, MT).

Only two builders had worked with a state organization that re-checked their verifiers’ work and these builders reported no problems. However, one of the builders from Idaho “had to scramble” to make sure that the state agency checked the home before the homebuyer moved in, and mentioned that the agency should schedule their services before the close of the home.

Of those respondents who had received an ENERGY STAR label for their homes, they said it generally took a few weeks to receive the label after the verifier approved the home. This was considered a satisfactory amount of time.

Additional Assistance

Respondents were asked what additional types of assistance they would like to receive from the ENERGY STAR Homes program. Two respondents said that they would like to have more frequent contact with a local field representative. For example, one Montana builder said that he would like a more available local ENERGY STAR representative with whom to review building plans and to from whom to receive marketing materials. The other builder in Southern Oregon said that his local ENERGY STAR representative was new and very busy and so it was difficult to schedule time to sit down and talk. Two builders thought the local representative should be doing more to educate realtors and

customers in the area about ENERGY STAR benefits. In particular, one small builder said that as a small firm, the impacts of its marketing activities are limited, and increased publicity in the area from the ENERGY STAR Homes program would be helpful. Overall, eight of the 10 builders were more inclined to seek assistance from a “program representative” than their verifier, although none mentioned specific problems with their verifier.

An Idaho builder said that she has been participating in the program since 2002 and still is not sure how to receive federal tax incentives for the ENERGY STAR homes she has built. When probed further, she said that she does not receive support from ENERGY STAR program staff and instead depends on her verifier for information. This builder also said that she was not receiving information about new research or input on new building techniques that she would like to see.

Other Programs

All three of the Washington builders were also involved with Built Green programs and all three Oregon builders had built homes through the Earth Advantage program. The builders in Idaho and Montana were not involved with other energy efficiency programs for builders. Five respondents mentioned that they were aware of the LEED program. None of the builders indicated that their clients had a strong preference for Built Green or Earth Advantage, over ENERGY STAR.

Program Challenges

Six of the 10 respondents said that the higher cost of building ENERGY STAR homes was the greatest challenge associated with program participation. Many potential homebuyers are attracted to the energy efficient features, but are ultimately not willing to pay the initial extra costs. One builder said that homebuyers would often rather spend the extra money on luxury items such as a hot tub.

Moreover, three respondents also said that the slow housing market had amplified this extra-cost problem, in cases where they compete with the very low prices of non-energy efficient homes. One respondent said that she was losing customers who were basing their purchasing decisions primarily on the cost per square foot.¹²

4.3 VERIFIER INTERVIEWS

This section presents the results of in-depth interviews conducted with eight participating ENERGY STAR verifiers. These verifiers are specialists providing third-party verification that ensure the requirements for an ENERGY STAR home are being met.

¹² Two builders in Washington (Tri-Cities and Puget Sound) said that the housing market had not experienced a downturn in their areas and four did not think the ENERGY STAR label provided a significant advantage or disadvantage in the slower market. As mentioned previously, one builder saw the ENERGY STAR brand as an asset in the depressed housing market.

The purpose of these interviews is to provide the verifier perspective on the various ENERGY STAR Homes program components, the ENERGY STAR Homes program training, the new Mistake Proof Verification training, and the verifiers' overall experience with the program.

Table 12 shows how the verifier interviews were distributed across the states, and the number of homes they had verified (also by state). The interview sample was chosen to get a mix of verifiers across states and to focus on verifiers that had received new training offered through the program in 2007. The experience level of the respondents ranged from those who had yet to verify a home to verifiers that had inspected 40 ENERGY STAR homes in 2007. Collectively, the verifiers we interviewed had inspected 75 ENERGY STAR homes in 2007. The Oregon verifiers were certified in 2006 and 2007, both Washington verifiers were certified in 2007, the Idaho verifiers in 2005 and 2007, and the Montana verifiers in 2007.

Table 12: Verifier Interview Sample By State

State	Sample	2007 Verified Homes
Oregon	2	41
Washington	2	0
Montana	2	0
Idaho	2	34
Total	8	75

Three of the four verifiers that have completed home verifications reported 100 percent certification rates. The other verifier reported a 95 percent certification rate for the homes he verified.

Business Environment

All of the interviewed verifiers said they work as an independent contractor, and each was also certified to perform duct testing for the program. In addition to verifying ENERGY STAR Homes, all respondents also provide other services, including:

- Residential home construction and remodeling
- Construction oversight/due diligence, general home inspections
- Energy advisory services and audits
- Duct testing, heat pump commissioning

- LEED and green building certification
- Realtor services

In most cases, the verifiers we spoke with recruited builders through the relationships they developed from offering the above services. A couple of verifiers also recruited builders through cold calls based on observed construction activity and through previous work they had performed in the construction sector.

Only the two verifiers in Oregon said that a significant amount of their work came from verification services. The first verifier stated that in a normal year, 25 percent of his workload was providing verification services, but recently that had grown to 50 percent as “regular” home inspections declined while green and energy efficient building increased (he had 60 homes “in the pipeline”). The second Oregon verifier related 30 percent of his business to verification. One verifier in Idaho said ENERGY STAR verifications accounted for 10 percent of his business, while the remaining five verifiers said verification accounted from zero to five percent.

Every verifier expected to do more home verifications in the next year, with the exception of one verifier in Idaho. This verifier stated that contractors “do not want to get on board” with the program and, in his opinion, will not build ENERGY STAR homes until they become code.

Verifiers in Montana and Oregon were optimistic about their business prospects. Both Oregon verifiers expected their verification businesses to grow, with one hoping to double his business. One Montana verifier stated that no one was marketing ENERGY STAR homes in his area of Southwest Montana. However, he also noted that “The Gallatin Valley is the fastest growing population in Montana, and with only two major competing markets in White Fish and Missoula both doing well in ENERGY STAR verification, I’m excited about my business prospects.” Although both Washington verifiers had yet to verify a home, one respondent said she had twelve homes scheduled for verification in the near future and was training staff in the expectation of getting more business. The second Washington verifier stated he was new to the program (trained in July 2007) and had only cultivated one relationship with an area builder.

The rates charged for services varied greatly. The first verifier in Oregon said he set his rates based on the fees charged by his competitor, Earth Advantage. This ranged anywhere from \$350 to \$800 depending on the house. The second Oregon verifier quoted a rate of \$400 per home. In Washington, the rate charged for verification services appears to be around \$65 per hour, which can increase when significant travel is required. In Idaho, both verifiers gave a range of \$200 to \$750 per home, depending on the size and type of home. Being new to the field, both Montana verifiers were unsure of the rate they would charge. When pressed, each stated in the neighborhood of \$50 to \$70 per hour. Every verifier claimed they did not expect their rates to increase in the coming year.

Next, verifiers were asked about their marketing efforts and which benefits of ENERGY STAR homes they emphasized. Comfort, brand recognition, energy and cost savings, product quality, and the rigorous third-party inspection were all aspects of the program highlighted by each verifier. The marketing channels most commonly used by verifiers were cold calling, letters to builders and contractors, and realtors, and word of mouth advertising.

Each of the eight verifiers was asked what kinds of program assistance would help them more effectively market the benefits of ENERGY STAR homes to builders. Their suggestions included:

- More training on how to properly size a heating system
- Web design help
- Help marketing ENERGY STAR as a component of green building
- Informing HVAC contractors of the value of ENERGY STAR
- Having information available on how ENERGY STAR homes are being built or sold more rapidly (i.e., “success stories”)

To help market the program more effectively, the verifiers suggested the following:

- Prominent newspaper advertisements thanking ENERGY STAR builders
- Bill inserts to promote local ENERGY STAR builders
- Enhanced homebuyer education, to make them more knowledgeable about indoor air quality and potential energy savings
- Advertising in magazines and local newspapers (with messages that ENERGY STAR homes can prevent coal fired power plants from being built)
- More builder breakfasts for builders, homebuyers, utilities and lenders

Training

Verifiers were asked to evaluate the initial ENERGY STAR Homes program technical training they received and also the program’s new Mistake Proof Verification training. Every verifier with the exception of one in Idaho felt the initial technical training adequately prepared him to verify ENERGY STAR homes. The verifier in Idaho, however, stated that there was not enough hands-on learning. He added that the amount of class work should be reduced to spend more time at ENERGY STAR built homes.

Additionally, each verifier had attended the program’s Mistake Proof Verification training component. Sometimes referred to as Critical Details or Tech Tips, this training

is provided by the program to show potential business strategies to verifiers and how to add value for builders by integrating quality assurance processes into their work. Seven of the eight verifiers found this training to be useful with the eighth saying he was impartial. This verifier further stated that he questioned this training's usefulness and was unsure if it would help convince contractors to get on-board with the program. The remaining seven verifiers said they particularly liked the Critical Details sheets that were handed out and felt they were the most valuable aspect of the training. That said, only one verifier reported that they actively use the Critical Details sheets while talking to builders.

Three verifiers reported that the Mistake Proof Verification training had increased their efforts to recruit builders. A fourth verifier stated that he was already comfortable talking to builders because of his previous work in construction. Together, these four verifiers have established new relationships with eight builders: three in Oregon, one in Washington and four in Montana. One verifier in Idaho said he has approached some builders about the program but they are only willing to listen if they have had a problem in areas addressed by ENERGY STAR homes. The other Idaho verifier said the training helped him approach a group of builders but he had not yet heard back from any of them.

Only one verifier in Oregon felt the training had changed the way he conducts business. This verifier claimed the training increased his ability to provide more thorough assistance and to a greater number of builders. He also added that the training improved his verification procedures and helps the builders he works with more easily comply with the ENERGY STAR standards.

Six of the eight verifiers did not have recommendations for improving the Mistake Proof Verification training. One verifier suggested making program information available in Spanish. A second verifier asked for more training in Eastern Washington so other potential verifiers did not have to travel to other states for training. The last verifier had no specific recommendation but was certain "There is a need to help implement the program with builders rather than just provide information to verifiers."

Program Support

All the verifiers were certified in 2007, except for one Oregon verifier and one Idaho verifier. The Oregon verifier was unaware that the program ever had a position called a Building Outreach Specialist. After learning of this previous program role, the Idaho verifier said that eliminating this role had not affected the program negatively.

Verifiers in Oregon and Montana said they had worked with the program's MDLs. Communication between verifiers and MDLs takes place via phone and email and occurs on a weekly basis. One Oregon verifier, attributing 50 percent of his business to verifications, communicates daily with his MDL and said he has built an extremely strong relationship with this person. Only one verifier in Idaho said they had worked with their utility regarding the ENERGY STAR homes program. This verifier said his interaction was discouraging as the utility focuses its rebates on homes with air conditioning only.

Upcoming Challenges

Convincing builders and contractors of the benefits of the ENERGY STAR homes label poses the greatest challenge to verifiers. Four of the eight interviewed verifiers said this will be their biggest barrier in the coming years. Other challenges described by verifiers include:

- Competing with Earth Advantage
- Getting their foot in the door with big contractors
- Establishing ENERGY STAR homes in a strong retrofit market (e.g., McCall, ID)
- Developing an untapped market in Southwest Montana

Suggestions from the verifiers for addressing the challenges facing the ENERGY STAR Homes program are listed below:

- Ensure fairness and equity in supporting all verifiers (“If the program can promote the ENERGY STAR label more then this will not be a problem.”)
- Give verifiers as much warning as possible about planned program changes
- Provide adequate verification leads in Eastern Washington and Montana
- Increase the amount of marketing to homebuyers and builders
- Increase awareness of the program through training and advertising
- Use success stories to promote the program to builders
- Run ads with builders highlighting the program’s success

Overall Program Comments

The verifiers had generally positive comments about the overall program. When asked to rate their overall experience with the program, responses ranged from “fair” to “excellent.” One verifier added that there was not enough training for new verifiers. As a result, he felt new verifiers “are left out in the cold to fend for themselves” during their initial participation. Listed below are additional comments from verifiers:

- “The program is managed well, program personnel are motivated, the questions get answered rapidly and overall the tech support is good.”
- “ENERGY STAR Homes is a strong program and is something I can support.”

- “The program training is good but many times it is hard to get there.”
- “Business lead generation is hard and is something the program should concentrate more on.”
- “The training aspect of the program is great.”

4.4 REALTOR INTERVIEWS

This section presents the results of interviews conducted with realtors that sell both “regular” single-family homes and certified ENERGY STAR homes. The purpose of these interviews is to provide the realtor perspective on the various ENERGY STAR homes program components, the new ENERGY STAR homes realtor training and the realtors’ overall experience with the program.

The interview sample was drawn from the attendance lists for the new ENERGY STAR homes realtor training. In total, interviews were conducted with six realtors representing five real estate firms in Idaho.¹³ Five of the six realtors had not yet sold an ENERGY STAR home themselves, however they estimated that their firms had collectively sold five ENERGY STAR homes in the past year. The other realtor, who serves the McCall area, had sold one certified home in Boise. Table 13 shows the market areas of the interviewed realtors.¹⁴

Table 13: Realtor Interview Sample

Realtor Market Area	Realtors Interviewed
McCall, ID	4
Meridian, ID	2
Total	6

Training

Feedback from the realtors on the quality of the new ENERGY STAR homes training was very positive. Three realtors said the training was “good,” one referred to the training as “interesting,” one said it was “very informative,” and the last realtor stated the training was “excellent.” Additionally, one realtor commented that the training was very necessary because many of the realtors present at the training were completely

¹³ The program only provided lists of Idaho attendees. See Appendix H for a list of trainings offered in 2007.

¹⁴ Both cities are in the general vicinity of Boise.

uninformed about ENERGY STAR homes. A second respondent noted that visiting an actual certified home was extremely useful.

Regarding the effectiveness of the training, each realtor enthusiastically said they now thoroughly understand the benefits and technical aspects of ENERGY STAR homes. Additionally, every respondent said they now have the knowledge needed to effectively sell ENERGY STAR homes because of the training. When asked what topics they recalled, they mentioned: the ENERGY STAR home requirements and certification process, energy and cost savings, insulation and heat loss, furnace efficiency, home depressurizing, blower door tests, efficient lighting, efficient windows, doors, and crawl spaces.

Four of the six respondents said they have had an opportunity to use the knowledge they gained in the training when talking to clients at open house events or speaking with potential homebuyers over the phone. When questioned on their experiences using this knowledge, each of the four respondents said that the market in Idaho is so slow it is hard to judge the effect they are having on new homebuyers. In the current Idaho real estate slump, one realtor said, rehabilitated homes in McCall are rapidly outselling new homes. A second realtor said that ENERGY STAR homes, in her experience, are considered an upgrade and new homebuyers are looking for the best deal they can get at the lowest cost. One realtor added that “People realize ENERGY STAR homes save money, but they don’t have the money to put up front.”

Business Environment

All realtors interviewed are actively marketing ENERGY STAR homes, usually through company web pages, local newspapers, and/or real estate magazines. Every realtor also reported that their firm advertises all their ENERGY STAR homes on the multiple listing service. When promoting ENERGY STAR homes in person, every realtor said they will emphasize the cost savings from reduced monthly utility bills to potential buyers. After this, five respondents said they will market the added comfort afforded by an ENERGY STAR home. Two of the six realtors also commented that they spend a significant amount of time promoting the appliances available in a certified home.

Respondents were asked if they thought homebuyers understood the benefits of an ENERGY STAR home. Three realtors felt there was not a lack of understanding among potential homebuyers. One of these realtors added that after homebuyers ask their preliminary questions and the realtor has a moment to spend with them, they do not have any questions. Two realtors stated that about half of their clients have a hard time understanding the benefits of an ENERGY STAR home, and the last realtor did not believe homebuyers have any understanding at all. According to the last three realtors, homebuyers have the hardest time with the concept of return on investment as it relates to the higher upfront cost of a certified home (which they estimated to be \$10 per square foot, or \$80 per month).

Realtors offered several suggestions to help educate homeowners. One realtor thought having the costs broken down in a brochure would help customers understand how energy savings accrue over a longer time period. A second realtor suggested providing literature comparing the monthly payments for a standard home mortgage to an ENERGY STAR mortgage, which would show homebuyers that an efficient house does not cost significantly more. A third realtor said providing case stories of actual energy bill savings and statistics on ENERGY STAR home adoption rates would also help realtors address customer questions. These handouts could be given to potential homebuyers attending open house events.

All six realtors agreed that the ENERGY STAR benefits are not as important to homebuyers when measured against other features of a home. As one realtor said, “Structural features trump energy savings all the time.” A second realtor added, “People prefer to have a nice sink over efficiency.” Lastly, as one respondent said, “Buyers prefer the aesthetics of a home more than the efficiency. Curb appeal is what sells homes in a tough market.” In light of all these comments, all the realtors interviewed agreed that the ENERGY STAR homes label is still valuable.

Realtors were asked to identify their biggest challenges in selling ENERGY STAR homes. Half of the realtors agreed that inadequate public awareness of the benefits of energy efficient housing presented a challenge to selling ENERGY STAR homes. The other respondents all agreed that the higher cost of the ENERGY STAR home made it difficult to sell homes.

To help meet these challenges, realtors offered the following suggestions:

- Provide literature showing how the initial higher cost of an ENERGY STAR home pays for itself over time
- Conduct magazine and TV advertising campaigns outlining the advantages of ENERGY STAR homes
- Provide continuous education for realtors and incentives for those that sell ENERGY STAR homes
- Provide realtors with ENERGY STAR labeled window signs and lawn signs to display at homes that are for sale

4.5 UTILITY INTERVIEWS

This section presents the results of in-depth interviews with 22 small, medium, and large utilities, most of which participate in the ENERGY STAR Homes Northwest program by offering whole-house incentives and/or measure-specific incentives to ENERGY STAR builders. The purpose of the interviews was to find out how their programs are

performing, identify reasons for non-participation, understand satisfaction with the program, and learn how NEEA can improve its assistance to utilities.

