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Process Evaluation of Avista's 2014-2015 Energy Efficiency Programs

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1 Executive Summary

Nexant Inc. and Research Into Action (collectively the evaluation team) conducted an impact and process evaluation of Avista's 2014-2015 residential and nonresidential energy efficiency programs. This report documents findings from the process evaluation activities. The main purpose of the process evaluation was to identify any improvements needed at the portfolio level to increase program effectiveness and efficiency. The evaluation team conducted the evaluation by reviewing program data and through interviews and surveys with various market actors. Table 1-1 lists the data collection activities and key topics covered by each data source.

Table 1-1: Overview of Data Collection Activities

Data Source (Sample by sector)	Type	When	Analytic Techniques	Key Topics
Staff (16; 4 nonres. and 12 res.)	Interview	Feb. 2015, & Oct. 2015	Qualitative, thematic	▪ Program goals and processes ▪ Communication and coordination ▪ Data tracking ▪ Future program opportunities ▪ Outreach
Implementers (7; 1 nonres. and 6 res.)	Interview	Oct. 2015	Qualitative, thematic	
Contractors (82; 29 nonres. and 53 res.)	Survey	Aug. 2015, Oct. 2015	Quantitative, univariate and bivariate frequencies	▪ Program awareness ▪ Satisfaction ▪ Motivations to participate ▪ EE Sales practices ▪ Net-to-Gross
Participants (680; 305 nonres. and 339 res.)	Survey	May 2015 – Feb. 2016	Quantitative, univariate and bivariate frequencies	▪ Program awareness ▪ Satisfaction ▪ Program experience ▪ Net-to-Gross ▪ Commercial uptake of Simple Steps products
Nonparticipants (140; 70 nonres. and 70 res.)	Survey	Oct. – Nov. 2015	Quantitative, univariate and bivariate frequencies	▪ Program awareness ▪ Experience with EE ▪ Commercial uptake of Simple Steps products ▪ Spillover
Retailers (27)	Survey	Jan. 2016	Quantitative	▪ Commercial uptake of Simple Steps products
Small Business staff and implementer (2)	Interview	December 2015	Qualitative, thematic	▪ Program goals and requirements ▪ Communication and coordination ▪ Marketing ▪ Implementation
Small Business installers (2)	Interview	December 2015	Qualitative, thematic	▪ Role in outreach ▪ Data collection and reporting ▪ Challenges and barriers to participation ▪ Implementation successes
Small Business participants (34)	Survey	January 2016	Quantitative, univariate and bivariate frequencies	▪ Program experience ▪ Satisfaction ▪ Future EE plans ▪ Business characteristics
Database analysis	Database review	Feb. 2015 – April 2016	Quantitative	▪ Identify participation patterns ▪ Number of repeat participants ▪ Assess HER+rebate savings

The 2014-2015 evaluation shows high levels of program awareness among all of Avista's customers and shows high levels of satisfaction among program participants and contractors. Program participants and contractors were complementary of Avista staff and generally appreciated the opportunities to save money, save energy, and improve their properties that the programs provide. The evaluation also shows that there are areas the programs could enhance to make them better able to respond to the ever changing market conditions in which these programs operate.

The results of the process evaluation identified the following key findings, organized by sector and by theme. Conclusions and recommendations follow the key findings.

1.1 Nonresidential Key Findings

1.1.1 Program Participation, Awareness and Involvement

- **Program participation declined over the last few years, especially in lighting.** The change to a T8 baseline lowered incentives available for T12 upgrades negatively effecting participation.
- **The Energy Smart Grocer market may need to be expanded to boost participation.** Staff reported that Energy Smart Grocer has seen diminished savings over the last few years due to the market getting saturated. Program staff is seeking new markets, such as restaurants and other food service establishments, to boost participation but that segment alone may not singularly compensate for the savings decline.
- Contractors play a notable role in the acquisition of projects, the implementation of projects, and in informing customers about rebates. More than half of contractors reported they play a key role in initiating upgrades and communicating rebate opportunities to customers. Customer's awareness of the program through contractors was associated with an increased likelihood of program participation, and contractors appear to be playing a larger role in preparing applications than in years past.

1.1.2 Influences on Customers Decision Making

- **Having a corporate culture that prioritizes energy savings appears associated with current participation.** Participants are twice as likely as nonparticipants to report having an energy saving policy or practice in place.
- Survey results show that saving money, improving operations and maintenance, and improving the comfort of facilities are key motivators to participation. Contractors and participants report that saving money motivates customers to participate. According to contractors, improving operations and maintenance also was an important motive of customers. There is also some evidence that improving the comfort of one's building is an important motivation for participants that implemented a gas project.

1.1.3 Program Experience

- **Participants were largely satisfied with Avista's programs.** The large majority of participants reported high levels of satisfaction with program elements such as the time it took to apply, the variety of equipment available, and the quality of the products received. A minority of participants could not rate their satisfaction with their project's energy savings so soon after project completion.
- **Contractors and participants reported high satisfaction with their interactions with program staff.** Most participants sought assistance from staff regarding their application compared to any other topics.
- **Contractors are not engaged or knowledgeable about Avista's marketing efforts.** Among contractors, the quality, and quantity of Avista's marketing received lower satisfaction scores than any other program element.

- **Contractors value Avista's rebates but there is an opportunity to use the programs to train contractors.** Contractors reported they value Avista's rebates to help them sell jobs and push customers to install more efficient equipment.

1.1.4 Opportunities for Increasing Program Participation

- **Planned equipment upgrades create opportunities for continued program-related savings.** Almost a third of nonparticipants reported they will make an upgrade in the next two years that could involve an efficiency upgrade, and the majority of those reported they would make a lighting upgrade.

1.1.5 Commercial Uptake of Simple Steps Measures

- **Customers are installing Simple Steps items in commercial buildings.** Survey results show that between 5 and 12% of Simple Steps CFLs and about 12% of Simple Steps LEDs are purchased for implementation in commercial properties.

1.1.6 Small Business Key Findings

- **The program is running smoothly.** The program is meeting its overall goals for measure installation and savings and there were no reports of any systemic problems with interval communication or administration.
- **There is an opportunity to improve the efficiency of small businesses, particularly in the lighting area**. Program data shows and installers reported ample opportunity in the market to replace T12s. More than a third of 2015 participants had T12 fixtures.
- **Staff and participants reported high levels of satisfaction with the measures and services provided by the program**. Very few participants reported removing any of the installed measures on their own, however the impact evaluation activities did find that a relatively significant number of participants surveyed did remove on their own at a later time.
- **The outreach model of the program provides Avista with an opportunity to develop relationships with their customers and engage customers about other program opportunities**. Installers often tell participants about energy saving actions they could take outside of the scope of the program. Most upgrade recommendations pertained to lighting and about a third of participants said they plan on making a lighting upgrade in the next year.

1.2 Residential Key Findings

1.2.1 Program Delivery

- **Although rebate programs are running smoothly, there is an opportunity to engage contractors more with Avista's programs.** Avista primarily interacts with contractors when contractors call to request information on behalf of their customers. Avista does not currently offer any formal training for contractors on the rebate programs, and Avista staff only occasionally visit contractor offices to hand out rebate information, the only face-to-face outreach activity reported by program staff.

- **Rebates are an effective sales tool for contractors.** Most contractors agreed that they always tell customers about rebates and that the rebates help them sell more energy efficient equipment and services to their customers, a finding that is supported by Avista staff.
- **Simple Steps, Smart Savings, Opower Home Energy Reports, and Low-income are running smoothly.** There were no reports of systemic problems with recruitment, communication, and implementation. Challenges encountered mainly revolved around customer databases. For example, smaller retailers in the Simple Steps, Smart Savings program struggle with reporting sales data because they lack a sophisticated reporting system that larger retailers typically have and Opower was unable to send Home Energy reports for about six months in 2015 when Avista changed its customer billing system in January/February 2015.

1.2.2 Awareness and Familiarity with Avista's programs

- **Contractors were aware and familiar with Avista's programs.** More than three-quarters of residential contractors reported completing projects that received Avista rebates for at least the past five years. Contractors also spent considerable time working on Avista-rebated projects.
- **Avista's marketing efforts are working in generating customer awareness.** The source of program awareness among customers is consistent with Avista's marketing activities. Of the nonparticipants who were aware of Avista incentives (41% of the sample), about half (45%) reported learning about Avista's rebate programs through channels Avista used for outreach.
- **Participants highlighted the importance of contractors in advertising Avista's programs.** Contractors were the main source of awareness for participants. Awareness through a contractor was greater than any other source and was by far the greatest predictor of program participation.
- **Awareness of other Avista programs among participants varied.** Fewer than half of surveyed participants were familiar with other energy efficiency rebate opportunities from Avista (besides the program in which they had participated) and this varied by program. Highest awareness was among Water Heat and Fuel Efficiency participants and lowest among ENERGY STAR Homes participants.

1.2.3 Program Experience

- **Participants were satisfied with the rebate programs.** More than four-fifths (84%) of surveyed participants reported their overall satisfaction with their Avista rebate program experience as being either "very" or "completely" satisfied.
- **Contractors satisfaction with the rebate programs varied.** Most (80-85%) contractors reported being satisfied with the length of time needed to complete the paperwork and range of qualifying products. The majority (67%) were satisfied with Avista website and about half (54%) reported being satisfied with the rebate amounts.
- **Contractors are unfamiliar with Avista's marketing efforts.** Contractors provided the lowest satisfaction ratings on the marketing aspects of the rebate programs. About one-tenth (11%) indicated they were dissatisfied with the amount of Avista's marketing and

nearly one-tenth (9%) noted they were dissatisfied with the quality of marketing. However, in their follow-up comments, these contractors indicated they were largely unaware of Avista's marketing efforts or only saw the materials sporadically, indicating that contractors may be more unfamiliar with Avista's marketing of the rebate programs than they are dissatisfied.

- **Nearly all rebate participants found program-related information clear.** A majority of participants reported that program-related information (e.g., website or rebate form) was clear on how to apply for a rebate, which equipment qualified for a rebate, expected energy savings of program eligible equipment, and who to contact if any issues arose. Program materials were less clear about the quality assurance process and regarding which equipment or items qualified for rebates for Shell participants than for other program participants.
- **Both participants and nonparticipants expressed interest in receiving additional information on Avista's program offers.** About three-quarters (77%) of participants and more than half (59%) of nonparticipants reported being interested in receiving energy-saving and/or program information from Avista.
- **Home Energy Reports can be effective at engaging customers and motivating them to take action** such as participating in Avista's rebate programs, such as the Fuel Efficiency program. These findings validate Avista's strategy to promote the rebate programs via the home energy reports.

1.2.4 Motivations and Barriers to Participation

- Top three motivations for participating in Avista's rebate programs were: increased comfort, saving energy, and saving money. Between 83-88% of participants reported these three motivations for participation.
- Up-front cost was the most frequently cited barrier to completing an energy efficiency upgrade by nonparticipants. This indicates an importance of offering an incentive to customers for home improvement projects.
- **The second most frequently cited barrier was living in a rental property.** Nonparticipants reported that living in a rental property prohibits them from making improvements to their home. Demographic analysis revealed that 27% of surveyed nonparticipants and 3% of surveyed participants were renters.

1.2.5 Participation Trends

- **Participation in Avista's residential rebate programs increased in the last two years.** The number of rebates declined sharply from 2010 to 2013, and then increased by 51% from 2013 to 2014 and by 43% from 2014 to 2015. Note that the evaluation team only examined the number of rebates for these six measures: 1) ENERGY STAR appliances, 2) shell, 3) HVAC, 4) fuel conversions (or Fuel Efficiency program), 5) water heater, and 6) ENERGY STAR Homes measures. Shell measure rebates, in particular, increased by 507% from 2013 to 2014. The decline in the overall number of rebates examined from 2010 to 2013 was related to the discontinued rebates for appliance measures, which accounted for 17,332 of the total decline of 23,453 measures.

1.2.6 Future Opportunities

- Program delivery actors suggested that ductless heat pumps, water heating measures, and plug load technologies could be an opportunity for Avista. Contractors provided suggestions for additional equipment they would like rebated through the programs, and ductless heat pumps and hot water saving measures were the most commonly cited. The CLEAResult representative listed several technologies that Avista could consider if they wanted to add measure to the program: advanced power strips, new lighting controls, water heaters, and ductless heat pumps.
- **An Opower representative suggested several customer engagement program opportunities:** 1) adding a monthly email report on top of the mail report; 2) alerting customers of their bills (if high); 3) offering customers a "points and rewards" option where they can collect points based on how much energy they save and redeem those points for a gift card; and 4) targeting small and medium businesses or low-income customers with the reports.
- **The Community Action Partners who deliver the low-income program for Avista also provided several suggestions:** 1) offering more in-depth education about saving energy such as offering a class to customers; 2) providing more funds for safety and health measures; 3) providing some funding for renewable measures.

1.3 Conclusions and Recommendations

The evaluation team concluded the following and provides several suggestions for Avista's programs. This section begins with conclusions and recommendations pertinent across all programs (cross-cutting), followed by nonresidential and small business, and ending with residential specific conclusions and recommendations.

1.3.1 Cross-cutting

Conclusion 1: Contractors are key program partners.

Contractors are the driving force of Avista's rebate programs, as they inform both nonresidential and residential consumers about Avista's rebate opportunities and convince them to purchase qualifying equipment. The nonresidential contractors also initiate a notable portion of work in comparison to customer-initiated jobs and appear to be playing a larger role in application preparation than in years past. Both nonresidential and residential customers report being highly satisfied with contractors and are taking into account contractor's recommendations on what to install.

Recommendations: Increase support for contractors.

Consider the following suggestions to continue strengthening relationships with contractors and to improve their effectiveness in generating program savings:

1. Offer an opt-in mailing list to contractors. Contractors subscribed to this mailing list would receive regular information on program offers, changes, trainings, and other program supporting information. This list would be open to any interested contractor.

2. Promote outreach to contractors: Encourage program staff and account executives to engage further with contractors by continuing and perhaps increasing their involvement with contractor-related resources such as the Northwest Lighting Network. This work can further educate contractors and nudge them to cross-promote the rebate programs to their customers. Additionally, training may help contractors' up-sell high efficiency equipment through the program by improving their understanding of and ability to sell high efficiency solutions. Therefore, Avista should continue to support contractors attending NEEA's training sessions including their recently launched comprehensive training for lighting contractors and distributors.

3. Share effective messaging or marketing collateral with contractors. Contractors could support program and marketing staff by providing insights into how to best target certain customer types, learn from Avista on how to better target certain customer segments, and possibly promote cross-program referrals and participation. As findings from the evaluation show that most contractors specialize in the nonresidential or residential sectors, even if they serve both, developing sector-specific messaging may be particularly effective.

4. Investigate offering cooperative (co-op) marketing. Co-op marketing can help contractors effectively market the program consistent with Avista's objectives and increase customer perceptions of contractor's credibility and cross-promote other programs.

Conclusion 2: Avista and its implementation contractors deliver rebate programs efficiently, and promoting the programs further could help maintain or even increase participation.

Several indicators suggest program promotions could be optimized. First, participants and nonparticipants expressed high interest in learning more about Avista's rebate programs, indicating that although they may be aware of Avista's offers, their knowledge is limited. Second, a majority of residential participants who indicated learning primarily about Avista's offers through contractors were not aware of other program opportunities outside the program they participated in.

Recommendation: Develop more abilities to target marketing. For example, cross-promote programs to recent participants by acknowledging their recent participation and informing them of other program opportunities applicable to their home or business.

Recommendation: For residential customers, continue improving messaging in direct mail promotions to better communicate program information since residential customers prefer to receive this information via mail.

1.3.2 Nonresidential, Including Small Business

Conclusion 3: Although declining participation rates could threaten Avista's ability to achieve long-term goals, evaluation results point to opportunities to drive additional savings.

Developing new strategies to encourage deeper savings or increased participation will be paramount to reversing the decline in participation and achieving long-term savings goals. Almost one-third of nonparticipants reported they will make a building upgrade in the next two years, indicating a continued potential for program participation. In particular, evidence suggests that much opportunity remains for converting lighting from T12s.

Recommendation: Develop a marketing approach specifically targeting replacement of T12 lamps.

The switch to a T8 baseline in 2012 had a dramatic effect on participation because the rebates became far less attractive to customers to upgrade from T12s.[1] While it may not be feasible for Avista to alter the baseline for T12 change-outs, Avista should look into developing targeted marketing strategies for convincing nonresidential customers with T12s to replace them with more efficient lighting, focusing not only on savings but improved lighting quality and performance. Avista could begin by targeting businesses that the Small Business Program has identified as still having T12s.

Recommendation: Work with nonresidential lighting contractors to promote replacement of T12 lamps.

Contractors make their living by selling equipment. Avista should work with nonresidential lighting contractors to make sure they are fully aware of the advantages that more efficient lighting (including the reduced wattage tube lighting that NEEA is targeting through its Reduced Wattage Lamp Replacement Initiative) offers their customers.

Recommendation: Consider claiming Simple Steps savings for bulbs purchased for the nonresidential sector.

The evaluation found that about 12% of Simple Steps LED sales and somewhere from 5% to 12% of Simple Steps CFL sales go to nonresidential customers. The mean hours of use for such lighting is much higher in a nonresidential than residential settings, meaning that the total Simple Steps savings is potentially higher than currently estimated, and at a minimum, Avista should consider claiming the additional savings for these purchases.

1.3.3 Residential

Conclusion 4: Participation in the Avista rebate programs has rebounded since 2013 driven by a fivefold increase in shell program participation.

[1] A very similar thing happened to another program administrator in Missouri. See Ameren Missouri BizSavers Process Evaluation Report 2015.

Rebate program participation reached a low point in 2013, after which participation increased year over year by 51% from 2013 to 2014 and by 43% from 2014 to 2015. This is a positive sign; however, maintaining or increasing program participation requires cost effective savings opportunities for residential customers. Avista's residential programs operate in a fast-changing market. Consumers are adopting LEDs rapidly, [2] retailers are transitioning away from CFLs to LEDs,[3] and the federal government and regulators are mandating higher efficiency standards for bulbs and other energy efficient technologies.[4] The convergence of these forces has implications for the cost effectiveness of Avista's downstream rebate programs. Program administrators throughout the United States are exploring and testing alternative program designs such as upstream and midstream designs in response to the evolving market. Although Avista is currently participating in the Simple Steps, Smart Savings program (a midstream program), when asked about future opportunities, program staff did not mention any upcoming pilots or programs that apply these types of designs.

Recommendation: Continue regularly reviewing the expected savings and cost-effectiveness of the measures in residential portfolio and exploring the benefits and costs of other program designs including upstream and/or midstream designs.
Consider these suggestions:

1. Continue monitoring the technological advances and availability of ductless heat pumps and water heating equipment. Surveyed contractors recommended both of these categories as candidates for inclusion in Avista's programs. NEEA, for example, has been working to promote the savings potential of heat pump water heaters in the Northwest via the Northern Climate Heat Pump Water Heater Specification,[5] and The Northwest Power and Conservation Council has identified both of these measure types as promising technologies in the recently adopted Seventh Power Plan.[6]

2. Explore upstream program opportunities outside of the lighting market. Upstream incentive programs offer the potential to increase the adoption of energy efficient technologies at a lower cost compared to downstream incentive programs. Program administrators in California and elsewhere have successfully tested or used upstream

[2] 1 of 20 A-line bulbs sold nationally was an LED in third quarter of 2014, whereas in the quarter prior to that, it was 1 in 30. This statistic comes from the *2015 LED Market Intelligence* report by Bonneville Power Administration. https://www.bpa.gov/ee/utility/research-archive/documents/momentum-savings-resources/led_market_intelligence_report.pdf

[3] Souza, Kim, 2016. *Walmart to transition lighting products away from compact fluorescent to LED.* Retrieved from http://talkbusiness.net/2016/02/walmart-to-transition-lighting-products-away-from-compact-fluorescent-to-led/

[4] The lighting standard, established by the Energy Independence and Security Act of 2007, requires that light bulbs use about 25% less energy by 2014. New efficiency heating and cooling standards from the U.S. Department of Energy, which have gone into effect Jan. 1, 2015, will increase the efficiency of heating, ventilation, and air-conditioning (HVAC) equipment in certain regions.

[5] http://neea.org/northernclimatespec/

[6] http://www.nwcouncil.org/energy/powerplan/7/plan/

program designs for technologies that Avista currently incents, including HVAC equipment and water heaters.[7]

Conclusion 5: Residential customers who rent their home are underserved. Nonparticipants say living in a rental property prohibits them from making improvements. This was the second most commonly cited barrier to making energy efficient upgrades among nonparticipants (after the up-front cost barrier). More than a quarter (27%) of nonparticipant survey respondents were renters, whereas only 3% of the participant survey respondents were renters. Renters account for about one-third of the population in Avista territory.[8]

Currently, Avista serves renters via the low-income program. The CAP agencies reported having difficulty serving the low-income renter population because it is difficult to convince landlords to participate. Additionally, there appears to be no multifamily program in the Avista portfolio that could serve this market, although Avista does offer an incentive for a natural gas space and water heating measures to multifamily property owners.

Recommendation: Investigate energy savings opportunities in the rental market. Consider the following suggestions:

1. Estimate the number and distribution of rental units in the single family, manufactured home, and among multifamily buildings. Analyzing these data geographically and by vintage would likely yield insights regarding the energy saving potential in these markets.

2. Conduct needs assessment research with landlords to understand their needs and concerns and explore ways to bolster their willingness to make energy efficiency upgrades on their properties. This research should consider the needs landlords serving low-income renters as well as renters not eligible for the low income program.

3. Conduct needs assessment research with renters to understand their needs and the barriers to participation they face. For example, although some energy savings activities may not be appropriate for renters (for example, HVAC system replacement), other activities such as installing energy efficient lighting and/or advanced power strips could be appropriate.

[7] Quaid, M. and H. Geller (2014). *Upstream Incentive Utility Programs: Experience and Lessons Learned.* Retrieved April 14, 2016. http://www.swenergy.org.

[8] US Census Bureau. "B25003 : Tenure." 2010 – 2014 American Community Survey 5-Year Estimates. Web. 13 April 2016.

2 Introduction

2.1 Purpose of Evaluation

The purpose of the process evaluation was to identify any improvements needed at the portfolio level to increase program effectiveness, efficiency, and identify opportunities for future programs. The process evaluation collected interview and survey data from program staff, implementation contractors, program participants, nonparticipants, contractors, and retailers. Additionally, the evaluation examined program participation data and Opower data.

Table 2-1 summarizes the primary objectives and specific areas for investigation along with the information sources the evaluation team used to investigate them.

Table 2-1: Process Evaluation Objectives and Information Sources

Objective	Program Document Review**	Staff interviews	Implementation Contractor Interviews	Participating Customer Survey	Participating Contractor Survey	Nonpartic-ipating Customer Survey	Retailers
Appropriateness of design, participation procedures, internal communication, rebate processing activities (e.g., ease of use, cycle time)		✓	✓	✓	✓	✓	
Participant satisfaction with programs	✓	*	*	✓	✓		
Barriers to participation, effectiveness of incentives in motivating action		*	*	✓	✓	✓	
Effectiveness of marketing and promotional efforts; status of marketing research activities	✓	✓	✓	✓	✓	✓	
Opportunities for process improvement and potential programs; status of Avista response to previous evaluation recommendations	✓	✓	✓	✓	✓	*	
Obtain data for net-to-gross analysis***				✓	✓	✓	
Understand declining participation rates of programs	✓						
Identify commercial uptake of Simple Steps items				✓		✓	✓
Understand the importance of savings associated with rebated measures and the Home Energy Reports	✓						
Review and update program logic models	✓	✓					

*Supporting information; ** Descriptions; procedures; design docs; application forms; participant records; marketing materials; etc.; *** Net-to-gross results appear in impact report

2.2 Description of Nonresidential Programs

Avista provided incentives and services for its nonresidential electric and gas customers throughout its Washington service territory and nonresidential electric customers in its Idaho service territory in 2014 and 2015.

Avista uses financial incentives and direct installation of efficient measures to encourage its commercial and industrial customers to install energy efficiency equipment. The evaluation team examined three core programs that constitute the bulk of Avista's nonresidential energy efficiency offerings in 2014 and 2015: the Prescriptive, Site Specific, and Energy Smart Grocer programs. In addition, the evaluation team examined Avista's new Small Business program which began in June 2015. Table 2-2 provides a summary of those programs and the sections below provide greater details about each program.

Table 2-2: Key Energy Efficiency Programs

Program	Implementer	Summary
Prescriptive	Avista	Contractors and account managers work with nonresidential customers to identify potential projects, submit paperwork, and process incentive applications.
Site Specific	Avista	Contractors, account managers, and program engineers' work with nonresidential customers to identify potential projects, submit paperwork, and verify project savings in order to process incentives.
Energy Smart Grocer	CLEAResult	Implementer staff conduct outreach to customers with refrigeration equipment (primarily grocery stores) and conduct an energy audit that identifies energy saving projects. If the customer elects to conduct the project(s), implementer staff work with the customer and contractors to install equipment.
Small Business	SBW	Implementer staff provide small business customer's (rate schedule 11) brief property assessments and energy efficiency measures such as LED lighting and faucet aerators.

2.2.1 Prescriptive

Avista's prescriptive program provides incentives and services for the following types of electric- and gas-using equipment.

- Food service equipment
- Commercial clothes washers
- Commercial water heaters
- Lighting
- HVAC
- Building shell (Windows and Insulation)
- Multifamily development
- Motors
- Variable Frequency Drives
- Compressed air leak detectors
- Power management for PC networks

These incentives and services are available to customers who purchase eligible equipment, submit a completed application within 90 days after installation, and provide proof of purchase for all relevant equipment and labor. Customers typically receive their reimbursement about four to six weeks after Avista receives a complete application. Avista reserves the right to inspect the installation before processing the rebate.

2.2.2 Site Specific

Avista provides Site Specific services that include helping customers identify energy saving opportunities and take action to implement those opportunities. Site specific projects may or may not include prescriptive measures but will always include measures specific to a facility. For example, a Site Specific project may include custom controls with prescriptive lighting installed at a given site Eligible measures must have a simple payback less than 15 years and qualify for $.20 per first year kWh saved for electricity and $3 per first year therm saved. Incentives are capped at 70% of the incremental project cost.

2.2.3 Energy Smart Grocer

Grocers, convenience stores, restaurants, and any customers with commercial refrigeration are eligible to participate in the Energy Smart Grocer program. The program, implemented by CLEAResult, provides no-cost assessments of eligible facilities that result in recommendations for prescriptive measures the customer could implement to save energy. Measures include case lighting, controls, refrigerated case gaskets, and motors. Similar to the prescriptive program, the customer must submit an application after the installation and usually wait four to six weeks before receiving their incentive. The customer may opt to release the incentive directly to the installation contractor.

2.2.4 Small Business Program

The Small Business (SB) program is a third-party-administered program that provides customer's energy efficiency opportunities by conducting the following activities.

1. Conduct a brief onsite audit to identify customer opportunities and interest in existing Avista programs,

2. Install appropriate energy-saving measures at each target site, and

3. Provide materials and contact information so that customers are able to follow up with additional energy efficiency measures under existing programs.

Direct-install measures include: faucet aerators, showerheads, pre-rinse spray valves, screw-in LED's, smart strips, CoolerMisers, and VendingMisers. In 2015 the SB program was only available to customers who receive electric service under Rate Schedule 11 in Washington and natural gas service under Rate Schedule 101 in Washington. The program intends to add Schedule 11 Idaho customers in 2016. They did not target Idaho in 2015 because they were waiting to see if Idaho would allow gas saving measures. Schedule 11 customers typically use less than 250,000 kWh per year. The smaller size and the relatively large number of schedule

11/101 customers makes them a notoriously difficult to reach and underserved market segment. SBW Consulting, Inc., based in Bellevue, WA, started program operations in June 2015 and is under contract to deliver the program through May 2017.

2.3 Description of Residential Programs

Avista provided incentives and services for its residential electric and gas customers throughout its Washington service territory and for residential electric customers throughout their Idaho service territory in 2014 and 2015.

Avista uses financial rebates or discounts, reports on energy usage, and direct installation of efficient measures to encourage its residential customers to install energy efficiency equipment. The evaluation team examined eight core programs that constitute the bulk of Avista's residential energy efficiency offerings in 2014 and 2015.Table 2-3 provides a summary of those programs and the sections below provider greater details about each program.

Table 2-3: Residential Program Type and Description

Type	Programs	Implementer	Description
Rebate	Appliance Recycling	JACO	Rebate for recycling fridge or freezer older than 1995. This program was discontinued in June 2015.
	ENERGY STAR® Homes	Avista	Rebate for purchase of ENERGY STAR® home
	Fuel Efficiency	Avista	Rebate for conversion of electric to natural gas furnace and/or water heater
	HVAC Program	Avista	Rebate for purchase of energy efficient and high efficiency HVAC equipment, including variable speed motors, air source heat pump, natural gas furnace and boiler, and smart thermostat
	Shell	Avista	Rebate for adding insulation to attic, walls, and floor, as well as adding energy efficient windows. Rebate for duct sealing, program measure discontinued at end of 2014.
	Water Heater	Avista	Rebate for installation of high efficiency gas or electric water heater, natural gas water heater, and Smart Savings showerhead
Midstream	Simple Steps, Smart Savings	CLEAResult	Direct manufacture discount for purchase of approved CFLs, LEDs (bulbs and fixtures), and low-flow showerheads.
Behavior	Home Energy Reports	Opower	The Opower program generates behavioral savings from a treatment group, which receives Home Energy Reports, which compares the customer's energy usage to similar homes in Avista's service territory.
Low-income	Low-income Programs	Community Action Partners (CAPs)	CAPs within Avista's Washington and Idaho service territories implement the projects. CAPs determine energy-efficiency measure installations based on the results of a home energy audit.

2.3.1 Appliance Recycling

The appliance recycling program ceased operation in June 2015 because it was deemed cost ineffective. Prior to that, the program provided customers a $40 rebate for recycling a refrigerator manufactured before 1995.

2.3.2 ENERGY STAR® Homes

New home buyers can apply for an $800 rebate for an ENERGY STAR® ECO-rated new manufactured home or $1,000 for an ENERGY STAR® stick-built home. The purchaser must submit the application and certification paperwork to Avista within 90 days of occupying the residence.

2.3.3 Fuel Efficiency

Customers interested in switching from electrically fueled heating and water heating equipment to gas fueled equipment are eligible for flat-rate rebates.

2.3.4 Heating, Ventilation, and Air Conditioning (HVAC) Rebates

Avista offers prescriptive rebates for heating equipment such as efficient furnaces or boilers and variable speed motors, and smart thermostats.

2.3.5 Water Heat Rebates

Avista offers prescriptive rebates for electric and gas efficient water heaters and water saving fixtures.

2.3.6 Shell Measures

The Shell program provides prescriptive rebates for shell measures like insulation (attic, wall, and floor), windows, and duct sealing. Contractors generate most of the participants in this program, except for duct sealing participants. Duct sealing is primarily implemented by UCONs, a third party contractor. UCONs offers duct sealing to customers free of charge and is responsible for duct sealing and installation of any other direct install measure that might be part of the agreement with Avista. UCONs duct sealing program ceased operating in 2015.

2.3.7 Simple Steps, Smart Savings

The Simple Steps, Smart Savings program provides discounts to manufacturers to lower the price of efficient light bulbs, light fixtures, showerheads, and appliances. This program, administered by CLEAResult, operates across the Pacific Northwest and utilities are able to select which items they want the price lowered. Avista chose general and special CFLs, LED light fixtures, LED bulbs,[9] and showerheads.

2.3.8 Home Energy Reports

Avista and Opower provide free Home Energy Reports (HERs) to a sample of customers that compares their energy usage to that of similar homes in their area. Using behavioral science, the program encourages customers to save energy and offers those that receive HERs with insights into how they can lower energy use.

2.3.9 Low-Income

Local CAP agencies within Avista's Washington and Idaho service territory implement projects with qualifying low income customers. CAPs assess homes for energy-efficiency measure applicability, combining funding from Avista and state/federal programs to apply appropriate measures to a home, based on the results of a home energy audit. CAPs typically approve the installation of the following measures: shell upgrades (insulation, air-sealing, etc.), duct sealing,

[9] Avista offered LED bulbs in 2014 and the last half of 2015.

refrigerator replacements, fuel conversions, low-cost measures (window plastic or lighting measures), and health and safety measures.

3 Methods

To conduct a process evaluation of Avista's energy efficiency programs, the evaluation team reviewed program data and completed 23 interviews and 902 surveys with market actors. Table 3-1 provides an overview of the data collection activities, including the type of data collection effort and the key topics covered. All interview and survey guides are provided in Appendix C.

Table 3-1: Overview of Data Collection Activities

Data Source (Sample by sector)	Type[a]	When	Analytic Techniques	Key Topics
Staff (16; 4 nonres. and 12 res.)	Interview	Feb. 2015, & Oct. 2015	Qualitative, thematic	▪ Program goals ▪ Program processes ▪ Communication and coordination ▪ Data tracking ▪ Future program opportunities ▪ Outreach
Implementers (7; 1 nonres. and 6 res.)	Interview	Oct. 2015	Qualitative, thematic	
Contractors (82; 29 nonres. and 53 res.)	Survey	Aug. 2015, Oct. 2015	Quantitative, univariate and bivariate frequencies	▪ Program awareness ▪ Satisfaction ▪ Motivations to participate ▪ EE Sales practices ▪ Net-to-Gross
Participants (680; 305 nonres. and 339 res.)	Survey	May 2015 – Feb. 2016	Quantitative, univariate and bivariate frequencies	▪ Program awareness ▪ Satisfaction ▪ Program experience ▪ Freeridership & spillover ▪ Leakage of Simple Steps products into commercial sector
Nonparticipants (140; 70 nonres. and 70 res.)	Survey	Oct. – Nov. 2015	Quantitative, univariate and bivariate frequencies	▪ Program awareness ▪ Experience with EE ▪ Leakage of Simple Steps products into commercial sector ▪ Spillover
Staff and implementer manager (2)	Interview	Dec. 2015	Qualitative, thematic	▪ Program goals ▪ Program requirements ▪ Communication and coordination ▪ Marketing ▪ Implementation
Installers (2)	Interview	Dec. 2015	Qualitative, thematic	▪ Staff background ▪ Role in outreach ▪ Data collection and reporting ▪ Challenges and barriers to participation ▪ Implementation successes
Participants (31)	Survey	Jan. - Feb. 2016	Quantitative, univariate and bivariate frequencies	▪ Program experience ▪ Satisfaction ▪ Future EE plans ▪ Business characteristics

[a] The Nexant survey call center fielded the surveys and Research Into Action staff conducted in-depth interviews.

The sections below provide a brief overview of the sample and methods used to analyze each data source. The evaluation team first provides an overview where data collection methods were the same for both the nonresidential and residential sectors (cross-cutting) followed by nonresidential, residential and special study specific methods.

3.1 Cross-cutting activities

3.1.1 Staff and Implementer Interview Methods

The evaluation team carried out two sets of staff interviews pertaining to the nonresidential and residential portfolios. One, conducted in February 2015, took place in a group setting and included program, engineering, and planning staff. This set of interviews helped the evaluation team better understand the residential and nonresidential programs and provided an opportunity for Avista staff to share questions they had for the evaluation. The evaluation team recorded each group interview, with the interviewees' permission. These interviews typically lasted 90 minutes.

The second set of interviews, conducted in September and October 2015, focused on key Avista staff responsible for nonresidential programs (prescriptive lighting, prescriptive non-lighting, and Site specific), residential programs (rebate programs, Opower HERs, Simple Steps, Smart Savings, and Low-income) marketing, and data management. Additionally, the evaluation team interviewed key implementers including a staff person representing the Energy Smart Grocer program, three implementers representing residential programs, and four Community Action agencies representing implementation staff of Avista's low income programs. Each interview lasted 45 to 60 minutes. Interviews covered topics such as roles and responsibilities, program goals, communication among staff and implementers, program processes, marketing, program changes, and future program opportunities. The evaluation team integrated results from these interviews into the findings sections of this report.

In addition to the staff and implementer interviews conducted as part of the nonresidential and residential portfolios, the team interviewed all staff and installers for the Small Business program. These interviews took place in December 2015 and lasted about 45 to 60 minutes. Interviews covered topics such as goals, future program plans, program implementation, marketing, and key successes and challenges. Results of these interviews are discussed in section 5.3.

3.1.2 Contractor Sample

The evaluation team elected to focus on high-impact contractors – those involved with projects that delivered the most savings in program year 2014 and 2015. In the nonresidential sector that meant interviewing lighting and HVAC contractors. In the residential sector that meant interviewing HVAC and building shell contractors.

Using data assembled by Avista staff, the evaluation team identified 658 unique contractors operating in Avista territory. The evaluation team categorized these contractors as lighting (400), HVAC (89), and Shell (55) contractors. The evaluation team could not classify the

remaining 114 contractors without additional information. Therefore, the evaluation team based the initial sample on the 544 categorized records.

About three-quarters of the way through completing surveys, the evaluation team determined additional sample was necessary to complete HVAC and lighting contractor surveys, particularly in the nonresidential sector. The evaluation team added 75 additional lighting contractors and 14 uncategorized records to the survey sample. Through additional research, we were able to identify these 14 records as likely HVAC contractors (Table 3-2).

Table 3-2: Contractor Population and Sample

	Initial Population	Initial Sample	Additional Sample	Total Sample
HVAC	89	89	14	103
Lighting	400	54	75	129
Shell	55	55	-	55
Uncategorized	114	-	-	-
Total	658	198	89	287

While some contractors likely worked in both the residential and nonresidential sectors, to lower the survey burden, the evaluation team surveyed each contractor about work done in only one of those sectors. The information available in program records did not identify whether a contractor worked primarily in the residential or nonresidential sector. To identify the primary sector served, the survey first asked contractors what percentage of their projects are in each sector. Those who reported completing 50% or more of their projects in the nonresidential sector answered questions about work done in the nonresidential sector and the rest answered questions about work done in the residential sector. A large majority (82%) of the respondents reported doing at least 70% of their work in one sector or the other, indicating a reasonably clear distinction between nonresidential and residential contractors.

As Table 3-3 shows, the evaluation team exceeded the total goal by six interviews. Because fewer contractors specialized in nonresidential work than expected, the evaluation team achieved fewer than the target number of survey completions for that sector.

Table 3-3: Contractor Survey Target and Completions

	Target			Completions		
	Residential	Nonres.	Total	Residential	Nonres.	Total
HVAC	19	19	38	35	8	43
Lighting	-	19	19	-	21	21
Shell	19	-	19	18	-	18
Total	38	38	76	53	29	82

If the distribution of mainly nonresidential and mainly residential contractors is the same in the population as in the survey, then there are about 202 mainly nonresidential contractors and 376 mainly residential contractors in Avista's territory.[10] The 29 nonresidential completions provides 90/14 confidence and precision and the 53 residential completions provides 90/10 confidence and precision in the findings.

The evaluation team interviewed all contractors about the following topics:

- Awareness of Avista energy efficiency programs
- Motivations to participate in programs
- Satisfaction with programs
- Sales practices related to energy efficient equipment

The evaluation team carried out the contractor telephone survey in August and October 2015. The evaluation team analyzed the close-ended data using SPSS and used MS Excel to code all open-ended responses.

3.2 Nonresidential Activities

Nonresidential data collection activities included surveys with participants and nonparticipants. The evaluation team describes each activity below.

3.2.1 Participant Survey Sample and Methods

The participant surveys covered the following process evaluation related topics:

- Awareness of Avista programs and incentives
- Awareness of energy efficient equipment
- Satisfaction with staff interactions, equipment, clarity of information, time needed to participate, and, if relevant, their audit experience.
- Energy efficient policies and practices

The evaluation team administered the survey in phases to provide Avista staff with up-to-date market feedback throughout the evaluation period. The first participant survey occurred in July 2015, capturing data from 2014 and Q1 and Q2 2015 participants. The next survey, conducted in October 2015, captured data from Q3 2015 participants and the last participant survey occurred in January 2016, capturing data from Q4 2015 participants. The evaluation team analyzed all survey data using SPSS and used MS Excel to code all open-end responses. The evaluation team examined responses for differences by state (Washington or Idaho) and year of

[10] The evaluation team assumed the proportion of the sample that is commercially focused, 35%, represents the population than there are 202 commercially focused contractors (.35*578 =202) and 376 (.65*578) residentially focused contractors.

participation (2014 or 2015). The final tally of survey completions provides for 95/5 confidence and precision at the portfolio level.

The evaluation team developed a stratified random sample of participating Avista customers by program and state that included both electric and gas customers. The evaluation team estimated the target completions using assumptions about participation as of January 2015. Actual participation varied from the estimates, resulting in fewer survey completions needed in some program types and more for other program types. Table 3-4 summarizes the targeted and actual number of completions by year, and Table 3-5 shows the distribution of the sample population and survey completes by program.

