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Memorandum

To: **Ted Light, Energy Trust of Oregon**

From: **Robin Maslowski, Kevin Cooney, and Barrett Mooney, Navigant Consulting, Inc.**

Date: **May 30, 2012**

Re: **Clothes Washer Market Transformation Model Development and Market Research—Research Findings To-Date and Recommended Next Steps**

This memo discusses the work that Navigant Consulting, Inc. conducted for the Energy Trust of Oregon from August 2011 through May 2012 on the market for residential clothes washers (RCW) with a Modified Energy Factor of 2.0 and above (MEF 2.0+). The objective for this work was to determine whether the MEF 2.0+ RCW market in Oregon has been transformed and investigate Energy Trust's influence on that market transformation.

Navigant's research to-date does not indicate that the market has been transformed by Energy Trust. The research also suggests that given the lack of reliable data sources, it would require significant additional effort to defensibly determine Energy Trust's relative influence amongst the many other factors influencing the market. Furthermore, even if Energy Trust has helped transform the market in some way, the potential savings are not likely to be significant. Thus, the discussion below documents Navigant's research efforts to-date and preliminary findings, such that

1) Energy Trust can make an informed decision about whether to continue market transformation research on the market for MEF 2.0+ residential clothes washers, and
2) Navigant's research findings can be leveraged in future research on the MEF 2.0+ or MEF 2.2+ markets, if Energy Trust decides not to continue this research at this time.

As shown in the Table of Contents below, Section I of this memo presents an overview of the research completed to-date, Sections II-VI describe the preliminary findings for the tasks proposed in the Statement of Work, and Section VII provides a summary of the findings, plus Navigant's recommendations to Energy Trust for next steps in RCW market transformation analysis.

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I. Overview of Research Completed and Sources Reviewed

The section below provides a brief overview of the research objectives, research completed to-date, and methods used. Energy Trust and Navigant identified the following as the primary research questions to be answered about the RCW market in Oregon:

1) Did Energy Trust's programs influence the equipment available on the market?
2) Did Energy Trust influence the sales of high efficiency clothes washers in their region?[1]
3) Did Energy Trust's efforts influence supply chain promotion and/or market acceptance of the technology?
4) How much of the market transformation in Oregon can be attributed to Energy Trust, above and beyond NEEA's efforts?
5) Were Energy Trust and its peers nationally highly influential on decisions regarding efficiency and/or timing of the federal standard due to their successes at making high-efficiency residential clothes washers available and increasing sales and acceptance?

To answer these questions, Navigant conducted an extensive secondary data review of available sources, as well as market actor interviews with in-store appliance retailers in Oregon. The results of this research are presented in the sections below, with brief descriptions of how each secondary data source may be helpful going forward.

II. Understanding NEEA's Market Transformation Efforts and Relation to Energy Trust's Program

A key objective for this project was to understand NEEA's past programs and savings claims to avoid double-counting the savings that NEEA has already claimed for transforming some portion of the

[1] A comparison of the market penetration of high efficiency clothes washers in Oregon to the penetration in other areas without Energy Trust influence is the planned method to answer this question (e.g., sales per capita the same or different than other regions?).

RCW market in Oregon. To do this, Navigant reviewed NEEA's publicly available documentation on the RCW market (see the resources listed in Table 3) and corresponded with NEEA staff.[2]

It is Navigant's understanding that NEEA's program for residential clothes washers ended when the federal standard changed in 2007 and that NEEA did not explicitly promote washers above MEF 1.8. (See Table 8 in Appendix C for a comparison of the MEF levels promoted by NEEA's program, Energy Trust's program, and other market influences.) Although NEEA tracks units with MEF 2.0+ at a high-level by estimating market share, NEEA has not actually claimed savings or conducted in-depth market share research for units above MEF 1.99. Since NEEA has not already claimed savings for washers with MEF 2.0+, the project team decided to focus efforts on this market.

Rather than evaluate the market for MEF 2.0+ as a whole, the project team decided to divide the market into three phases based on the different efficiency tiers promoted by Energy Trust's program, as shown in Table 1. This memo documents the efforts completed to-date towards Phase I.

Table 1. Recommended Phases for Residential Clothes Washer Market Transformation Evaluation

Phase	Efficiency Tier to Evaluate	Per-Unit Savings Rate to Apply
I	MEF 2.0+	MEF 2.00-2.19
II	MEF 2.2+	MEF 2.20-2.45
III	MEF 2.46+	MEF 2.46+

One of the key reasons for choosing this approach was the lack of data available on market share of clothes washers by efficiency level. Relatively little data exists on the market for MEF 2.0+, and even less data currently exists for the higher efficiency tiers. This approach, which mirrors the approach used in NEEA's ACE model and LTMT reports, allows the analysis to proceed through Phase I without data on market share for MEF 2.2+, while still allowing Energy Trust to assess and claim savings for the MEF 2.2+ market in the future using an incremental per-unit savings rate. Appendix C shows how the savings for each tier would be applied.

III. Estimate Total Market Size

To establish the total number of RCW sold in Oregon each year, Navigant purchased data from the Association of Home Appliance Manufacturers (AHAM) on distributor sales by state from 2004-2010. The data for Oregon is shown in Table 2.

Table 2. Estimated Total Market Size for Oregon

Year	Number of Automatic Washer Sales
2004	102,000
2005	101,762
2006	106,471
2007	118,189
2008	137,555
2009	145,862
2010	155,100

[2] Email and phone conversations with Rob Russell, Northwest Energy Efficiency Alliance, October 2011.

Source: Association of Home Appliance Manufacturers, 2004-2010 "Distributor Sales by State.xls", http://www.aham.org/.

To complete the analysis, this data would be adjusted to reflect the portion of Oregon residents served by Energy Trust utilities. This dataset also contains data on the total number of RCW sold nationally each year, which would be used to estimate the baseline market share.

IV. Estimate Hi-E Clothes Washer Market Share and Investigate Energy Trust's Influence on the Hi-E Market in Oregon

To determine the extent to which the RCW market for MEF 2.0+ in Oregon has been transformed by Energy Trust's program, the project team sought to collect both quantitative market share data for high efficiency (Hi-E) RCW and qualitative market actor interview findings on market influences. The sections below present the research conducted and the preliminary findings.

A. Secondary Sources Reviewed

Navigant reviewed a number of sources for information on market share of RCW with MEF 2.0+ in the state of Oregon to inform the high efficiency (Hi-E) market share, and at the national level to inform the baseline market share (see Section V). **Most of the sources reviewed did not have market share data available at the national level, and no source had this data available for the state of Oregon that would be appropriate for this project.** This research is summarized in Table 3 below, so that future research efforts in this market may take advantage of the findings (see Appendix A for a bibliography of these sources).

