# Washington 2016 DSM Annual Conservation Report & Cost-Effectiveness Analysis

June 1, 2017

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# 1 Executive Summary

The 2016 Demand-Side Management (DSM) Annual Report summarizes Avista Utilities' (Avista) annual energy efficiency achievements for its Washington electric and natural gas customers. These programs are intended to deliver all cost-effective conservation with the funding provided through Avista's Schedules 91 and 191, also known as the "Tariff Rider" which is a non-bypassable system benefit charge applied to all electric and natural gas retail sales.

2016 is the first year of the fourth Biennial Conservation Plan (BCP) for Washington's Energy Independence Act (Initiative 937 or I-937). Avista's annual target as reported in the 2016 Business Plan is 54,978 MWh. In 2016, Avista acquired 71,572 MWh (adjusted reported gross savings) in Washington, or 130% percent of its annual target. Avista's target as filed in its 2016-17 BCP is 76,257 MWh. Primary drivers for electric savings included the nonresidential prescriptive lighting, residential Home Energy Reports, and residential lighting efforts. Site-specific lighting and Small Business projects also contributed a significant amount to the overall savings contribution. In 2016, Avista's natural gas efficiency portfolio delivered 548,756 therms in savings (adjusted reported gross savings), achieving 97 percent of the Company's 2016 natural gas target of 567,653 therms as noted in the 2016 Business Plan. Primary drivers for the natural gas savings include residential prescriptive HVAC and shell measures and nonresidential prescriptive and site-specific HVAC.

In 2016, over $4.6 million in rebates were provided directly to Washington residential customers to offset the cost of implementing these energy efficiency measures. All programs within the residential portfolio contributed over 33,300 MWh and over 367,000 therms to the annual energy savings. In addition, more than 1,800 prescriptive and site specific nonresidential projects were incented. Additionally, the Small Business program installed over 14,000 measures. Avista's tariff rider funded more than $9.0 million for energy efficiency incentives in nonresidential and small business applications. Nonresidential programs realized over 37,400 MWh and 162,000 therms in annual first-year energy savings.

A summary of acquired savings in 2016 by sector is provided for both fuels in Tables ES-1 and ES-2 below.

Table ES-1: 2016 Washington Electric Energy Savings (Adjusted Reported Gross)

| Segment | kWh (Conservation + Conversions) | Conversions | I-937 kWh Total (Conservation Only) |
|---|---|---|---|
| Residential | 43,083,551 | 9,766,855 | 33,316,696 |
| Low Income | 546,066 | 273,628 | 272,438 |
| Nonresidential | 38,226,357 | 805,779 | 37,420,578 |
| **Subtotal** | **81,855,974** | **10,846,262** | **71,009,712** |
| Generation | 384,000 | - | 384,000 |
| Distribution | 177,990 | - | 177,990 |
| **Total** | **82,417,964** | **10,846,262** | **71,571,702** |

Table ES-2: 2016 Washington Natural Gas Savings (Adjusted Reported Gross)

| Segment | Therms |
|---|---|
| Residential | 367,891 |
| Low Income | 18,490 |
| Nonresidential | 162,375 |
| **Total** | **548,756** |

The above mentioned acquisition has been delivered through local energy efficiency programs managed by the utility or third-party contractors. Avista also funds a regional market transformation effort through the Northwest Energy Efficiency Alliance (NEEA), however, reported electric energy savings, cost-effectiveness and other related information is specific to local programs unless otherwise noted. The savings indicated above are gross, adjusted reported savings based on all program participants.

## 1.1 Cost-Effectiveness

Avista judges the effectiveness of the energy efficiency portfolio based upon a number of metrics. Two of the most commonly applied metrics are the TRC (total resource cost) test, a benefit-to-cost test from the customer perspective including all measure costs and non-energy benefits and excluding incentives. The other is the PAC (program administrator cost) test also known as the UCT (utility cost test). The PAC is a benefit-to-cost test from the utility perspective including incentives and excluding net costs and non-energy benefits of participants related to

energy efficiency services. Both tests provide insight as to the net value to all customers. At present, the Washington Utilities and Transportation Commission has requested that Avista operate its natural gas energy efficiency programs under the PAC test rather than the TRC test.