Table 14 shows how the utilities were distributed across the states. Among the 22 utilities that were interviewed, four had no ENERGY STAR Homes program, seven had started a program in 2007, and 11 had started a program prior to 2007.¹⁵ Included in this last group is the Energy Trust of Oregon, which helps sponsor and implement NEEA’s ENERGY STAR Homes program within Oregon.

Table 14: Interviewed Utilities by State, Size, Ownership and Program Start Year

State	Total Sample	Size ¹⁶			Ownership		Program Start		
		Small	Medium	Large	Investor Owned	Public	None	2007	Pre-2007
Oregon	11	5	4	2	1	10	1	6	4
Washington	7	1	2	4	2	5	1	1	5
Montana	1	0	1	0	0	1	1	0	0
Idaho	3	2	0	1	1	2	1	0	2
Total	22	8	7	7	4	18	4	7	11

Utility Program Offerings

Utilities that started ENERGY STAR Homes programs in 2007 cited a variety of reasons for doing so. For two small utilities, the local availability of newly trained verifiers was a key program driver. Following are some of the other reasons utility program managers gave for starting a new ENERGY STAR Homes program:

- “We were doing lighting and retrofits before, but wanted to get the whole house right the first time. We’re also consistent with our neighbors now. Builders and trade allies were very frustrated by the different programs being offered across adjacent service areas.”
- “We wanted a fairly simple, user friendly program requiring little staff time, and ENERGY STAR seemed to fit the bill. We’re also expecting high growth here in the next five years and we want to develop a stock of good builders.”¹⁷

¹⁵ Information on 3 new Oregon utility programs was obtained from one private firm that implements energy efficiency programs for small utilities.

¹⁶ Based on residential customer base.

¹⁷ This utility serves a coastal city in Oregon that is attractive to retirees.

- “A homes program seemed needed and like a logical addition to our portfolio. Folks rely on us for energy efficiency information and now we can encourage customers to get an electric heat home built to a higher standard.”
- “We want to get it right the first time, because the industry left to itself doesn't have enough knowledge about energy efficiency. This was a good template for them [builders] to adopt as a first step.”

All of the seven new programs are using Conservation Rate Credits (CRCs) from BPA as their primary source of funding.¹⁸ One utility program manager said that while the CRCs are helpful, they really are not sufficient to operate a robust program, and another utility had already expended its latest CRC allocation. The new programs are targeting builders primarily, and the smallest ones are relying on local verifiers to build up the market due to staff and resource constraints.

All of the new programs provide a whole-house incentive of \$1,000 to builders. One utility also does performance testing and loans out equipment, because “the local HVAC firms are not up to speed.” Another utility gives an additional \$300 to heating contractors that serve ENERGY STAR homes, while a third utility pays builders’ private market verification costs and gives homebuyers a \$250 credit on their first energy bill.

One new program provides free verification services and plans to continue doing so in the future. The program manager noted that, “The PTCS supply here is limited, some companies failed, so we got ourselves trained. We want to keep builders out of trouble, so we review plans with them so there are no missed steps. We probably can’t go away completely in the future. Under Super Good Cents we had a strong role and were proud to sign our name to good homes. Super Good Cents homes still mean something, and credibility is key for ENERGY STAR too. Will private verifiers do a good job?”

The other six new programs do or will rely on private verifiers to serve builders. One program manager said a local heating/AC vendor approached them to provide this service. They helped him to get trained and certified and will use him exclusively for the time being (no homes have been built). A program implementer for three utilities noted a similar situation, where private verifiers had proactively offered their services. In one case, however, the verifier had established prices that assumed a high volume of homes, and since no homes had actually been constructed, his business future was in doubt. Another program manager said Earth Advantage verifies most of their homes, as their builders usually get both the Earth Advantage and ENERGY STAR certifications.

Among the more established ENERGY STAR programs, the larger utilities primarily use ratepayer funds to fund their programs, while the smaller ones rely on BPA CRCs. These

¹⁸ These 7 programs are all offered by public utilities; 4 are medium sized and 3 are small.

programs also target builders primarily, including individual custom homeowners, and “anyone even looking at vacant land”.

Nine of the 11 older programs offer whole house incentives, which ranged from \$50 to \$2,300 (\$400 to \$1,100 is most common). Incentives for gas homes are typically 40 percent less than for electrically heated homes, and programs with lower whole house incentives have higher incentives for specific measures. Typical incentive levels for efficient measures were: \$150 to \$350 for furnaces, \$150 to \$250 for water heaters (one sells them directly to builders), \$300 to \$750 for electric heat pumps, \$300 to \$800 for lighting (for CFLs and fixtures, respectively), and \$350 for duct testing.¹⁹

The older programs typically assist builders with cooperative (newspaper) advertising funding, site signage, and by co-sponsoring homes tours. About half of the programs had also sponsored training for technical trades, realtors, or builders. One large utility program in Idaho provides significant newspaper/radio advertising assistance to a group of 100 percent builders, and another large utility program in Washington has listed its local ENERGY STAR builders in bill inserts.

Regarding verification, four of the older programs provide this service free of charge and are likely to continue. Two program managers said this is because they have a long history of providing good service to their builders and they want credit for the good homes they are helping to build. Another rural utility program manager said there is simply no one else around to provide this service. Two other utilities initially provided free verifications but had switched to private providers, with one noting that this had worked well. At another utility free verifications are occasionally provided if the only private firm nearby is unavailable or a builder won't pay its fees. Four utilities rely on private firms for verifications, with one program manager in Idaho noting that “Our two [verifiers] don't seem busy, but I think they'll stick around.”

Utility Program Goals, Achievements and Plans

Six of the seven new programs did not have specific homes goals for 2007 and instead adopted a “let's see how it works and get what we can” approach.²⁰ Five of the seven new programs built three or fewer ENERGY STAR homes in 2007, although some programs were actively working with potential project developers in spring 2008. Among the new programs, some homes projects went well while others struggled to meet the specifications. One program that is targeting smaller niche builders certified 12 ENERGY STAR Homes in 2007, which was considered to be satisfactory (the goal was 30). Another program certified 39 homes.

¹⁹ Fixtures are usually reimbursed at \$10 to \$20 per fixture.

²⁰ Often their energy savings goals are for their whole energy efficiency portfolio of programs.

Going forward, the new programs have adopted a wait-and-see approach to future program planning. In the short-term, they do not expect to increase marketing efforts significantly due in part to budget constraints. In addition, the Oregon programs want to see the early effects of changes to the Oregon building codes and ENERGY STAR specifications before they make further program changes. While one program manager noted that “the initial excitement of our program has fizzled out”, another program was working more closely with its local homebuilders association to try to get ENERGY STAR integrated into a new Built Green program.

Only one of the older programs achieved its 2007 homes goals by getting 7 percent market share (the goal was 5 percent). Programs with numeric homes goals did not achieve them, mainly because overall housing construction was down significantly. Many of those interviewed, however, could point to encouraging signs. One program manager was pleased to have maintained her program’s ENERGY STAR market share. Another program had signed up 30 new builders and was also getting increased builder inquiries in late 2007. Other program managers noted that green building is perceived as an advantage now, and they are coming closer to our ENERGY STAR goals even in the slower market. They noted that ENERGY STAR builders are now focusing more on custom homes than in previous years. Two utilities had no formal goals because they serve small communities, and one “tries to hit NEEA’s market share, but never can.”²¹

Seven of the older programs did not make changes in 2008 because they file multiyear tariffs or because they wanted to see how the home market changes. Two utilities had reduced their numeric homes goals, and one was on track to hit its revised goal. Another utility increased its market share goal to 7 percent after achieving that in 2007. Another utility was redesigning its entire program, “because nothing’s happened in the last six months.” The Energy Trust of Oregon was planning on a significant goal reduction in 2009 due to the Oregon code change and more stringent ENERGY STAR specifications, “which will be hard for builders initially.”

Most of the program managers did not plan to change their program target focus (builders) or recruitment efforts. Said one, “All our builders are aware now and won’t change their minds with more recruiting.” Three utilities, however, are budgeting to do more consumer outreach and education in the next few years, and two are already conducting market strategy and segmentation studies.

Program Marketing

The smallest utility programs do not have sufficient staff or financial resources to do significant program marketing or builder recruitment. They rely primarily on builder word-of-mouth. Among the new programs, the most common form of program

²¹ One utility has a goal to directly contact each new permit applicant, and they came close to achieving this.

promotion was through the utilities' websites, followed by informational seminars for builders and their subcontractors.

The more established programs use a variety of marketing methods, including: utility websites, informational seminars, bill inserts, promotions in newspapers and free local monthly magazines, information kits for realtors and homebuyers, radio advertising, and presentations to homebuilder associations. Three utilities send letters to housing permit applicants, and one includes a list of the local verifiers with instructions to meet with one before breaking ground. Four utilities have staff meet personally with potential ENERGY STAR builders, often with an MDL and verifier in attendance. Said one program manager, "We tell them we're here to help you get going, the meetings are pretty low key and they usually go well."

ENERGY STAR Program Strengths

Several utility program managers said they are very satisfied with the level of personal support they get from their utility coordinators and local MDLs.²² The Fluid team is perceived to know the market well and works diligently to recruit builders. One program manager said that she and Fluid had developed a strong partnership for builder recruitment, which will be needed more as the housing construction market declines. She added that, "Builders like to see that the program actors are connected. It gives them confidence and there is good coordination with Fluid." Other program strengths noted by the program managers include:

- The program's whole home focus, engineering tradeoffs, and willingness to recognize new building techniques and equipment (e.g., ductless heat pumps) make it an effective and practical program.
- The monthly teleconferences for utilities are well run and informative.
- The Mistake Proof Verification and Tech Tips are very useful resources.
- The marketing support to utilities and builder partners is helpful, since builders do not have large marketing budgets.

ENERGY STAR Program Challenges

Following are the key program challenges the utility program managers identified:

²² Utilities that received less program attention usually noted that they had not requested much assistance or acknowledged their programs were too small to realistically warrant significant support.

- Many prospective homebuyers do not understand the concept of long-term energy bill savings or prefer more expensive home finishes (e.g., marble countertops).
- Some regional builders would like to build ENERGY STAR homes in adjacent cities but there are large utility program gaps.
- In Oregon the more stringent building code and program specs will be difficult for builders to meet. In particular, the thermal bypass checklist will be a big hurdle.
- ENERGY STAR Homes is a high maintenance program for small utilities and private energy companies to deliver. In addition, small markets depend heavily on BPA funding and there is concern that this funding will be reduced when the Oregon code changes.
- In Oregon, some builders are confused about the differences between ENERGY STAR, Earth Advantage, LEED, and tax credit homes. Said one program manager, “If builders have problems with any of these homes, they will avoid them all in the future.”²³
- In Washington, the Built Green program offers more energy options for homes that cannot easily meet the ENERGY STAR requirements.
- Since there are no settled utility boundaries between Yakima in Central Washington and Walla Walla in Southeast Washington any utility can serve any city, making it difficult to efficiently target builders for marketing.
- The program does not give enough attention to the South Puget Sound region. Said one program manager, “The perception is that we have mostly small, non-progressive builders. We need some model projects for customers to go look at because customers won’t go to King County.”
- In Idaho, some contractors that received free program training tell builders that utility rebates will not cover their extra costs, and actively discourage building ENERGY STAR homes.
- In Idaho, HPSs (also know as verifiers) sometimes lack business skills and can convey a poor professional image. Said one program manager, “I have to push them to contact builders, who will have no time when the market gets hot again.”

²³ Also, one manager noted that some Super Good Cents homes were built too tight and had ventilation problems, so “There may be some lingering bad taste.”

Reasons for Utilities Non-Participation

Following are the reasons why four utilities did not have an ENERGY STAR Homes program:

- In the case of a medium sized public utility in Montana, electric resistance heat is the best option for the area and the TCOs do not adequately accommodate this, according to the programs manager.
- At a medium sized public utility in Oregon the programs manager perceived that there is no interest among local builders, even though four neighboring utilities have programs (so builders are probably aware of ENERGY STAR).
- A small public utility in Idaho did not have a local HPS to certify homes and thus did not want to promote a program to local builders (although it would like to).²⁴
- A programs manager at a large public electric utility in Washington noted that few electrically heated homes are being built in his territory and these would have difficulty meeting the program requirements. Also, most of the development is small in-fill projects, and there would be no economies for marketing.

Overall Program Perceptions

Almost all of the program managers, even those in territories with little builder activity, had positive perceptions of the program design and delivery, noting that things “are fine overall, Fluid and NEEA are very supportive of their partners and the utilities.” Two program managers specifically said they like Fluid’s delivery approach, which they think has a strong utility and marketing focus. Said one, “The marketing focus is working better than the building science focus the program had in the past.” Another said, “Fluid is more Internet based, they use emails and phone calls a lot and do less on-sites. The Fluid model is working well because builders are finding it harder to sell homes and want frequent advice.”

Several program managers said the program needs a larger budget to fund additional program staff and/or more marketing collateral for builders and homebuyers. They noted that builder interest is growing in their areas, and “Fluid does a good job, but they are probably stretched too thin.” One program implementer for small utilities said, “ENERGY STAR is a good program, but in my small markets everyone is looking at each other asking, ‘who will make it happen?’ There has to be a business model that makes it profitable for verifiers and currently it’s a money loser. The program wants

²⁴ This person also thought the existing HPS's are reluctant to actually recruit builders, and that the program should do this recruiting, acknowledging that staff resources are probably limited.

these [small] utilities to be the leaders since they get the construction news first, but that's not realistic. More manpower is needed to pull the parties together.”

Two program managers were confused why local verifiers were doing so much builder outreach, and thought this is the program's responsibility. Lastly, one program manager thought that there are too many TCOs and that the program standards are not stringent enough.

Utility Suggestions for Program Improvement

On the technical side, one program manager thought the program allows too many screw-in CFLs and more fixtures should be required, since they are readily available via the Internet. She also thought that all ducting should be moved inside (not just as an option). Another program manager said the program should start verifying wall insulation to achieve uniform R-values. According to him, builders often use truss, pitch, and overhang designs that do not provide enough room to blow in insulation all the way up the walls (and then he gets high bill complaints from the homeowners).

Most suggestions pertained to program design issues, and these are listed below:

- The program should clearly communicate what will happen when the Oregon code changes. It needs to maintain credibility with key builders over time, and cannot lose them when the specs are increased. New codes education should also be used to simultaneously market ENERGY STAR to non-participating builders.
- Nearly all of the program managers noted that more marketing to consumers is needed. Consumers need to know to ask for ENERGY STAR so builders can charge a premium to pay for more expensive systems. Currently most builders offer ENERGY STAR “passively”. Said one program manager, “The program's reliance on the market/builders to always supply the cash to make the program work is unrealistic.”
- Recommended marketing channels included: billboards in rural markets (“Everyone sees them!”), television home improvement programs on PBS, Internet banner ads, and direct presentations to rural builder associations (who don't always trust their local utilities).
- Smaller utility program managers desired: more personal help recruiting builders, more Critical Details compact disks to give to builders, examples of good newspaper and radio advertising, and a comprehensive program summary document “that tells you everything that has to happen in sequence.”
- Program managers at both large and small utilities desired: case studies of successful ENERGY STAR builders (even in the down market) and satisfied customers for widespread distribution, more “plug and play” resources (e.g., consumer marketing campaigns, homeowner guidebooks), a traveling booth with

ENERGY STAR construction displays/video/materials that utilities and verifiers can use, and more prominent and permanent labeling of ENERGY STAR homes.²⁵

- There should be more focus on telling builders to find a verifier early in their projects, and the program website should tell builders that verifiers can find HVAC/lighting contractors (i.e., "solutions") for builders.
- The program should build upon the success of the G4 to further enhance utility cooperation.²⁶ Collaborative marketing by the utilities could focus on unified messaging and focused builder recruitment.
- A few program managers thought that more PTCS training and follow up is needed. According to one program manager, “Only 10 percent of the attendees buy the necessary equipment or change their practices after the classes.”
- The program website should add: examples of successful marketing materials, a link to the national program website (“where there is good information on how to build up a utility program”), more information on heat pumps and water heaters, and a new portal “with a sales focus, before you get to the technical information.”

4.6 STATE CERTIFICATION OFFICE / QA INTERVIEWS

In-depth interviews were conducted with staff at the state energy offices that work on the ENERGY STAR Homes program. The interviewees are the Quality Assurance (QA) specialists working for the State Certification Organization (SCO) providing the third-party certification of the ENERGY STAR Homes. The QA specialists work with the verifiers to ensure that the verification process is proceeding smoothly and the ENERGY STAR standards are being met. For this evaluation, we spoke by phone with five QA specialists; two in Washington and one in each of the other three states.

QA Process

Each state has a different agency serving as the SCO for the program: In Oregon, the SCO is the Department of Energy, in Washington it is the Washington State University Energy Program, in Idaho it is the Energy Division of the Department of Water Resources (IDWR), and in Montana it is the National Center for Appropriate Technology

²⁵ According to one program manager, “The certificate goes in a file and won't transfer with the owner. A sticker is also mailed to the owner, but that may not go on. Some owners don't know they have an ENERGY STAR home.”

²⁶ The G4 is a regular meeting attended by program staff and four of the largest and most actively involved utilities/organizations in the program: Puget Sound Energy, Idaho Power, Energy Trust of Oregon and PacifiCorp.

(NCAT). While all use a QA process to confirm that homes inspected and certified by verifiers do in fact meet the ENERGY STAR requirements, the number and types of inspection visits, and the person or persons doing the visits vary.

In Oregon, all of the QA inspections in 2007 were conducted by a third party retained and directed by the SCO. In Idaho, a contractor retained to inspect homes in 2006 was brought on as an employee in 2007 to allow greater geographic flexibility (since it was easier to cover an employee's travel costs than a contractor's). In Washington and Montana, inspections are conducted by SCO staff.