Table 3. Sources Reviewed to Estimate Hi-E and Baseline Clothes Washer Market Share

Source	Description of Available Data	Useable in the Analysis?
Association of Home Appliance Manufacturers (AHAM)	Data on clothes washer efficiency only available as the weighted average MEF for all residential clothes washers sold nationally each year. No data is available at a national or regional level on the market share of different efficiency levels.	No
Oregon Department of Energy (ODOE) Tax Credit Data (RETC)	Includes the number of MEF 2.00-2.19 and 2.2+ clothes washers that received tax credits after 2007 for the entire state of Oregon. (Zip code included to identify the portion in Energy Trust's territory.)	Yes, to benchmark influence of tax credit vs. Energy Trust incentive
Energy Trust Fast Feedback Results	Fast Feedback is a quarterly survey of a sample of Energy Trust program participants to assess satisfaction, customer decision making, and program/process improvement suggestions.	Yes, for qualitatively supporting market actor interview findings
DOE Federal Standard Rulemaking Documentation	AHAM shipments data at a national level broken out by efficiency from 2006-2008. DOE uses this data in their analysis by holding the 2008 breakdown constant into the future. Shipments data for additional years may be available from LBNL once the final rulemaking is released.	Yes, for the baseline market share (see Section V)
Discussions with Navigant's DOE team	Anecdotal estimates that the market for top-loading washers will continue to grow at about 1-2% per year. The market for front-loaders is estimated to continue to grow and surpass the	Yes, for the baseline market share (see Section V)

Source	Description of Available Data	Useable in the Analysis?
	market for top-loaders, but eventually level off at around 50-60% of the market.	
NEEA *Long Term Monitoring and Tracking*	Includes regional market share for MEF 2.0+; however, this market share was estimated based on the market share of MEF 1.8+, rather than on research findings, since NEEA has not claimed savings for MEF 2.0+ and did not need to rigorously identify this market share for their study.	No
NEEA's MPERs	Includes data from 2002-2006 on the portion of Energy Star sales in Oregon that were ultra-high efficiency (UHE) (MEF > 1.8), based on ODOE tax credit data. Data is likely conservative, since not all UHE sales likely received tax credits. The 2007 MPER estimated a UHE market share of 50% of Energy Star sales (25% of all Oregon sales) in 2006.	No
NEEA ACE model	NEEA gets state-level data from AHAM, but it isn't broken out by MEF. NEEA has been looking into getting it broken out by MEF, but uses an efficiency breakdown from Energy Star in the meantime. The Energy Star breakdown is not applicable for this project since it does not provide market share above MEF 1.8.	No
Regional Technical Forum (RTF) Deemed RCW Savings Methodology	Market share estimated by using the number of models available by MEF in the California Energy Commission Database as a proxy for the percentage of models sold by MEF.	Maybe, could help benchmark or extrapolate market share findings (see method discussed in Section V).
Consortium for Energy Efficiency (CEE)	The CEE promotes higher efficiency tiers than Energy Star, but does not have market share or sales data available. CEE publishes a qualified products list, which lists units by model number, MEF, WF, and CEE Tier.	Maybe, for an alternative baseline calculation (to confirm the method in Section V)
Energy Star	Energy Star began promoting MEF 2.0+ in 2011. Since Energy Star contains sales data broken out by state, but not by efficiency tier, Energy Star data for MEF 2.0+ will only be available for 2011 onward. Also publishes a qualified products list.	Maybe, if this data is available at the time of analysis, it could help benchmark or extrapolate market share findings (see method discussed in Section V).
D&R International	D&R International has been aggregating retailer sales data for Energy Star; thus, data is not available for MEF 2.0+ prior to the Energy Star standard change to 2.0 in 2011.	No
Appliance Magazine	Does not currently offer market information from	No

Source	Description of Available Data	Useable in the Analysis?
	their website. Industry information is available in the form of white papers, but no sales information is readily available.	
NPD	Does not currently track sales by MEF. Could add MEF into their database, but it could cost as much as $75-100k for one year of data.	No
Sears sales data	No contact available (possible contact through PECI pending).	Pending

Note: See Appendix A for the bibliography of these sources.

B. Influence of ODOE Tax Credits

In addition to the Energy Trust's program, Oregon customers who purchased high efficiency residential clothes washers from 2004-2011 could also claim a tax credit from the Oregon Department of Energy (ODOE), known as the Residential Energy Tax Credit (RETC). Since the Energy Trust incentive and the tax credit potentially both influenced the customer's purchasing decision, one of the research objectives was to determine the relative influence of each one on the customer and how to appropriately attribute that influence in transforming the market.

Navigant first compared the quantity of ODOE tax credits with the quantity of Energy Trust incentives claimed by customers to see if the volume of tax credits was significant enough that it may have influenced the market. As shown in Table 4, the number of ODOE tax credits and Energy Trust incentives was very close in 2008-2010 for units with MEF 2.0+, suggesting that most people did claim both rebates. (See Table 8 in Appendix C for a comparison of the MEF levels promoted by ODOE, Energy Trust's program, and other market influences.)

Table 4. Number of Energy Trust Incentives Compared to ODOE Tax Credits Provided for Clothes Washers with MEF 2.0+

	2008	2009	2010	2011
Energy Trust incentives	21,086	22,904	21,834	18,180
ODOE tax credits	21,908	20,923	21,726	10,461
% difference	-4%	9%	0%	42%[1]

[1] Data only available through September 2011. Difference between Energy Trust and ODOE may be due to customers waiting until year-end to file for the tax credit.

Source: "CWs by Program Measure Desc and Year.xlsx", Provided by Ted Light, Energy Trust of Oregon, October 4, 2011.

Source: "RetcCW_ETO2008_Sep2011.xlsx", Provided by Ted Light, Energy Trust of Oregon, October 22, 2011.

It should be noted that the ODOE tax credits represent the entire state of Oregon, while Energy Trust's incentives were only available in Energy Trust's service territory. Given this factor, the finding from a recent Fast Feedback customer survey that 84 percent of customers who received an Energy Trust incentive have applied (or will apply) for a tax credit[3] seems reasonably consistent with the volume of rebates claimed.

To help understand the relative contributions of ODOE and Energy Trust, Navigant included a series of questions on the ODOE tax credit in the market actor interview guide (see Appendix D). The preliminary findings from the in-store retailer interviews suggest equivalent influence from the tax

[3] Energy Trust of Oregon, "Fast Feedback Results: Q1 2011," Prepared by Sarah Castor, June 2, 2011.

credit and the program. Both Energy Trust's program and the ODOE tax credit received an average response of 4.5 for the question "In general, how much have each of the following factors influenced your company's sales of high efficiency clothes washers? Please indicate your answer on a scale of 1 to 5, where 1 is 'did not have any influence on your company's sales' and 5 is 'had a great influence on your company's sales.'"

If Energy Trust wishes to more conclusively determine the relative influence of the ODOE tax credit versus the Energy Trust incentive, Energy Trust could enlarge the interview sample size by conducting additional interviews with market actors at the regional level. Navigant also recommends talking to ODOE and Energy Trust staff about when each organization began promoting MEF 2.0+ units because data provided by each organization suggests that ODOE began promoting these more efficient units first. However, it is difficult to tell for sure from the data available.

The Energy Trust ultimately determined that, if Energy Trust has transformed the market, all of the savings for this transformation could be claimed by Energy Trust, since no other Oregon stakeholder intends to claim savings from this transformation. This would be based on the following framework: To determine if Energy Trust has transformed the market, two questions need to be answered: 1) Has the Oregon market been transformed? 2) Has the Energy Trust been a *material* contributor to a critical step in this transformation? (See Appendix G for a discussion on material contributions.) Once it has been established that Energy Trust materially contributed to the market transformation, savings for the market transformation in Energy Trust's service territory can be claimed. As Energy Trust's claim of savings is defined in terms of "material contribution to a critical step in market transformation," the transformation would not have happened to the same extent without Energy Trust's material contribution. If no other material contributors intend to claim savings from this transformation, all of the savings would be available for the Energy Trust to claim.

C. Retailer Interview Findings – Supply Chain

Identifying and contacting the appropriate market actors within the residential clothes washer supply chain has proved to be a challenging part of this project. *Residential appliance markets, like the RCW market in Oregon, often involve supply chains where retailers and customers are the primary players; however, distributors and contractors are typically much easier to interview for aggregate information than retailers and customers, who are more likely to have data sensitivity concerns and may not have information available for only Energy Trust's service territory.* In the case of residential clothes washers, Energy Trust thought that smaller retailers may buy from a local distributor, but the larger big box stores likely buy directly from the manufacturers. Thus, Navigant chose to focus on retailer interviews.