Benefit-to-cost ratios in excess of 1.00 indicate that the benefits exceed the costs. In 2016, the gross TRC benefit-to-cost ratios were 1.76 for electric and 0.37 for natural gas. The PAC test benefit-to-cost ratios were 2.79 for electric and 1.28 for natural gas. Tables ES-3 and ES-4 present the TRC cost-effectiveness results for the electric portfolio and the PAC test results for the natural gas portfolio.

**Table ES-3: 2016 WA Electric Total Resource Cost (TRC) (Gross)**

| | Regular Income Portfolio | Low Income Portfolio** | Overall Portfolio |
|---|---|---|---|
| Electric Avoided Costs | $51,152,153 | $683,365 | $51,835,518 |
| Natural Gas Avoided Costs | -$3,276,767 | -$65,888 | -$3,342,655 |
| Non-Energy Benefits | $627,818 | $152,301 | $780,119 |
| **TRC Benefits** | $48,503,204 | $769,778 | $49,272,982 |
| | | | |
| Non-Incentive Utility Costs | $4,047,818 | $142,354 | $4,190,172 |
| Customer Costs | $22,488,028 | $1,378,727 | $23,866,755 |
| **TRC Costs** | $26,535,846 | $1,521,081 | $28,056,927 |
| | | | |
| **TRC Ratio** | 1.83 | 0.51 | 1.76 |
| **Residual* TRC Benefits** | $21,967,358 | -$751,303 | $21,216,055 |

*The “Residual TRC” is used to denote the difference between TRC benefits and costs. The term “Residual” is used in lieu of the term “Net” as not to be confused with TRC benefits and costs where Net to Gross adjustments have been applied.
**Includes costs funded to the CAP agencies.

**Table ES-4: 2016 WA Natural Gas Program Administrator Cost (PAC) (Gross)**

| | Regular Income Portfolio | Low Income Portfolio | Overall Portfolio |
|---|---|---|---|
| Natural Gas Avoided Costs | $3,496,094 | $182,677 | $3,678,771 |
| Electric Avoided Costs | $133,649 | $0 | $133,649 |
| **PAC Benefits** | $3,629,743 | $182,677 | $3,812,420 |
| | | | |
| Non-Incentive Utility Costs | $267,886 | $8,028 | $275,914 |
| Incentive Costs | $1,598,530 | $1,096,124 | $2,694,654 |
| **PAC Costs** | $1,866,416 | $1,104,152 | $2,970,568 |
| | | | |
| **PAC Ratio** | 1.94 | 0.17 | 1.28 |
| **Net PAC Benefits** | $1,763,327 | -$921,475 | $841,852 |

## 1.2 Tariff Rider Balances

As of the start of 2016, the Washington electric tariff rider balance was underfunded by $575,628. During 2016, $11.9 million in tariff rider revenue was collected to fund electric energy efficiency while $19.6 million was expended to operate energy efficiency programs. The $7.7 million under-collection of tariff rider funding resulted in a year-end, underfunded balance of $8.2 million, which aligns with the 2016 increase in energy efficiency savings. The primary driver for the underfunding was the increase in participation in the nonresidential lighting program.

## 1.3 Third-Party Evaluation

Nexant, Inc., in partnership with Research Into Action, (the evaluation team) was retained as the Company's external evaluator to independently measure and verify the portfolio energy savings for the 2014-2015 and 2016-2017 biennium period. Avista has reviewed and responded to the conclusions and recommendations made by the evaluation team for the 2014-2015 biennium and the status updates can be found in Section 5. Avista appreciates and agrees with the overall review that programs are operating effectively. A large portion of the recommendations are around encouraging Avista to continue to deliver programs with the same level of rigor that has delivered success in the programs to-date.

The evaluation team is conducting on-going evaluation activities for the 2016-2017 biennium and values presented in this Annual Report and used for the cost-effectiveness analysis are 'adjusted reported values'. Realization rates have not been applied to the 2016 savings because evaluation activities are only partway to completion and current findings do not

represent a statistically significant portion of the 2016-2017 population. However, adjustment factors, based on any discrepancies found during the evaluation team's review of the tracking database, have been applied to the reported savings and are reported as 'adjusted reported values'.