Table 3-4: Nonresidential Participant Survey Completions by Program Type and Fuel

	Target Survey Completions			Actual Survey Completions		
Program type	2014	2015	Total 2014-2015	2014	2015	Total 2014-2015
Washington/Idaho Electric						
Prescriptive Lighting	32	36	68	40	42	82
Prescriptive Energy Smart Grocer	20	24	44	22	13	35
Prescriptive Non-Lighting Other	12	12	24	14	14	28
Cascade Energy Pilot	-	4	4	-	-	-
Site Specific	40	44	84	46	39	85
Washington Gas						
Prescriptive (Appliance)	5	6	11	1	-	1
Prescriptive (Shell)	12	12	24	15	7	22
HVAC	12	12	24	9	12	21
Food Service	5	6	11	2	8	10
Site Specific	20	23	43	5	16	21
TOTAL	158	180	338	154	151	305

Table 3-5: Population and Completed Sample Distribution by Program

Program name	2014		2015	
	Sample Population*	Survey Completions	Sample Population*	Survey Complete
Food Service	53	12	25	13
HVAC	44	9	83	19
Prescriptive Lighting	180	40	235	42
Water Heat	3	2	1	-
Windows and Insulation	42	16	10	9
Energy Smart Grocer	57	22	20	13
Green Motors	10	2	-	-
Site Specific	101	51	108	55
Standby Generator Block Heater	6	-	-	-
TOTAL	**496**	**154**	**482**	**151**

* Indicates number of participants in which we were able to draw a sample.

3.2.2 Nonparticipant Survey Sample and Methods

The nonparticipant survey covered the following topics related to the process evaluation:

- Awareness of Avista programs
- Recent history of using energy efficient equipment
- Planned upgrades that will use energy efficient equipment
- Energy efficient policies and practices
- Interest in energy efficiency programs

According to data received from Avista, there were 43,848 unique nonparticipant commercial accounts throughout Avista's Washington and Idaho territory in 2015. The evaluation team identified 23,180 unique telephone numbers within the population of accounts, and used that number as a proxy for the size of the population of nonparticipant contacts. To ensure that the survey correctly represented the high- and low-density areas of Washington and Idaho, the evaluation team stratified the random sample on state as well as on population density.[11] The distribution of completed interviews across the four strata closely matched the distribution of the population across the strata (Table 3-6), and the 70 completes provide for 90/10 confidence and precision.

[11] The mean population density is 588 people per zip code. The low-density strata included zip codes with population densities below the mean (588) for all zip codes in Avista territory, and high-density strata included zip codes with population densities greater than or equal to the mean for all zip codes in Avista territory.

Table 3-6: Nonparticipant Nonresidential Population and Survey Completes

	Nonparticipant Population of Unique Contacts		Survey Completes	
	Count	Percent	Count	Percent
Low Population Density - ID	8,741	38%	25	36%
Low Population Density - WA	6,231	27%	18	26%
High Population Density - ID	772	3%	3	4%
High Population Density - WA	7,436	32%	24	34%
TOTAL	**23,180**	**100%**	**70**	**100%**

The evaluation team administered the survey in October and November 2015 and analyzed the data using SPSS for close-ended data and MS Excel to code all open-ended responses. The evaluation team examined responses for differences by state (Washington or Idaho) and year of participation (2014 or 2015).

3.2.3 Small Business Process Evaluation Methods

The primary goal of the Small Business (SB) process evaluation was to assess and provide information on program delivery and implementation and market response to the program. The evaluation focused on program design and theory, implementation and delivery, and market feedback.

The evaluation team evaluated the programs through interviews with pertinent program actors including Avista and third-party implementation staff, auditors/installers, and participants (Table 3-7). Avista engaged the evaluation team to evaluate the SB program after the evaluation of the rest of the program portfolio had begun, and under a separate contract. Therefore, the evaluation team conducted specific staff and implementer interviews for the SB program, separately from other staff and implementer interviews. The SB-specific interviews are described in this section rather than in Section 3.1.1, above, as they are not cross-cutting.

Table 3-7: Overview of Small Business Data Collection Activities

Source (Sample)	Type	When	Analytic Techniques	Key Topics
Staff and implementer manager (2)	Interview	Dec. 2015	Qualitative, thematic	▪ Program goals ▪ Program requirements ▪ Communication and coordination ▪ Marketing ▪ Implementation
Installers (2)	Interview	Dec. 2015	Qualitative, thematic	▪ Staff background ▪ Role in outreach ▪ Data collection and reporting ▪ Challenges and barriers to participation ▪ Implementation successes
Participants (34)	Survey	Jan. - Feb. 2016	Quantitative, univariate and bivariate frequencies	▪ Program experience ▪ Satisfaction ▪ Future EE plans ▪ Business characteristics

Of the 1,181 SB participants in the program database, 35 had received audits but did not have any measures installed, leaving 1,146 with measures. Of those, 344 had phone numbers. The distribution of those with phone numbers did not differ noticeably from the population in terms of measures received or location; therefore, the evaluation team concluded that sampling from those with phone numbers would not bias the sample in terms of those key variables. Assuming a response rate of about 15%, the evaluation team selected a random sample of 200 from the list of 344 participants with phone numbers.

The evaluation team randomized the sample and called businesses in the random order. To ensure that the completed survey covered all the areas in which the program was active, the evaluation team set quotas by location (North Washington, South Washington, and Spokane) to ensure that distribution of survey completions across the three areas would be similar to the distribution of the participant population across those areas.

The evaluation team exceeded its assumed response rate, achieving a 32% response rate, and was able to complete the survey after calling the first 105 businesses in the sample. Table 3-8 shows the disposition of the entire sample.

Table 3-8: Disposition Summary

	Count	Percent of Sample Attempted
Complete	34	32%
Refusal	6	6%
Not reached	63	60%
Left job	1	1%
Bad number	1	1%
Sampled businesses called	105	100%
Sample businesses not called	95	-
TOTAL	**200**	**-**

The completed sample closely matched the participant population on the three locations in which the program was active (Table 3-9). As the table shows, the sample also included a greater percentage of lighting, water-saving, and non-lighting power-saving measures than the participant population.[12]

Table 3-9: Distribution of Population, Sample, and Completed Sample

	Population (*n* = 1,013)		Sample (*n* = 200)		Complete (*n* = 34)	
	Count	Percent	Count	Percent	Count	Percent
Location						
North Washington	156	15%	17	9%	7	20%
South Washington	160	16%	28	14%	6	17%
Spokane	697	69%	155	78%	21	62%
Measure Type						
Any lighting	303	30%	76	38%	15	44%
Any water saving	949	94%	193	97%	34	100%
Any non-lighting, power-saving	320	32%	71	36%	18	53%

The completed sample achieved at least 14% precision at 90% confidence.

3.3 Residential Activities

Residential data collection activities included surveys with participants and nonparticipants. The participant and nonparticipant surveys covered the following process evaluation related topics:

- Awareness of Avista programs and rebates

[12] This is because it had a higher percentage of participants with multiple measures than did the population.

- Motivations and barriers to participation
- Program experience, if participants
- Attitudes toward Energy Use and Conservation
- Purchases of energy efficient products

The evaluation team received 2014 and 2015 residential customer account data from Avista that identified rebate and appliance recycling participants and all other residential customers (nonparticipants). The data contained: 1) measures installed/recycled and the rebate received for program participants; 2) geographic location (ID or WA); 3) utility services (gas, electric, or both); and 4) contact information.[13] The 2014 and 2015 data included approximately 480,000 residential customers, containing a total of 7,505 participants in 2014 and 11,620 participants in 2015.

To facilitate the evaluation team's evaluation of the residential lighting program, Simple Steps, Smart Savings, and the residential behavior program administered by Opower, the evaluation team included survey questions asking respondents whether they purchased discounted products from participating retailers or received Home Energy Reports or HERs to identify possible participants in these two programs.

The evaluation team developed a stratified random sample of rebate/appliance recycling participants and nonparticipants. The evaluation team stratified the participant sample by year of participation (2014 or 2015) and state (WA or ID). Nonparticipant sample was stratified by state (WA or ID) and urban area (whether living in urban or rural zip codes). Both samples included electric and gas Avista customers. Table 3-10 summarizes the number of participant and nonparticipant completes by state and year.

Table 3-10: Sample Distribution for Residential Program Participants and Nonparticipants

State	2014 Participants		2015 Participants		Nonparticipants	
	Population	Sample	Population	Sample *	Total	Sample
ID	1,143	29	1,823	59	160,455	23
WA	6,362	124	9,797	127	319,370	47
TOTAL	**7,505**	**153**	**11,620**	**186**	**479,825**	**70**

* 67 interviewed in Quarter 1 (Q1) of 2015, 53 interviewed in Q2, 46 interviewed in Q3, and 20 interviewed in Q4 of 2015.

The evaluation team also monitored the status of the participant survey to ensure the relevant programs and measures were represented in the survey responses. The evaluation team exceeded the target samples for all programs except the WA gas water heat and ENERGY STAR Homes programs (Table 3-11).

[13] The evaluation team received contact information for the sample only.

Table 3-11: Residential Participant Surveys

Residential Program	Target Completes			Actual Completes		
	2014	2015	Total	2014	2015	Total
Washington/Idaho Electric						
Appliance Recycling	34	36	70	35	37	72
HVAC	32	36	68	32	36	68
Water Heat	5	8	13	5	8	13
ENERGY STAR Homes	7	8	15	11	5	16
Fuel Efficiency	5	20	25	5	20	25
Shell	12	12	24	13	15	28
Washington Gas						
Water Heat	5	8	13	5	6	11
ENERGY STAR Homes	5	8	13	1	10	11
HVAC	22	24	46	24	24	48
SHELL	22	24	46	22	25	47
TOTAL	**149**	**184**	**333**	**153**	**186**	**339**

3.4 Special Studies Activities

The evaluation team conducted several special studies as part of the evaluation. This section provides a brief description of the methods used for each activity. Details about the methods used for the declining participation rates and participation rates among Opower participants are provided in sections 7.1 and 7.2.

3.4.1 Declining Participation Rates

The 2012-2013 process evaluation report[14] noted that program participation rates based on the number of rebated measures have declined since 2010. The 2012-2013 process evaluation report also suggested that one explanation for the decline in participation was fewer measures offered through the programs and the reduced incentive amounts that Avista offered in response to declining avoided costs. The evaluation team examined the list of rebated measures in both nonresidential and residential 2010-2015 program databases to assess the potential impact of the fewer rebated measures and the reduced incentive amounts on participation.

[14] Avista 2012-2013 Process Evaluation Report, May 15, 2014, Cadmus.

3.4.2 Participation Rates Among Opower Behavioral Program Participants and Nonparticipants

Understanding the importance of savings associated with rebated measures and the Opower Behavioral Program (Home Energy Reports (HER) program) will enable Avista to better understand the extent of induced behavioral savings not attributed to rebated measures and the rebated measure portion of the savings. The evaluation team used residential customer data and program participant's data to conduct this analysis.

3.4.3 Commercial Uptake of Simple Steps Measures Methods

The evaluation team used two methods to estimate the proportion of the CFL and LED markdown measures (Simple Steps measures) going to the residential and nonresidential sectors, respectively. Both methods relied on data collected from the process evaluation. The first approach relied on data from the nonresidential participant and nonparticipant surveys. The second approach relied on a survey of store and department managers at the dominant retailers of Simple Steps items. These following subsections describe these approaches.

3.4.3.1 Nonresidential Customer Surveys

The nonresidential participant (*n*=305) and nonparticipant surveys (*n*=70) asked respondents to estimate the number of light bulbs they purchased for their businesses and if they recalled seeing Simple Steps marketing materials near or on their(See section 3.2 for discussions of the sample frame preparation for participants and nonparticipants). The evaluation team analyzed responses using SPSS and Microsoft Excel®. The evaluation team summed the number of CFL and LED items attributable to Simple Steps separately for participants and nonparticipants.

3.4.3.2 Retail Store Manager Survey

The survey of retail store managers asked respondents to estimate the proportion of sales of Simple Steps measures that went to residential and nonresidential customers. In a previous, similar project, members of the evaluation team determined that the only types of respondents who were able to answer such questions were those from large chain stores like The Home Depot, Costco, and Walmart, which have staff devoted to selling lighting products and/or sell large quantities of incented items.

A review of the Simple Steps sales data in Avista territory showed that those same three retailers accounted for about 90% of sales (Table 3-12); the sample frame thus included the 28 participating stores from those three retailers. It also included the four participating Lowes stores; this chain is similar to the three dominant retailers and sold, on average, many times more units per store than retailers other than Walmart, Costco, and Home Depot. In sum, the sample frame consisted of 32 stores from one of these four retailers.

Table 3-12: Retailer Sales Data in Simple Steps

Retailer	Number of Stores	Total Units Sold	% Of All Units Sold	Mean Units Sold per Store	Included in Sample Frame
Walmart	16	421,376	35%	26,336	Yes
Costco	5	394,185	33%	78,837	Yes
Home Depot	7	266,434	22%	38,062	Yes
Lowes	4	24,046	2%	6,012	Yes
All other stores	102	96,435	8%	945	No
TOTAL	**134**	**1,202,476**	**100%**	**8,974**	**N/A**

The evaluation team surveyed representatives from 27 of the 32 stores and reached all four retailers in January 2016. Surveys took approximately five to 10 minutes to complete. The evaluation team analyzed responses using SPSS and Microsoft Excel®.

3.5 Review of Program Logic Models

The evaluation team updated the existing logic models for the residential and nonresidential programs after speaking with program staff and implementers. Each updated logic model is located in the Appendix B.

4 Nonresidential Process Results

The sections below provide the results of the nonresidential process evaluation of Avista's nonresidential programs. This section begins with an overview of the administration activities of the programs and a summary of challenges staff reported facing with administration of programs. Subsequent sections discuss program awareness, the company culture of market actors, the experience of market actors within the program, and concludes with possible opportunities to increase program participation.

4.1 Program Administration

The evaluation team interviewed the leaders of each nonresidential program covered in this evaluation. The following section describes the key points noted by staff regarding the administration of the program and possible program changes.

Nonresidential program staff and implementers did not report any systemic problems or issues of concern in program implementation. During the mid-year interviews, they all stated that data tracking and reporting was adequate for their needs and all reported smooth internal communications with one another.

Staff noted that Avista changed customer databases between 2014 and 2015 which did cause some anticipated difficulties querying customer records over time. However, this change in databases appeared to be a temporary problem typical of transitioning from one system to another. The change did not negatively affect program staff's ability to carry out their roles. However, the customer database does not provide the capabilities that a customer relationship management tool (CRM) could provide. Marketing staff would like the ability to target customers with messaging about efficiency opportunities and the new database does not offer this capability. According to staff, the ability to develop targets will happen at some unspecified point in the future.

Staff noted the following challenges facing Avista's nonresidential programs and expressed how they plan on meeting those challenges.

- Lighting: The change to a T8 baseline instead of T12 lowered participation because the savings are not as large for a T8 to LED replacement as they were for a T12 to LED replacement. Adding LED replacements for HID fixtures to the list of prescriptive lighting measures is one way the program plans to make the program attractive to potential participants.

  Additionally, the program is considering simplifying its online lighting calculator to improve customer satisfaction with that tool. The revised tool will help customers by providing estimated payback and help them determine whether their project will follow the prescriptive or site specific path. According to staff, this tool could help overcome customer frustration that occurs occasionally when a customer incorrectly submits a

prescriptive application instead of site specific. Staff also noted the tool could provide immediate quality control, making that process less time-intensive for them.

- Energy Smart Grocer: The market appears saturated as the program has delivered less savings each year over the last few years. Staff noted two possible ways to address this problem. 1) Develop deemed savings measures that would make it easier for customers to participate. 2) Encourage more participation among restaurants instead of concentrating on groceries and convenience stores, the programs traditional key participants.
- Site specific: Account executives currently play an important role in marketing the program to customers and contractors. Encouraging additional participation may require new avenues for marketing and outreach and further supporting account executives in their outreach role.

4.2 Program Awareness and Involvement

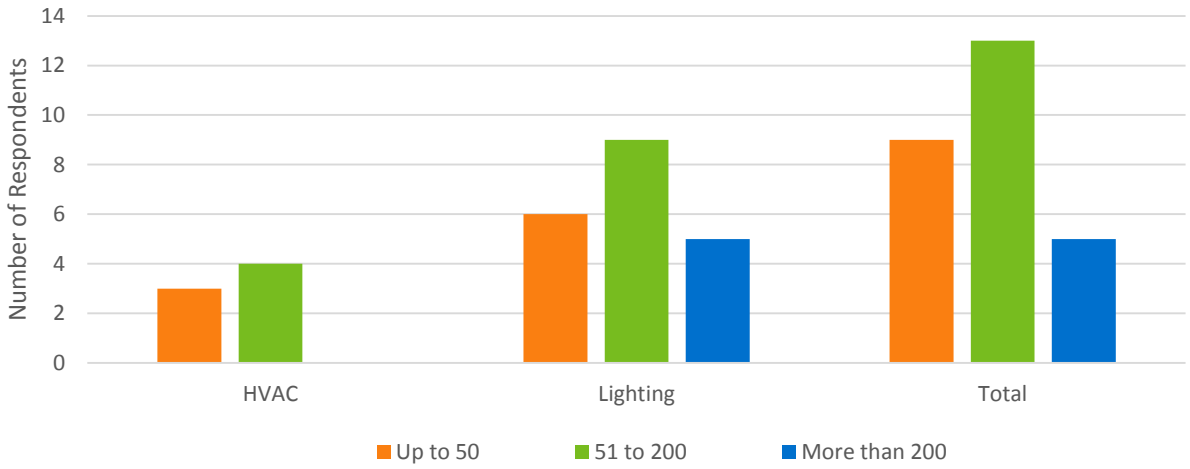
To identify how customers become aware of Avista's programs, the evaluation team asked participants, nonparticipants, and contractors how they learned about programs and about their reasons for participating and not participating. The sections below summarize each group's program awareness and provides some insights into motivations and concerns about program participation.

4.2.1 Contractor Involvement

Most of the 29 nonresidential contractors have been familiar with Avista programs for many years. Twenty-two of the 29 contractors surveyed reported having more than five years of experience implementing Avista-incented jobs. Of the remaining seven, four reported at least four to five years of Avista experience and three reported two to three years of experience.

The nonresidential contractors represented varying levels of activity. As expected, the lighting contractors tended to report doing more projects per year than the HVAC contractors (Figure 4-1).

Figure 4-1: Nonresidential Contractor Activity Level



Twenty-four of the 29 nonresidential contractors surveyed were able to estimate the proportion of their commercial jobs that receive an Avista rebate. The evaluation team found that most of the surveyed contractors' work does not receive Avista rebates, with a mean of only 24% of jobs receiving a rebate. Most (19) respondents reported a quarter or fewer of their jobs receiving an Avista rebate. Of the remaining five respondents, one each reported that 50% and 75% of their work receives rebates and three (two lighting contractors and one HVAC) reported that all of their work receives Avista rebates.

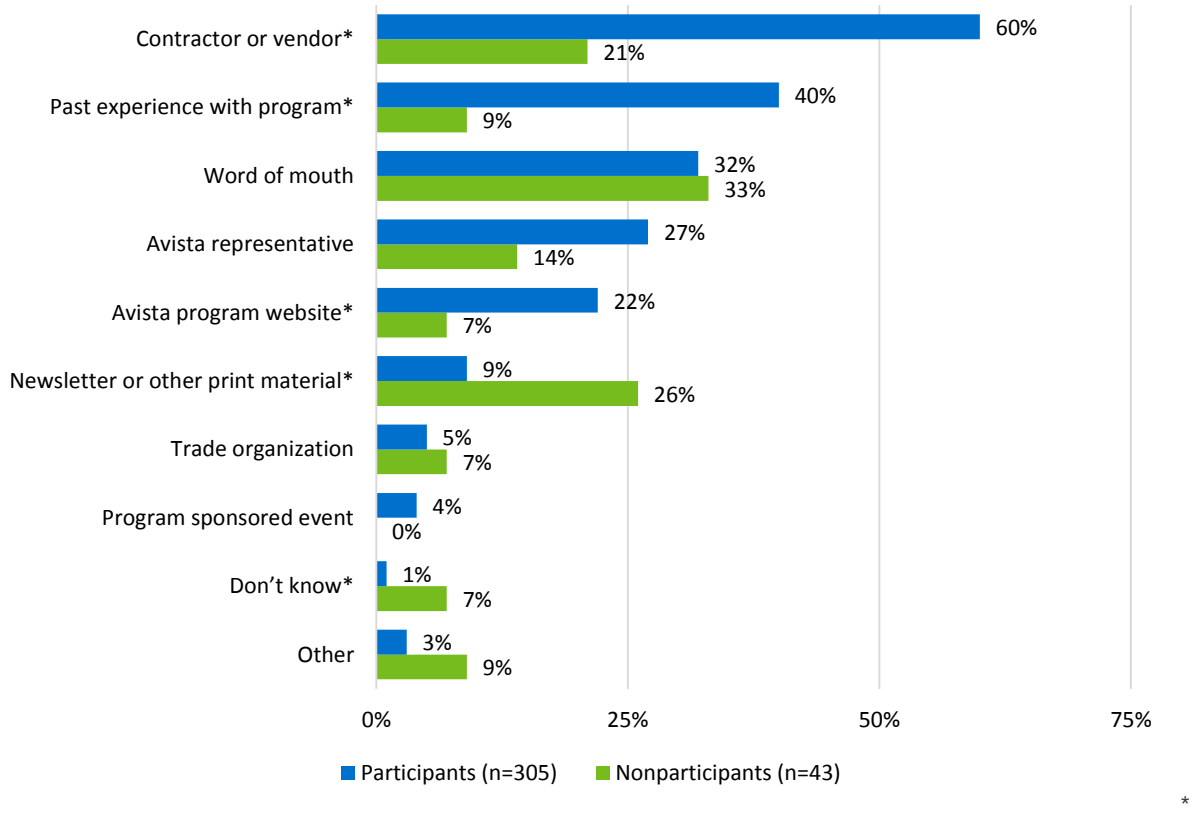
The above findings indicate there is variability in the degree to which contractors are effectively using Avista's program, with some using them very effectively but more of them making little effective use of the programs. Section (4.4.4), below, further explores contractors' role in driving incented upgrades.

4.2.2 Nonresidential Customer Awareness

Nonresidential customers, 305 participants and 70 nonparticipants, were asked how they became aware of Avista's programs. Customers were allowed multiple responses.

Compared to nonparticipants that were aware of the program (*n* = 43), participants were more likely to have heard about the program through a contractor via the program website, and through past program experience. Compared to participants, nonparticipants were more likely to have heard about the program via printed material and other sources of awareness (Figure 4-2).

Figure 4-2: Source of Program Awareness (Multiple Responses Allowed)



*Significant ($p < .05$)

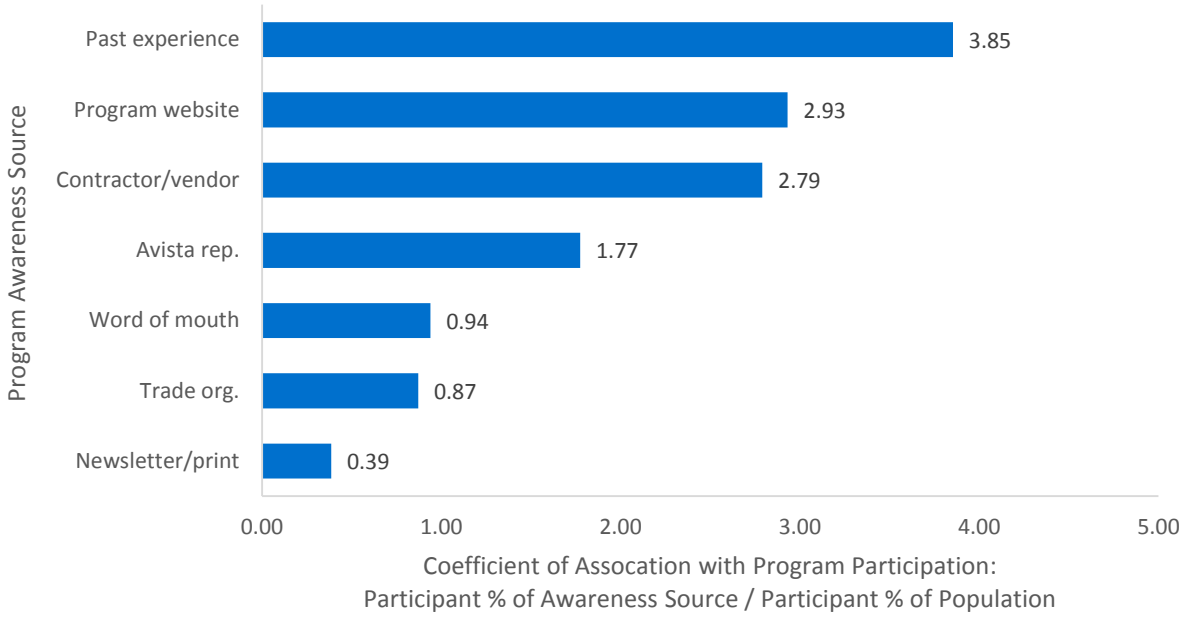
It is difficult to gauge the relative impact of each source of program awareness just by comparing the percentages of participants and nonparticipants that reported a source. For example, a fairly substantial percentage of participants reported word of mouth, but so did nonparticipants, so what does the comparison tell us?

The evaluation team developed a coefficient that better illustrates how strong the association was between each source of awareness and program participation. For each awareness source, the coefficient was the ratio between two percentages: 1) the percentage of participants among those who cited a source of program awareness; and 2) the overall percentage of participants in the population. For any given coefficient, the greater the value, the more strongly that source of awareness predicts program participation.

Figure 4-3 shows the coefficient for each source of awareness for program participants. This shows that awareness through past experience with the program was the greatest predictor of

program participation.[15] More noteworthy perhaps is that awareness through a contractor or vendor was positively associated with program participation, as were awareness through the program website and through an Avista representative. Compared to the overall population, those who learned about the program through past experience are four times more likely to be a participant.

Figure 4-3: Relative Association of Participant Awareness with Participant Population



More than three-fifths of nonparticipants (57% in Idaho, 64% in Washington) reported being familiar with Avista rebates (Table 4-1). Nonparticipants primarily reported familiarity with prescriptive lighting rebates, followed by shell improvement and appliance rebates. They were far less aware of rebates for HVAC, and water heating.

[15] The evaluation team defined program nonparticipants as those who did not participate in 2014 or 2015, but some nonparticipants so defined could have participated in 2013 or earlier. This likely explains why some nonparticipants identified past program experience as their source of program awareness.

Table 4-1: Nonparticipant Awareness of Avista Rebates (*n*= 70, Multiple Responses Allowed)

Rebates Familiar With	Count	Percent
Aware of any rebates	43	61%
Prescriptive Lighting	24	34%
Prescriptive Shell	8	11%
Appliances	7	10%
HVAC Program	4	6%
Motor Controls HVAC	1	1%
Hot water heater	2	3%
Other	3	4%
Don't know	7	10%

Participants and nonparticipants each expressed interest in future program participation. A slightly higher percentage of participants than nonparticipants expressed interest in learning more about efficiency programs and opportunities, but the difference was not statistically significant. Participants were more likely to express interest in attending a workshop or event about efficiency than were nonparticipants; this difference was statistically significant by chi-square ($p < .05$; Table 4-2).

Table 4-2: Interest in Future Participation (Multiple Responses Allowed)

	Nonparticipants (*n* = 70)		Participants (*n* = 305)	
	Count	%	Count	%
Interest in any future participation	47	67%	221	72%
Energy efficiency programs	45	64%	217	71%
Energy savings opportunities	45	64%	215	71%
Workshops or events about energy efficiency*	28	40%	170	56%

* Significant ($p< .05$)

Both nonparticipants and participants expressed interest in receiving Avista program information. While participants indicated they would prefer to receive program information via email over any other method, nonparticipants were almost as likely to want information via US mail (not as part of their bill) and they were more likely than participants to request information via mail (Table 4-3). As an overall percentage, participants and nonparticipants did not differ much in their preference for person-to-person contact. However, participants were more specific than nonparticipants when requesting direct person-to-person contact, reporting five different methods compared to just one for nonparticipants. The 32 participants who indicated a preference for person-to-person contact suggested such contact might occur at a webinar, community event, or training or by telephone – none cited more commonly than others.

Table 4-3: Nonresidential Customer Preferred Method of Receiving Information from Avista (Multiple Responses Allowed)

Preferred Method of Contact	Nonparticipants (*n* = 47)		Participants (*n* = 305)	
	Count	%	Count	%
Email	27	57%	196	64%
By US mail separate from bill insert*	26	55%	72	24%
By US mail via bill insert	16	34%	71	23%
Avista website	5	11%	55	18%
Person-to-person contact	3	6%	32	10%
Through trade associations	-	-	5	2%
Don't know	-	-	7	2%
Other	2	4%	4	1%
Refused to provide contact method	-	-	21	7%

* Significant ($p < .05$)

4.3 Influences on Customers Decision Making

The evaluation investigated several topics relating to customer decision making, their proactivity toward energy efficiency and their motives for investing in efficient equipment.

4.3.1 Energy Practices and Policies

More than half of participants (57%) reported that their company had one or more energy-related policies compared to 40% of nonparticipants; this difference was statistically significant (Chi-square, $p < .05$). The most commonly reported specific practice was having an employee or employees responsible for monitoring or managing energy use, with 44% of participants reporting this practice compared to 17% of nonparticipants. A significant difference between groups also exists for purchasing energy efficient equipment and having energy and carbon related goals (Table 4-4).

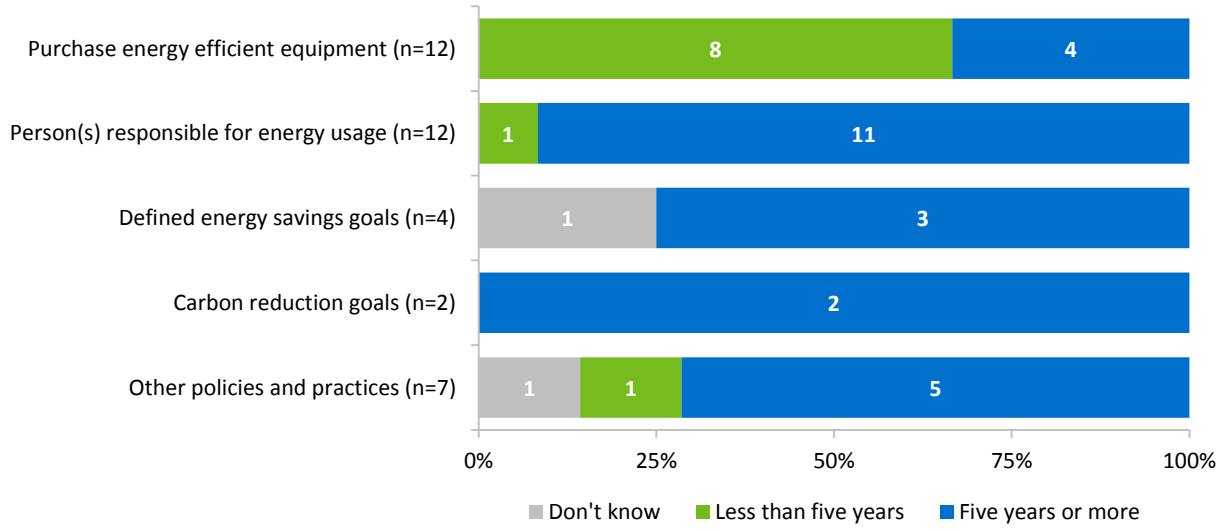
Table 4-4: Energy Savings Policies and Practices

	Nonparticipants (*n* = 70)		Participants (*n* = 305)	
	Count	Percent	Count	Percent
Any policy or practice	28	40%	175	57%
Person(s) responsible for energy use	12	17%	133	44%
Policy requiring energy efficient purchasing	12	17%	92	30%
Defined energy savings goals	4	6%	63	21%
Carbon reduction goals	2	3%	46	15%
Other[a]	7	10%	4	1%
Don't know/Refused	0	0%	2	1%

[a] Among nonparticipants that reported other policies, four reported offering general encouragement to staff on reducing energy, two reported having recycling programs, and one reported replacing current lighting with LEDs

The evaluation team also surveyed nonparticipants about the length of time their energy saving policies and practices were in place. Most nonparticipants who had policies or practices related to energy management reported that they had been in place for five years or more, with the exception of policies related to the purchase of energy efficient equipment (Figure 4-4). Of the 12 nonparticipants who reported awareness of Avista's energy efficiency programs, few indicated that their awareness influenced their companies' decision to implement energy management policies or practice (two or fewer providing a rating of 4 or 5 on a 5-point scale from "not at all influential" to "very influential").

Figure 4-4: Length of Time Energy Related Goals and Policies Have Been In Place at Nonparticipants' Organizations



Another indication of a company culture interested in energy efficiency is having staff with Builder Operator Certification (BOC). One nonparticipant (1% of sample) and 12 participants (4%) reported possessing BOC certification.

4.3.2 Customer Motives

The evaluation team investigated customer motives from the perspectives of both program participants and contractors.

Participants provided many reasons for applying for the program rebate. Topping the list of reasons were to save money and to save energy (Table 4-5). Washington participants were significantly more likely than Idaho participants to say that increasing the comfort of their facility was the reason for participating in a program (67% of WA participants compared to 54% of Idaho participants; $p < .05$).[16]

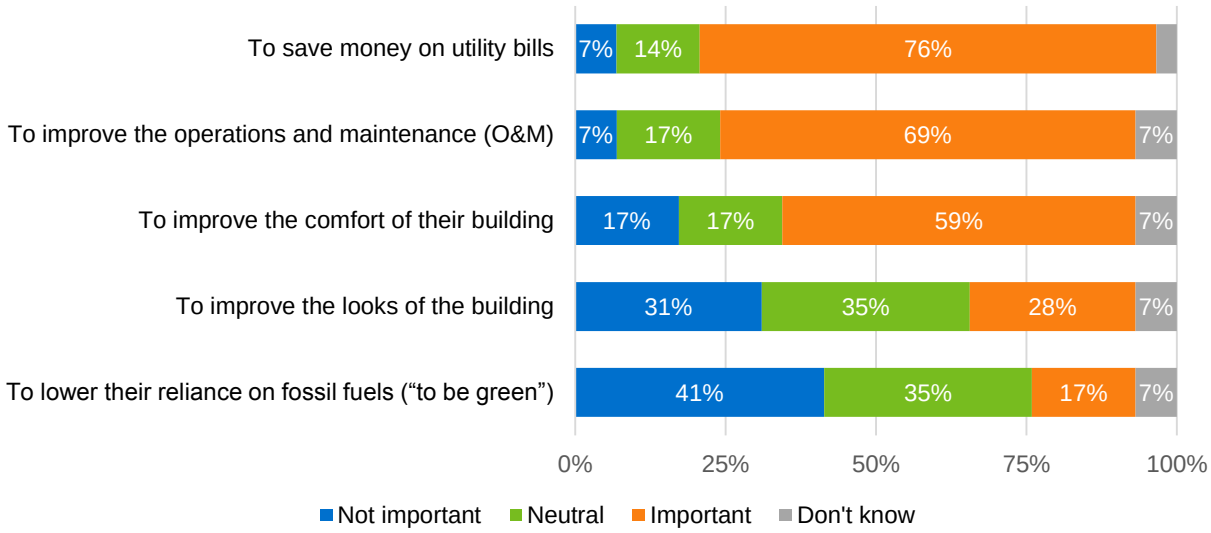
Table 4-5: Reasons for Applying to Program (Multiple Responses Allowed) (*n* = 305)

	Count	Percent
To save money	297	97%
To save energy	290	95%
Seemed easy to use program	217	71%
General trust of Avista programs	199	65%
Increase comfort of facility	193	63%
Good experience with another Avista efficiency program	190	62%
Contractor recommended	180	59%
Obtain high quality equipment	18	6%

Contractors also indicated that customers carry out incented jobs largely to save on their utility bills and to increase comfort levels (Figure 4-5). They also indicated that improving building operations and maintenance is an important motive. Neither contractors nor participants reported that being “green” was an important motive.

[16] We found no statistically significant comparisons for the other seven reasons for applying to the program. To control for Type I error across the eight comparisons, we examined the probability of finding a chi-square result with at least the observed level of statistical significance in the eight comparisons. A goodness-of-fit chi-square was not statistically significant, indicating that the one “significant” effect could have occurred by chance. Nevertheless, we have opted to present this finding as it is possibly meaningful, reflecting the fact that Washington participants, but not Idaho participants, may have had gas-related projects which are more commonly HVAC and comfort-related.

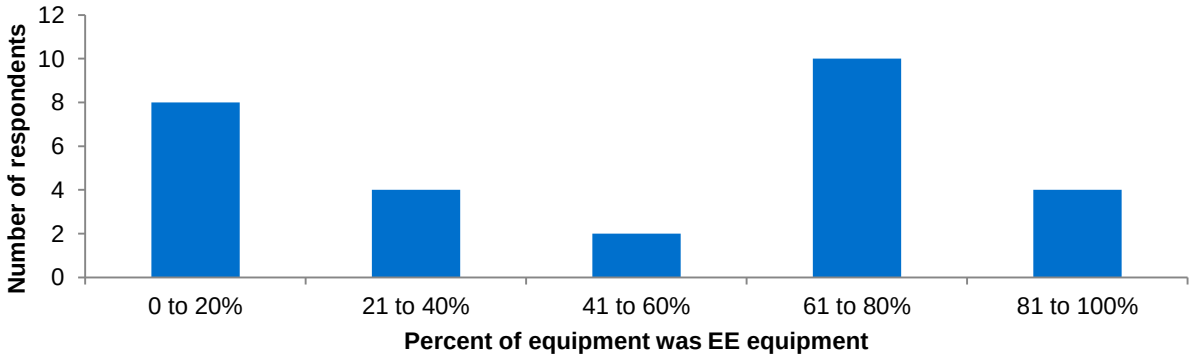
Figure 4-5: Contractor Perspective: Importance of Reasons Nonresidential Customers Implement Avista Energy Efficiency Projects (*n* = 29)



4.3.3 Contractors’ Sales Practices

All but one surveyed contractor reported they did not recall ever discouraging a customer from ordering a high efficiency equipment option. (The one contractor who did recall doing so said that it was because the incentive was not sufficient to produce a good ROI on the higher-cost equipment.) Nevertheless, contractors varied greatly in how much of the equipment they sold is high efficient, from 5% to 95% of their sales. Figure 4-6 shows that most contractors fall into two groups: 1) those whose high efficient equipment sales represent more than 60% of their sales; and 2) those whose high efficient equipment sales represent 40% or less of total sales, most of whom reported that high efficient equipment makes up 20% or less of their sales.

Figure 4-6: Percentage of Equipment Sold (*n* = 28)[17]



[17] One respondent did not know the percent of their equipment sold that was high efficient.

When asked how many equipment options they offer customers when bidding work, 26 respondents were able to report a specific number of options. Most respondents (22) reported offering two or three options, with the other four reporting they offer only one option. Respondents most frequently cited price (10 respondents) and energy efficiency (9 respondents) as the factors that differentiated the options they offer. Less frequently identified differentiators were differences in product quality or technical characteristics (4) and non-energy benefits (3). (Four respondents cited multiple differentiators.)

4.4 Program Experience

The section below describes the experience participants and contractors had using Avista programs. This includes participants' and contractors' satisfaction with the programs, their motivations to participate, and possible barriers to participation. This section also describes nonparticipants' reasons for not participating in the program.