Navigant had several discussions with Energy Trust and PECI, the program implementer, about whether regional retail representatives or in-store sales representatives should be interviewed. Navigant initially requested to speak to the regional representatives; however, PECI felt that the in-store sales representatives would have a better understanding of terms like MEF and better insight into the program's influence, since they receive special training from PECI through the program[4] and interface directly with the consumer. While the in-store retailer interviews were important for establishing some of the qualitative market drivers, no respondent was willing and able to provide market share data in the six interviews that Navigant completed. Furthermore, discrepancies between the findings from the in-store retailer interviews and additional research findings suggest that the in-store retailer interviews are insufficient for assessing market transformation, as discussed below.

[4] Through the program, PECI provides an initial one-hour training for sales staff, general education/training to the retailers, subsequent periodic roundtable discussions with some of the sales staff, and literature/direct marketing to the customers.

Once these trends became apparent, PECI reached out to regional retail representatives to acquire sales data. While Sears was initially receptive to providing data, Sears was ultimately unable to access the data without significant effort on their part. Attempts to access data from other retailers were also unsuccessful. Ideally, Navigant targets having sales data from 75-80 percent of the market for this type of analysis, although a minimum of two-thirds of the market would be sufficient to draw conclusions from a consistent data sample. Table 5 shows the percent of Energy Trust incentives provided by the top seven retailers in Energy Trust's service territory. If this data is used as a proxy for total RCW market share in Oregon, it shows that Sears's data alone would be insufficient for the analysis and Navigant would need to acquire data from at least three retailers.

Table 5. Percent of Energy Trust Incentives Provided by the Top Retailers

Retailer	Share of Energy Trust Incentives (%)
Sears	31%
Standard TV & Appliance Inc.	16%
Home Depot	14%
Lowe's	12%
Best Buy	5%
Kelly's Home Center	3%
Riegelmann's Appliance	2%

Notes: For washer incentives provided from 2004-2011. All other retailers contributed one percent or less of total Energy Trust incentives. These numbers do not include online sales; however, total online sales are less than one percent for each retailer.
Source: "Washers by Retailer and Year.xls", provided by Ted Light on September 19, 2011.

Because future market transformation evaluation efforts are likely to face these types of data collection challenges for a variety of residential appliance types, not just clothes washers, Navigant recommends requiring implementation contractors to collect certain data on appliance sales going forward and has proposed a data collection format in Table 11 (see Appendix F). Navigant also recommends conducting interviews with retailers at both the regional level and in-store level to help verify the in-store retailers' qualitative assessments of market influences.

D. Retailer Interview Findings – Preliminary Interview Results

The retailer interviews conducted to date have not provided clear evidence that the market for Hi-E RCW in Oregon has been transformed by Energy Trust. *While the interviews do not rule out the possibility that Energy Trust has transformed the market, they do suggest that incentives are still driving the market and finding strong, conclusive evidence that Energy Trust influenced the market is unlikely*. The preliminary findings discussed below represent the viewpoints of six in-store retailers from four local retail stores and two nationwide big box chains (see Appendix E for the list of interviewees). The interviewees were sales staff, general managers, and store owners.

Several of the retailers' responses indicate that the market has not been transformed and incentives are still driving sales. Four out of six retailers said that when the incentives go away, the demand for high efficiency washers will also go away because the cost is still high. In fact, some retailers said that after the incentives go away, they will stock more washers at a lower efficiency tier to meet the same price point. In response to the question "Do you expect sales of high efficiency residential clothes washers to increase, decrease, or stay the same in Oregon in 2012?" these retailers said the following:

- *Decrease. The low end will sell more and the higher ends receiving rebates will sell less because net cost will still be high.*[5]
- *Decrease. The units that don't current hit rebates don't sell. Moving to stocking less as the MEF minimums increase. The net price of the machines is a huge factor in selling them.*
- *Decrease. Will be changing stocking practices to stock the cheaper models that may not be included in the incentive.*
- *Decrease, because the Oregon tax credit is going away. The dollar amount people can tolerate is the most crucial factor. It's not really affecting the store's focus (which will continue to be on Front Loading machines), but the store has just brought in a line of less efficient top loaders to meet the price point that the rebates helped more efficient machines fill.*

Additional findings from discussions with other retailers agree that incentives are driving Hi-E RCW sales, but suggest that a decrease in sales after the incentives change may not apply as widely as these comments indicate. Because of this, the retailers' stocking practices going forward are unclear. After learning about Navigant's discussions with in-store retailers, PECI also spoke to other in-store retail sales staff about their stocking practices. Contrary to the retailer responses cited above, PECI found that "the majority of retail sales staff have said they are mainly stocking models that qualify for Energy Trust's incentives (2.46 MEF+). They have a few less expensive models at lower efficiency levels, but those make up a very small portion of their stock."[6] The discrepancy between PECI's and Navigant's findings may be explained by 1) the fact that Navigant's interviews occurred before Energy Trust's incentive levels changed at the beginning of 2012 and PECI spoke to retailers a few months later; 2) motivations on the part of the retailer to emphasize different aspects of their stocking practices to the different interviewers; 3) ambiguities in how the responses were stated and reported (e.g., a "line of less efficient top loaders" may still constitute a "very small portion of their stock" to a retailer), or 4) underrepresentation of the broader retail market in Navigant's interview sample.[7]
Surveys the Energy Trust conducted with customers also contradicted some of the findings from the retailer interviews. The results below from Energy Trust's Fast Feedback customer surveys suggest that there may be more complex market drivers contributing to sales than just the incentives:

a) 62-75 percent of the incentive recipients would have bought exactly the same washer if Energy Trust incentives and information were not available.
b) Only 16 percent said they would have bought a less expensive washer if Energy Trust incentives and information were not available, and less than 5 percent said they would have bought a less efficient washer if Energy Trust incentives and information were not available.
c) Only 32-50 percent of the incentive recipients rated the incentives as influential (i.e., a 4 or 5 in terms of influence, where 5 is most influential), while 57-69 percent rated the salesperson/retailer as influential. (17-48 percent rated the information from Energy Trust as influential.)[8,9]

Without market share data or additional interviews, it is difficult to conclusively determine whether the retailers or the customers are portraying a more accurate picture of the market. The first two of these survey results almost directly contradict the retailers' responses that the higher efficiency units

[5] This response was actually in response to the question worded slightly differently: "Do you expect sales of residential clothes washers with MEF 2.0 or greater to increase, decrease, or stay the same in Oregon in 2012?"
[6] Email communications with Shauna Richardson, PECI, February 24, 2012.
[7] PECI did speak to a few salespeople with different answers, most of whom indicated that they were closing, moving towards used appliance sales, weren't sure of their company's buying practices or weren't sure what direction they were going to move in. Email communications with Shauna Richardson, PECI, March 13, 2012.
[8] Energy Trust of Oregon, "Fast Feedback Results: Q1 2011," Prepared by Sarah Castor, June 2, 2011.
[9] Energy Trust of Oregon, "Fast Feedback Program Rollout: Nonresidential & Residential Program Portfolio," Prepared by Research Into Action, Inc., December 31, 2010.

won't sell without the rebates, while all three survey results suggest that the retailers are misjudging the priorities of the customer.

While the high percentage of customers saying that incentives were not the primary influence in their purchasing decision suggests that the market may actually be transformed, it is unclear what is influencing the customer, if the incentive or other information available from Energy Trust is not the primary influence.

As noted in finding c) above, the customer surveys point to the salesperson/retailer as one of the influences. Energy Trust's program *may be* responsible for some of this influence, since Energy Trust provides sales staff training, marketing materials, and incentives that make the Hi-E units more attractive for sales staff to promote. The extent of Energy Trust's influence on the salesperson/retailer, however, cannot be confirmed from the interviews and surveys conducted to-date.