Most of the verifiers in Oregon are affiliated with the Earth Advantage program or with utilities—in contrast to the other states, where they are predominantly independent businesses. In addition, the performance testing/verification functions are separate in Oregon and Montana, while they are combined in the Home Performance Specialist (HPS) role in Idaho and often performed by the same contractor in Washington.

Verification Trends and QA Sampling

According to data from the program website, 20 percent of the verifiers in each state account for more than 80 percent of homes verified, and just three verifiers in each state account for at least half the homes verified per state.²⁷ From a QA standpoint, this means that relatively fewer QA inspections should be called for. Program growth, however, will always require bringing “new” verifiers into the QA process. The overall QA plan calls for each of the first three homes verified by a new verifier to go through the QA process, and the percentage of homes sampled is reduced only after the verifier achieves a better than minimum passing score. As a result, new verifiers account for a disproportionate share of QA resources.

Due to the increased number of constructed ENERGY STAR homes in 2007, all of the states have had to ensure adequate availability of verifiers as well as QA infrastructure.

- In Montana and Idaho, several new verifiers are working in parts of their states that previously were served from other cities. While this has supported the participation of several new builders, the high travel time and cost associated with inspecting homes in more remote areas increases the cost of QA for the SCO. The ability to cover travel costs to areas farther away was one reason the Idaho SCO brought its private contractor on staff.
- Montana QA inspections for new verifiers are still usually conducted in real time, with the SCO QA specialist accompanying the verifier on his/her visit and inspecting the work as it is done. This allows the QA and verifier education to be

²⁷ Website data as of March 31, 2008. One QA specialist noted that the verifier information on the website does not always mirror the database as it should. He said, “Builders only know what they see on the Energy Star Homes Northwest site. When that's not accurate, it bugs the builder.”

completed simultaneously and gives the QA specialist a good sense of the verifier's abilities.

- In Oregon, Earth Advantage has established a new rover position for an experienced verifier who will help guide new verifiers through their first inspections to ensure high quality.
- In parts of Washington, a few Performance Testers/Verifiers have handled much of the increased workload by establishing close working relationships with builders in specific geographic areas and encouraging program participation.

The selection of homes to inspect also varies by state, although all states are now using a pragmatic approach that focuses on new builders and verifiers and those that have had problems in the past. Idaho adopted a new selection process in early 2008 whereby the program's QA inspector will choose one of three regions of the state and review the database to see where there should be homes to inspect, with a focus on new builders and HPSs. During his visit to that area (up to a week), the inspector will conduct QA on as many homes as possible. The Idaho QA specialist said this gives them more flexibility, and "The construction industry requires flexibility." Despite some problems scheduling the QA inspections before buyers move in, the QA process has not created delays in the construction process itself.

Finally, some of the QA specialists said that the slowing real estate market and the expected decline in ENERGY STAR homes and certification income in 2008 threatens their ability to conduct the required level of QA inspections without NEEA's continued support, since the SCOs cannot eliminate staff positions and still conduct even a reduced level of QA.

Failure Rate/Reasons

In Washington, about 15 percent of QA inspections find some sort of discrepancy, usually as a result of builder, performance tester, or verifier inexperience. Both WSU QA specialists said most failures occur when they are unable to replicate the duct leakage results obtained by the performance tester. One of them explained that, "Half the time when we find a failure it is because the system was tested earlier, but then was degraded by another sub who got into the crawlspace or attic. That's a surprisingly common occurrence."

Oregon's SCO representative said they have not found outright failures during QA for some time, since verifiers are capturing the major remaining problem areas, which are duct leakage tests that do not match the initial performance test, the wrong windows being delivered, or difficulty commissioning the heat pump. The Oregon SCO representative said that in the past, homes sometimes would not have the required 50 percent CFLs, but that this problem is diminishing.

Idaho specialists reported that, about 15 percent of homes experience problems related to insulation, both crawlspace and blow-in, but particularly the latter. The QA specialists

said that many of the insulators do not use English as their primary language and some instructions may not be understood. And while some HPSs are conscientious about being at the site to make sure the problem is fixed, others are less diligent. In general, builders and contractors have few problems with duct and envelope tightness and the heating equipment meets the necessary specifications.

Because Montana's QA inspectors accompany the verifier on many of their QA visits, there are rarely failures that are not caught by the verifier. QA inspections are conducted before the occupant moves in, so the QA staff usually does not observe what they have heard occurs in homes after, which is that some homeowners remove the newly installed CFLs.

Tax Incentives and Certifier Training

One external factor that has been a significant influence on QA-related aspects of the ENERGY STAR program is the availability of federal tax credits for energy efficient homes. First, the tax credits have increased overall demand for ENERGY STAR homes, since tax credit homes are generally 15 percent more efficient than ENERGY STAR homes and easily meet the ENERGY STAR requirements. Two QA specialists said tax credits are helping to cover the incremental cost of meeting ENERGY STAR requirements and three specialists said the credits have attracted builders to the program.

In addition to spurring interest in efficient homes, the availability of tax credits has influenced the kind of training offered by the SCOs and demanded by verifiers, with more states providing a full five-day Home Energy Rating System (HERS) rater course in addition to (and sometimes in place of) the two-day verifier course.²⁸ Notably, all of the SCOs are certified to offer the HERS training required to certify tax credit homes. Montana, for example, is moving toward the Idaho model of conducting complete HERS rater training over five days instead of separate two-day trainings for verifiers and performance testers. The SCO reports that there is more interest in the full HERS training than in the two-day verifier only training.

A Washington QA specialist said that verifiers charge more for certifying tax credit homes because of the requirements to do this work; i.e., they must be a nationally recognized HERS rater and carry \$500,000 in liability insurance. The Montana SCO emphasized the greater rigor of the five-day training and corresponding HERS test. "I don't know that I've seen anyone go through the verifier training without passing, but on the national HERS rater test, only about 50 percent pass. If you get people who pass the national rater test, they're going to be knowledgeable."

²⁸ The HERS Index is a scoring system established by the Residential Energy Services Network (RESNET) whereby a home built to the specifications of the HERS Reference Home receives a score of 100, while a net zero energy home receives a score of 0. The lower a home's HERS Index score, the more energy efficient it is in comparison to the HERS Reference Home. Home inspectors that are certified by RESNET are called raters.

Response to QA and Additional Assistance Needed

All respondents said their states use the QA results to give feedback to the builders (and their contractors), performance testers and verifiers. Builders often take action as a result of the verification and QA inspections, dropping subcontractors who do not perform as required. With regard to the verification process, the Montana QA specialist noted that “Builders may not have thought long and hard about the verification process, but they are always curious about the results.”

In Oregon and Washington, most builders have been responsive to the QA process. In Idaho, however, builders have been displeased by some QA inspections that occurred after homes were occupied. In Montana some builders have been alienated by what they see as the unrealistic TCO addressing conditioned crawl spaces.

The Montana SCO also reported that builders want the builder guide in addition to the Critical Detail sheets to help them pass the verifier’s inspection. Other QA specialists said the Critical Detail sheets have been very helpful.

In Washington, builders in some areas find that the verification and QA functions provided by the ENERGY STAR Homes program are not as beneficial as the marketing advantages offered by other programs, such as the well-established Built Green program. Built Green has a very strong marketing presence and for the lower levels in its 1-5 rating scale the homes can be self-certified, so that verification costs are minimal and participation fees can be devoted to marketing.

New Verifier Responsibilities

Several SCO representatives noted that having the verifiers take on additional builder contact responsibility has led to a greater emphasis on marketing. As noted previously, a core group of verifiers accounts for most of the inspections, and the greater emphasis on marketing has provided this entrepreneurial group with added resources to build business. A Washington QA specialist noted that the previous program management contractor (PMC) had a more technical focus. “Now it’s more marketing and less technical. Before the verifiers clamored for marketing assistance, and I’m not hearing that as much.”

The Montana QA specialist also believes the verifiers find the improved business training helpful, but pointed out that there are relatively few verifiers in his state, and most of those cannot take the time for a day of training. In addition, “The model assumed by Fluid is that you have entrepreneurs trying to build a business as a verifier, but we just don’t have that many people doing that. Most of them take this on as an adjunct to another business.”

Program Coordination

While representatives of the SCOs said they enjoyed good communications with other SCOs, the PMC, NEEA, and other program representatives, all emphasized the complexity of the program because of the multiple players with whom they must interact. Depending on the state, the SCO may have to coordinate with several different

representatives of the program itself (NEEA, the PMC, one or more subcontractors), the regional technical committee, builders, performance testers, and verifiers – not to mention the utilities, BPA and other housing programs (e.g., Built Green).

The new PMC generally received high marks for communication and the greater marketing emphasis brought to the program. On the other hand, one SCO pointed out that the transition to a new PMC had been difficult but was improving.

In Oregon, there was some concern about coordination related to updating the ENERGY STAR requirements in light of the new state building code, which basically meets existing program requirements. Oregon must integrate the efforts of multiple market actors, such as Energy Trust of Oregon, the Earth Advantage Program, and the utilities – including those not participating in the Energy Trust programs. The Oregon SCO representative believes it would be valuable to have a single program brochure that covers the entire state to describe the ENERGY STAR program after the new Oregon code takes effect. He said the biggest challenge will be maintaining coordination as builders are moved along to more efficient practices. The question is whether “we move them to the new ENERGY STAR program or to High Performance, which is Earth Advantage Platinum and also gets them a tax credit.”

SCO Conclusions and Outlook

Following are the key findings regarding the QA process, and suggestions for program improvement offered by the SCOs:

- Just 20 percent of verifiers in each state account for almost 90 percent of homes verified. In contrast, new verifiers account for a disproportionate share of QA resources.
- The fact that up to 15 percent of homes still fail some aspect of the QA inspection emphasizes the importance of the QA process, particularly for new builders and verifiers, and suggests that the percentage of inspections should not be reduced for this group.
- Tax credits are a major factor driving interest in the ENERGY STAR Homes program and in the training demanded by verifiers. The SCOs should make current verifiers aware of the path to full HERS rater certification. This would provide the verifiers with an additional source of potential income and would also raise the overall level of ENERGY STAR verifier expertise.
- Since the number of homes to be verified in some parts of the region is nowhere near enough to support verification as a full time business, training and other resources offered to verifiers should recognize that many individuals offer this service only as an adjunct to another business.

- The new program database should be designed to allow individual identification of verifiers working for organizations such as EWEB and Earth Advantage so that less experienced verifiers can be targeted for QA purposes.
- The ENERGY STAR Homes Northwest website should be kept up to date so that information on the status of builders, verifiers, and performance testers is as accurate as possible.

Despite an increase in participation in the ENERGY STAR Homes Northwest program toward the end of 2007, all of the SCO representatives worried that the targets for 2008 would be difficult to reach in light of the current new construction market. This in turn would limit the resources available to support the QA effort. On the other hand, strong interest in green building across the region may encourage greater builder participation even as the overall market declines. Emphasizing the role of verification and QA in ensuring that buyers of ENERGY STAR homes receive a truly earth-friendly, energy efficient home should help the program to capitalize on that interest.

5. REVIEW OF NEEA COST EFFECTIVENESS (ACE) MODEL

As part of this evaluation, ECONorthwest conducted a review of the Alliance Cost Effectiveness Model (ACE Model) used by NEEA to calculate the cost effectiveness of the ENERGY STAR Homes program. This review included both a review of the model assumptions documentation (draft dated April 26, 2007) and the Excel file that contains the ACE Model.

The following are suggestions based on our review, many of which deal with information contained in the ACE model documentation.

1. **Increase retention rate adjustment for CFLs.** The current model assumes a retention rate of 98 percent (for the standard BOP) and 96 percent for the “plus” package for CFLs. This adjustment factor means that two to four percent of CFLs are removed and replaced with incandescents. The on-site verification audits conducted as part of the evaluation showed that CFL retention is actually 100 percent. This is due to the fact that, while some homeowners remove the lamps, others are increasing their use of CFLs to additional sockets resulting in no net loss of CFLs.

On a minor note, the adjustment factor used is referred to as the Net-to-gross Removal ratio, abbreviated as (NTGR). The acronym NTGR is commonly used for Net-to-Gross Ratio so there may be some confusion using it in the ACE model to refer to retention. If this adjustment is not removed altogether, we recommend that it be called the retention rate to avoid confusion.

2. **Have duct tests/sealing as a separate measure rather than combined with AC and Heat Pump impacts.** The current model has the duct test impacts integrated in with the impacts for AC and Heat Pumps. However, due to the recent changes in standards there should be no kWh savings associated with cooling. To make this clear (and to help with the review of duct test impacts), it would be useful to have the impacts associated with duct testing and sealing reported separately from the cooling and heating impacts. Additionally, having the duct test impacts embedded automatically imposes the measure life of the AC or Heat Pump (18 years) on the duct sealing measure (20 years).
3. **CFL costs should be revised downward.** The ACE Model assumes a customer cost of \$5 per CFL and this cost is kept constant throughout the model time horizon (through 2015). Data from NEEA’s evaluation of the residential lighting market indicate that customer costs average about \$4 per CFL. Furthermore, this cost should continue to decline in future years. If a single CFL cost number is to be used for all years, we recommend that a value of \$3 per CFL be used for customer costs and \$1.50 per CFL be used for builder costs.
4. **Incremental costs should be updated.** In addition to CFL costs, some of the other incremental cost values may need to be updated. The RTF assumptions have been updated in 2007 (some as recently as January 2008), but it is unclear if any changes

have been made (or are even needed) in the most recent ACE model. If no changes are needed, the ACE documentation should state that the latest RTF numbers have been reviewed and the cost values are consistent with the latest numbers available as of a certain date.

5. **Cost of ENERGY STAR certification should be included in the ACE Model.** Currently the costs of ENERGY STAR certification (several hundred dollars on average per home) is not included as a cost in the ACE Model. The certification cost should be added to the model, as it is one of the incremental costs associated with an ENERGY STAR home.
6. **Non-energy benefits need to be defined better and updated so that the spreadsheet and documentation numbers match.** There is little discussion in the documentation on the non-energy benefits, which appear to be related to gas savings. The numbers in the current documentation also do not match the ACE model spreadsheet we reviewed.

A couple of additional recommendations regarding how the ACE model results are presented in the documentation include the following:

7. **Show total ES Homes, utility, baseline, and net program homes all in one table.** Currently the numbers used in the model are spread across multiple tables, and there is no single place where one can see the total number of ES Homes per year and how this number is divided between baseline, utility program, and net program homes. For review purposes, it would be helpful to have all this in one place.
8. **Add changes in assumptions to field in Excel file.** There is currently a field in the Program tab of the ACE Model spreadsheet that is intended for documenting changes in model assumptions. This field is currently blank. For ease of reviewing and determining if assumptions have been changed, it would be helpful to have this field filled in whenever the ACE model is updated.

6. CONCLUSIONS AND RECOMMENDATIONS

Despite a significant downturn in the regional housing construction market in 2007 the ENERGY STAR Homes Program made strong progress towards attaining its market share and market transformation goals. Following are the key findings that can be drawn from the data sources and analysis presented in this report:

- **In 2007 the program achieved a 4.6 percent market share, compared to 3 percent in 2006.** Market share growth was particularly strong in Washington, where it increased from 2.1 percent to 4.7 percent between 2006 and 2007. This is important since the program's overall performance relies heavily on Washington, where about half of all 2007 homes were built.
- **Program participation grew in 2007 during a slow housing market.** The program recruited 327 new builders in 2007, compared to 288 in 2006, and 59 new verifiers joined in 2007, compared to 40 in 2006.
- **Market actors did not identify any persistent technical challenges.** In particular, the new builders we spoke with were generally building ENERGY STAR homes without much difficulty. On a minor note, there are still some negative perceptions of CFLs, and some markets have a limited selection of hardwired fixtures.
- **There is growing interest in green building from consumers, and builders are using the ENERGY STAR brand and other green program brands to differentiate their product in the market.** Most of the new builders we spoke with viewed the ENERGY STAR brand name as an effective marketing tool to attract appropriate clients and were planning to specialize further in ENERGY STAR in 2008. Various market actors also said more ENERGY STAR construction is occurring in the higher-end, custom homes market, as ENERGY STAR homes have more difficulty competing with low-cost, standard homes where there is currently excess supply. Federal tax credits are helping to address the higher initial costs of ENERGY STAR homes construction.
- **The program is well positioned to achieve further market share growth in 2008.** Contributing factors include:
 - **A large number of ENERGY STAR homes were initiated in the last months of 2007.** Unless these homes are not completed, perhaps due to tightening credit markets, they should add to the stock of certified homes in 2008.
 - **The new home construction market is expected to decline further.** Builders will increasingly need to differentiate their product, and green and energy efficient homes are drawing strong attention from more builders and buyers, particularly in an

environment of rising energy prices and concerns about global warming.

- **Oregon energy code change.** In 2007 The ENERGY STAR Homes Program was influential in getting the State of Oregon to adopt more stringent energy codes for new home construction.²⁹ Starting in July 2008, new homes in Oregon will essentially have to meet the program's technical requirements, until new requirements take affect in 2009.
 - **Integration with Earth Advantage.** Starting in July 2008, all new Earth Advantage homes must also meet the full requirements for ENERGY STAR homes. This gives the program an increasingly popular strategic partner with whom to promote the ENERGY STAR brand in 2008 and beyond.
 - **ENERGY STAR homes are now recognized in two major MLS listings.** In 2007 the Northwest Multiple Listing Service (which serves Washington) and the Regional Multiple Listing Service (which serves 21 counties in Oregon and southwest Washington) introduced changes that allow realtors to easily list and locate green and energy efficient homes for their clients.
- **Verifiers and utilities generally value the new Mistake Proof Verification training and Tech Tips materials.** The verifiers we spoke with are applying their new technical and marketing knowledge where possible, have developed new relationships with builders, and generally felt they would obtain more business in 2008. In addition, utilities in smaller markets like to distribute these materials to a wide range of market actors to generate program interest and proactively increase the quality of construction.
 - **There is still a shortage of verifiers in some markets, and in other markets some verifiers do not have enough work.** The presence of a local verifier was identified as a critical factor for utilities that recently started up programs, and one utility that would like to do so. That said, the new builders we interviewed were inclined to seek information from program staff, and not from their local verifiers.
 - **Participating utilities value the new “marketing focused” delivery approach by Fluid.** Several of the utilities and verifiers said they value the marketing assistance they get from their MDLs. In particular, they noted that maintaining relationships with utilities and builders through weak and strong markets will

²⁹ The ENERGY STAR Homes program, with the support of the Oregon Department of Energy, provided the broad guidelines and also the technical approach that effectively drove the code change.

serve the program well in the long-run. While there is high satisfaction with the overall program delivery, however, budget and staff constraints still hinder the aggressive attention that may still be needed in smaller, less urban markets.

