April 20, 2010
REPORT #E10-214

Northwest ENERGY STAR Homes

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Northwest ENERGY STAR Homes Program

Seventh Market Progress Evaluation Report

A Report to the Northwest Energy Efficiency Alliance

April 20, 2010

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Acknowledgements

This report was prepared by ECONorthwest's Portland office for the Northwest Energy Efficiency Alliance. Dr. Stephen Grover was the ECONorthwest project manager for this analysis and was the primary author of this report. Questions regarding the report should be directed to him at grover@portland.econw.com or by phoning the Portland office at (503) 222-6060. Dr. Grover was assisted in this project by John Boroski, Logan Van Ert, Jenny Yaillen, Alex Reed and Tami Rasmussen. Itron and Dr. Phil Willems also assisted with this evaluation and report.

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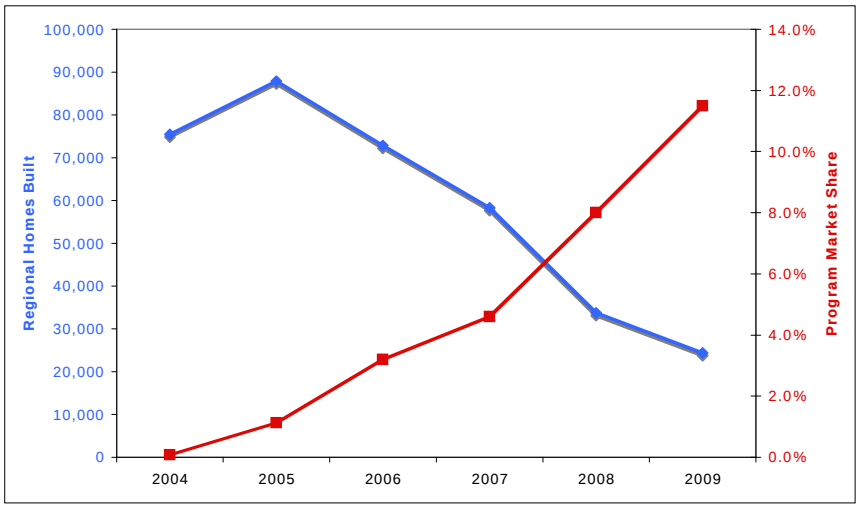
EXECUTIVE SUMMARY

This is the seventh Market Progress Evaluation Report (MPER) of the Northwest ENERGY STAR Homes program. This report presents evaluation findings based on a telephone survey of regional homebuyers and in-depth interviews with many market actors, including participating builders, technical training recipients in Oregon, Home Performance Specialists (i.e., verifiers) in Idaho, building supply companies, and utilities that support the program. The report also includes current data on the new home market in the Northwest.

Progress Towards Goals

As shown below, program market share continued to increase in the declining single-family construction market—from 8 percent in 2008 to 11.5 percent in 2009 (the program goal was 14 percent). Washington, the program's largest market, enjoyed healthy growth (7.7 to 11.4 percent), while Oregon's share increased from 11.7 percent to 12.1 after the state adopted more stringent base energy codes and ENERGY STAR specifications in 2008. Although fewer ENERGY STAR homes were built in Idaho and Montana, market share in those states increased dramatically in 2009 and at 11 percent is now on par with the larger states.

Figure ES-1: Regional Single-Family Construction and Program Market Share



Process Evaluation Findings

According to the Quality Assurance Specialists interviewed for this evaluation there do not appear to be any significant or recurring technical challenges for program builders. In Oregon, builders and verifiers that attended trainings for the new Thermal Bypass Requirements largely believed that they are well prepared to implement the requirements, although close monitoring may still be warranted in 2010 to learn if their subcontractors are implementing the requirements correctly.

The consumer marketing campaigns that were initiated in 2008 and continued in 2009 received mostly positive reviews from market actors (e.g., builders, utility representatives) familiar with them. Many of these program actors noted that mass market campaigns often have to run for multiple years to yield the greatest impacts. Thus, the program should continue its mass market and site-oriented marketing campaigns, which have helped increase homebuyer awareness in recent years.

Support from the program's building supply company partners is growing but could still be strengthened. The program should more actively engage its growing list of building supply partners, to better understand partner expectations and requirements for making additional financial, materials and/or staff time contributions. Future support may be more forthcoming when the economy improves and if the program addresses partners' desires for more collaboration, technical changes, and additional marketing to builders.

To make further progress toward market transformation, the program needs to continue working closely with states that are implementing new energy codes. The experience in Oregon shows that ENERGY STAR homes can retain and even gain market share after a code change when program staff are actively engaged in informing the process and end result, and high-quality training is offered to facilitate the transition. The program should also issue frequent communications to all program partners during the specifications update process.

Market Progress

Homebuyer awareness of the ENERGY STAR label for homes has increased from 19 percent in 2004 to 51 percent in 2009. Perhaps not surprisingly, telephone surveys and interviews conducted with program builders in 2009 found that 30 to 40 percent of program builders have received more homebuyer inquiries about ENERGY STAR homes compared to previous years. As 313 new builders joined the program in 2009, the program appears to be well positioned to benefit from growing awareness and demand for energy efficient and green homes.

Importantly, program builders are using the program label to differentiate themselves. All of the key program builders interviewed for this evaluation believed that the ENERGY STAR label provides a sales advantage in the slow and competitive housing market. Most of these builders rely on their own sales representatives to market their homes, and had sent all of their representatives to ENERGY STAR homes marketing training offered by the program. In the broader market, 72 percent of all surveyed builders in 2009 believed the ENERGY STAR label makes homes more saleable.

In addition, builders have become more knowledgeable about duct testing and its benefits. Builder awareness of duct testing increased from 59 percent to 70 percent between 2004 and 2009. More regional builders are having duct tests performed on the homes they build, and few builders are experiencing problems with duct testing.

1. INTRODUCTION

1.1 EVALUATION OVERVIEW

This report is the third of three Market Progress Evaluation Reports (MPERs) of the Northwest Energy Efficiency Alliance's (NEEA's) Northwest ENERGY STAR Homes program for the 2007-2009 funding period, and the seventh MPER since the program started. The Northwest ENERGY STAR Homes Program promotes the construction and sale of new homes built to the Northwest ENERGY STAR Homes 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 design and past evaluation activities that have been conducted.

This evaluation report presents the findings of an evaluation conducted on NEEA's Northwest ENERGY STAR Homes program for the period through December 31, 2009. In January 2007 Fluid Market Strategies (Fluid) became the program management contractor (PMC) in charge of implementing the program. NEEA/Fluid implemented the following key program changes and initiatives in 2009:

- Energy Inspectors became the designated program provider in Idaho, replacing the Idaho Office of Energy Resources.

- The PMC and its subcontractors conducted several trainings for builders and verifiers in Oregon on the new Thermal Bypass Checklist, which was required to be implemented in ENERGY STAR homes beginning in September 2009. The Checklist requires visual inspection of framing areas where air barriers are commonly missed and inspection of insulation to ensure proper alignment with air barriers, thus serving as an extra check that the air and thermal barriers are continuous and complete.

- A key new feature of the consumer marketing campaign was the Toyota Prius giveaway contest in the Portland region, which was promoted through community events and television, radio, Internet and print advertising. To enter the contest, participants had to purchase an ENERGY STAR home or visit a range of contest partners (program builders, Umpqua Bank, Toyota dealers, Green product retailers) and submit a game card with stickers received at the sites.

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 Indicators

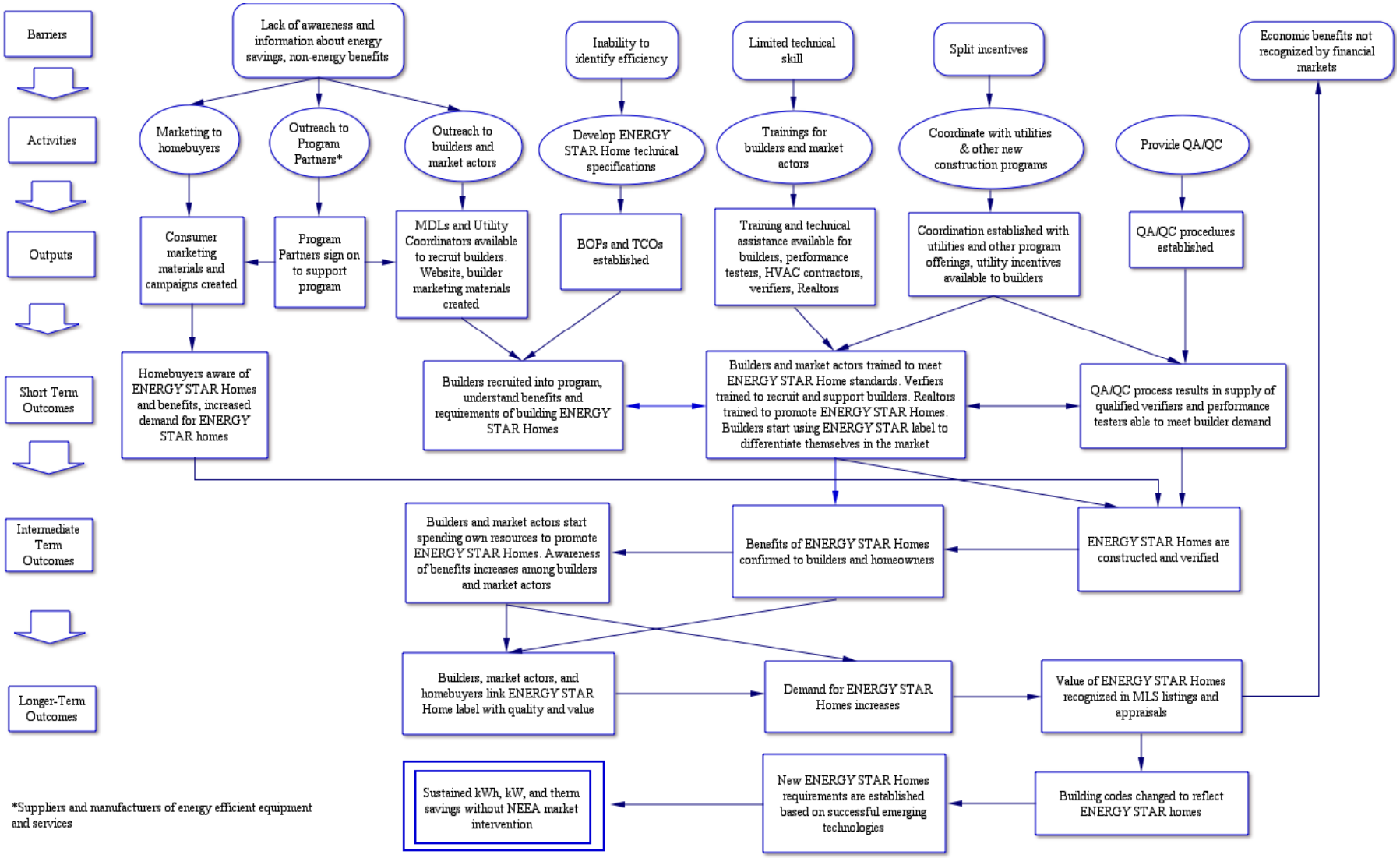
- Builders use the ENERGY STAR label to differentiate themselves in the marketplace;
- Consumers, builders, and other market actors link ENERGY STAR homes and home quality/value;
- Builders are convinced of the long-term cost savings from reductions in call-backs that should result from performance testing 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. Measurement and tracking of these indicators in the current and future evaluations provide an indication of the success of the overall program design.

Figure 1: Northwest ENERGY STAR Homes Logic Model



2. EVALUATION METHODOLOGY

This report evaluates the market progress of the Northwest ENERGY STAR Homes Program. First, the report presents current market data on new home construction and program progress towards market share goals. A second major component of this report is a quantitative survey of regional homebuyers, which was conducted to understand current perceptions of ENERGY STAR and other green and/or energy efficient homes. Finally, in-depth interviews were conducted with several types of market actors that are involved in implementing the Northwest ENERGY STAR Homes Program.

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 HOMEBUYERS SURVEY

Much of this evaluation focused on obtaining detailed information from homebuyers via a quantitative survey. The sample included 200 homebuyers that had purchased a newly constructed home no earlier than January 2008. In a departure from previous homebuyer surveys, the survey also inquired about awareness and purchases of other "green" and energy efficient homes (e.g., Earth Advantage, Built Green) to develop a better understanding of the broad market for these types of homes. The survey collected information on:

- ENERGY STAR and other program awareness among homebuyers
- Key factors in home purchasing decisions
- How ENERGY STAR homes are promoted
- Perceptions of the ENERGY STAR label and what it signifies for homes

ECONorthwest and Itron developed the homebuyer survey instrument and Itron fielded the survey. Questions are linked to specific market progress indicators set for the Northwest ENERGY STAR Homes program. Consequently, some survey responses are used to evaluate program progress on key progress metrics over the life of the program.

2.3 In-Depth Interviews

The market actor interviews are designed to provide an additional perspective on key Northwest ENERGY STAR Homes Program components. These interviews were conducted by phone and involved extended conversations with builders, home verifiers, and building supply companies that are involved in the program. We also interviewed new home construction program implementers in Oregon that promote energy efficient and green homes. Interviews were also conducted with representatives of utilities with ENERGY STAR homes programs, and with staff for each state's State Certification Office (SCO). All interviews focused on program implementation issues and were designed to elicit suggestions for improving the current program.

The sample sizes for each interview group are shown in Table 1. All interviews were conducted by phone from July to November of 2009.

Table 1: In-Depth Interview Samples

Interview Group	Sample Size
Participating Builders	10
Program Partners (e.g., building supply companies)	9
Thermal Bypass Checklist Trainees	10
Oregon Program Implementers	3
Idaho Verifiers (HPSs)	5
Participating Utilities	20
State Certifying Offices	4
Total	**61**

3. Market Characterization

This section provides an overview of the residential construction market for Washington, Oregon, Idaho, and Montana through 2009 using the most current data available. Builder participation, program goals, and ENERGY STAR home construction data are also reviewed and provide context for the evaluation results presented in subsequent chapters.

3.1 Residential New Construction Market Overview

The decline in single-family home construction that began in 2006 has continued through 2009, although the rate of decline has moderated somewhat. As Table 2 shows, total new housing construction in the program territory decreased by 28 percent in 2009 relative to

2008. Among the states, the decline was fairly consistent, ranging from 24 percent in Washington to 31 percent in Montana.

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	33,431	20,483	15,370	3,596	72,880	-17.1%
2007	28,485	15,825	10,622	3,357	58,289	-20.0%
2008	17,335	7,793	6,550	2,043	33,721	-42.1%
2009	12,787	5,609	4,568	1,434	24,398	-27.6%
Change From 2008 to 2009	**-23.5%**	**-28.7%**	**-28.0%**	**-31.2%**		

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

Table 3 shows the number of builders that were issued single-family building permits in markets defined by the *Construction Monitor*. According to these data, all five markets had significantly fewer active builders in 2009 compared to 2008. The smallest decrease in builders was in the Inland Empire market (23 percent), while the largest decrease was in the Puget Sound market (52 percent). While the data do not cover all of the NEEA program territory, they do provide key information about building permits that is not obtainable from other sources.

Table 3: Number of Builders Issued Permits by Region (2009)

Area Name	2008	2009	Percent Change
Inland Empire (Eastern WA, Northern ID)	495	383	-23%
Portland / Vancouver / Salem	1,030	723	-30%
Puget Sound	1,735	840	-52%
Southern Idaho	919	519	-44%
Western Montana	686	452	-34%
Total	**4,865**	**2,917**	**-40%**

Source: *Construction Monitor*.

According to the *Construction Monitor* data, the vast majority of builders that were issued permits (84 percent) were small builders constructing four or fewer homes a year (see Table 4). These builders accounted for 27 percent of the total homes built in 2009. In contrast, there were 16 very large builders (constructing 100 homes or more) in the program area. This small group, however, accounted for 24 percent of the total homes built in 2009. Moreover, larger builders (25 homes or more) accounted for 46 percent of all homes built in 2009, compared to 30 percent of total homes built in 2008. These data reflect two market trends: 1) smaller home builders are finding it more difficult to finance raw land purchases with credit (bigger builders can contribute more equity), and 2) large mortgages are less available to buyers of custom homes, often built by small builders.

Table 4: Builders by Region and Volume (2009)

Region	Number of Units Built Annually					
	1-4	5-9	10-24	25-99	100+	Total
Inland Empire	337	18	20	5	3	383
Portland/ Vancouver/ Salem	604	73	32	10	4	723
Puget Sound	662	76	61	35	6	840
Southern Idaho	452	35	18	11	3	519
Western Montana	397	31	17	7	0	452
Total	**2,452**	**233**	**148**	**68**	**16**	**2,917**
Percentage of Grand Total	**84%**	**8%**	**5%**	**2%**	**<1%**	

Source: *Construction Monitor.*

3.2 PROGRESS ASSESSMENT

As shown in Table 5, 313 new builders contractually agreed to join the program in 2009, which is close to the 326 who joined in 2008 when the home construction market was somewhat stronger. Builder recruitment declined in three of the four states while Washington added 111 builders in 2009 compared to 94 builders in 2008. Across all four states combined, 17 percent of the total participating builders joined the program during 2009.

Table 5: Participating Builders – New and Cumulative[1]

State	2009 New Participating Builders: Small-Volume Builders (<100 homes)	2009 New Participating Builders: Large-Volume Builders (100+ homes)	Cumulative Total of Participating Builders: Small-Volume Builders (<100 homes)	Cumulative Total of Participating Builders: Large-Volume Builders (100+ homes)	2009 Participating Builders as a Percentage of Cumulative Total
WA	111	1	532	13	21%
OR	106	0	749	4	14%
ID	58	0	413	3	14%
MT	37	0	151	0	25%
Total	**312**	**1**	**1,845**	**20**	**17%**

Source: *ENERGY STAR Database.* Data as of January 21, 2010.

Overall, 45 percent of the participating builders in the four states have yet to complete an ENERGY STAR home (see Table 6). This statistic is most likely due to the slow housing market (with many unsold existing homes and increasingly stringent mortgage requirements) that has restrained new 2008 and 2009 program participants from building new homes. Builders who have completed an ENERGY STAR home have mostly built between one and four ENERGY STAR homes.

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

State	Number of Total ENERGY STAR Units Completed: 0	1 to 4	5 to 9	10 to 24	25 to 99	100 or more	Total Number of Builders
WA	279	176	33	27	17	13	545
OR	371	287	41	31	19	4	753
ID	137	205	34	30	7	3	416
MT	58	76	9	7	1	0	151
Total	**845**	**744**	**117**	**95**	**44**	**20**	**1,865**

Source: *ENERGY STAR Database.* Data as of January 21, 2010.

[1] Participating or "active" builders were identified by program staff, and are those builders that have initiated an ENERGY STAR Home in the last one and a half years. Program builders that do not meet this requirement are deemed to be "inactive" and are not tabulated above. Home volumes are based on actual certified ENERGY STAR homes recorded in the program database; some new builders have historically been "large volume" builders in past years when they were not in the program.

Table 7 shows the cumulative number of completed ENERGY STAR homes by builder volume group, and 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 (one percent of program builders) account for 50 percent of 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	1,229	11%
5 to 9	783	7%
10 to 24	1,431	12%
25 to 99	2,295	20%
100 or more	5,813	50%
Total	**11,551**	**100%**

Source: *ENERGY STAR Database*. Data as of January 21, 2010.