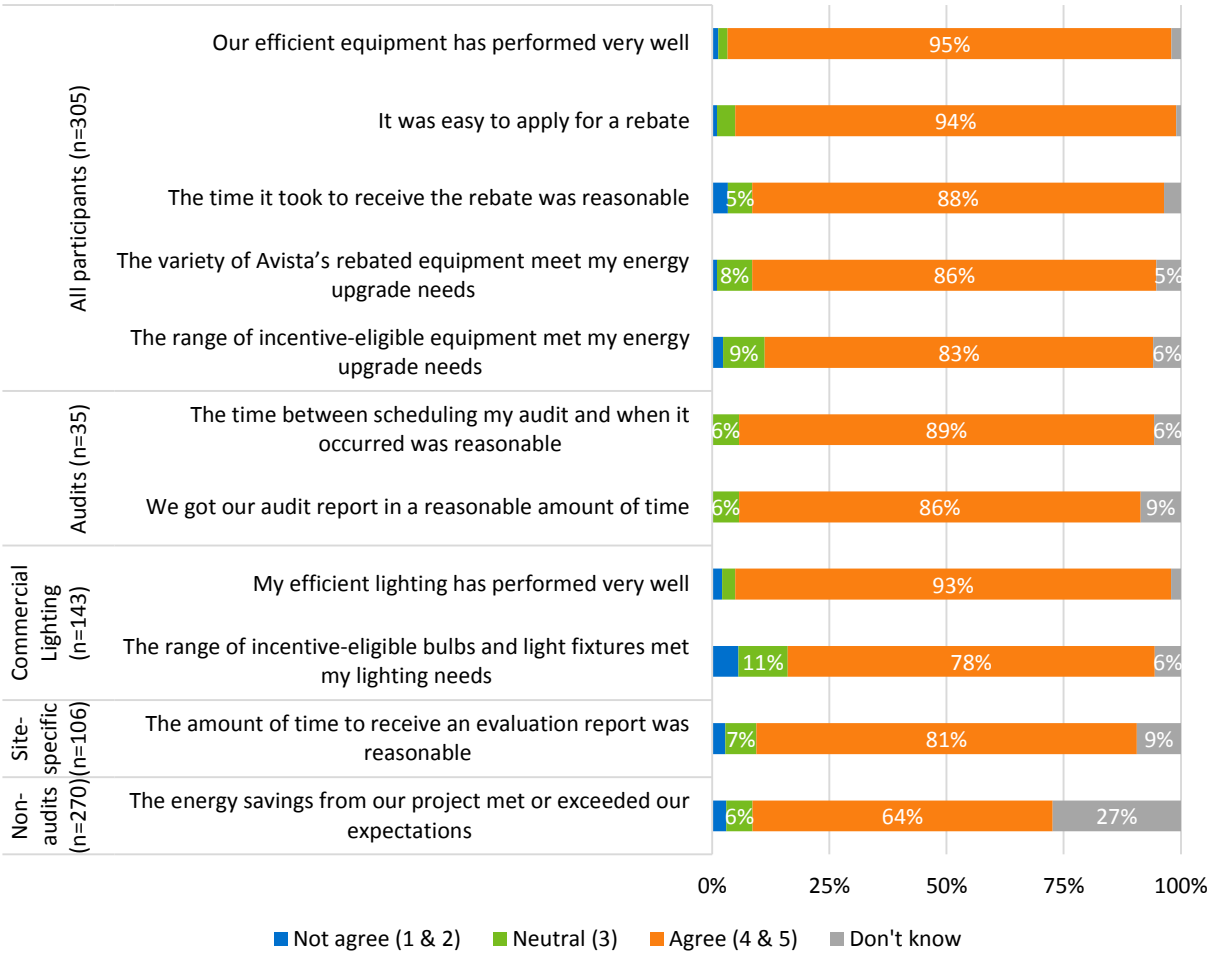
4.4.1 Participant Program Satisfaction

Participants from all programs were generally satisfied with their participation, with no more than 5% of respondents reporting negative satisfaction with any element (Figure 4-7). This did not differ by year of participation or location (WA vs ID). For all but two elements, responses indicated that more than 80% of respondents thought the program provided an easy-to-use process and adequate equipment. The two exceptions were as follows:

- Of the 270 respondents that received rebates for equipment upgrades, 64% agreed that the project energy savings met or exceeded their expectations. However, many of these participants (27%) did not know whether the energy savings met or exceeded expectation, suggesting that it may have been too early for the respondent to know whether the project was delivering savings. Excluding those that did not know about the energy savings, 88% agreed the savings met or exceeded expectations.

- Of the 143 respondents that received lighting rebates, 78% reported that the range of eligible lighting equipment met their needs, while 16% reported some dissatisfaction with the range of lighting equipment. Shedding some light on this finding, program staff had noted challenges in keeping up a list of eligible equipment in the rapidly changing lighting market, particularly with growing interest in LEDs.

Figure 4-7: Satisfaction with Program Elements



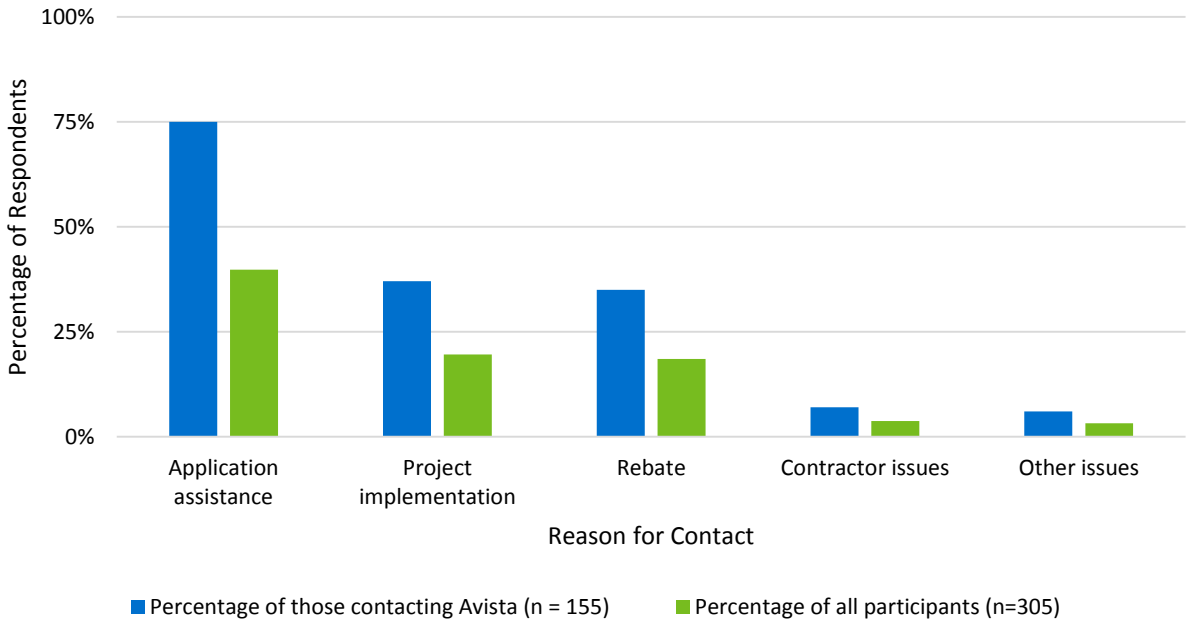
To better understand what equipment changes might be useful for the program to consider, interviewers asked those that did not agree or were neutral about the range of rebate eligible equipment about possible changes to improve the range of equipment. Responses generally were not specific. One respondent requested more LED lighting options and three said that the lists were heavily weighted towards lighting measures but lacked other equipment types. Of the other 28 respondents, 14 indicated a general desire for more variety of equipment, one said there was an insufficient range of eligible "electric" equipment, and one said that program equipment often did not align with the list of equipment approved by their national franchise.

As noted above in Section 4.1, program staff reported possible plans to simplify the online lighting calculator to provide estimated payback and help identify the appropriate project path, possibly increasing customer satisfaction. This may be very valuable to customers, but considering that 94% of customers consider the application process easy, such a revision may not be completely necessary.

4.4.1.1 Satisfaction with Program Representatives

Participants who engaged staff or program representatives reported high levels of satisfaction across various situations. Just more than half of participant respondents (53%) reported having contact with an Avista representative, most commonly regarding their application. Other reasons included concerns or questions about project implementation or the rebate. Far fewer respondents reported contacting Avista representatives about contractors or other issues (Figure 4-8). Of the 155 respondents who had contact with an Avista representative, almost all (96%) agreed that the Avista representatives they worked with were courteous and helpful.

Figure 4-8: Reasons for Contact with Avista Representatives



Of the 95 participants that received on-site inspections for their prescriptive shell work or site specific work, all agreed the program representative was courteous and efficient when conducting the inspection. All 18 participants familiar with the on-site audit reported the auditor helped them understand energy efficiency opportunities and how to pursue those opportunities.

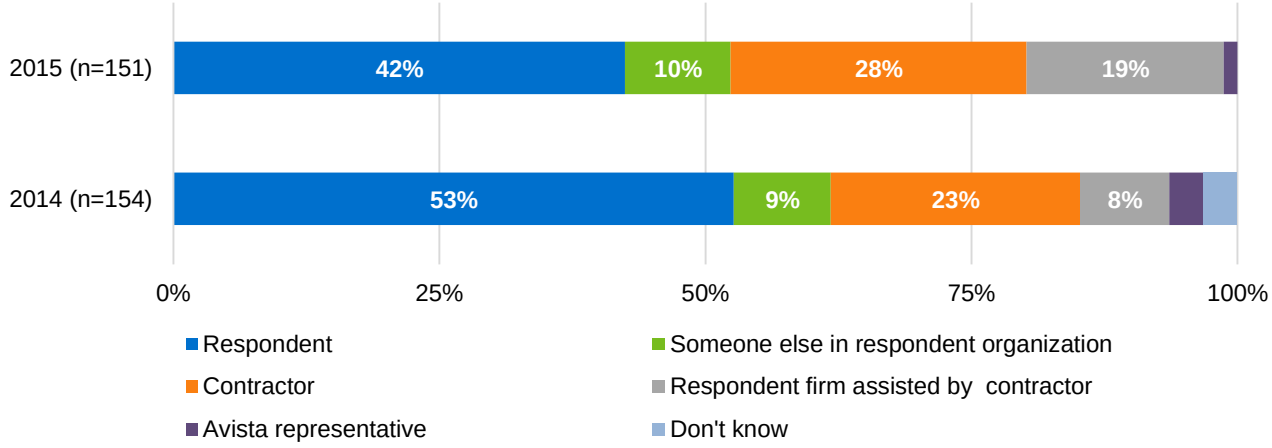
Audit participants generally reported their program experience would likely result in future actions. Of the 35 participants who received an audit, most (24) indicated they were in the process of implementing all (10) or some (13) of the recommendations (one did not know whether it was some or all). Of the remaining 11 participants, seven did not know whether any of the audit-related upgrades were planned or under way and four stated they would not implement any audit recommendations.

4.4.1.2 Application Preparation

Across both years studied, about half of all participants reported they prepared the information for the rebate, but this percentage was somewhat lower for 2015 participants than for 2014 participants (Figure 4-9). A larger percentage of 2015 respondents reported that their contractor

was involved in preparing the application than did 2014 respondents (47% vs. 31%; Chi-square, $p < .005$).[18] Similarly, Washington participants were more likely to receive assistance from their contractor than Idaho participants (16% vs. 6% respectively, Chi-square $p < .05$).

Figure 4-9: Who Prepared Application?

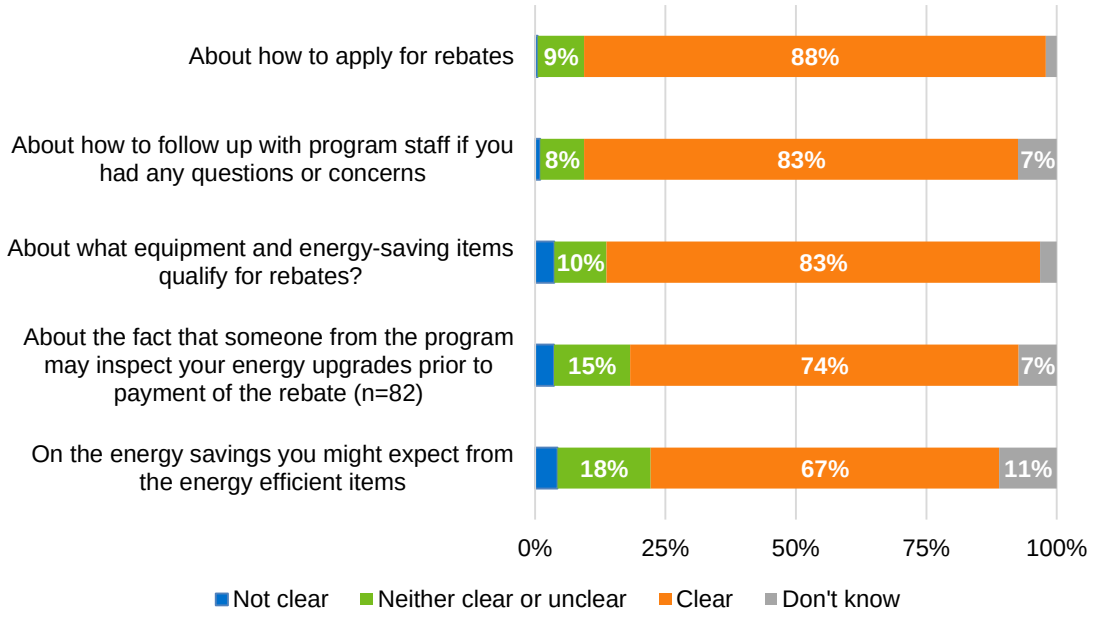


The above information is not completely consistent with contractors' reports that customers typically do not complete rebate applications without assistance from a contractor or distributor. Almost 80% of surveyed contractors (23) reported that the contractor completes the application (12), the respondent and the contractor complete the application together (8), or a third party such as a distributor completes the application (3). Possibly some of the difference between the participant and contractor responses reflects projects that customers self-installed, which the contractors would not know about. However, it is unlikely that this accounts for a large part of the discrepancy.

A total of 190 respondents reported they reviewed Avista program information. Of those, about three-quarters or more said that information from Avista was clear regarding how to apply, what equipment was eligible, and how to reach program staff for assistance. A somewhat lower percentage (67%) reported that the information on potential energy savings was clear (Figure 4-10).

[18] These percentages refer to the light green ("Contractor") and purple ("Respondent firm assisted by contractor") portions of each bar, combined.

Figure 4-10: Clarity of Avista Program Information (*n* = 190)



* This applies only to participants of programs with audits. Therefore the *n* for this is 82, not 190.

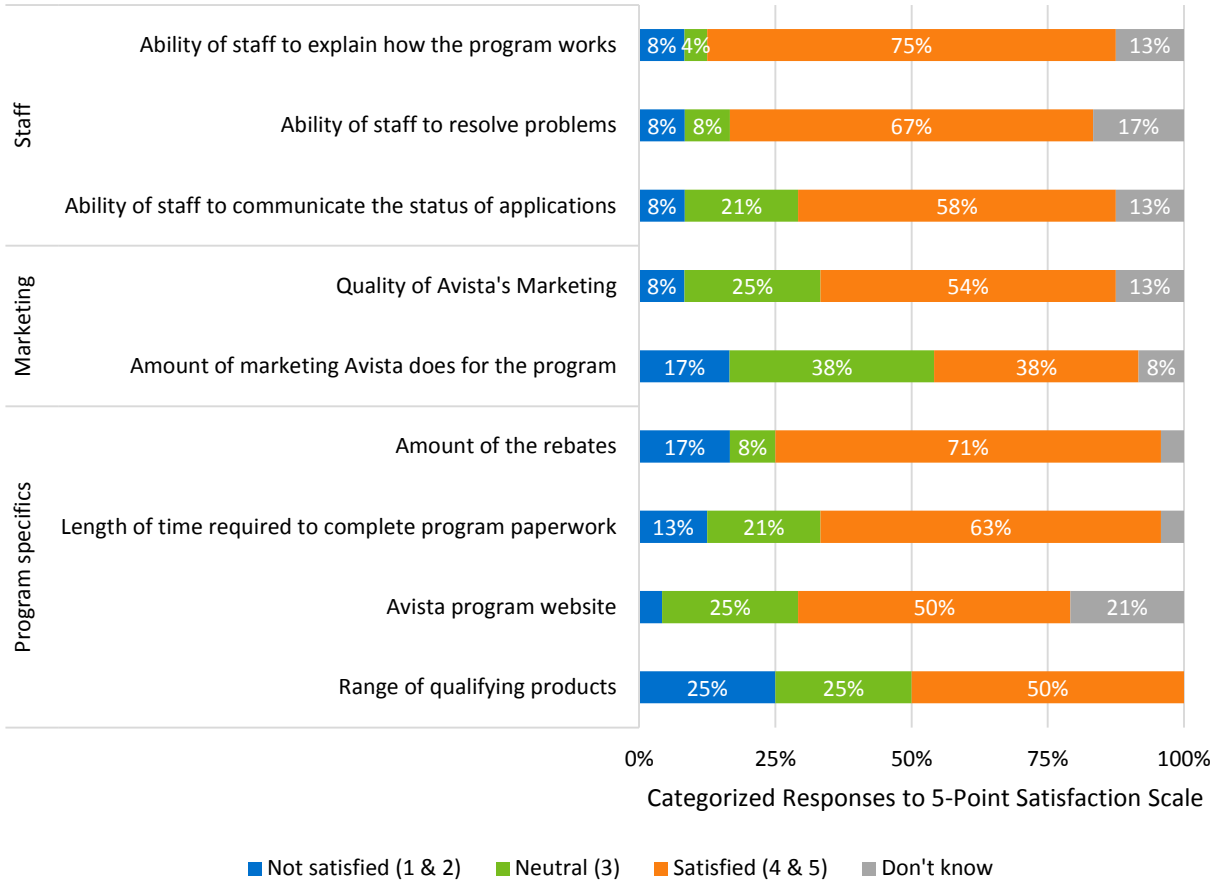
4.4.2 Contractor Program Satisfaction

The 24 contractors that reported any of their jobs received an Avista rebate reported their satisfaction with nine elements of the program across three areas: program-specific areas like rebates and measures, interactions with program staff, and program marketing.

Satisfaction levels varied across the program elements. Contractors reported highest satisfaction with how staff explains the program, the amount of rebates, and the ability of staff to resolve problems.[19] They were less satisfied with marketing and the range of qualifying products; overall, 22 reported they were less than satisfied with at least one element (Figure 4-11). Program staff reported that marketing is not widely conducted, particularly in the site specific program. Account executives conduct most customer and contractor outreach, which means that contractors do not see or at least are not aware of marketing efforts.

[19] Here, "satisfied" means they rated an item as four or five on a satisfaction scale ranging from one ("not at all satisfied") to five ("very satisfied"); "less than satisfied" means a rating of three or lower.

Figure 4-11: Commercial Contractor Satisfaction with Program Elements (*n* = 24)



The evaluation team asked all contractors that were less than satisfied with a program element to specify what they were dissatisfied with. Contractors identified the following issues:

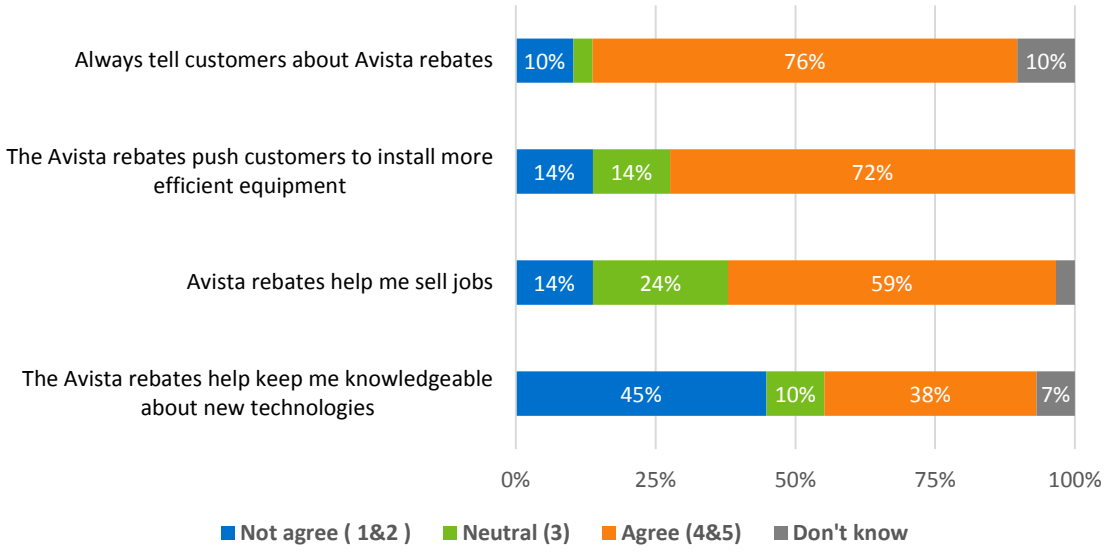
- **Marketing.** Of the 14 who were less than satisfied about the amount of marketing Avista does, one suggested that Avista advertise the program in supply houses. The others provided no suggestions beyond that Avista should do more marketing directly to commercial customers.
- **Range of qualifying options.** Of the 12 that commented about the range of qualifying options, eight provided specific issues. Three did not approve of using the Design Lights Consortium (DLC) list because it excluded specific items. Two noted that the exclusion of T8s from the incented list hurt their business. Two others stated specific lights were not on the list – one reported specific LED fixtures that require onsite evaluation and the other noted 1000 watt LEDs are not covered.
- **Length of time required to complete program paperwork.** Eight contractors remarked that the time it takes to complete program paperwork, typically 4 to 6 weeks, is too long. One contractor reported it took his last customer four to five months to receive their rebate.

- **Avista program website**. Seven contractors had difficulty finding the information they needed on the website.
- **Amount of the rebates**. Six contractors reported the rebates were too small to motivate some customers to do projects. One of these contractors implied that in order to make up for the smaller rebates, installers are doing jobs for less profit than in the past.
- **Staff responses.** Seven contractors reported difficulties with staff not getting back to them when needed.
- **Ability of staff to explain the program or resolve problems.** Of five contractors noting some type of difficulty in this area, two noted staff were inflexible in their interpretations of installed work, while three simply reported generic problems communicating with staff.

4.4.3 Perceived Value of Rebates – Contractor Perspectives

Three-quarters of the contractors reported they always tell customers about rebates, and nearly as many said that rebates drive customers to install efficient equipment. Fewer contractors agreed that Avista rebates help sell jobs. This suggests perhaps that some contractors believe they would still be able to sell work without the rebates, but the work would not necessarily involve efficient equipment. Even fewer agreed that the program rebates help keep them knowledgeable about new technologies (Figure 4-12).

Figure 4-12: Contractor Perceived Value of Avista Rebates (*n* = 29)



The latter finding does not mean that the program does not in some way help to keep contractors knowledgeable about new technologies, just that the rebates themselves do not necessarily do that. Staff expressed interest in providing more education and training opportunities for contractors in the future. If more training occurs, future evaluations may demonstrate that the program rebates contribute to contractor knowledge.

4.4.4 Driving Incented Upgrades – Contractor Perspectives

Contractors reported their and their customers' roles in initiating upgrade projects and communicating about rebates. When asked what percentage of upgrade jobs they and their customers initiated, contractors most commonly indicated that customers always or usually (at least 60% of the time) initiated upgrades, but one-third said that it was close to half customer-initiated and half-contractor initiated. The least common response was that the contractor initiates most or all upgrades (Table 4-6).

Table 4-6: Contractors' and Customers' Roles in Initiating Upgrades

Who initiates commercial upgrade jobs?	Count	Percent
Always contractor	2	7%
Usually contractor*	4	15%
Mixed	9	33%
Usually customer*	6	22%
Always customer	6	22%
TOTAL	**27**	**100%**

*Usually = at least 60% of the time.

Surveyed contractors reported the percentage of customer-initiated upgrade jobs in which the customer asked about rebates and, conversely, the percentage of contractor-initiated upgrade jobs in which the contractor (or their staff) told the customers about the rebates. This provides additional information about the importance of whether customers or contractors initiate upgrades: if customers do not ask about rebates when they initiate upgrades, then it is important for Avista to ensure that contractors always tell their customers about the rebates.

Findings from the contractor survey show that customers do not commonly ask about rebates when they come to the contractor with an upgrade idea. By contrast, contractors reported that they do usually tell their customers about the rebates when they themselves suggest the upgrade idea (Table 4-7).

Table 4-7: Contractors' and Customers' Roles in Discussing Rebates

Percentage of jobs	In what percentage of…			
	…customer-initiated jobs do customers ask about rebates?		…contractor-initiated jobs do contractors tell about rebates?	
	Count	Percent	Count	Percent
0%	3	10%	7	24%
1% to 25%	16	55%	0	0%
26% to 50%	5	17%	4	14%
51% to 75%	1	3%	1	3%
76% to 100%	4	14%	17	59%
TOTAL	**29**	**100%**	**29**	**100%**
MEAN	**30%**		**65%**	

Simultaneously considering both of the above sets of questions – what percentage of projects are contractor- or customer-initiated and what percentage of contractors and customers take the initiative in discussing rebates when they initiate the upgrade discussion – provides additional information, including a more meaningful look at the contractors' role in driving incented upgrades.

For one thing, looking at all the data together presents a different perspective of the roles that contractors and customers have in driving the rebate discussion than the above table shows. Of the 24 contractors who answered all of the pertinent questions, 13 reported both that they told customers about rebates in at least 75% of the jobs they initiated *and* that customers asked about rebates in 25% or fewer of the jobs the customers initiated. Thus, for just more than half of contractors, the rebates likely would not get discussed unless they brought them up.

So how often do rebates get discussed? For each contractor, the percentage of upgrades in which rebates are discussed is the sum of two products: 1) the percentage of customer-initiated jobs times the percentage of those jobs where the customer asks about rebates; and 2) the percentage of contractor-initiated jobs times the percentage of those jobs where the contractor tells the customer about rebates. For the 24 respondents that provided all those data, this analysis indicates that, on average, rebates are discussed in 57% of upgrade jobs. This is more than double the mean percentage of jobs that actually *receive* rebates (reported in Section 4.2.1, above), suggesting that less than half of potential jobs in which rebates are discussed actually become incented upgrades. A deeper investigation into the process from initial discussions between the contractor and customer through installation of incented high-efficiency equipment may prove fruitful in future evaluation research.

Table 4-8 shows a final perspective on the relative roles that contractors and customers play in driving incented upgrades according to contractors. The evaluation team coded responses as indicating whether customers and contractors each played a large, mixed, or small role.

Responses indicate that contractors are much more likely than customers to play a large role in driving rebate upgrades, while customers are much more likely to play a small role.

Table 4-8: Contractors' and Customers' Relative Roles in Driving Incented Upgrades

Size of role	Customers…	Count	Contractors…	Count
Large	…initiate jobs ***and*** ask about rebates at least 50% of the time	5	…initiate jobs ***and*** tell about rebates at least 50% of the time	14
Mixed	…initiate jobs ***or*** ask about rebates at least 50% of the time	18	…initiate jobs ***or*** tell about rebates at least 50% of the time	10
Small	…initiate jobs ***and*** ask about rebates less than 50% of the time	5	…initiate jobs ***and*** tell about rebates less than 50% of the time	1

4.4.5 Participant Concerns

Six percent of participants (19 of 305) reported they had had some concerns at some point about their participation in the program. Twelve reported concerns relating to program processes, four expressed concern that the rebate would be inadequate, two noted concern about the quality of products, and two others expressed concern about the range of products available. Of the 19 expressing some concern about participation, 12 suggested that their contractor (6) or an Avista representative (6) helped alleviate their concerns about participation.

4.5 Opportunities for Increasing Program Participation

Avista staff have considered ways to increase program participation, such as continuing to move often-used Site Specific measures into the prescriptive measures list, developing deemed savings measures for the existing Energy Smart Grocer program and expanding outreach to restaurants, and mining customer data to better target customers for efficiency programs.

To assess possible opportunities for the program, the evaluation team asked nonparticipants about recent building upgrades and future plans for upgrades. Lighting and HVAC upgrades were the most commonly cited recent upgrades, and more nonparticipants reported installing efficient lighting than efficient HVAC equipment.

A total of 43 of the 70 (61%) surveyed nonparticipants reported either that they had upgraded equipment or building features in the past two years (n = 34) or that they planned to do so in the next two years (n = 20). An additional 17 respondents said they were not sure whether or not they would upgrade equipment, while about half of the respondents (n = 33) said they do not plan upgrades in the next two years. Of the past and planned upgrades, a little more than half of were for lighting or lighting controls, with HVAC representing the next most common equipment type (Table 4-9).

Table 4-9: Equipment Replacements or Upgrades Made by Nonparticipants in Past Two Years or Planned for Next Two Years (Count and Percent of Total)

Equipment or Upgrade	Upgraded (*n* = 34)		Plan to Upgrade (*n* = 20)		Upgraded and/or Plan to Upgrade (*n* = 43)	
Lighting or lighting controls	23	(68%)	11	(55%)	29	(67%)
Heating, cooling, HVAC	7	(21%)	6	(30%)	10	(23%)
Building shell [a]	4	(12%)	2	(10%)	5	(12%)
Water heating	4	(12%)	3	(15%)	6	(14%)
Motors or motor controls	3	(9%)	1	(5%)	3	(7%)
Food processing and storage	2	(6%)	0	(0%)	2	(5%)
Other	3	(9%)	4	(20%)	7	(16%)

[a] Includes insulation (attic, ceiling, and wall) and windows.

Of the 34 nonparticipants who reported recent equipment or building upgrades, 25 (74%) said they selected an energy efficient version.[20] Similarly, 17 of the 20 nonparticipants (85%) who *planned* future equipment or building upgrades affirmed that they were considering using above-standard-efficiency equipment, while the other three said they were unsure what equipment they would select or that they might select energy efficient equipment if the cost was not too high. A total of 34 – half of the respondents – reported they either did use or planned to incorporate energy efficiency in an equipment upgrade.

Respondents rated the influence of various factors on their decision to carry out energy efficient upgrades and/or on their plans to do so. Increasing comfort, reducing O&M costs, and increasing productivity were most commonly cited as being influential, and Avista marketing was least influential (achieving a green image and contractor/vendor recommendations had intermediate levels of influence; Table 4-10).[21]

[20] Four respondents reported that they received financial incentives from utilities or government agencies for their upgrades – three, for lighting or lighting controls and one, for unknown equipment.

[21] Here, "influential" means they rated influence as a 4 or 5 on 1-5 scale, where 1 was "no influence" and 5 was "great influence;"

Table 4-10: Factors Influencing Nonparticipants' Recent or Planned Purchase of Energy Efficient Upgrades

Equipment or Upgrade	Count of Respondents Rating Each Factor as Influential [a]					
	Increasing comfort	Reducing O&M costs	Increasing product-ivity	Achieving a "green" image	Avista Marketing	Contractor or vendor
Recent upgrades (*n* = 38)						
Lighting/lighting controls (*n* = 18)	3	14	6	5	1	7
Non-lighting (n = 9)	7	6	6	4	2	4
Planned upgrades (*n* = 17)						
Any planned upgrade (*n* = 17)	9	15	9	10	7	6

[a] "Influential" is defined here as a rating of 4 or 5 on a 5-point scale, from "no influence" to a "great influence."

The small samples sizes argue for caution in comparing the ratings for past and planned upgrades or those for lighting and non-lighting upgrades. Nevertheless, one comparison is worth mentioning. Three-quarters of respondents who did non-lighting upgrades cited "increasing comfort" as influential; by contrast, the proportion was closer to one in six for those who did lighting-related upgrades. The idea that upgrading HVAC or building envelope can produce greater comfort may seem obvious, while associating lighting with increased comfort may seem less so – nobody puts on a sweater because of poor lighting. However, research has demonstrated that lighting is an important factor in workplace comfort and satisfaction.[22] Given that employee comfort is a motive for upgrading other equipment types, messaging that cites proper lighting as a comfort issue, and not just a productivity or cost issue, may help motivate greater uptake of energy efficient lighting.

Of the nonparticipants who reported plans for energy efficiency upgrades in the next two years, ten reported it was likely their organization would apply for Avista rebates, and two were not sure whether it was likely or not.[23] Of the five who indicated they were unlikely to apply for Avista rebates, one indicated it was because they rely heavily on propane. The other four did not provide clear reasons: one said that the use of rebates was "not part of their policy directive" but did not explain why, two said it was because of lack of awareness of the rebates, but they did not clarify the likelihood of applying would change now that they were aware of the rebates, and one did not provide any reason at all.

[22] See, for example, a summary of research conducted at Cornell University: http://ergo.human.cornell.edu/lighting/lilstudy/lilstudy.htm. Accessed on April 6, 2016.

[23] "Likely to apply" = a score of 4 or 5 on a scale where 1 equaled not at all likely to participate and 5 equaled very likely to participate.

The six nonparticipants who did not do efficiency upgrades as part of their equipment replacements either said they lacked capital (two mentions) or they did not prioritize energy efficiency, were not aware of efficient options or incentives, or did not find efficient equipment that matched their needs.

4.6 Freeridership and Spillover

This section summarizes results about freeridership and spillover, two key aspects of energy efficiency programs. Freeridership represents an estimate of the energy savings that the program participants would have achieved without the program's assistance, and spillover is what additional energy saving actions occurred outside the program but as a result of program influence. For a discussion of the methods used to calculate freeridership and spillover values, see the 2014-2015 impact report discussion about net-to-gross calculations. Additionally, the impact report covers how freeridership and spillover rates affect savings.

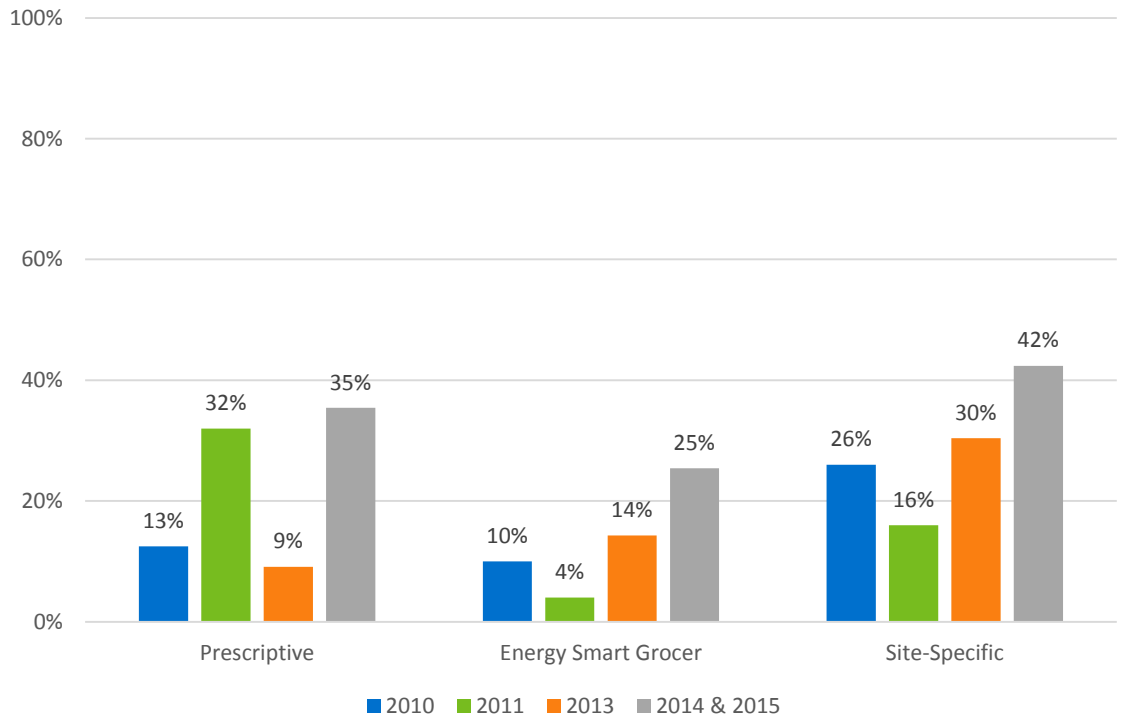
This section discusses freeridership first and spillover second.

4.6.1 Freeridership

The evaluation team examined freeridership for three nonresidential programs: Prescriptive, Energy Smart Grocer, and Site-Specific. Figure 4-13 shows the PY2014 and PY2015 freeridership results, weighted by program savings, plotted next to the weighted results reported in the previous evaluation.[24] The figure shows a general trend toward increase freeridership over time, except for the values for PY2011.

[24] Avista 2012-2013 Process Evaluation Report, May 15, 2014. Submitted by Cadmus to Avista Corporation. The previous evaluation did not report freeridership values for PY2012.

Figure 4-13: Freeridership Values Over Time



The previous evaluation attributed year-over-year changes in freeridership from 2010 to 2013 to a small number of participant scores having large effects on the program freeridership score because of the size of their project savings. Freeridership scores are weighted by savings and the highest saving projects in the sample can have a strong influence on freeridership scores. Not discounting the possibility that some of the increase in freeridership in PY2014 and PY2015, relative to those from prior years, may to some degree reflect different methodologies used to calculate freeridership, the evaluation team below has identified some possible explanations for some of the observed variability over time in freeridership. These explanations are hypotheses that would require additional analysis and research to verify.

4.6.1.1 Prescriptive

The dip in freeridership from 2011 to 2013 could reflect the removal of T12s as a baseline lighting measure in 2012. Prior to December 2012, freeridership may have increased as customers interested in replacing their T12s took action in 2011 and 2012 to maximize their rebate amount before the baseline change to T8s lowered rebate amounts. According to this hypothesis, many of those customers would have replaced their T12s anyway, and so were freeriders or partial freeriders. After the baseline changed in 2013, freeridership then declined (according to this hypothesis) because many of the T12 customers – likely partial freeriders – were no longer participating, leaving mainly customers who really needed the incentives to carry out the upgrades.

The uptick in freeridership seen in 2014 & 2015 could reflect the success of Avista's programs in transforming the market over time. Another possibility is that the increase in affordable LEDs over the last two years, in conjunction with rebates, may be spurring customers – likely partial freeriders – to take action earlier than they otherwise would.

4.6.1.2 EnergySmart Grocer

The general trend in freeridership for the Energy Smart Grocer program is increasing over time. This increase in freeridership co-occurs with declining participation rates in the program over the last five years. In the earlier years of the program, freeridership may have been low because the program was reaching grocers that were unaware of savings opportunities and were therefore heavily influenced by the program – they were low freeriders – to take action. With the program well established after several years of operation, possibly driving an increase in general awareness of efficiency opportunities, one might expect to see an increase in freeridership as more grocers are aware of energy saving opportunities and thus more likely to be interested in participating.

4.6.1.3 Site Specific

The general trend in Site-Specific freeridership shows an increase over time. The explanations for the increase in Prescriptive program freeridership and Energy Smart Grocer rates also apply here. As Avista's programs mature, awareness of efficiency opportunities increases in the market, which in turn drives up freeridership rates.

Additionally, the LED lighting issue discussed in section 4.6.1.1 may also apply to site-specific participants. The increased affordability of LEDs combined with the rebate prompts customers considering a lighting upgrade to make that upgrade sooner making them partial freeriders and driving the freeridership rate up.

4.6.2 Participant Spillover

Participant spillover occurs when program participants elect to conduct energy saving activities outside of the program as a result of program influence. Because the actions took place outside of the program, the program has no mechanism to capture these actions other than during customer surveys. The analysis below shows how many participants reported they took a spillover action. For an analysis and discussion of what effect these actions had on savings, see the PY2014 and PY2015 impact report.

Of the 305 participants in the sample, twenty reported they were partially (10) or fully (10) influenced by the program to undertake an energy efficiency project that did not receive a rebate. Ten of the spillover participants took part in the prescriptive program (6%) and the other ten took part in the Site-Specific program (9%). No Energy Smart Grocer participant reported taking a spillover action (Table 4-11).