- **The new ENERGY STAR Homes training for realtors received positive reviews.** Furthermore, the trained realtors are generally using the information they received to promote ENERGY STAR homes, although it has had little impact on their sales success in Idaho, due primarily to the very slow market and glut of low-cost homes.
- **Consumer awareness and understanding of ENERGY STAR homes is still inadequate.** Many market actors said the program has to dedicate significant advertising resources to further increase homebuyer demand and clarify distinctions with ENERGY STAR appliances. In particular, the messaging needs to make homebuyers clearly understand how long term energy cost savings will exceed higher upfront costs.

Based on the evaluation findings, we make the following recommendations:

- **Conduct a regional marketing campaign to homebuyers.** Many homebuyers are still unaware of the ENERGY STAR brand and do not ask builders for these homes. Due to regional migration patterns (extending into California), a large and regional marketing campaign should be undertaken to increase brand awareness. Marketing examples and templates should also be shared with participating utilities for potential replication.
- **Develop and distribute more standardized marketing collateral.** Utilities and realtors would like a comprehensive and ready supply of program materials from the program to give to prospective builders and homebuyers. In particular, case studies of successful builders and satisfied homebuyers are desired.
- **Thoroughly explain the changes to Oregon’s energy code and the ENERGY STAR specifications to all market actors.** All market actors, and builders in particular, must accurately understand code changes and how they will be enforced. Use this opportunity to educate non-participating builders about the ENERGY STAR Homes program and to solidify relationships with participating builders.
- **Update builder-tracking tools (e.g., builder signup sheets, lead lists) to include more information about builder recruiting.** While the program implementers have a sense of which builders have been recruited in each market, there is no formal tracking mechanism to identify which market actor (MDL or verifier, or both) was actually responsible for “landing” each new builder. Changes to builder tracking tools would help to confirm if the verifier-led recruitment model is working as planned.

- **Increase efforts to work in tandem with green building programs.** Green building programs are gaining regional market share and thus the program should make concerted efforts to keep the ENERGY STAR specifications integrated into existing and emerging green homes programs. Where the ENERGY STAR specifications are integrated, the program should implement joint marketing efforts to leverage program advertising dollars. Proactive collaboration with green building programs will become increasingly important in meeting the program’s market share goals.
- **Regularly inform builders that local verifiers are there to help them.** Most of the new builders we interviewed assumed that they should go to official “program staff” for assistance, while verifiers in some markets are underutilized. The program’s desired relationship between builders and verifiers needs to be better understood by all market actors, including the utilities.
- **Maintain frequent contact with newly trained verifiers.** Some verifiers do not have enough local building activity to stay gainfully employed, while others are not aggressively pursuing business that may be available. The program needs to stay abreast of these situations in order to provide additional assistance, direct builders to other verifiers, or develop regional coverage strategies.
- **Expand the realtor trainings to other states.** Participating realtors in Idaho gave favorable reviews of this training and have been implementing elements of it as they can. Delivering this training in other states (where ENERGY STAR homes are clearly identified in MLS listings) will further increase industry understanding of the program and could yield stronger sales results in different market conditions.³⁰
- **Update ACE Model assumptions.** In particular, the ACE model should be updated to attribute additional market transformation impacts to utility programs, and to disaggregate duct testing and sealing impacts from heating and cooling impacts. (Additional minor recommendations are discussed in Chapter 5 of this report.)

³⁰ The Intermountain Multiple Listing Service (IMLS), which serves Boise and southwest Idaho, does not include specific fields to denote energy efficient homes, although energy efficiency is sometimes mentioned in a Comments field.

APPENDIX A: GLOSSARY

Annual Fuel Utilization Efficiency (AFUE). A numeric efficiency rating for furnaces. An AFUE rating of 0.90 or higher for gas furnaces and 0.80 for propane heating is needed to qualify for the ENERGY STAR Homes program.

Air Changes per Hour (ACH). Refers to the number of times air is circulated within a home within an hour. Minimum levels are established to help combat mold due to tight building envelopes required for efficient homes.

Builder Option Package (BOP). A specified list of measures and building practices that builders can follow to build an ENERGY STAR-qualifying home.

Building Outreach Specialist (BOS). A representative of the program that recruits builders and provides technical assistance. BOS's work in Oregon only and report to the Energy Trust of Oregon.

Compact fluorescent light (CFL). A type of lightbulb that is more energy efficient than a regular incandescent bulb and has a longer equipment life. A CFL often has a distinctive twisted design.

CFL fixture. A lighting fixture where only CFL lamps can be used. These fixtures usually require pin-based CFL lamps so that the bulb cannot be swapped out for incandescent bulbs.

Conservation Services Group (CSG). One of the companies implementing the ENERGY STAR Homes program in Oregon.

Duct Test. General term referring to either a duct blaster test (where only the ductwork is tested for leaks) or a blower door test (where the whole house is tested for leaks).

Earth Advantage. A sustainable buildings program originally created by Portland General Electric.

Energy Factor (EF). An EF value shows the efficiency of water heaters. For gas water heaters, an EF of 0.60 or better is required, while electric water heaters require an EF of 0.93 or better.

Energy Trust of Oregon (ETO). Energy Trust of Oregon implements energy efficiency programs in Oregon using public benefits funds collected from several utilities. Energy Trust of Oregon also helps sponsor and implement NEEA's ENERGY STAR Homes program within Oregon.

Fluid Market Strategies (Fluid). Fluid is the company that has been hired by NEEA to implement the ENERGY STAR Homes program for NEEA.

HVAC. Refers to heating, ventilation, and air conditioning systems and is used as a generic term for heating and cooling equipment.

Heat Pump. A type of air conditioner that will also provide heat during the winter.

Heat Recovery Ventilator (HRV). An HRV provides an efficient method for bringing in fresh air into a building while removing stale air. The HRV will preheat the incoming air in the winter and cool the incoming air in the summer.

Home Performance Specialist. The job title used for verifiers in Idaho.

Heating Seasonal Performance Factor (HSPF). A measure of efficiency for heat pumps. The ENERGY STAR Homes program requires an HSPF of 8.0 or better to qualify for the program.

Market Development Lead (MDL). A program representative that serves one or more of the program's submarkets (e.g., Puget Sound, eastern Idaho). MDLs work closely with builders, existing and new verifier companies, and utilities to help promote the program, answer technical questions, and forge local relationships among key market actors.

Market Progress Evaluation Report (MPER). MPER is the acronym used by NEEA for all its evaluation reports.

NCAT. National Center for Appropriate Technology is located in Montana and promotes energy efficiency and appropriate uses of technology for low income communities. Also serves as the SCO for the ENERGY STAR Homes program in Montana.

NEEA. The Northwest Energy Efficiency Alliance is the agency sponsoring the ENERGY STAR Homes program. See the website www.nwalliance.org for more detailed information.

Performance Testing. A more general term used for duct testing and could involve a duct blaster and/or a blower door test.

Quality assurance (QA) specialist. A quality assurance specialist works for the State Certifying Organization to monitor and verify the work completed by the verifiers.

RESNET. A national non-profit organization devoted to creating consistent national standards for energy efficiency ratings. RESNET developed the Home Energy Rating System (HERS) rating for homes.

State Certifying Organization (SCO). An SCO is the agency that provides the final certification for an ENERGY STAR Home.

State Energy Office (SEO). An SEO is the state government office in charge of energy issues for the state (such as the Oregon Department of Energy). In the case of Oregon and Idaho, the SEO is also the SCO for ENERGY STAR homes within the state.

Seasonal Energy Efficiency Rating (SEER). A numeric rating system for air conditioner and heat pump efficiency. A SEER rating of 13 is required by the ENERGY STAR Homes program.

Technical Compliance Option (TCO). A TCO are additional specifications within a BOP that allow for different equipment to be installed and still meet the ENERGY STAR Homes specification requirements.

Verifier. A verifier provides third-party verification that the requirements for an ENERGY STAR home are being met.

APPENDIX B: PROGRAM DESCRIPTION AND PAST EVALUATION ACTIVITIES

The ENERGY STAR Homes Northwest program officially began in May 2004 with a goal of achieving a 20 percent market share for ENERGY STAR homes within the residential new construction market by the end of 2009. In 2006, the program revised its goal to reflect the longer than anticipated ramp-up time, and now hopes to achieve a 14 percent market share by the end of 2009. The program markets the benefits of building homes to ENERGY STAR standards to builders. The ENERGY STAR brand serves as a mechanism to differentiate builders and the homes they build and also provides consumers with an easy way to identify energy efficient homes. Certification, labeling, and marketing efforts are designed to increase the market share of ENERGY STAR new homes while simultaneously protecting the ENERGY STAR brand.

While it has been successful in other parts of the country, the national program model for ENERGY STAR homes was not a good fit for the Northwest region. This can be attributed to a number of factors, the most significant of which include the success of robust energy codes in Oregon and Washington, past focus on (electric heat) Super Good Cents branding for new construction, and the lack of an energy-rating infrastructure that has traditionally been used in other parts of the country.

In order to make the ENERGY STAR Homes program work in the Northwest, the EPA worked with NEEA and its stakeholders to develop a tailored specification that includes a package of prescribed conservation measures and is designed to be fuel-neutral. As the current codes in Washington and Oregon already meet the national ENERGY STAR standard, it was necessary to develop new and more stringent ENERGY STAR requirements for the region if significant efficiency gains were to be achieved in the new homes market. (The detailed prescriptive specifications for the various ENERGY STAR Home options are provided in Appendix B.)

In addition to the prescriptive measure requirements, there are several program elements that are designed to assist builders and contractors with the ENERGY STAR requirements. These program elements include:

- Infrastructure development and market actor training and education, particularly for HVAC contractors and performance testers;
- A quality assurance process, which requires that:
 - Every central HVAC system be performance tested (unless the State Certification Office (SCO) determines that only a sample of HVAC systems needs to be tested);
 - Every home be inspected by a certified verifier for compliance with ENERGY STAR Northwest program specifications (unless the SCO determines that only a sample of homes needs to be inspected); and

- Every home be certified by a third-party contractor operating under an independent ENERGY STAR Northwest quality assurance process.
- Marketing, outreach, promotion, and consumer education focused on branding and labeling, quality and value, and other co-branding and cross-promotion opportunities. This is done through press releases, articles, and newsletters that advertise the program and provide information on the benefits of ENERGY STAR homes. The program also provides marketing materials to builders so that they can promote the fact that their homes are ENERGY STAR rated. In addition, the program has developed the program website www.northwestenergystar.com as an additional information resource for builders and potential new homebuyers.
- Coordination and incorporation of multiple program efforts by utilities and others, specifically including technical standards and financial incentives.
- Promotion and support for “plus” packages that increase energy efficiency or other attributes such as green or healthy buildings (beyond base program requirements) that will further support builder differentiation through efficiency.

Market Barriers and Market Opportunities

There are a number of barriers to increasing the efficiency of energy use in new homes, including:

Lack of Awareness and Information. Builders, consumers, and other market actors are often unaware of the magnitude and potential value of energy savings that can result from improved construction practices. Similarly, there is a lack of awareness and appreciation of the non-energy benefits such as improved indoor air quality and lower maintenance costs that result from more efficient construction.

Inability to Identify Efficiency. Many builders claim to be building efficient homes, but consumers cannot always differentiate between accurate and false efficiency claims. In addition, the presence of multiple individual utility and other local programs promoting energy efficiency and green building practices may add to market confusion regarding what constitutes an energy efficient home.

Split Incentives. For new homes, builders and contractors make energy efficiency design and investment decisions but do not ultimately pay the energy bills. Many builders doubt they will be able to increase the home sales price in order to cover the initial costs of the energy efficiency improvements.

Limited Technical Skill. Many builders and subcontractors have an inadequate understanding of the nature of key efficiency losses in the home, such as through HVAC ducts or building air leakage. These are critical elements for capturing the

energy efficiency potential in new homes and yet there are few contractors currently trained and certified to deliver results. Building the infrastructure necessary to support a viable contractor pool that can provide heating and cooling system commissioning and duct testing and sealing is a major challenge for this program.

Economic Benefits Not Recognized by Financial Markets. Appraisers do not value energy efficiency improvements or benefits when making their valuations. As a result, homebuyers who stay in their new homes only a few years are unable to recoup the extra cost of efficiency investments through bill savings alone. Similarly, most mortgage lenders do not distinguish between efficient and inefficient homes when deciding whether a consumer can afford a mortgage or when developing mortgage products that reflect lower risk of default from homes that are more efficient and therefore have lower energy bills.³¹

Despite the market barriers, the current new construction market offers a number of opportunities for market transformation. Market opportunities addressed by the program include:

Builder Differentiation. Given the large number of builders in the market, individual builders must differentiate themselves from their competitors. In addition, the desire to differentiate tends to fluctuate with the market: When demand for housing decreases, builders are more interested in differentiation as a means to capture business.

Consumer Demand for New Home Efficiency. Historically, consumer surveys have shown that efficiency is a key component in what is expected in a new home. However, since the home is brand new, many consumers already assume that it will be energy efficient simply because it is new.

Consumer Awareness of ENERGY STAR Brand. Many consumers are already aware of the ENERGY STAR label for products but additional education may be needed to establish awareness of the label for homes. To facilitate this, the ENERGY STAR requirements for homes need to represent a significant improvement over current practice.

Interest in Sustainable Building Practices. There is a small but growing interest in sustainable or “green” construction practices among both builders and homebuyers. However, efficiency is not always part of the package of specified

³¹ This barrier primarily impacts those that have trouble qualifying for a mortgage such as some first time home buyers and low income households. The importance of this barrier is lessened somewhat in the current market that is enjoying very low interest rates but will become more of a factor as mortgage interest rates rise.

sustainable measures. The program will need to link efficiency to sustainability with those partners that may view efficiency or ENERGY STAR as competitors.

Table 15 summarizes the main components of the MPERs that have been completed for the ENERGY STAR Northwest Homes evaluations. Each report contains a market assessment showing current conditions in the new home market and tracking changes over time. Phone surveys of both builders and new homebuyers were included in the first and fourth MPERs in the previous funding cycle. In-depth interviews with a smaller sample of builders and various market actors, including realtors and building contractors, were conducted for all five reports. The process evaluation component also includes interviews with utilities, state energy offices, and home verifiers involved with the program. Beginning in 2005, a combination of post-occupancy phone surveys and on-site audits were used to collect information on homeowner satisfaction and retention of individual measures.

Table 15: Evaluation Report Components

Analysis Component	MPER 1 Baseline Report	MPER 2 (3Q 2005)	MPER 3 (3Q2006)	MPER 4 (2Q 2007)	MPER 5 (2Q 2008)
Market Characterization	λ	λ	λ	λ	λ
Market Actor Interviews	λ	λ	λ	λ	λ
Utility Interviews	λ			λ	λ
Builder Phone Survey	λ			λ	
Builder In-Depth Interviews	λ	λ	λ	λ	λ
Homebuyer Phone Survey	λ			λ	
Process Evaluation		λ	λ	λ	λ
Post-Occupancy Homebuyer Survey			λ		
Performance Testing Impact Analysis				λ	
On-Site Post Occupancy Survey				λ	
Duct Test Impact Analysis				λ	
Review of Cost Effectiveness Modeling		λ		λ	λ

APPENDIX C: ENERGY STAR HOMES NORTHWEST SPECIFICATIONS

Table 16 provides a summary of the two prescriptive Builder Options Packages (BOPs) for single-family, site-built homes. The ENERGY STAR Homes Northwest package was designed to include efficiency measures that would result in a level of performance that was a minimum of 15 percent better than that required by codes in the region. It is also designed to include efficiency improvements in all major end-uses including space heating and cooling, water heating, lighting, and appliances. Testing the HVAC and duct systems for leaks is also required using ENERGY STAR Northwest performance testing specifications. Finally, the requirements were designed to maximize the marketing impact by linking to as many ENERGY STAR branded components as possible, from the heating and cooling system to lighting and appliances.

Table 16. ENERGY STAR Homes Northwest Technical Specifications

Component	BOP 1 (Heat Pump/Gas Furnace)	BOP 2 (Zonal Electric/Propane)
Ceiling	R-38 Std	R-38 Std
Wall	R-21 Std.	R-21 Std. + 2.5 sheath
Floor Insulation	R-30	R-30
Unheated Slab Below Grade	R-10	R-10
Windows	U-0.35	U-0.30
Heating System	8.5 HSPF 0.90 AFUE	N/A / 0.80 AFUE
Ventilation System	Central Exhaust	HRV 70%
Air Conditioning System	SEER 13	SEER 13
Duct Insulation	R-8	Electric: N/A Propane: R-8
Duct Sealing	Mastic	Electric: N/A Propane: Mastic
Duct Tightness	< 0.06 CFM per ft ² Floor OR 75 CFM Total @ 50 Pa	Electric N/A Propane: same as BOP1
Envelope Tightness	7.0 ACH @ 50 Pa	2.5 ACH @ 50 Pa
Water Heating	Electric 0.93 EF / Gas 0.60 EF / (> 60 gal.)	Electric 0.93 EF / Gas 0.60 EF / (> 60 gal.)
Appliances	All built-ins are ENERGY STAR	
Lighting	> 50% of sockets either ENERGY STAR lamps or fixtures	

To further increase the flexibility of these requirements, there are also several Technical Compliance Options (TCO) that are allowed within each of the two BOPs:

- TCO #1 substitutes perimeter insulation for floor insulation in homes with crawlspaces.