Table 8 lists the number of ENERGY STAR homes certified and initiated in 2009, by state. "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 Northwest ENERGY STAR Homes Database listed as pending.[2] Based on the 2,796 certified homes completed in 2009, the program was able to achieve an overall market share of 11.5 percent, which is an increase over the 8 percent market share for 2008.[3]

The program's overall performance relies heavily on Washington, where about half of all 2009 homes were built. Washington achieved a market share of 11.4 percent in 2009, which is a strong improvement over 2008 when market share was 7.7 percent. Oregon led all states with a 12.1 percent market share, and also increased market share over 2008 (11.7 percent) when the state adopted more stringent energy codes. Idaho and Montana made more notable strides in their market share attainment. Idaho's market share doubled from 5.5 percent to 11 percent between 2008 and 2009 while Montana's market share nearly tripled in that time period (from 3.9 to 11 percent).

[2] 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.

[3] For 2009 the program's market share goal was 14 percent of the four-state market. In 2008 the goal was 9 percent.

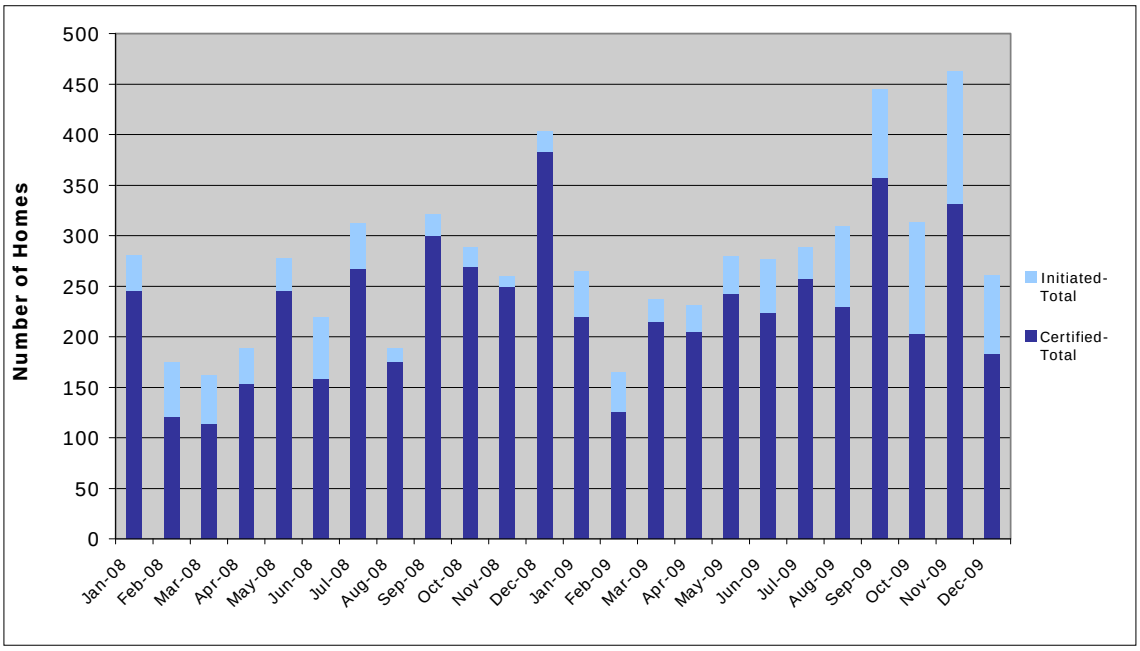
Table 8: 2009 ENERGY STAR Home Construction Status

State	ENERGY STAR Homes Certified	ENERGY STAR Homes Initiated	2009 New Homes	Market Share of ENERGY STAR Certified Homes
WA	1,455	305	12,787	11.4%
OR	681	262	5,609	12.1%
ID	502	133	4,568	11.0%
MT	158	40	1,434	11.0%
Total	**2,796**	**740**	**24,398**	**11.5%**

Source: *ENERGY STAR Database*. Data as of January 21, 2010.

Figure 2 shows the monthly totals of homes that were initiated and certified from January 2008 through December 2009. Certifications in the first quarter of 2008 dropped off markedly from December 2007 (not shown) and then gradually began to rise in the last half of the year, peaking in December. Certifications in 2009 followed a similar pattern as 2008, although certification levels were more consistent during the summer months and peaked in September instead of December. Almost 500 new program homes were initiated in the last five months of 2009. Monthly program activity by state is provided in Appendix E.

Figure 2. Certified and Initiated Homes (Monthly Totals)



Source: *ENERGY STAR Database*. Data as of January 21, 2010.

4. FINDINGS

4.1 HOMEBUYER PHONE SURVEY

This section presents the results of a phone survey of 200 homebuyers that had purchased a newly constructed home no earlier than January 2008 (additional findings are included in Appendix F). Sample data were purchased from Survey Sampling International (SSI). The survey utilized a random, stratified sample with sample quotas established by state, to correspond to new home construction permits issued in 2008 (as documented in MPER6). The sample was therefore designed to be a representative sample of new homebuyers in the four program states, although ultimately no sample data could be obtained for Montana.[4] The distribution of the homebuyer survey sample by state is shown in Table 9. Itron fielded this most recent phone survey in June 2009. (The homebuyer survey instrument is included in Appendix D.) This section also includes results from the previous homebuyer survey (fielded by Itron in March 2007) for comparison purposes.

Table 9: Homebuyer Survey Sample

	Number of Respondents	Percent of Total Sample
WA	108	54%
OR	49	24%
ID	43	22%
MT	0	0%
Total	**200**	**100%**

Table 10 shows the size and price of the homes purchased by the survey respondents. Compared to 2007, respondents in 2009 indicated that they were generally buying smaller homes. In particular, 2009 respondents had purchased fewer homes in the 2,100 to 2,799 square feet range, and relatively more homes measuring less than 1,700 square feet. Not surprisingly, the purchase price of the homes in our survey sample decreased somewhat since 2007. In 2007, 86 percent of the purchased homes cost $200,000 or more, while in 2009, 78 percent of the homes cost this much.

[4] No Montana home sales data were available from any of the three data providers we inquired with for this timeframe. Based on 2008 new home construction values, Montana respondents were planned to comprise six percent of the total homebuyer sample. Even in the unlikely event that all Montana respondents would have given uniform responses, it would not materially affect the key *regional* conclusions reported in this section.

Table 10: Respondents by Home Size and Price

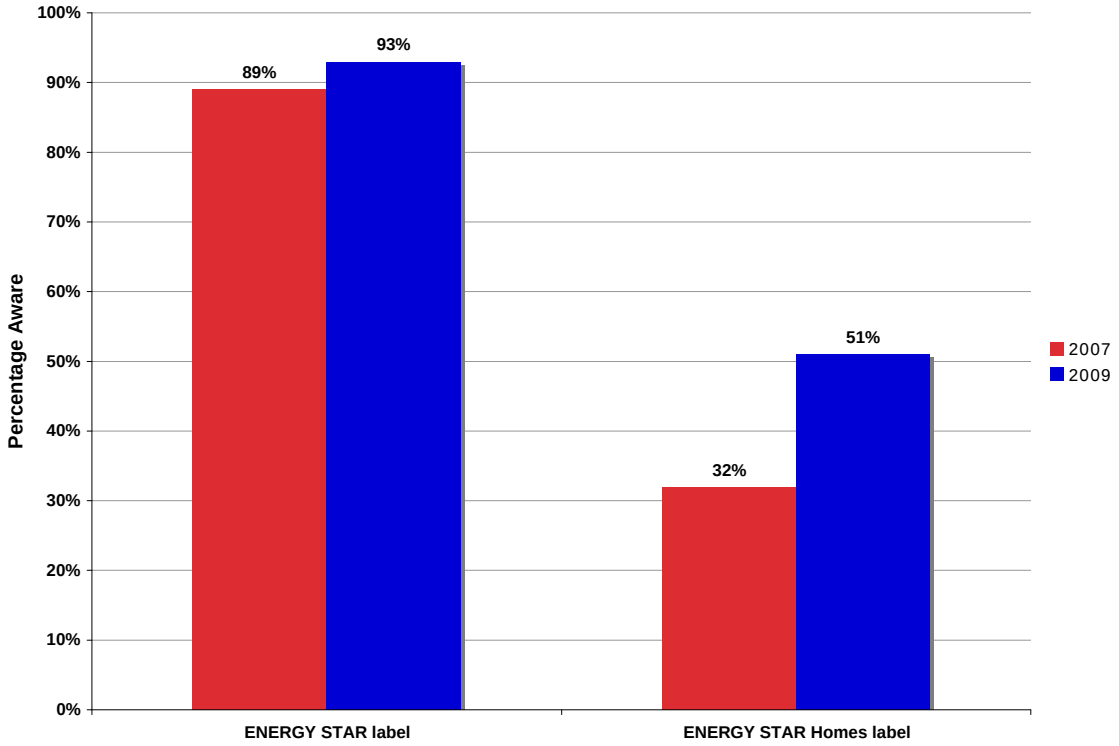
	2007	2009
	Percent of Total Sample	**Percent of Total Sample**
Home Size	**(N=287)**	**(N=200)**
<1,700 ft^2	17%	27%
1,700-2,099 ft^2	21%	20%
2,100-2,799 ft^2	38%	29%
≥2,800 ft^2	24%	24%
Total	100%	100%
Home Price	**(N=281)**	**(N=186)**
< $150,000	2%	6%
$150,000-$199,999	12%	16%
$200,000-$299,999	36%	31%
≥ $300,000	50%	47%
Total	**100%**	**100%**

Q6/Q60. What is the approximate square footage of the house? / Please stop me when I read the price range that includes the price you paid for your new home.

Note: Shading signifies that the responses from the 2007 and 2009 surveys are significantly different at the 90 percent confidence level.

All respondents were asked about their familiarity with the ENERGY STAR label, and the results are shown in Figure 3. Nearly all (93 percent) of the homebuyers we surveyed were aware of the ENERGY STAR label from other products such as refrigerators, clothes washers, and dishwashers. This high awareness level was not significantly different from 2007 (89 percent). Awareness of the ENERGY STAR label for new homes was lower, at 51 percent, however, awareness has increased significantly from 2007 (32 percent) and 2004 (19 percent) when the first homebuyer survey was conducted.

Figure 3: Awareness of the ENERGY STAR Label



Q20,Q21/Q25. Have you ever seen or heard of the ENERGY STAR label / ENERGY STAR label for homes?

Table 11 shows homebuyer awareness of the ENERGY STAR label for homes and other green/environmentally friendly home certifications broken out by state. Overall, homeowners were most aware of ENERGY STAR homes (51 percent) followed by Built Green homes (37 percent), which are offered primarily in Washington and also northern Idaho. Earth Advantage homes are currently built only in Oregon, where they must also meet the requirements for ENERGY STAR homes, and also in southwest Washington. In Oregon, the ENERGY STAR label was more widely recognized than Earth Advantage, while in Washington, the Built Green label was more widely recognized than ENERGY STAR.

Table 11: Awareness of Green/Environmentally Friendly Homes by State

State	ENERGY STAR Percent Aware (N=200)	Earth Advantage Percent Aware (N=200)	Built Green Percent Aware (N=200)	LEED Percent Aware (N=200)	NAHB Green Percent Aware (N=200)
Idaho (N=43)	67%	5%	24%	14%	16%
Oregon (N=49)	53%	35%	27%	20%	18%
Washington (N=108)	43%	4%	47%	13%	26%
Total	**51%**	**12%**	**37%**	**15%**	**22%**

Q25/Q31/Q32. Please tell me the names of any green or environmentally friendly home certifications you are aware of. Have you ever heard of….?

Fifty-six percent of the 101 respondents aware of ENERGY STAR homes said they had seen or heard program advertising in the last 12 months (see Table 12). The state with the highest percentage of positive responses was Idaho (72 percent).

Table 12: Seen/Heard ENERGY STAR Homes Advertising by State

Response	Overall Percent (N=101)	WA (N=46)	OR (N=26)	ID (N=29)
Yes	56%	52%	46%	72%
No	40%	46%	42%	28%
Don't Know	4%	2%	12%	0%

Q27. (If aware of ENERGY STAR homes) In the last 12 months, have you seen or heard any advertising of ENERGY STAR homes?

The varied types of advertisements homebuyers saw or heard are listed in Table 13. The most frequently cited source among the 57 respondents was TV ads (39 percent). Commonly cited other sources (which comprised 23 percent of responses) included the Internet, signs/banners, and TV.

Table 13: ENERGY STAR Homes Advertising Source by State

Response	Overall Percent of Total (N=57)*	WA (N=24)	OR (N=12)	ID (N=21)
TV Ads	39%	42%	17%	48%
Newspaper Ads	30%	29%	58%	14%
Another Source	23%	25%	8%	29%
Magazine Ads	14%	13%	17%	14%
Radio Ads	11%	17%	17%	0%
Billboards	7%	0%	0%	19%
Don't Know	5%	8%	8%	0%

Q28. Where did you see or hear about ENERGY STAR homes?

*Multiple Responses allowed.

Table 14 reports the perceived value of owning an ENERGY STAR-certified home among respondents that are aware of the ENERGY STAR label for homes. Most respondents viewed an ENERGY STAR home as being highly valuable—rated 4 or 5 on a 5-point value scale—and only one respondent claimed that ENERGY STAR homes offer little to no value. Overall, respondents gave ENERGY STAR homes an average rating of 4.4, indicating that homeowners place a high value on energy efficiency in a new home. This higher rating is significantly higher than the 2007 average value (4.2).

Table 14: Value of an ENERGY STAR Home

	2007	2009
	Percent (N=97)	Percent (N=101)
5 Extremely valuable	50%	53%
4	28%	37%
3	16%	9%
2	5%	1%
1 Not at all valuable	1%	0%
Don't Know	0%	0%
Total	**100%**	**100%**
Mean Value	**4.2**	**4.4**

Q29. Using a 1 to 5 scale, with 1 being not at all valuable and 5 being extremely valuable, how would you rate the value of having an ENERGY STAR-certified home

Note: Shading signifies that the responses from the 2007 and 2009 surveys are significantly different at the 90 percent confidence level.

Respondents who did not purchase an ENERGY STAR home were provided with a brief description of the significance of the ENERGY STAR label for new homes. They were

then asked how much more money they would have paid for the home they recently purchased had it been an ENERGY STAR home. As shown in Table 15, the average additional amount that 2009 respondents stated they would have paid for their home was $6,220, nearly one thousand dollars less then the 2007 average value ($7,173). While this difference is not statistically significant, it is not surprising in light of the tenuous economy in which consumers of all products are increasingly cost-conscious. Notably, half of the respondents claimed they would pay nothing extra for an ENERGY STAR home. Compared to respondents that would have paid some amount for the ENERGY STAR features, the "zero-payer" group was *not* significantly more inclined to believe that ENERGY STAR homes are priced too high, believe that new homes are (already) highly energy-efficient, or to place low value on energy efficient homes. These findings suggest that many prospective homebuyers believe that high energy efficiency should be part of the standard new home package, for which they will not pay more.

Table 15: Added Value for ENERGY STAR Label

Added Value ($)	2007 Percent (N=196)	2009 Percent (N=145)
$0	41%	50%
<$5,001	28%	17%
$5,001-$10,000	16%	22%
$10,001-$15,000	3%	1%
$15,001-$20,000	0%	4%
$20,001-$25,000	7%	3%
$25,000+	6%	3%
Total	100%	100%
Mean Value	**$7,173**	**$6,220**

The homebuyers were also asked to list the features included in an ENERGY STAR certified home, and the results are presented in Table 16. The largest group of respondents thought that certification implied (general) *energy savings* (41 percent), which was a significant decrease from the 2007 survey (69 percent). However, 2009 respondents were more inclined to mention other *specific* home features, such as increased insulation (37 percent), high efficiency windows (23 percent) and high efficiency furnaces (21 percent), all of which would contribute to general energy savings. Compared to 2007, respondents in 2009 were also more inclined to associate ENERGY STAR homes with good environmental stewardship and high overall construction quality. In both years, however, relatively few respondents associated ENERGY STAR homes with tight ducts or CFL lighting, although builders that perform duct testing are increasingly associating duct testing with increased value to homebuyers (and a marketing benefit to themselves), as documented in MPER 6.

Table 16: Perceived Components of ENERGY STAR Certification

Component	2007 (N=97) Percent who think component is part of certification	2009 (N=101) Percent who think component is part of certification
Save energy/efficiency	69%	41%
Increased insulation	20%	37%
Save money	38%	36%
ENERGY STAR appliances	18%	26%
High efficiency windows	16%	23%
High efficiency furnace	10%	21%
Tight construction	13%	17%
Environmentally better	5%	16%
High efficiency cooling	8%	15%
Recyclable building materials	5%	8%
Higher quality overall/built better	0%	8%
Tight ducts	3%	6%
House inspected by state energy office	4%	5%
Lighting (CFLs)	1%	4%
Efficient water heaters	0%	3%
Other	0%	2%
More comfortable home	0%	1%
House positioned to reduce energy needs	6%	0%
Don't know	0%	4%

Q30. To the best of your knowledge, what does it mean if a home is ENERGY STAR - certified?

Note: Shading signifies that the responses from the 2007 and 2009 surveys are significantly different at the 90 percent confidence level.

The majority of respondents—78 percent—felt that the primary benefit of an ENERGY STAR-certified home is *lower energy bills,* confirming that homebuyers do in fact associate the homes with overall energy efficiency (see Table 17). The next largest group of respondents felt that a certified home would be "Green" or *environmentally friendly* (35 percent). In 2009, two of the top five most recognized benefits had significantly increased since 2007: *better indoor air quality* (12 percent) and *more insulation* (10 percent).