In addition, there is one measure category for which a realization rate has been applied to the values in the 2016 Annual Report. Based on the measurement and verification activities for Avista's prescriptive interior lighting measure category, the evaluation team calculated an interim realization rate of 71% for the category. One of the factors behind this realization rate is based on the evaluation team's review of TLED measures incented in the 2016 program year. Specifically, in the 2016 program year, Avista offered two prescriptive lighting measures for TLEDs:1-Lamp T12/T8 Fixture to 1-Lamp LED 8W to 15W, incentivized at $15 per lamp, and 1-Lamp T12/T8 Fixture to 1-Lamp LED 16W to 23W, incentivized at $10 per lamp. As early project applications were submitted, Avista became aware that TLED lamps were labeled under a lower wattage than their DLC product specifications. TLED lamps were found in the market with a labeled wattage of 14-15W, while the Design Lights Consortium (DLC) testing indicated that these lamps consume 17-18W. The evaluation team believes that this discrepancy is because TLED lamp power consumption is subject to different ballast configurations. Thus, a TLED in a low ballast factor (LBF) ballast may only consume 14W, but in a normal ballast factor (NBF) ballast, the same lamp uses 17W. The DLC maintains performance data for its certified lamps as tested with a 0.89 ballast factor.

An issue was identified where program guidelines required DLC listed lamps and customers were selecting lamps based on the DLC listing. Early on in 2016 some customers who installed DLC listed lamps were paid a lower incentive based on the DLC listed wattage rather than the lamp labeled wattage. Avista agreed that this could be confusing to customers who met the written program requirements of installing DLC listed lamps and applied for incentives based on the lamp's listed wattage. Avista clarified that customers should be paid based on the wattage printed on the lamp packaging. Avista communicated clarifications to customers and vendors regarding measure eligibility recognizing that some DLC listed TLEDs may have the same wattage on both the TLED lamp and packaging as well as the DLC listed wattage and some may differ. This potential delta along with other energy savings data such as hours of use would be evaluated by the evaluation team.

After the 2016 year had ended, the evaluation team applied a realization rate to the total savings associated with these measures. Because Avista has adjusted the savings associated with this measure for the 2017 program year, the evaluation team believes that the final realization rate for the 2016-2017 evaluation period will increase. In addition, the measure

category remains cost-effective on a Total Resource Cost (TRC) basis with the application of the 71% realization rate for the 2016 program year.

## 1.4 2016 Program Highlights, Challenges and Changes

Avista practices active management and continuous process improvement when delivering energy efficiency programs. Through the evaluation team's on-going evaluation activities and through internal active management, Avista recognizes program successes and challenges throughout the biennium and practices continuous process improvement to strive for the delivery of successful and cost-effective energy efficiency programs. Some of Avista's 2016 program highlights as well as some challenges are described below.

- Programs that included the commercial lighting and residential electric to natural gas conversion measures are worthy of highlighting because they included proactive program management and quality assurance and were able to avoid systemic issues in the market. Both measure categories saw tremendous growth in 2016. These programs continued to deliver designed results due to successful, proactive and frequent communications with market actors to ensure concerns were addressed and program guidelines were met.
- Another highlight of Avista's adaptive management and striving for process improvement was seen in the company's approach to the Simple Steps, Smart Savings program. Historically Avista has used the allocated approach for the internal reporting of savings and costs associated with the program by state. While the allocation method of splitting program achievements 70/30 between states is useful to approximate each jurisdiction's savings achieved, the company has further refined the process to provide more accurate savings information. While there were some additional administrative hurdles, as a result of 2016 learnings, going forward in 2017 Avista will be reporting Simple Steps based on actual sales in each state rather than an allocation of total program results for both internal reporting and annual reporting, energy savings and costs.
- In 2016 Avista introduced a duct repair and duct sealing rebate in Idaho. Avista had hit a point of saturation in Washington providing this treatment to underserved manufactured home customers through a direct install approach that was cost-effective by leveraging state funds. Without access to similar imported funds in Idaho, Avista designed and implemented a rebated measure approach. This approach was challenged early on in the implementation and discontinued when Avista was unable to cost-effectively ensure program guidelines, anticipated savings, and customer care goals were achieved.