Another likely influence is the customer's basic appeal for the product. The recent trend in customer preferences is toward front-loaders because they are "in vogue," clean clothes better, are advertised on TV, are painted bold colors, etc. Front-loaders also tend to be the more efficient models.[10] These distinctions between top-loading and front-loading washing machines likely contribute to the relatively high portion of Hi-E washer sales occurring outside the influence of an energy efficiency program. For example, between 2010 and 2011, Energy Trust estimated a free-ridership rate for their program of around 48-55 percent. Similarly, the most recent national market share data available indicated that MEF 2.0+ washers comprised roughly 42 percent of the market in 2008,[11] which suggests that a fairly significant portion of people were purchasing Hi-E washers in parts of the country without incentive programs. *Thus, many customer purchases may be based more on basic customer appeal for the product than the concerted actions of a market stakeholder.*

The other findings from the retailer interviews are largely consistent with the finding presented above that retailers feel incentives are still driving sales Hi-E RCW. These additional findings are presented below, where a rating of 1 corresponds to not having any influence and a 5 corresponds to having great influence. Aside from finding #5 and, to some extent, #6 below, the retailer interviews do not provide much evidence that Energy Trust has transformed the market in Oregon:

1. Retailers rated the incentive as the most influential program component offered by Energy Trust for increasing sales of Hi-E RCW. On average, the retailers rated the influence of the program components as:
    a. Training for sales staff = 3.7
    b. Marketing materials for customers = 4.0
    c. Incentive = 4.8[12]
2. Two of the retailers thought sales of Hi-E RCW would stay the same in 2012, while the other four retailers thought sales would decrease.

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[10] Washers with MEF ≥ 2.0 comprise roughly 84 percent of the front-loading models listed, while washers with MEF ≥ 2.0 comprise only about 30 percent of the top-loading models listed. Based on the active appliance listings in: California Energy Commission, Appliance Efficiency Database, http://www.appliances.energy.ca.gov/, Accessed May 29, 2012.

[11] AHAM Data Submission, Document #EERE-2008-BT-STD-0019-0027, http://www.regulations.gov/#!documentDetail;D=EERE-2008-BT-STD-0019-0027. AHAM Data Submission, Document #EERE-2008-BT-STD-0019-0029, http://www.regulations.gov/#!documentDetail;D=EERE-2008-BT-STD-0019-0029.

[12] On a scale from 1 to 5, where 1 was "did not have any influence on increasing sales" and 5 was "had a great influence on increasing sales."

   a. All four of the retailers who thought sales would decrease in 2012 rated the influence of the Oregon tax credit's disappearance on this decrease as a 5.
   b. In contrast, only two of the retailers who thought sales would decrease in 2012 rated the influence of Energy Trust's program as a 5, while the other two retailers rated Energy Trust's influence as a 4.[13]
3. Both Energy Trust's program and the Oregon tax credit received an average rating of 4.5 in terms of influence on Hi-E RCW sales. Energy Star received an average rating of 3.3, information from manufacturers and distributors received an average of 2.5, and customer demand received an average of 1.7 (although three retailers did not respond to the customer demand question).
4. When asked if there has been a single factor most influential on sales of Hi-E RCW, one retailer said "rebates," two retailers said the combined effect of the tax credit and the Energy Trust incentives, and the other three retailers said "multiple factors" (e.g., environment, energy, rebates, energy efficiency, and water efficiency).
5. Four retailers thought that Energy Trust had influenced the Hi-E RCW market in Oregon beyond Energy Trust's program. One retailer said they thought Energy Trust's advertising has changed the public's interest in clothes washers, while another retailer said that Energy Trust has trained people over the years to look for it.
6. Four out of six retailers said they market or mention Energy Trust's incentive to all customers. The other two retailers said they market or mention the incentive to 50-60 percent of customers and cited customer concerns about machine efficacy as the reason.
7. None of the retailers had a good sense for the portion of their sales above MEF 2.2 and/or MEF 2.46.

To some extent, the lack of strong evidence that Energy Trust has transformed the market in Oregon may be due to the significant number of additional influences on the market, such as the Oregon tax credit, Energy Star, appealing product design and marketing from the manufacturer, and the inherent advantages of more efficient front-loading machines over older top-loading machines. It was well-known prior to starting this research that several of these influences were present in the market. However, their influence relative to Energy Trust's program was unknown. *The research conducted to-date suggests that the influence of additional market influences is not insignificant, but their relative influence is difficult to discern from Energy Trust's program without additional research, and may not be possible to defensibly discern at all.*

Thus, Navigant recommends assessing the merits of continuing to evaluate the MEF 2.0+ market, in light of 1) confirmation that the market dynamics are too complex to build a simple case for market transformation, 2) a lack of strong evidence for market transformation after reviewing the available secondary literature and conducting retailer interviews, and 3) the high penetration of Hi-E RCW nationally suggesting that even if Energy Trust was responsible for transforming some portion of the market, the savings are not likely to be significant. Instead, Navigant recommends wrapping up this phase of the Hi-E RCW analysis, moving on to the next phase for MEF 2.2+, and preparing to address the federal standard change.

V. Estimate Baseline Hi-E Clothes Washer Market Share

To determine what the market share for RCW with MEF 2.0+ would have been in Oregon without the presence of Energy Trust's program, Navigant chose to look for national market share data on high

[13] On a scale from 1 to 5, where 1 was "would not have any influence on sales in 2012" and 5 was "would have a great influence on sales in 2012."

efficiency RCW. Although national market share data provides a more conservative (i.e., more efficient) baseline than market share data for regions without any voluntary incentive programs, Navigant chose national data since it seemed to be the most likely source of data available and it mirrored the baseline approach used in NEEA's LTMT reports.

Even at the national level, Navigant found very little sales data broken out by efficiency level for RCW. As noted in Table 3, national market share by efficiency level is available for 2006-2008 from the DOE's Federal Standard Rulemaking Documentation for RCW, as well as anecdotal expectations on the likely trajectory of the RCW market.

If Energy Trust decides to proceed with the analysis, Navigant would develop a baseline using the 2006-2008 national data available from the DOE. Navigant would then extrapolate this data through 2012 by benchmarking against the number of models available for each efficiency level in the California Energy Commission Database over the past several years, and project ahead to 2016 by using the anecdotal expectations provided by Navigant's DOE team (see Table 3). Energy Star market share data from 2011 onward may also be used for the extrapolation, since Energy Trust began promoting RCW with MEF 2.0+ in 2011.

VI. Investigate Energy Trust's Influence on the Federal Standard Change

At the time of this writing, the final rulemaking for the RCW federal standard change scheduled to take effect in 2015 had not been released. As such, Navigant has not yet been able to conduct in-depth research on potential market transformation savings as a result of the federal standard change. To-date, Navigant has reviewed the preliminary rulemaking documentation and discussed its contents with Navigant staff working on this standard through the DOE.

Part of the federal standard change analysis will be understanding NEEA's planned savings claims to avoid claiming overlapping savings. The project team discussed this need at the kick-off meeting and learned the following about NEEA's plans: Because NEEA exited the market after 2007, NEEA does not feel they have justification to claim savings greater than MEF 1.8 and will likely just claim the residual savings after other regional stakeholders have claimed savings. NEEA is debating internally how much this may be; however, in general, NEEA expects to claim 25 percent or less in the region for codes and standards, and perhaps 15 percent or less in the case of clothes washers—which could leave significant regional savings on the table for Energy Trust or others active in the home appliance efficiency market. NEEA agreed to keep Energy Trust informed about NEEA's decision on what to claim from the RCW standard.