- TCO #3 utilizes the U.S. EPA’s Advanced Lighting Package³² in place of the current BOP standard.
- TCO #4 allows for a gas hydronic heating system for use with BOP #1 and includes several modifications to the efficiency requirements for water heating and insulation depending on the type of system.
- TCO #5 allows for an electric hydronic heating system for use with BOP #2 and includes several modifications to the efficiency requirements for water heating and insulation depending on the type of system.
- TCO #6 allows for U-value trade-offs within BOP #1.
- TCO #7 allows for U-value trade-offs within BOP #2.
- TCO #8 allows for trade-offs between hot water heater efficiency and insulation requirements.
- TCO #9 provides for hybrid gas unit heaters with electric resistance zonal heating.
- TCO #10 allows for hybrid “ductless split” heat pumps with electric resistance zonal heating.
- TCO #11 provides for propane furnaces (90 AFUE minimum).
- TCO #12 allows an HSPF 8.3 heat pump when coupled to a 90 AFUE furnace backup within BOP#1.
- TCO #13 provides for foam in place insulation in Cathedral Attics within BOP#1 for Idaho and Montana only.

These TCOs help the program to include a greater range of equipment options, many of which are driven by alternative building practices.

³² The U.S. EPA Advanced Lighting Package requires that 50 percent of high-use rooms and outdoor lights must have ENERGY STAR fixtures. In addition, all ceiling fans must be ENERGY STAR and 25 percent of medium-use and low-use rooms must have ENERGY STAR fixtures.

APPENDIX D: BUILDER WEBSITES REVIEW

As mentioned in the report findings, six of the 10 builders that were interviewed said they market their ENERGY STAR homes on their websites, and websites were the most common form of marketing media that all of these builders were using (as opposed to newspaper advertising, yard signs, etc.). A website review was conducted to confirm that these participating builders are in fact using their websites to market ENERGY STAR homes, and to better understand the methods and content they utilize. Thus, each website was reviewed to see if any of the following were included:

- ENERGY STAR logo
- Addresses and/or images of ENERGY STAR homes
- ENERGY STAR technical specifications or equipment descriptions (directly or via links)
- ENERGY STAR FAQs
- Energy savings and improved comfort messages
- Other relevant information

In addition, the overall ease of finding ENERGY STAR information was considered.

The first part of this analysis is an examination of the websites for the six builders with whom in-depth interviews were conducted. Most of these builders are small volume builders. The second part of the analysis reviewed the websites of the top 20 ENERGY STAR builders in 2007, acknowledging that some of these builders may not have websites, and none claimed to use them for ENERGY STAR marketing.

Interviewed Builders

Of the six builders that claimed to market ENERGY STAR homes on their websites, the evaluation team verified that five of them actually have ENERGY STAR Homes program marketing on their main company websites.³³

The prominence of the ENERGY STAR marketing varied among the five websites. Two of the builders extensively promote ENERGY STAR homes on their websites, which is not surprising since both homepages emphasize that these companies construct only ENERGY STAR compliant homes. Both websites include detailed technical information about the ENERGY STAR construction process in addition to an explanation of the

³³ We also searched for the company websites of the remaining four builders who did not mention that they advertised ENERGY STAR homes through a company website during the interviews. Three websites were identified. Two websites promoted either Earth Advantage (Oregon) or Built Green (Washington), instead of ENERGY STAR. The other website had no advertisements for any green building programs.

energy savings, increased comfort, and environmental benefits of the homes. However, only one website quantified the energy savings (noting that the homes are 15 percent more efficient than code). One website includes hotlinks to the federal and Idaho ENERGY STAR homes websites³⁴, and the other links web users to official ENERGY STAR PDF files with technical information about the construction and verification processes, as well as qualified appliances. Both builders posted images of ENERGY STAR home projects on their websites, and one also lists the street addresses.

The remaining three builder websites promote ENERGY STAR, but to a lesser degree. One company website has only the ENERGY STAR logo. The other two builders also placed the ENERGY STAR logo on their homepages, and the image also serves as a hotlink to external, official ENERGY STAR sites.³⁵ However, the significance of the ENERGY STAR brand is not explained upfront. One website has a page with ENERGY STAR information that can be accessed by clicking on “Environmental Commitment.” This page explains the expected energy savings (20 percent higher than code), increased comfort, and the environmental benefits, but does not explain the technical elements. In his interview, this builder said that he plans to build only ENERGY STAR homes in 2008.

The second company’s site has a link to its company newsletter announcing that it became a 100 percent ENERGY STAR builder in June 2007. The newsletter lists technical information about the ENERGY STAR construction process, and also promotes the energy savings (15 percent higher than code), increased comfort, and the expected higher home re-sale value. However, the link to the newsletter is not prominent on the website and there is no indication that the newsletter includes ENERGY STAR information.

Overall, the ENERGY STAR logo is the most commonly employed website marketing tool.

2007 Top 20 Builders

The evaluation team also conducted a similar analysis for the top 20 ENERGY STAR builders in 2007. The top 20 builders built between 26 and 412 ENERGY STAR homes in 2007. Table 17 shows the distribution of the top 20 builders by state.

³⁴ Idaho ENERGY STAR website (<http://www.idahoenergystar.com/>). The Idaho website links to the Federal ENERGY STAR website, which contains comprehensive technical information and details on the benefits of ENERGY STAR homes.

³⁵ Northwest Energy Star website (<http://www.northwestenergystar.com/>) and the Federal Energy Star website (<http://www.energystar.gov/>). The sites contain comprehensive technical information and details on the benefits of ENERGY STAR homes.

Table 17: Top 20 ENERGY STAR Homes Builders in 2007

State	Sample
Oregon	5
Washington	13
Montana	0
Idaho	2
Total	20

Websites were identified for 18 out of the 20 builders. Half of the 18 websites did not promote the ENERGY STAR Homes program.

All of the nine websites that promoted the ENERGY STAR Homes program included the ENERGY STAR logo on their websites. One of the websites had only the logo. However, the remaining eight advertised the benefits of ENERGY STAR homes (energy savings, comfort and health, environmental benefits), provided at least a brief description of the technical elements, and provided hotlinks or web addresses of external ENERGY STAR websites.

Moreover, four of these websites explicitly mentioned that ENERGY STAR homes are 15 percent more energy efficient than code. Only three builder websites displayed images of their ENERGY STAR homes (one with map addresses). While other builders have photo galleries of their homes, there is no clear indication that the homes are ENERGY STAR certified. Four of these websites promote their participation in other green building programs: three mentioned Built Green and one mentioned Earth Advantage.

As shown in Table 18, out of the 30 builders included in this website review, about half promoted the ENERGY STAR Homes program on their company websites in some manner. All of the builders who advertised included the official ENERGY STAR logo.

Table 18: ENERGY STAR Homes Program Promoted on Website

	(N=30)
Yes	47%
No	43%
No website	10%

APPENDIX E: FIXTURES PILOT PROGRAM DESCRIPTION AND FINDINGS

This Lighting Fixtures Pilot program is conducting four modest pilot initiatives in the Puget Sound region that are collectively designed to test different approaches to increasing market understanding and installations of energy efficient lighting fixtures, including in ENERGY STAR homes.³⁶ Following are brief descriptions of the initiatives:

- The Existing Advocates initiative has selected two market actors that already promote energy efficient fixtures to receive additional training so they are empowered to do outreach to a broader audience (e.g., more builders, utilities, industry events) and also provide significant technical support to market actors. No evaluation activities were conducted for this MPER.
- The Model Home Demonstration is working with a builder that is a strong ENERGY STAR supporter to develop a model home featuring ENERGY STAR fixtures that will be open to homebuyers, realtors, and builders for six months or more. The home is expected to be open in late summer of 2008 and will utilize a range of fixtures to highlight their functional and aesthetic characteristics. No evaluation activities were conducted for this MPER.
- The Builder Rep Outreach initiative provided technical and marketing training to lighting showroom staff that work primarily with builders. The goals of this training are to increase salesperson understanding and advocacy of fixtures so that builders select efficient fixtures more often. Information from in-depth interviews with the builder reps that received training will be included in the next MPER in 2009.
- The Training and Outreach initiative will provide technical and marketing training to lighting showroom staff in the Puget Sound region that work primarily with residential homeowners. The goals of this training are to increase salesperson understanding and advocacy of fixtures so that homeowners select efficient fixtures more often. No evaluation activities were conducted for this MPER.

In 2008 the Fixtures Pilot Program will develop case studies documenting the successes and challenges associated with each of the four initiatives, and it is not expected that the market demand for fixtures will increase dramatically based on these modest pilot initiatives alone. According to the program implementer, longer-term market transformation of the fixtures market will depend on one or more utilities developing full-time programs building upon one or more of these initiatives, which is also a goal of the Fixtures Pilot Program.

³⁶ ICF International is implementing the pilot program.

For this MPER, program managers at three participating utilities were asked questions about their experience with the Fixtures Pilot Program to date. Regarding their utility goals, one said his utility “wants to develop better relationships with showroom reps, have their needs met too, and get them to be more proactive with builders.” In particular, the program manager wanted more participation from a lighting supplier that has 80 percent local market share. Another program manager “wants to see if fixtures take off or not. We want to give it a shot, and if it increases awareness by showrooms and builders, that's good.” The last utility hopes to learn “what really works for builder reps and showrooms to convince builders,” and will likely train internal staff to become fixtures experts.

Regarding the Pilot's relationship to the ENERGY STAR Homes program, one program manager emphasized that it is a lighting project that should benefit ENERGY STAR Homes secondarily. Another program manager noted that, “Lighting has been a challenge for builders, who need good information quickly or they will install incandescents.” The last program manager thought the greatest value to the ENERGY STAR Homes program would be the testing and documentation of strategies to more effectively engage key market actors in general.

According to two of the program managers, the main challenge of the program has been to get full utility participation and it has been hard to keep moving forward sometimes (e.g., only two were participating in the Model Home Demonstration). One thought that there “needs to be regional support in the eyes of consumer, or we may not get the full impacts from this.” The other program manager thought the main challenges for the program were builders' risk aversion, technical issues (e.g., few dimmers, poor color rendering) and insufficient incentives for sales staff to promote fixtures.

APPENDIX F: SURVEY INSTRUMENTS / INTERVIEW GUIDES

ENERGY STAR Participating Builder Interview Guide January 2008

Objectives:

- Determine satisfaction among builders with ESHNW program
- Identify areas for improvement
- Test program logic
- Identify known & unknown challenges to building ES Homes in the NW

Target Audience: 6-8 participating builders that joined in 2007
 2-3 participating builders that joined prior to 2007
 Sampling subject to availability of builders in the 7 markets

Hello, my name is _____ calling on behalf of ECONorthwest, an energy research firm based in Portland. First, I want to assure you that this is not a sales call. The Northwest Energy Efficiency Alliance has asked us to help them better understand how well the current ENERGY STAR Homes Northwest Program is operating. Could I speak to _____ or could I speak to the person at your firm most involved with the ENERGY STAR Homes program?

[IF NECESSARY:] This survey is extremely important to NEEA's understanding of the new homes market, and will help in the design and delivery of programs that will directly affect firms like yours. We're willing to work around your company's schedule to find a time when the appropriate person at your firm can speak with us for about twenty minutes.

[IF NECESSARY:] The Northwest Energy Efficiency Alliance is a non-profit corporation supported by electric utilities, public benefits administrators, state governments, public interest groups and energy efficiency industry representatives. These entities work together to make affordable, energy-efficient products and services available in the marketplace. NEEA is currently offering a northwest regional version of the national Energy Star homes program. That's why they are looking for input from new homebuilders in the Pacific Northwest.

[WHEN CORRECT PERSON IS ON-LINE:]

Name: _____
Company: _____
Title: _____
Phone: _____

Program Participation

First, let me ask you a few questions on how you decided to participate in the program and then we'll talk about the various steps involved in the program.

- 1) (IF JOINED PROGRAM IN 2007): What caused you to join the ENERGY STAR Homes program in 2007? (Probe to see if Market Development Lead (MDL) and/or verifier was involved in recruitment)

- 2) Approximately how many total homes did you build or start in 2007? And how many of these were ENERGY STAR homes?
 - a) If no ENERGY STAR homes built or started, ask: Why didn't you build any ENERGY STAR homes in 2007? (Probe for reasons: low customer demand, too costly etc.)
- 3) Approximately how many total homes do you expect to build in 2008? If less than number built in 2007 ask: Why do you think you will build fewer homes in 2008?
- 4) Of your homes built in 2008, will they all be ENERGY STAR, or will ENERGY STAR be offered as a possible option on some? (Get estimate on how many ES if appropriate)
 - a) If NONE are planned to be ENERGY STAR, ask: Why aren't you planning to build any ENERGY STAR homes this year?
 - b) What would have to change for you to build ENERGY STAR homes in the next year?
- 5) What, if any, do you consider to be the biggest advantages to you from participating in the ENERGY STAR homes program?
- 6) And what, if any, are the biggest disadvantages? (If in Puget Sound area probe for reasons)
- 7) What types of program support do you find the most valuable? The least valuable?

Possible support areas – DO NOT READ:

Verification/Inspection of homes

Co-op advertising

Incentives

PR support

Marketing materials [probe for specifics on which materials they found helpful]

PT Training for HVAC contractors

Training for contractors

Training for builders

Program Requirements

- 8) How easy or difficult has it been for you to find information regarding program requirements and participation? Why do you say that?
- 9) There are many different options (or BOPs) for builders to qualify their homes for the program. How does that affect you? Do you use one particular option for all of your homes?
- 10) Do you get most of your technical information from a homes verifier/building performance specialist (BPS), from the State Energy office, a utility, HVAC contractor or from program technical staff?

- a. If from verifier: Which verifier company or organization do you work with primarily?
- 11) Do you feel that they are able to answer your technical questions satisfactorily?
- a. If not, why?
- 12) (IF BUILDER JOINED PRIOR TO 2007) How satisfied are you with the program technical support. Has it changed since you joined the program?
- 13) What has been the biggest challenge for you in participating in the ENERGY STAR Homes program? What has been the toughest ENERGY STAR requirement for you to meet?
- 14) What additional types of assistance would you like to see provided to builders by the ES Homes program?
- 15) Does your utility support the program? What kind of support do they provide? How important is that support for your participating in the program?
- 16) Are you aware of other energy efficiency related programs for homes? Do you also build homes to their requirements?
- a) If YES, ask: Would you say the programs complement one another or compete with each other? Why?
 - b) Which types of homes do your homebuyers tend to prefer? Why?

Lighting Requirement

Now I'm going to ask you some questions about the program's lighting requirement.

- 17) Has your opinion of the lighting requirement changed since you started the program? Was meeting the lighting requirement easier or harder than you expected?
- 18) In general, what percent of your CFL lighting are fixtures, as opposed to bulbs?
- 19) Have you increased the percent of lighting that is fixtures in the last year? Why or why not?
- a) If YES, ask: Was a lighting distributor builder rep influential in your decision to install more fixtures? Which one?
- 20) Where do you buy the CFL lamps and fixtures you use for your homes? (Probe on type of store (big-box, hardware, lighting showroom) and purchase process details)
- 21) Have you had any problems finding any equipment needed to meet the ENERGY STAR requirements? (probe specifically for CFL bulbs and fixtures)

Marketing

Now I'd like to talk to you about how you market your ENERGY STAR homes.

- 22) Do you sell your homes through your own sales reps or through real estate agents?
- 23) Do you feel your sales reps are knowledgeable about the program? Do you feel they are effectively selling the advantages of ENERGY STAR homes?
- 24) Have any of your reps received program specific training in the last year (ask through who if known)? Did they give you any feedback about the quality of the training? What was their feedback?
- 25) Which methods do you use to promote your ENERGY STAR homes?
- 26) If website not mentioned: Do you have a website for homebuyers? (If yes, get URL)
- 27) Which ENERGY STAR benefits do you/will you promote when marketing these homes?
- 28) Can we get contact information for your primary advertising or marketing manager for the NW region? (If it is the builder, ask them to send some samples of their printed advertising from the past year. Otherwise, get name and phone number.)
- 29) What do you think are the biggest marketing challenges for ENERGY STAR homes?
- 30) Do you feel that the ENERGY STAR label provides a sales advantage or disadvantage in the slow housing market such as we are experiencing now?
- 31) What do you think the ENERGY STAR homes program should do to effectively market the benefits of an ENERGY STAR home?
- 32) Do you feel that you have been well informed by the program regarding marketing opportunities?

(If they don't know what these opportunities are, say: They are co-op advertising, signage for outside and inside the house, brochures, and homeowner guides for when the homeowner moves in.)
- 33) Which ones have you used, found most helpful? Do you have any issues/concerns with any of the marketing support?

Performance Testing

Now I'd like to ask a few questions regarding the performance testing of ducts that is required by the ENERGY STAR homes program.

- 34) First, has your HVAC contractor been trained on the program requirements?
- a) If Yes: How beneficial has the ENERGY STAR training been for your HVAC contractor? Do you feel that they were brought up to speed in a timely manner? Have there been any problems?
- 35) Who does the duct testing for your homes?
- 36) What do you think are the benefits of duct testing to the builder?
- 37) What are the benefits to the homebuyer of duct testing? Do you believe that the homebuyer is aware of these benefits?
- 38) Have you had any problems locating a tester or scheduling a time for them to come and do the tests?
- 39) What are the disadvantages with duct testing, if any?
- 40) How would you rate the value of duct testing relative to its cost?
- 41) Have any of your homes failed the duct test at some point? Why did they fail and what was done to correct the problem?
- 42) Do you have any other comments about the duct testing process?