Table 4-11: Number of Participants Reporting a Spillover Action

Program	Total Participants in Sample	Participants Who Did Spillover Project	Percent of Participants Who Did Spillover Project
Prescriptive	164	10	6%
Energy Smart Grocer	35	0	0%
Site-Specific	106	10	9%
TOTAL	**305**	**20**	**7%**

5 Small Business Process Results

5.1 Small Business Process Evaluation Overview

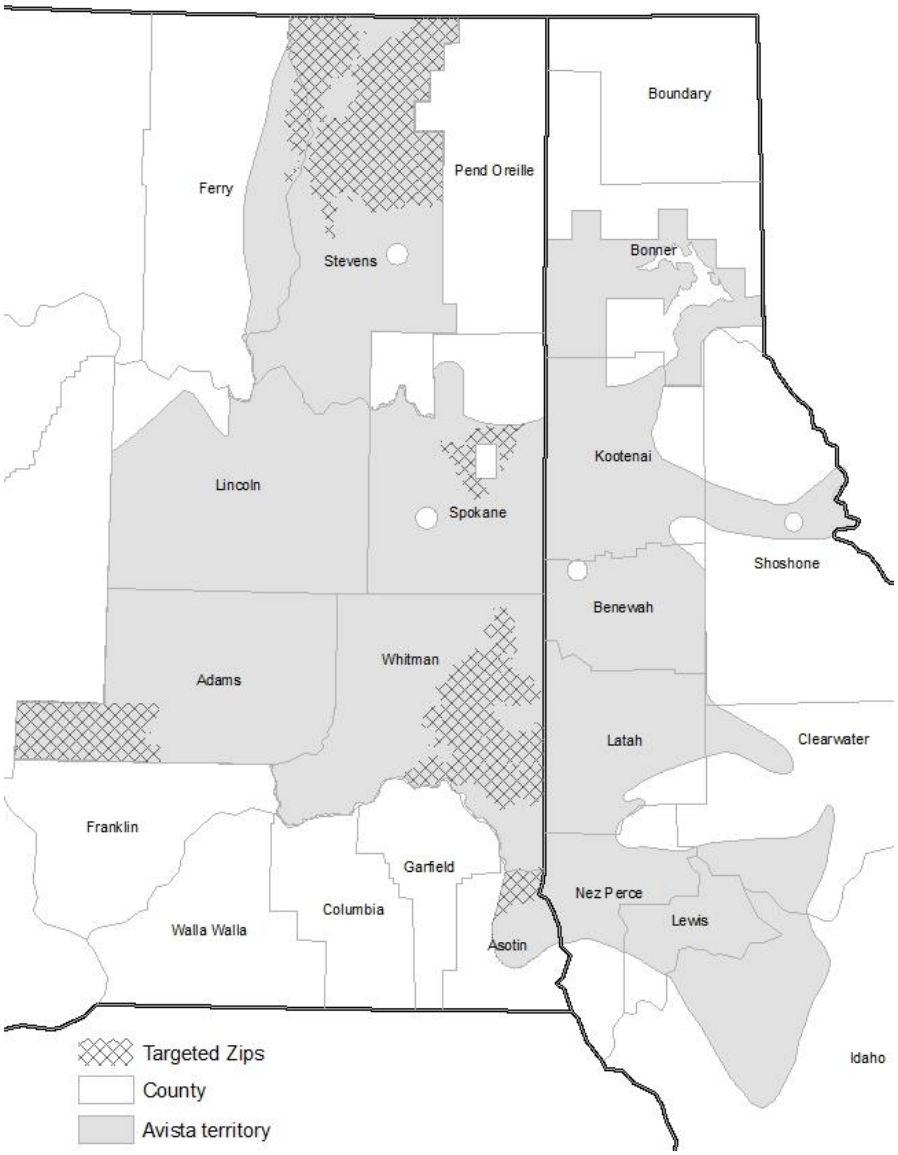
The primary goal of the Small Business (SB) process evaluation was to assess and provide information on program delivery and implementation and market response to the program. The evaluation focused on program design and theory, implementation and delivery, and market feedback.

5.2 Summary of Program Data

In 2015, the program served 1,181 customers. All 1,181 customers received a basic, HVAC, and lighting audit to determine savings opportunities and 1,013 (86%) received at least one direct install measure.

Program staff target specific zip codes when conducting audits and installations. As of the end of 2015, staff conducted audits largely in the Spokane area (69%) followed by the territory south of Spokane (16%) and the area north of Spokane (15%) (Figure 5-1). As noted earlier, program staff did not do work in Idaho but anticipate doing so in 2016.

Figure 5-1: Areas targeted by SB program in 2015



Overall, the program is meeting its participation estimates by exceeding estimated participation in some areas and not meeting expectations in other areas. For example, the program exceeded its overall lighting and audit estimates having installed 2,781 LED bulbs when they anticipated installing 1,000 in 2015 and conducting 3,543 audits when anticipating 3,000. The program did not meet its estimates in water saving items by installing 2,851 items compared to their estimate of 4,325. Including audits as a “measure” the program exceeded the number of all measures they anticipated for 2015 by 518. Excluding the audits by counting only installed items, the program almost achieved its 2015 estimate perfectly by installing 15 units shy of the expected number (Table 5-1).

Table 5-1 Participation to Date Compared to Estimated Participation

	Actual Participation	Estimated Participation			
	2015	2015	2016	2017	Total
Water saving measures	**2,851**	**4,325**	**8,650**	**4,325**	**17,300**
Faucet Aerator (.5 and 1 GPM)	2,561	4,000	8,000	4,000	16,000
Shower Head (incl. Fitness Center)	147	250	500	250	1,000
Spray Valve	143	75	150	75	300
Plug load devices	**778**	**1,100**	**2,200**	**1,100**	**4,400**
CoolerMiser	277	75	150	75	300
VendingMiser	106	25	50	25	100
Tier 1 smart power strip	395	1,000	2,000	1,000	4,000
Lighting	**2,781**	**1,000**	**2,000**	**1,000**	**4,000**
Screw-in LED lamp (A-line 40W)	528	[a]	[a]	[a]	[a]
Screw-in LED lamp (A-line 60W)	508	[a]	[a]	[a]	[a]
Screw-in LED lamp (A-line 75W)	5	250	500	250	1,000
Screw-in LED lamp (A-line 100W)	129	250	500	250	1,000
Screw-in LED lamp (BR30)	802	125	250	125	500
Screw-in LED lamp (BR40)	180	125	250	125	500
Screw-in LED lamp (PAR30)	393	125	250	125	500
Screw-in LED lamp (Par38)	236	125	250	125	500
Audits	**3,543**	**3,000**	**6,000**	**3,000**	**12,000**
Basic	1,181	2,000	4,000	2,000	8,000
HVAC	1,181	500	1,000	500	2,000
Lighting	1,181	500	1,000	500	2,000
Total measures including audits	**9,953**	**9,435**	**18,850**	**9,425**	**37,700**
Total measures excluding audits	**6,410**	**6,425**	**12,850**	**6,425**	**25,700**

[a] The program did not provide estimates for these two measures.

5.3 Staff and Implementer Interviews

The evaluation team interviewed the Avista SB program manager, the SBW program manager, the SBW field manager/auditor/installer, and SBW auditor/installer in December 2015 to better understand the program. The interviews covered program goals and plans, implementation and delivery, marketing and outreach, and program successes. The outcomes of the interviews are summarized in the following subsections.

5.3.1 Program Goals and Plans for the Future

The program aims to serve customers that are typically hard to reach, such as “mom and pop” operations. Typically this excludes national and regional chains that receive services via traditional efficiency programs. A primary emphasis of the program is to develop interest in other

Avista programs and identify savings opportunities. Staff reported many opportunities for lighting upgrades, particularly replacing T12s[25], and upgrading food service equipment.

Currently, the program's exclusion of national accounts can exclude franchises owned by a "mom and pop" operator. The program may consider expanding services to franchisees.

The program elected not to extend service to Idaho in 2015 because gas saving measures were deemed not cost effective and, therefore, the program could not claim gas savings. Idaho is reassessing gas measure cost effectiveness in 2016, at which point the program hopes to begin serving the state.

The program is interested in doing a pilot study offering Tier II smart strips to customers.

5.3.2 Implementation and Delivery

The program initially targeted the Spokane area to allow Avista staff to easily attend inaugural site visits and work out any potential problems that can arise in early implementation of a new program. Staff reported few problems in the early stages of the program and all reported successful and adequate amounts of communication between Avista and SBW.

The auditors/installers pass leads to other Avista program staff, relying on their assessment of the participant's likelihood to proceed with another program. According to both Avista and SBW staff, the auditors/installers have struck the right balance of providing good leads to Avista without overwhelming Avista staff with leads unlikely to result in projects.

Auditors/installers pay close attention to the hours a business uses its lights before installing lighting measures. Lights are not installed where the existing lights are used less than 60 hours per week, as such replacements would not be cost effective.

5.3.3 Marketing and Outreach

Auditors/installers conduct almost all program marketing through door-to-door outreach efforts. Occasionally program staff receive leads from other small businesses that heard about the program via a colleague or neighboring small business.

Avista provides a list of Schedule 11 customers that SBW uses to target potential participants. In the rare occurrence an auditor/installer sees a business not on the list that looks like it qualifies, they can seek permission from Avista to reach out to the business. Permission is typically granted quickly. Auditors/installers try "multiple attempts" to reach targeted small businesses before giving up on a site.

[25] Program data shows that 35% of SB participants had T12 lights in place.

5.3.4 Program Successes

According to program staff, customers rarely reject items and the program data reviewed by the evaluation team supports their assertion. There were two cases where customers refused a specific recommended item and 18 decommissioned items[26] out of the original 6,428 installed.

Once approached by staff, very few small business participants refuse the service. According to staff, as of mid-December 2015, 12 of about 1,000 potential participants refused. Typically these refusals are because the auditor/installer could not ultimately reach a decision maker in the business or because of general suspicion of the program.

Staff reported the SB program offers strong customer service and relationship building between Avista and its SB customers. For example, according to staff, businesses were particularly "grateful" for the outreach from their utility immediately following the November 2015 windstorm that left 200,000 businesses without power. Staff also noted that a key trait required of the auditor/installer is someone with "excellent" customer service skills who can serve as an "ambassador" for the utility by relating to people and meeting with participants when it is convenient for them.

5.4 Participant Surveys

The participant survey covered how respondents learned about the program, their rationale for participating, energy saving topics discussed with the installer, program satisfaction, and plans for future upgrades. The evaluation team covers these topics below starting with a profile of respondents and their businesses.

5.4.1.1 Business Characteristics

Respondents represented a variety business types with a variety of energy using types of equipment. Retail establishments and offices represented close to half of all survey respondents followed by warehouses, auto repair shops, and food service establishments. All respondents had heating equipment and almost all had water heating, computers, and cooling equipment (Table 5-2).

[26] Staff removed eight .5 gpm aerators, eight spray vales, one CoolerMiser, and one VendingMiser after installation due to customer complaints about the measure. Customers, particularly dishwashers, were dissatisfied with the water pressure post installation. It was unclear why the participants were dissatisfied with the Misers.

Table 5-2: Small Business Respondent Characteristics (*n* = 34)

	Count	Percent
Business Types		
Retail	8	24%
General office	7	21%
Warehouse/wholesale	4	12%
Auto/truck repair	4	12%
Food service (restaurants)	3	9%
Personal services (spa, salon, gym)	2	6%
Medical or dental	2	6%
Small production	2	6%
Small grocery	1	3%
Religious institution	1	3%
Energy Using Equipment		
Heating equipment	34	100%
Water heating equipment	33	97%
Electric water heating	*17*	*50%*
Gas water heating	*16*	*47%*
Computer and office equipment	33	97%
Cooling equipment	32	94%
Refrigerator	28	82%
Air compressor	8	24%
Ventilation fans	7	21%
Freezer	5	15%
Cooking equipment	4	12%
Other	3	9%

5.4.1.2 Program Marketing and Rationale for Participation

The evaluation team conducted the surveys with SB owners, managers, or other people in a leadership at the business. Almost all reported learning about the SB program through an in-person visit (26 of 34) or a phone call from a program representative (5 of 34). The remaining three respondents did not remember how they heard about the program.

Respondents chose to participate for a myriad of reasons. More than two-thirds of respondents (23 of 34) reported two or more reasons for participating in the program. Most commonly

respondents elected to participate to save money on their energy bills (59%) or for equipment-specific reasons (47%; Table 5-3).[27]

Table 5-3: Reasons for Participating in SB Program (*n* = 34)

	Count	Percent
Saving money on energy bills	20	59%
Equipment-related reasons	16	47%
Get free equipment	12	35%
Acquire the latest equipment	2	6%
Seek improved lighting	2	6%
Learn more about energy efficient lighting	2	6%
Conserving energy/protecting the environment	10	29%
Representative was convincing	3	9%
Overall positive for store	1	3%

In addition to the reasons for participating, shown above, 18 respondents (53%) said they participated because participation was easy. Ease of participation is not in itself a reason to participate – it does not offer any specific benefit. But these responses provide important feedback about the process, namely that an easy participation process encourages participation. Three respondents gave no reason for participating other than that it was easy.

Respondents largely had not considered installing SB measures prior to the program. Four of the 34 respondents stated they considered upgrading the efficiency of their lights, and no respondent noted considering water or power saving upgrades such as aerators or power misers. Of the four that considered lighting upgrades, three stated it was unlikely they would have made the change without the program and one reported it was likely.

5.4.1.3 Energy Savings Discussions with Installer

To understand how the interactions with the assessor helped them decide what equipment to replace, the survey asked respondents what they discussed with the assessor. More than three-quarters reported discussing lighting upgrades, mainly about the type or quantity of lighting to be replaced (Table 5-4). A minority of those who mentioned lighting indicated that they had discussed past Avista-supported lighting upgrades with the assessor. Other common discussion topics were the expected energy savings from upgrades and water-saving measures. Far fewer respondents indicated that they discussed prioritization of energy-saving projects or about equipment cost.

[27] Ultimately, the equipment-related reasons likely are not really the ultimate motives. It is likely that these responses signify one of the other motives that were stated more explicitly, namely, saving money or environmental reasons.

Table 5-4: Topics Discussed with Installer (*n* = 34; Multiple Responses Allowed)

	Count	Percent
Lighting upgrades	27	79%
Type of lights/fixtures to be replaced	20	59%
Quantity of lights/fixtures to be replaced	13	38%
(Past) fluorescent replacement [a]	6	18%
Quality of lights/fixtures	4	12%
Energy savings resulting from installed equipment	16	47%
Water measures	11	32%
Prioritization of energy-saving projects	4	12%
Plug load	1	3%
Equipment cost	1	3%

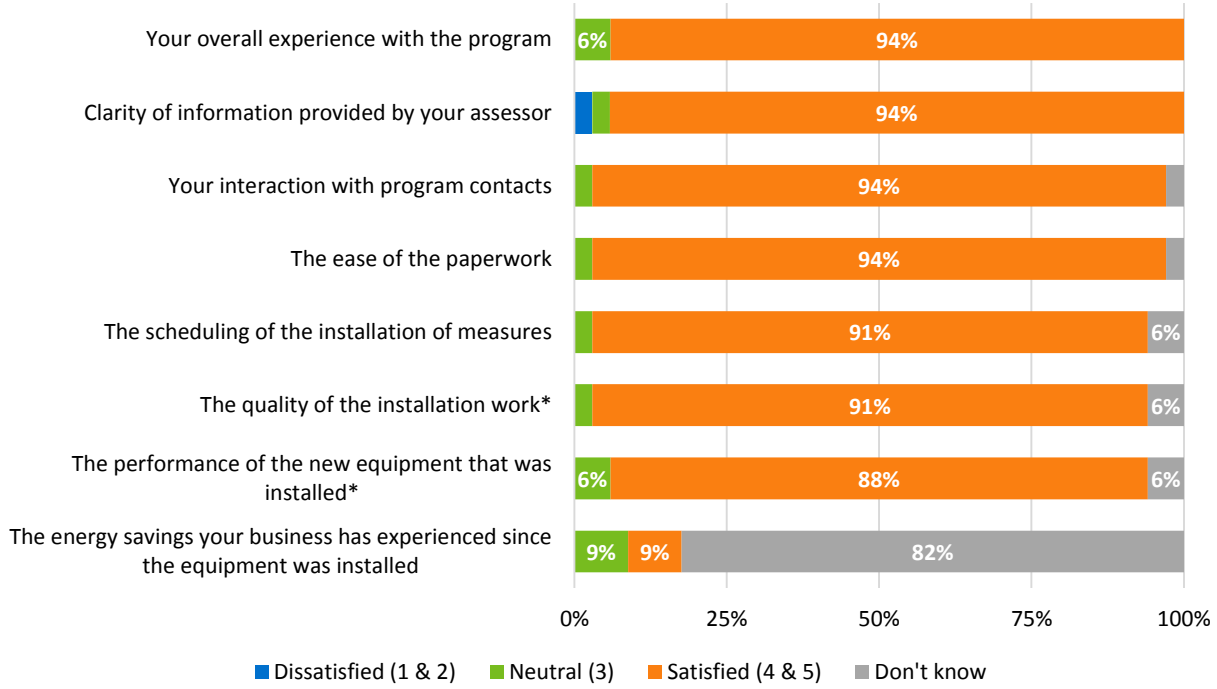
[a] The current SB program does not incent fluorescent lighting; the context of some of the comments indicated that this refers to a previous fluorescent change-out.

More than half (20 of 34) of respondents reported that the installer recommended energy-saving projects outside the scope of the SB program. Of those 20, most reported the installer recommended lighting changes (15), including one specifying motion sensors. Four reported that the installer recommended HVAC upgrades, two said the installer recommended a refrigeration control unit, and two did not recall the recommendation. No respondent suggested the program should supply additional equipment.

5.4.1.4 Program Satisfaction

Participants tended to be satisfied with all aspects of the program other than the energy savings resulting from program participation. In that case, most participants reported not knowing what savings, if any, resulted from the program measures.

Table 5-5: Satisfaction with Program Elements



Of the five respondents reporting they were dissatisfied or neutral about an element, three explained their reasons for not being fully satisfied.

- One respondent was dissatisfied with the water pressure from the program-supplied spray valve.[28]
- One respondent was dissatisfied with all program elements because she was ineligible to receive many measures because her store did not meet the minimum weekly number hours of lighting.[29]
- One respondent reported the auditor never followed up with them or provided equipment.[30]

Respondents tended to report that they upgraded all areas they could with program measures. In the two cases in which a respondent reported not replacing any water-saving equipment, they reported the measures did not fit.[31]

[28] This respondent may have had their spray valve decommissioned by program staff. Of the 1,013 participants that received an item, 18, or 1.8% of the population had something decommissioned by staff. This one case out of 34 represents 2.9% of the sample.

[29] This respondent's business was open 48 hours per week and the program requires lights to be used 60 hours or more week before making LED replacements. This respondent received two faucet aerators.

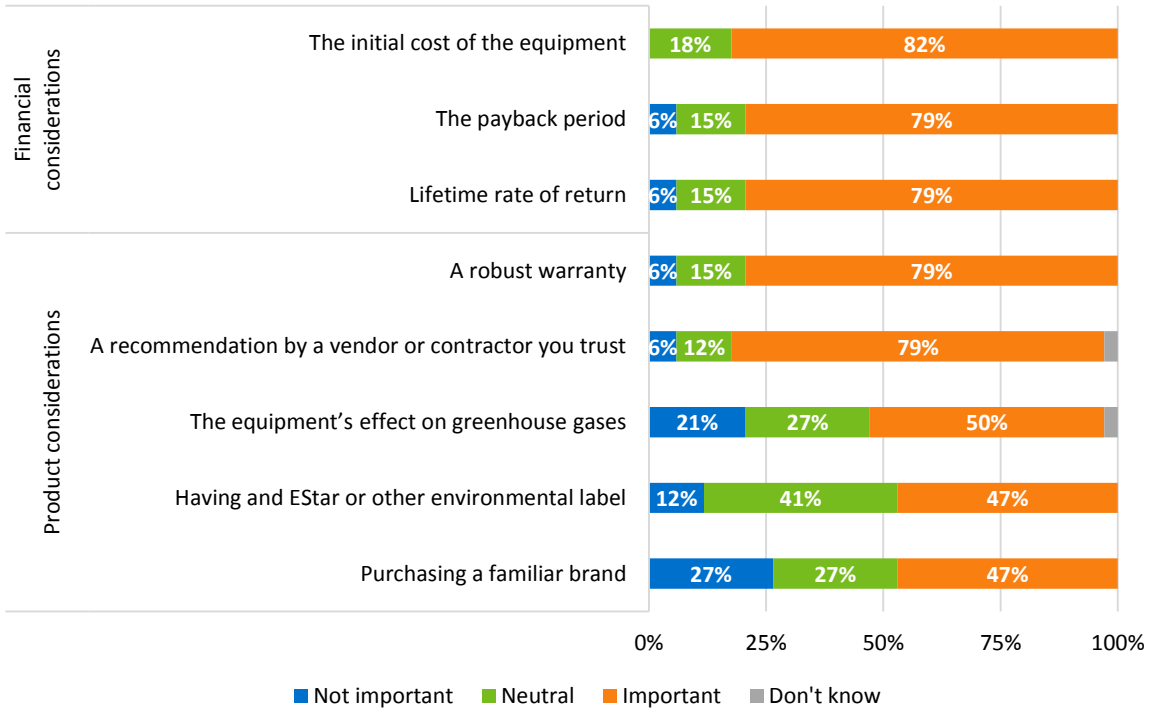
[30] The respondent did receive a promised faucet aerator and vending miser. Program staff verified this during a follow-up call on or about February 5, 2016.

5.4.1.5 Future Upgrades

About two-fifths of respondents (14 of 34) reported plans to make energy saving upgrades within a year after their SB program participation. Most of these respondents (11) said they plan to make a lighting change, three reported plans to make an HVAC upgrade, and one said they plan to install a programmable thermostat[32]. Of the 11 indicating they will make a lighting change, two respondents noted they are making the change to save energy, one of whom is also interested in improving the light quality in his building. The remaining nine did not provide a reason why. Almost two-thirds of those who plan to make an upgrade (9 of 14) said their participation in the SB program influenced this decision. Four respondents stated the program was not influential in their future upgrade decision and one respondent was neutral about the program's influence.

Respondents reported financial considerations, like the cost of equipment and the payback period, were important considerations when making building upgrades. Almost the same percentage of respondents reported product considerations, such as a robust warranty and recommendations from contractors, were important. Far fewer respondents reported environmental attributes of the equipment or labeling was important to them (Figure 5-2).

Figure 5-2: Considerations When Making Building Upgrades (*n* = 34)



[31] Program data shows these respondents did actually receive aerators.

Almost half of respondents (16) said they had known about Avista energy saving programs before they participated in the SB program, with three to four each reporting their source of awareness being a contractor/distributor, word-of-mouth, Avista bill stuffer, or regular contact with an Avista representative and one each citing print advertisements and the Avista website.

Almost all respondents (32) reported they could consider contacting Avista prior to making any building upgrades; the other two did not know whether they would contact Avista.

6 Residential Process Results

6.1 Program Administration

The evaluation team conducted in-depth interviews with Avista program staff, implementation contractors, and Community Action Partners (CAPs) and a survey with contractors to obtain an understanding of how the Avista's residential programs are administered and what challenges these various actors have faced in delivering these programs to the market. The following subsections describe the findings from these interviews and the contractor survey.

Note that the evaluation team organized this section by each program covered in this evaluation. The organization is as follows:

- For the rebate programs, the evaluation team described feedback provided by contractors and Avista's program manager about administration and experience with these programs.
- For the Appliance Recycling, the team reported feedback by JACO, the program implementer, on administration and program challenges.
- For the Simple Steps, Smart Savings, the team reported feedback by Avista's program manager and CLEAResult, the program implementer, on administration, program evolution, and future opportunities.
- For Home Energy Reports or HERs, the team reported feedback by Avista's program manager and Opower, the program implementer, on administration, challenges, and future opportunities.
- The team also reported feedback from CAP agencies – agencies who implement the low-income program for Avista.

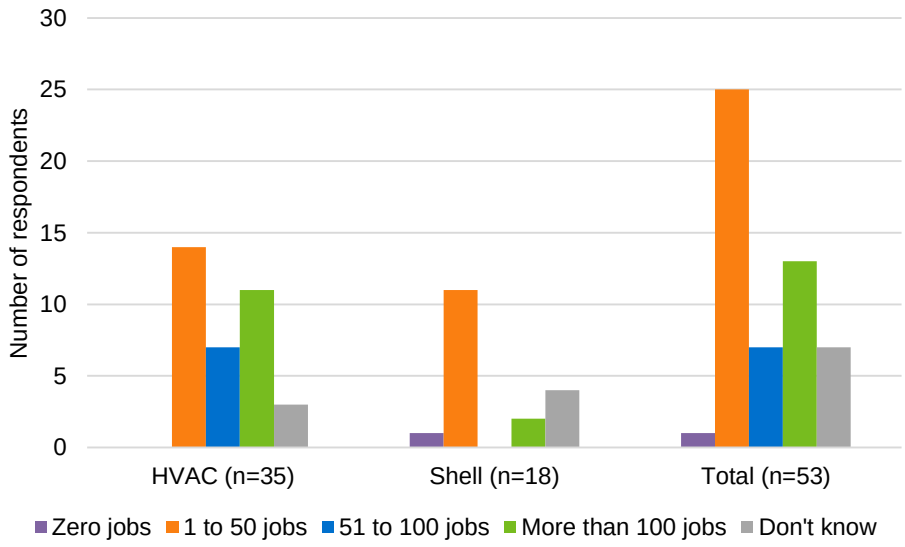
6.1.1 Rebate Programs

This section presents results from the contractor survey and Avista staff interviews related to the rebate programs (i.e., Shell, HVAC, Fuel Efficiency, Water Heat, and ENERGY STAR Homes). Contractors were surveyed about their interactions with Avista program staff, their satisfaction with Avista's residential rebate programs, their sales history and their recommendations for future program opportunities. Avista staff reported on interactions with contractors and future program opportunities.

6.1.1.1 Contractors Interaction with Avista and Program Awareness

Almost all contractors reported doing an Avista rebated project in the last year and about half completed 50 or fewer Avista rebated jobs in 2015. HVAC contractors reported doing more Avista rebated projects than Shell contractors (Figure 6-1).

Figure 6-1: Contractors Number of Avista-Rebated Projects (*n*=53)



Avista projects constituted a considerable portion of all contractors work. HVAC contractors reported, on average, that 42% of their work received Avista incentives and shell contractors reported, on average, that 31% of their work received Avista incentives.

Surveyed contractors reported being aware and familiar with at least some Avista programs. More than three-quarters (42) of residential contractors reported completing projects that received Avista rebates for at least the past five years. Seven more reported completing Avista-projects for four to five years, and four contractors reported completing rebated projects for three years or less. Furthermore, almost all (45 of 46) residential contractors who were able to estimate the amount of Avista-related work they completed in the last year, reported completing at least one rebated project in the last year. Additional analysis shows contractors spend considerable time working on Avista-rebated projects. Almost two-fifths (39%) of contractor completed projects, on average, received Avista rebates.

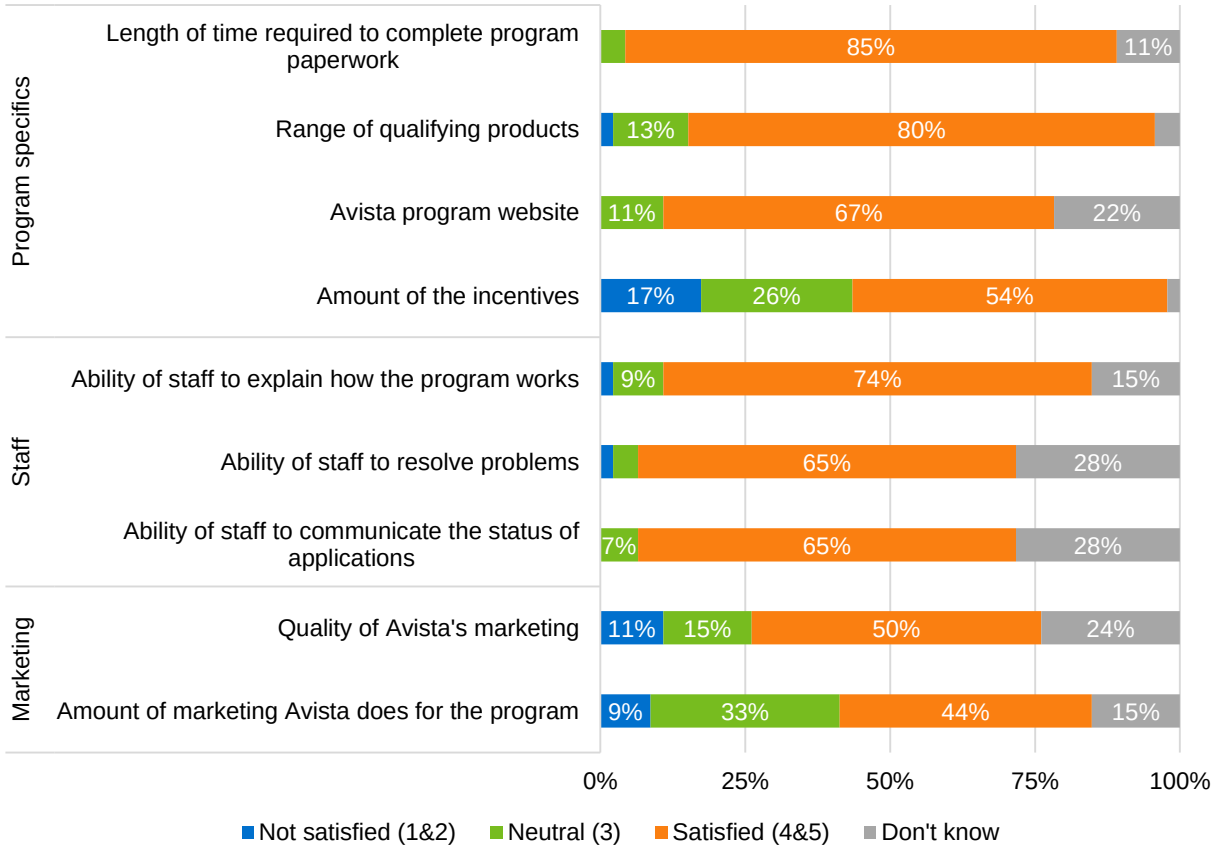
6.1.1.2 Avista's Interaction with Contractors

Although contractors are familiar with the Avista's rebate programs, there are relatively few interactions between Avista staff and contractors. According to program staff, Avista primarily interacts with contractors when contractors call to request information on behalf of their customers. Avista does not currently offer any formal training for contractors on the rebate programs, and Avista staff only occasionally visit contractor offices to hand out rebate information, the only face-to-face outreach activity reported by program staff. This indicates that there is an opportunity for Avista to engage contractors more with the rebate programs.

6.1.1.3 Contractors' Program Satisfaction

Surveyed contractors reported their satisfaction with nine elements of the program across three different areas: 1) program specific elements including rebates and measures; 2) their interactions with program staff; and 3) program marketing (Figure 6-2).

Figure 6-2: Residential Contractors Satisfaction with Program Elements (n=46)*



*n=46 and not 53 because this question was seen only by those who reported a proportion of their projects received an Avista rebate.

Of the three areas investigated, the program-specific elements had the highest proportion of satisfied contractors. Most contractors reported being generally satisfied with three of the four program specific elements included in the survey. The exception was rebate amounts, for which nearly half reported being satisfied, and, unsurprisingly, nearly one-in-six contractors reported being dissatisfied[33]—the single largest area of concern among the nine elements in the survey. Specific mentions of dissatisfaction by respondents included:

- 22 respondents made unspecific comments about their desire for higher rebate levels.
- Seven respondents reported dissatisfaction with the number of rebate eligible products in Idaho (2), the lack of geothermal products (1), and the lack of renewable energy

[33] The evaluation team has seen across many evaluations that contractors often report wanting higher incentives. Higher incentives help them sell more jobs.

product rebates (1). The remaining three implied that the existing range of products was not large enough to attract customers but did not specify products or services.

- Five respondents expressed frustration with the program website finding it "confusing" and hard to find information.
- Two respondents reported dissatisfaction with the amount of time it takes to complete program paperwork.

A majority of contractors also reported being satisfied with the interactions with Avista staff. At the same time, this is also a topic area for which many contractors responded "don't know", suggesting that they either had no opinion on the topic or were unfamiliar or otherwise unwilling to answer the survey questions. However, after excluding those respondents who reported "don't know" about their staff interactions, the results indicate high levels of satisfaction with Avista staff. Ninety-one percent of contractors (48 of 53) were satisfied with staff's ability to resolve problems and communicate application status, and 87% were satisfied with program staff's ability to explain how the program works.

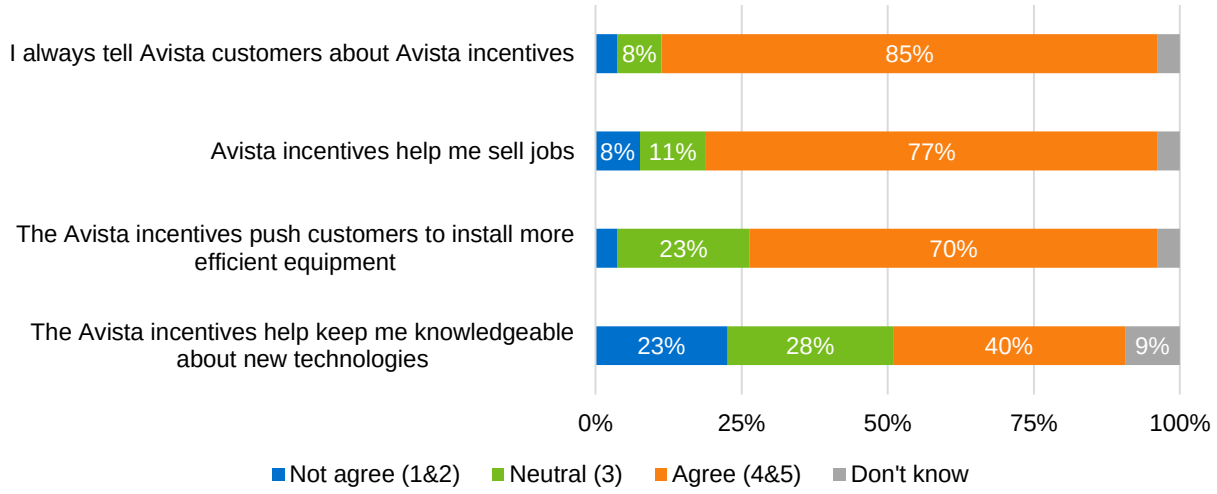
Seven contractors reported some degree of dissatisfaction regarding their interactions with Avista staff. Five reported communication-related difficulties with staff such as delays in getting questions answered or problems identifying and contacting the right staff person. One noted dissatisfaction with the amount of support staff provided in promoting the program and expressed interest in having staff reach out to contractors more and help contractors promote the program. The seventh respondent rated their staff interactions as a three (on a five-point scale) but their comment about staff suggested they were pleased with staff performance.

Of the three satisfaction topic areas investigated, the marketing-related elements had the lowest share of satisfied contractors. A minority of contractors, about one-tenth (11%) indicated they were dissatisfied with the amount of Avista's marketing and nearly one-tenth (9%) noted they were dissatisfied the quality of marketing. However, in their follow-up comments, these five contractors indicated they were largely unaware of Avista's marketing efforts or only saw the materials sporadically. In addition, a notable minority of contractors answered "don't know" to the two marketing-related questions, and a number of respondents answered the question with a '3'—the midpoint on the rating scale. Collectively, these results suggest that contractors may be more unfamiliar with Avista's marketing of the rebate programs more than they are dissatisfied.

6.1.1.4 Contractors' Sales of Efficient Equipment

Rebates are an effective sales tool for contractors. Most contractors agreed that they always tell customers about rebates and that the rebates help them sell more energy efficient equipment and services to their customers, a finding that is supported by Avista staff. However, a relatively low number of contractors agreed that the Avista rebates were helping them stay up-to-date about new technologies (Figure 6-3).

Figure 6-3: How Program Helps Residential Contractors (n=53)

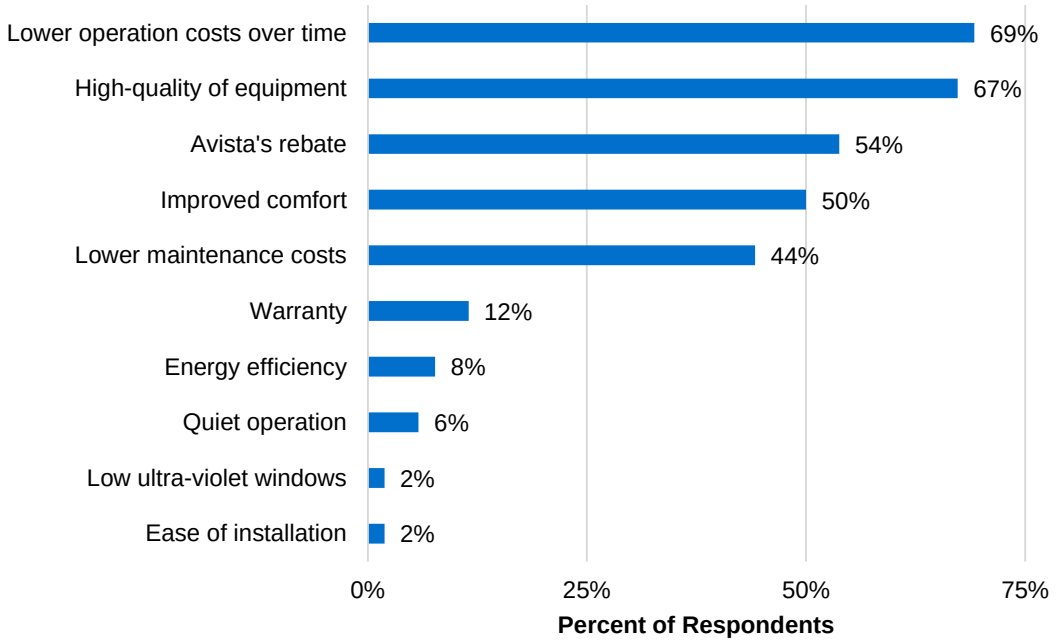


Almost all residential contractors offer customers more than one option when selling products or services. Of the 45 respondents that reported how many options they typically provide customers[34], 89% offered two or more options, and 42% of contractors offered three or more options. The most commonly cited distinguishing characteristic among the options was energy efficiency (62%), followed by price (22%), and then quality (18%). Only a few respondents (4%) reported using non-energy benefits, such as improved comfort, to differentiate the options they presented.

When discussing high-efficiency equipment options with customers, contractors tended to mention lower operating costs (69%), higher quality (67%), and the Avista rebate associated with the equipment (54%) (Figure 6-4).

[34] Eight reported don't know

Figure 6-4: Benefits of Efficient Equipment Mentioned During Sales (n=52)*



* One respondent, excluded from this analysis, did not report mentioning any benefits of efficient equipment.

Three-quarters of contractors reported that they prepare all or most of the rebate application (55%) or do the application in concert with the customer (21%). About a quarter stated the customer typically prepares the application.

Six surveyed residential contractors reported discouraging their customers from purchasing highly efficient equipment. They mentioned the following reasons:

- Three respondents mentioned structural barriers that made it difficult to install high efficiency equipment. For example, one respondent reported adding additional venting needed for a high efficiency furnace may add too much to the cost of the project to make it viable.
- Two respondents reported the customer needed the lowest cost option.
- One respondent did not recommend high efficiency equipment when they knew a customer would not benefit from the savings. For example, if a customer was not going to be in the house long enough to realize benefits or savings of efficient equipment.

6.1.1.5 Future Rebate Program Opportunities

Contractors provided suggestions for additional equipment they would like rebated through the programs, and ductless heat pumps and hot water saving measures were the most commonly cited (Table 6-1). All 34 contractors that wanted these pieces of equipment added to the program indicated they thought it would improve or encourage program participation.

Table 6-1: Contractor Suggestions for Additional Program Measures

	Count	Percent
Ductless heat pump	11	21%
Hot water measures	7	13%
Doors	5	9%
Air conditioning	3	6%
Geothermal	3	6%
Thermostats	1	2%
Furnace	1	2%
Insulated siding	1	2%
CO2 demand control ventilation	1	2%
Non-equipment specific suggestions*	4	9%
TOTAL	**34**	**100%**

* Two respondents wanted the lists in Idaho and Washington to be the same, one wanted gas rebates for people in Kootenai Electric territory, and one wanted unspecified "new" equipment incented.

Avista staff reported investigating several possible future program and/or measure opportunities, showing that Avista staff are preparing for the future and thinking about market changes and innovative opportunities:

- Avista is tracking the heat pump water heater technology to assess whether it is an opportunity in milder climate zones.
- Avista is testing the effectiveness of a smart thermostat pilot to assess whether the pilot can be scaled-up into a program.
- There is some discussion on reconnecting with contractors.
- Avista is considering offering the manufactured home duct sealing program in Idaho and increasing certain rebates: 1) water heater tank rebate (from $20 to $50), 2) tankless water heater rebate (from $130-$180), and 3) high efficiency furnace rebate (from $250 to $300).
- Avista also is planning to install AMI meters in Washington to be able to develop innovative options for delivering programs or different types of smart-grid programs in the future.

6.1.2 Appliance Recycling Program

This section describes feedback from the interview with the implementation contractor, JACO. JACO was interviewed about program administration and challenges.

1.1.1.1 Program Administration and Efficiencies

The Appliance Recycling program launched in 2008, and since then, JACO has worked to improve the program's administrative processes. In 2014 and 2015, while the program was operating, there were no major inefficiencies in these processes. As explained by the JACO

representative, the basic process is as follows: customers call the toll-free number to schedule a pick-up of a refrigerator or freezer, JACO will ask customers whether the unit is working, the size of the unit, and the age of the unit to determine whether the unit qualifies for the program. If the unit is eligible, JACO schedules a pick-up. At the pick-up site, JACO will check whether the unit is working and the age of the unit prior to loading it onto the truck to decommission it. JACO records all the information about the unit and the customer in their database. This database allows JACO to have automated reporting to Avista and an automated dashboard that Avista staff can access to view program progress. Additionally, customers receive an incentive check in about four to six weeks from the pick-up date. The JACO representative reported that this process has been refined and optimized over the years.