Table 17: Perceived Benefits of an ENERGY STAR Home

	2007 (N=97)	2009 (N=101)
Benefit	Percent who recognize benefit	Percent who recognize benefit
Lower energy bills	74%	78%
Green/environmentally friendly	30%	35%
Reduced draftiness/improved comfort	19%	12%
Better indoor air quality	5%	12%
More insulation	0%	10%
More energy efficient heating equipment	16%	9%
More energy efficient cooling equipment	12%	7%
Higher resale value	9%	7%
Higher quality/built better	0%	6%
More efficient building materials	8%	4%
Efficient lighting	0%	3%
Energy Star appliances	0%	2%
Third party verified/certified	0%	1%
House inspected by state energy office	0%	1%
Other	1%	1%
Don't know	3%	4%

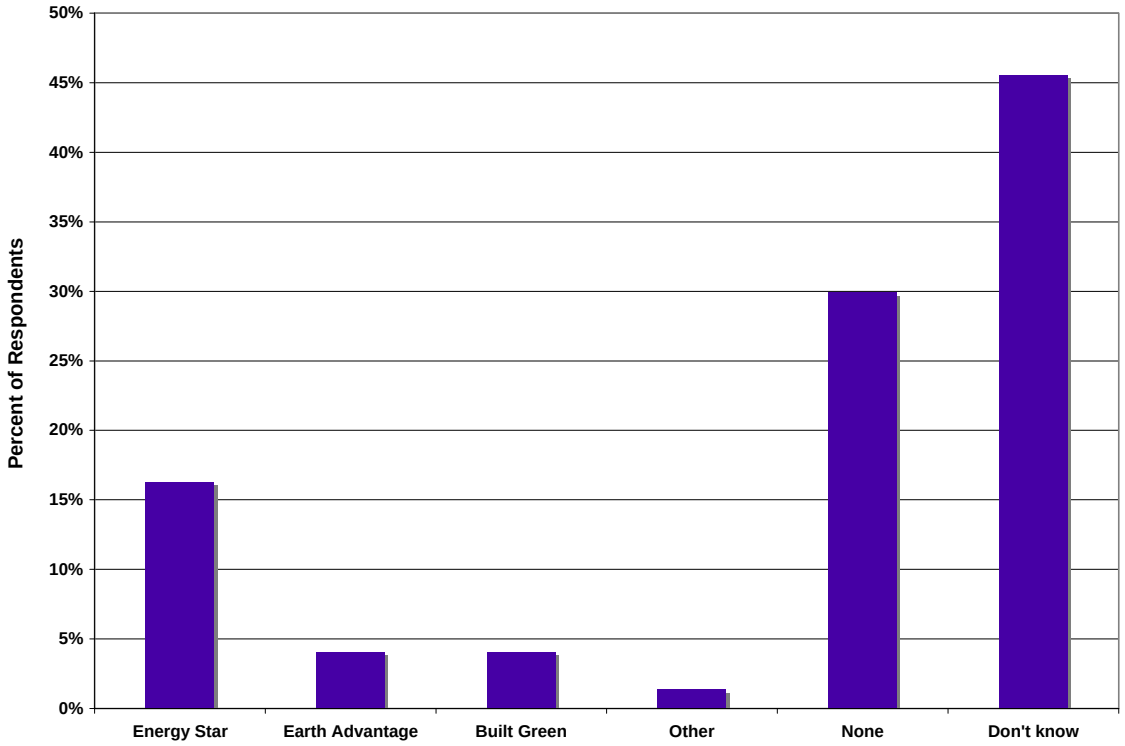
Q36. What do you consider to be the benefits of having an ENERGY STAR certified home?

Note: Shading signifies that the responses from the 2007 and 2009 surveys are significantly different at the 90 percent confidence level.

Figure 4 shows the percentage of respondents that had actually purchased an ENERGY STAR or green home, if they were aware of at least one type of green or energy efficient home. Sixteen percent of respondents (12 percent of the total sample) believed that the home they had purchased was ENERGY STAR-certified. Thirty percent of respondents indicated that their homes did not have a green/energy efficient certification, while, surprisingly, 46 percent of respondents did not know if their newly purchased home had a certification.

In 2007, 8 percent of the total sample said they had purchased an ENERGY STAR home, while only 15 percent did not know if their home was certified or not (the survey did not inquire about other green home certifications).

Figure 4: Respondents who Purchased a Green or Energy Efficient Home (N=147)



Q33. (If aware of green/energy efficient homes) What home certifications, if any, does your home have?

Three-quarters of the 24 ENERGY STAR homeowners said that the builder or their agent actively discussed the energy-saving qualities of their new home, which was a significant increase from the 2007 survey when 46 percent of homeowners said this. This indicates that builders are increasingly promoting energy efficiency benefits to prospective homebuyers.

Table 18: Promotion of ENERGY STAR Homes

	2007 (N=24)	2009 (N=24)
Response	**Percent**	**Percent**
Yes	46%	75%
No	42%	25%
Don't Know	12%	0%
Total	**100%**	**100%**

Q39. Did the sales agent or builder promote the fact that your home was an ENERGY STAR home?

Note: Shading signifies that the responses from the 2007 and 2009 surveys are significantly different at the 90 percent confidence level.

The specific home features that the builder or sales agent promoted to the ENERGY STAR homebuyers are listed in Table 19. The two most frequent responses in 2009 were efficient appliances and insulation (50 percent), followed by the heating system (44 percent). The promotion of efficient appliances has increased significantly from 2007, when it was not even mentioned. Thirty-three percent of respondents in 2009 said efficient lighting was actively promoted (another feature that significantly increased from 2007 when it was not mentioned), while 22 percent of respondents said tight construction was promoted (a significant decrease from 2007, when 55 percent of respondents gave this response).

Table 19: ENERGY STAR Home Features Promoted by Builders/Sales Agents

	2007 (N=-11)	2009 (N=18)
Feature*	Percent of sales agents or builders that promoted feature	Percent of sales agents or builders that promoted feature
Efficient appliances	0%	50%
Insulation	55%	50%
Heating system	18%	44%
Efficient lighting	0%	33%
Cooling system	9%	22%
Tight construction	55%	22%
Energy efficiency	36%	17%
Recycled building materials	0%	6%
Water savings	0%	6%
Windows	0%	6%
Air quality	9%	0%
Overall quality	27%	0%
Duct tightness	18%	0%
Other	9%	17%
Don't know	9%	6%

Q40. What home features did the sales agent or builder promote?

Note: Shading signifies that the responses from the 2007 and 2009 surveys are significantly different at the 90 percent confidence level.

*Multiple responses allowed

As shown in Table 20, less than half of the respondents (42 percent) reported being told about the benefits of heating/cooling duct testing (i.e., less leaking). This percentage was unchanged from the 2007 survey.

Table 20: Duct Testing Benefits Explained to ENERGY STAR Homebuyers

	2007 (N=24)	2009 (N=24)
Response	**Percent**	**Percent**
Yes	42%	42%
No	46%	54%
Don't Know	12%	4%
Total	**100%**	**100%**

Q41. Did the sales agent or builder mention anything about the heating and cooling ducts in the home being tested for tightness to ensure they don't leak?

ENERGY STAR homebuyers that said their sales agent or builder had discussed duct tightness tests and benefits were then asked to rate the importance of having these duct tests performed. For those ten respondents, six ranked the importance as high as possible (extremely important).

Table 21: Importance of Duct Tightness Testing

	2009 (N=10)
Response	**Percent**
5 Extremely important	60%
4	20%
3	20%
2	0%
1 Not at all important	0%
Total	**100%**
Mean	**4.4**

Q42. On a scale of 1 to 5, where 1 is not at all important and 5 is extremely important, how would you rate the importance of having these tests done?

Table 22 shows homebuyer responses to various statements regarding energy-efficient homes. The statement "energy-efficient homes have lower energy bills" achieved the highest level of agreement, with 67 percent strongly agreeing with this statement and 26 percent agreeing somewhat. The statement that received the second highest level of agreement was "most newly built homes could be much more energy-efficient," with 44 percent strongly agreeing and 36 percent agreeing somewhat. This indicates that homeowners acknowledge the savings generated by an energy-efficient home, but believe there is more that can be done. Compared to 2007, respondents were significantly more likely to believe that "energy efficient homes have greater resale value", but were significantly less likely to believe that "energy efficient homes are more comfortable than standard new homes." In 2009 the statement that achieved the lowest level of agreement

was "new homes often have leaky air ducts," which shows that homeowners believe that improved energy savings are attained through other home components.

Table 22: Homebuyer Attitudes and Perceptions Regarding Energy Efficient Homes

Statements	Strongly Agree (1)	Somewhat Agree (2)	Neither (3)	Somewhat Disagree (4)	Strongly Disagree (5)	Don't know	Mean- 2007 (N=300)	Mean- 2009 (N=200)
Energy efficient homes have lower energy bills	67%	26%	3%	2%	2%	<1%	1.4	1.5
Most newly built homes could be much more energy-efficient	44%	36%	8%	4%	4%	4%	1.7	1.8
Energy efficient homes have greater resale value	43%	34%	12%	2%	3%	6%	1.5	1.8
Energy efficient homes are more comfortable than standard new homes	31%	30%	18%	9%	2%	10%	1.9	2.1
Most new homes are highly energy-efficient	23%	36%	11%	19%	8%	3%	2.3	2.5
New homes often allow heated or air-conditioned air from the inside to escape to the outside	11%	26%	17%	17%	16%	13%	2.9	3.0
New homes often have leaky air ducts	7%	17%	22%	22%	16%	16%	3.3	3.3

Q54. Please tell me how much you agree or disagree with each of the following statements. Would you say that you strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, or strongly disagree that…

Note: Shading signifies that the responses from the 2007 and 2009 surveys are significantly different at the 90 percent confidence level.

4.2 PARTICIPATING BUILDER INTERVIEWS

For this evaluation, we conducted qualitative in-depth interviews with ten key program builders that were identified by program staff as being among the highest volume ENERGY STAR homebuilders in the Northwest. Interviews were completed with four builders in Washington, three in Oregon, two in Idaho, and one in Montana. In 2009, seven of these builders were building only ENERGY STAR homes, and 80 to 90 percent of constructed homes were ENERGY STAR certified for the other three builders. Key objectives of these interviews were to learn how Oregon builders are adapting to new energy code and program changes, how ENERGY STAR homes compare to other green homes, and to identify current and future challenges to program builders.

The three Oregon builders had mixed perceptions of the Oregon code changes. One said the code changes made the ENERGY STAR Homes program more attractive (because certification is more difficult and thus has higher value), while another said it made the program less attractive (because the absolute energy savings are lower). The third builder said his attitude about the program has not changed. None of the builders had any specific concerns or problems related to building to the new specification, and two builders said they would refer to Earth Advantage staff to address any problems that arise. Two of the builders were aware of the new thermal bypass checklist. One builder thought the new requirements were a little too stringent, but the other was supportive and has sent his entire management staff to the training.

Eight of the builders we interviewed have their own company sales representatives to promote and sell their ENERGY STAR homes. All of these builders said that their sales representatives have attended training and are effectively selling the advantages of ENERGY STAR homes. Six of the builders emphasize the overall quality of ENERGY STAR homes as the primary benefit to the buyer. In addition, builders promote energy and cost savings, air quality, and comfort benefits of the homes to homebuyers.

Six of the builders we interviewed were not aware of the mass media marketing campaign that began in 2008. Builders who were aware of the campaign had positive impressions of it, commenting that the program is successfully increasing brand recognition and promoting key attributes of the homes. All ten builders stated that the ENERGY STAR label provides a sales advantage in the current slow housing market, and four builders reported that they have had more inquiries about ENERGY STAR homes this past year. Going forward, the builders said that their highest needs from the program were for advertising support and continued sales staff training.

One builder constructs his homes to LEED standards in addition to ENERGY STAR and three other builders participate in the Earth Advantage program. One builder said he considered building LEED homes but stopped because of the high costs, and because the ENERGY STAR specifications are easier to comply with. Another builder was striving to become LEED-certified because he already exceeds the ENERGY STAR standards. While some builders were aware of the Built Green program, none were building these homes or offered impressions of the program. Nine of the ten builders said that all of their 2010 homes would be ENERGY STAR certified, and overall about 550 ENERGY STAR homes were planned.

There was general agreement among the builders that the ENERGY STAR brand name is very well recognized by the public, more so than any other homes program. Some builders believed that awareness of ENERGY STAR homes has reached its full potential, while others said the program should continue its marketing campaigns because not all homebuyers are aware or convinced of the value of ENERGY STAR homes.

Nine of the ten builders said their utility provides incentives for building ENERGY STAR homes. All of these builders said the incentives are very important or essential to their program participation because they cover a good portion of the higher upfront

construction costs. One builder said he absorbs these higher costs himself, and does not increase the price of his homes, as he believes most builders do.

The builders offered two main recommendations to improve the program: more regular training for builders' staff and sales agents and multiple ENERGY STAR certification levels (like LEED) to promote further differentiation among builders in the marketplace and recognize builders who exceed the current program standards. Looking to the future, three builders stated that it will be very important for the Northwest ENERGY STAR Homes Program to "stay ahead of the curve" on state code requirements so the program does not become irrelevant. On the other hand, four builders were concerned that the program requirements may become too stringent and costly and drive some builders out of the program. Overall, the program must strike a balance between exceeding state energy codes and becoming unrealistically stringent.

4.3 PROGRAM PARTNER INTERVIEWS

The Northwest Homes Partner Program engages local, regional and national manufacturers and suppliers of green building products and services to help support the construction of ENERGY STAR homes. Participating members have helped the program deliver trainings, cooperative advertising campaigns and other initiatives to promote the program to the building community. For this evaluation, we interviewed six companies that program staff considers to be key partners, and three other companies, for a total of 9 companies. These companies officially joined the Partner Program between October 2008 and June 2009. Key objectives of these interviews were to understand how well the initiative is serving participants and to learn how more effective partnering can occur in the future.

Five of the interviewed partners said their company had not contributed anything to the Northwest ENERGY STAR Homes program, including four of the key partners identified by the program. One of these five partners said they had been asked to donate product for events, but that given the state of the economy, they not could justify doing so. The other four non-contributing partners did not mention having been asked to donate. Of the four partners that *had* contributed to the program, one said he had promoted the program to his building clients and had attended a program business roundtable. Three had contributed lighting fixtures or appliances (one time) to a program event or model home.

All of the interviewed partners said their primary goal was to realize marketing benefits. Two were interested solely in brand building, while the others placed more emphasis on garnering actual customers from the program. The two companies interested in building their brands did not have direct ways of measuring the effect of their partnership. Therefore, they based their assessments on what they had seen the program doing. One interviewee had positive perceptions. Although he would prefer more frequent updates about what his company's donations were accomplishing, he felt the company's goals (e.g., increased exposure) were being achieved. The other interviewed partner had not perceived much action by the program, and so felt that the partnership was not yielding benefits for his company.

The other seven partners expected to increase sales to program builders. Two of these companies said they had anecdotally heard of program builders buying from them. These partners thought that their partnership with the program was important to those sales, and were satisfied with the partnership. Of the other five partners that wanted to see increased sales, two did not think they had enough information to know if they had realized benefits or not. The remaining three felt they had received no sales benefit from the program and were dissatisfied.

The interviewed partners had many suggestions for the ENERGY STAR Homes Northwest program, which fell into three broad categories: priorities, technical requirements, and outreach. Two of the partners felt that Northwest ENERGY STAR Homes prioritizes builders' interests over those of manufacturers and distributors. For example, one interviewee said that what he really wanted from the partnership was a good contact list of program builders so he could sell to them, and he had not yet received a usable list.

Two partners said that the program was not keeping up technically with other green homebuilding programs. Specifically, they claimed that the LEED and NAHB Green programs did a better job of setting more effective standards. Perceptions of the program's technical requirements varied by product area: lighting and appliance companies said Northwest ENERGY STAR Homes was doing a good job technically, while insulation and HVAC partners would like to see more focus on wind and moisture barriers and ductwork.

All nine partners thought Northwest ENERGY STAR Homes should increase its outreach and marketing. Seven thought campaigns to recruit more local builders would be the best approach, while two thought consumer outreach through co-op TV ads would be equally effective. Specific marketing ideas included: an event or campaign focused on federal stimulus dollars for energy efficiency; short, interesting seminars focused on builder profitability; and opportunities for partners to collaborate on print or email ads to program builders. For each of these ideas, the partner that presented the idea said they would be willing to contribute, but not be the sole sponsor.

Seven of the interviewed partners said that they would be willing to contribute more to program initiatives if the program addressed their concerns. The partners whose main concern was marketing said that, if presented with a well-thought-out marketing campaign, they would contribute towards it. The partners that had concerns about priorities or technical requirements said that those concerns needed to be addressed first—then they would consider contributing to a good marketing campaign. The two remaining partners were both satisfied with current program initiatives; one said that his company was planning to contribute when the economy improved.

4.4 THERMAL BYPASS CHECKLIST TRAINEE INTERVIEWS

This section presents the results of interviews with 10 ENERGY STAR builders and verifiers that received the Thermal Bypass Checklist (TBC) training in Oregon. The

Checklist requires visual inspection of framing areas where air barriers are commonly missed and inspection of insulation to ensure proper alignment with air barriers. The purpose of these interviews is to assess the effectiveness of the training, understand any significant implementation issues, and gather feedback regarding the trainees' experience with the program and their recommendations for program improvement.

The five interviewed verifiers varied greatly in their professional experience with the program. Earth Advantage employed two verifiers, two were independent contractors, and the fifth interviewee was contracted by an electric utility. Three of the five verifiers said they were working with one or no builders, and the number of ENERGY STAR verifications they had done ranged from none to 300. The majority of the interviewed builders were experienced program participants. Four of the five builders had built 10 or fewer ENERGY STAR homes since the July 2008 code change, but before the change, the number of ENERGY STAR homes built ranged from 2 to 100, with three builders completing between 16 and 34 homes.

Regarding the impacts of Oregon's code change, all three of the verifiers that had verified ENERGY STAR homes after the code change indicated that their practices changed very little and there were no significant challenges. Of the four builders that had completed an ENERGY STAR home after the code change, three said they had to do things differently, including more foaming/caulking, tighter air sealing, blowing more insulation in attics, and trying to minimize thermal break when building the foundation and floor. Overall, the transition went well for these builders.

Nine out of the 10 interviewees felt that the TBC training adequately prepared them to build to/verify the checklist. The four assenting verifiers indicated that the training concepts were fairly clear and gave them a good general knowledge of what to look for, as all possible field scenarios could not be covered in the training. The dissenting verifier also felt that the trainings were well delivered, but that additional ongoing training is required. Although all five builders agreed the training was adequate, some felt that they could have obtained the same value from having just the training pictures, and one builder said that translating the new changes to subcontractors would be challenging.

All five verifiers said there was nothing unclear about the requirements; two respondents, however, questioned the reasoning behind under floor insulation and the 6-sided barrier behind tubs. Four of five builders also agreed there wasn't anything confusing about the checklist. The fifth builder indicated that two topics were unclear (and maybe not feasible): installing 6-sided barriers on skylights and details regarding insulating attic knee walls. Overall, the most valued aspects of the training included: illustrations of what to do/not to do, detailed discussion of (some) actual procedures and the general emphasis on improving construction quality (particularly insulation).

Some verifiers felt the following requirements would be challenging to builders: insulation enclosures behind fireplaces and shower tubs, ceiling underside insulation, and exterior sheeting on the backside of walls. One verifier said that the guidelines for stairway construction were insufficient. Builders weren't as concerned as verifiers with

the checklist requirements, but air sealing (in general) and floor insulation were mentioned as difficult tasks.

The interviewees were also asked to rate their experience with the Northwest ENERGY STAR Homes Program, offer suggestions to improve program marketing, and identify needed program support. On a 1 to 10 scale, where 10 was best and 1 worst, three verifiers ranked their program experience an 8, one a 7, and another declined to answer. All five verifiers felt that it is imperative to educate potential homebuyers to increase demand for ENERGY STAR homes. Additional recommendations included: further engaging real estate agents as program allies, more advertising with explicit information on energy savings and long run benefits/costs, and increased marketing to large building associations and trade groups. Two verifiers also identified subcontractor training as a critical need for the future, as these firms ramp up when the housing market improves.

Regarding their overall program experience, builders gave the following ratings: one 10, one 8, two 7's and a 4. To better market ENERGY STAR homes, builders suggested: more co-funded advertising (spending) by the program, focused marketing of the differences between ENERGY STAR and standard homes, marketing the brand (sales) advantages of the ENERGY STAR label to builders, and varied educational tools and venues (e.g., at Home shows, to HBA's, etc.). When asked to identify the most critical support needed from the program, responses included: subcontractor training, design details to achieve very high energy efficiency, advertising cost sharing, and additional consumer education.

4.5 OREGON PROGRAM IMPLEMENTER INTERVIEWS

In July 2008 the ENERGY STAR prescriptive path became the base energy specification for Earth Advantage homes in Oregon. For this evaluation, interviews were conducted with staff at Earth Advantage and Portland Energy Conservation, Inc. (PECI) to understand how well the program integration is working, identify future challenges for ENERGY STAR/Earth Advantage homes, and identify ways that the programs can work together effectively in the future.