VII. Summary and Recommended Next Steps

In summary, the research to-date does not indicate that the market for MEF 2.0+ RCW in Oregon has been transformed by Energy Trust. The research also 1) confirms that the market dynamics are too complex to build a simple case for market transformation, 2) suggests that it would require significant additional effort to defensibly determine Energy Trust's relative influence amongst the many other factors influencing the market, given the lack of reliable and consistent data sources, and 3) suggests that even if Energy Trust was responsible for transforming some portion of the market, the savings are not likely to be significant. Some of the key findings supporting these conclusions are presented here:

- Market share data for RCW sales in Oregon has been difficult to obtain. Residential appliance markets, like the RCW market in Oregon, often involve supply chains where retailers and customers are the primary players; however, distributors and contractors are typically much

easier to interview for aggregate information than retailers and customers, who are more likely to have data sensitivity concerns and may not have information available for only Energy Trust's service territory.

- While Navigant's in-store retailer interviews do not rule out the possibility that Energy Trust has transformed the market, they do suggest that strong, conclusive evidence of Energy Trust influencing the market is unlikely.
- In both Navigant's retailer in-store interviews and PECI's discussions with the retailers, the retailers are largely reporting that the incentive is the primary factor driving their stocking practices.
- Other evidence suggests that many customer purchases may be based more on basic customer appeal for the product than the concerted actions of a market stakeholder.
- The salesperson/retailer is another influence on customer purchases identified. Energy Trust's program *may be* responsible for some of this influence, since Energy Trust provides sales staff training, marketing materials, and incentives that make the Hi-E units more attractive for sales staff to promote. The extent of Energy Trust's influence on the salesperson/retailer, however, cannot be confirmed from the interviews and surveys conducted to-date.
- The research conducted to-date suggests that the influence of additional market influences (e.g., the Oregon tax credit, Energy Star, product design and marketing, inherent differences between more efficient front-loading machines and older top-loading machines, etc.) is not insignificant, but the relative influence of these things is difficult to discern from Energy Trust's program without additional research, and may not be possible to defensibly discern at all.

Thus, Navigant recommends assessing the merits of continuing to evaluate the MEF 2.0+ market. This section proposes different options for moving forward and the steps Energy Trust should take to support future phases of the analysis.

Option #1: Claim no savings for transforming the MEF 2.0+ RCW market.
Given the findings to-date, Navigant's primary recommendation is to wrap up this phase of the Hi-E RCW analysis for MEF 2.0+, claim that no savings beyond incented sales can be conclusively attributed to Energy Trust for transforming the MEF 2.0+ market in Oregon, prepare to address the federal standard change, and begin laying the foundation for the next analysis phase of MEF 2.2+ RCW.

Navigant recommends that Energy Trust finish collecting market share data through PECI from regional retailers (e.g., Sears) to inform the federal standard change analysis and the evaluation of future RCW phases. Once the market share data is received, Navigant also recommends completing a high-level analysis of the data to confirm that the data does not indicate the need for additional market transformation analysis before wrapping up Phase I. If it does, Navigant and Energy Trust would discuss pursuing portions of Option #2 below. Otherwise, Navigant would not plan on conducting any additional interviews for MEF 2.0+ because the qualitative interview results to-date have not provided consistent viewpoints and additional interviews alone are not expected to make a strong enough case without data that quantitatively corroborates market transformation. This will also help avoid unnecessarily straining relationships with the retailers.

This memo documents Navigant's executed research and findings, such that future research on the federal standard change and/or MEF 2.2+ market will not need to duplicate efforts for the MEF 2.0+

market. If Energy Trust decides to discontinue the analysis, this memo may serve as a final report for this phase.

Option #2: Continue assessing market transformation savings potential for MEF 2.0+ RCW.
If Energy Trust wishes to continue pursuing market transformation savings for the MEF 2.0+ RCW market, Navigant recommends the following steps:

- Establish that the Hi-E market share is, in fact, higher than the baseline market share by identifying the Hi-E market share in Oregon and comparing it to the Hi-E baseline market share nationally.
- If this criteria can be established, conduct interviews with regional retailers to help verify the in-store retailers' qualitative assessments of market influences, additional interviews with in-store retailers (e.g., Sears), or both to further investigate the purchasing drivers for the customer.
- To more conclusively determine the relative influence of the ODOE tax credit versus the Energy Trust incentive, Navigant recommends:
    - Interview market actors at the regional level about the influence of the tax credit to bolster findings from the in-store retailers.
    - Talk to ODOE and Energy Trust staff about when each organization began promoting MEF 2.0+ units because data provided by each organization suggests that ODOE began promoting these more efficient units first. However, it is difficult to tell for sure from the data provided.
- Develop a baseline market share estimate using the 2006-2008 national data available from the DOE. Navigant would then extrapolate this data through 2012 by benchmarking against the number of models available for each efficiency level in the California Energy Commission Database over the past several years, and project ahead to 2016 by using the anecdotal expectations provided by Navigant's DOE team (see Table 3). Energy Star market share data from 2011 onward may also be used for the extrapolation, since Energy Trust began promoting RCW with MEF 2.0+ in 2011.
- Leverage this memo for the final report.

The actions listed below are additional steps that Energy Trust should consider for <u>either</u> option:

- Apply a phased approach to independently evaluate the MEF 2.0+, MEF 2.2+, and MEF 2.46+ RCW efficiency tiers, as discussed in Section II and Appendix C. This approach mirrors the approach used in NEEA's ACE model and LTMT reports.
- As noted above, residential clothes washers and other appliances (e.g., refrigerators) represent difficult markets for sales data collection by efficiency level, since the data collection largely must occur through either in-store retailers who have a very local view of the market and are unlikely to track sales data by efficiency level, or regional retailers who may not be able to disaggregate data by region or willing to provide sensitive data, rather than contractors or distributors who often have a more regionally-focused view. Furthermore, in the case of residential clothes washers, no publicly available sources exist on market share for higher efficiency models. To compensate for this, Navigant recommends the following:
    - Work with PECI to request market share data for residential clothes washers and other appliances from regional retailers, where available, on a regular basis.
    - NEEA is currently working on a Residential Building Stock Assessment (RBSA), and anticipates having raw data available by Q2 2012 (Q3 2012 at the latest) and a draft or final report available by Q3 2012. The RBSA might help determine sales of RCW in the region by efficiency level by matching the model numbers and washer age

collected to MEF.[14] This dataset may be used as a "check" going forward in future phases or to extrapolate the 2006-2008 baseline market share data from the DOE, if no other baseline data becomes available.

- Review the federal standard rulemaking documentation, when it becomes available, for additional data on national market share of Hi-E RCW.

- Prepare for the federal standard change analysis by collecting the market share data from PECI and coordinating with NEEA when the rulemaking documentation becomes available to avoid overlapping their savings claims.

[14] Communications with NEEA staff, Clothes Washer Market Transformation Kick-Off Meeting, September 13, 2011.