The vintage requirement for eligible appliances is 1995 or before, and while on-site JACO also checks the age of the unit. If the unit is determined to not meet the eligibility requirements, JACO still takes the unit to ensure good customer service. This policy has worked well for Avista and JACO in managing customer satisfaction.

1.1.1.2 Program Challenges

Avista's Appliance Recycling program ceased to be cost-effective, which prompted Avista to discontinue the program in June 2015. The JACO representative with whom we spoke provided several suggestions on what Avista could have done to improve program cost-effectiveness: 1) reducing or eliminating the incentive; 2) relying more on in-house marketing such as bill inserts to manage marketing costs; and 3) processing, not destroying, CFC11 foam (destroying is costly).

The JACO representative also noted that the program was not been able to achieve its goals. In the last 3 to 4 years, JACO had a target of recycling about 1,500 units. JACO recycled around 1,100 units in 2014 and expected to recycle close to 1,100 units in 2015. There was not enough budget to commit to the recycling volume Avista wanted to achieve. The JACO representative further noted that Avista committed about 60% of the marketing budget that was needed to achieve the established goals. JACO stated that they optimized this budget by identifying the areas with likely higher participation rates, while ensuring that other areas were still being served. Simple Steps, Smart Savings Midstream Program

This section presents results from the program implementer (CLEAResult) and Avista manager of the Simple Steps, Smart Savings Program. CLEAResult and Avista manager were asked about the program efficiencies, challenges they face during program implementation, and recommendations for future program opportunities.

6.1.2.1 Program Efficiencies

The Simple Steps, Smart Savings program is Bonneville Power Administration's (BPA's) regional promotion designed to increase adoption of various energy efficient technologies, such as compact fluorescent lamps (CFLs), light emitting diode bulbs (LEDs), light fixtures, and energy-saving showerheads. The program includes four delivery components: retail, direct

install, direct mail, and bulk purchase. Avista participates only in the retail component of the program and CLEAResult implements this program for Avista. Avista's staff explained that Avista allocates funds for this program because it is easy to administer and achieves energy savings. Staff explained:

> *Generally, we run this program because of the savings. It is a low touch with the implementer, not a lot of time on our end to implement. Easy to get those savings.*

Avista's staff did not report any communication issues with CLEAResult or BPA related to the program. Likewise, CLEAResult also did not report any communication challenges with Avista. Avista's staff communicates with CLEAResult once a month, when CLEAResult sends Avista a monthly invoice. The invoice includes sales data, savings associated with sold products, and a report noting services rendered by CLEAResult (for example, the number of store visits).[35] Additional communication occurs during contract renewal phase, special product promotions, and when CLEAResult forecasts sales by product category once a year. Avista's communication with BPA is infrequent. There is a monthly conference call with BPA's program manager, who provides program updates and facilities discussion about the program.

Avista's and CLEAResult's experience with Simple Steps, Smart Savings program indicates that the program is delivered efficiently to the market. CLEAResult 1) recruits and negotiates contracts with retailers and/or manufactures; 2) interacts with retailers to communicate program updates and requirements as well as provide point-of-sale (POS) materials; and 3) conducts quality control (QC) checks to verify pricing, POS materials (if present), and products (if on the shelf). Avista conducts QC checks every quarter. The CLEAResult representative reports that nearly all major retailers participate in the program, and the program is helping retailers sell more efficient products. Both Avista staff and the CLEAResult representative note that discounted products are found on store shelves, and the pricing has nearly always been correct.

6.1.2.2 Program Challenges

The challenges identified through the interviews relate to sales data reporting and POS materials. The CLEAResult representative reported that smaller retailers have difficulty providing sales data to CLEAResult because they lack a sophisticated reporting system that larger retailers typically have. Avista's staff noted that different retailers have different rules on what they will display on the shelf. When no POS materials are found on the shelf (it is unclear how often this occurs), customers will not be able to learn of Avista's discount, which can translate into higher free-ridership. Avista staff noted working with CLEAResult to ensure POS materials are displayed in all the stores.

[35] Avista may also receive a document noting any changes to the measures.

6.1.2.3 Program Evolution and Future Opportunities

Although the Simple Steps, Smart Savings program functions well, it has changed recently to meet the needs of BPA and the participating utilities. Specifically, in 2015, BPA no longer pays for non-participating utility savings. Instead, non-participating utility savings are distributed proportionally to participating utilities based on their share of the savings from purchases during that fiscal year.[36] Stated differently, most of the savings from the stores in Avista territory are shared between Avista and other nearby public utilities. For example, if Avista wanted to support a store whose Avista-related sales account for 60% of the store's total qualifying sales, then someone else would have to pay for the remaining 40% of the sales. Before, BPA would step in and pay for the 40% if no other utility wanted to cover the 40%. Now, BPA no longer pays for the 40%. Participating utilities buy savings from Simple Steps, Smart Savings at a cost that covers both their participation savings and a proportionate amount of non-participant savings. In addition, because incentives are no longer fixed, CLEAResult, as explained by their representative, is authorized to reduce the incentives for a product to mitigate the cost of non-participating utility savings in a store.

The CLEAResult representative listed several technologies that Avista should consider if they wanted to add measures to the program: advanced power strips, new lighting controls, water heaters, and ductless heat pumps. The representative also emphasized that Avista should continue with special promotions where higher incentives are promoted for a limited period. Retailers like the limited-term promotions, and these promotions can drive sales. The representative also commented on CFLs. He noted CFLs have not saturated the market and are still an opportunity for utilities because they are cheaper than LEDs. CLEAResult, through their direct install program, has observed three CFLs, on average, in the homes with typically 20-30 sockets.

6.1.3 Home Energy Reports Behavior Program

This section presents results from the program implementer (Opower) and Avista manager of the HER Program. Opower and Avista program staff were asked about the program performance, customization opportunities, challenges they face during program implementation, and recommendations for future program opportunities.

6.1.3.1 Program Administration and Performance

Avista has contracted with Opower to deliver Home Energy Reports (HERs) for about three years, starting in 2013. As part of the agreement, Opower is expected to mail the HERs to participating Avista customers once per month for three months, and then once every two months after that. This is an opt-out program; customers who have been randomly assigned into

36 BPA allocates savings to Avista by using the Regional Sales Allocation Tool (RSAT). RSAT identifies the amount of savings that Avista and other utilities can expect to receive from stores that are in their territories, and that participate in the program.

the group receiving HERs (the treatment group) and have not opted out participate in this program. Avista provides Opower with contact information for participating customers, and Opower manages the program data and analytics; Avista conducts follow-up quality control checks on the customer data provided to Opower.

Avista staff reported expecting 1% to 3% savings per year from this program, and the program achieved ~2% savings across 2014 and 2015. Further, there is evidence that the Avista promotions described in the HERs have engaged customers. Avista staff reported that there are typically 5-6 reports per year, and two of these reports include an Avista promotion for electric to gas conversions or active rebate programs. Due to issues with the transition from one customer database in 2014 to a new one in 2015, only two reports were sent out in 2015. A prior evaluation documented an increased rate of participation in fuel conversion programs among those in the HER treatment group compared to the control group.[37] The current evaluation showed that HERs plus rebate combination appears to act as the Multiplier Effect[38], amplifying savings, perhaps because HERs are influencing the type and number of rebate programs that customers participate in or additional energy saving behaviors customers are undertaking in their homes (for more detail on this analysis, see Section 7.2).

6.1.3.2 HER Customization

Presently, there is limited ability to customize the HERs, according to Avista staff, but that will change since Opower is re-designing their reports at this time to make them more customizable. The old 2015 reports are customizable, but the new report design, which Opower is working on, will open more space in the report for customized content. An Opower representative noted that the new re-designed reports will incorporate old non-customizable components (some of those elements will be shortened) and allow for more space in the report for utility rebranding and promotional offers. The old or 2015 report design includes four main components:

- Neighbor comparisons (Not customizable; comparing 100 similar-sized homes or homes with similar attributes)
- Personal comparison (Not customizable; compares customer usage to the usage in the same period last year)
- Tips (Customizable; Avista can add tips to the library, populate tips with rebate information, or add a rebate graphic or a website address)
- Optional marketing module (Customizable; Opower can design this module in any way for Avista to promote an offer)

[37] Cadmus (2014). *Avista 2013 Idaho Electric Impact Evaluation Report* and *Avista 2012-2013 Washington Electric Impact Evaluation Report.*

[38] Multiplier effect occurs when a change in one variable leads to a much larger change in another variable.

6.1.3.3 Program Challenges

The program faced a major delivery challenge when Avista changed its customer billing system in January/February 2015. For about six months after the change, Opower did not receive the necessary customer data from Avista that it needed to mail the HERs. Avista resolved the data issue by June 2015, after which Opower continued sending HERs to participating customers.

Other challenges experienced relate to the eligibility criteria for this program. Initially, Avista wanted to target high energy users. However, Avista did not have enough of these types of customers because Opower needed about 100 homes within 100 miles radius with similar load curves for each target customer to set up a comparison group. Avista also had to exclude homes where usage was seasonal such as vacation homes. Thus, Avista staff decided to use a lower minimum energy usage threshold for this program than they initially expected. The final criterion that was established was 12,000 kWh/year or more in Washington and 8,000 kWh/year or more in Idaho.

6.1.3.4 Future Program Opportunities

The Opower representative provided several suggestions on ways to expand the program:

- Opower suggested adding a monthly email report option for customers. If an email is sent, there are live links that could link to promotions for the rebate programs on Avista's web-based customer portal. In another utility territory, Opower saw a 45% open rate on an email HER and 8% click-through rate. Opower also reported seeing an increase in savings with the email-based HER option.
- The Opower representative also suggested a high bill alert option, in which Opower can send customers high bill alert notices to customers whose bills are projected to be higher than expected. In other territories, Opower saw a 61% open rate for these types of alerts and a click-through rate of 21%.
- A third suggestion relates to Opower's "points and rewards" option. With this option, customers can collect points based on how much energy they save. The points can be redeemed for an Amazon gift card, for example. Opower suggested this could nudge customers to change their behavior.
- A fourth suggestion offered by Opower was to target small and medium business with the reports. Like the consumer facing program, targeting small and medium businesses requires a minimum number of eligible customers to implement this option effectively.
- The last suggestion offered relates to low-income customers. Opower has developed HERs suitable for low-income households which contain tips and suggestion that are appropriate for this group of customers.

Avista staff informed the evaluation team that they are already considering ways to broaden participation in their consumer behavior change programs. For example, Avista staff reported planning installations of AMI meters in Washington in 2017. AMI meters will allow Avista to design many different types of customer engagement and/or smart-grid programs. For example,

Avista could use the data from these meters to send real-time usage feedback or bill alerts to customers to their mobile devices.

6.1.4 Low-income Program

This section reports the results from interviews with CAP agencies and Avista program staff who work on the low-income program. Overall, the CAPs have an efficient method of delivering services to low income customers, and customers are generally satisfied with the services they received from CAP agencies. Nevertheless, CAPs struggle to serve the low-income market because of limited budgets and high demand for their services.

6.1.4.1 Program Administration

Avista relies on CAP agencies to deliver this program. Figure 6-5 shows the process of how CAP agencies deliver services to low-income customers

Figure 6-5: CAPs Delivery Process to Low-Income Customers

To date, recruiting customers into the low-income program has not been difficult for the CAPs. Most participating low-income customers come from the bill assistance programs. The CAPs also conduct some marketing and outreach, such as bulk mailings, advertising at community fairs, posting flyers in the libraries or food banks, or including flyers in the Avista bills. Larger CAPs, in particular, conduct more marketing than smaller CAPs.

Verifying program eligibility goes beyond documenting the customer's income. Some CAPs will look at the condition of the customer's home; if it is in a bad shape (a roof needs to be replaced, for example), then the CAPs may reject the applicant because the program funding generally cannot cover non-weatherization repairs that exceed the amount of budget allowed for such repairs.[39] Some CAPs also prioritize applicants based on their energy usage or if there are elderly or children in the home. This prioritization enables the CAPs the flexibility to serve customers with bigger electricity bills or other needs.

The pre-installation audit determines whether a customer is eligible for services. The auditors examine energy usage in a home and identify any major repair issues as well as measures that the program could install. For example, auditors at one CAP agency use modeling software on a subset of homes to identify the most cost-effective measures to install, whereas another CAP uses the audit to identify and assess which measures can be installed and subsidized by Avista

[39] Avista allocates only 15% of its funds for non-weatherization measures, typically safety or health measures.

or other funders. All CAPs use the audit information to assess customer eligibility, as discussed previously.

The CAPs rarely outsource the installation of weatherization measures. Most (three of four) of the interviewed CAPs have their own internal installation crews. One CAP outsources the installation work to various contractors. The CAPs with internal crews may work with other contractors, if there are health and safety issues to remedy or if there is no expertise to install a certain measure. Ordinarily, the CAPs typically approve the installation of the following measures:

- Shell upgrades (Insulation, air-sealing, etc.)
- Duct sealing
- Refrigerator replacements
- Fuel conversions
- Low-cost measures (window plastic or lighting measures)
- Health and safety measures (CO_2 detector installation, asbestos, or rodent abetment, etc.)

Some of these measures (for example, insulation) are priority measures for Avista because they provide more energy savings and are more cost-effective. Priority measures are 100% reimbursed, while non-priority measures are partially reimbursed.

Lastly, every project goes through a quality control (QC) inspection. QC is an important step. It ensures CAPs catch any mistakes in the installation. CAPs use their internal staff for the QC inspection, but they also rely on the city, county, or the state officials to inspect the work for which contractors had to obtain the permits.

6.1.4.2 CAP Agency Interactions with Avista Staff

The CAPs communicate with Avista staff, when needed, and have reported no communication challenges to date. All CAPs except one reported having no invoicing issues as well. (CAPs send monthly invoices or reimbursement form to Avista, which Avista uses to track the progress of this program.) The one CAP contact that noted an invoicing issue stated the invoicing was complex and time-consuming. The representative explained that program staff and not agency's accounting department had to complete the invoicing because of the dollar limitations Avista places on measures.

6.1.4.3 CAP Agency Interactions with Participants

CAPs communicate with low-income customers from start to finish throughout the entire participation process. CAPs also conduct surveys with their customers to gauge customer satisfaction. Generally, customers reported being satisfied with the work done on their home, according to the CAPs. The only negative comment CAPs have received relates to window installations. All of the interviewed CAPs mentioned that participants want window

replacements, but windows are not a cost-effective measure. CAPs will replace a limited number of windows and try to explain to customers that other measures such as insulation or air sealing will yield more energy savings than windows. However, customers have difficulty understanding this concept.

6.1.4.4 Program Challenges

To CAPs, the main challenge is having sufficient funds to more effectively serve the low-income market. Two CAPs noted that there is a bigger need in the market than what they can provide with their services. The same two reported having waiting lists. One CAP noted that the working class segment of the low-income population is underserved.[40] Additionally, all CAPs report some struggle in serving customers because budgets are limited. CAPs would like more funding, and they are always looking to prioritize what they can afford. This is especially the case with funding allocated for safety and health measures. One CAP mentioned constantly fighting over those funds because they cannot weatherize a home without doing at least some repairs. They also reported being cautious not to repair anything for which they will not be reimbursed. Avista staff noted that previously federal funds (especially funding from the American Recovery and Reinvestment Act or ARRA) outweighed utility funds for these programs; today, utility-provided funds outweigh the funds from the federal sources.

CAPs noted a few additional challenges:

- Scheduling an inspection: Two CAPs noted that at times it is difficult to reach customers to schedule an inspection. Inspection is necessary for CAPs to finalize their paperwork and receive reimbursement.
- Difficulty in serving the low-income renter population: One CAP explained that benefits of the weatherization work have to go to the low-income renter only. To ensure this, the program would require landlords to not raise the rent for about 3 years or sell the property for a certain period after work completion. If they sold, then they would have to return some money to CAPs. Landlords are reluctant to sign-off on such requirements.
- Not covering gas measures in Idaho: One CAP has difficulty in identifying enough qualifying customers in Idaho because Idaho funding covers electric measures only.

The main challenge noted by Avista program staff is to make this program cost-effective. Avista staff explained that low-income projects are expensive and Avista tries to make this program as cost-effective as possible. Additionally, Avista has found that over time the savings may be overestimated for some homes that do not use much energy. This also affects cost-effectiveness. Avista might have used a deemed energy savings value for a home when

[40] The working class families often believe they do not qualify for CAP services because they work. Yet, a CAP can consider helping families up to 200% above the federal poverty line with some funding streams. CAPs typically receive funding from: 1) federal agencies (U.S. Department of Energy and U.S. Department of Health and Human Services); 2) regional organizations (Bonneville Power Administration and Avista); and 3) state agencies (Washington Department of Commerce).

estimating savings, but when they examined the annual usage, they have found claimed savings to be more than the usage in certain homes. Avista caps those savings at 20% or 25% of the usage.

6.1.4.5 Suggestions for Improvement

The CAPs provided several suggestions on how to improve the program:

- Avista could help low-income customers offer more in-depth education about saving energy such as offering a class.
- Although acknowledging that only 15% of Avista funds are used for safety or health measures, one CAP suggested Avista could cover more non-weatherization measures such as plumbing leaks.
- Avista could consider funding for newer technologies, especially renewables such as solar.

Avista staff also noted a couple of options they are considering to reach low-income customers, such as working with tribal weatherization agencies to reach additional customers that are typically hard to reach.

6.2 Customer Experience with Rebate Programs

To assess the residential customer experience with Avista's rebate programs during 2014 and 2015, the evaluation team compared survey results between program participants and nonparticipants as well as between customers in Idaho and Washington. Statistically significant differences between the states or years have been highlighted.[41]

This section documents the key findings from participant and nonparticipant surveys as related to Avista's rebate programs (i.e., Shell, HVAC, Fuel Efficiency, Water Heat, and ENERGY STAR Homes). The team also discusses findings related to Appliance Recycling program in this section because Appliance Recycling participants received an incentive for the unit they recycled. Topics covered include awareness and familiarity with Avista rebate programs, motivation and barriers to participation, program experience, and attitudes toward energy use and conservation.

Overall, the survey results suggest that Avista's marketing has been effective in increasing customer awareness of the Avista rebate programs. For participants, in particular, contractors were the main source of awareness of rebate offers and were influential in participants'

[41] Statistical significance was determined based on differences between proportions or means at a 5% level of significance.

decisions to participate. Both participants and nonparticipants expressed interest in learning more about Avista's programs. Direct mail (bill inserts, for example) were identified as good means of providing this information to customers. Additionally, participants were largely satisfied with the programs, although this varied by program type. Furthermore, program participants did not report any major challenges with the programs, although they expressed a desire for more marketing and outreach about rebate offers and for clarifying program-related information about quality assurance (QA) inspections. Aging or broken equipment and wanting to save energy or money typically motivated participants to make energy efficient upgrades to their homes, whereas the most commonly cited barrier to making efficient upgrades for nonparticipants was the up-front cost of efficient upgrades or repairs. Subsections below document these findings.

6.2.1 Awareness and Familiarity with Avista Programs

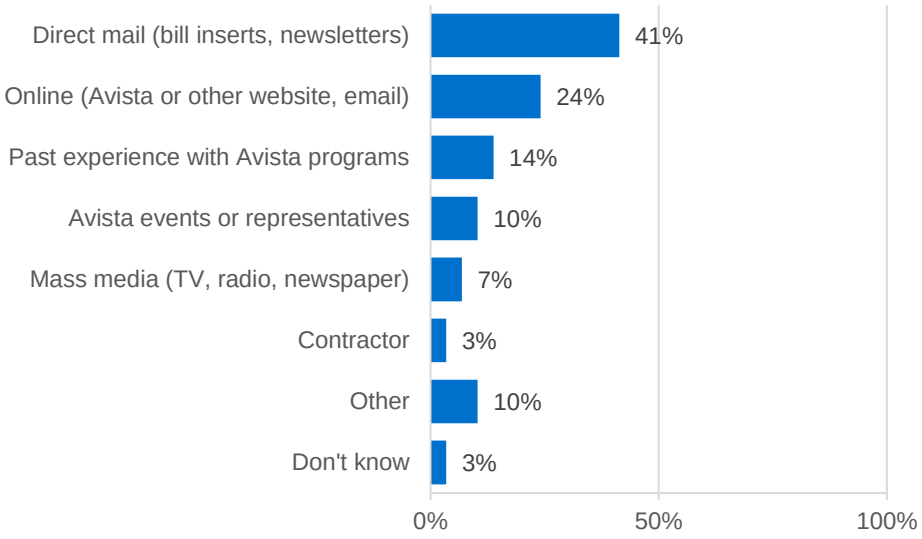
The evaluation team reviewed program-related marketing materials and responses from participant and nonparticipant surveys regarding awareness and familiarity with Avista's programs to determine whether customers are learning of Avista's offerings through the marketing channels used by Avista. Survey findings indicate Avista's marketing activities appear to be effective at increasing customer awareness.

The evaluation team's review of Avista's marketing and outreach documents indicates that Avista conducted the following marketing activities in 2014 and 2015:

- Direct mail and bill inserts;
- Print advertisements in newspapers;
- Television advertisements and newscast spots;
- Energy fairs at malls and community centers; and,
- Online digital advertisements.

The source of program awareness among customers is consistent with Avista's marketing activities. Of the 29 nonparticipants who were aware of Avista incentives (41% of the sample), about half (45%) reported learning about Avista's rebate programs through channels Avista used for outreach, such as newsletters, bill inserts, representatives, and events (Figure 6-6). Please note that the nonparticipant sample is representative of the Avista's residential customer population.

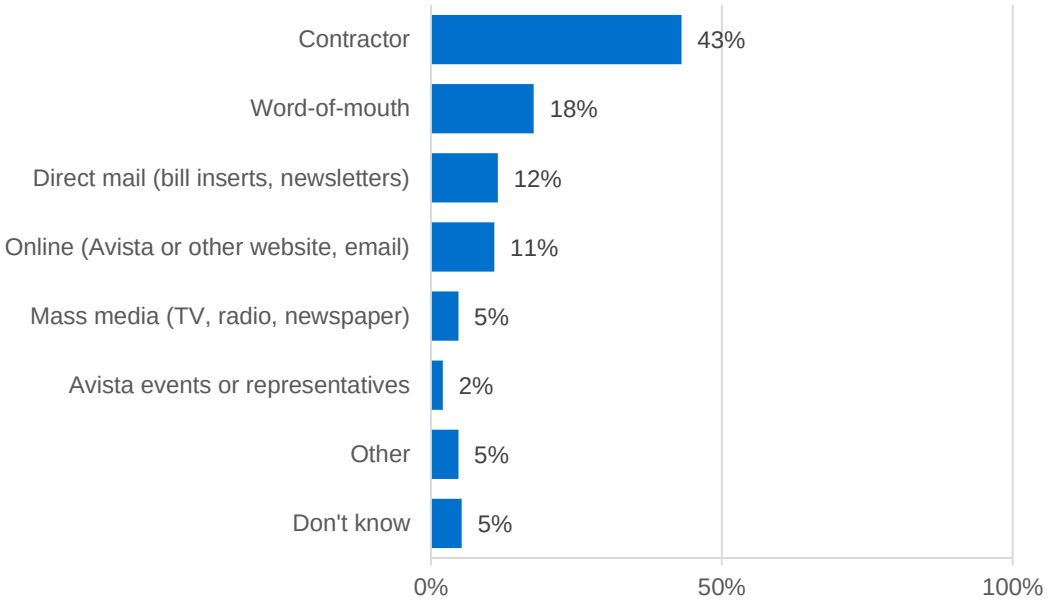
Figure 6-6: Source of Program Awareness (2015 Nonparticipants)



Participants highlighted the importance of contractors in advertising Avista's programs. Contractors were the main source of awareness for participants (Figure 6-7). Nearly half of the surveyed participants indicated they first heard about Avista's programs from contractors, whereas less than one-fifth (14%) reported first learning about the program they participated in via channels Avista used for outreach.[42]

[42] Participants and nonparticipants received slightly different questions. The evaluation team asked participants how participants first heard about the Avista incentive they received (respondents provided a single response). The evaluation team asked nonparticipants who were aware of Avista rebates, how they heard about the rebate (respondents were allowed to provide multiple responses).

Figure 6-7: Source of Program Awareness (2014 and 2015 Participants)



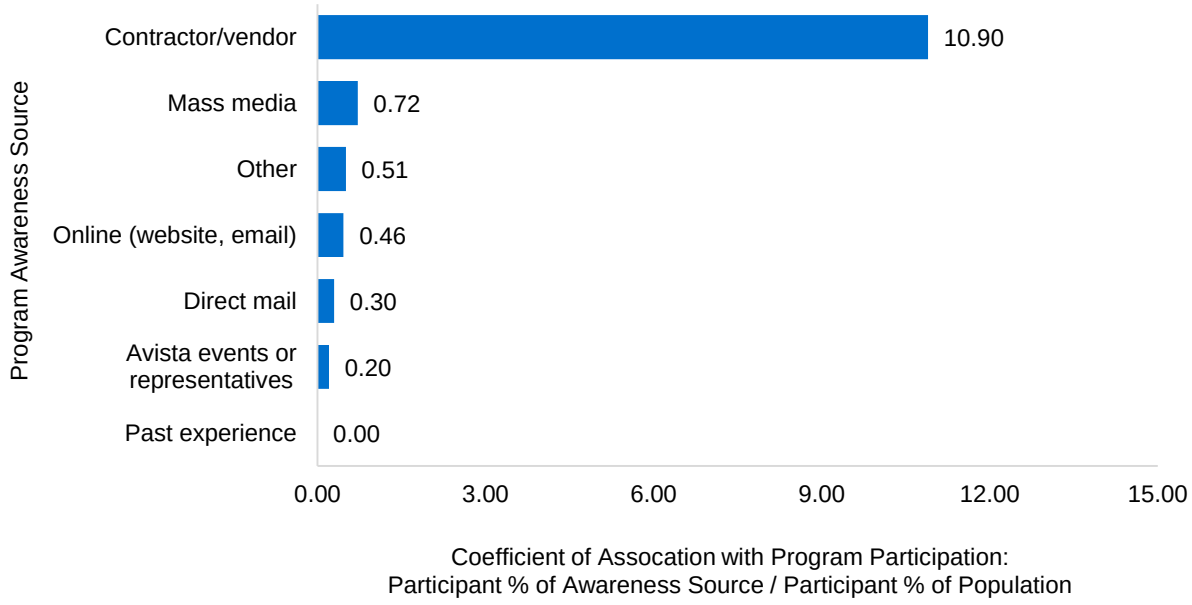
It is difficult to gauge the relative impact of each source of program awareness just by comparing the percentages of participants and nonparticipants that reported a source. A much higher percentage of participants than nonparticipants cited a contractor as a source of program awareness, but what exactly does that tell us about the relative impact of having a contractor make someone aware of the program? How much does that increase the likelihood that someone will become a participant?

The evaluation team developed a coefficient that better illustrates how strong the association was between each source of awareness and program participation. For each awareness source, the coefficient was the ratio between two percentages: 1) the percentage of participants among those who cited a source of program awareness; and 2) the overall percentage of participants in the population. For any given coefficient, the greater the value, the more strongly that source of awareness predicts program participation.

Figure 6-8 shows the coefficient for each source of awareness for program participants. This shows that awareness through a contractor was by far the greatest predictor of program participation.[43] Compared to the overall population, those who learned about the program through a contractor are 11 times more likely to be a participant.

[43] The evaluation team defined program nonparticipants as those who did not participate in 2014 or 2015, but some nonparticipants so defined could have participated in 2013 or earlier. This likely explains why some nonparticipants identified past program experience as their source of program awareness.

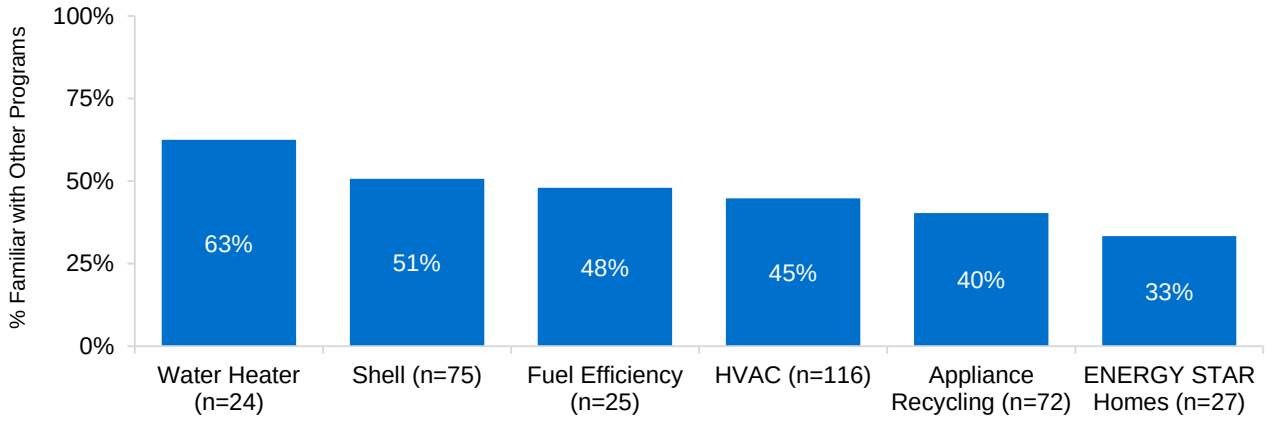
Figure 6-8: Relative Association of Residential Participant Awareness with Participant Population



Consistent with the finding that contractors are the single largest source of awareness and information regarding Avista's programs among participants, it is not surprising that fewer than half (46%) of participants reported being familiar with other energy efficiency rebate opportunities from Avista (besides the program in which they had participated).

Awareness of other Avista energy efficiency rebate opportunities was highest among Water Heat and Fuel Efficiency program participants and lowest among ENERGY STAR Homes participants (Figure 6-9), which further suggests there may be some knowledge "gaps" among the various contractors supporting Avista's programs regarding their awareness and familiarity with Avista's full range of program offerings.

Figure 6-9: Percentage of 2014 and 2015 Participants Familiar with Avista Rebates for Other Programs



Among the twenty-nine nonparticipants (41% of the sample) that reported being familiar with Avista incentives, between one-third and one-half reported being familiar with the Shell, HVAC, Appliance Recycling, and Fuel Efficiency incentives (Table 6-2). Two surveyed nonparticipants reported being familiar with CFL and LED store discounts offered by Avista. None reported being familiar with Water Heater or ENERGY STAR Homes incentives programs.

Table 6-2: Nonparticipant Awareness of Avista Incentives, (n=29; Multiple Responses Allowed)

Incentives Familiar With	Count	Percent
Shell (insulation and windows)	13	45%
HVAC	11	38%
Appliance Recycling	10	35%
Fuel Efficiency (electric to gas furnace or water heater conversions)	10	35%
CFL and LED store discounts	2	7%
Other	4	14%
Don't know	1	3%

Interest in receiving additional information regarding Avista's energy efficiency offerings is high among both participants and nonparticipants. About three-quarters (77%) of participants reported being interested in receiving energy-saving information from Avista (Table 6-3). Although still a majority, significantly fewer nonparticipants reported wanting information from Avista. Information on energy efficiency programs and energy savings opportunities were the most common types of information requested by respondents. However, significantly fewer nonparticipants reported that they would like information on energy efficiency programs compared to participants.

Table 6-3: Additional Energy Saving Information Requested (2014 and 2015 Participants and 2015 Nonparticipants; Multiple Responses Allowed)

Information regarding…	Participants (n=339)		Nonparticipants (n=70)	
	Count	Percent	Count	Percent
Energy efficiency programs	226	67%	37	53%[a]
Energy savings opportunities	222	65%	41	59%
Workshops or events on energy efficiency	103	30%	22	31%
Nothing	76	22%	28	40%
Don't know	1	0%	0	0%

[a] Differences between participants and nonparticipants are statistically significant (Chi-square Test at p<0.05).

Participants and nonparticipants indicated they wanted to receive additional information from Avista regarding energy efficiency by mail – which suggests that direct mail approaches are good avenues to market programs. Both participants and nonparticipants who reported wanting additional information from Avista indicated they would prefer to receive the information by mail (78% and 90%, respectively) – primarily via a bill insert (Table 6-4). The evaluation team found that nearly three-quarters of participants and nonparticipants reported receiving their bills in the mail (71% and 70%, respectively).

Table 6-4: Preferred Method of Receiving Information from Avista (2014 and 2015 Participants and 2015 Nonparticipants; Multiple Responses Allowed)

How first heard	Participants (n=262)		Nonparticipants (n=42)	
	Count	Percent	Count	Percent
By US mail	204	78%	38	90%
By US mail via bill insert	162	62%	26	62%
By US mail separate from bill insert	96	37%	19	45%
By e-mail	81	31%	14	33%
Avista website	28	11%	2	5%
Other	17	6%	2	5%

Nonparticipant survey findings, which are representative of the overall residential customer base, also suggested Avista's marketing efforts were having an influence on customers. Of the 25 nonparticipants who reported making efficient upgrades to their home, over half (14 respondents) reported that Avista marketing was "very influential" in their selection of the equipment (a rating of 4 or 5 on a five-point scale, from "no influence" to "great influence").

6.2.2 Motivation and Barriers to Participation

Participants reported increased home comfort, saving energy, and saving money as the top three motivations for participating in a rebate program, and they reported ease of participation as a close fourth (Table 6-5).[44] The evaluation team found that significantly more participants in Idaho reported being motivated by a recommendation from a contractor, builder, or vendor compared to Washington participants (70% in ID; 55% in WA; Chi-square Tests at p<0.05).

Table 6-5: Motivations for Participating in a Rebate Program (2014 and 2015 Participants; Multiple Responses Allowed)

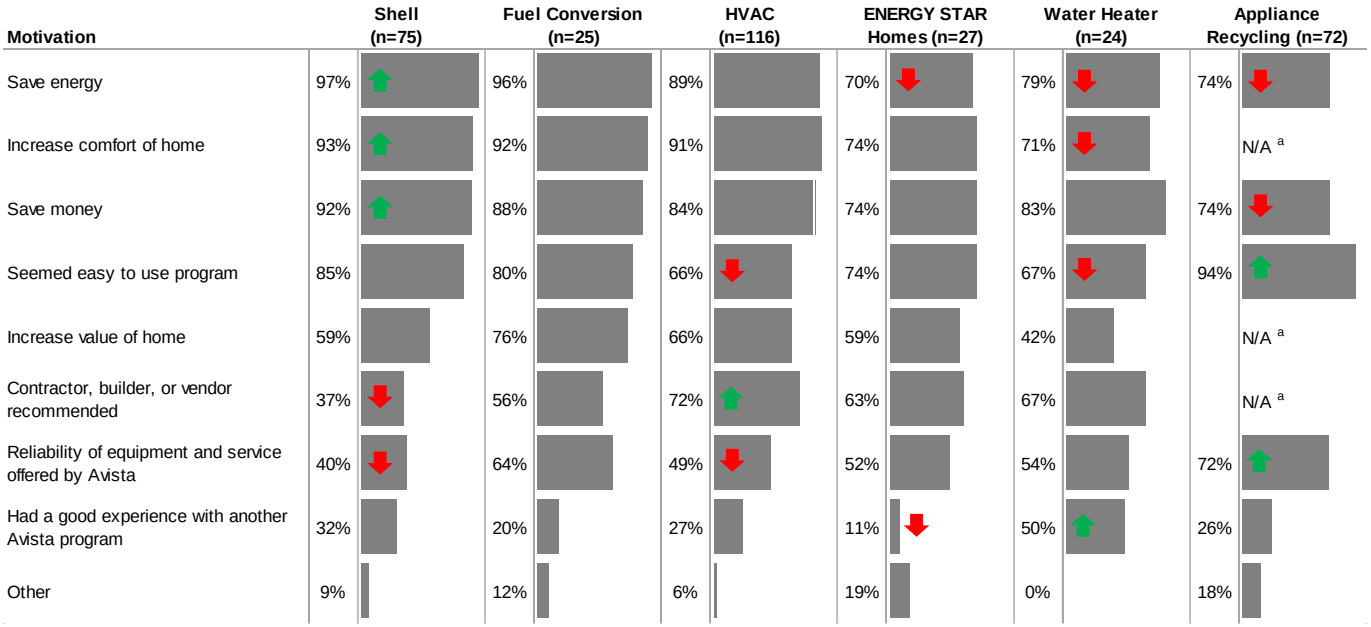
Motivation	Count	Percent
Increase comfort of home *(n=267)*	235	88%
Save energy *(n=339)*	291	86%
Save money *(n=339)*	281	83%
Seemed easy to use program *(n=339)*	265	78%
Increase value of home *(n=267)*	166	62%
Reliability of equipment and service offered by Avista *(n=305)*	182	60%
Contractor, builder, or vendor recommended *(n=267)*	159	60%
Had a good experience with another Avista program *(n=339)*	94	28%
Other *(n=339)*	35	10%

Avista leverages the contractor channel to promote rebate programs. The overall participation in the rebate programs has increased by 43% from 2014 to 2015 (see Section Table 7-1). This increase in participation may indicate that contractors have been engaged in promotion of Avista's rebates more so in 2015 than 2014. There is some evidence of this supposition. Compared to 2014, there was an increase in the proportion of participants reporting being motivated by a recommendation from a contractor, builder, or vendor to participate in a rebate program in 2015 (53%, up from 40% in 2014).

Figure 6-10 shows that participant motivations for completing efficient upgrades to their home vary by program type. For example, significantly more Shell participants reported participating in the program to save energy compared to ENERYG STAR Homes, Water Heater, and Appliance Recycling participants (Z-Test of Proportions at p<0.05). These differences suggest that customers are participating in the various programs for different reasons, which speaks to the importance of tailoring the marketing messages for each program.

[44] This includes all rebate programs, including Appliance Recycling. The evaluation team included Appliance Recycling participants because they also received a rebate for recycling their refrigerators or freezers.

Figure 6-10: Motivations for Participating in a Rebate Program, by Program (2014 and 2015 Participants; Multiple Responses Allowed) [a]



[a] Arrows in figure represent significant differences between program types. Green, upward arrows indicate the value is significantly higher than the values with red, downward arrows (Z-Test of Proportions at p<0.05).
[b] Appliance Recycling program participants were not provided with this option.

Twenty-five (36% of the sample) of nonparticipants reported completing an upgrade at their home in the past two years. Nonparticipants reported completing a variety of upgrades, including windows (eight mentions), insulation (seven mentions), and lighting upgrades (five mentions). Eighteen (82%) of nonparticipants who completed an upgrade reported that at least one of the upgrades they have made in the past two years were installations of equipment labeled as ENERGY STAR certified or otherwise being highly energy efficient.

Aging equipment was the primary motivation for replacing or upgrading equipment reported by nonparticipants, followed by broken equipment (10 and 5 mentions, respectively). A minority (four mentions) also noted wanting to save energy as a reason for completing efficient upgrades to their home. Please note that the evaluation team asked nonparticipants about their reasons for making upgrades to their home, whereas participants reported only about their motivations for participating in a rebate program.

About one-quarter (24%) of nonparticipants reported they planned to make an efficient upgrade to their home within the next two years. Among those respondents planning an upgrade, window replacement was most commonly mentioned (eight mentions), followed by HVAC equipment (four mentions) and lighting upgrades (three mentions). (Table 6-6).

Table 6-6: Future Upgrades Planned (2015 Nonparticipants; n=70; Multiple Responses Allowed)

Upgrades Planned	Count	Percent
Windows	8	11%
HVAC	4	6%
Lighting	3	4%
Insulation	2	3%
Refrigerator or freezer recycling	2	3%
Water heater	1	1%
Other	5	7%
Nothing	53	76%

About half (54%) of nonparticipants, reported facing at least one barrier to saving energy in their home. The most frequently cited barrier was the up-front cost of efficient equipment or repairs (Table 6-7), which indicates an importance of offering an incentive to customers for home improvement projects. Nonparticipants also reported that living in a rental property prohibits them from making improvements to their home. Further, demographic analysis revealed that nonparticipants were significantly more likely to report being renters than participants (27% vs. 3%, respectively; Chi-square Test at $p<0.05$).

Table 6-7: Barriers to Making Energy Efficiency Improvements (2015 Nonparticipants; n=38; Multiple Responses Allowed)

Barriers	Count	Percent
Up-front cost of equipment or repairs	16	42%
Renter - unable to make improvements	9	24%
Unspecific issues related to older/inefficient home	4	11%
Other occupants of home / Occupant behavior	3	8%
Lack of time	2	5%
Payback period of equipment or repairs	2	5%
Other	6	16%

6.2.3 Program Experience

The following section provides a summary of participant survey findings related to satisfaction with program elements, satisfaction with contractor interactions, and the clarity of program information.

6.2.3.1 Program Satisfaction

More than four-fifths (84%) of program participants reported their overall satisfaction with their Avista rebate program experience as being either "very" or "completely" satisfied (Figure 6-11). The evaluation team found that overall program satisfaction has decreased for Washington participants from 2014 to 2015 (80% "very" or "completely" satisfied, down from 89% in 2014; marginally significant Chi-square Tests at $p<0.1$).