According to the interviewees, the ENERGY STAR specification has been well accepted by Earth Advantage builders, and there have been no notable defections due to the integration. While some builders were confused when the ENERGY STAR specification officially changed, most builders fully understand the requirements now after a concerted round of program education. On the technical side, the new zonal pressure relief requirement has introduced some challenges, particularly since it cannot be tested until late in the construction process. While most contractors have adapted well due to their experience with advanced ductwork and heating, some contractors forget this requirement. More importantly, contractors are using many different construction approaches, and costs to the builder can vary from $50 to $1,200. Additionally, some builders place inappropriately colored CFLs in rooms, and view homes in Central Oregon can be constrained by the ENERGY STAR limit on window glazing. On the

administrative side, Earth Advantage had to increase its charges to builders due to the extensive paperwork required by Energy Trust and ODOE.

Regarding programs marketing, PECI only markets Energy Trust's Energy Performance Score (EPS) Program, which is very attractive to (many) builders who are exceeding the ENERGY STAR requirements. Earth Advantage staff perceived that green homes are in higher demand than (only) energy efficient homes, and typical marketing messages explain "Earth Advantage homes have ENERGY STAR on the inside." Earth Advantage promotes the ENERGY STAR specification for any homes that are likely to exceed the state code, and will also promote the specification to builders that ultimately object to comprehensive green homes. Earth Advantage also promotes the ENERGY STAR path over LEED certification, which entails higher costs and more rigid and onerous regulation.

The interviewees had several recommendations to improve the ENERGY STAR program. On the technical front, NEEA should consult with all four states more closely on proposed changes to the 2011 spec, so that the Regional Technical Forum has "better" information on actual expected energy savings (e.g., blown insulation can perform better than batt in some cases). Potential changes to consider include: ducts inside conditioned spaces, better window U values, rigid foam insulation, and advanced framing. If possible, NEEA should also use the 2011 specification to re-unify the four states into a single program, to reduce builder and homebuyer confusion. The program should also introduce changes infrequently and systematically (i.e., to fit with Oregon's Reach Code cycle), so that subcontractors, already challenged by high turnover, do not have to be constantly trained on numerous, piecemeal changes.

On the organizational side, Earth Advantage desired more direction and leadership from the ENERGY STAR program on how ODOE and Earth Advantage should inspect and perform quality assurance for the thermal bypass checklist until the requirements are strictly enforced in 2010. In addition, more technical, marketing and business planning support needs to be provided to independent (non-Earth Advantage) verifiers, who are currently relying on PECI for technical support. These verifiers are struggling to keep pace with changing requirements and earn income from verification services alone.

Regarding future marketing, the interviewees said the program should continue its model home incentives, which drive buyers to sites. Similarly, the current Prius promotion, which brings potential buyers to ENERGY STAR homes, is highly valued by builders and should be replicated. In addition, the program should do more direct promotions to homebuilder associations, since the independent verifier network is perceived to be weak at marketing. Overall, the program should prioritize targeted promotions like these over broad consumer advertising campaigns where it is hard to measure return on investment.

4.6 IDAHO VERIFIER (HPS) INTERVIEWS

In 2009 Energy Inspectors became the designated program provider in Idaho, replacing the Idaho Office of Energy Resources. This section presents the results of interviews conducted with five Home Performance Specialists (HPSs) in Idaho. These individuals

provide third-party verification that the requirements for ENERGY STAR homes are being met. The purpose of these interviews is to understand how well the program is working in Idaho with respect to the homes certification process, quality assurance (QA), and Energy Inspectors' technical assistance to HPSs.[5]

The HPSs we interviewed have had 10 to 70 homes certified by Energy Inspectors, and all are using the program database to record homes information for certification. None of the HPSs reported any significant or recurring problems, and generally noted that the data submittal process works very smoothly (e.g., no hardcopy materials get lost). On a minor note, one HPS that was too busy to attend database training wanted to know if batch data entry is supported. This HPS was also not able to search the database for jobs using fields other than the unique database number. Another HPS said that some of the "extra" information he entered (e.g., actual SEER values) was deleted for a batch of homes, although Energy Inspectors told him they did not make the deletion. Two HPSs that have entered incorrect home addresses said that Energy Inspectors corrects the errors and reissues the certificates quickly. Overall, the HPSs were "satisfied" or "very satisfied" with the home certification process, and were pleased that Energy Inspectors processes certifications and HPS invoices weekly.

Four of the HPSs regularly work with experienced builders who have no problems meeting the program requirements. The other HPS said that Energy Inspectors had (satisfactorily) helped him and a builder to identify efficiency upgrades/alternatives to offset high window glazing, so that a few homes could meet the program requirements.

For QA, Energy Inspectors informs HPSs one month in advance when they will be in their area to get a list of homes in various construction phases. The four HPSs that had had homes QA'd by Energy Inspectors reported no coordination or inspection problems, although one noted that fast production builders sometimes cover insulation before the scheduled QA visits. Overall the HPSs are satisfied with the QA process, with one noting that there have been productive question/answer sessions between builders and Energy Inspectors staff.

Regarding program challenges and concerns, two HPSs said they and their builders need more information about expected program changes when Idaho's energy code changes in 2010. One offered that the program should consider more stringent leakage maximums and more efficient windows and AC before adopting more expensive changes. One HPS wants advice from program staff on how to market his business, while two want to see more regional consumer marketing dollars spent in Idaho (although one thought that two major utilities had declined to co-fund activities).[6] Lastly, one HPS was concerned that

[5] Interviews were conducted with verifiers from all four states for the MPER5 evaluation.

[6] According to the HPSs, one large ID builder typically sells 100 percent of his ENERGY STAR homes, while other ENERGY STAR builders are reporting high buyer satisfaction. The program should advertise these findings.

that some small builders may be marketing homes as "meeting" or "similar to" ENERGY STAR, or may have built custom ENERGY STAR homes for clients without paying program fees.

4.7 UTILITY INTERVIEWS

Interviews were conducted with representatives of 20 utilities that offer whole-house incentives and/or measure-specific incentives to ENERGY STAR builders. Table 23 shows how the utilities were distributed across the states. Included in this group is the Energy Trust of Oregon, which helps implement NEEA's ENERGY STAR Homes program in Oregon. The purpose of the interviews was to find out how their programs are performing, understand program challenges, and learn how NEEA can improve its assistance to market actors.

Table 23: Interviewed Utilities by State, Size, and Ownership

		Size[7]			Ownership	
State	Total Sample	Small	Medium	Large	Investor Owned	Public
Oregon	5	1	2	2	1	4
Washington	9	3	2	4	3	6
Montana	3	0	2	1	1	2
Idaho	3	1	0	2	2	1
Total	**20**	**5**	**6**	**9**	**7**	**13**

Achievement of program goals during the past 18 months has varied greatly. The smallest utilities often have no production goals, but actual certifications have been disappointing, as construction has virtually stopped in many areas. On the other hand, six medium and large utilities, with and without formal production/market share goals, met or exceeded expectations. In slow markets, some utilities are trying to strengthen builder ties for the eventual housing recovery, while one Oregon utility stopped promoting ENERGY STAR after the state code increased. In Washington two utilities have tried to integrate ENERGY STAR into military housing and Habitat For Humanity homes. A few utility representatives noted that before the market declined, builders were increasingly becoming interested in green/energy efficient homes, but now only the "true believers" are building these homes. Roughly equal numbers of utilities planned to increase, decrease, and maintain their level of program promotions in 2010.

Regarding other green homes programs, one Oregon utility provides higher incentives for Earth Advantage homes, which require ENERGY STAR. The others only promote

[7] Based on program staff and implementation contractor assessment of utility residential customer base.

ENERGY STAR homes. Urban Washington utilities often give component incentives and are program neutral, and thus support Built Green while promoting the ENERGY STAR energy specification. Built Green and LEED homes have a minor presence in Washington's rural areas, and builders have become confused about the different home types. In Idaho, NAHB Green homes are gaining traction, although ENERGY STAR is just an optional requirement. Claiming that ENERGY STAR has no builder champion in Northern Idaho, one utility provides incentives for NAHB Green homes, hoping that all levels will eventually require "full ENERGY STAR." In Montana, two utilities are promoting The Montana Home, which has higher insulation and window requirements than ENERGY STAR and doesn't require heat recovery ventilation. This program is relatively new and is attracting some builders, although some of these early homes will also be ENERGY STAR. A few of the interviewed utility representatives were concerned about the number of programs available to builders, which causes confusion, and believed combining efforts with ENERGY STAR was a logical step. That said, they also believed that many builders and buyers prefer a range of choices. While they were not sure how to actually enact programs integration, they typically envisioned a model with energy efficiency as the base/required specification, upon which different layers of "green" could be added.

About half of the utility representatives had not noticed the consumer marketing campaign (which was not run everywhere), but some also said they "tune out" media advertising. Representatives that noticed the advertising generally gave good reviews of the messages and educational content, but wished the campaign had been initiated earlier. These utility representatives have noticed a modest number of new homebuyer and builder inquiries about ENERGY STAR and green homes.

The most frequently mentioned challenge to the program was the poor economy with little/no new construction. In particular, there are fewer qualified buyers now, and they will often sacrifice energy efficiency to get any home they can. Builders are downgrading their entry-level homes to match this demand, and high private verifier/certification fees in some markets can cause new and participating builders to reject the program (production builders can defray these costs more easily).

At the more expensive end of the market, green homes are perceived to have a market advantage, due to more effective promotions and also low energy prices. Buyers still tend to take energy efficiency for granted, and energy efficiency is too often an "intangible" for the builder, since "it is covered up." In Washington, ENERGY STAR is often not required in the lower Built Green ratings because builders perceive ENERGY STAR to be too onerous and/or not compelling. Thus the numerous local programs offer broad options to increase membership (and each is inclined to seek its own sponsorship funding, hindering consolidation into a single statewide program).

On the technical side, utility representatives felt that it would be hard to cost-effectively exceed the increasing Washington and Idaho codes by 15 percent, and feared initial builder confusion when the ENERGY STAR specification increases. In Oregon, there was some concern that builders will have difficulties communicating the thermal bypass

requirements to their subcontractors. Two utility representatives suggested that the Northwest ENERGY STAR Homes Program could stop soon, since the states are aggressively increasing their codes. About half of the utilities were tracking EPA's proposed 2011 specification change and generally felt that it strays too far from energy efficiency, will require extensive verification and forms, and builders would resist the program.

The utility representatives offered a wide range of suggestions to the program. In Washington, NEEA should consider bringing ducts inside homes, higher insulation, better windows, and more use of ductless heat pumps. In Oregon, ongoing thermal bypass training was recommended, and efforts to get independent verifiers certified to inspect Earth Advantage homes too. Some representatives stated that the consumer marketing campaign must continue for a while longer (because consumers "only pay attention the fifth time they hear something"), while others believed it should be reactivated when the market improves. In addition, the program needs to ensure that ENERGY STAR homebuyers know what they have 1 year after their purchase, so they can potentially promote the program too (alternatively, place the ENERGY STAR logo somewhere on the exterior). One representative stressed that the program needs to focus on lenders to monetize energy bill savings, and cannot just rely on "responsible buyers" for program growth. Lastly, ENERGY STAR integration with other green homes programs must be kept "as simple as possible" to reduce market confusion.

4.8 STATE CERTIFICATION OFFICE (QA) INTERVIEWS

In-depth interviews were conducted with Quality Assurance (QA) specialists working for the State Certification Organizations (SCOs) providing third-party certification of ENERGY STAR homes. The QA specialists work with the verifiers to ensure that the verification process is proceeding smoothly and program standards are met. For this evaluation, we spoke by phone with a QA specialist for each of the four states.

QA Process

The agencies serving as SCO for the program remained the same in three states: the Oregon Department of Energy, the Washington State University Energy Program, and the National Center for Appropriate Technology (NCAT) in Montana. In Idaho, Energy Inspectors (EI), took over certification duties in mid-2009. In Oregon, QA inspections are conducted by a contractor retained and directed by the SCO; in other states, they are conducted by SCO staff. For all states, lower construction volumes cut the number of inspections required, since SCOs inspect 5 to 10 percent of certified homes overall and the first three homes of new builders or verifiers. With fewer homes ready for inspection at any time, QA resources were more difficult to deploy cost-effectively.

All SCOs reported that the certification process is generally operating smoothly. In Idaho, the transition to the new SCO appears to have occurred with no problems, with a system now in place to efficiently handle certification and inspections. EI is trying to improve coverage of underserved areas, and has two new verifiers starting in parts of the state that

previously were not covered. They have one QA specialist in the state currently, and can add more if the volume of homes increases.

Failures

The SCO representatives interviewed said that few homes actually fail QA, although inspectors sometimes find that their blower door or duct test results do not match those of the verifier. Most of these minor discrepancies can be easily resolved through a discussion with the verifier. The Washington SCO noted that any remaining problems primarily still involve ductwork and the failure of contractors to fully seal all ducts as required. In Oregon, the SCO has allowed a grace period during the transition to the new Thermal Bypass Checklist, but will begin to fail homes that do not comply as of January 2010. The SCO was minimally involved in the trainings conducted for builders and verifiers, noting that the PMC was leading this effort.

A concern in several states is the failure of some builders and verifiers to follow up promptly with required paperwork. Oregon's SCO found that when ENERGY STAR stickers were sent to the builders, there was no incentive for builders to put them on if the house had already sold, so they started sending the labels to the verifiers to apply after the final inspection. Similarly, Montana's SCO reported that verifiers sometimes fail to send stickers to the builder after they have done their final inspection and entered results into the database, requiring follow up calls in response to builder complaints.

Database

All of the SCOs said they think the new program database and the QA database are worthy ideas, but the transition to the new system has not been consistently smooth.

- In Idaho, Energy Inspectors has made use of the databases a priority in its effort to provide timely certification. HPSs enter data into the database, every Monday the SCO pulls the previous week's data to find homes ready for certification, and by Tuesday afternoon they issue the paperwork. The Idaho QA Specialist called the database "tremendous" and noted that one HPS who initially asked to send paper results has become an enthusiastic database user.

- In Oregon, the SCO said that 2009 was a mostly disorganized QA year as database "bugs" were addressed. Now that the database is working well and verifiers can view the detailed QA results directly, there is increased transparency and less need for the SCO to discuss the QA findings with verifiers.

- Washington's SCO reported that the database had not been fully integrated into their QA operations, since QA inspection forms come to the SCO, which forwards them to a data entry person in Spokane.

- Montana's QA Specialist knew he should be able to enter QA results into the database, but had gone months without doing so because he was unable to open up

the appropriate screen, and did not know who to contact for assistance (no program staff are assigned to Montana now). As a result, they still had the QA data only in hard copy. The QA Specialist also expressed concern that verifiers and builders shown as not active in the program database may still show up as active on the public website.

Training, Code and Program Changes

Much of the training in Oregon and Washington has focused on preparing verifiers and other trade allies for new codes, while Montana and Idaho have trained new verifiers/HPSs to improve coverage. The QA Specialists say training has been effective, but note that continued on-the-job training is necessary for new verifiers, whether for the existing program or for new standards.

Several QA Specialists expressed concern about the uncertain future of residential codes and the ENERGY STAR standards, since these directly affect their QA role.

- Washington's new residential code will take effect in July 2010, yet specific requirements remain to be finalized in a highly political process. The SCO expects that the new code will demand the kind of verification and testing that ENERGY STAR requires now, so that many builders, contractors and local building inspectors will have to be trained. Also, Washington's version of ENERGY STAR will have to be made more efficient than code—while the very existence of a separate Northwest ENERGY STAR standard will be determined by negotiations with EPA for 2011 and beyond.

- Oregon's new residential code and thermal bypass checklist have highlighted the degree to which such changes create a need for extensive training. The QA Specialist thinks the new 2011 ENERGY STAR specification may have 5 or 6 more checklists, with a corresponding need for training.

- In Montana there is also concern about potential changes in the national program, since Montana builders can choose between the national and regional standards.

All of these potential changes have implications for the QA process. One QA specialist said that the biggest future challenge in working with verifiers will be all the new code and ENERGY STAR requirements they will have to deal with. NEEA and the utilities will want to maintain savings above code, requiring additional levels of inspection and verification and necessitating more than a single visit at the end of the process. The QA process has tried to match the verifier's process, and if verifiers have to visit homes multiple times, QA will also have to test houses at different stages of construction. Another respondent noted that as the scope of systems addressed by ENERGY STAR expands beyond energy use, verifiers and HERS raters may face potential liability issues if they are seen as responsible for overall building integrity.

Communication and Coordination

The SCOs were all pleased with the overall job Fluid is doing in implementing the program and they particularly appreciate the marketing and training support provided in their states. They say communications among Fluid, NEEA and the SCOs are generally good. That said, all of the SCOs would like to be more regularly informed regarding negotiations and planning for the coming ENERGY STAR national and regional specifications, so they are not caught unprepared.

5. REVIEW OF NEEA COST EFFECTIVENESS (ACE) MODEL

In April 2009, ECONorthwest conducted a review of the Alliance Cost Effectiveness Model (ACE Model) used by NEEA to calculate the cost effectiveness of the Northwest ENERGY STAR Homes Program.[8] This review included both the model assumptions documentation and the Excel file that contains the ACE Model.

Review of Heating Type Distributions

As part of our review of the ACE model and its parameters we assessed the distribution of heating system types in 2008 certified ENERGY STAR homes. Table 24 below shows the most recent ACE model heating type distributions compared with our findings using 2008 ENERGY STAR tracking data. The distributions are generally the same, however the most notable change was an increase in heat pumps of almost four percent between the ACE model and the 2008 ENERGY STAR homes tracking data.

Table 24: Heating Type Distributions

Source	Heat Pump	Zonal	Gas w/ AC	Gas w/o AC
ACE model	12.5%	1.9%	27.9%	57.6%
2008 ES homes data	16.4%	0.2%	26.2%	57.0%

Adjustments to ACE Model Savings Values

The per-unit savings calculated in the ACE model spreadsheet were recalculated for Oregon using adjusted savings values produced by the Northwest Power and Conservation Council (the Council). The Council's savings values for the four types of heating systems mentioned above are adjusted to take into account the July 2008 code change in Oregon. The average savings value for each heating type was calculated by taking an average of the values for the Council's home types (Crawlspace w/ PTCS, Crawlspace w/ Interior HVAC & Ducts, or Basement w/ Interior HVAC & Ducts) and using a weighted average of the three city regions (Portland, Redmond, and Medford).

[8] After April 2009, NEEA only made updates to projected 2009 regional construction volumes and certified ENERGY STAR homes; we assume these values will be updated to actual volumes early in 2010 using Census and official program data.

The regional weights were determined using the regional distribution of 2008 ENERGY STAR homes in Oregon, as listed in the tracking data.

Table 25 and Table 26 below show the original (region-wide) and adjusted (Oregon specific) ACE model kWh savings for each of the heating types and their weights. In almost all cases the updated Oregon savings values are lower than the region-wide values, with the exception of cooling savings for homes with heat pumps or gas with central air conditioning. Ultimately, the per unit savings value calculated in the ACE model spreadsheet decreases from 1,630 kWh for the region to 1,217 kWh for Oregon. We were not able to calculate a new region-wide savings value because sufficient savings data were not provided for the individual states of Washington, Idaho, and Montana.