Appendix A: Bibliography for Sources Reviewed to Estimate Hi-E and Baseline Clothes Washer Market Share

Table 6. Bibliography for Sources Reviewed to Estimate Hi-E and Baseline Clothes Washer Market Share

Source	Reference
AHAM	Association of Home Appliance Manufacturers, 2004-2010 "Distributor Sales by State.xls", http://www.aham.org/. Baker, Nick, interview by Barrett Mooney. *AHAM Manager, Communications & Membership* (11 2011). Notini, Jill, interview by Barrett Mooney. *AHAM Vice President, Communications and Marketing* (11 2011).
Appliance Magazine	*Appliance Magazine.com.* 2012. http://www.appliancemagazine.com/whitepaper/index.php (accessed 12 2011).
Consortium for Energy Efficiency (CEE)	Consortium for Energy Efficiency, Inc. *CEE Clothes Washer Qualifying Product List.* 2000-2011. http://www.cee1.org/resid/seha/rwsh/rwsh-main.php3 (accessed 10 2011). Shel Feldman Management Consulting, Research Into Action, Inc., XENERGY, Inc. *The Residential Clothes Washer Initiative: A Case Study of the Contributions of a Collaborative Effort to Transform a Market.* Boston, MA: Consortium for Energy Efficiency, 2001.
D&R International	Representative, D&R International, interview by Barrett Mooney. *Sales Associate* (11 2011).
Discussions with Navigant's DOE team	Phone and email communications with Timothy Sutherland and Judith Reich, Navigant Consulting, Inc., September and December 2011.
Discussions with PECI	Phone and email communications with Shauna Richardson and Elizabeth Freeman, PECI, Ongoing.
DOE Federal Standard Rulemaking Documentation	AHAM Data Submission, Document #EERE-2008-BT-STD-0019-0027, http://www.regulations.gov/#!documentDetail;D=EERE-2008-BT-STD-0019-0027. AHAM Data Submission, Document #EERE-2008-BT-STD-0019-0029, http://www.regulations.gov/#!documentDetail;D=EERE-2008-BT-STD-0019-0029.
Energy Star	U.S. Environmental Protection Agency Energy Star. *National Awareness of ENERGY STAR for 2008.* Washington, D.C.: U.S. EPA, 2008. U.S. Environmental Protection Agency, Energy Star. *EnergyStar Resources for Appliance Manufacturers and Retailers.* http://www.energystar.gov/index.cfm?c=manuf_res.pt_appliances (accessed 10 2011). U.S. Environmental Protection Energy Star. *Market Impact Analysis of Potential Changes to the ENERGY STAR Criteria for Clothes Washers.* Washington, D.C.: US EPA, 2004.
Energy Trust Fast Feedback Results	Energy Trust of Oregon, "Fast Feedback Results: Q1 2011," Prepared by Sarah Castor, June 2, 2011. Energy Trust of Oregon, "Fast Feedback Program Rollout: Nonresidential & Residential Program Portfolio," Prepared by Research Into Action, Inc., December 31, 2010.
NEEA ACE model	"Energy Star Washer ACE Model V2.xlsx", Provided by Ted Light, Energy Trust of Oregon, September 14, 2011.
NEEA *Long Term Monitoring and*	Northwest Energy Efficiency Alliance. *Long Term Monitoring and Tracking Report on 2009 Activities*. Prepared by: Navigant Consulting, Inc. Report #

Source	Reference
Tracking	E10-218. October 26, 2010. Northwest Energy Efficiency Alliance. *Long Term Monitoring and Tracking Report on 2007 Activities*. Prepared by: Summit Blue Consulting, Inc. May 28, 2008.
NEEA's MPERs	KEMA, Inc. . *ENERGY STAR Consumer Products Market Progress Evaluation Report.* #E05-151, Portland, OR: Northweast Energy Efficiency Alliance, 2005. KEMA, Inc. *ENERGY STAR Consumer Products Program Market Progress Evaluation Report.* #07-174, Portland, OR: Northwest Energy Efficiency Alliance, 2007. KEMA, Inc. *EnergyStar Consumer Products Program Market Progress Evaluation Report.* #E06-156, Portland, OR: Northwest Energy Efficinecy Alliance, 2006.
NPD	Phone and email communications with Aaron Heffron, The NPD Group, Inc., October 2011.
ODOE Tax Credit Data (RETC)	"RetcCW_ETO2008_Sep2011.xlsx", Provided by Ted Light, Energy Trust of Oregon, October 22, 2011.
Regional Technical Forum (RTF) Deemed RCW Savings Methodology	Email communications with Ryan Firestone, Navigant Consulting, Inc., October 2011. (Lead on a RCW measure assessment for BPA conducted in 2010 and presented to the RTF. The RTF now uses this methodology for their deemed RCW savings.)

Appendix B: Characterization of the Market and Per-Unit Savings

Navigant completed preliminary research on the per-unit savings rate to be used in the analysis and domestic hot water (DHW) and dryer fuel type breakdown amongst customers on Energy Trust's service territory. Navigant and Energy Trust discussed developing bottom-up per-unit savings assumptions as part of this project, but decided against this approach since identifying the appropriate per-unit savings during each year of the program would have required work beyond the scope of the current contract. This work may be worthwhile investigating further in the future. The fuel type breakdowns are needed to apply the appropriate fuel-specific per-unit savings rates. The results of this research are summarized below in Table 7.

Table 7. Sources Reviewed on Per-Unit Savings and Fuel Type Breakdowns

Source	Description of Available Data	Useable in the Analysis?
Per-Unit Savings		
Energy Trust Program Data	Energy Trust's program savings each year by efficiency tier and fuel type breakdown, as well as the total number of program units each year. Best available data source without significant additional research.	Yes, divide program savings by total units each year to get the average per-unit savings.
RTF Savings[15]	Baseline of 1.92 MEF, based on weighted AHAM data from 2009 and extrapolated to 2010. Energy Trust recommends not using this as the baseline.	No
Energy Trust Blessing Memos[16]	Data on per-unit savings and baseline for per-unit savings assumed each year of the program.	Yes, to track to assumed baseline for each year of the program.
Fuel Type Breakdowns[17]		
Energy Trust Resource Assessment	DHW fuel type split from surveys with selected utilities. 43% electric and 57% gas.	Yes, averaged with the Energy Trust's program data (below)
Energy Trust RCW Program Tracking System	DHW fuel type split amongst participating customers. 41% electric and 59% gas.	Yes, averaged with the data from the Resource Assessment (above)
Energy Trust Blessing Memos	Dryer fuel type split assumptions.	Yes

The following relates discussion between Navigant and Energy Trust to characterize the aspects of the RCW market for MEF 2.0+ that should be considered in the analysis:

- Include both retrofit and new construction programs in the analysis.
- Do not need to consider cost effectiveness for this program.
- Do not need to consider multi-family (MF) homes, since they make up a small portion of the program units and essentially represent a different market segment:

[15] "ResClothesWashersSF_FY10v2_0.xls", Available from: http://www.nwcouncil.org/energy/rtf/measures/res/ResClothesWashersSF_FY10v2_0.xls. Discussions with Paul Sklar, Energy Trust of Oregon, October 11, 2011.

[16] "2008_bencost_tiered_incentive_strategy.xls", "071203 fg & mb bless 2 tiers.doc", "v2_ETO_CEC_clotheswashers2010.xlsx", "101119 ps fg update res clothes wash mf and merge categories.mht", Provided by Paul Sklar, Energy Trust of Oregon, October 11, 2011.

[17] Email communications with Ted Light, Energy Trust of Oregon, November 22, 2011.