Verification Process

Next I'd like to ask you some questions about the verifier (in Idaho – Home Performance Specialist) you have for your ENERGY STAR homes

- 43) If not provided earlier: Which verifier companies or organizations do you work with primarily?
- 44) How did you find a verifier/Home Performance Specialist for your homes? (Probe source, did verifier approach them, did they talk to more than one verifier)
- 45) Approximately how many ENERGY STAR homes have you had verified to date?
- 46) In general, how well has the verification process gone? Have you noticed any improvements in the past year?
- 47) Does your verifier/HPS provide you with any other types of building assistance in addition to verifying the various ENERGY STAR Homes requirements (If yes, get details)
- 48) Have any of the ENERGY STAR Homes you built failed any of the verification stages? (If so, find out specific issues.

- 49) If yes, for those that failed, how long did it take to fix the problem and then have the verifier/HPS come back and complete the verification?
- 50) Have there been any delays in construction due to the verification process? If so, what do you think should be done to help improve the verification process to prevent delays?
- 51) What are the disadvantages (if any) of the verification process?
- 52) Do you think that building homes to the ENERGY STAR specifications reduces callbacks?

Quality Assurance / Certification

Finally, I'd like to ask you some questions about the program's quality assurance processes.

- 53) The ENERGY STAR Homes program has a state organization that randomly visits a sample of homes to check up on the Verifier/Home Performance Specialists work. Have you had any interactions with the program quality assurance that oversee the certification process? (If yes, get details)
- 54) How well did the QA process go? Did this cause any delay in the process?
- 55) Have you received an ENERGY STAR label for any of your homes?
- 56) How long did it take from the time your Verifier/Home Performance Specialist approved the home to the time you received the label on the home? Were there problems with this process?

Those are all the questions I have for you today. Thank you very much for your time.

ENERGY STAR Other Homes Programs Interview Guide February 2008

Objectives:

- Understand relationships and differences between energy efficient homes programs
- Learn which products customers prefer and why
- Identify ways that programs could work together constructively

Target Audience: Earth Advantage in Oregon, Built Green for King/Snohomish Counties

Hello, my name is _____ calling on behalf of ECONorthwest, an energy research firm based in Portland. The Northwest Energy Efficiency Alliance has asked us to help them better understand how well the current ENERGY STAR Homes Northwest Program is operating and how it could be improved. As part of this study we are speaking with representatives of other new homes programs in the Northwest. Could I speak to _____?

[WHEN CORRECT PERSON IS ON-LINE:]

Name: _____
Company: _____
Title: _____
Phone: _____

Program Specific Information and Customer Preferences

First, I'd like to ask you a few questions about your new homes program and its relationship to ENERGY STAR Homes. Then we'll talk about your perceptions of NEEA's regional homes program, and how the program could potentially be improved.

- 1) First, when did your program initially start up?
- 2) What market needs were you trying to fill?
- 3) What certifications do you offer now for new homes?
- 4) (IF NOT MENTIONED): Does your program also help to produce or certify ENERGY STAR Homes? (Find out if this is a separate certification, a minimum spec/required for another certification, or one level on a ratings scale)
- 5) (IF THEY ALSO DO ES): What do you consider to be the biggest advantages of helping to produce ENERGY STAR homes?
- 6) (IF ENERGY STAR IS NOT PART OF BASELINE SPEC): How do the requirements for ENERGY STAR Homes compare to the requirements for your other certified homes? What are the major differences? (Probe to see if they are more/less stringent, etc.)
- 7) (IF NOT MENTIONED): Do you think homebuyers understand the differences between the different types of energy efficient homes that are available to them?

- 8) (IF ENERGY STAR IS NOT PART OF BASELINE SPEC): Do you think the programs are complementary or compete with each other? Does homebuyer awareness of one type of home also increase awareness of the other types of homes you work with?
- 9) Approximately how many homes did your program certify in 2007? (Get breakdown if multiple certifications) And how many of these homes were sold?
- 10) How many homes do you think your program will certify in 2008? (Get breakdown)
- 11) Which homes do you think homebuyers tend to prefer, ENERGY STAR homes or other homes certified by your program, or by other programs? Why do you say that? Are there any particular features that they value? (Probe to see if there are awareness issues, important spec differences, benefit/cost issues, perception differences)
- 12) How about builders? Do you think they prefer building a particular type of energy efficient home? Why? (Probe to see if there are awareness issues, important spec differences, benefit/cost issues, perception differences)
- 13) Do you know, or have you heard about any specific ENERGY STAR requirements that builders or homebuyers object to?
- 14) Do the utilities that you work with more actively promote certain types of efficient homes, either directly or indirectly?
- 15) Do you market your homes more towards builders or consumers?
- 16) Do builders contribute marketing funding, or does the program cover all these costs?
- 17) How are you marketing your homes? (Also ask about ENERGY STAR specifically if it's a separate option) What methods seem to be the most effective?
- 18) Approximately how much money do you spend annually on advertising?
- 19) What challenges is your program facing in the new homes market?
- 20) How do you hope to overcome those challenges?

NEEA's Northwest Program

Now I'd like to ask you some questions about NEEA's ENERGY STAR Homes Northwest program.

- 21) First, what are your overall impressions of NEEA's program?
- 22) Do you feel that you need additional information about the program? If so, regarding what?

- 23) Do you stay in regular contact with the NEEA program? If so, with who?
- 24) (FOR Earth Advantage): Do you perceive any program coordination or delivery problems between the Energy Trust's statewide program and NEEA's regional efforts?
- 25) What are the biggest challenges facing NEEA's program?
- 26) Do you have any suggestions for promoting the ENERGY STAR program to builders and consumers?
- 27) Are there any other program changes that you recommend?
- 28) Do you think there are ways that your program and NEEA's program could work together more effectively in the future?

Those are all the questions I have for you today. Thank you very much for your time.

ENERGY STAR Verifier / BPS Interview Guide

January 2008

(Note to Interviewer: In Idaho verifiers are called “home performance specialists”)

Objectives:

- Review of Program processes
- Determine reaction to current program (working w/MDLs, training/recruiting builders)
- Determine findings feed into Program Logic Model

Target Audience: Verifiers joined prior to 2007 (2-3)
Verifiers joined in 2007 (5-7)
All have received MPV training through program
Assume 2 verifiers per state

Hello, my name is _____ calling on behalf of ECONorthwest, an energy research firm based in Portland. First, I want to assure you that this is not a sales call. The Northwest Energy Efficiency Alliance has asked us to help them better understand how well the current ENERGY STAR Homes Northwest Program is operating. Could I speak to _____ or could I speak to the person at your firm most involved in with the ENERGY STAR Homes program?

[IF NECESSARY:] This survey is extremely important to NEEA’s understanding of the new homes market, and will help in the design and delivery of programs that will directly affect firms like yours. We’re willing to work around your company’s schedule to find a time when the appropriate person at your firm can speak with us for about twenty minutes.

[IF NECESSARY:] The Northwest Energy Efficiency Alliance is a non-profit corporation supported by electric utilities, public benefits administrators, state governments, public interest groups and energy efficiency industry representatives. These entities work together to make affordable, energy-efficient products and services available in the marketplace. NEEA is currently in the process of developing and offering a Northwest regional version of the national ENERGY STAR homes program. That’s why they are looking for input from builders, distributors, and other firms who operate in the Pacific Northwest new homes market.

[WHEN CORRECT PERSON IS ON-LINE:]

Name: _____

Company: _____

Title: _____

Phone: _____

Hello, my name is _____ and I’m calling on behalf of ECONorthwest, an energy market research firm based in Portland. First, I want to assure you that this is not a sales call. The Northwest Energy Efficiency Alliance has asked us to help them better understand the market for energy-saving features in the residential new home construction market. We are talking to verifiers/home performance specialists to understand their experience in relation to the ENERGY STAR Homes program. Can I confirm that you are engaged in verifications for the ENERGY STAR Homes program?

If YES, continue. If NO, thank and terminate:

I. INTRODUCTION AND BUSINESS SCOPE

Please note that most of the questions I am going to ask you refer to your program experiences starting in 2007.

I'd like to start with some general information about you and your company.

1. When did you become a verifier [in Idaho, Home Performance Specialist]?
2. Do you have a contract to be a verifier with another organization, or are you an independent contractor?
 - a. If they have a contract, ask: Who do you have a contract with
3. How did you become involved in the ES Homes program? (Listen and probe for mention of Market Development Lead (MDL)) What specifically motivated you to sign on?
4. Approximately how many ENERGY STAR home verifications have you done to date?
5. Do you also perform duct testing on ENERGY STAR homes? What is your primary business?
 - a. Yes, also do duct testing
 - b. No duct testing
6. Do you offer any other services to builders or contractors that are involved with building homes?

How much of your business is from ENERGY STAR home verification?

 - a. Verification: _____
 - b. Duct Testing: _____
 - c. Other: _____
7. Do you expect this to change in the upcoming year? In what way? (Probe for expectations of work as a verifier, will verifications increase or decrease, etc.)
8. How big of a business opportunity do you consider verification to be? (Probe to see if homes verification can serve as a value-add to their overall offerings to builders.)
9. How many different builders are you currently working with as a verifier for the ENERGY STAR homes program? [IF ALSO DUCT TESTER, ASK] Of these, how many do you do duct tests for?
10. How much do you charge for your verification services? (Per home)
11. Do you expect your fee to change in the upcoming year?

12. IF INDEPENDENT CONTRACTOR, ASK:] For your current builder clients, how did they find you? Do you actively market your verification services to builders (Probe for channels, methods)? If so, what benefits do you emphasize?
13. What kinds of assistance would help you more effectively market these ENERGY STAR benefits to builders more effectively?
14. What do you think the ENERGY STAR program should be doing to help market ENERGY STAR homes? (Probe for suggestions for marketing to builders, contractors, and homebuyers)

II. TRAINING

Next I'd like to ask you some questions specifically about your experience with the ENERGY STAR Homes program training:

15. Who trained you to become a verifier for the ENERGY STAR Homes program? Do you feel that the training adequately prepared you to verify ENERGY STAR homes? If not, why?
16. Have you received Mistake Proof Verification training from the program? (Note: The training is also referred to as "Critical Details" and "Tech Tips")

If they do not know what this is, say: This is education provided by the program on potential business strategies for verifiers, and how to add value for builders by integrating quality assurance processes into your work.

17. Do you think that the training you received was useful?
 - a. If not, why?
 - b. What about the training did you like in particular?
18. Have you utilized any of the strategies or tools presented at the training, or changed your business organization in any way?
19. (Ask if not mentioned yet) Have you used the Mistake Proof Verification checklists that are available through the program?
 - a. If not aware: "This is a series of comprehensive checklists to help builders comply with the program requirements."
 - b. If aware: Have you utilized the checklists? Have they improved your verification procedures, or helped builders to comply more easily?
20. Have you increased your efforts to recruit builders to the ES Homes Program as a result of this training?
 - a. If YES: How have these efforts gone? Have you actually brought on any new builders? What steps did you take to do this? (Probe to see if they are working with MLDs, what they are learning from them)
 - b. If NO: Why not?

21. What, if any, recommendations do you have for improving the Mistake Proof Verification training?
22. Are you satisfied with the ongoing technical support provided to you by the program?
Why/Why not?
23. How about builders, have you had any experience with the training offered to builders regarding ENERGY STAR? How do you feel this training is going? (Probe for opinion on if builders are adequately trained on the various ENERGY STAR requirements including duct testing, proper HVAC installation, lighting)
24. Do you have any suggestions for the program for improving the builder training?

III. VERIFICATION PROCESS COORDINATION

Next I'd like to ask you some questions about the verification process and how you coordinate your activities with builders and others involved in the process.

25. How do you coordinate the timing of the verification visits with the builder? (Probe for how well they are kept informed of building stages and how quickly they can get this information, their use of online database, timing of information and if it's kept up-to-date.)
26. How long does a typical verification visit last? (Probe for activities, what they look for, what they discuss with the builder, etc.)
27. Based on your experience, which of the ENERGY STAR requirements, if any, pose (or would pose) significant challenges to builders and other contractors? (Probe for ventilation, testing, equipment availability, difficult installation, need to do mastic sealing of ducts, etc.)
28. How soon after conducting your verifications do you enter your information in the program database?
29. How long does it take you to enter your verification information into the database for one home, on average?

SKIP NEXT 2 QUESTIONS IF THEY BECAME VERIFIER IN 2007

30. Has the elimination of the Building Outreach Specialist (BOS) role affected your role positively or negatively?
 - a. If YES, ask: In what ways?
31. Do you think this program change has been beneficial for builders? Why/Why not?
32. Have you had any interactions with the program's Market Development Leads?

If they do not know what MDLs do, say: Market Development Leads are program staff that help to recruit new builders and verifiers to the program and assist builders with their first ENERGY STAR homes.

- a. If YES, ask: How do you work with the MDLs? What is working well or poorly?
How often do you work together or communicate about the program?
33. Have you worked with the utilities? If so, what has been the utility involvement? How has the process worked for you? (Probe for benefits and problems)
34. Have you had any interactions with the State Energy Offices that provide the quality assurance (QA) oversight for verifiers?
35. How does the state coordinate its QA activities with you and your builders? How has this process worked so far? Any suggestions for improvement?
36. How about certification, what percent of your verified homes have ultimately been certified? Once you approve a home for certification, is the SEO getting the certificate and the label to you/the builder in a timely manner?
37. Have you received any technical support from the state energy office? For what kinds of issues? What could have been done differently? (Probe for areas for improvement)
38. Do you feel you are getting consistent program information and are up to date on technical details? Do you receive the technical updates via e-mail? Are these helpful? Do you have any suggestions for improvement on program communications?

IV. OVERALL PROGRAM INTERACTION/CONCLUSIONS

Finally, I'd like to conclude by asking you a few questions about the overall program...

39. Overall, how would you rate your experience with the ENERGY STAR Homes program?
Why do you say that? (Probe fully.)
40. Is there anything about the program that is confusing/unclear?
41. What do you think will be the biggest future challenges for you as a verifier?
42. What can the ENERGY STAR Homes program do to help address these challenges?
43. Do you have any final comments on the ENERGY STAR Homes program?

Those are all the questions I have for you today. Thank you very much for your time.

ENERGY STAR Realtor Interview Guide

February 2008

Objectives:

- Get feedback on homebuyers' understanding of and desire for ENERGY STAR Homes
- Get feedback on quality of ENERGY STAR Homes training for Realtors and Builders Reps
- Identify areas for program improvement

Target Audience: 4-6 Realtors or Builders Reps that received ENERGY STAR Homes training in 2007

Hello, my name is _____ calling on behalf of ECONorthwest, an energy market research firm based in Portland. First, I want to assure you that this is not a sales call. The Northwest Energy Efficiency Alliance has asked us to help them better understand the market for ENERGY STAR homes. As part of our study, we are speaking with Realtors and Builders Reps that have received formal ENERGY STAR Homes training. Could I speak to _____?

[IF NECESSARY:] This survey is extremely important to NEEA's understanding of the new homes market, and will help in the design and delivery of programs that will directly affect firms like yours. We're willing to work around your company's schedule to find a time when the appropriate person at your firm can speak with us for about twenty minutes.

[IF NECESSARY:] The Northwest Energy Efficiency Alliance is a non-profit corporation supported by electric utilities, public benefits administrators, state governments, public interest groups and energy efficiency industry representatives. These entities work together to make affordable, energy-efficient products and services available in the marketplace. NEEA is currently in the process of developing and offering a Northwest regional version of the national ENERGY STAR homes program. That's why they are looking for input from those involved in selling new homes in the Pacific Northwest.

[WHEN CORRECT PERSON IS ON-LINE:]

Name: _____

Company: _____

Title: _____

Phone: _____

Hello, my name is _____ and I'm calling on behalf of ECONorthwest, an energy market research firm based in Portland. First, I want to assure you that this is not a sales call. The Northwest Energy Efficiency Alliance has asked us to help them better understand the market for ENERGY STAR homes. You were referred to us by the ENERGY STAR Homes program as someone who has received formal training on ENERGY STAR homes. Is that correct?

If YES, continue. If NO, thank and terminate:

I. INTRODUCTION AND BUSINESS SCOPE

I'd like to start with some general information about you and your company.

1. For which company are you currently selling new homes?
2. How long has (NAME OF COMPANY) been in business?

3. Approximately how many new homes did your office sell last year? How many do you expect to sell this year?
4. How many of the new homes you sold last year were ENERGY STAR homes? How many ENERGY STAR homes do you expect to sell in the upcoming year? (Probe for number, or if they have any on the market at the moment.)

II. EXPERIENCE WITH THE ES HOMES PROGRAM

Now I'm going to ask you some questions about the ENERGY STAR Homes training you received and your experience marketing ENERGY STAR homes.

5. First, who gave the training you received? What topics did this training cover?
6. Overall, how would you characterize the training? Do you feel that you thoroughly understand the benefits and technical aspects of ENERGY STAR labeled homes?
7. Do you feel that it gave you the tools needed to effectively sell ENERGY STAR homes?
 - 1) If NOT: What additional information or tools do you need to sell ES Homes?
 - 2) If YES: Have you utilized any of the tools or strategies presented at the training? How has this gone? Have they helped you to sell more ENERGY STAR Homes?
8. What, if any, recommendations do you have for improving the ENERGY STAR training for Realtors?
9. Is there anything about the ENERGY STAR Homes program that is unclear to you?
10. If you need additional information about ENERGY STAR homes or strategies to help you sell them, whom do you go to? Are they generally able to answer your questions?
11. Do you ever refer to the program's website for information? What are your impressions about the website?
12. In general, do you actively promote the benefits of an ENERGY STAR home? How?
13. What are the benefits of an ENERGY STAR home that you promote to the customers?