Table 25: Region-Wide ACE Model kWh Savings

	Heat Pump	Zonal	Gas w/ AC	Gas no AC	Weighted Average
Weights	**12.5%**	**1.9%**	**27.9%**	**57.6%**	**100%**
Heating	2,734	2,639	0	0	392
Cooling	116	0	116	0	47
Hot water	129	253	0	0	21
Lighting	992	894	992	992	989
Appliances	0	53	0	0	1
Total	**3,970**	**3,839**	**1,108**	**992**	**1,449**

Table 26: Adjusted Oregon ACE Model kWh Savings

	Heat Pump	Zonal	Gas w/ AC	Gas no AC	Weighted Average
Weights	**16.4%**	**0.2%**	**26.2%**	**57.0%**	**100%**
Heating	2,427	1,646	0	0	402
Cooling	163	0	157	0	68
Hot water	101	101	0	0	17
Lighting	579	623	579	579	578
Appliances*	0	53	0	0	0
Total	**3,270**	**2,423**	**736**	**579**	**1,065**

*Appliance savings values were not changed since no adjusted values were provided by the Council

6. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings presented in this MPER, the following conclusions can be drawn about the short-term market progress indicators established for the ENERGY STAR Homes program.

1. ***Market Indicator**: Builders use the ENERGY STAR label to differentiate themselves in the marketplace.*

Evaluation Finding: Eight of the 10 large program builders we interviewed rely on their sales representatives to market their homes. All these builders had sent all of their sales representatives to ENERGY STAR homes training and they are now promoting the benefits of ENERGY STAR homes to potential buyers. All 10 of the interviewed builders believed that the ENERGY STAR label provides a sales advantage in the slow housing market, and four builders reported getting more inquiries about ENERGY STAR homes. Among recent ENERGY STAR homebuyers, 75 percent indicated that the builder or sales representative discussed the energy saving features of the ENERGY STAR home during their home search.

2. ***Market Indicator**: Consumers, builders, and other market actors link ENERGY STAR homes and home quality/value.*

Evaluation Finding: Six of the interviewed program builders emphasize overall home quality in their promotions, while also describing energy/bill savings, air quality and comfort benefits. Among the surveyed homebuyers that purchased an ENERGY STAR home, 78 percent linked the ENERGY STAR certification to lower energy bills (i.e., energy savings), while also mentioning other elements of overall quality (e.g., reduced draftiness, better indoor air).

3. ***Market Indicator**: Builders are convinced of the long-term cost savings from reductions in callbacks that should result from performance testing and quality assurance practices.*

Evaluation Finding: Findings presented in MPER 6 show that builders are increasingly associating proper duct function with increased value to homebuyers, as opposed to benefits to themselves (reduced callbacks). See MPER 6 for more detailed findings.

4. ***Market Indicator**: Increased awareness by builders and subcontractors of key efficiency and quality issues.*

Evaluation Finding: As documented in MPER 6, builder awareness of duct testing increased significantly between 2007 and 2009, from 61 percent to 70 percent. In addition, significantly more builders indicated that they have duct tests performed on at least some of the homes they build (26 percent compared to 18 percent in 2007). Most builders, however, view overall insulation, high efficiency HVAC and construction tightness as the key efficiency elements. See MPER for more details.

5. ***Market Indicator**: Other market actors and trade allies are spending their own resources marketing ENERGY STAR Homes and matching NEEA investments.*

Evaluation Finding: Most of the interviewed program builders were trying to reduce costs and were relying heavily on low cost marketing materials provided by the program (e.g., fliers, brochures, window stickers, welcome mats and plaques). Only two larger builders had increased their marketing efforts through print, TV, radio and billboard advertising.

6. ***Market Indicator**: 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.*

Evaluation Finding: None of the key program builders we interviewed mentioned significant or recurring problems implementing the technical requirements of the program (see MPER 6 for more detailed results about duct testing). Similarly, none of the interviewed QA Specialists identified significant issues that cause homes to fail the QA inspections. In Oregon, extensive trainings have been conducted by program staff and Earth Advantage to educate builders, verifiers and subcontractors on the current state ENERGY STAR specification, and the Thermal Bypass Checklist that is being implemented.

7. ***Market Indicator**: Increasing recognition of the ENERGY STAR label and understanding what it means for new homes.*

Evaluation Finding: Homebuyer awareness of the ENERGY STAR label for homes increased from 32 percent in 2007 to 51 percent in 2009. ENERGY STAR homes are associated with a wide range of features, including: energy/bill savings, increased insulation, ENERGY STAR appliances, efficient windows, efficient HVAC and tight construction. Half of the homebuyers rated the ENERGY STAR label as "extremely valuable."

Following are additional conclusions that can be drawn from the evaluation research:

- **In 2009 the program achieved an 11.5 percent market share, compared to 8 percent in 2008.** A high number of new builders (313) joined the program again in 2009, despite the continued slow new construction market. This suggests that non-program builders (a declining population) are increasingly willing to consider building energy efficient homes to differentiate their product (as program builders say they are doing).

- **The homes certification and QA processes are working well in Idaho under the direction of Energy Inspectors.** Homes certifications are consistently processed in a timely manner, and the certifications process is more transparent and efficient due to using the program database regularly.

- **The transition to the new Oregon ENERGY STAR specification has been smooth.** None of the Oregon builders or program implementers interviewed for this evaluation mentioned significant problems building to the new requirements.

- **The Thermal Bypass Checklist trainings in Oregon have been well received by interviewed verifiers and builders.** That said, there is some concern that builders will have challenges communicating the requirements to subcontractors that did not attend training.

- **Overall, integration of the ENERGY STAR requirements with Earth Advantage is working well.** Now that builders have been trained on the ENERGY STAR requirements the main challenge is getting new builders to submit forms correctly, as ODOE and Energy Trust require significant documentation.

- **The consumer marketing campaign received mostly positive reviews from market actors familiar with it (e.g., utility representatives, program builders, program implementers).** The campaign is attributed with increasing brand recognition and is successfully promoting key attributes of program homes.

- **Forty-six percent of surveyed homebuyers did not know if they owned a green or energy efficient home.** In addition, QA Specialists in Oregon and Montana stated that there have been problems getting ENERGY STAR certified homes properly labeled. It is possible that ENERGY STAR brand awareness among homebuyers could be improved through more thorough or prominent labeling.

- **The Partnership Program is showing mixed results.** Some partners perceive anecdotal sales benefits or product brand enhancement, while others would still like firm evidence of increased sales. Future support may be more forthcoming when the economy improves and if the program addresses desires for more attention to partners, technical changes, and additional marketing to builders.

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

- **Work closely with Northwest states that are implementing new energy codes.** The experience in Oregon shows that ENERGY STAR homes can retain and even gain market share after a code change when program staff are actively engaged in informing the process and end result.

- **Issue frequent communications to all program partners (SCOs, utilities, builders, verifiers, etc.) during the ENERGY STAR specifications update process.** There is high anticipation and anxiety about expected new ENERGY STAR homes specifications, and program partners would appreciate frequent updates (even if little progress has been made) so they feel informed and involved.

- **Be very cognizant of increased builder costs (compared to feasible utility incentives) during the update process.** Builders and homebuyers are becoming increasingly cost-conscious, and partner utilities must be able to prove cost-effective energy savings in order to continue their ENERGY STAR programs.

- **Plan to conduct or assist significant regional training efforts.** As new state energy codes and program specifications are implemented, the program will have to educate a large number of builders, subcontractors, verifiers and realtors on the new requirements.

- **Monitor verification fees, which are consuming a high portion of utility incentives in some markets.** Some utilities report that this is already a main builder objection to the ENERGY STAR program in some areas, and this problem could be exacerbated with increased program requirements/checklists.

- **Emphasize site-oriented promotions if the consumer marketing campaign continues.** While the general media campaigns received positive reviews, builders highly value site-focused marketing/assistance (e.g., model homes promotions, Prius campaign) that bring serious homebuyers to their ENERGY STAR homes.

- **Conduct further research among owners of known ENERGY STAR homes.** This research could confirm the extent to which ENERGY STAR homeowners are aware/unaware of their ENERGY STAR certification, and explore their receptiveness to more prominent labeling.

- **Survey all Program Partners to better understand their expectations and requirements for increasing program contributions.** The ENERGY STAR program has successfully signed up many program partners now, but still struggles to leverage financial and time commitments from them. Findings from this evaluation suggest some partners are willing to contribute more if they can help formulate program marketing approaches, for instance.

APPENDIX A: GLOSSARY

Advanced Lighting Package (ALP). EPA designation that applies to lighting packages, in new home construction, that consist of a minimum of 60 percent ENERGY STAR qualified hard-wired fixtures.

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.

Portland Energy Conservation, Inc. (PECI). PECI is the company that has been hired by Energy Trust of Oregon to deliver its new homes programs. PECI has subcontracts with Earth Advantage and others to operate the program.

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.

Thermal Bypass Checklist. The Thermal Bypass Checklist is a comprehensive list of building details where thermal bypass, or the movement of heat around or through insulation, frequently occurs due to missing air barriers or gaps between the air barrier and insulation. The Thermal Bypass Checklist must be completed by a certified home energy verifier in order for a home to be qualified as ENERGY STAR.

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 Northwest ENERGY STAR Homes 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.[9]

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

[9] 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.

Table 27 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, and also in the current cycle. In-depth interviews with a smaller sample of builders and various market actors, including realtors and building contractors, were conducted for many of the 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 with ENERGY STAR homes and retention of individual measures.

Table 27: Evaluation Report Components

Analysis Component	MPER 1 Baseline Report	MPER 2 (3Q 2005)	MPER 3 (3Q2006)	MPER 4 (2Q 2007)	MPER 5 (2Q 2008)	MPER 6 (2Q 2009)	MPER 7 (1Q 2010)
Market Characterization	λ	λ	λ	λ	λ	λ	λ
Market Actor Interviews	λ	λ	λ	λ	λ	λ	λ
Utility Interviews	λ			λ	λ	λ	λ
Builder Phone Survey	λ			λ		λ	
Builder In-Depth Interviews	λ	λ	λ	λ	λ		λ
Homebuyer Phone Survey	λ			λ			λ
Process Evaluation		λ	λ	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		λ

APPENDIX C: NORTHWEST ENERGY STAR HOMES SPECIFICATIONS

The Northwest ENERGY STAR Homes package is designed to include efficiency measures that will result in a level of performance that is 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 Northwest ENERGY STAR 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 28 provides a summary of Builder Options Package (BOP) #1 for single-family, site-built homes in Oregon with gas furnaces or electric heat pumps. The BOP allows builders to choose among four paths to achieve energy savings. These paths are:

- Upgrading the building envelope
- Installing an on demand water heater
- Upgrading the walls
- Locating ducts and HVAC equipment inside the conditioned space

Table 29 provides a summary of BOP #2 for Oregon homes with zonal electric heating.

Two Technical Compliance Options (TCOs) are allowed in Oregon:

- TCO #14 OR allows the use of efficient lighting to achieve an overall rating of 0.8 Watts per square foot, in place of the 75 percent CFL lamps/fixtures requirement.
- TCO #001 OR allows the use of hot water distribution systems based on radiant floors, fan coils or radiators.

In addition, beginning in September 2009, the Thermal Bypass Inspection Checklist must be completed for homes to earn the ENERGY STAR label. The Checklist requires visual inspection of framing areas where air barriers are commonly missed and inspection of insulation to ensure proper alignment with air barriers, thus serving as an extra check that the air and thermal barriers are continuous and complete.

Table 30 provides a summary of the two prescriptive BOPs for single-family homes in Washington, Idaho and Montana.

Table 28. Northwest ENERGY STAR Homes BOP 1 Specifications – Oregon

Component	Code	BOP 1 Path Options (Natural Gas or Electric Heat Pump)			
		Envelope Upgrade	**Tankless Water Heater**	**Wall Upgrade**	**HVAC/Ducts Inside**
Ceiling Insulation	R-38	**R-49**	R-38	**R-49**	R-38
Wall Insulation	R-21	R-21	R-21	**R-21 + R-3 sheath**	R-21
Floor Insulation	R-30	**R-38**	R-30	R-30	R-30
Unheated Slab Below Grade	R-15 Perimeter	**R-10 Full Slab**	R-15 Perimeter	**R-10 Full Slab or R-15 Perimeter with R-21 Wall + R-5 Sheathing**	R-15 Perimeter
Windows	U-0.35	**U-0.32 Max**	U-0.35 Max	**U-0.32 Max**	U-0.35 Max
Heating System	8.5 HSPF 0.90 AFUE	8.5 HSPF 0.90 AFUE	8.5 HSPF 0.90 AFUE	8.5 HSPF 0.90 AFUE	8.5 HSPF 0.90 AFUE
Ventilation System	Operable Windows	**Mechanical**	**Mechanical**	**Mechanical**	**Mechanical**
Air Conditioning	SEER 13	SEER 13	SEER 13	SEER 13	SEER 13
Duct Insulation	R-8	R-8	R-8	R-8	Exempt
Duct Sealing	Mastic or Inside Envelope	Mastic	Mastic	Mastic	**Ducts/HVAC in conditioned space, Mastic**
Duct Tightness	< 0.06 CFM/ft^2 Floor or 75 CFM Total @ 50 Pa	< 0.06 CFM/ft^2 Floor or 75 CFM Total @ 50 Pa	< 0.06 CFM/ft^2 Floor or 75 CFM Total @ 50 Pa	< 0.06 CFM/ft^2 Floor or 75 CFM Total @ 50 Pa	No testing required
Envelope Tightness	No requirement	**7.0 ACH @ 50 Pa**	**7.0 ACH @ 50 Pa**	**7.0 ACH @ 50 Pa**	**7.0 ACH @ 50 Pa**
Water Heating	Electric 0.87 EF (> 70 gal.) Gas 0.55 EF (> 60 gal.)	**Electric 0.92 EF (> 70 gal.)** **Gas 0.62 EF (> 60 gal.)**	**On Demand EF 0.82**	**Electric 0.92 EF (> 70 gal.)** **Gas 0.62 EF (> 60 gal.)**	**Electric 0.92 EF (> 70 gal.)** **Gas 0.62 EF (> 60 gal.)**
Dishwasher	No Requirement	**ENERGY STAR**	**ENERGY STAR**	**ENERGY STAR**	**ENERGY STAR**
Lighting	50% ENERGY STAR lamps or fixtures	**75%**	**75%**	**75%**	**75%**

Table 29. Northwest ENERGY STAR Homes BOP 2 Specifications - Oregon

Component	Code	BOP 2 Requirements (Zonal Electric Heating)
Ceiling Insulation	R-38	**R-49**
Wall Insulation	R-21	**R-21 + R-4 Sheath**
Floor Insulation	R-30	R-30
Unheated Slab Below Grade	R-15 Perimeter	**R-15, 4 foot depth**
Windows	U-0.35	**U-0.32 Max**
Zonal Electric Heating	No Requirement	No Requirement
Combustion Appliance Zone (CAZ)	No Requirement	**CAZ Pressure Test Required**
Ventilation System	Operable Windows	**Central Ventilation with 70% Heat Recovery**
Duct Insulation	R-8	R-8
Duct Sealing	No Requirement for Non-heating	**Mastic**
Duct Tightness	No Requirement for Non-heating	**< 0.06 CFM/ft^2 Floor** **or** **75 CFM Total @ 50 Pa**
Envelope Tightness	No requirement	**2.5 ACH @ 50 Pa**
Water Heating	Electric 0.87 EF (> 70 gal.) Gas 0.55 EF (> 60 gal.)	**Electric 0.92 EF (> 70 gal.)** **Gas 0.61 EF (> 60 gal.)**
Dishwasher	No Requirement	**ENERGY STAR**
Lighting	50% ENERGY STAR lamps or fixtures	**75%**

Table 30. Northwest ENERGY STAR Homes Technical Specifications – Washington, Idaho, and Montana

Component	BOP 1 (Heat Pump/Gas Furnace)	BOP 2 (Zonal Electric/Propane)
Ceiling Insulation	R-38	R-38
Wall Insulation	R-21	R-21 + 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 0.92 EF (> 70 gal.) Gas 0.60 EF (> 60 gal.)	Electric 0.93 EF (all sizes) 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 (TCOs) 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 Package[10] in place of the current BOP standard.

[10] 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: SURVEY INSTRUMENTS / INTERVIEW GUIDES

Homebuyers Phone Survey

June 2009

Hello, my name is _____ with Itron, an energy market research firm, and I'm calling on behalf of the Northwest Energy Efficiency Alliance, a regional non-profit corporation that works to make energy-efficient products and services available in the marketplace. We're conducting a study among households about their home buying decision. I want to assure you that this is not a sales call and that the information that you provide will be kept strictly confidential. This will only take about 10 minutes of your time.

(DO NOT READ) If asked about the Northwest Energy Efficiency Alliance, say:

The 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.

[WHEN CORRECT PERSON IS ON-LINE:]
Hello, my name is _____ with Itron, an energy market research firm based in Berkeley, California. I'm calling on behalf of the Northwest Energy Efficiency Alliance. We're conducting a study among households about their home buying decision. I want to assure you that this is not a sales call and that the information that you provide will be kept strictly confidential. This will only take about 10 minutes of your time.

SCREEN1: Can I confirm that you were responsible for choosing the house you purchased?

1)	Yes	[CONTINUE]
2)	No	[ASK TO SPEAK WITH CORRECT PERSON, CALL BACK]
88)	Refused	[TERMINATE]
99)	Don't know	[ASK TO SPEAK WITH CORRECT PERSON, OR TERMINATE]

SCREEN2: Can I confirm that the house you purchased is a newly constructed home? That is, was your house built shortly before you moved in and are you the first occupant?

1)	Yes	[CONTINUE]
2)	No	[TERMINATE]
88)	Refused	[TERMINATE]
99)	Don't know	[TERMINATE]

SCREEN3: Also, can I confirm that the house is currently occupied by the owner as a single-family household?

1)	Yes	[CONTINUE]
2)	No	[TERMINATE]
88)	Refused	[TERMINATE]
99)	Don't know	[TERMINATE]

SCREEN4: And is the home a single family detached home?

1) Yes [CONTINUE]
2) No [TERMINATE]
88) Refused [TERMINATE]
99) Don't know [TERMINATE]

Terminate: Unfortunately you do not meet the criteria for our research and we do not need to complete this survey. Thank you for your time and consideration. Good bye.

I. Home Purchase Info

Q 1. What year was your home built?

1) 2009
2) 2008
3) 2007
4) 2006
5) 2005
6) 2004 or before
88) Refused

99) Don't know

Q 2. In what month and year did you purchase your new house?

1) January
2) February
3) March
4) April
5) May
6) June
7) July
8) August
9) September
10) October
11) November
12) December
88) Refused
99) Don't know

Q 3. And in which year?

1) 2009
2) 2008
3) 2007
4) 2006
5) 2005
6) 2004 or before
88) Refused
99) Don't know

IF HOME WAS PURCHASED BEFORE JUNE 2007 (OR IN 2007 AND MONTH UNKNOWN) THEN TERMINATE SURVEY:

Thank you for your time and consideration. Unfortunately for the purposes of this research we are only interviewing homebuyers who purchased a new home since June of 2007. Since you purchased your home before this date we do not need to complete the remainder of this survey.

Q 4. Now we would like to know a little about the characteristics of the house you purchased? How many bedrooms does it have?