Additionally, participants reported the lowest satisfaction with the rebate amount they received (Figure 6-11). Similarly, contractors reported the lowest satisfaction with the amount of incentives provided by Avista when they rated various elements of Avista's rebate programs (see Section 6.1.1.2).[45]

Figure 6-11: Satisfaction with Program Elements (2014 and 2015 Participants)

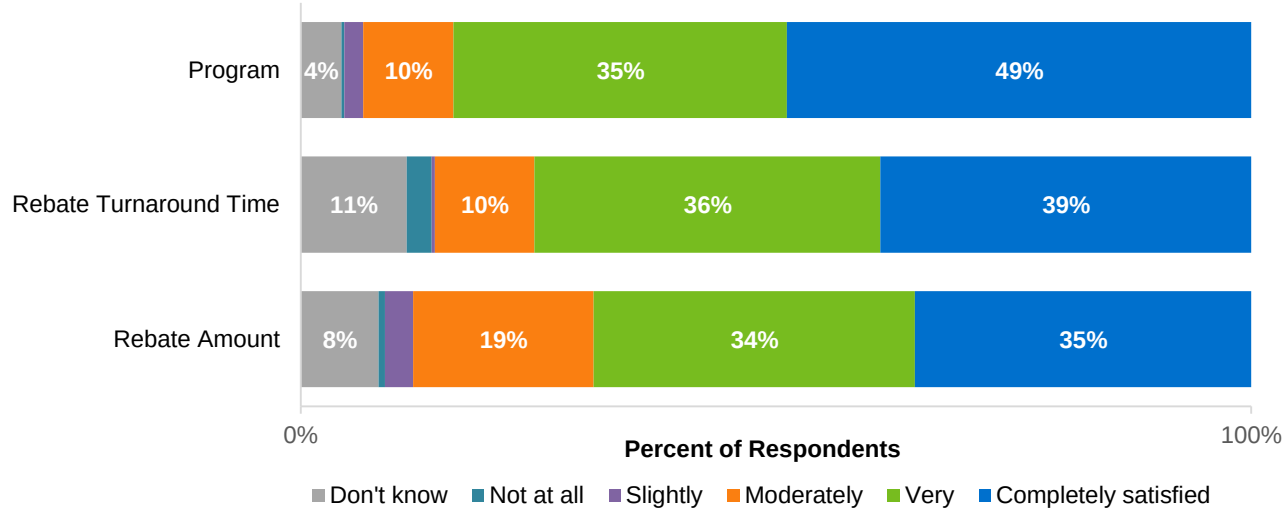
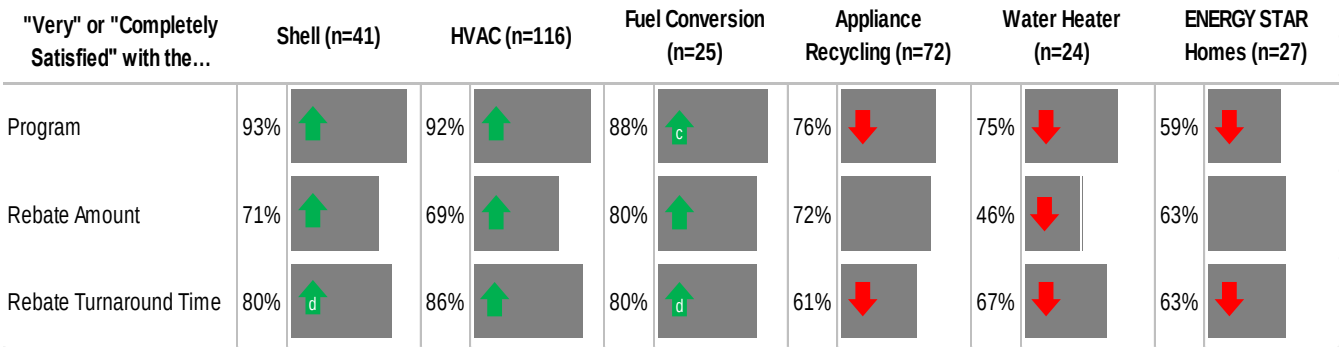


Figure 6-12 shows that Shell, HVAC, and Fuel Conversion participants are generally more satisfied with their program experience than Appliance Recycling, Water Heater, and ENERGY STAR Homes participants. For example, Shell, HVAC, and Fuel Conversion participants reported significantly higher satisfaction ratings compared to Water Heater participants (Z-Test of Proportions at $p<0.05$).

[45] The evaluation team has seen across many evaluations that program participants and contractors often report wanting higher incentives. Higher incentives allow participants to offset more of the incremental cost and contractors to sell more jobs.

Figure 6-12: Satisfaction Rating, by Program (2014 and 2015 Participants) [a, b]



[a] Percent reporting "Very" or "Completely Satisfied" on a 5-pt. scale (not at all, slightly, moderately, very, and completely satisfied).
[b] Arrows in the figure represent significant differences between program types. Green, upward arrows indicate the value is significantly higher than the values with red, downward arrows (Z-Test of Proportions at p<0.05).
[c] Only significantly higher than Water Heating and ENERGY STAR Homes participants (Z-Test of Proportions at p<0.05).
[d] Only significantly higher than Appliance Recycling participants (Z-Test of Proportions at p<0.05).

Based on interviews with JACO staff, Avista's appliance recycling implementation contractor, most complaints regarding the Appliance Recycling program relate to appliance pick-up difficulties during inclement weather, delays in the customer verification process, and incentive check delays. The evaluation team had no additional information on complaints by participants in the Water Heater or ENERGY STAR Homes programs, two other groups that exhibited lower satisfaction.

One hundred respondents offered suggestions for improving the Avista rebate programs (Table 6-8).[46] About two-fifths (39%) of these respondents felt that more or better program information through marketing and program materials would improve the programs. However, respondents did not provide more specifics regarding the types of materials or messaging that they would like to see.

[46] One-hundred and fifty-seven respondents said "Do not know" when asked to provide suggestions for improving the rebate program.

Table 6-8: Suggestions for Improving the Rebate Program (2014 and 2015 Participants; n=100; Multiple Responses Allowed) [a]

Suggestion	Count	Percent
More program outreach and advertising	37	37%
Higher rebate	18	18%
Communication improvements/Confusion with program requirements	11	11%
Process is too slow - increase speed	11	11%
Improvements to application process	10	10%
Offer additional incentives/Financial assistance	6	6%
Other	12	12%

[a] Includes all 2014 and 2015 respondents saying they have suggestions on how to improve the rebate program; 157 said they did not know and 48 said the program is working well with no need for improvement. Thirty-four participants in the direct install duct-sealing program were excluded as they did not receive a rebate.

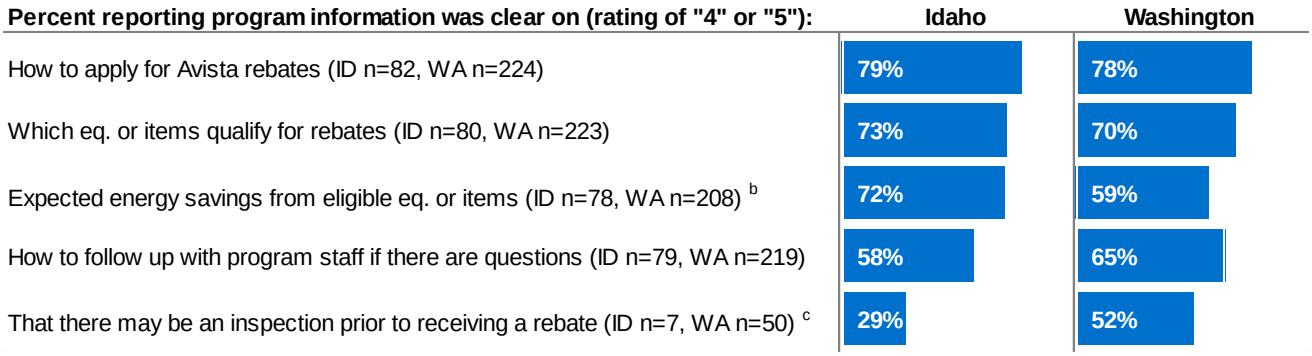
6.2.3.2 Participant's Satisfaction with Contractors

Nearly all (91%) of the surveyed Fuel Efficiency, HVAC, Shell, and Water Heater participants used a contractor to install the measure. About four-fifths (83%) of Water Heater participants reported using a contractor, compared to 89% of Shell, 92% of HVAC, and all of Fuel Efficiency program participants. The majority (88%) of these participants reported being satisfied with their contractors (rating of "Very" or "Completely Satisfied" on a 5-pt. scale). The evaluation team found participation satisfaction with their contractor increased significantly between 2014 and 2015 (92%, up from 83% in 2014; Chi-square Tests at $p<0.05$). Almost all (93%) of those who used a contractor reported they would recommend their contractor to other people.

6.2.3.3 Clarity of the Program Information

A majority of participants reported that program-related information (e.g., website or rebate form) was clear on how to apply for a rebate, which equipment qualified for a rebate, expected energy savings of program eligible equipment, and who to contact if any issues arose (Figure 6-13). Significantly fewer Washington participants reported the expected energy savings claims were clear in program collateral compared to Idaho participants (59% vs. 72%, respectively; Chi-square Tests at $p<0.05$), although it is unclear whether the program materials, in fact, differ by state. Figure 6-13 also shows that for Shell program participants, the program materials were less clear about the quality assurance (QA) process. Additionally, the evaluation team found that the clarity of information regarding which equipment or items qualified for rebates was less clear for Shell participants than for other program participants (70%, compared to 90% for Water Heater, 83% for ENERGY STAR Homes and Fuel Efficiency, and 80% for HVAC and Appliance Recycling participants; Chi-square Tests at $p<0.05$).

Figure 6-13: Clarity of the Program Information by State across 2014 and 2015 (2014 and 2015 Participants) [a]



[a] Percent saying "4" or "5" on a 5-pt scale where 1 meant "the information was not at all clear" 5 meant "the information was very clear." The evaluation team excluded "not applicable" from this analysis.
[b] Difference between Idaho and Washington statistical significant (Chi-square Tests at p<0.05).
[c] Only Shell participants were asked this question.

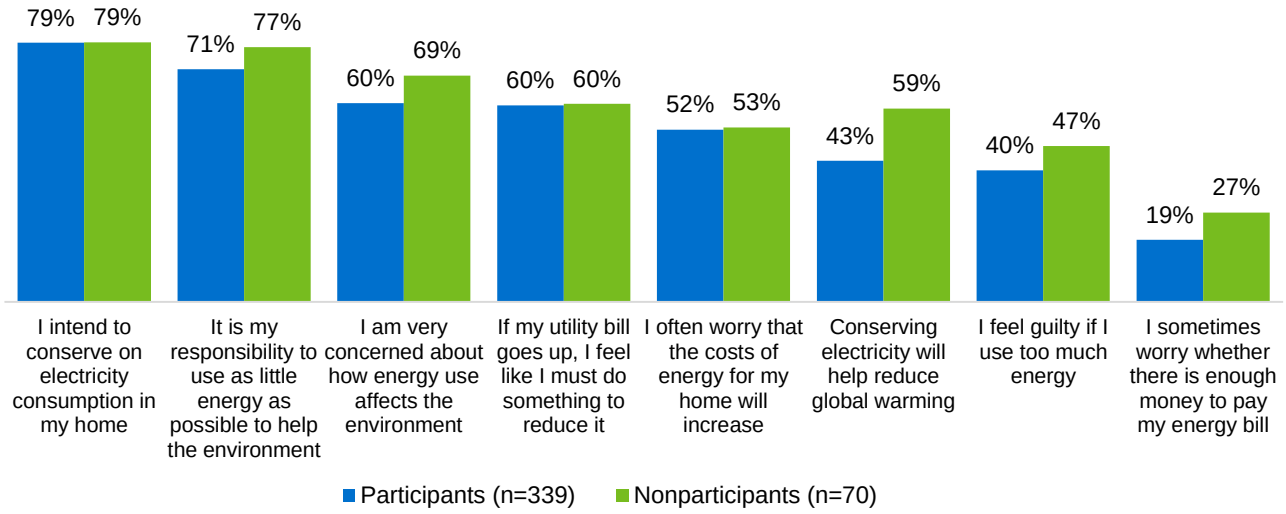
6.2.4 Attitudes toward Energy Use and Conservation

Participants and nonparticipants rated their agreement with eight statements designed to measure respondents' attitudes towards adopting energy efficient behaviors. The statements asked about intention to conserve, concern about environment or cost of energy, among others. The evaluation team relied on the previous research, specifically the Awareness-Knowledge-Attitude-Behavior (akAB) model of change, to develop these statements. The akAB model is grounded in years of social science research on how individuals make energy conservation and efficiency choices, as well as "green" choices more generally. It includes five stages of energy-efficient behavior change: awareness/knowledge, concern, ascription of responsibility, intention to conserve, and maintaining the behavior.[47] The participant and nonparticipant surveys only included statements on intention to conserve, ascription of responsibility, and concern.

Overall, respondents reported highest agreement (providing a 4 or 5 on a scale 1 "not at all agree" to 5 "completely agree") that they intend to conserve electricity in their home and that it is their responsibility to use less energy to help the environment (Figure 6-14). Although participants and nonparticipants differed in responses on several metrics, differences were not statistically significant, suggesting that participants do not differ from nonparticipants in relation to how they think about the energy saving concepts noted in the figure below.

[47] For more information, see the following study: PG&E and SCE. 2011-2012 General Households Population Study in California, *http://www.calmac.org/publications/GPS_Report_08302012_FINALES.pdf*

Figure 6-14: Agreement with Eight Statements Associated with Energy Usage and Conservation [a]



[a] Respondents rated their agreement with each statement on a five-point scale with 1 being "not at all agree" and 5 being "completely agree."

6.3 Customer Experience with Simple Steps, Smart Savings Program

This section provides findings regarding customers' experience with the Simple Steps, Smart Savings midstream program. Simple Steps, Smart Savings is BPA's regional promotion designed to increase adoption of various energy efficient products, including CFLs, LEDs, light fixtures, and energy-saving showerheads. The program discounts the following measures at retail locations: standard and specialty CFLs, LED bulbs and fixtures, and low-flow showerheads.

The evaluation team asked both rebate program participants and nonparticipants a series of questions to determine: 1) the incidence rate of purchasing a CFL, LED, or a showerhead; 2) the usefulness of in store point-of-purchase (POP) materials to buyers; and 3) their awareness of the Simple Steps, Smart Savings program. By design, the nonparticipant sample is more representative of customers in Avista's territory than the participant sample and thus provides a more accurate representation of customer experience with the Simple Steps, Smart Savings program. The participant sample consists only of a subset of Avista's customers (those who participated in Avista's rebate programs), whereas the nonparticipant sample was drawn from the entire Avista customer database and was designed to be representative of the state and

urban/rural population.[48] To provide results that are more representative of Avista's customer population, the evaluation team only presents findings from the nonparticipant survey in this section.

Most (71%) nonparticipants reported purchasing at least one product referenced above in 2015. Among respondents who purchased CFLs, LEDs, or showerheads, most (78%) reported purchasing standard CFL bulbs, followed by LED fixtures (34%), and low-flow shower heads (26%; Table 6-9).

Table 6-9: Purchases of CFLs, LEDs, or Showerheads in 2015 (2015 Nonparticipants; n=50; Multiple Response Allowed) [a]

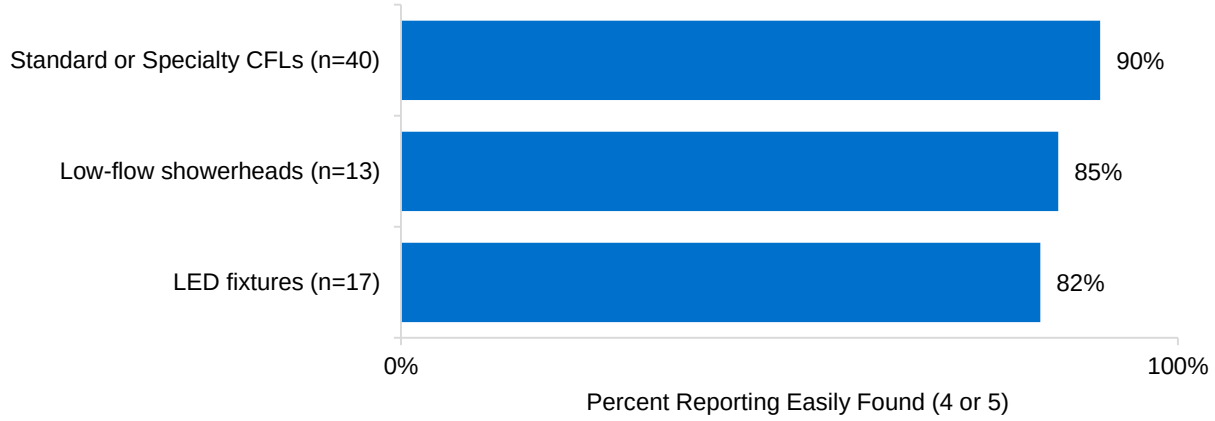
Measure	Count	Percent	Average number purchased
Standard CFL bulbs	39	78%	12
LED fixtures	17	34%	6
Low-flow showerheads	13	26%	1
Specialty CFL bulbs	7	14%	2

[a] The evaluation team did not ask nonparticipants about LED bulbs because they were not added to the Simple Steps, Smart Savings program until July of 2015.

Figure 6-15 shows that a large majority of nonparticipants reported they were easily able to find CFLs, LEDs, and low-flow showerheads at the stores where they commonly buy these products (providing a rating of 4 or 5 on a five-point scale with 1 being "not at all easy" and 5 being "very easy").

[48] Participants are more likely to be urban dwellers than nonparticipants. Additionally, participants were more likely to be homeowners and have higher incomes.

Figure 6-15: Ease of Finding Lighting and Low-flow Showerheads (2015 Nonparticipants)[a]



[a] Respondents rated the ease of finding the products on a five-point scale with 1 being "not at all easy" and 5 being "very easy."

Findings also suggest that some of the products purchased by nonparticipants were program-discounted measures. Nonparticipants who purchased CLFs, LED fixtures, or showerheads reported whether they recalled seeing the Simple Steps, Smart Savings point-of-purchase (POP) materials where they were shopping for these products. About one-quarter (12 of 50) reported seeing the POP materials, of these, five reported recalling the product they purchased was part of the Simple Steps, Smart Savings program (i.e., the product was discounted). In comparison, more than two-fifths (44%) of rebate participants who purchased a CFL, LED, or showerhead reported recalling the product they purchased was part of the Simple Steps, Smart Savings program. This finding suggests that rebate participants may pay greater attention to POP materials (either due to greater brand awareness or they are more likely to be looking for discounts) when making these purchases than the general customer population.

6.4 Customer Experience with the Behavior Program

The evaluation team asked participants and nonparticipants a series of questions regarding the Home Energy Reports they receive from Opower to determine their usefulness and impact. The evaluation team found that there is some confusion among respondents as to whether they received a HER. Slightly less than one-third of participants and nonparticipants reported receiving a HER from Avista in 2014 (28% and 30%, respectively). However, after reviewing program data, the evaluation team determined that fewer than one in ten (9% of participants and 6% of nonparticipants) respondents surveyed actually received a HER from Avista in 2014 or 2015.[49] It is possible that the respondents who incorrectly reported receiving a HER were

[49] To determine who received a HER, the evaluation team matched participant and nonparticipant IDs with those in the HER treatment group.

referring to the energy saving information they received through their monthly online or paper bill rather than the HER.

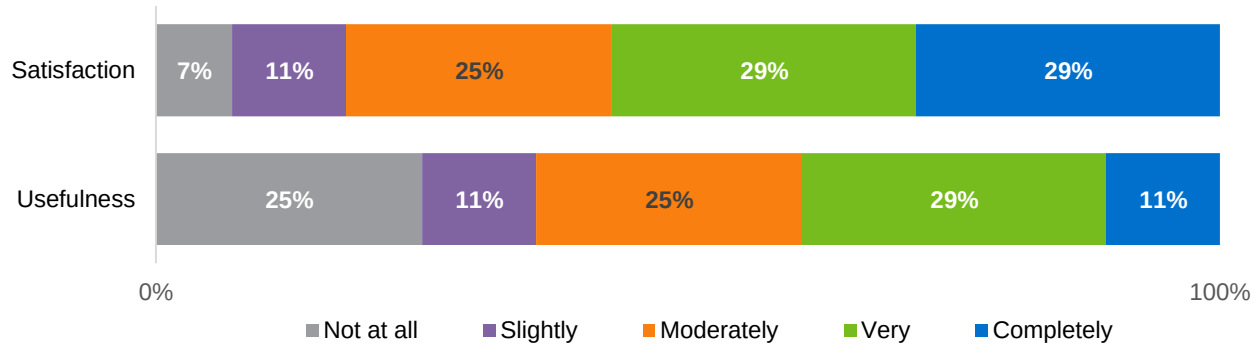
The overall recall rate among those who the evaluation team confirmed received a HER (n=29) was high and consistent with findings from other data sources. About four-fifths of the 36 participants and nonparticipants who received a HER, correctly reported receiving a HER (78% and 100%, respectively). The remaining respondents reported either they did not know if they received (four mentions) or that they did not receive (two mentions) a HER. The recall rate is consistent with a 2014 study conducted by MDC Research, which found about four-fifths (78% unaided and 81% aided) of Avista customers who received a HER recalled receiving it.[50]

There is evidence that HERs are engaging customers to save energy in their homes. Among those 29 participants and nonparticipants who reported and who actually received a HER, all but two reported they "usually" or "always" read the report. Of the remaining respondents, one reported reading the HER once or twice and one reported never reading the HER. Additionally, about two-thirds (64%) of respondents who actually received and read their HER reported taking action to save energy in response to the reports. Participants reported taking various energy-saving actions, including: making unspecific energy saving modifications to their home, adjusting how or when they use energy (eight mentions each), purchasing energy saving products and receiving Avista rebates (six mentions), purchasing energy saving products and not receiving Avista rebates, and looking for additional information on how to save energy (two mentions each).

Participants and nonparticipants who correctly reported receiving and who read their HERs reported varying levels of satisfaction and usefulness of the reports. Of the 28 participants who confirmed they received and read their HERs, over half (58%) reported they were "very" or "completely" satisfied with the report (Figure 6-16). Similarly, about two-fifths (40%) reported finding the HER to be "very" or "completely" useful in helping them to better understand their home's energy use.

[50] MDC Research. Avista Energy Usage Communications Research Presentation. June 2014.

Figure 6-16: Usefulness and Satisfaction with HER (2014 and 2015 Participants and 2015 Nonparticipants; n=28) [a]



[a] Note: this analysis excludes one respondent who reported never reading the HER the received.

Twelve respondents provided additional comments regarding the HERs they received. Comments included: being concerned with the accuracy of the HER (four mentions), wanting more information and tips (four mentions), not understanding the comparisons between their home's energy use and others (three mentions), and finding the HER interesting and easy to understand (one mention).

6.5 Freeridership and Spillover

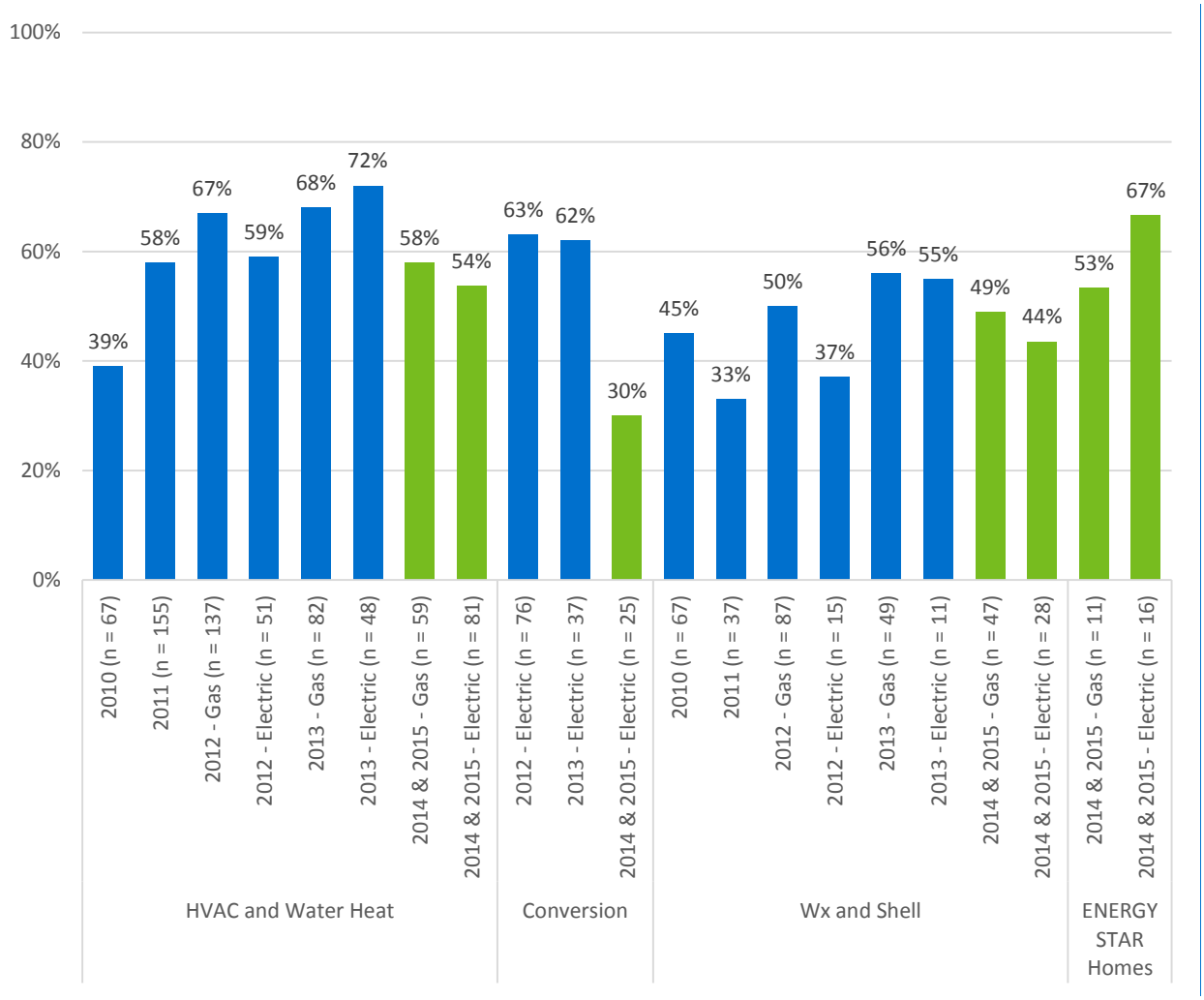
This section summarizes results about freeridership and spillover, two key aspects of energy efficiency programs. Freeridership represents an estimate of the energy savings that the program participants would have achieved without the program's assistance, and spillover is what additional energy saving actions occurred outside the program but as a result of program influence. This section begins with a discussion of freeridership and concludes with a discussion of spillover. For a discussion of the methods used to calculate freeridership and spillover values, see the 2014-2015 impact report discussion about net-to-gross calculations. Additionally, the impact report covers how freeridership and spillover rates effect savings.

6.5.1 Freeridership

The evaluation team examined freeridership for five program types: appliances, HVAC and Water Heat, Fuel Conversion, Weatherization and Shell, and ENERGY STAR homes. To see how freeridership changed over time, the evaluation team plotted freeridership results for PY2014 and PY2015 next to results from the previous evaluation dating back as far as 2010. Fuel conversion freeridership scores were available back to 2012 and there were no reported freeridership values for ENERGY STAR Homes in the previous evaluation.

Figure 6-17 shows freeridership values for active programs[51] and shows, on average, slightly lower rates for HVAC/Water Heat and Weatherization/Shell measures and a considerably lower freeridership rate for Fuel Conversion, compared to the 2013 evaluation.

Figure 6-17: Freeridership Over Time*



*Orange bars reflect values calculated by the evaluation team. Blue bars are values reported in previous process evaluation (Avista 2012-2013 Process Evaluation Report, May 15, 2014, prepared by Cadmus Inc.)

The previous evaluation attributed the general upward trend in freeridership, seen from 2010 to 2013 across HVAC/Water Heat and Weatherization/Shell, to the influence the program is having on the market. The evaluation team agrees that the program could have influenced the market

[51] Appliance recycling is not included here because it was discontinued in 2015.

and that influence could have affected freeridership rates. Some of the differences seen in freeridership scores between 2014 & 2015 values and prior analyses may be a result of different methodologies used to calculate freeridership.

The Fuel Conversion program values noticeably differ from the other programs, however. The evaluation team hypothesizes that the sharp drop in freeridership from 62% to 30% for the Fuel Conversion program from 2013 to 2014 & 2015 may be a result of the distribution of low-income participants in each program year. If in 2014 & 2015 there was a high participation rate among low-income customers, that may drive freeridership values lower as low-income participants are likely to be low free-riders. Conversely, if there were relatively few low-income participants in 2012 and 2013 that could increase freeridership values.

Another hypothesis related to the decline in freeridership in the Fuel Conversion program relates to price of natural gas over the last six years. The decline of natural gas prices from 2008 to 2015[52] may have driven participants to convert to gas during the years the prices decreased most notably, 2009 – 2013. As the price of gas plateaued in 2014 to 2015, customers may feel less inclined to convert to gas, thus lowering freeridership.

6.5.2 Participant Spillover

Participant spillover occurs when program participants elect to conduct energy saving activities outside of the program as a result of program influence. Because the actions took place outside of the program, the program has no mechanism to capture these actions other than during process surveys. The analysis below shows that 3% of weatherization/shell participants and 1% of HVAC/Water Heat participants reported they took a spillover action (Table 6-10). Other program participants reported no spillover.

Table 6-10: Number of Participants Reporting a Spillover Action

Program	Total Participants in Sample	Participants Who Did Spillover Project	Percent of Participants Who Did Spillover Project
Weatherization and Shell	75	2	3%
HVAC and Water Heat	140	2	1%
All other programs[53]	52	0	0%
TOTAL	**267**	**4**	**1%**

For an analysis and discussion of what effect these actions had on savings, see the impact report.

[52] Energy Information Administration, Natural Gas Prices. https://www.eia.gov/dnav/ng/hist/n3010us3a.htm (Accessed on April 22, 2016)

[53] Appliance recycling participants were excluded from the table because that program was discontinued in 2015.

7 Special Studies

7.1 Declining Program Participation Rates

The 2012-2013 process evaluation report[54] noted that program participation rates, based on the number of rebated measures, have declined since 2010. The 2012-2013 process evaluation report also suggested that explanations for the decline in participation included a decrease in the list of rebated measures and a reduction in the incentive amounts that Avista offered in response to declining measurable gross savings or higher freeridership. To investigate this issue further, the evaluation team examined the list of rebated measures in both the nonresidential and residential 2010-2015 program databases to assess the potential impact that the reduction in the rebated measures list and the reduced incentive amounts had on participation. The evaluation team also examined whether a decrease in repeat participation may have partly contributed to the decline in participation. Finally, specifically for the residential sector, the evaluation team examined whether evidence exists that the availability of qualifying measures may have changed from 2010 to 2015, possibly contributing to the decline in participation.

7.1.1 Nonresidential Participation Trends

7.1.1.1 Discontinued Measures and Reduced Rebate Incentives

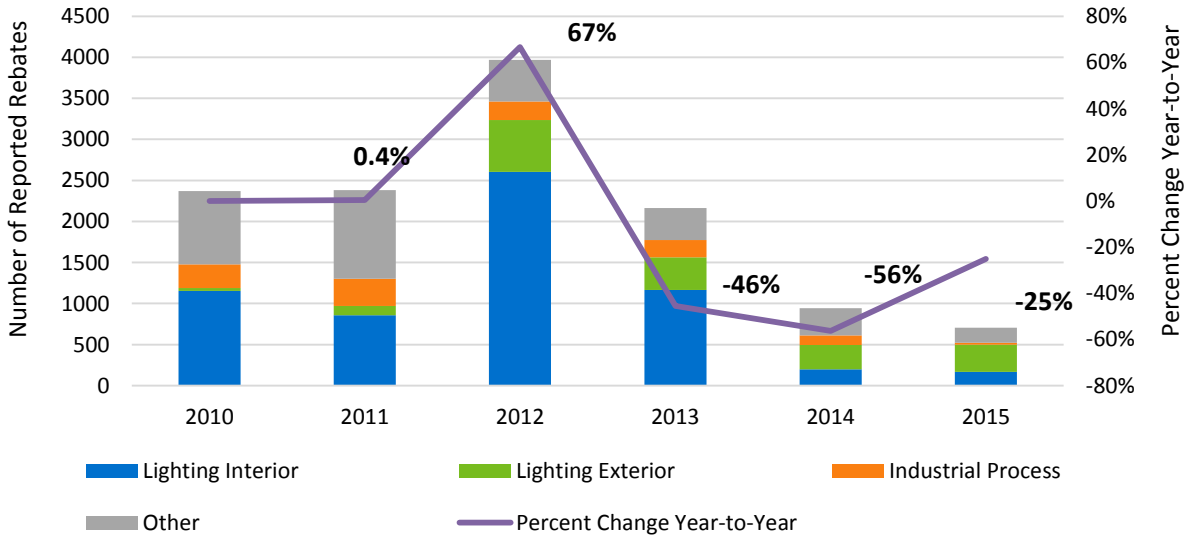
For the analysis of discontinued program measures and reduced incentives the evaluation team combined information from the 2010 to 2015 program databases. The combined 2010-2015 nonresidential program database contained 13,845 rebated measures. The evaluation team focused on analyzing the prescriptive and Energy Smart Grocer rebated measures only because these measures combined accounted for 91% of all the measures in the combined 2010-2015 database, respectively. The evaluation team excluded the Site Specific measures from this analysis because this program provides custom incentives based on measured energy savings, and so there is no standardized unit of analysis. The evaluation team excluded Oregon measures because this evaluation focuses on Idaho and Washington and excluded measures classified under “UCON MF” because of limited data.

[54] Cadmus (2014). *Avista 2012-2013 Process Evaluation Report.*

Also note that we combined prescriptive and Energy Smart Grocer rebated measures, when reporting findings.[55]

The overall number of rebates declined in 2013, 2014, and 2015. The rate of decline slowed down in 2015 (Figure 7-1). Lighting rebates, in particular, abruptly increased in 2012 and declined substantially in subsequent years. Industrial process rebates started to decline in 2012 and continued declining in subsequent years. These lighting and industrial process measures accounted for 73% of all the rebated measures examined in the 2010-2015 data.

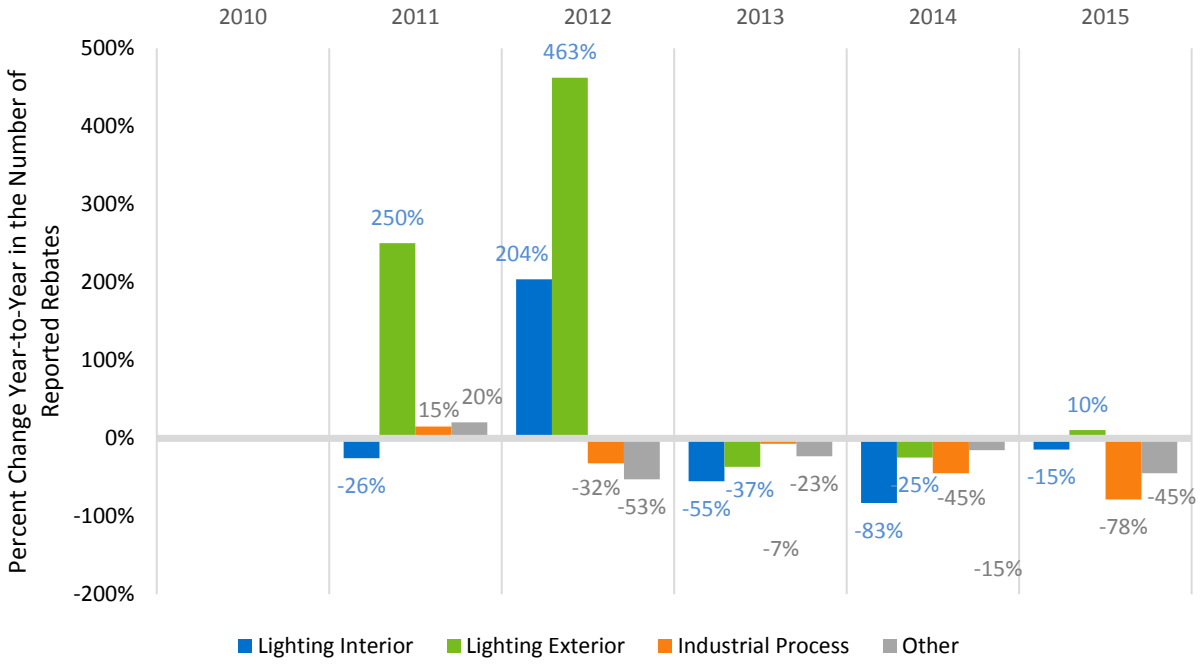
Figure 7-1: Reported Number of Nonresidential Rebates, 2010-2015 Nonresidential Program Data



The quantity of interior and exterior lighting rebates peaked in 2012 and declined by 55% and 37%, respectively, from 2012 to 2013 (Figure 7-2).

[55] The Energy Smart Grocer measures accounted for a small proportion of all the measures in the database – less than 15%. Additionally, the team struggled in separating Energy Smart Grocer measures from the same measures in the prescriptive program in the database.

Figure 7-2: Percent Change Year-to-Year by Measure Rebate Type, 2010-2015 Nonresidential Program Data*



* The percentage shown above or below each column represents the percentage change in rebates that year relative to the previous year.

The abrupt increase in lighting rebates in 2012 was most likely related to changes in linear fluorescent lamp standards. Effective July 14, 2012, all linear florescent lamps manufactured or imported for sale in the U.S. had to meet more stringent lighting standards as stipulated by the Energy Policy Act (EPACT) of 2005 and Independence and Security Act (EISA) of 2007. This resulted in the cessation of U.S. production and importation of T12 fluorescent lamps after July, 2012. Likely in response to this new standard, which effectively shifted the baseline for commercial lighting technologies, Avista changed the rebate amounts for lighting measures. Avista's average rebate amounts per BTU[56] saved decreased from 2012 to 2015 for lighting measures (Table 7-1; this data comes from the 2010-2015 program database). Nonresidential customers and contractors may have anticipated this reduction in rebate amounts by Avista after 2012, which could explain the abrupt increase in the quantity of the lighting upgrades through the Avista's programs in 2012.

[56] BTU= British Thermal Unit. Many records in the database included both electric (kWh) and gas (Therm) savings. To estimate total (electric+gas) savings, the evaluation team converted kWh and Therm savings for each record to BTUs, a traditional unit of energy.

Table 7-1: Lighting Rebate Amounts By Energy Savings By Measure Type, 2010-2015 Nonresidential Program Data

Measures	Average Rebate Amount Per 1000 BTUs Saved ($/1000 BTUs)					
	2010	2011	2012	2013	2014	2015
Lighting Interior	0.07	0.05	0.29	1.29	0.04	0.05
Lighting Exterior	0.03	0.04	0.25	0.08	0.11	0.06

To further assess changes in participation, the evaluation team examined the rebated measures in the 2010-2015 program data and DSM business plans to determine which nonresidential measures were discontinued since 2010. To quantify the effect of the discontinued measures on overall participation, the evaluation team looked at the difference between two quantities: 1) the quantity of measures that would have been incented in 2015 if the non-discontinued measures had the same participation as in 2013, when the lighting standards shifted (the “2015 theoretical” quantity); and 2) the quantity of measures that were actually incented in 2015 (the “2015 actual” quantity).

Table 7-2 shows each rebated measure, whether the measure was available (“Y”) or not available (“N”) each year from 2010 to 2015, the number of 2013 rebates for that measure, and the “2015 theoretical” and “2015 actual” quantities described above. Comparison of the 2015 theoretical and actual quantities shows that most of the overall decline in the number of rebates was not attributable to the discontinued measures. Discontinued measures accounted for a reduction of 27 measures, representing 2% of the total decline of 1,356 measures (Table 7-2).