    - The Energy Trust Program Manager says that most stores are aware that units are occasionally purchased for MF buildings and lets them go through the program.
    - The MF market likely uses different outreach/distribution channels (e.g., distributors), so separate analysis would be required.
    - May need to consider in the federal standard change analysis.
- Include water savings if the information is readily available.
- The following have not been specifically promoted through the Energy Trust's RCW program to-date:
    - Top- versus front-loaders
    - Water Factor (WF)
    - Low income program

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Appendix C: Supporting Tables

Table 8. Timeline for Modified Energy Factors (MEF) Promoted by Programs and Standards

Entity	Efficiency Level/Program	2004	2005	2006	2007	2008	2009	2010	2011
Department of Energy	Front-Loaders	1.04+			1.26+				1.26+
Energy Star	Front-Loaders	1.42+			1.72+		1.80+*		2.00+
CEE	Tier 1			1.42-1.59	1.80-1.99				2.00-2.19
	Tier 2			1.60-1.79	2.00-2.19				2.20-2.39
	Tier 3			1.80+	2.20+				2.40+
NEEA	Consumer Products	1.80 - 1.99							
ODOE	Tier 1	1.42-1.59		1.60-1.79					
	Tier 2	1.60-1.79		1.80-1.99	2.00-2.19				
	Tier 3	1.80+		2.00+	2.20+				
Energy Trust	Tier 1	1.26-1.79	1.80+	1.80+	1.80-1.99	2.00-2.19			2.20-2.45
	Tier 2	1.80+			2.00+	2.20+			2.46+

Sources:
Department of Energy:
http://www1.eere.energy.gov/buildings/appliance_standards/residential/clothes_washers_support_stakeholder_negotiations.html
Energy Star: http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW
CEE: http://www.cee1.org/resid/seha/rwsh/rwsh-main.php3
NEEA: Email and phone conversations with Rob Russell, Northwest Energy Efficiency Alliance, October 2011.
ODOE: "CWMEF_WF_2006.xls", Provided by Ted Light, Energy Trust of Oregon, October 19, 2011.
Energy Trust: Email communications with Ted Light and Pete Catching, Energy Trust of Oregon, October 2011.

Table 9. Sample Analysis Demonstrating a Phased Approach for Applying RCW Savings by Efficiency Tier*

Input		Calculation	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Number of High-Efficiency RCW Units by Efficiency Tier**												
A	Phase I (MEF 2.0+)		10	20	30	40	50	60	70	80	90	100
B	Phase II (MEF 2.2+)		5	10	15	20	25	30	35	40	45	50
C	Phase III (MEF 2.46+)		1	2	3	4	5	6	7	8	9	10
Per-Unit Savings by Efficiency Tier												
D	MEF 2.0+ (baseline = MEF 1.6)		100 kWh/yr									
E	MEF 2.2+ (baseline = MEF 1.6)		150 kWh/yr									
F	MEF 2.46+ (baseline = MEF 1.6)		200 kWh/yr									
Incremental Savings by Efficiency Tier												
G	Between MEF 2.0+ and MEF 2.2+	[E – D]	50 kWh/yr									
H	Between MEF 2.2+ and MEF 2.46+	[F – E]	50 kWh/yr									
Total Savings Applied to High-Efficiency RCW Units												
I	Phase I (MEF 2.0+)	[A x D]	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
J	Phase II (MEF 2.2+)	[B x G]	250	500	750	1000	1250	1500	1750	2000	2250	2500
K	Phase III (MEF 2.46+)	[C x H]	50	100	150	200	250	300	350	400	450	500
L	**Phases I-III**	**[I + J + K]**	**1300**	**2600**	**3900**	**5200**	**6500**	**7800**	**9100**	**10400**	**11700**	**13000**

* Numbers presented here are meant for illustration only and are not representative of real results.
** This sample approach is intended to show how per-units savings could be appropriately applied using a phased approach to avoid double-counting savings. The Number of High-Efficiency RCW Units by efficiency tier presented here is meant to illustrate how the per-unit savings in a phased approach would be applied to the number of Hi-E, Hi-E Baseline, and Hi-E Program units identified using the market share analysis discussed above in this memo. Thus, the market transformation savings attributed to Energy Trust for each phase would be the (Number of Hi-E Units – Number of Hi-E Baseline Units – Number of Energy Trust Hi-E Program Units) x Total Savings Applied to High-Efficiency RCW Units for each phase.

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Appendix D: Retailer Interview Guide

INTRODUCTION

1. What is your current job title?

   _____

   [FOR INTERVIEWER USE ONLY] Interviewee's role most closely aligns with a:

   a. General manager

   b. Sales person

   Comments:

2. How long have you been with your current company?

   _____

3. Do you work for just this location or multiple locations?

   a. Just this location

      i. What is the address for this location? [verify] _____
      _____

      _____

   b. Multiple locations

      i. Please identify the locations or region: _____
      _____

      _____

4. **[If Q1 = a]** Do you know approximately what percentage of your company's residential clothes washer sales your location(s) serve(s)? _____

   [If response is 'ballpark', please note how confident the respondent seemed in their response:]

   _____

5. **[If Q1 = a]** Do you know approximately what percentage of the residential clothes washer market share in Oregon your company serves? _____

   [If response is 'ballpark', please note how confident the respondent seemed in their response:]

   _____

   [READ THE FOLLOWING:]

For the remainder of the interview, we would like to ask you questions about **high efficiency residential clothes washer sales in Oregon**.[18] For the purpose of this interview, **we define "high efficiency" as having a Modified Energy Factor (or MEF) of 2.0 or greater**.

6. In general, are you familiar with which clothes washer models have an efficiency of "MEF 2.0 or greater"?

    a. Yes – Please think of these models when asked the following questions about "high efficiency" clothes washers.

    b. No

    Comments:

7. **[If Q6 = b, then ask:]** Clothes washers with MEF 2.0 or greater represent clothes washers that qualified for an Energy Trust of Oregon incentive between 2007 and 2010. In general, are you familiar with clothes washers that qualify for these incentives?

    a. Yes – Please think of these models when asked the following questions about "high efficiency" clothes washers.

    b. No – [If no, thank the respondent and request to speak to a different person at the company.]

    Comments:

[READ THE FOLLOWING:]

Please note that Energy Trust stopped promoting residential clothes washers with MEF 2.00-2.19 last year. However, we would like to discuss the market for washers with MEF 2.0 and greater to help Energy Trust determine the effects of their program dating back to 2007 and going forward. Do you have any questions on this before we begin?

FOR ALL INTERVIEWEES

8. In general, how much have each of the following factors influenced your company's sales of high efficiency clothes washers?

    Please indicate if you are familiar with each factor and how influential you think each factor is, on a scale of 1 to 5, where 1 is "did not have any influence on your company's sales" and 5 is "had a great influence on your company's sales."

#	Factor	Are you familiar? (Y/N)	1	2	3	4	5	N/A
a.	Energy Trust's program							
b.	Oregon Residential Energy tax credit							
c.	Energy Star qualified product							
d.	Information from manufacturers or distributors							
e.	Customer demand							

[18] We are ***not*** interested in coin-operated clothes washer sales.

f.	Other _____							

Comments:

9. **How influential would you say the Energy Trust's ***training for your sales staff*** has been on increasing sales of high efficiency clothes washers?

   Please indicate your answer on a scale of 1 to 5, where 1 is "did not have any influence on increasing sales" and 5 is "had a great influence on increasing sales."

   1 2 3 4 5 N/A Don't know

   Comments:

10. **How influential would you say the Energy Trust's ***marketing materials for customers*** have been on increasing sales of high efficiency clothes washers?

    Please indicate your answer on a scale of 1 to 5, where 1 is "did not have any influence on increasing sales" and 5 is "had a great influence on increasing sales."

    1 2 3 4 5 N/A Don't know

    Comments:

11. **How influential would you say the Energy Trust's ***incentive*** has been on increasing sales of high efficiency clothes washers?

    Please indicate your answer on a scale of 1 to 5, where 1 is "did not have any influence on increasing sales" and 5 is "had a great influence on increasing sales."

    1 2 3 4 5 N/A Don't know

    Comments:

FOR SALES REPS ONLY

12. To approximately what percentage of your customers in 2011 did you market or mention Energy Trust's incentive program for residential clothes washers?

    a. _____ [fill in percent]
    b. Refused
    c. Don't know

13. To approximately what percentage of your customers in 2011 did you market or mention the Oregon Residential Energy Tax Credit for residential clothes washers?

    a. _____ [fill in percent]
    b. Refused
    c. Don't Know

[READ THE FOLLOWING:]

I would like you to estimate the portion of clothes washers you sold between 2007 and 2011 with MEF 2.0 or greater. Since this information can be difficult to provide over the phone, may I email you one short table to fill out after this call?