1) 1
2) 2
3) 3
4) 4
5) 5
6) 6
7) 7
8) 8
9) 9
10) 10
88) Refused
99) Don't know

Q 5. How many bathrooms does it have? (Use decimals for partial bathrooms)

FORMAT is N.N (2 and 1\2 baths = 2.5)

1) Enter Number: _____
88) Refused
99) Don't know

Q 6. What is the approximate square footage of the house?

1) Enter Number: _____
88888) Refused
99999) Don't know

IF THEY SAY "DON'T KNOW": Maybe you have a general idea of your home's size. Please stop me when I read the range that most likely includes the square footage of your house.

(Programmer note: Post-code raw response above into ranges below also – new field.)

1) Less than 1,700 square feet
2) Between 1,700 and 2,099 square feet
3) Between 2,100 and 2,799 square feet
4) Between 2,800 and 3,499 square feet
5) 3,500 or more square feet

Q 7. What is your primary type of home heating fuel?

1) Gas furnace
2) Electric (baseboard)
3) Electric (central "forced air")

4) Heat pump
5) Propane
6) Oil
7) Wood
77) Other (Specify)
88) Refused (SKIP TO Q 9)
99) Don't know (SKIP TO Q 9)

Q 8. And what other heating fuels do you use? (ACCEPT MULTIPLE RESPONSES)

1) Gas furnace
2) Electric (baseboard)
3) Electric (central "forced air")
4) Heat pump
5) Propane
6) Oil
7) Wood
77) Other (Specify)
88) Refused
99) Don't know

Q 9. Does your house have air conditioning? (Probe for central AC or window units)

1) Yes, central
2) Yes, window units
3) Yes, both
4) None
88) Refused
99) Don't know

Q 10. Did you have input on the final design of your home?

1) Yes
2) No
88) Refused
99) Don't know

Q 11. (Ask if Q 10 = YES) What specific features did you have input on? (DO NOT READ, MULTIPLE RESPONSES ACCEPTED)

1) Floor plan/layout
2) Heating and/or AC equipment
3) Lighting fixtures
4) Bathrooms – number
5) Bathrooms – location
6) Bathrooms – plumbing fixtures
7) Kitchen finishes
8) Floor materials
77) Other (Specify)
88) Refused
99) Don't know

Q 12. What was the most important attribute that you were looking for in a home – not the location or schools, but specifically what did you want in the home itself? (DO NOT READ)

DO NOT ACCEPT: amount of noise/street traffic, schools, commuting distance/proximity to work, local taxes, crime or desirable neighborhood. PROMPT THEM FOR A SPECIFIC HOME FEATURE.

1) # of bedrooms
2) Size of kitchen
3) Size of yard
4) Price
5) Interior finishes (countertops, cabinets, built-ins, etc.)
6) Energy efficiency
7) Green/environmental features
8) Home office
9) Layout/design/floor plan
10) Builder reputation
11) Overall home size
12) Home entertainment/media room
13) Pool/hot tub
14) House style/appearance
15) Porches
16) Landscaping
77) Other (Specify)
88) Refused (Skip to **Q 15**)
99) Don't know (Skip to **Q 15**)

Q 13. Was there another important attribute that you were looking for in the home itself? (DO NOT READ)

1) # of bedrooms
2) Size of kitchen
3) Size of yard
4) Price
5) Interior finishes (countertops, cabinets, built-ins, etc.)
6) Energy efficiency
7) Green/environmental features
8) Home office
9) Layout/design/floor plan
10) Builder reputation
11) Overall home size
12) Home entertainment/media room
13) Pool/hot tub
14) House style/appearance
15) Porches
16) Landscaping
77) Other (Specify)
88) Refused (Skip to **Q 15**)
99) Don't know (Skip to **Q 15**)

Q 14. Was there another important attribute, even if it wasn't at the top of your list? (DO NOT READ)

1) # of bedrooms
2) Size of kitchen
3) Size of yard
4) Price
5) Interior finishes (countertops, cabinets, built-ins, etc.)
6) Energy efficiency
7) Green/environmental features
8) Home office
9) Layout/design/floor plan
10) Builder reputation
11) Overall home size
12) Home entertainment/media room
13) Pool/hot tub
14) House style/appearance
15) Porches
16) Landscaping
77) Other (Specify)
88) Refused
99) Don't know

Q 15. Using a 1 to 10 scale, where 1 is not at all important and 10 is extremely important, please tell me how important energy efficiency was to you in your selection of a new home?

[RECORD EE SCORE]

88) Refused
99) Don't know

Q 16. (Ask If EE SCORE = 7 or higher) What energy efficient home features are most important to you? (DO NOT READ, RECORD ALL MENTIONED)

1) High efficiency air conditioner/HVAC
2) Construction tightness, air seal, building envelope
3) High efficiency appliances
4) Clock/programmable thermostat
5) Tight/insulated ducts
6) Fans (attic, whole house)
7) High efficiency furnace
8) Using more gas or electric
9) Heat pump
10) Insulation (Roof)
11) Insulation (Walls)
12) Insulation (Overall)
13) High efficiency windows
14) High efficiency/ENERGY STAR lighting
15) High efficiency water heater
77) Other (Specify)
88) Refused
99) Don't know

Q 17. Which of the following resources did you use to find your new home? [READ LIST, AND PROBE FOR ANY OTHERS]

1) Real estate agent
2) Real estate company
3) Real estate tabloid (free)
4) Real estate section in newspaper
5) Classified advertising
6) Internet search engine
7) Internet web sites
8) Friends/family
9) Builder/developer brochures/advertising
77) Other (Specify)
88) Refused
99) Don't know

Q 18. (Ask if If Q 17 = Real Estate Company) Which real estate companies did you use?

1) Company_____
88) Refused
99) Don't know

Q 19. (Ask if Q 17 = Internet Web Sites) Which Internet Web Sites did you use?

1) Web site_____
88) Refused
99) Don't know

II. Energy Star Awareness

Q 20. Have you ever seen or heard of the ENERGY STAR label?

1. Yes
2. No
88) Refused
99) Don't know

Q 21. (Ask if Q 20 NOT = YES) The ENERGY STAR label is used to signify energy efficiency for appliances, lighting, and consumer products. The label has the word "energy" and a star symbol. Now that I've described ENERGY STAR label to you, do you recall seeing or hearing anything about it before this survey?

1. Yes
2. No
88) Refused
99) Don't know

[Continue if Q 20 or Q 21 = YES, ELSE SKIP TO *SECTION III*]

Q 22. On what types of products have you seen the ENERGY STAR label? (MULTIPLE RESPONSE, DO NOT READ) How about any other products? (….. until they say That's all, None, No More, etc.)

1) Clothes washer
2) Dehumidifiers
3) Dishwashers
4) Refrigerators
5) Room Air Conditioner
6) Central AC
7) Ceiling Fan
8) Programmable Thermostat
9) Furnace
10) DVD
11) VCR
12) Television
13) Cordless Phones
14) CFL Bulbs
15) Computers
16) Copiers
17) Printers
18) Scanners
19) Windows/Doors/Skylights
20) Water cooler
77) Other (Specify)
88) Refused
99) Don't know

Q 23. (Ask if Q 22 not = Television) Have you ever seen or heard of televisions with the ENERGY STAR label?

1) Yes
2) No
88) Refused
99) Don't know

Q 24. (Ask if Q 22 = Television or Q 23 = YES) Which of the following best describes how you believe ENERGY STAR televisions compare with standard televisions? Would you say that… (READ UNTIL RESPONSE GIVEN)

1) ENERGY STAR televisions use substantially less energy than standard TVs
2) ENERGY STAR televisions use somewhat less energy than standard TVs
3) ENERGY STAR televisions use about the same energy as standard TVs
4) ENERGY STAR televisions use somewhat more energy than standard TVs
5) ENERGY STAR televisions use substantially more energy than standard TVs
88) Refused
99) Don't know (Ask for their best guess from above)

Q 25. Have you ever seen or heard of the ENERGY STAR label for homes?

1) Yes
2) No (Skip to *Section III*)
88) Refused (Skip to *Section III*)
99) Don't know (Skip to *Section III*)

Q 26. How did you find out about ENERGY STAR homes? (MULTIPLE RESPONSE, DO NOT READ)

1) Friends/Family/Word of mouth
2) Realtor
3) Lender
4) Builder
5) Internet web site (probe for name or organization)
6) Appraiser
7) Utility literature
8) Radio
9) Newspaper
10) Magazine
11) Television
12) Homes/home products convention
13) Street/Parade of Homes event
14) Billboard
77) Other (Specify)
88) Refused
99) Don't know

Q 27. In the last 12 months, have you seen or heard any advertising of ENERGY STAR homes?

1) Yes
2) No
88) Refused
99) Don't know

Q 28. (Ask if Q 27 = YES) Where did you see or hear about ENERGY STAR homes? (CHECK ALL THAT APPLY)

NOTE: IF THEY GIVE SPECIFIC INFO – e.g., Sunset Magazine – RECORD THAT AND ALSO GENERAL MEDIA BELOW. DO NOT PROBE FOR SPECIFIC MAGAZINE NAMES, STATION NUMBERS, HOWEVER.

1) Radio advertising
2) Newspaper advertising
3) Magazine advertising
4) Television advertising
5) Billboard advertising
77) Another form of advertising (specify)
78) Media details field (may be multiple)
88) Refused
99) Don't know

Q 29. How would you rate the value of having an ENERGY STAR-certified home on a scale of 1-5, where 1 is not at all valuable and 5 is extremely valuable?

1) 1 NOT AT ALL VALUABLE,
2) 2
3) 3
4) 4
5) 5 EXTREMELY VALUABLE
88) Refused

99) Don't know

Q 30. To the best of your knowledge, what does it mean if a home is ENERGY STAR – certified? (Multiple Response, DO NOT READ) Does it mean anything else? (…. until they say That's all, Nothing more, etc.)

1) Increased Insulation
2) Tight construction
3) High efficiency windows
4) Energy star appliances
5) Tight ducts
6) High efficiency furnace
7) High efficiency air conditioner/cooling
8) Lighting (CFLs or dedicated fixtures)
9) Construction materials are recyclable or less damaging
10) Energy efficient/saves energy
11) Good for the environment
12) Lower energy bills/saves money
13) House inspected by state energy office
14) Higher quality overall/built better
15) More comfortable home
77) Other (Specify)
88) Refused
99) Don't know

III. ENERGY STAR and Other Green Home Experience

As you may know, some newly constructed homes are certified by building organizations as being more energy efficient than standard homes, or as using recycled materials, saving water, or having better air quality, for instance. These homes are often called "green" or "environmentally friendly" homes.

Q 31. Please tell me the names of any green or environmentally friendly home certifications you are aware of. (PROBE: "Are you aware of any others?" UNTIL NO MORE)

88) Don't know/Not aware of any
99) Refused

Q 32. Have you ever heard of _____? (READ LIST, ONLY THOSE NOT ALREADY MENTIONED, ACCEPT MULTIPLE RESPONSES)

1) Earth Advantage homes
2) Built Green homes
3) LEED homes – which stands for Leadership in Energy and Environmental Design
4) The National Association of Home builders Green Building Program

IF NOT AWARE OF ENERGY STAR HOMES (Q 25) AND ALL PROGRAMS ABOVE, SKIP TO *SECTION V*

Q 33. What home certifications, if any, does your home have? (DO NOT READ, ACCEPT MULTIPLES)

1) None
2) ENERGY STAR (SKIP TO **Q 36**)
3) Earth Advantage
4) Built Green
5) LEED
6) Green home certified by the National Association of Homebuilders
7) Environments for Living
8) Other (Specify)
88) Refused
99) Don't know

PROGRAMMING NOTE: RECORD RESPONSES 2-8 IN [PROGRAM] VARIABLE, FOR USE IN SUBSEQUENT QUESTIONS. COMBINE PROGRAM NAMES IF NEEDED (E.G. "Energy Star and Earth Advantage") IF Q 33 = 8 MAKE [PROGRAM] = "green or energy efficient".

If Not Aware of ENERGY STAR Homes (Q 25), SKIP TO *SECTION IV*

Q 34. Did you consider an ENERGY STAR home when shopping for your new home?

1) Yes
2) No
88) Refused
99) Don't know

Q 35. Why didn't you purchase an ENERGY STAR home? (DO NOT READ)

1) Cost
2) Didn't believe claims on energy savings/benefits
3) Inconvenient/undesirable features in ES home
4) Hassle of certification
5) Wasn't offered for the house we wanted
6) Wanted more green features than just energy efficiency
77) Other (Specify)
88) Refused
99) Don't know

Q 36. What do you consider to be the benefits of having an ENERGY STAR-certified home? (DO NOT READ, MULTIPLE RESPONSES ACCEPTED) Are there any other benefits? (… until they say That's all, Nothing more, etc.)

1) Reduced draftiness/improved comfort
2) Better indoor air quality
3) Lower energy bills
4) More energy efficient heating equipment (boiler, furnaces, heat pumps)
5) More energy efficient cooling equipment (central AC)
6) "Green" or environmentally friendly
7) House inspected by state energy office
8) Efficient lighting
9) More insulation
10) Higher resale value
11) More efficient building materials
12) Higher quality/built better
13) Third-party verified/certified
77) Other (Specify)
88) Refused
99) Don't know

Q 37. Please tell me how much you agree or disagree with each of the following statements. Would you say that you strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, or strongly disagree that: [RANDOMIZE].

A. ENERGY STAR homes are hard to find
B. ENERGY STAR homes are more comfortable than standard new homes
C. Most new homes are highly energy-efficient even if they are not ENERGY STAR certified
D. ENERGY STAR homes provide additional quality
E. ENERGY STAR homes are worth more
F. It's hard to understand the benefits of ENERGY STAR homes
G. ENERGY STAR homes have lower energy bills

IV. ENERGY STAR/Green Homebuyers Only

CONTINUE IF THEY OWN A GREEN/EE HOME (Q 33), ELSE:

> **IF NOT AWARE OF ENERGY STAR PRODUCTS (Q 20 AND Q 21), SKIP TO Q 45, ELSE:**
>
> **SKIP TO *SECTION V***

Q 38. What did you consider to be the most important benefit of purchasing a [PROGRAM] home? (DO NOT READ)

1. Lower energy bills
2. More comfort
3. Higher quality
4. Environmentally friendly

5. Lower water bills
6. Efficient use of materials/sustainability
7. Better indoor air quality
77) Other (Specify)
88) Refused
99) Don't know

Q 39. Did the sales agent or builder promote the fact that your home was a [PROGRAM] home?

1) Yes
2) No
88) Refused
99) Don't know

Q 40. (Ask if Q 39 = 1) What home features did the sales agent or builder promote? (DO NOT READ LIST, MULTIPLE RESPONSES)

1) Overall energy efficiency/savings
2) Air quality
3) Overall quality
4) Cooling system
5) Heating system
6) Duct tightness
7) Tight construction/less draftiness
8) Recycled building materials
9) Efficient appliances
10) Insulation
11) Efficient lighting
12) Water savings
77) Other (Specify)
88) Refused
99) Don't know

Q 41. Did the sales agent or builder mention anything about the heating and cooling ducts in the home being tested for tightness to ensure they don't leak?

1) Yes
2) No
88) Refused
99) Don't know

Q 42. (Ask if Q 41 = 1) On a scale of 1 to 5, where 1 is not at all important and 5 is extremely important, how would you rate the importance of having these tests done?

1) 1 NOT AT ALL IMPORTANT
2)
3)
4)
5) 5 EXTREMELY IMPORTANT
88) Refused
99) Don't know

V. Home Features

Q 43. Please tell me which of the following items in your home are ENERGY STAR. (READ LIST, RECORD – YES, NO, DON'T KNOW)

1) Clothes Washer
2) Refrigerator
3) Air Conditioner
4) Dishwasher
5) Lighting Fixture(s)
6) Compact Fluorescent light bulbs (CFLs)
7) Furnace
8) Windows
9) Television
88) Refused

Q 44. For each of the items I just mentioned, did you consider buying ENERGY STAR but chose not to? Did you consider an ENERGY STAR _____? (ONLY READ THOSE WHERE Q 43 = NO, RECORD - YES, NO, COULD NOT CHOOSE/CAME WITH HOUSE, DON'T KNOW)

1) Clothes Washer
2) Refrigerator
3) Air Conditioner
4) Dishwasher
5) Lighting Fixture(s)
6) Compact Fluorescent light bulbs (CFLs)
7) Furnace
8) Windows
9) Television
88) Refused

Q 45. (Ask if Q 43 not = 6) Do you have CFLs installed in your house?

1) Yes
2) No (Skip to **Q 52**)
88) Refused (Skip to **Q 52**)
99) Don't know (Skip to **Q 52**)

Q 46. Please tell me which rooms in your home have CFLs in them: (READ LIST, RECORD – YES, NO, DON"T KNOW)

1) Kitchen
2) Dining Room
3) Living Room
4) Family Room
5) Master Bedroom
6) Other Bedrooms
7) Bathrooms
8) Closets
9) Hall
10) Utility Room
11) Garage

12) Outdoor Lighting
13) No CFLs/Did not install (Skip to **Q 52**)
77) Other (Specify)
88) Refused

Q 47. (For each room above where Q 46 = YES, ask:) How many CFLS are installed in the … (RECORD ODD NUMBER IF THEY GIVE A RANGE)

1) Kitchen (RECORD KITCH#)
2) Dining Room (RECORD DR#)
3) Living Room (RECORD LR#)
4) Family Room (RECORD FR#)
5) Master Bedroom (RECORD MBR#)
6) Other Bedrooms (RECORD OBR#)
7) Bathrooms (RECORD BATH#)
8) Closets (RECORD CLOS#)
9) Hall (RECORD HALL#)
10) Utility Room (RECORD UTIL#)
11) Garage (RECORD GAR#)
12) Outdoor Lighting (RECORD OUT#)
77) Other (Specify) (RECORD OTH#)
88) Refused

Q 48. (If Any CFLs Installed) Have you ever replaced any of the CFLs?

1) Yes
2) No (**SKIP to Q 52)**
88) Refused (**SKIP to Q 52)**
99) Don't know (**SKIP to Q 52)**

Q 49. How many CFLs did you replace?

1) Number_____
88) Refused
99) Don't know

Q 50. Why did you replace the CFL(s)? (DO NOT READ, ACCEPT MULTIPLE ANSWERS)

1) Burnt out
2) Too dim
3) Took to long to start up
4) Poor light color/quality
5) Bulbs are unattractive/don't look right
77) Other (Specify)
88) Refused
99) Don't know

Q 51. Did you replace the CFLs with other CFLs or with standard incandescent bulbs?

1) Replaced with CFL
2) Replaced with incandescent
3) Both CFLs and incandescents
4) Haven't replaced yet
88) Refused

99) Don’t know

Q 52. (Ask for each Q 44 = YES) Earlier you said you considered purchasing an ENERGY STAR _____ but decided against it. Why didn't you buy an ENERGY STAR _____?

1) Clothes Washer
2) Refrigerator
3) Air Conditioner
4) Dishwasher
5) Lighting Fixture(s)
6) Compact Fluorescent light bulbs (CFLs)
7) Furnace
8) Windows
9) Television
88) Refused

Answer choices (ACCEPT MULTIPLE):

1) Cost/too expensive
2) Decided to use existing model longer
3) Didn’t believe energy savings claims
4) Undesirable/inconvenient features
5) Poor light color/quality
6) Bulbs are unattractive/don’t look right
7) Does not get clothes clean
8) Does not clean dishes well
9) General performance problems
77) Other (Specify)
88) Refused
99) Don’t know

Q 53. How would you rate the value of having an energy-efficient home on a scale of 1-5, where 1 is not at all valuable and 5 is extremely valuable?