LISTEN FOR BUT DO NOT READ:

- 1) Tight construction
- 2) Insulation
- 3) Windows
- 4) High efficiency HVAC
- 5) Lighting
- 6) Duct testing
- 7) Verification / 3rd party certification
- 8) Lower energy bills
- 9) Better air quality
- 10) Other: _____

14. Which of these benefits are homebuyers most interested in?
15. Are there any "green" home features that customers often ask about or are looking for?

16. Do homebuyers see any drawbacks to ENERGY STAR homes?
17. Do you believe that homebuyers understand the benefits of an ENERGY STAR home? Are there particular benefits that customers have a difficult time understanding? How do you explain these benefits to them? What types of assistance can the program offer to help address this?
18. How important are the ENERGY STAR benefits to customers relative to the other home features? Do many customers specifically ask to see ENERGY STAR homes that are for sale?
19. Given your experience, is the ENERGY STAR label valuable? Does it make a new home easier to sell? Do ENERGY STAR homes sell faster than other homes? Do they sell for a higher price? (If so, get price increment and base price of house)
20. How do you market the homes you sell?

LISTEN FOR BUT DO NOT READ:

- 1) Newspaper ads
 - 2) TV/Radio
 - 3) Real estate ads
 - 4) Outdoor signs
 - 5) Model homes
 - 6) Brochures / Sales materials
 - 7) Internet
 - 8) Multiple listing service
 - 9) Other_____
 1. Don't Know
 - 10) Refused
21. What are the biggest challenges you face in marketing ENERGY STAR homes? (Probe for issues with specific features such as HVAC, lighting, etc. and added costs)
 22. What do you think the ENERGY STAR program should be doing to help market ENERGY STAR homes to new homebuyers?
 23. Do you think it would be useful to have ENERGY STAR certification listed as a feature in the MLS?
 24. Overall, how would you rate your experience with the ENERGY STAR homes program?
 25. Do you have any final comments on the ENERGY STAR new homes program?

Those are all the questions I have for you today. Thank you very much for your time.

ENERGY STAR Utilities Interview Guide
January 2008

Objectives:

- Understand satisfaction with NEEA’s ESHNW program and if needs are adequately being met.
- Identify reasons for non-participation.
- Determine how NEEA can improve its assistance to utilities with their current programs or anticipated programs

Target Audience: Large, medium and small utilities. (n=19)

Hello, my name is _____ calling from ECONorthwest, an energy research firm based in Portland. My company is evaluating the ENERGY STAR Homes program for the Northwest Energy Efficiency Alliance. Right now we’re interviewing a group of utility contacts to better understand how well the program is operating and to gather feedback regarding how the program could potentially be improved. This interview should take 30 minutes or less and your answers will be kept confidential and will be grouped with other respondents for reporting in aggregate form only. Your name will not be used in any reports or documents.

Utilities Without ENERGY STAR Homes Program

Does your utility currently have an ENERGY STAR Homes program?

If NO, CONTINUE

If YES, GO TO “Have Program” Section

57) Are you familiar with the ENERGY STAR Homes program?

a) If YES, ask: How familiar are you?

58) Have you considered starting an ENERGY STAR Homes program?

a) If YES, ask: Why did you consider having a program?

b) If NO, ask: Why haven’t you considered offering a program?

59) What would you say are the major reasons your utility does not have an ENERGY STAR Homes program? DO NOT READ, and probe for other possible reasons.

- a) Customer interest level
- b) Sufficient staff resources
- c) Inadequate program understanding
- d) Lack of funding

60) What would need to occur for your utility to start a new ENERGY STAR Homes program?

61) Is there anything NEEA could do to help you establish an ENERGY STAR Homes program?
Are there any particular types of assistance or information you need?

Utilities With ENERGY STAR Homes Program

First I'm going to ask you some specific questions about your own utility's programs. Then I'll ask you some questions about NEEA's ENERGY STAR Homes Northwest Program.

- 1) (FOR UTILITIES THAT JOINED IN 2007) What made your utility start an ENERGY STAR Homes program in 2007?
- 2) What funding sources are you using to fund your utility's ENERGY STAR Homes program?
- 3) Who is your primary program target market? (Probe for builders, residential customers, both, other)
- 4) What services or incentives is your utility currently providing to program participants? Ask about/get some details:
 - a) Whole house incentives
 - b) Component incentives
 - c) Verification services (find out what they charge)
 - d) Performance testing services
 - e) Marketing services
 - f) Subsidized technical training
 - g) Other
- 5) Have any of these services changed in the last year? How so/Why not?
- 6) (If verification services are provided) Briefly, tell me about the verification process you have in place? (Listen and probe for cost to builders, reporting issues, if things are working well, desired changes)
 - a) If verifications are free or low cost: How long do you expect to provide verification services?
- 7) Which methods do you use to promote your ENERGY STAR homes program? Probe for:
 - Direct mailings
 - Newspaper ads
 - TV/Radio
 - Real estate ads
 - Internet
 - Other
- 8) What do you consider to be the biggest advantages to you from having an ENERGY STAR Homes program?
- 9) Would you say that your 2007 goals were met? How so?
- 10) What are your program goals for 2008? Do you think that they will be met? What are your biggest challenges?

- 11) Will your goals for 2009 be different? If so, why?
- 12) Will you be increasing your efforts to increase participation in your program? If so, how?
- 13) How could NEEA's program better support your endeavors?

Now I'd like to ask you some questions regarding your opinions about NEEA's ENERGY STAR Homes Northwest program.

- 14) First, what are your overall impressions of NEEA's program?
- 15) What features of the program do you like best and have worked well for you?
- 16) What has not worked well? Why do you say that?
- 17) How satisfied have you been with the support and technical resources that are available through the program?
- 18) How would you describe your relationship with your ENERGY STAR Homes Coordinator?
- 19) (DO NOT ASK IF JOINED IN 2007) Has the level of support you receive from your Coordinator changed in the past year? If so, how?
- 20) Are you satisfied with the level of support you receive from your Coordinator?
- 21) What do you need more or less of from the program?
- 22) Have you visited the ENERGY STAR Homes Program website in the past 6 months?

If YES, ask:
 - a) How many times?
 - b) For what purposes?
 - c) Did you find the information you were looking for?
 - i) If NO, ask: What other resources did you use to find the information you needed?
 - d) Do you have any recommendations for improving the website?
- 23) What do you think are the biggest challenges for ENERGY STAR homes?
- 24) Do you have any suggestions for promoting the program to builders and consumers?

Fixtures Pilot Participants (Puget Sound Energy, Seattle City Light, Tacoma Power)

NOTE: these questions may have to be addressed to different utility contacts.

Now I'm going to ask you final questions about the Fixtures Pilot Program in particular that ICF is implementing.

- 25) What is your utility's role in the Fixtures Pilot Program?
- 26) What does your utility hope to get out of the Fixtures Pilot Program?
- 27) What does the Fixtures Pilot Program have to accomplish in order to be considered successful?
- 28) How do you expect the Fixtures Pilot Program to enhance the ENERGY STAR Homes Program in the short-term and the long-term?
- 29) What are the main challenges for the Fixture Pilot Program?
- 30) Should NEEA's participation in this Pilot program change in any way? (Probe for more or less involvement, different focus needed) Do you think the Pilot program is being delivered effectively? Why do you say that? (Note: Make sure to probe on their response)

Those are all the questions I have for you today. Thank you very much for your time.

ENERGY STAR State Energy Office Staff Interview Guide

January 2008

Objectives:

- Conduct process check-in to determine if duties and responsibilities have remained the same since last year.
- Determine if program changes have benefited SCO in their responsibilities.
- Identify areas for improvement.

Target Audience: 4-6 State Certification Offices.

Hello, my name is _____ calling on behalf of ECONorthwest, an energy market research firm based in Portland. We are working with the ENERGY STAR Homes Northwest program and the Northwest Energy Efficiency Alliance to help them to better understand how well the current program is operating. Could I speak to _____?

[WHEN CORRECT PERSON IS ON-LINE:]

Name: _____

Company: _____

Title: _____

Phone: _____

I. BACKGROUND

1. What are your primary responsibilities in relation to quality assurance for the ENERGY STAR homes program?
2. How many homes/builders are you working with right now? How many different verifiers does this involve?
3. How balanced is the demand for your QA services compared to your budget and staffing levels? Has anything changed in your organization related to the ES Homes QA function? (Probe on this)
4. Approximately how many ENERGY STAR homes have you done the QA for to date? How many of these were completed in 2007.
5. Overall, what percentage of ENERGY STAR homes has passed/failed the QA inspection process? (Probe for differences by builder)
6. To date, what have been the primary reasons that homes have failed QA? (Probe for recent trends or changes)

II. QA PROCESS

I'd like to ask you a few questions regarding the QA process. In the past year, what if any changes have occurred in the QA process?

7. Overall, how would you characterize the coordination between you and the builders? Any issues? Is there anything the program can do to improve coordination and communication between you and the builders?
8. In the past year, have you noticed that more or fewer homes are passing their inspections? Why do you think this is?
9. How are builders reacting to the QA process? Do builders believe in the benefits of the QA process? Are they clear on the distinction between verification and QA?
10. On average, once a home has been verified, how long does it take your office to do the final paperwork to complete the ENERGY STAR certification? Are there any issues with this process? Any suggestions for improving the process?
11. Do you use the online database for your work? If so, does it help you? (Probe for details and any suggestions for improving the database)
12. Have you noticed any changes regarding how frequently the program database is updated with builder or verification information?
13. Overall, how well do you think the QA process is working? What is working well? What have been the most challenging aspects of the QA process?
14. What do you anticipate will be the greatest future challenges for the ES Homes QA process?
15. Any other suggestions as to how the ENERGY STAR Homes program can improve the QA process?

III. VERIFICATION PROCESS

Next I'd like to ask you some questions about the ENERGY STAR Homes verification as a separate process from the QA.

16. First, how would you characterize your relationship with the verifiers you work with? What kind of interaction do you have with verifiers? (Probe for issues relating to coordination and communication.) Has this changed in the past year to allow you to work more efficiently or effectively?

17. How would you characterize the technical training that verifiers have received prior to working for the ENERGY STAR Homes program. Does it appear that verifiers have been adequately trained? What aspects of the training do you think has been most valuable for verifiers? Any areas where more training might be needed?
18. What are your overall impressions about the new program changes, such as improved technical and business training for verifiers and elimination of the BOS role? (Probe to see if they have interacted with the Market Development Leads (MDLs), how this has gone.)
19. Do you feel sufficiently coordinated with the program trainings?
20. What else do you feel the program could provide the verifier/BPS companies?
21. Based on your experience with QA so far, how are the verifiers doing? What are the biggest challenges facing verifiers? (Probe for specific problems with verifiers)

IV. OTHER COORDINATION ISSUES

Next I'd like to ask you about your interactions with other agencies involved with the ENERGY STAR Homes program.

22. Have you worked with staff from the Fluid? If so, please describe your interaction with them. What, has worked well? What, if anything, hasn't worked well? (probe for details on coordination and communication)
23. How about utilities, have you had any interaction with them regarding the ENERGY STAR Homes program? If so, please describe your interaction. What, if anything, hasn't worked well? (probe for details on coordination and communication)
24. How about the Northwest Energy Efficiency Alliance, have you worked with any of their staff? If so, please describe your interaction with them. What, if anything, hasn't worked well? (probe for details on coordination and communication)
25. Do you think that coordination between the many program parties has changed with the new program implementer? If so, how?
26. Overall, how would you rate your experience with the ENERGY STAR Homes program so far? Why do you say that?
27. What kinds of assistance from the ENERGY STAR program would help you do your job more effectively?
28. Do you have any final comments on the ENERGY STAR homes program?

Those are all the questions I have for you today. Thank you very much for your time.

APPENDIX G: CERTIFIED AND INITIATED HOMES BY STATE

Below are charts showing the total number of certified and initiated homes by month and by state.

Figure 3: Certified and Initiated Homes by Month - ID

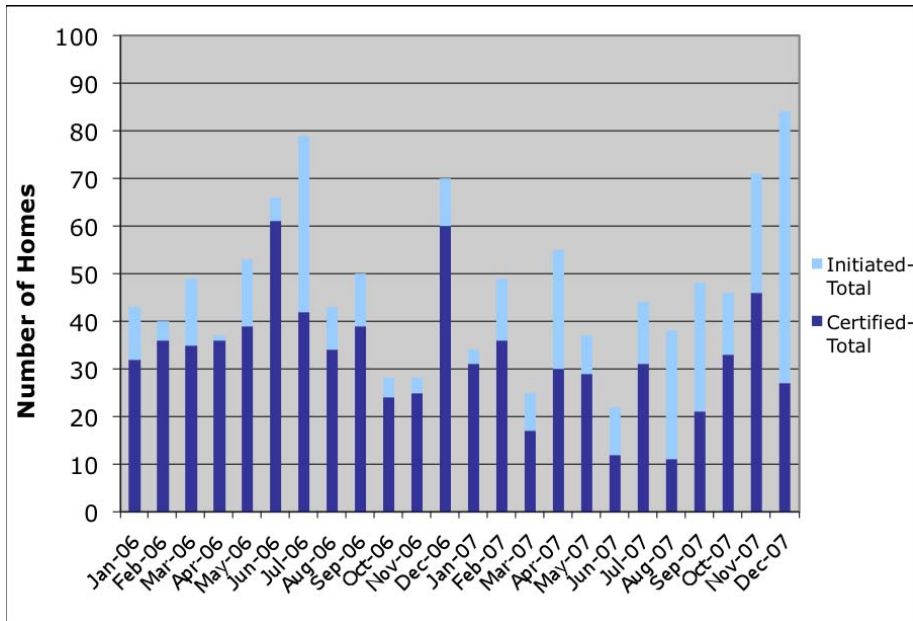


Figure 4: Certified and Initiated Homes by Month - MT

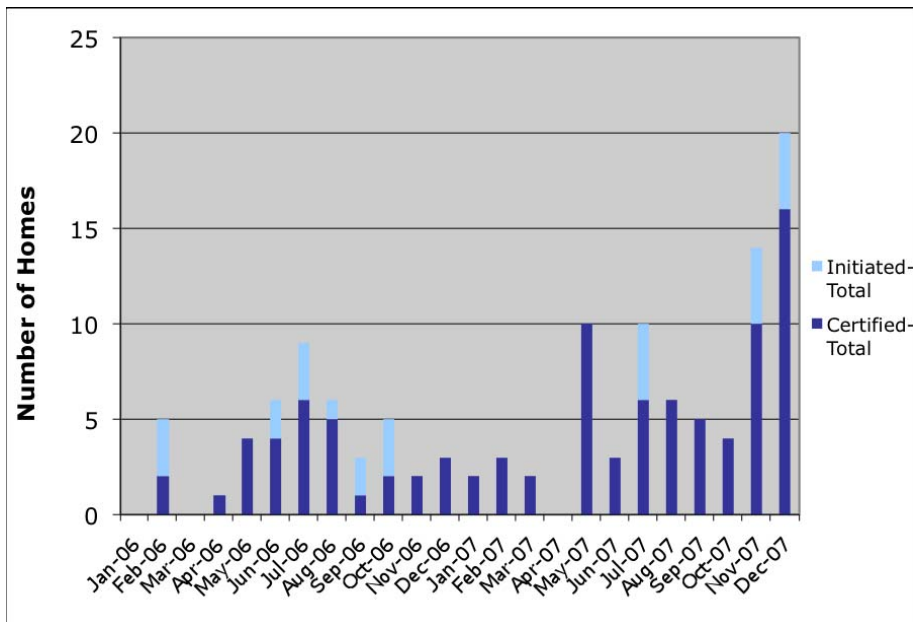


Figure 5: Certified and Initiated Homes by Month - OR

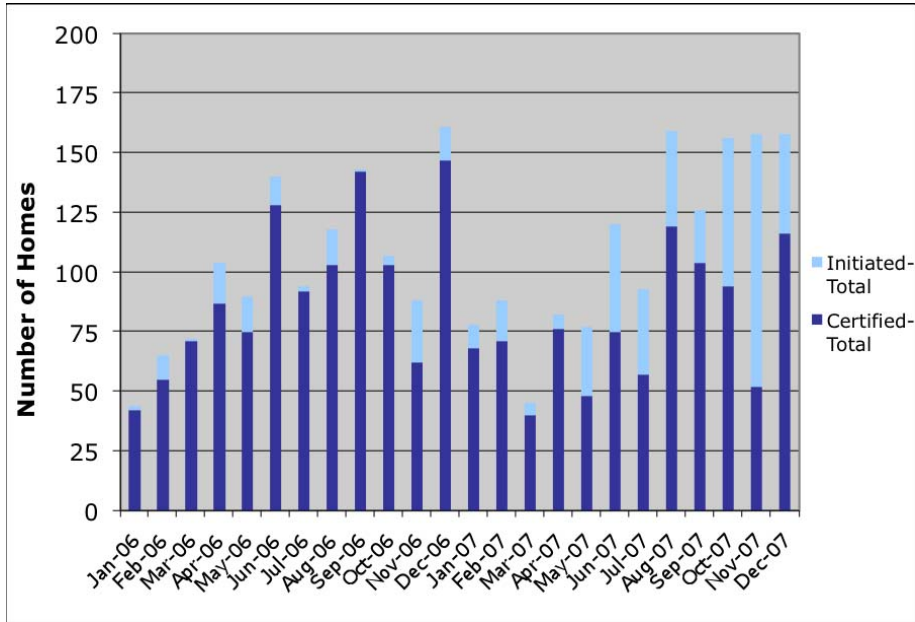
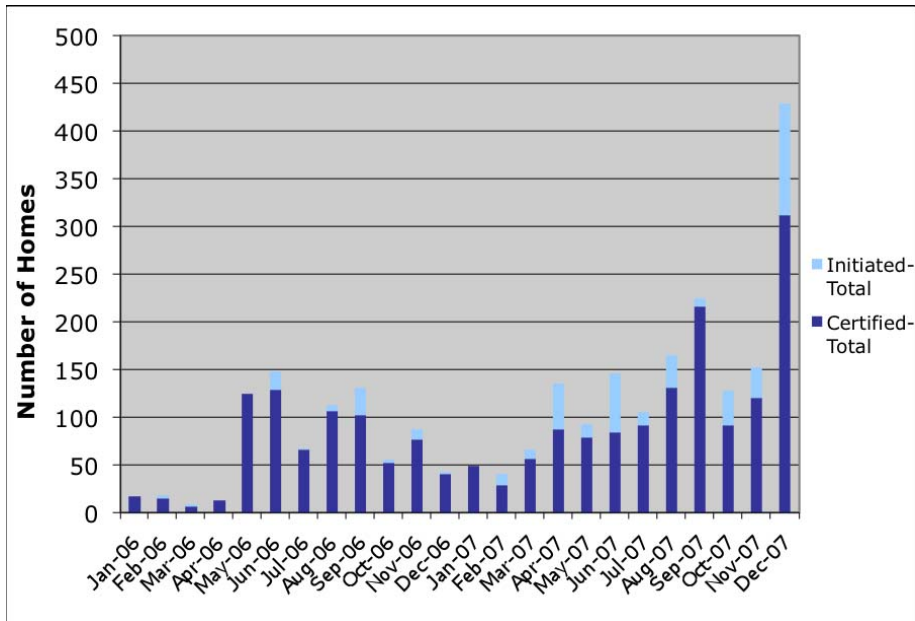