[Get appropriate email address, if not already provided:]

Email: _____

14. What percentage of units sold in Oregon had a **MEF of 2.0 or greater** each year?

Efficiency Category	2007	2008	2009	2010	2011 to date
MEF 2.0+					

15. **Do you expect sales of residential clothes washers with ***MEF 2.0 or greater*** to increase, decrease, or stay the same in Oregon in 2012?

    a. Increase

    Why? _____

    b. Decrease

    Why? _____

    c. Stay the same

16. **How influential is the Energy Trust's program on your projection for sales of residential clothes washers with MEF 2.0 or greater to **[increase/decrease/stay the same]** in Oregon in 2012?

    Please indicate your answer on a scale of 1 to 5, where 1 is "will not have any influence on sales in 2012" and 5 is "will have a great influence on sales in 2012."

    1 2 3 4 5 N/A Don't know

    Comments:

17. ** **[Skip if Q8b indicates "Not familiar with the tax credits"]** The Oregon Residential Energy Tax Credit will change at the end of 2011 and may no longer include appliances. How influential do you think this change of the tax credit would likely be on your sales of high efficiency residential clothes washers in 2012?

    Please indicate your answer on a scale of 1 to 5, where 1 is "would not have any influence on sales in 2012" and 5 is "would have a great influence on sales in 2012."

    1 2 3 4 5 N/A Don't know

    Comments:

18. Do you have a good sense for the portion of your sales above MEF 2.2 and/or MEF 2.46?

    a. Yes

    b. No

19. **[If Q17 = a]** What percentage of units sold in Oregon had a **MEF of 2.2 or greater** each year? **MEF of 2.46 or greater**?

Efficiency Category	2007	2008	2009	2010	2011 to date
MEF 2.2-2.45					
MEF 2.46+					

20. Do you expect sales of high efficiency residential clothes washers to increase, decrease, or stay the same in Oregon in 2012?

    d. Increase

       Why? _____

    e. Decrease

       Why? _____

    f. Stay the same

21. How influential is the Energy Trust's program on your projection for sales of high efficiency residential clothes washers to **[increase/decrease/stay the same]** in Oregon in 2012?

    Please indicate your answer on a scale of 1 to 5, where 1 is "will not have any influence on sales in 2012" and 5 is "will have a great influence on sales in 2012."

    1 2 3 4 5 N/A Don't know

    Comments:

22. ** **[Skip if Q8b indicates "Not familiar with the tax credits"]** The Oregon Residential Energy Tax Credit will change at the end of 2011 and may no longer include appliances. How influential do you think this change of the tax credit would likely be on your sales of high efficiency residential clothes washers in 2012?

    Please indicate your answer on a scale of 1 to 5, where 1 is "would not have any influence on sales in 2012" and 5 is "would have a great influence on sales in 2012."

    1 2 3 4 5 N/A Don't know

    Comments:

23. How influential has the Energy Trust's program been on your stocking practices, in general?

    Please indicate your answer on a scale of 1 to 5, where 1 is "no influence on our stocking practices" and 5 is "great influence on our stocking practices."

    1 2 3 4 5 N/A Don't know

    Comments:

24. Do you think Energy Trust has influenced the high efficiency clothes washer market in Oregon beyond the Energy Trust's program? Why or why not?

    a. Yes

    b. No

    c. Refused

    Comments:

25. **Are you aware that the federal energy efficiency standard for residential clothes washers is scheduled to change in 2015?

    a. Yes

    b. No

    c. Refused

26. ** **[If Q22 = a]** How influential do you think this upcoming federal standard change will likely be on your stocking practices?

    Please indicate your answer on a scale of 1 to 5, where 1 is "will likely not have any influence on our stocking practices" and 5 is "will likely have a great influence on our stocking practices."

    1 2 3 4 5 N/A Don't know

    Comments:

CLOSING

27. Is there a single factor that you think has been most influential on your sales of high efficiency clothes washers? If so, what was that factor?

    a. Yes: _____

    b. No single factor

    Comments:

28. Is there anything else that I didn't ask, but should have, about this topic? [open-ended]

29. If I have any additional questions as I'm reviewing my notes, would it be OK if I contacted you again for clarification? Would you prefer phone or email?

    [Get appropriate phone number and/or email address, if not already provided:]

    Phone: _____

    Email: _____

Appendix E: List of Interviewees

Table 10. List of Retail Stores in Oregon Interviewed

Retail Store	Store Location
Home Depot	Oregon City
Kelly's Home Center	Salem
Lowes	Tigard
Riegelmann's	Gresham
Standard TV & Appliance	Portland and Beaverton
West Coast Appliance	Central Point

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Memorandum

Appendix F: Recommendation for Appliance Sales Data Collection Format

The table below is a suggested format for collecting appliance sales data from retailers for market transformation evaluation. The Efficiency tiers should represent appropriate and meaningful appliance-specific efficiency level and should align with Energy Trust's programs. Clothes washer efficiency levels are included here as examples.

Table 11. Appliance Sales in Energy Trust's Service Territory by Year and Efficiency

Retail Sales	Efficiency	Units	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012*
			(*where available*)									
Efficiency Tier 1 (Baseline) Sales	*MEF <2.0*	units/yr or % of total sales/yr										
Efficiency Tier 2 Sales	*MEF 2.0-2.19*	units/yr or % of total sales/yr										
Efficiency Tier 3 Sales	*MEF 2.2-2.45*	units/yr or % of total sales/yr										
Efficiency Tier 4 Sales	*MEF 2.46+*	units/yr or % of total sales/yr										
Total Sales	**All**	**units/yr**										
Estimated Market Share**	**All**	**% of market/yr**										
Provide a description of the region this data applies to (e.g., Energy Trust's service territory, all of Oregon, etc.):												

*Please provide estimated sales for 2012
**This is the market share for your total sales as a percent of all sales in Energy Trust's service territory

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Appendix G: Framework for Standards Attribution

The text below describes the role of state and regional efficiency organizations in transforming markets by accelerating the adoption and/or increasing the efficiency level of standards changes. This framework was developed by the Energy Trust of Oregon, the Northwest Energy Efficiency Alliance, and Navigant Consulting, Inc.[19] to guide market transformation evaluation, specifically relating to efficiency standards, although components of the framework apply more broadly to market transformation evaluation in general.

Key question: Was the organization a *material* contributor to a *critical* collective action that led to a *substantive* state or federal decision on the level and/or timing of a new standard adoption?

The bar regarding whether the contribution of the individual organization was *material* or not includes:

- Was the organization "in from the beginning" or at least early enough to have influence on important stakeholders, for example, by bringing data to the table that changes fundamental assumptions?
- Did the organization take a leadership position to support critical elements of the national coordinated action, i.e. did the organization really help make the outcome happen?
- Did the organization contribute by providing a proportionate or better share of the logic/information/credibility/etc that led to the substantive state or federal decision?
- Would the collective action been less effective in leading to a meaningful decision if the organization had NOT been at the table?

The bar regarding what constitutes a *substantive* state or federal decision:

Without the collective action, the standards action would NOT have occurred when it did and/or at the level it was passed. [Note: The counter-argument regarding what would have happened in the absence of the organization and/or the collective action would arguably represent the 'baseline' situation for a standard adoption.]

[19] This version of the framework is based on a version sent by Kevin Cooney on April 25, 2012 and should be regarded as a draft.