1) 1 NOT AT ALL VALUABLE
2) 2
3) 3
4) 4
5) 5 EXTREMELY VALUABLE
88) Refused
99) Don’t know

Q 54. Please tell me how much you agree or disagree with each of the following statements. Would you say that you strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, or strongly disagree that: [RANDOMIZE].

A. Energy efficient homes are more comfortable than standard new homes
B. Most new homes are highly energy-efficient
C. Energy efficient homes have lower energy bills
D. Most newly built homes could be much more energy efficient
E. New homes often allow heated or air-conditioned air from inside to escape to the outside
F. New homes often have leaky air ducts
G. Energy efficient homes have a greater resale value

CONTINUE IF THEY DO NOT OWN AN ENERGY STAR HOME (Q 33), ELSE SKIP TO "DEMOGRAPHICS"

READ: The ENERGY STAR Label is awarded to homes that have been certified to be 15 percent more energy efficient than required by state law. As a result, ENERGY STAR CERTIFIED homes are more comfortable because they are less drafty and have better indoor air quality. These homes also require lower maintenance due to the tight construction, and independent testing required to earn the ENERGY STAR LABEL. Buyers of ENERGY STAR homes also enjoy lower energy bills because the homes are constructed with high efficiency heating and cooling systems, appliances, and windows.

Considering the home you just purchased, please tell me how much more, if anything, you would have been willing to pay if your home had been an ENERGY STAR home, and included all the features and benefits I just described.

Q 55. PROMPT IF RESPONDENT ASKS HOW MUCH THEY'LL SAVE IF THEY HAD AN ENERGY STAR HOME - "It is expected you will save 15 percent off of your energy bill."

[Interviewer, select one option below for each interviewee]

1. They DID NOT ask,
2. They ASKED for percentage

Q 56. Enter dollar amount that they would pay:

1) $_____
88) Refused
99) Don't know

VI. Demographics

The following questions are for classification purposes only. All your answers will be kept confidential.

Q 57. Including yourself, how many people live in your home? Please include children.

1) 1
2) 2
3) 3
4) 4
5) 5
6) 6
7) 7
8) 8
9) 9
10) 10
11) 11
12) 12
13) 13
14) 14
15) 15
16) More than 15

88) Refused
99) Don't know

Q 58. Please tell me which of the following categories best describes your age.

a. Less than 25
b. Between 25 and 34
c. Between 35 and 44
d. Between 45 and 54
e. Between 55 and 64
f. 65 and older
88) Refused
99) Don't know

Q 59. Which of the following describes your educational background?

1) Less than high school,
2) High school or GED
3) Some college
4) Technical College (2 year degree)
5) 4 Year college
6) Graduate degree
88) Refused
99) Don't know

Q 60. Please stop me when I read the price range that includes the price you paid for your new home.

1) Less than 150K
2) 150 – 199K
3) 200 – 249K
4) 250 – 299K
5) 300 – 399K
6) 400 – 499K
7) 500K and over
88) Refused
99) Don't know

[Ask if they own an ENERGY STAR home (Q 33**), else skip to Q 63]**

Q 61. Did your house cost more because it was ENERGY STAR-certified?

1) Yes
2) No
88) Refused
99) Don't know

Q 62. (Ask if Q 61 = 1) **How much more did you pay for your house because it was ENERGY STAR-certified?**

1) $_____
88) Refused
99) Don't know

Q 63. Which of the following best represents your annual household income (IF NEEDED: from all sources in 2008, before taxes)?

1) < 40K
2) Between 40K and 60K
3) Between 61K and 80K
4) Between 81K and 120K
5) Over 120K
88) Refused

99) Don't know

Q 64. For verification purposes only, may I have your name.

1) Name: _____
88) Refused
99) Don't know

Q 65. [Interviewer: Record Gender.]

1) Male
2) Female
99) Don't know

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

ENERGY STAR Large Builder Interview Guide

September 2009

Objectives:

- Learn how Oregon builders are adapting to state code and program spec changes
- Understand how builders are marketing ES Homes, and perception of consumer marketing campaign
- Understand how ES Homes relate/compare to other green homes
- Identify current and future challenges to building ES Homes in the NW

Target Audience: 10 large program builders

Hello, my name is _____ calling on behalf of ECONorthwest, an energy research firm based in Portland. The Northwest Energy Efficiency Alliance (NEEA) has asked us to help them better understand how well the current Northwest ENERGY STAR Homes Program is operating and how it could potentially be improved. As part of this study we are speaking with key program builders like you. This interview should take 30 minutes or less and your feedback will be reported to NEEA in a confidential, "summary" format that combines responses from all interviewees.

[RECORD:]

Name: _____
Company: _____
Phone: _____

Introduction and Business Scope

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

1) Approximately how many total homes did you build or start in 2009? And how many of these were ENERGY STAR homes?

2) Approximately how many total homes do you expect to build in 2010?

3) Of your homes built in 2010, 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 next year? (Probe to see if building other types of green homes)

   b) What would have to change for you to build ENERGY STAR homes next year?

Program Requirements

Now I'd like to ask you about the program requirements.

4) There are different options (or BOPs) for builders to qualify their homes for the program. Do you use one particular option for all or most of your program homes? Why?

5) Do you have any recommended changes to the BOPs you can build to?

6) (OREGON ONLY) How many ENERGY STAR homes have you built or started under the new specification that took effect in July 2008?

   IF > 0:

   a) How did this go?
   b) Who helps you address any problems related to the new specification? How has this gone?

7) (OREGON ONLY) Have Oregon's energy code changes made the ENERGY STAR program more or less attractive to you? (Probe to see if homebuyers think the standard codes are high enough)

8) (OREGON ONLY) Are you aware of the new framing, air sealing and insulation requirements – also known as the thermal bypass checklist – that builders must meet to

qualify as a NW ENERGY STAR home? If YES: What are your impressions of the requirements?

9) How satisfied are you with the program's technical support? Has it changed since you joined the program?

10) Do you get most of your technical information from a homes verifier (BPS/rater in Idaho), 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) Does your utility support the program? What kind of support do they provide? How important is that support for your participating in the program?

13) What has been the biggest challenge for you in participating in the ENERGY STAR Homes program?

14) What additional types of assistance would you like to see provided to builders by the ES Homes program?

15) Are you aware of other energy efficiency related programs for homes? Do you also build homes to their requirements?

16) (If AWARE of other programs) How do you think homebuyers perceive the ENERGY STAR Homes brand compared to other green homebuilding programs? What are the implications for the ENERGY STAR homes program?

Marketing

Now I'd like to ask you about the marketing of ENERGY STAR homes.

17) Do you sell your homes through your own sales reps or through real estate agents?

If Sales Reps Used:

a) Have any of your reps received ENERGY STAR Homes training in the last year? Did they give you any feedback about the quality of the training? What was their feedback?

b) Are they effectively selling the advantages of your ENERGY STAR homes?

If Realtors Used:

c) Do you think realtors understand the advantages of ENERGY STAR homes?

d) Do you think realtors are adequately promoting the advantages of ENERGY STAR homes?

18) Which methods do you use to promote your ENERGY STAR homes?

a) If website not mentioned: Do you have a website for homebuyers?

19) Which ENERGY STAR benefits do you promote when marketing these homes?

20) What are your impressions of program's mass media marketing campaign, which began in 2008? (Probe to see if they have noticed more marketing, what is quality level?)

21) Have you received more inquiries about ENERGY STAR homes in the past year?

22) What do you think the ENERGY STAR homes program should do to effectively market the benefits of an ENERGY STAR home?

23) Does the ENERGY STAR label provide a sales advantage or disadvantage in the slow housing market such as we are experiencing now?

24) What do you think are the biggest marketing challenges for ENERGY STAR homes?

Overall Program

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

25) What do you consider to be the biggest advantages to you from being an ENERGY STAR builder?

26) And what are the biggest disadvantages, if any?

27) What types of program support do you find the most valuable? The least valuable?

28) What do you think are the biggest challenges for ENERGY STAR Homes going forward? Do you have any suggestions for overcoming these challenges?

29) What is the most critical support the program could provide to program builders and subcontractors in the near future? (Probe to see if technical/field support, consumer marketing, subcontractor training, other preferred) Why do you say that?

30) 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 Partners Interview Guide

September 2009

Objectives:

- Understand how well the Partners initiative is serving current participants
- Learn how ENERGY STAR Homes can partner more effectively in the future
- Solicit suggestions for Partner initiative improvement

Target Audience: 6-8 participating program Partners, large and small contributors

(If Contact not reached directly) Could I speak to _____?

Hello, my name is _____ calling on behalf of ECONorthwest, an energy research firm based in Portland. The Northwest Energy Efficiency Alliance (NEEA) has asked us to help them better understand how well the current Northwest ENERGY STAR Homes Program is operating and how it could potentially be improved. As part of this study we are speaking with official program Partners such as you, to understand your experience in the program. This interview should take 20 minutes or less and your feedback will be reported to NEEA in a confidential, "summary" format that combines responses from all interviewees.

[RECORD:]

Name: _____

Company: _____

Phone: _____

1) First, approximately how long have you been an official partner with the ENERGY STAR Homes program?

2) How have you assisted or promoted the ENERGY STAR Homes program? (Probe on dollars spent, gifts donated, webpage references, labor hours donated, etc.)

3) And how has the program supported your company?

4) How valuable is it to partner with the ENERGY STAR Homes program? What value does your company get from being a partner?

   a) Has your partnership with the program resulted in increased inquiries from builders or consumers, or sales to them?

5) Overall, what do you hope your company achieves from its partnership with ENERGY STAR Homes?

6) How could the ENERGY STAR Homes program provide more value to your company?

   a) What types of co-op marketing activities or media would benefit you the most? (Probe for radio ads, TV ads, local builder campaigns, other)

7) And what types of events would your company be most interested in sponsoring, through product giveaways or financial support? (Probe for Builder Parade of Homes, Home & Garden shows, Realtor trainings, other trainings, other)

8) What types of events would you be most interested in staffing as a sponsor? (Probe for Builder Parade of Homes, Home & Garden shows, Builder trainings, Realtor trainings, other trainings, other)

9) Under what conditions might your company increase its support to the program?

10) Have you been to the ENERGY STAR program website? If YES:

   11) Did you find the layout of the Partners page of the website to be compelling and informative?

   12) Do you recommend any changes to the Partners page of the website?

13) Do you have any suggestions for improving the Partnership initiative of the ENERGY STAR Homes program?

14) How do you perceive the ENERGY STAR Homes brand compared to other green homebuilding programs? Do you also sponsor other programs? (If YES) In what ways?

15) What do you think are the biggest challenges for ENERGY STAR Homes going forward? Do you have any suggestions for overcoming these challenges?

16) Do you have any other 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 Thermal Bypass Trainee Interview Guide

September 2009

Objectives:

- Assess effectiveness of thermal bypass training
- Understand significant/expected implementation issues
- Get feedback on future needs from program

Target Audience: 10 Oregon verifiers, builders and/or utility staff that received thermal bypass training

(If Contact not reached directly) Could I speak to _____?

Hello, my name is _____ calling on behalf of ECONorthwest, an energy research firm based in Portland. The Northwest Energy Efficiency Alliance (NEEA) has asked us to help them better understand how well the current Northwest ENERGY STAR Homes Program is operating and how it could potentially be improved. As part of this study we are speaking with Oregon builders and verifiers that have received training on the new framing, air sealing and insulation requirements – also known as the thermal bypass checklist. This training was provided by [builders – Dan Wildenhouse, verifiers – Advanced Energy]. This interview should take 20 minutes or less and your feedback will be reported to NEEA in a confidential, "summary" format that combines responses from all interviewees.

[RECORD:]

Name: _____
Company: _____
Phone: _____

I. INTRODUCTION AND BUSINESS SCOPE

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

1. (UTILITIES) First, do you personally inspect and verify ENERGY STAR homes as part of your job responsibilities?

   If NO, TERMINATE: Thank you, but we are only speaking with ENERGY STAR program builders and verifiers for this interview.

   If YES, CONTINUE - UTILITY STAFF GET SAME QUESTIONS AS VERIFIERS/ALL, EXCEPT NEXT ONE.

2. (VERIFIERS, NO UTILITIES) First, are you an independent contractor or company owner, or employed by another organization?
   a. If they have a contract, ask: Who do you have a contract with?

3. (VERIFIERS) How many different builders are you currently working with as a verifier for the ENERGY STAR homes program?

4. (VERIFIERS) Approximately how many ENERGY STAR home verifications have you done to date?
    a. Have you verified any homes under the new Oregon specification that took effect in July 2008? If YES: How did this go?

5. (VERIFIERS) How much do you charge for your verification services? (Per home)

6. (VERIFIERS) Has this changed in the past year, or will it change in the upcoming year? If CHANGES: Why did/will you change your fees?

7. (BUILDERS) First, how many ENERGY STAR homes have you built under the new specification that took effect in July 2008? IF > 0: How did this go?

8. (BUILDERS) And approximately how many ENERGY STAR Homes did you build before the specification changed?

9. (BUILDERS) Have Oregon's energy code changes made the ENERGY STAR program more or less attractive to you? (Probe to see if homebuyers think the standard codes are high enough)

II. TRAINING

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

10. First, who provided this training?

11. Do you feel that the training adequately prepared you to (verify/build) ENERGY STAR homes that implement the thermal bypass checklist? If not, why?

12. Is there anything about the requirements that is confusing/unclear?

13. What about the training was most useful/beneficial to you?

14. Based on your experience, which of the thermal bypass requirements, if any, pose a significant challenge to builders and other contractors?

15. Have you utilized the procedures presented at the training yet? If YES: How has this gone?

    a. (VERIFIERS) Are builders implementing the checklist correctly?
    b. (BUILDERS) Are your verifiers checking the thermal bypass correctly?

16. Who will you contact if you have future questions about the thermal bypass requirements?

17. Have you received any technical support from the state energy office? For what kinds of issues? How did this go?

18. Do you feel you are getting consistent program information and are up to date on technical details? Do you have any suggestions for improvement on program communications?

III. *OVERALL PROGRAM*

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

19. Overall, how would you rate your experience with the ENERGY STAR Homes program? Why do you say that? (Probe fully.)

20. What do you think will be the biggest future challenges for you as a (verifier/builder)?

21. What can the ENERGY STAR Homes program do to help address these challenges?

22. (BUILDERS) What are your impressions of program's mass media marketing campaign, which began in 2008?

23. What do you think the ENERGY STAR program should be doing to market ENERGY STAR homes? (Probe for suggestions for marketing to builders, contractors, and homebuyers)

24. What is the most critical support the program could provide to program builders and verifiers in the near future? (Probe to see if technical/field support, consumer marketing, subcontractor training, other preferred) Why do you say that?

25. 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 Oregon Implementers Interview Guide

October 2009

Objectives:

- Understand how well the integration of ENERGY STAR/Earth Advantage is working
- Identify future challenges for ENERGY STAR/Earth Advantage homes
- Identify ways that the programs could work together effectively in the future

Target Audience: Earth Advantage (EA), PECI Inc.

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 Program is operating in Oregon and how it could be improved. Could I speak to _____?

First, I'd like to ask you a few questions about your Earth Advantage new homes program.

1) How well has the ENERGY STAR/Earth Advantage program integration been working thus far?

    a) Were there any initial problems for builders or their subcontractors? Have these been resolved?

2) Are there any specific ENERGY STAR requirements that builders or homebuyers object to? (Probe on new thermal bypass requirements)

3) Have any builders dropped out of the ES/EA program or joined up due to the integration?

4) Are there any ENERGY STAR spec changes that you recommend?

5) (EA) What was the most challenging part of the programs integration?

    a) How was this challenge addressed?

6) Whom do you communicate with at NEEA and/or Fluid? How often, and regarding what? How is this going?

7) Do you need additional information about NEEA's program? If so, regarding what?

8) Do you think there are ways that Earth Advantage and NEEA's program could work together more effectively in the future?

9) In your opinion, what is the most appropriate role for NEEA and the Northwest ENERGY STAR program going forward in Oregon?

10) What role does the Oregon Department of Energy play in supporting ES/EA homes? How is this working for your organization?

11) How are you marketing your ES/EA program?

12) (EA) You also deliver the NAHB Green and LEED programs in Oregon. How is ENERGY STAR integrated with these programs, if at all?

    a) Are builders confused by the different brands? About anything in particular?
    b) Going forward, how do you think builders will perceive these programs relative to ENERGY STAR/Earth Advantage? Which program(s) are best positioned to gain market share? Why?

13) Does Energy Trust's focus on Home Performance Scores make the ENERGY STAR label more or less attractive to builders wanting to implement energy efficiency?

14) What challenges is the Earth Advantage program facing in the new homes market?

    a) How do you hope to overcome those challenges?

15) (EA) Do you plan to implement any changes to the Earth Advantage program in 2010? Why?

16) (EA) Do you expect your number of ES/EA homes to increase or decrease in 2010? Why?

17) If EPA's ENERGY STAR spec goes up in 2011, how would the Earth Advantage program be affected? How could NEEA help address your program's needs?

18) What are your impressions of NEEA's ENERGY STAR Homes mass media marketing campaign, which began in 2008?

19) Do you have any suggestions for promoting ENERGY STAR homes to builders and consumers?

20) What is the most critical support NEEA's program could provide to program builders and verifiers in the near future? (Probe to see if technical/field support, consumer marketing, more subcontractor training, other preferred) Why do you say that?

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

ENERGY STAR Idaho HPS Interview Guide

September 2009

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

Objectives:

- Understand how the program is working in Idaho with respect to: Energy Inspectors' technical assistance to HPS's, data collection on homes, homes certification, and quality assurance (QA)
- Identify specific areas, if any, needed for improvement in the Idaho program territory
- Solicit suggestions for program improvement

Target Audience: 5 Home Performance Specialists in Idaho

(If Contact not reached directly) Could I speak to _____?

Hello, my name is _____ calling on behalf of ECONorthwest, an energy research firm based in Portland. The Northwest Energy Efficiency Alliance (NEEA) has asked us to help them better understand how well the current Northwest ENERGY STAR Homes Program is operating in Idaho and how it could potentially be improved. As part of this study we are speaking with Home Performance Specialists such as you. This interview should take 20 minutes or less and your feedback will be reported to NEEA in a confidential, "summary" format that combines responses from all interviewees.

[RECORD:]

Name: _____

Company: _____

Phone: _____

I'd like to begin with some questions about the certification process for ENERGY STAR homes.

1) First, how do you currently transmit information to Energy Inspectors, so they can certify your builders' homes?

2) Approximately how many of your homes has Energy Inspectors certified?

3) How well is the data submittal process working for you? Please comment on the time requirements, level of difficulty, the timeliness of Energy Inspectors' data review, and how your questions are addressed.

4) Have you had any significant or recurring problems when submitting data to Energy Inspectors for homes certification? If YES, ask:

    a) What was the specific issue and how did you try to solve it?
    b) Did you report the problem to program staff or Energy Inspectors?
    c) Did they acknowledge your concerns?
    d) How was the situation ultimately resolved? Was the resolution satisfactory?

5) (If not mentioned) If needed, who makes corrections to your data entries? How is this going?