Figure 6: Certified and Initiated Homes by Month - WA



APPENDIX H: MISTAKE PROOF VERIFICATION AND REALTOR TRAINING OFFERED IN 2007

Class	City	State	Date	Attendees
Mistake Proof Verification for Verifiers	Seattle	Washington	21-Aug-07	14
	Portland	Oregon	27-Aug-07	15
	Boise	Idaho	11-Sep-07	10
	Missoula	Montana	23-Oct-07	3
	Bozeman	Montana	24-Oct-07	4
	Brookings	Oregon	1-Nov-07	4
	Eugene	Oregon	13-Nov-07	12
	Spokane	Washington	15-Nov-07	10
	Total Attendees			
NW ENERGY STAR for Realtors	Boise	Idaho	17-Apr-07	28
	Spokane	Washington	18-Apr-07	24
	Bellevue	Washington	9-Aug-07	60
	Boise	Idaho	7-Aug-07	12
	McCall	Idaho	26-Sep-07	24
	Meridian	Idaho	27-Sep-07	11
	Blackfoot	Idaho	2-Oct-07	27
	Total Attendees			

APPENDIX I: OTHER HOMES PROGRAMS INTERVIEWS

This section presents the results of interviews with representatives of the Earth Advantage program in Oregon and the Built Green program for King and Snohomish counties in Washington. These large and successful homes programs operate in the same territory as the ENERGY STAR homes program and offer additional options for homebuyers seeking environmentally friendly or green homes. The purpose of these interviews was to better understand the relationships and differences between the different homes programs, how they fit into the regional new homes market, and to identify ways that the programs may constructively work together in the future.

Offerings and Achievements

The King/Snohomish Built Green program started in 1999 when key staff noted that a growing percentage of homebuyers wanted greener housing, while the new homes market had no real stewardship ethic to deliver environmental benefits (or mitigate damage). Some builders also noticed that this demand was not being met, however they “didn’t speak the green language” and did not know what types of housing to build or what products to use. Built Green was started to bridge this gap by defining a set of green building products that would be appealing to environmentally conscious homebuyers.

Single family Built Green homes in King and Snohomish counties attain ratings of 3 to 5 stars depending on how many green features they incorporate across six categories (e.g., energy efficiency, materials efficiency, site, water protection). Homes receiving 3 stars can be self-certified by the builder and focus primarily on using sustainable materials. Only 4 and 5 star homes require full ENERGY STAR certification (by a third-party) or its equivalent (i.e., they must demonstrate that they are 15 percent more efficient than code).³⁷ Almost all 4 and 5 star homes opt for the ENERGY STAR certification, as equivalency can require complex energy modeling and be difficult to prove.

The program initially incorporated the ENERGY STAR brand into its highest rated homes because it wanted to be affiliated with a reputable brand that would help the program to grow. Since then “The Built Green brand has become reputable in its own right”, but the ENERGY STAR brand has been retained because “it tackles the energy issues very well, and is good enough for me,” said the program representative.

In 2007 King/Snohomish Built Green certified over 2,100 homes, about 250 of which were certified as ENERGY STAR. Most Built Green homes in Western Washington (80 percent) have been certified at 3 stars and are typically built by larger production builders. Most 4 and 5 star homes are built in Seattle and in specific projects where the developer requires ENERGY STAR certification (e.g., Issaquah Highlands). In the future, the program representative thinks 4 and 5 star homes will comprise 50 percent of

³⁷ The representative that we spoke with had heard anecdotally that ENERGY STAR homes may in fact be 20 percent more efficient than code.

all Built Green homes, and that in five years, Built Green will have a local market share of 50 percent of all new homes (it is currently 20 percent).³⁸ While 2008 will see fewer housing starts, Built Green's market share is still expected to increase.

The Earth Advantage program was started in 2000 by Portland General Electric and originally had a narrow energy efficiency and conservation focus. In May 2005 the program transferred to a private non-profit organization and its focus broadened to include sustainable building techniques and materials so that builders could take a more comprehensive approach to green building.

Earth Advantage homes attain one of four certifications (standard, silver, gold, platinum) depending on how many points they earn across four broad categories (indoor air quality, energy efficiency, environmental responsibility, resource efficiency). ENERGY STAR certification is an option for builders, who are permitted to pick specific energy efficient measures that may or may not "add up" to the full ENERGY STAR requirements. Starting in July 2008, however, all new Earth Advantage homes must also meet the full requirements for ENERGY STAR homes.

Since the program started in 2000 it has certified 9,150 total homes.³⁹ In 2007 about 3,000 homes were certified as Earth Advantage, 60 percent of which were also certified as ENERGY STAR homes. According to the program representative, Oregon's ENERGY STAR homes goal for 2008 is almost 1,000 homes, and "Earth Advantage will likely bring in 95 percent of these homes."

Marketing

The Built Green program markets its brand to the building community through educational presentations and by providing information to local permitting departments. The program will provide builders with small materials (e.g., logos, stickers) but builders pay the costs of marketing their own homes. The program also markets to the general public through radio and print advertising, and home show attendance. Each year program information appears on the inside cover of the local Chinook Book and the program is also promoted in the Sustainable Industries Journal. The program has not done any major magazine promotions since 2004; however it may start again soon. Seattle

³⁸ Built Green programs are growing in popularity throughout the Northwest region, although they can differ in their offerings and requirements. In the Tri-Cities area of Washington, a new Built Green program requires ENERGY STAR certification for all homes and the local Home Builders Association (HBA) conducts all verifications. A Built Green program in Spokane is just starting up through the local HBA and has not yet completed any homes. Most of the interest in this program comes from local 100 percent ENERGY STAR builders, and ENERGY STAR certification will be required for 4 and 5 star homes (ratings of 1 to 3 stars are also possible under the program, but do not require ENERGY STAR). The City of Coeur d'Alene, Idaho is also considering establishing a Built Green program, and the National Association of Homebuilders in Montana is considering establishing a green building program.

³⁹ Most of these homes were certified in the last few years, as the program was slow to gain traction.

Mariners radio advertising has also been successful but is expensive (“Radio can be effective but it is hard to find the right stations, it took us awhile”). Program advertising has not mentioned ENERGY STAR specifically in the past but will start doing so this spring with a new “5 Star Play of the Game” Mariners live radio broadcast campaign. Overall, the program spends \$60,000 to \$70,000 annually on marketing and advertising.

The Earth Advantage program markets mostly to builders and is wary of having too much direct consumer interaction due to its small staff size. Instead the program works with and provides training to realtors to reach potential consumers indirectly. In the past, print advertising has been placed in the Sustainable Industries Journal, Oregon Home Magazine, Green and Solar Tour brochures, and the ReDirect Guide. Program staff also attends homes shows (e.g., Better Living Home Expos) periodically. The program will not do radio or TV advertising unless it is offered for free.⁴⁰ In all cases, prospective homebuyers are referred to participating builders (not the program) for more information. The program used to offer cooperative marketing funding to builders when it was operated by PGE, however the program no longer pays for builder marketing except by providing small Earth Advantage branded materials (brochures, decals). Overall, the program spends about \$200,000 annually on marketing and advertising.

Perceptions of the New Homes Market

The Built Green representative said that homebuyers cannot really distinguish between various brands of environmentally friendly homes. Built Green itself has not emphasized its different star levels in the past, although it is starting to do so now to better “define shades of green that match the values of buyers.” He also thought the Built Green and ENERGY STAR Homes programs both complement and compete with each other. “Buyers should think Built Green and ENERGY STAR are complementary, and builders like the overlap too, but in reality there is some program competition to attract builders, who have to decide which certification to choose.” He sees some builders building both types of homes and some that build only one type, and there is no clear trend.

Regarding homebuyer preferences, he thinks the more expensive 4 and 5 star homes clearly offer higher value, as “More details are thought out, water usage is modeled. It tells very strong story.” He suspects that most buyers “kind of care” about the environment, and that costs may still be a barrier for 4 and 5 star homes. Builders, in turn, base their construction decisions on their local markets (i.e., the competition), demographics, and the local environmental ethic. Interestingly, builders’ marketing efforts are often not correlated with the number of stars a home attains: 2 star homes may be promoted very aggressively whereas 5 star homes may not get much attention.

Regarding the ENERGY STAR Homes program, the Built Green representative said that Fluid and NEEA staff are pleasant to work, they have fairly regular contact, and that he

⁴⁰ FOX 12 television once profiled an Earth Advantage home during a series of Saturdays, showing its construction from start to finish.

has been able get information as needed from a program Market Development Lead. On the technical side, however, he has heard that the program is “inflexible” and “challenging for builders to work with.” On the other hand, he said, “This could also be a mark of program integrity.” While he used to hear about CFL performance and acceptance problems, he no longer does, although window glazing can still be a problem for builders of homes with scenic views. In his area, he said that the utilities support the ENERGY STAR Homes program “over all other programs,” and Built Green’s funding is increasingly contingent on promoting ENERGY STAR too (which is not a concern for him).

In the past, Built Green has struggled with the perception that green building has to be more expensive, but this is less true now and the program is doing more to change perceptions. Going forward, the program wants to be proactive in defining what “green” signifies, so it is not lumped in with other new programs that are fairly or unfairly labeled as “greenwashers.” To maintain program integrity Built Green will continue to update program specifications and develop strong messages to address controversial issues.⁴¹

The Earth Advantage representative also thinks that homebuyers have difficulty distinguishing between different home brands, mainly because the ENERGY STAR messaging is confusing. According to him, “The consumer is aware of green and is aware of energy efficiency. The attempt at crossover is what confuses consumers. Some of the messaging that states ‘blue is the new green’ or [something] similar complicates the message.”⁴² In his opinion, the programs do not compete with each other and Earth Advantage “does not try to equalize with ENERGY STAR, as Earth Advantage is built upon four distinct pillars that are more comprehensive (than the ENERGY STAR requirements).” He believes that Oregon’s utilities are fairly neutral regarding which of the two programs they promote.

Regarding market preferences, he felt strongly that realtors, appraisers, builders, and buyers would all rather have a green home that includes energy efficiency, and that “energy efficiency alone has very little cache.” As evidence he noted the results of a recent Earth Advantage survey of 450 builders that build ENERGY STAR and Earth Advantage homes. In the survey, 42 percent of the builders gave Earth Advantage homes a rating of “excellent,” compared to 25 percent for ENERGY STAR homes. Overall, Earth Advantage homes received a rating of 3.31 (out of 5) compared to 2.28 for ENERGY STAR homes.⁴³

Regarding the ENERGY STAR Homes program, the Earth Advantage representative said he stays in contact with Fluid staff and they are very responsive to him. While he has tried to synergize with the regional ENERGY STAR Homes program, however, he said

⁴¹ For example, homes that are larger than average must offset additional square footage with even more energy efficiency and “better” materials (e.g., certified sustainable wood).

⁴² In addition, consumers still confuse marketing and branding for ENERGY STAR homes and appliances.

⁴³ LEED homes scored the lowest and also have the highest construction costs.

the only time he was really consulted was to develop the 2009 program specifications.⁴⁴ On a day-to-day level, Earth Advantage works much more closely with Energy Trust of Oregon, and thus he could not comment on NEEA's regional program implementation or the coordination between PECE (Energy Trust's implementer in Oregon) and Fluid.

In the Oregon market, he said there is "lots of room for improvement" on the deployment side of things. According to him, "The program is in a position to affect the market, but the program model does not always connect the actors. Participants confuse the ENERGY STAR program with Earth Advantage because NEEA doesn't clarify the role of NEEA/ENERGY STAR well. Earth Advantage is getting some heat now in response to the 2009 BOP, and NEEA could make this easier."⁴⁵

As an example, he noted that NEEA should have better informed builders about the decision to require jumper ducts in more applications. In this particular case, ODOE had started instructing verifiers that homes not using jumper ducts in a broader range of conditions should fail their inspection. "Until then, jumper ducts were not a big issue because but they were not emphasized up front [in the specifications] in the main BOP. When we asked ENERGY STAR Homes to tell builders about the change *first*, and the reasons for the change, the program declined and Earth Advantage was left in the difficult spot of being the messenger. And no one knew where ENERGY STAR really stood on the new requirements."⁴⁶ In his view, the ENERGY STAR Homes program did not lead effectively on this issue.

On the technical side, he noted that CFL performance and perceptions had been the main problem areas, and although the industry is addressing these, the ENERGY STAR program still needs to disseminate more lighting information to dispel the critics. In addition, "Builders get push-back from the HVAC subcontractors who have to shoulder the extra expense of the whole HVAC system. The 90 percent furnace costs \$500 to \$1,000 more plus the additional requirements. A lot is expected of the HVAC industry." Other obstacles include allowable window areas and U-values coupled with the cost of large volume water heaters. On the financial side, both Earth Advantage and ENERGY STAR builders tell him they will build more homes when the homes can be cost neutral. Legend Homes, for instance, has developed systems that enable it to build green/energy efficient homes with no incremental costs, and now they are only building Earth Advantage homes.

Going forward, the Earth Advantage representative said there has recently been a great upsurge in builder enrollment, as builders have time now to compare programs and are

⁴⁴ The Earth Advantage representative perceives that NEEA mainly considers Earth Advantage to be verifier/BPS firm.

⁴⁵ The 2009 BOP for Oregon is more stringent than previous BOPs.

⁴⁶ According to the representative, ODOE later softened its stance, and explained that the jumper duct instructions to verifiers were only a "recommendation".

looking for any advantage to make sure their homes sell. Earth Advantage’s main challenge will be finding staff to handle the additional builder inquiries.

ENERGY STAR Program Challenges

The Built Green representative thought that the market share of ENERGY STAR homes should be increasing, and was not sure why the program was “not hitting its numbers goals” as he had heard. “Are the targets realistic?” he asked. Continuing on, he noted that Built Green has historically had very close ties to various building associations and has earned their trust over the years. While Built Green “is in the circle,” ENERGY STAR probably is not and some associations and builders may wonder, “Can we trust you?”

The Earth Advantage representative perceived the following challenges that affect the program’s design and delivery:

- Funding is inadequate to initiate many program plans, and the regional program often cannot synchronize with Energy Trust’s Oregon initiatives.
- The new verifier-as-recruiter model is not serving constituents well. According to him, “There is no evidence that the independent verifier model works in Oregon, and there is too little market to go around. Is there any evidence that verifiers are really recruiting builders anywhere?” he asked.⁴⁷
- The four state territory has urban and sparsely populated areas and a wide range of building codes, making it hard to deliver a consistent and practical program.
- A perceived “command and control” approach to program design alienates many existing and potential allies.

Suggestions for Program Improvement

The Built Green representative was not familiar enough with the ENERGY STAR homes delivery approach to suggest program changes. From a marketing perspective, he said that ENERGY STAR homes consumer advertising has been lagging far behind market actor education, and that there is a need to do more mainstream marketing of ENERGY STAR homes. Noting that Built Green will conduct a marketing campaign this summer with Puget Sound Energy that will highlight ENERGY STAR, he said, “If ENERGY STAR could do something similar to help Built Green, each would benefit. Leveraging funds to do some joint marketing of 4 and 5 star homes would get more bang for the

⁴⁷ In contrast, he noted that the national LEED program deployed 11 providerships to get the program on firm ground, before it was opened up to multiple private actors.

buck. Everyone is busy, but it would be nice to meet more regularly with ENERGY STAR staff to perhaps do some mid- and long-term planning together.”

The Earth Advantage representative strongly recommended allowing his program or any credible green building program to deliver the ENERGY STAR Homes program, “end of story.” Currently, the program’s verifier-led model “does not seek out green homes programs, when nationally almost every green homes program is doing great. Green programs offer the holistic package that builders and consumers want and ENERGY STAR should do more partnering with them.”⁴⁸ According to him, Earth Advantage “delivers the goods” and will be expanding into other states, and “it would have been good to work more hand in hand.”

⁴⁸ As evidence he noted that Earth Advantage’s market share was 12 percent in Oregon (in 2007), while ENERGY STAR got 5.86 percent.