Table 7-2: Theoretical Versus Actual Participation, Accounting for Discontinued Measures, 2010-2015 Nonresidential Program Data

Measures[b]	Availability of Rebates[a]						Baseline: # of 2013 rebates	2015 theoretical quantity[c]	2015 actual quantity
	2010	2011	2012	2013	2014	2015			
Top 3 measures, accounting for 73% of all 2010-2015 rebates									
Lighting Interior	Y	Y	Y	Y	Y	Y	1,164	1,164	330
Lighting Exterior	Y	Y	Y	Y	Y	Y	398	398	169
Industrial Process	Y	Y	Y	Y	Y	Y	210	210	25
Other measures, accounting for 27% of all 2010-2015 rebates									
Case lighting	Y	Y	Y	Y	Y	Y	128	128	36
Food service equipment	Y	Y	Y	Y	Y	Y	83	83	72
Windows and insulation	N	N	Y	Y	Y	Y	73	73	21
HVAC	Y	Y	Y	Y	Y	Y	41	41	34
Green motors	Y	Y	Y	Y	Y	Y	15	15	5
Motor controls, HVAC	Y	Y	Y	Y	Y	Y	12	12	14
Appliances	Y	Y	Y	Y	Y	Y	11	11	0
Commercial water heater	Y	N	N	N	Y	Y	0	6[d]	1
Compressed air	Y	Y	N	Y	N	Y	1	1	0
PC network controls	Y	Y	Y	Y	Y	Y	0	0	0
Shell	Y	Y	Y	Y	Y	Y	0	0	0
Motors	Y	Y	Y	Y	N	N	0	0	0
Renewables	Y	Y	Y	Y	N	N	3	0	0
Generator block heater	N	Y	Y	Y	Y	N	24	0	0
TOTAL	-	-	-	-	-	-	**2,163**	**2,136**	**707**
Number of rebates decline from baseline								**27**	**1,356**

[a] Y means "yes, available that year" and N means "no, not available that year."

[b] Excludes steam trap replacement, vending machine, side-stream filtration, refrigerated warehousing, LED traffic signals, demand controlled ventilation, LEED certification, motor control (industrial), and multifamily measures, as those were not available any year from 2013 to 2015 and so, by definition, do not contribute to any of the counts.

[c] Assumes the non-discontinued measures would have had the same number of rebates as in 2013.

[d] Used 2014 rather than 2013 rebate number since this measure was not available in 2013.

Next, the evaluation team examined changes to the rebate amounts from 2013 to 2015 to assess whether reduced incentives may have affected participation. The average rebate amounts per BTU saved declined for each measure from 2013 to 2015, except for the HVAC measure (Table 7-3). As the rebate amounts declined so did the quantity of rebated measures (Table 7-3; Correlation=0.5), indicating that the reduced rebates could have affected participation rates.

Table 7-3: Percent Change in Rebate Amounts and Counts, 2010-2015 Nonresidential Program Data

Measures	Average Rebate Amount Per 1000 BTUs ($/1000 BTUs)						% change in avg. rebate, $ per 1000 BTUs	% change in rebate quantity
	2010	2011	2012	2013	2014	2015	2013-2015	2013-2015
Lighting Interior	0.07	0.05	0.29	1.29	0.04	0.05	-96%	-85%
Lighting Exterior	0.03	0.04	0.25	0.08	0.11	0.06	-25%	-17%
Industrial Process	0.04	0.04	0.04	0.04	0.04	0.03	-15%	-88%
Case lighting	0.06	0.05	0.06	0.06	0.05	0.04	-33%	-72%
Food service eq.	0.03	0.02	0.02	0.03	0.03	0.02	-31%	-13%
Windows and insulation	-	-	0.05	0.05	0.06	0.03	-43%	-71%
HVAC	0.04	0.03	0.02	0.02	0.02	0.02	30%	-17%
Green motors	0.03	0.03	0.03	0.04	0.02	0.02	-50%	-67%
Motor controls, HVAC	0.02	0.03	0.02	0.04	0.02	0.03	-32%	17%

Note: The evaluation team excluded discontinued measures from this analysis. The evaluation team also excluded compressed air, PC network controls, shell (not windows and insulation), appliances, and water heater measures from this analysis because no rebates were recorded in 2015 for these measures (even though 2015 DSM business plan notes rebates were offered) or rebates were offered recently (not much data to assess percent change).

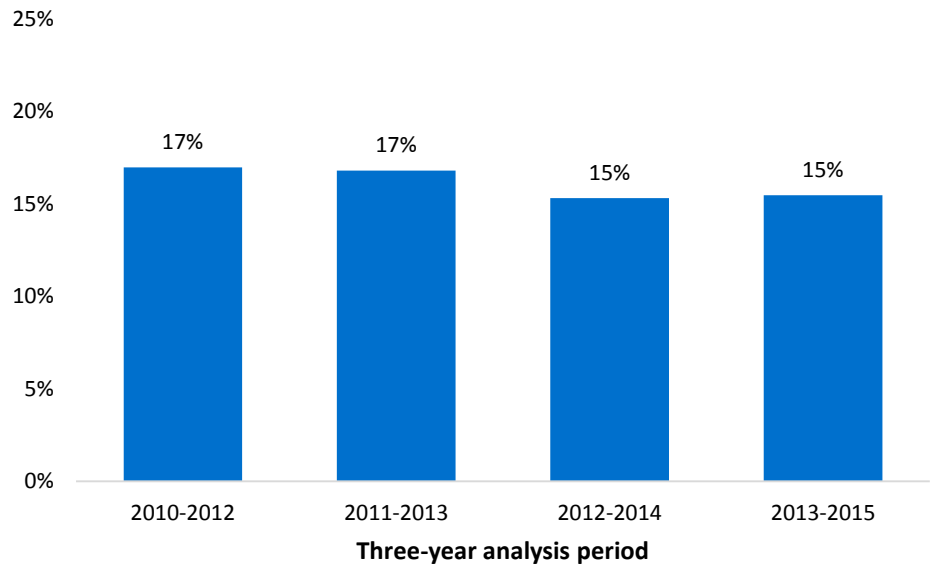
7.1.1.2 Analysis of Repeat Participation Among Customers

The evaluation team conducted another analysis to assess patterns of repeat participation among nonresidential customers over rolling three-year periods, using the combined 2010-2015 program database. For each three-year period (2010-2012, 2011-2013, 2012-2014, and 2013-2015), the evaluation team identified the number of unique customers that *either*: 1) participated in more than one program; or 2) participated in the same program more than one time within that three-year period. (The team refers to these customers as repeat participants). For each of those three-year periods, dividing the number of repeat participants by the total number of unique customers that participated in any program within that three-year period produced the repeat participation rate for that period. For example, the formula for calculating repeat participation within the period from 2010 to 2012 was:

$$\text{Repeat participation rate} = \frac{\text{The total number of unique customers that either participated in multiple programs within 2010-2012 or participated in the same program multiple times within 2010-2012}}{\text{The total number of unique customers that participated in any programs within 2010-2012}}$$

Repeat participation rates declined slightly from 2010 to 2015 (Figure 7-3). Repeat participation also appears to be an important driver of participation since more than one-tenth of nonresidential participants participated in multiple programs or multiple times since 2010.

Figure 7-3: Percent of Nonresidential Customers Participating in Multiple Programs or Same Program Multiple Times, 2010-2015 Nonresidential Program Data



7.1.2 Residential Participation Trends

7.1.2.1 Discontinued Measures and Reduced Rebate Incentives

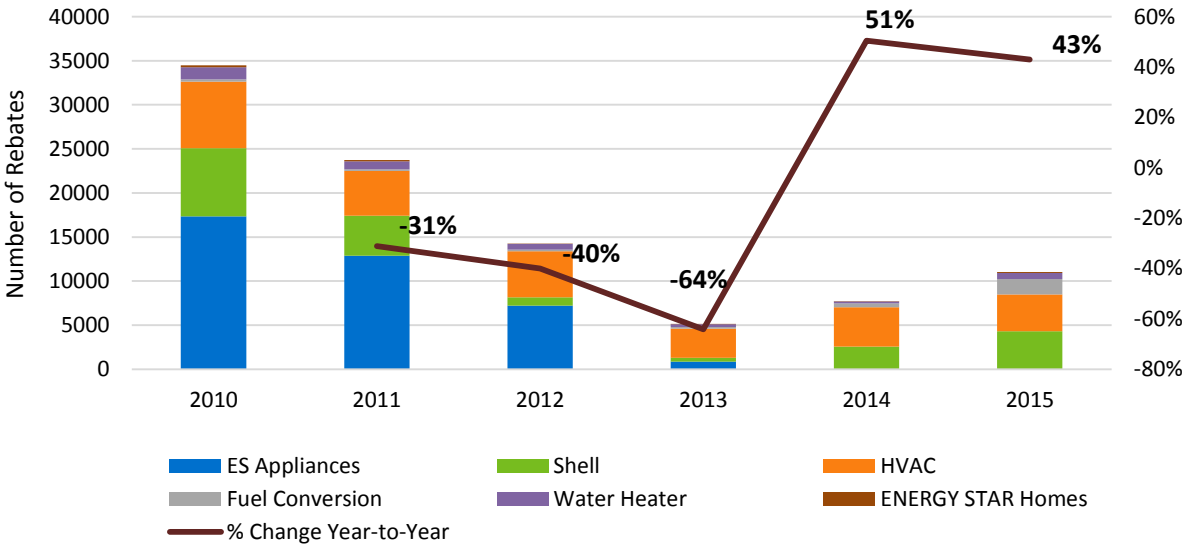
For the analysis of discontinued residential program measures and reduced incentives, the evaluation team combined information from the 2010-2013 program database with program data from 2014 and 2015. The combined 2010-2015 residential program database contained 100,796 measures, of which the evaluation team analyzed 96,343 measures (or 96% of all the measures in the database).[57] The evaluation team binned these measures into six categories: 1) ENERGY STAR appliances, 2) shell, 3) HVAC, 4) fuel conversions (or Fuel Efficiency program), 5) water heater, and 6) ENERGY STAR Homes measures. The 2010-2013 program database lacked the information necessary to identify low-income program participants, who also couldn't be uniquely identified based on the measure. Thus, the subsequent analyses and findings document overall participation trends because the evaluation team was not able to separate low-income program participants from other rebate program participants.[58]

[57] The evaluation team did not have a complete set of data for all the measures. For example, the program data extracts contained no information on 2010-2013 Appliance Recycling and UCON duct sealing measures.

[58] 2014 and 2015 program data included the information on low-income participants. About 10% of all 2014 and 2015 measures were installed in low-income residences.

The overall number of rebated measures declined from 2010 to 2013 (Figure 7-4). In 2014 and 2015, the number of rebates increased but were well below the levels reported in 2010.

Figure 7-4: Reported Number of Residential Rebates, 2010-2015 Program Data



According to the prior evaluation, Avista staff believed that the decline in the number of rebates was due to the expiration of tax credits for energy efficient upgrades and high-efficiency home appliances offered under the American Recovery and Reinvestment Act (ARRA) of 2009.[59] Staff reported that these tax credits likely prompted an increase in rebate program participation in 2009 and 2010, followed by a decrease in participation by 2011 when ARRA incentives started to wane.

Further analysis revealed that ENERGY STAR appliances, in particular, accounted for 40% of all the rebated measures examined in the 2010-2015 data. Avista ceased offering rebates for ENERGY STAR appliances in 2013, except to low-income customers.[60] This likely explains the abrupt drop in appliance measures in 2013 and thereafter, as rebates were not discontinued for any other measures.[61]

To quantify the effect of the discontinued appliance measures on overall participation, the evaluation team looked at the difference between two quantities: 1) the quantity of measures

[59] Cadmus (2014). *Avista 2012-2013 Process Evaluation Report.*

[60] There is no incentive budget in 2013-2015 Avista's DSM plans for appliance measures.

[61] The one exception is that the Avista 2013 DSM plan did not include water heater rebates in 2013, but did include them in all other years of this analysis.

that would have been incented in 2015 if the non-discontinued measures had the same participation as in 2010,[62] when the decline in rebate quantity began (the "2015 theoretical" quantity); and 2) the quantity of measures that were actually incented in 2015 (the "2015 actual" quantity). Note that the appliance measure was not discontinued for low-income customers and there were 26 low-income appliance rebates in 2015. Therefore, the first of the above quantities also assumes there would have been 26 low-income appliance rebates in 2015.

Table 7-2 shows each rebated measure, whether the measure was available ("Y") or not available ("N") each year from 2010 to 2015, the number of 2010 rebates for that measure, and the "2015 theoretical" and "2015 actual" quantities described above. Comparison of the 2015 theoretical and actual quantities shows that most of the overall decline in the number of rebates was attributed to the discontinued appliance measures, which accounted for 17,332 of the total decline of 23,453 measures, or 74% of the total (Table 7-2).

Table 7-4: Theoretical Versus Actual Participation, Accounting for Discontinued Measures, 2010-2015 Residential Program Data

b	Availability of Rebates						Baseline	2015	2015
Measures	2010	2011	2012	2013	2014	2015	2010, # of rebates	Projected # of rebates**	Actual # of rebates
Appliances	Y	Y	Y	N*	N*	N*	17358	26	26
Shell	Y	Y	Y	Y	Y	Y	7728	7728	4295
HVAC	Y	Y	Y	Y	Y	Y	7562	7562	4181
Fuel Conversion	Y	Y	Y	Y	Y	Y	256	256	1742
Water Heater	Y	Y	Y	N*	Y	Y	1345	1345	688
ENERGY STAR Homes	Y	Y	Y	Y	Y	Y	220	220	84
TOTAL	-	-	-	-	-	-	**34,469**	**17,137**	**11,011**
Number of rebates decline from baseline	-	-	-	-	-	-		**17,332**	**23,458**

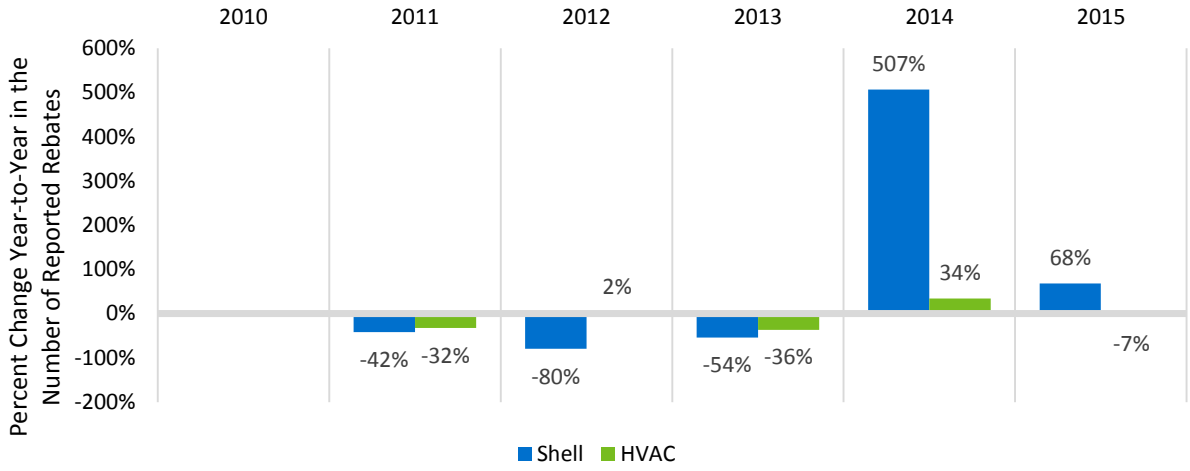
* Low-income customers still received Avista's rebates for appliance or water heaters.

** The number of rebates is the same as in 2010, except for discontinued measures.

Appliances were the most common measures in the 2010-2015 program data, followed by shell, and HVAC measures. With regard to shell and HVAC measures, these measures declined from 2010-2013, but not in 2014 and 2015. As shown in Figure 7-5, shell rebates increased by 507% and 68% from 2013 to 2014 and 2014 to 2015, respectively. HVAC rebates increased by 34% from 2013 to 2014 and decreased by 7% from 2014 to 2015.

[62] In contrast with the nonresidential analysis, which used 2013 as the baseline, the evaluation team selected 2010 as the baseline because the team wanted to include the period when ARRA funding was available for residential energy efficiency upgrades, which the previous evaluation identified as one reason for increased participation in Avista's rebate programs.

Figure 7-5: Percent Change Year-to-Year by Measure Rebate Type, 2010-2015 Residential Program Data



Because the shell and HVAC measures accounted for 52% of all the measures in the 2010-2015 program data, the evaluation team examined rebate amounts associated with these measures to assess whether changes in incentive amounts affected shell and HVAC program participation. To compare changes to the rebate amounts across the various shell and HVAC measures, the evaluation team divided rebate amounts with estimated energy savings for each record in the database. Many records in the database included both electric (kWh) and gas (therm) savings. To estimate total (electric+gas) savings, the evaluation team converted kWh and Therm savings for each record to British Thermal Units or BTUs.

Among the four shell measures examined and listed in Table 7-3, one measure in particular, windows, accounted for nearly two-thirds of the total number of shell measures contained in the 2010-2015 program database. The average rebate amount per BTU saved for windows declined from 2010 to 2013 and then increased from 2013 to 2015 (Table 7-3). This change could explain why participation in the shell program declined from 2010 to 2013 and then increased in 2014 and 2015.

Among the five HVAC measures listed in Table 7-3, three accounted for nearly all the HVAC measures in the 2010-2015 program data: high efficiency furnace or boiler, high efficiency air-source heat pump, and variable speed motor. The average rebate amount per BTU saved for air source heat pumps and variable speed motors increased from 2010 to 2015, while the quantity of rebated measures for air source heat pumps and variable speed motors decreased (Table 7-5). This indicates that the higher incentives per BTU saved in 2015 compared to 2010 did not halt the decline in incented air source heat pump and variable speed motor installations. The average rebate amount per BTU saved for the natural gas furnace or boiler measure decreased from 2010 to 2015. This decrease in rebate amount may be associated with the decrease in the quantity of natural gas furnace or boiler measures from 2010 to 2015 (Table 7-5).

Table 7-5: Percent Change in Rebate Amounts and Counts, 2010-2015 Residential Program Data

Measures	Average Rebate Amount Per 1000 BTUs ($/1000 BTUs)						% change in avg. rebate $ per 1000 BTUs	% change in rebate quantity
	2010	2011	2012	2013	2014	2015	2010-2015	2010-2015
Shell								
Windows*	0.036	0.034	0.031	0.000	0.047	0.054	48%	-44%
Attic Insulation	0.035	0.031	0.044	0.060	0.035	0.030	-14%	-64%
Floor Insulation	0.014	0.015	0.017	0.023	0.036	0.027	90%	-33%
Wall Insulation	0.013	0.016	0.016	0.025	0.046	0.034	161%	-65%
HVAC								
Nat. Gas Boiler/Furnace*	0.033	0.033	0.038	0.038	0.028	0.024	-26%	-52%
Air Source Heat Pump*	0.038	0.037	0.140	0.097	0.056	0.054	43%	-80%
Variable Speed Motor*	0.052	0.052	0.065	0.067	0.067	0.067	28%	-24%
Ductless Heat Pump	0.071	0.073	0.073	0.073	0.000	0.000	-100%	-100%
A/C Replacement	0.054	0.000	0.000	0.000	0.000	0.000	-100%	-100%

Note: Program data included a few additional shell and HVAC measures in 2014 and 2015. Because these measures were not listed in 2010-2013 data extract, the evaluation team excluded these measures from this analysis.

* These are the most frequent measures and they constitute the majority of the measures in the shell or HVAC programs.

7.1.2.2 Analysis of Repeat Participation Among Customers

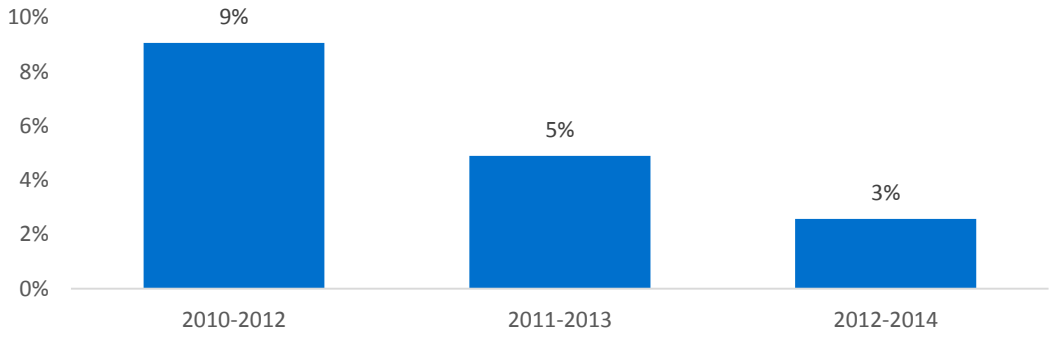
The evaluation team conducted another analysis to assess patterns of repeat participation among residential customers over rolling three-year periods, using data from the program databases from 2010 through 2014.[63] For each three-year period (2010-2012, 2011-2013, and 2012-2014), the evaluation team identified the number of unique customers that *either*: 1) participated in more than one program; or 2) participated in the same program more than one time within that three-year period. Then, for each of those three-year periods, the above quantity was divided by the total number of unique customers that participated in any program within that three-year period. For example, the formula for calculating repeat participation within the period from 2010 to 2012 was:

[63] The evaluation team had difficulty in matching participant ID variable with records in 2015 data.

$$\text{Repeat participation rate} = \frac{\text{The total number of unique customers that either participated in multiple programs within 2010-2012 or participated in the same program multiple times within 2010-2012}}{\text{The total number of unique customers that participated in any programs within 2010-2012}}$$

Repeat participation rates declined threefold from 2010 to 2015, but this decline had little effect on overall participation rates since less than one-tenth of residential participants participated in multiple programs or multiple times since 2010 (Figure 7-6).

Figure 7-6: Percent of Residential Customers Participating in Multiple Programs or Same Program Multiple Times, 2010-2014 Residential Program Data



7.1.2.3 Analysis of Availability of Qualifying Measures at Lower Price Points

The evaluation team conducted a third analysis using available 2010-2015 program data to determine whether limited product availability may have affected program participation. Previous research conducted by the evaluation team for the Energy Trust of Oregon revealed that the proportion of rebated refrigerators at lower price points declined sharply over several years in the Pacific Northwest. A single brand dominated the lower-priced refrigerator models that qualified for rebates, suggesting that consumers had relatively few models to choose from at the lower end of the market. The evaluation team did not have actual market data on model availability, as it did for the Energy Trust analysis, but the evaluation team examined unit cost of the rebated measure to determine whether evidence exists of a change in model availability. Data on price paid were examined for these two measures: natural gas furnace/boiler and water heater.

Customers participating in Avista's HVAC program are buying furnaces or boilers at lower cost, on average, in 2015 than in the prior years. The average price of incented furnaces or boilers peaked in 2012 and then declined in subsequent years (this trend was significant; ANOVA at $p<0.05$). The average price in 2012 ($4,084), in particular, was significantly lower than the average price in 2015 ($3,756) (Tukey post-hoc test at $p<0.05$), indicating that in recent years participating customers have bought more incented units at lower price points. On the other

hand, customers participating in Avista's Water Heater program are buying water heaters at higher cost, on average, in 2014 and 2015 than in the prior years. The average price of incented water heater units increased since 2010. The lack of a consistent relationship between average price paid and participation rate does not support the hypothesis that the decline in participation resulted from a change in model availability at different price points.

7.2 Participation Rates Among Opower Behavioral Program Participants and Nonparticipants

The evaluation team analyzed participation data from Avista's residential Behavioral Program, which is administered by Opower (Opower program), to gather insight into the effectiveness of Opower's home energy reports at encouraging customers to do more energy savings activities and/or participate in Avista's rebate programs. This analysis specifically investigates the effectiveness of one particular combination: Opower plus Avista rebates.

The evaluation team used randomized-control trial participation data from Opower combined with Avista rebate participation data to analyze differences in energy savings across four groups of customers in a quasi-experimental study. The team performed this analysis to determine whether participation in both the Opower program and one or more Avista rebate programs resulted in more electricity savings than the combined savings associated with programs individually. That is, the evaluation team wanted to determine whether there was a "multiplier effect" associated with customer participation in both the Opower program and the rebate programs.

The four customer groups the team analyzed were:

- *Opower+Rebate participants,* who participated in both the Opower program and one or more Avista rebate programs
- *Opower-only participants,* who participated in only the Opower program but not in an Avista rebate program
- *Rebate-only participants* who participated only in one or more Avista rebate programs but not in the Opower program
- *Nonparticipants* who did not participate in either the Opower program or in one of the Avista rebate programs

7.2.1 Data and Methods

7.2.1.1 Data Preparation

A sample of over 86,000 Avista customers in Washington and Idaho were randomly assigned by Opower to two groups: a treatment group that received home energy reports from Opower (Opower participants) and a control group that did not receive the reports (Opower nonparticipants) (Table 7-6). The evaluation team prepared the participation data for

Washington and Idaho customers (see impact evaluation reports for more details on data preparation) as follows:

- Calendarized customer monthly billing data into calendar months, and
- Removed customers with duplicate billing data, customers with no billing data after the month when the Opower reports began, and customers with no billing data for at least 12 months before the Opower reports began.

The evaluation team combined data from the two states into a single dataset for this analysis (Table 7-6). For this analysis, the evaluation team also required a data set in which the proportions of participants and nonparticipants in Idaho matched the proportions of participants and nonparticipants in Washington. In the original data, the percentage of Opower participants and nonparticipants in Idaho was 66% and 34% respectively, and the proportions for Washington customers was 79% and 21%, respectively. To achieve proportionality between the states, the team excluded a random sample of 5,380 Opower nonparticipant customers in Idaho (Table 7-6).

Table 7-6: Number of Opower Participants and Nonparticipants Before and After Removing Random Sample from Idaho Control Group

	Total		Washington		Idaho	
	N	%	N	%	N	%
Original Sample Sizes						
Opower nonparticipants	22,579	26.2%	11,292	21.3%	11,287	34.1%
Opower participants	63,502	73.8%	41,695	78.7%	21,807	65.9%
TOTAL	**86,081**	**100%**	**52,987**	**100%**	**33,094**	**100%**
Sample sizes after removing random sample of Idaho nonparticipant customers						
Opower nonparticipants	17,199	21.3%	11,292	21.3%	5,907	21.3%
Opower participants	63,502	78.7%	41,695	78.7%	21,807	78.7%
TOTAL	**80,701**	**100%**	**52,987**	**100%**	**33,094**	**100%**

In accordance with the program, Opower participants began receiving the home energy reports in June and July of 2013, and continued receiving reports through December 2015 (treatment period).[64] However, due to a change to Avista's customer billing system during the first half of 2015, none of the Opower participants received Opower reports between February and July of

[64] Opower participants received eight home energy reports in a year, or two per quarter of a year.

2015 (pause period). Opower participants began receiving reports again from August 2015 through December 2015, the end of the evaluation period.[65]

During the treatment period between July 2013 and December 2015, about four percent of the Opower participants and nonparticipants participated in one or more Avista rebate programs (Table 7-7).[66] The evaluation team merged the rebate program participation data with the Opower program participation data.

Table 7-7: Number of Opower and Avista Rebate Participants and Nonparticipants

	Opower Participant		Opower Nonparticipant		Total	
	N	%	N	%	N	%
Avista Rebate Participant	2,531	4.0%	656	3.8%	3,187	3.9%
Avista Rebate Nonparticipant	60,971	96.0%	16,543	96.2%	77,514	96.1%
TOTAL	**63,502**	**100%**	**17,199**	**100%**	**80,701**	**100%**

Calendarized monthly electricity usage data from billing records, including total monthly kWhs and average daily kWhs, were available for all customers in the dataset for 16 months preceding July 2013 (the pre-treatment period, March 2012 to June 2013). These data were also available for up to 30 months during the treatment period (July 2013 to December 2015). The data were structured such that each row represented a calendar month of customer billing data, in which each unique customer could have up to 46 rows, or months, of billing data.

About 22% of customers opted-out of the Opower program or moved residences at some point during the treatment period such that 63,283 customers remained in the dataset through the entire treatment period. The evaluation team included the customers that opted out or moved residences in its analyses to maintain the quasi-experimental design of the study and to avoid reducing the relatively small number of Avista rebate participants in the dataset.[67]

For the analysis, the team used the following variables:

- Opower_ID: unique identifier for each customer.

[65] Opower participants continued to receive Opower reports after December 2015 but all subsequent months fall outside the current evaluation period and are not included in analyses.

[66] Avista's "rebate" programs include rebates for high efficiency heating, ventilation, and air conditioning equipment upgrades, high efficiency water heating equipment upgrades, conversions from electric to natural gas space and water heating equipment, insulation and windows, and high efficiency equipment for ENERGY STAR® homes; the team also included UCONS direct install duct sealing and incentives for appliance recycling.

[67] Nonparticipants could not "opt out" since they were not receiving Opower reports, and the team had no way to identify which nonparticipants would have opted out if they had been receiving the Opower reports.

- Daily_Average_kWh: measure of average daily kWh usage for each customer and month.
- Daily_Average_kWh_Logged: logarithmic measure of average daily kWh usage for each customer and month.
- Daily_Average_kWh_Preusage: measure of average daily kWh usage for each customer and month in the pre-treatment period, coded to respective months in the treatment period (e.g. daily average kWh usage for each customer in May 2013 is coded for the customer in May 2014 and in May 2015).
- Year_Month: measure of time specifying the year and month of each electric bill.
- Pre_Post: indicator of the pre-treatment period (coded '0' for each month, March 2012 to June 2013) and treatment period (coded '1' for each month, July 2013 to December 2015).
- Opower_Participant: indicator of whether the customer is an Opower participant (coded '1' for all months) or Opower nonparticipant (coded '0' for all months).
- Avista_Rebate_Participant: indicator of whether the customer is an Avista rebate participant (coded '1' for the month in which they participated and all subsequent months and coded '0' for all months prior to participation) or nonparticipant (coded '0' for all months).

7.2.1.2 Analysis Methods

The evaluation team analyzed the prepared data set to determine whether participation in one or more Avista rebate programs and the Opower program results in more electricity savings than the sum of the electricity savings attributed to participation in each program separately. That is, the evaluation team wanted to determine whether there was a "multiplier effect" associated with customer participation in both the Opower program and the rebate programs. To do this, the evaluation team constructed cumulative and monthly lagged dependent variable (LDV) regression models that estimate electricity savings of Opower-only, Avista Rebate-only, and Opower+Avista Rebate program participation, compared to nonparticipants, using daily average kWh usage as the dependent variable.

The team used two different statistical regression methods to estimate the differences in electricity savings among the different customer groups. With the first method, the evaluation team included binary (yes/no) indicator variables to denote participation in the Opower and Avista rebate programs along with another indicator variable (an interaction term) that indicated whether the customer was a participant in both programs.[68] In the second method, the team

68 LDV Cumulative interaction model: Daily_average_kWh_usage = Opower_participant(β) + Avista_Rebate_participant (β) + Opower_participant (β)*Avista_Rebate_participant (β) + year_month+ daily_average_kWh_preusage + ε

LDV Monthly interaction model: Daily_average_kWh_usage = ([HER_participant_group(β) + Rebate_participant_group(β) + HER_participant_group(β)*Rebate_participant_group(β)] by year_month) + year_month + daily_average_kWh_preusage + ε

conducted separate regression models for each of the following six group comparisons.[69] The group comparison models do not control for the excluded groups like the interaction models do but the team performed these group comparison models as verification that results from the interaction models are robust.

- Nonparticipants (0) vs. Opower-only participants (1)
- Nonparticipants (0) vs. Avista Rebate-only participants (1)
- Nonparticipants (0) vs. Opower+Avista rebate participants (1)
- Opower-only (0) vs. Avista Rebate-only participants (1)
- Opower-only (0) vs. Opower+Avista Rebate participants (1)
- Avista Rebate-only (0) vs. Opower+Avista Rebate participants (1)

Electricity savings were measured in these models by comparing the actual daily average kWh usage (from monthly billing data) in the treatment period across the four groups, controlling for average daily kWh usage during the months in the pre-treatment period. The percent electricity savings were measured by replacing actual daily average kWh usage with the logarithmic measure of daily average kWh usage.

Due to the quasi-experimental design of the study, in which customers participated in Avista rebate programs in different months of the treatment period, there were too few Avista Rebate-only participants in the first three months of the treatment period ($n < 45$) to have the statistical power needed to include these data in the analyses. In addition, the team excluded from analyses data from customers using 500 daily kWhs or more in a month (n=48).

7.2.2 Findings

The evaluation team estimated the average daily electricity usage differences and percent electricity savings across the four customer groups: nonparticipants, Opower-only participants, Avista Rebate-only participants, and Opower+Avista Rebate participants. This section first describes differences between these groups and then answers the question about whether the combined Opower+Avista Rebate results in more electricity savings than the sum of the savings attributed to each program separately.

During the pre-treatment period, nonparticipants and Opower-only participants had the lowest average daily kWh usage, followed by the Opower+Avista Rebate participants and Avista

69 LDV Cumulative comparison models: Daily_average_kWh_usage = group1vsgroup2(β) + year_month + daily_average_kWh_preusage + ε

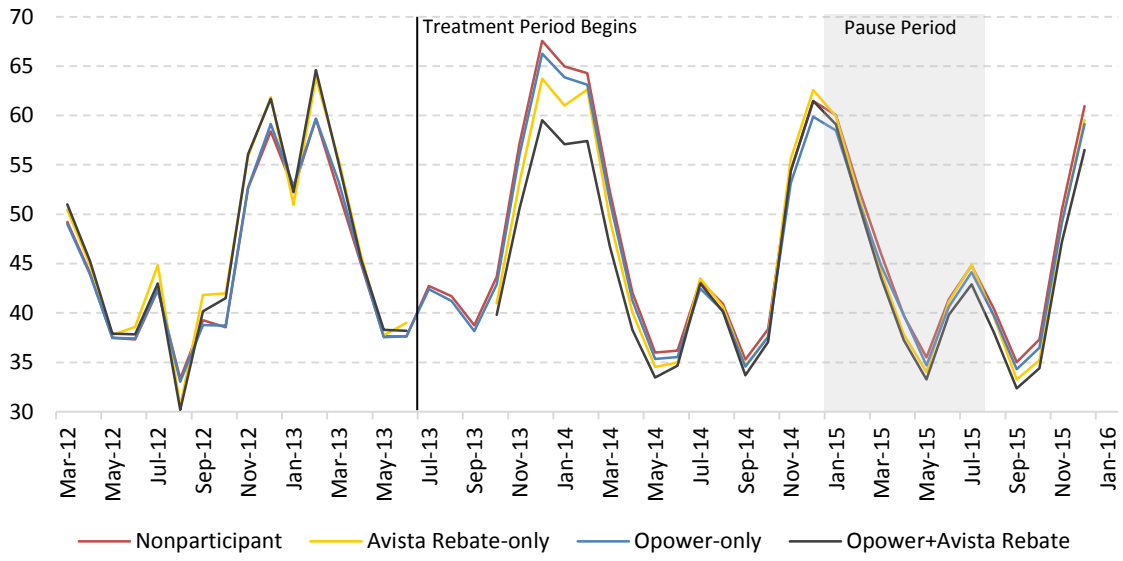
LDV Cumulative comparison models: Daily_average_kWh_usage = group1vsgroup2(β) by year_month + year_month + daily_average_kWh_preusage + ε

Rebate-only participants. However, during the treatment period, these trends changed such that Opower+Avista Rebate participants had the lowest average daily kWh usage, followed by Avista Rebate-only participants, Opower-only participants, and, lastly, nonparticipants (Table 7-8). These trends are illustrated across each month of the pre-treatment and treatment periods in Figure 7-7.

Table 7-8: Average Daily kWh Usage Before and During the Treatment Period by Group

	Nonparticipant	Opower-only	Avista Rebate-only	Opower+Avista Rebate
Pre-treatment period	44.8	44.9	46.4	46.2
Treatment period	46.9	46.0	44.9	43.6

Figure 7-7: Monthly Average Daily Energy Usage by Group



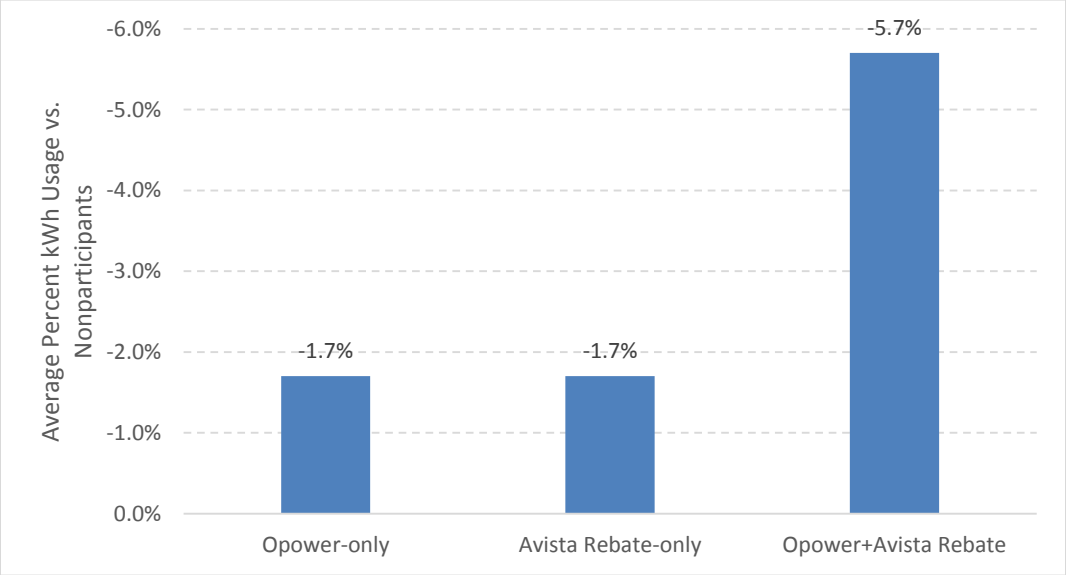
7.2.2.1 Cumulative LDV Model Results

The combination of the Opower home energy reports and Avista rebates appears to amplify electricity savings. Opower+Avista Rebate participants used significantly less electricity during the entire treatment period, on average, than the other groups (Figure 7-8; Table 1 in Appendix A). Opower+Avista Rebate participants, compared with nonparticipants (or the baseline), used 5.7% less electricity (or 2.82 kWh/day less).

These savings in electricity usage were significantly greater than the sum of the average savings attributed to the rebate programs alone (1.7%, or 1.35 kWh/day; Avista Rebate-only group versus baseline) plus the Opower program alone (1.7%, or 0.90 kWh/day; Opower-only group versus baseline). The sum of the savings from the two groups of customers individually resulted in 3.4% savings, or 2.25 kWh/day.

These results were determined using the LDV cumulative regression model with the interaction term (see equation in footnote 3 and full results in Table 1 in Appendix A). The model results are similar to but more conservative than the results from using the group comparison LDV cumulative regression models; these more conservative results were expected since the group comparison models do not include all customer groups in the same model (see Table 2 in Appendix A).

Figure 7-8: Average Cumulative Percent Electricity Usage Compared to Nonparticipants



* statistically significant at p≤.05

Note: These findings only take into account electric (kWh) savings. About 14% of Avista's rebate participants in the Opower dataset participated in Avista's Fuel Efficiency program, which means they converted from electric to natural gas space and/or water heating. These customers had an increase in natural gas consumption (therms) that is not accounted for in this and subsequent analyses.