6) Would you prefer other options for submitting your data to Energy Inspectors? (If YES) What would you prefer?

7) Overall, how would you rate your experience with the data submittal process? Would you say that you are Very Satisfied, Satisfied, Neutral, Somewhat Dissatisfied, or Very Dissatisfied?

8) (If not mentioned) Who actually gives the builder the printed home certifications, you or Energy Inspectors? Is this your preference? (If NOT) Why?

9) If your builders are having difficulties meeting the program requirements, do you ever inquire with Energy Inspectors to see what options are available to the builder? (If YES) How has this gone? (If NO) Why not?

10) Are you aware of any builders that have sold homes labeled as ENERGY STAR that did not get their homes certified?

Now I'd like to ask you about the QA process for ENERGY STAR Homes.

11) Have any of your builders had homes QA'd by Energy Inspectors? (If YES) How were the inspections coordinated with the builder and/or you, if at all?

12) (If builders were QA'd) Has this been an effective process? If issues mentioned, ask:

a) What was the specific issue and how did you or the builder try to solve it?
b) Did you report the issue to program staff or Energy Inspectors?
c) Did they acknowledge your concerns?
d) How was the situation ultimately resolved? Was the solution satisfactory?

13) (If not already mentioned) Who gives the QA feedback to your builders, you or Energy Inspectors?

14) (If not already mentioned) Who would you prefer to give this feedback? Why?

15) Now I'd like you to rate your overall satisfaction with various program elements. For each of the following, would you say that you are Very Satisfied, Satisfied, Neutral, Somewhat Dissatisfied, Very Dissatisfied, or Cannot Comment?

a) Smoothness and consistency of the *certification* process
b) Certification timeliness
c) Energy Inspectors' overall customer service to BPS's
d) Smoothness and consistency of the *QA* process
e) Responsiveness of Energy Inspectors to identified issues and questions
f) Timely notification from Energy Inspectors of emerging issues or challenges
g) Overall communications with Energy Inspectors

16) (If not mentioned) Do you have any suggestions for improving the homes certification and QA processes in Idaho?

17) Have you worked with the utilities for ENERGY STAR homes? If so, regarding what? How has this process worked for you?

18) What are your impressions of program's mass media marketing campaign, which began in 2008?

19) What do you think will be the biggest future challenges for you as an HPS?

20) What can the ENERGY STAR homes program do to help address these challenges? (Probe to see if more builder recruitment, technical field support, consumer marketing, builder training, subcontractor training, needed)?

21) 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 Utilities Interview Guide

July 2009

Objectives:

- Understand utility program offerings and promotions, and recent changes
- Understand satisfaction with NEEA's ESHNW program and if needs are adequately being met.
- Determine how NEEA can improve its assistance to utilities with their current programs or anticipated programs

Target Audience: About 20 large, medium and small utilities with ENERGY STAR Homes programs.

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.

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 Northwest ENERGY STAR Homes Program.

1) (FOR UTILITIES THAT JOINED IN 2008 or 2009) What made your utility start an ENERGY STAR Homes program in 2008/2009?

2) Who is your primary program target market? (Probe for builders, residential customers, both, other)

3) What services or incentives is your utility currently providing to ENERGY STAR 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

4) Have any of these services changed in the last year? How so/Why not?

5) Does your utility work with any other green home building programs? If YES, ask: In what ways? (Probe to see if incentives, services offered to other building programs too)

6) (If verification services are provided) Briefly, tell me about the verification services you offer? (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) Have your promotion efforts increased or decreased in the past year? Why, and how so?

9) What do you consider to be the biggest advantages to you from having an ENERGY STAR Homes program?

10) Would you say that your 2008 goals were met? How so?

11) What are your program goals for 2009? Do you think that they will be met? What are your biggest challenges?

12) Will your goals for 2010 be different? If so, why?

13) Will you be increasing your efforts to increase participation in your program? If so, how?

14) How could NEEA's program better support your endeavors?

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

15) First, what are your overall impressions of NEEA's program?

16) What features of the program do you like best and have worked well for you?

17) What has not worked well? Why do you say that?

18) How satisfied have you been with the support and technical resources that are available through the program?

19) (FOR IDAHO UTILITIES) I'd like to talk about your experiences with Energy Inspectors, since they are running the program in Idaho now. How are things going in your opinion? (Probe to see what is going well, and what is not)

    a) (If not mentioned already) Are you aware of any backlog of homes that need to be certified? (If YES) How is this being resolved?

20) How would you describe your relationship with your primary contact from the Fluid team? (Find out who this is)

21) Are you satisfied with the level of support you receive from your contact person?

22) What do you need more or less of from the program?

23) 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?

24) What do you think are the biggest challenges for ENERGY STAR homes?

25) Do you have any suggestions for promoting the program to builders and consumers?

26) What are your impressions of program's mass media marketing campaign, which began in 2008?

27) Should NEEA and the Northwest utilities work with green building programs to establish minimum efficiency requirements? How should this be done?

28) What is the most critical support the program could provide to program builders and verifiers in the near future? (Probe to see if technical/field support, consumer marketing, more subcontractor training, other preferred) Why do you say that?

29) If EPA's ENERGY STAR spec goes up in 2011, how would your program be affected? How could the NW ENERGY STAR program best meet your utility's needs in this case?

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

September 2009

Objectives:

- Conduct process check-in to determine if SCO responsibilities and outcomes have changed, in what ways.
- Assess if program changes have affected the SCOs and/or program participants.
- Identify areas for program improvement.

Target Audience: 4 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 Northwest ENERGY STAR Homes 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 regarding quality assurance for the ENERGY STAR homes program?

2. How many homes/builders are you working with right now? How many different verifiers/BPS's does this involve?

3. How balanced is the demand for your QA services compared to your budget and staffing levels? (Do NOT ask ENERGY INSPECTORS/ID, are new) Has anything changed in your organization related to the ES Homes QA function? What has changed?

4. Approximately how many ENERGY STAR homes have you done the QA for to date? How many of these were completed in 2009?

5. What percentage of ENERGY STAR homes has passed/failed the QA inspection process in the past year? (Probe for differences by builder) (Not ID) Has the failure rate changed significantly from previous years?

6. What have been the primary reasons that homes have failed QA in the past year? Why do you think this is?

   (OR Only, if not already mentioned) Has the new program spec in Oregon affected the QA process or failure rate in any way?

II. QA PROCESS

I'd like to ask you a few questions regarding the QA process.

7. In the past year, what if any changes have occurred in the QA process?

8. 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?

9. How do builders react 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. (OR only) What is ODOE doing to facilitate the transition to the new ENERGY STAR specification, and get builders and verifiers knowledgeable on the new thermal bypass requirements?

11. (OR only) What are your impressions of the thermal bypass requirements? Are builders implementing this correctly? Do you have any concerns about the new requirements?

12. 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?

13. 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)

14. (ID only) How have things been going with allowing BPS's to directly enter homes information into the program database?

15. Is the database sufficiently up to date with builder and verification information?

16. Overall, how well is the QA process is working? What is working particularly well? What have been the most challenging aspects of the QA process?

17. What do you anticipate will be the greatest future challenges for the ES Homes QA process?

18. 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.

19. 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?

20. 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? Any areas where more training might be needed? (For OR, probe on effectiveness of thermal bypass training)

21. Do you feel sufficiently coordinated with the program trainings?

22. What else do you feel the program could provide the verifier/BPS companies?

23. 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.

24. 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)

25. 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)

26. 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)

27. Do you think that coordination between the many program parties is working effectively? If not, why?

28. Overall, how would you rate your experience with the ENERGY STAR Homes program? Why do you say that?

29. What kinds of assistance from the ENERGY STAR program would help you do your job more effectively?

30. In which areas should the program focus its resources going forward? (Probe to see if technical field support, consumer marketing, builder training, subcontractor training, etc.)

31. 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 E: CERTIFIED AND INITIATED HOMES BY STATE

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

Figure 5: Certified and Initiated Homes by Month - ID

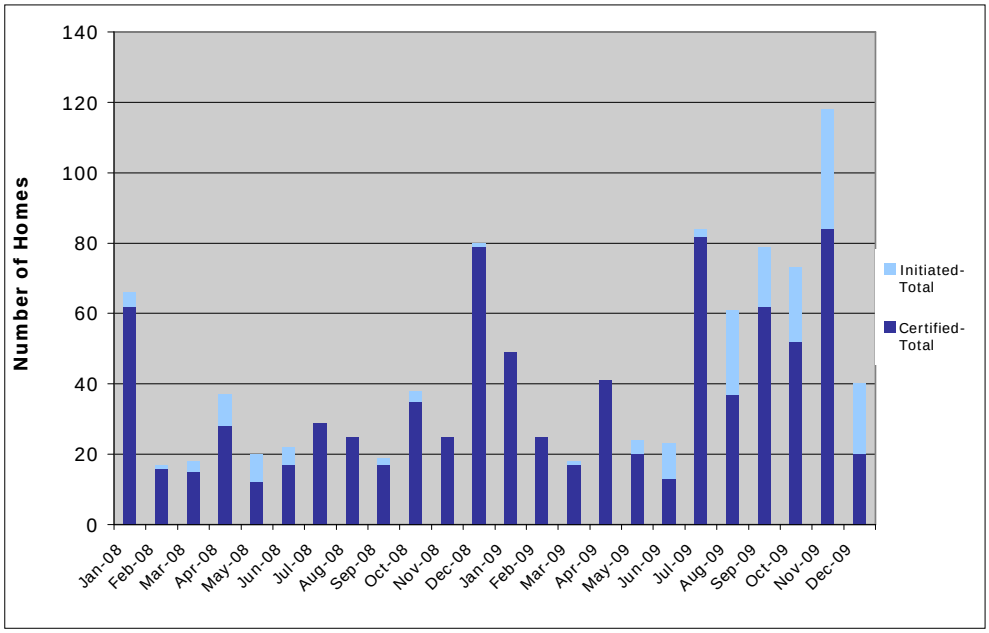


Figure 6: Certified and Initiated Homes by Month - MT

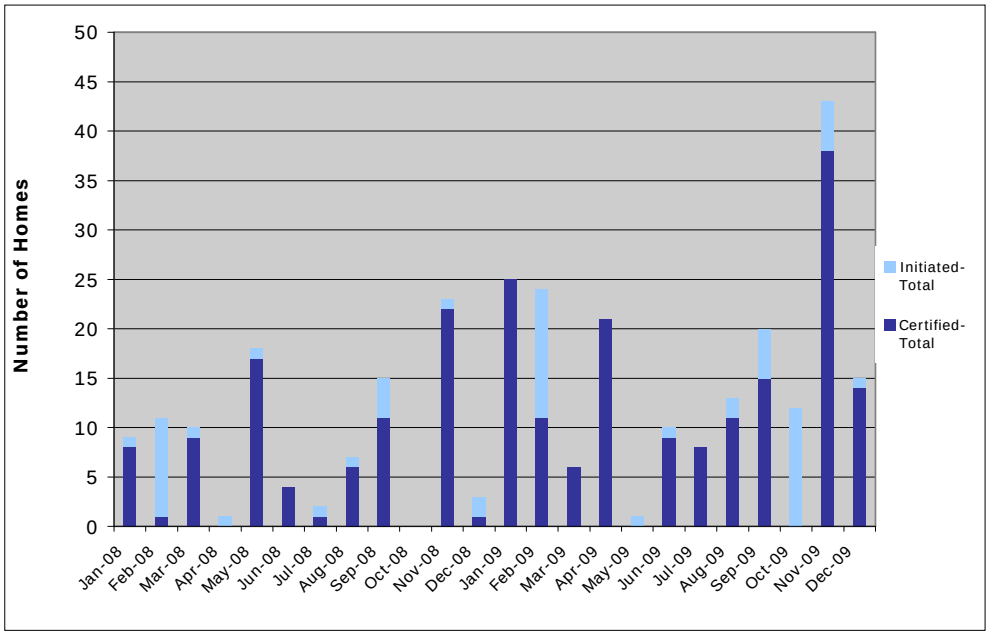


Figure 7: Certified and Initiated Homes by Month - OR

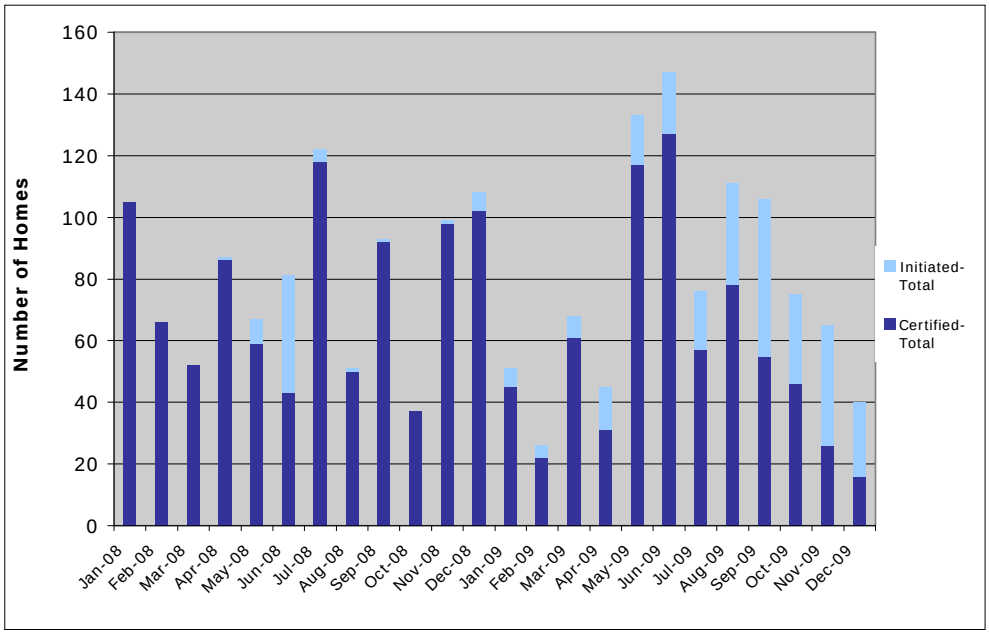
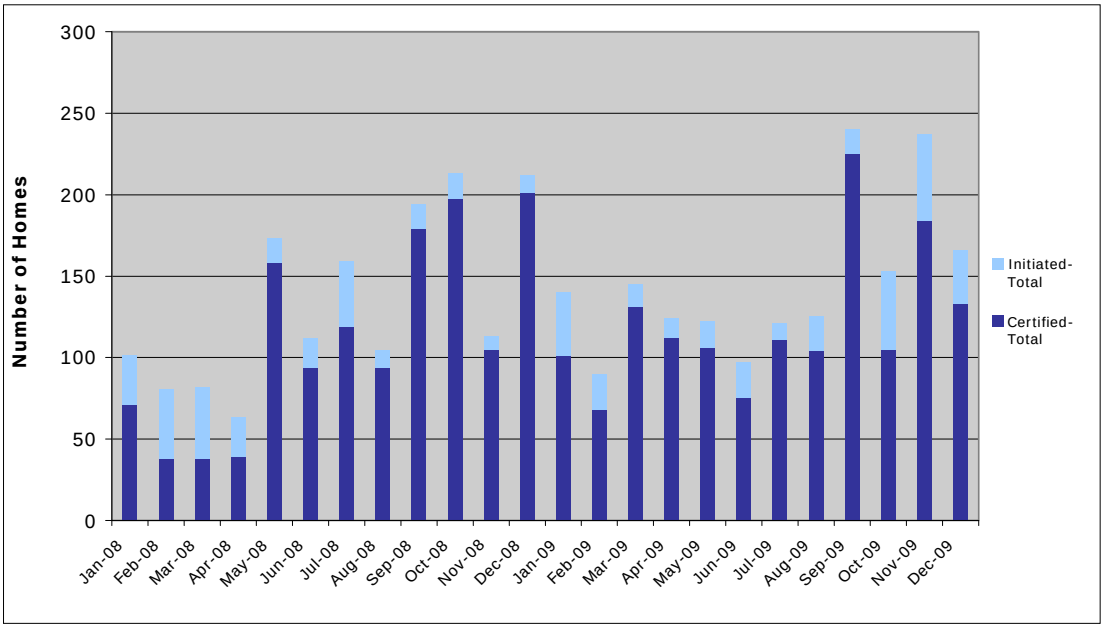


Figure 8: Certified and Initiated Homes by Month - WA



APPENDIX F: SUPPLEMENTARY HOMEBUYER SURVEY TABLES

Table 31: Most Important Attributes in New Home Selection

	2009 (N=200)
Response	**Percent**
Layout/design/floor plan	63%
Overall home size	32%
Number of bedrooms	26%
Price	16%
Energy efficiency	15%
Size of kitchen	15%
Size of yard/lot	15%
Interior finishes (countertops, cabinets, built-ins, etc.)	10%
House style/appearance	8%
Wanted home with no previous occupant	5%
Builder reputation	4%
Landscaping	4%
Quality construction	4%
3 car garage	3%
HVAC	3%
Green/environmental features	2%
Storage	2%
Windows	2%
Home office	2%
Other	9%
Don't know	5%

Q12,Q13,Q14. What was the most important attribute that you were looking for in a home itself? Was there another important attribute?

*Multiple responses allowed

Table 32: Most Important Energy-Efficient Home Features

	2009 (N=148)
Feature	**Percent**
Insulation (overall)	40%
High efficiency windows	37%
High efficiency air conditioner/HVAC	30%
High efficiency appliances	26%
High efficiency furnace	22%
Tight construction	9%
High efficiency water heater	7%
High efficiency/ENERGY STAR lighting	6%
Insulation (walls)	5%
Using more gas or electric	5%
Heat pump	4%
Insulation (roof)	4%
Other	8%
Don't know	5%

Q16. What energy efficient home features are most important to you?
*Multiple responses allowed

Table 33: Source of ENERGY STAR Homes Awareness by State

Response	Washington (N=46)	Oregon (N=26)	Idaho (N=29)	Total (N=101)
Builder	26%	27%	23%	23%
Magazine	22%	23%	10%	19%
Realtor	11%	23%	17%	16%
Friends/Family/Word of Mouth	15%	23%	3%	14%
Internet web site	11%	8%	24%	14%
Television	9%	12%	24%	14%
Newspaper	13%	11%	10%	12%
Homes/home products convention	9%	0%	3%	5%
Utility literature	4%	0%	10%	5%
Street/Parade of Homes event	2%	4%	3%	3%
Billboard	2%	0%	7%	3%
Radio	2%	4%	0%	2%
Other	4%	8%	3%	5%
Don't Know	2%	0%	7%	3%

Q26. How did you find out about ENERGY STAR homes?

*Multiple responses allowed

Table 34: Reasons for not Purchasing an ENERGY STAR Home

	2009 (N=78)
Response	**Percent**
Cost	22%
Wasn't offered for the house we wanted	19%
Not available in the area	19%
Other features were more important	13%
Energy efficiency was not a factor in decision	9%
Other	11%
Don't know	17%

Q35. Why didn't you purchase an ENERGY STAR home?

*Multiple responses allowed

Table 35: Value of Owning an Energy Efficient Home

	2009 (N=200)
Response	**Percent**
5 Extremely valuable	51%
4	32%
3	14%
2	1%
1 Not at all valuable	<1%
Don't know	2%
Total	**100%**
Mean	**4.3**

Q53. On a scale of 1 to 5, where 1 is not at all valuable and 5 is extremely valuable, how would you rate the value of having an energy efficient home?