7.2.2.2 Monthly LDV Model Results

Although the energy usage difference between the Opower plus Avista rebate group and the other customer groups is significant, further analyses revealed that Opower plus Avista rebate participation significantly affected electricity usage only during the early months of the treatment period. Figure 7-8 shows the average daily percent electricity usage for each group compared with nonparticipants and for each month in the treatment period from October 2013 to December 2015.[70] The Opower+Avista Rebate participants, compared with Nonparticipants, saved significantly more electricity per day, on average, during three months of the heating

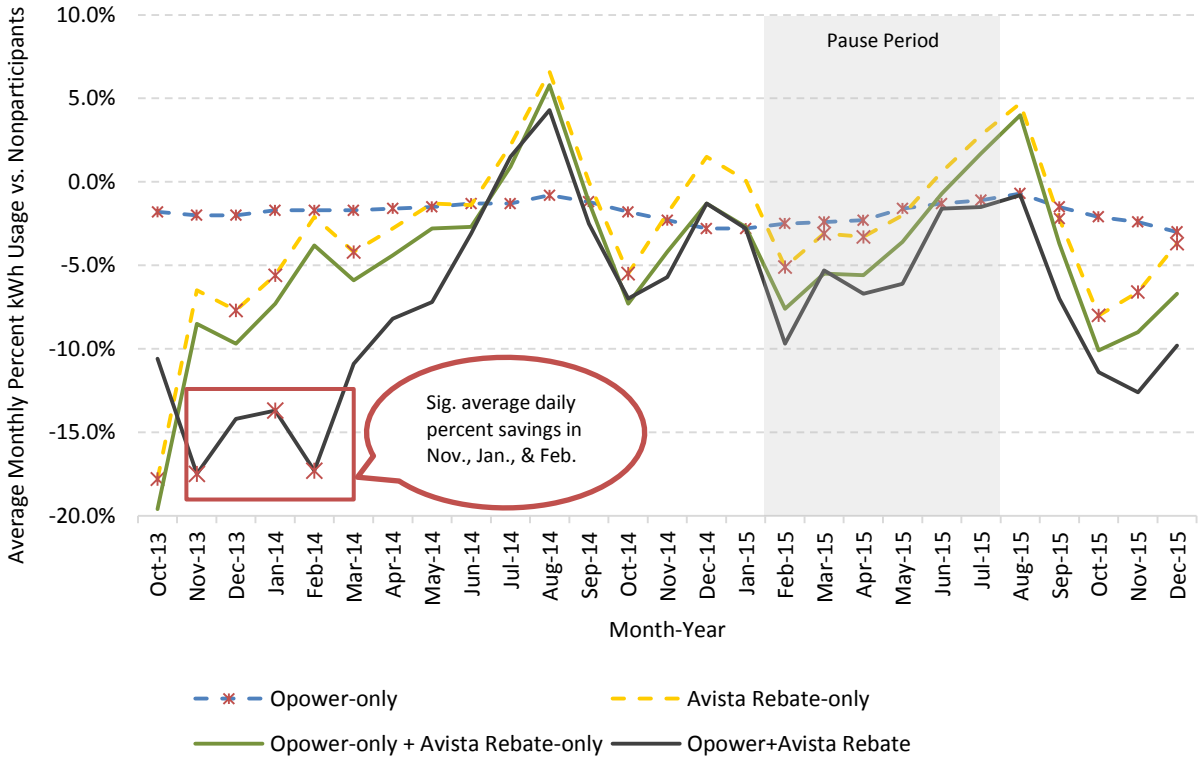
[70] The team excluded the months of July 2013 to September 2013 due to the small number of Avista rebate participants in the dataset for these months; the number of rebate participants is too small (n<45) to have the statistical power to perform the analysis.

season early in the treatment period of the Opower program: November 2013, January 2014, and February 2014.

As shown in Figure 7-8 although the average daily electricity usage was not significantly different during the following 2014-2015 heating season, these months coincide with the pause period for distributing the home energy reports to participating customers. The evaluation team lacked the data to extend its analysis through the 2015-2016 heating season; Figure 7-8 however, does show some evidence that Opower+Avista Rebate participants may have been saving more energy during these months.

The results from the LDV monthly regression model with the interaction term are similar to but more conservative than the results from the group comparison LDV monthly regression models (see equation in footnote 3 and full results in Table 1 in Appendix A); the more conservative results were expected since the group comparison models do not include all groups in the same model (see Table 2 in Appendix A).

Figure 7-8: Average Daily Percent Electricity Usage for Each Month Compared to Nonparticipants*



* Red asterisks (✳) indicate statistically significant average daily percent savings at p≤.10

7.2.3 Discussion

It appears that there is a multiplier effect when rebate participants receive home energy reports. The amplified Opower+Avista Rebate savings could be the result of additional electricity saving

actions these customers undertook in their homes. Furthermore, the Opower home energy reports could be influencing the type and number of rebate programs in which these customers are participating. For example, a significantly higher percentage of Opower+Avista Rebate participants participated in the Fuel Efficiency rebate program to convert from electric to natural gas space and/or water heating compared with Avista Rebate-only participants (14% vs. 12%, respectively; p≤.10). In addition, Opower+Avista Rebate participants participated in significantly more rebate programs, on average, compared with Avista Rebate-only participants (1.55 vs. 1.46 rebate programs, respectively; p≤.05). However, Opower+Avista Rebate participants did not participate in Avista rebate programs at a higher rate compared with Avista Rebate-only participants (4% vs. 3.8%, respectively; not significantly different).

Collectively, these findings suggest that home energy reports can be effective at engaging customers and motivating them to take actions such as participating in Avista's rebate programs, such as the Fuel Efficiency program. These findings validate Avista's strategy to promote the rebate programs via the home energy reports.

These findings also suggest that customers who receive both home energy reports and rebates are saving even more energy than would be expected based on the average per-customer savings associated with each program. However, based on the current analysis, it is unclear whether the additional savings are only realized seasonally, or if the additional savings are a temporary phenomenon and lack persistence. Nevertheless, the possibility of a multiplier effect could have important implications for future program planning.

Future research should continue exploring the question of whether a combination of the home energy reports and rebate program participation results in more electric savings compared with participation in each program alone. For example, it is important to try and replicate these findings to ensure they are not an isolated outcome. It is also important to further analyze the savings to determine whether the savings are persistent and/or whether they are only realized during certain portions of the year (e.g., the heating season). Future research also should investigate further the type and number of rebate programs in which customers are participating and explore whether other program combinations could also amplify savings. Lastly, future research should further examine attribution of electricity savings from the combination of Opower participation and utility program participation to determine to what extent the Opower reports are influencing customers to participate in other programs.

7.3 Commercial Uptake of Simple Steps Lighting

The Simple Steps, Smart Savings program promotes the sales of CFL and LEDs to residential customers. Avista currently only reports savings for this offering through their residential lighting program. However, due to the delivery mechanism of the program (in-store buy down promotions), the evaluation team sought to understand if nonresidential customers were purchasing bulbs discounted through the program and if so, what percent of Simple Steps bulbs are 'leaking' into the nonresidential sector. The evaluation team estimated this "leakage" into the commercial sector using the responses of customers (participants and nonparticipants), as well

as by conducting a survey of large retailers that sell Simple Steps items. The following section describes this special study's objective, and results.

7.3.1 Objective

The objective of this study aimed to determine the distribution of Simple Steps, Smart Savings CFL and LED items across the residential and commercial sectors. A second purpose was to determine when retailers joined the Simple Steps program and identify future opportunities for savings and participation in the Simple Steps program.

7.3.2 Results

The evaluation team describes the results of each method below, beginning with the customer results.

7.3.2.1 Customer Results (Participant and Nonparticipant Surveys)

Of 375 surveyed nonresidential customers (participants and nonparticipants), 25 reported purchasing 2,685 Simple Steps items for their businesses. About half of the items were CFLs and half were LED items (Table 7-9).

Table 7-9: Summary Items in the Commercial Sector Attributable to Simple Steps

	Participants (*n*=305)		Nonparticipants (*n*=70)		Total (*n*=375)	
	Respondents	Items	Respondents	Items	Respondents	Items
Standard CFLs	11	1,030	3	60	14	1,090
Specialty CFLs	8	274	1	12	9	286
LEDs*	11	736	0	0	11	736
LED Fixtures	4	517	2	56	6	573
TOTAL	**21**	**2,557**	**4**	**128**	**25**	**2,685**

* Incented in 2014 and second half of 2015

Multiplying each sample total by the inverse of the respective sampling ratio produced estimates of 47,452 CFLs and 37,338 LEDs sold to nonresidential customers.[71] Those estimates represent 5.3% of the 896,485 of Simple Steps CFL items and 12.6% of the 295,870 of Simple Steps LED items sold in Avista territory that were sold to nonresidential customers, thus equating to the leakage percent of the program into this sector. The sample size of 375 provided 5% precision at 95% confidence.

[71] The "sampling ratio," also known as the "sampling fragment," is the ratio of the sample size to the population size (https://en.wikipedia.org/wiki/Sampling_fraction). Thus, the total numbers of Simple Steps CFLs and of LEDs reported by participants were multiplied by the inverse of the participant survey sampling ratio and the total numbers of Simple Steps CFLs and of LEDs reported by nonparticipants were multiplied by the inverse of the nonparticipant survey sampling ratio.

7.3.2.2 Retail Manager Surveys

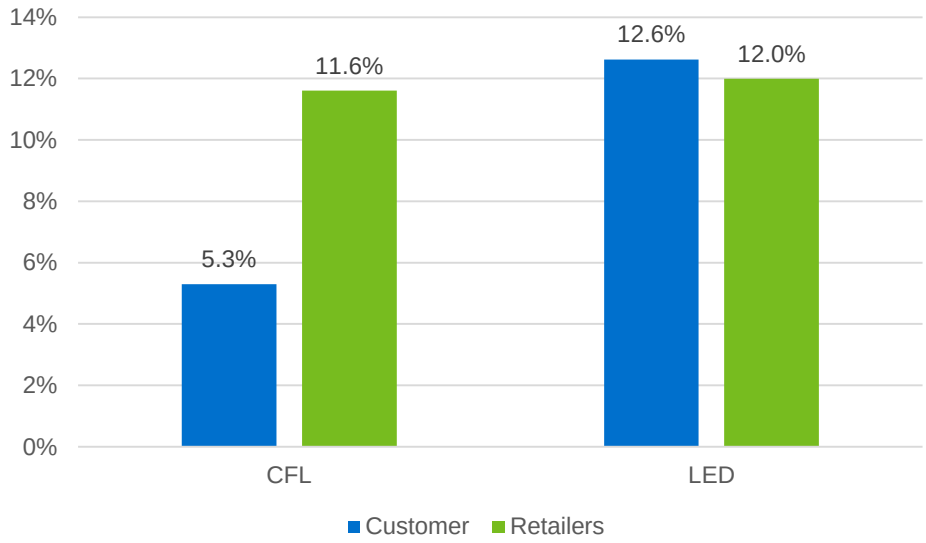
Retail respondents were typically lighting or electrical department managers and had held their position from three months to 20 years, for an average of four years. Overall, the 27 respondents represented stores that sold 75% of all Simple Steps CFLs and 85% of all Simple Steps LEDs. Of the 27 retailers surveyed, 17 could provide an estimate of the number of CFLs sold to nonresidential customers, representing 51% of all Simple Steps CFL sales, and 14 could provide an estimate of the number of LEDs sold in that sector, representing 53% of all Simple Steps LED sales.

The evaluation team calculated the number of Simple Steps items sold to the commercial sector by calculating the mean percentage of Simple Steps items sold to nonresidential customers, weighted by the total number of Simple Steps items sold per respondent. Using the above methods, the evaluation team estimated that 11.6% of Simple Steps CFLs (or 104,019 bulbs) and 12% of LEDs (or 35,476 bulbs) were sold to nonresidential customers.

7.3.2.3 Comparison of Participant/Nonparticipant and Retail Manager Results

Figure 7-9 shows the estimated percentage of Simple Steps lighting sold to nonresidential customers that each data source (customer surveys and retailer survey) produced. The two data sources produced similar values: 12.6% and 12% of LED leakage for the customer and retailer surveys, respectively. The estimates are less similar for CFLs, with values of 5.3% and 11.6% for the customer and retailer surveys, respectively.

Figure 7-9: Estimates of Percent of Products in Commercial Sector



7.3.3 Retailers Experience with Simple Steps

Respondents reported promoting CFLs for longer time periods than LEDs. Fourteen of 27 respondents could estimate how long they had promoted Simple Steps CFLs; responses ranged from three months to six years, averaging 2.2 years. Twelve of the 27 respondents could

estimate how long they had been promoting LEDs and reported promoting Simple Steps LEDs from three months to two years, averaging slightly less than one year.

7.3.4 Other Opportunities for Simple Steps

Retailer respondents did not report many opportunities to improve the Simple Steps program for residential or nonresidential customers going forward. Five of the 27 suggested maintaining or expanding the program's LED offerings. None reported participating in the recent Simple Steps washing machine offering.[72]

[72] Simple Steps, Smart Savings, Appliance Frequently Asked Questions, http://www.simplestepsnw.com/consumer/How%2520to%2520Choose/Appliance%20FAQ

8 Conclusions and Recommendations

The 2014-2015 evaluation shows high levels of program awareness among all of Avista's customers and shows high levels of satisfaction among program participants and contractors. Program participants and contractors were complementary of Avista staff and generally appreciated the opportunities to save money, save energy, and improve their properties that the programs provide. The evaluation also shows that there are areas the programs could enhance to make them better able to respond to the ever changing market conditions in which these programs operate.

The evaluation team concluded the following and provides several suggestions for Avista's programs. This section begins with conclusions and recommendations pertinent across all programs (cross-cutting), followed by nonresidential and small business, and ending with residential specific conclusions and recommendations.

8.1 Cross-cutting

Conclusion 1: Contractors are key program partners.
Contractors are the driving force of Avista's rebate programs, as they inform both nonresidential and residential consumers about Avista's rebate opportunities and convince them to purchase qualifying equipment. The nonresidential contractors also initiate a notable portion of work in comparison to customer-initiated jobs and appear to be playing a larger role in application preparation than in years past. Both nonresidential and residential customers report being highly satisfied with contractors and are taking into account contractor's recommendations on what to install. Although developing a trade ally network is not a priority, there are several things that can be done short of an official network that could result in increased participation and savings.

Recommendations: Increase support for contractors.
Consider the following suggestions to continue strengthening relationships with contractors and to improve their effectiveness in generating program savings:

1. Offer an opt-in mailing list to contractors. Contractors subscribed to this mailing list would receive regular information on program offers, changes, trainings, and other program supporting information. This list would be open to any interested contractor.

2. Promote outreach to contractors: Encourage program staff and account executives to engage further with contractors by continuing and perhaps increasing their involvement with contractor-related resources such as the Northwest Lighting Network. This work can further educate contractors and nudge them to cross-promote the rebate programs to their customers. Additionally, training may help contractors up-sell high efficiency equipment through the program by improving their understanding of and ability to sell high efficiency solutions. Therefore, Avista should continue to support contractors

attending NEEA's training sessions including their recently launched comprehensive training for lighting contractors and distributors.

3. Share effective messaging or marketing collateral with contractors. Contractors could support program and marketing staff by providing insights into how to best target certain customer types, learn from Avista on how to better target certain customer segments, and possibly promote cross-program referrals and participation. As findings from the evaluation show that most contractors specialize in the nonresidential or residential sectors, even if they serve both, developing sector-specific messaging may be particularly effective.

4. Investigate offering cooperative (co-op) marketing. Co-op marketing can help contractors effectively market the program consistent with Avista's objectives and increase customer perceptions of contractor's credibility and cross-promote other programs.

Conclusion 2: Although Avista and its implementation contractors deliver rebate programs efficiently, promoting the programs further could help maintain or even increase participation.

Several indicators suggest program promotions could be optimized. First, participants and nonparticipants expressed high interest in learning more about Avista's rebate programs, indicating that although they may be aware of Avista's offers, their knowledge is limited. Second, a majority of residential participants who indicated learning primarily about Avista's offers through contractors were not aware of other program opportunities outside the program they participated in.

Recommendation: Develop more abilities to target marketing. For example, cross-promote programs to recent participants by acknowledging their recent participation and informing them of other program opportunities applicable to their home or business.

Recommendation: For residential customers, continue improving messaging in direct mail promotions to better communicate program information since residential customers prefer to receive this information via mail.

8.2 Nonresidential, Including Small Business

Conclusion 3: Although declining participation rates could threaten Avista's ability to achieve long-term goals, evaluation results point to opportunities to drive additional savings.

Developing new strategies to encourage deeper savings or increased participation will be paramount to reversing the decline in participation and achieving long-term savings goals. Almost one-third of nonparticipants reported they will make a building upgrade in the next two years, indicating a continued potential for program participation. In particular, evidence suggests that much opportunity remains for converting lighting from T12s.

Recommendation: Develop a marketing approach specifically targeting replacement of T12 lamps.

The switch to a T8 baseline in 2012 had a dramatic effect on participation because the rebates became far less attractive to customers to upgrade from T12s.[73] While it may not be feasible for Avista to alter the baseline for T12 change-outs, Avista should look into developing targeted marketing strategies for convincing nonresidential customers with T12s to replace them with more efficient lighting, focusing not only on savings but improved lighting quality and performance. Avista could begin by targeting businesses that the Small Business Program has identified as still having T12s.

Recommendation: Work with nonresidential lighting contractors to promote replacement of T12 lamps.

Contractors make their living by selling equipment. Avista should work with nonresidential lighting contractors to make sure they are fully aware of the advantages that more efficient lighting (including the reduced wattage tube lighting that NEEA is targeting through its Reduced Wattage Lamp Replacement Initiative) offer their customers.

Recommendation: Consider claiming Simple Steps savings for bulbs purchased for the nonresidential sector.

The evaluation found that about 12% of Simple Steps LED sales and somewhere from 5% to 12% of Simple Steps CFL sales go to nonresidential customers. The mean hours of use for such lighting is much higher in a nonresidential than residential settings, meaning that the total Simple Steps savings is potentially higher than currently estimated, and at a minimum, Avista should consider claiming the additional savings for these purchases.

8.3 Residential

Conclusion 4: Participation in the Avista rebate programs has rebounded since 2013 driven by a fivefold increase in shell program participation.

Rebate program participation reached a low point in 2013, after which participation increased year over year by 51% from 2013 to 2014 and by 43% from 2014 to 2015. This is a positive sign; however, maintaining or increasing program participation requires cost effective savings opportunities for residential customers. Avista's residential programs operate in a fast-changing market. Consumers are adopting LEDs rapidly,[74] retailers are transitioning away from CFLs to

[73] A very similar thing happened to another program administrator in Missouri. See Ameren Missouri BizSavers Process Evaluation Report 2015.

[74] 1 of 20 A-line bulbs sold nationally was an LED in third quarter of 2014, whereas in the quarter prior to that, it was 1 in 30. This statistic comes from the *2015 LED Market Intelligence* report by Bonneville Power Administration. https://www.bpa.gov/ee/utility/research-archive/documents/momentum-savings-resources/led_market_intelligence_report.pdf

LEDs,[75] and the federal government and regulators are mandating higher efficiency standards for bulbs and other energy efficient technologies.[76] The convergence of these forces has implications for the cost effectiveness of Avista's downstream rebate programs. Program administrators throughout the United States are exploring and testing alternative program designs such as upstream and midstream designs in response to the evolving market. Although Avista is currently participating in the Simple Steps, Smart Savings program (a midstream program), when asked about future opportunities, program staff did not mention any upcoming pilots or programs that apply these types of designs.

Recommendation: Continue regularly reviewing the expected savings and cost-effectiveness of the measures in residential portfolio and exploring the benefits and costs of other program designs including upstream and/or midstream designs.
Consider these suggestions:

1. Continue monitoring the technological advances and availability of ductless heat pumps and water heating equipment. Surveyed contractors recommended both of these categories as candidates for inclusion in Avista's programs. NEEA, for example, has been working to promote the savings potential of heat pump water heaters in the Northwest via the Northern Climate Heat Pump Water Heater Specification,[77] and The Northwest Power and Conservation Council has identified both of these measure types as promising technologies in the recently adopted Seventh Power Plan.[78]

2. Explore upstream program opportunities outside of the lighting market. Upstream incentive programs offer the potential to increase the adoption of energy efficient technologies at a lower cost compared to downstream incentive programs. Program administrators in California and elsewhere have successfully tested or used upstream program designs for technologies that Avista currently incents, including HVAC equipment and water heaters.[79]

Conclusion 5: Residential customers who rent their home are underserved.

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[75] Souza, Kim, 2016. *Walmart to transition lighting products away from compact fluorescent to LED.* Retrieved from http://talkbusiness.net/2016/02/walmart-to-transition-lighting-products-away-from-compact-fluorescent-to-led/

[76] The lighting standard, established by the Energy Independence and Security Act of 2007, requires that light bulbs use about 25% less energy by 2014. New efficiency heating and cooling standards from the U.S. Department of Energy, which have gone into effect Jan. 1, 2015, will increase the efficiency of heating, ventilation, and air-conditioning (HVAC) equipment in certain regions.

[77] http://neea.org/northernclimatespec/

[78] http://www.nwcouncil.org/energy/powerplan/7/plan/

[79] Quaid, M. and H. Geller (2014). *Upstream Incentive Utility Programs: Experience and Lessons Learned.* Retrieved April 14, 2016. http://www.swenergy.org.

Nonparticipants say living in a rental property prohibits them from making improvements. This was the second most commonly cited barrier to making energy efficient upgrades among nonparticipants (after the up-front cost barrier). More than a quarter (27%) of nonparticipant survey respondents were renters, whereas only 3% of the participant survey respondents were renters. Renters account for about one-third of the population in Avista territory.[80]

Currently, Avista serves renters via the low-income program. The CAP agencies reported having difficulty serving the low-income renter population because it is difficult to convince landlords to participate. Additionally, there appears to be no multifamily program in the Avista portfolio that could serve this market, although Avista does offer an incentive for a natural gas space and water heating measures to multifamily property owners.

Recommendation: Investigate energy savings opportunities in the rental market. Consider the following suggestions:

1. Estimate the number and distribution of rental units in the single family, manufactured home, and among multifamily buildings. Analyzing these data geographically and by vintage would likely yield insights regarding the energy saving potential in these markets.

2. Conduct needs assessment research with landlords to understand their needs and concerns and explore ways to bolster their willingness to make energy efficiency upgrades on their properties. This research should consider the needs landlords serving low-income renters as well as renters not eligible for the low income program.

3. Conduct needs assessment research with renters to understand their needs and the barriers to participation they face. For example, although some energy savings activities may not be appropriate for renters (for example, HVAC system replacement), other activities such as installing energy efficient lighting and/or advanced power strips could be appropriate.

[80] US Census Bureau. “B25003 : Tenure.” 2010 – 2014 American Community Survey 5-Year Estimates. Web. 13 April 2016.

Appendix A Opower

Table 1: Average Daily kWh Savings (β) Compared to Nonparticipants from Cumulative and Monthly Lagged Dependent Variable Interaction Models

	Opower Group[1]		Avista Rebate Group[1]		Opower Group X Avista Rebate Group[1,2]	
	β	%	β	%	β	%
Cumulative Model[3]:	**-0.90**	-1.7%	**-1.35**	-1.7%	**-0.56**	-2.3%
Monthly Model[4]:						
October 2013	**-0.85**	**-1.8%**	**-6.94**	**-17.8%**	2.89	9.0%
November 2013	**-1.16**	**-2.0%**	-1.65	-6.5%	**-6.09**	**-9.0%**
December 2013	**-1.31**	**-2.0%**	**-3.64**	**-7.7%**	-3.20	-4.5%
January 2014	**-1.13**	**-1.7%**	**-3.43**	**-5.6%**	**-3.38**	**-6.4%**
February 2014	**-1.14**	**-1.7%**	-0.85	-2.1%	**-8.33**	**-13.5%**
March 2014	**-1.00**	**-1.7%**	**-2.88**	**-4.2%**	-1.71	-5.0%
April 2014	**-0.79**	**-1.6%**	-1.86	-2.8%	-1.11	-3.8%
May 2014	**-0.58**	**-1.5%**	-0.86	-1.3%	-1.45	-4.4%
June 2014	**-0.58**	**-1.3%**	-1.30	-1.4%	0.20	-0.4%
July 2014	**-0.75**	**-1.3%**	-0.39	2.2%	0.48	0.6%
August 2014	**-0.58**	**-0.8%**	1.26	6.6%	-0.03	-1.5%
September 2014	**-0.66**	**-1.2%**	-0.78	0.0%	-0.19	-1.3%
October 2014	**-0.85**	**-1.8%**	**-2.95**	**-5.5%**	0.46	0.3%
November 2014	**-1.20**	**-2.3%**	-1.20	-1.9%	-0.61	-1.5%
December 2014	**-1.60**	**-2.8%**	1.08	1.5%	0.48	0.0%
January 2015	**-1.56**	**-2.8%**	0.12	0.1%	0.49	-0.1%
February 2015	**-1.24**	**-2.5%**	**-2.98**	**-5.1%**	-0.92	-2.1%
March 2015	**-1.16**	**-2.4%**	**-1.83**	**-3.1%**	0.57	0.2%
April 2015	**-0.97**	**-2.3%**	**-1.90**	**-3.3%**	0.37	-1.1%
May 2015	**-0.69**	**-1.6%**	-1.27	-2.0%	-0.29	-2.5%
June 2015	**-0.67**	**-1.3%**	-0.67	0.6%	-0.06	-0.9%
July 2015	**-0.72**	**-1.1%**	-0.70	2.8%	-0.39	-3.2%
August 2015	**-0.53**	**-0.7%**	0.51	4.7%	-1.07	-4.8%
September 2015	**-0.67**	**-1.5%**	**-1.88**	**-2.2%**	-0.12	-3.3%
October 2015	**-0.81**	**-2.1%**	**-3.72**	**-8.0%**	0.26	-1.3%
November 2015	**-1.15**	**-2.4%**	**-3.12**	**-6.6%**	-1.01	-3.6%
December 2015	**-1.81**	**-3.0%**	**-1.49**	**-3.7%**	-1.21	-3.1%
Observations	**2,114,861**					

	Opower Group[1]	Avista Rebate Group[1]	Opower Group X Avista Rebate Group[1,2]
R-squared	**0.37**		

[1] All bolded βs are significant at p≤ 0.10.

[2] βs & percentages are for the interaction term, and the actual values for the Opower+Rebate group are the sum of columns 2, 4, and 6 for βs and the sum of columns 3, 5, & 7 for percentages.

[3] Cumulative lagged dependent variable regression model: *Daily_average_kWh_usage = Opower_participant(β) + Avista_Rebate_participant (β) + Opower_participant (β)*Avista_Rebate_participant (β) + year_month+ daily_average_kWh_preusage + ε*

[4] Monthly lagged dependent variable regression model: *Daily_average_kWh_usage = ([HER_participant_group(β) + Rebate_participant_group(β) + HER_participant_group(β)*Rebate_participant_group(β)] by year_month) + year_month + daily_average_kWh_preusage + ε*

Table 2: Average Daily kWh Savings (β) from Cumulative and Monthly Lagged Dependent Variable Group Comparison Models

	Nonparticipants vs. Opower-only Participants[1]		Nonparticipants vs. Avista Rebate-only Participants[1]		Nonparticipants vs. Opower+ Avista Rebate Participants[1]		Opower-only vs. Avista Rebate-only Participants[1]		Opower-only vs. Opower+Avista Rebate Participants[1]		Avista Rebate-only vs. Opower+ Avista Rebate Participants[1]	
	β	%	β	%	β	%	β	%	β	%	β	%
Cumulative Model[2]:	**-0.90**	**-1.7%**	**-1.60**	**-2.2%**	**-3.30**	**-6.5%**	**-0.48**	-0.1%	**-1.90**	-4.0%	**-1.53**	-4.0%
Monthly Model[3]:												
Oct. 2013	**-0.85**	1.8%	**-7.03**	-17.9%	**-4.92**	-10.7%	**-6.06**	-16.0%	**-4.04**	-8.9%	0.35	4.5%
Nov. 2013	**-1.16**	2.0%	-1.48	-6.3%	**-9.06**	-17.8%	-0.54	-4.5%	**-7.70**	-15.5%	**-6.45**	-10.7%
Dec. 2013	**-1.31**	2.0%	0.01	-2.8%	**-10.51**	-17.4%	-2.37	-5.7%	**-6.82**	-12.2%	**-8.26**	-11.9%
Jan. 2014	**-1.13**	1.7%	-0.83	-2.0%	**-8.40**	-14.3%	-2.41	-4.0%	**-6.81**	-12.0%	**-6.29**	-11.0%
Feb. 2014	**-1.14**	1.7%	-0.82	-2.1%	**-10.44**	-17.4%	0.28	-0.4%	**-9.14**	-15.5%	**-8.12**	-13.4%
March 2014	**-1.00**	1.7%	**-3.09**	-4.6%	**-7.12**	-13.6%	-1.88	-2.5%	**-4.59**	-9.2%	**-3.68**	-8.5%
April 2014	**-0.79**	1.6%	-1.70	-2.4%	**-3.72**	-8.2%	-1.08	-1.2%	**-2.98**	-6.6%	**-2.40**	-6.6%
May 2014	**-0.58**	1.5%	-0.99	-1.6%	**-2.81**	-6.9%	-0.22	0.3%	**-2.35**	-5.7%	-1.83	-5.4%
June 2014	**-0.58**	1.3%	-1.34	-1.5%	**-1.72**	-3.3%	-0.71	0.0%	**-1.08**	-1.8%	-0.38	-1.8%
July 2014	**-0.75**	1.3%	-0.37	2.3%	-0.65	1.6%	0.36	3.5%	0.09	2.9%	-0.26	-0.6%
August 2014	**-0.58**	0.8%	0.80	5.6%	0.24	3.3%	**2.03**	7.9%	**1.40**	5.5%	-0.62	-2.4%
Sept. 2014	**-0.66**	1.2%	-0.69	0.2%	**-1.60**	-2.4%	-0.83	-0.7%	**-1.40**	-2.4%	-0.57	-1.7%
Oct. 2014	**-0.85**	1.8%	**-3.03**	-5.5%	**-3.43**	-7.1%	**-2.07**	-3.6%	**-2.48**	-5.2%	-0.40	-1.5%
Nov. 2014	**-1.21**	2.4%	-1.41	-2.2%	**-3.26**	-6.1%	0.05	0.5%	**-1.75**	-3.4%	**-1.84**	-3.9%
Dec. 2014	**-1.60**	2.8%	-0.40	-0.6%	**-2.63**	-4.9%	**2.69**	4.3%	**1.59**	1.6%	**-2.00**	-4.0%
Jan. 2015	**-1.55**	2.8%	1.37	2.0%	**-1.05**	-3.0%	**1.63**	2.9%	0.62	0.0%	**-1.85**	-4.2%
Feb. 2015	**-1.24**	2.5%	**-3.12**	-5.3%	**-5.20**	-9.8%	**-1.73**	-2.6%	**-3.85**	-7.2%	**-1.83**	-4.1%
Feb. 2015	**-1.24**	2.5%	**-3.12**	-5.3%	**-5.20**	-9.8%	**-1.73**	-2.6%	**-3.85**	-7.2%	**-1.83**	-4.1%
March 2015	**-1.16**	2.4%	**-3.65**	-6.6%	**-4.21**	-8.7%	-0.67	-0.7%	**-1.26**	-2.9%	-0.59	-2.2%
April 2015	**-0.97**	.3%	**-2.04**	-3.6%	**-2.51**	-6.7%	-0.93	-1.1%	**-1.53**	-4.4%	-0.08	-2.1%
May 2015	**-0.69**	1.6%	-1.34	-2.1%	**-2.25**	-6.1%	-0.57	-0.3%	**-1.58**	-4.5%	-0.98	-4.2%
June 2015	**-0.67**	1.3%	-0.79	0.3%	**-1.35**	-1.6%	0.04	1.9%	-0.74	-0.4%	-0.62	-1.9%
July 2015	**-0.72**	1.1%	-0.67	2.8%	**-1.81**	-1.5%	0.01	3.8%	**-1.09**	-0.4%	-1.08	-4.1%
August 2015	**-0.53**	0.7%	0.12	3.7%	**-1.46**	-1.7%	1.20	5.8%	-0.40	0.3%	**-1.60**	-5.5%

	Nonparticipants vs. Opower-only Participants[1]		Nonparticipants vs. Avista Rebate-only Participants[1]		Nonparticipants vs. Opower+ Avista Rebate Participants[1]		Opower-only vs. Avista Rebate-only Participants[1]		Opower-only vs. Opower+Avista Rebate Participants[1]		Avista Rebate-only vs. Opower+ Avista Rebate Participants[1]	
	β	%	β	%	β	%	β	%	β	%	β	%
Sept. 2015	**-0.68**	1.5%	**-1.79**	-1.9%	**-2.68**	-7.0%	**-1.98**	-2.6%	**-2.25**	-6.1%	-0.32	-3.5%
Oct. 2015	**-0.81**	2.1%	**-3.72**	-7.9%	**-4.28**	-11.4%	**-2.91**	-6.0%	**-3.46**	-9.3%	-0.58	-3.4%
Nov. 2015	**-1.15**	2.4%	**-3.25**	-6.7%	**-5.39**	-12.7%	**-1.94**	-4.2%	**-4.09**	-10.1%	**-2.14**	-5.9%
Dec. 2015	**-1.81**	3.0%	**-3.40**	-6.4%	**-6.32**	-12.5%	0.34	-0.6%	**-2.69**	-6.8%	**-3.01**	-6.1%
Observations	***2,067,403***		***450,317***		***478,045***		***1,636,816***		***1,664,544***		***47,458***	
R-squared	***0.37***		***0.50***		***0.49***		***0.38***		***0.38***		***0.42***	

[1] All bolded βs are significant at p≤ 0.10.

2 Cumulative lagged dependent variable regression model: *Daily_average_kWh_usage = group1vsgroup2(β) + year_month + daily_average_kWh_preusage + ε*

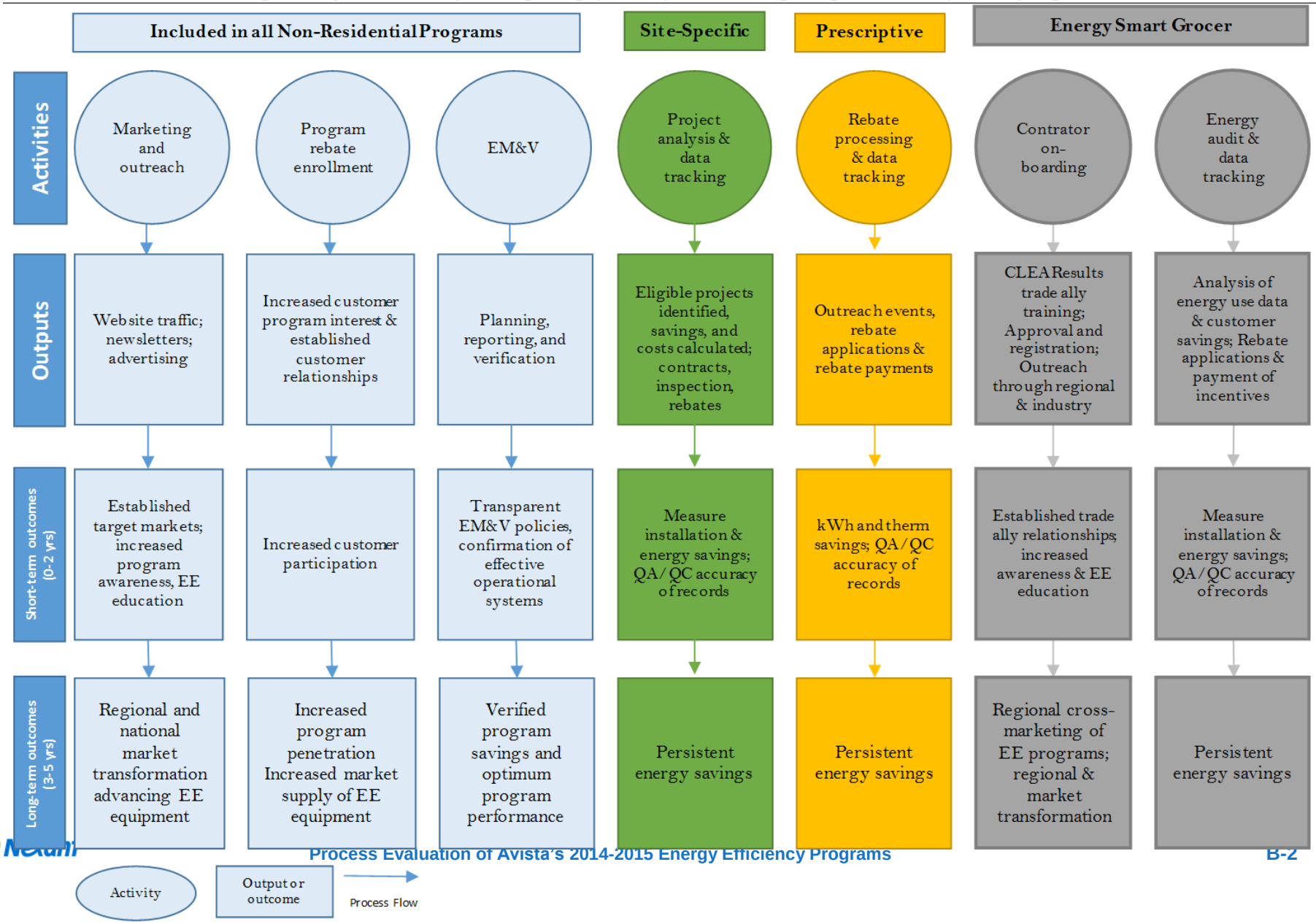
3 Monthly lagged dependent variable regression model: *Daily_average_kWh_usage = group1vsgroup2(β) by year_month + year_month + daily_average_kWh_preusage + ε*

Appendix B Program Logic Models

Avista Nonresidential Natural Gas and Electric Program Logic Model

Data sources: Logic model from the prior evaluation, program documentation, Avista staff

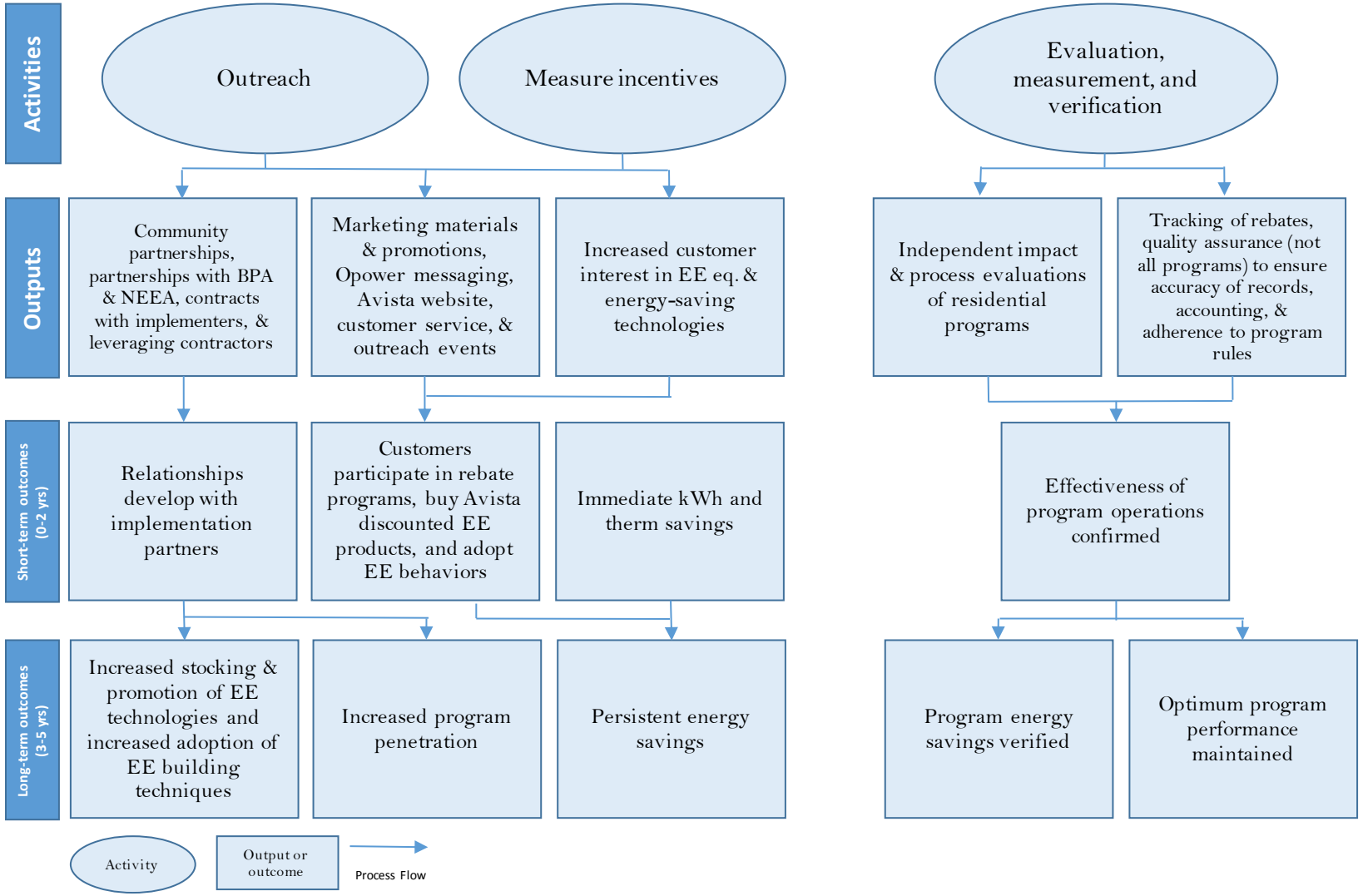
Program inputs: Prescriptive lighting, prescriptive non-lighting, and site-specific programs



Avista Residential Natural Gas and Elctric and Electic-Only Program Logic Model

Data sources: Logic model from the prior evaluation, program documentation, Avista staff , Opower, JACO, and CLEAResult staff

Program inputs: Rebate programs (weatherization and shell, HVAC, conversions, etc.), Simple Steps Smart Savings, Behavior Home Energy Reports, and Appliance Recycling*



* Appliance Recycling program was discontinued in June, 2015.

Appendix C Survey Instruments