Continuing the integrated resource planning and conservation potential assessment processes, Avista reviews existing and potential programs as part of the DSM business planning process. In 2016, through adaptive management, programs were modified to reflect updated savings and cost information that affected incentive levels. New non-residential offers in 2016 included

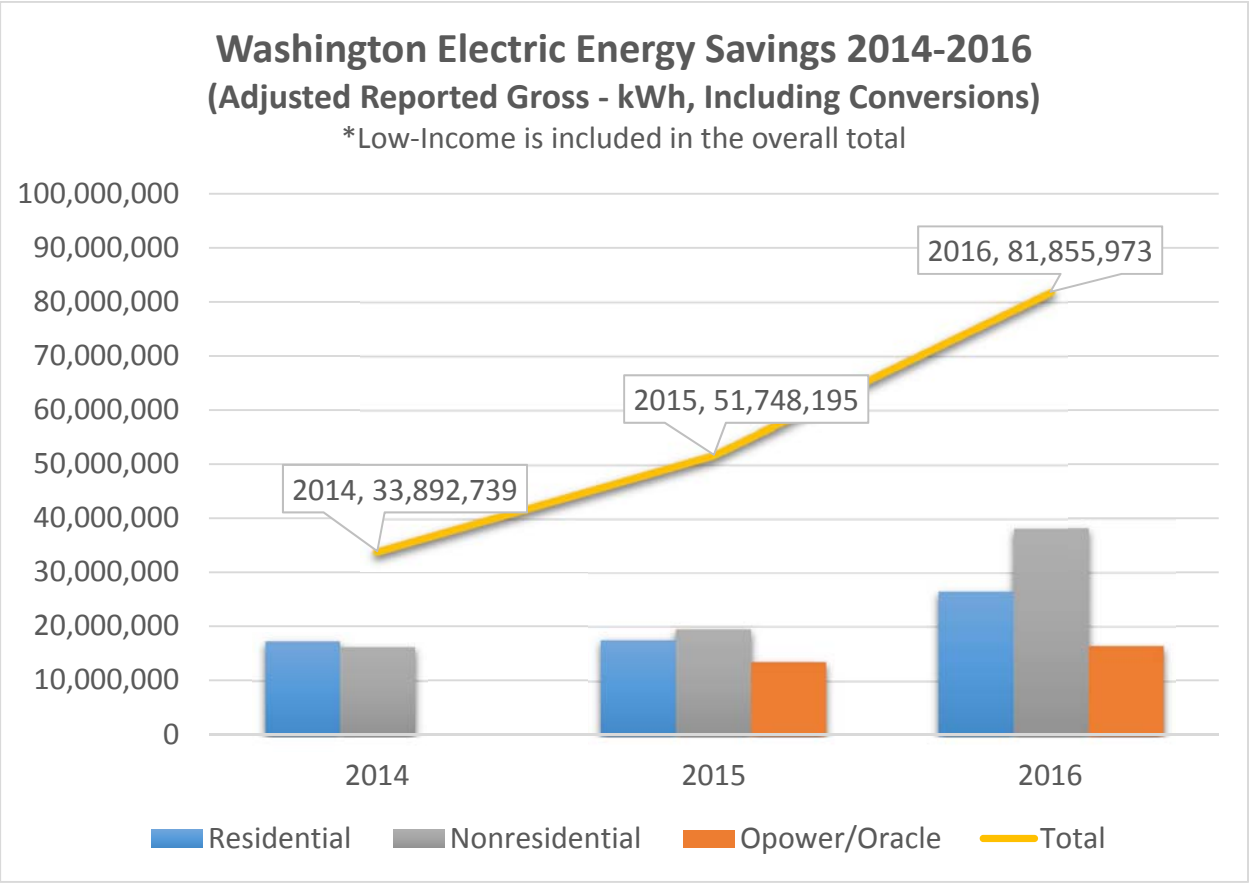
several lighting incentives as well as the expansion of AirGuardian to include rotary screw air compressors and two new food service equipment measures (electric and natural gas griddles). Commercial power management for PC networks, clothes washers, and some lighting measures were discontinued as a result of the business planning process. Finally, site-specific incentive guidelines were aligned to flat incentive levels of $0.20 per kWh for electric, $3.00 per therm for natural gas, capped at 70% of incremental project costs for projects with a less than 15-year simple payback.

Though the nature of this report is to look backwards on the performance of the previous year, successes and lessons from this process are applied during the forward-looking business planning process to inform and improve program design, including program modification and termination where necessary. Avista remains committed to continuing to deliver responsible and cost-effective energy efficiency programs to our customers.

## 1.5 2016 Portfolio Trends

Avista experienced increased savings in 2016 compared to its previous years and much of the change is attributed to the increasing popularity of LED lighting, TLED lighting and Fuel Conversions. Avista's 81,855,973 kWh of energy savings from 2016 is 58% higher than its 2015 savings of 51,748,195 kWh and 142% higher than its 2014 savings of 33,892,739 kWh. See Figure ES-1 for an illustration of these trends.

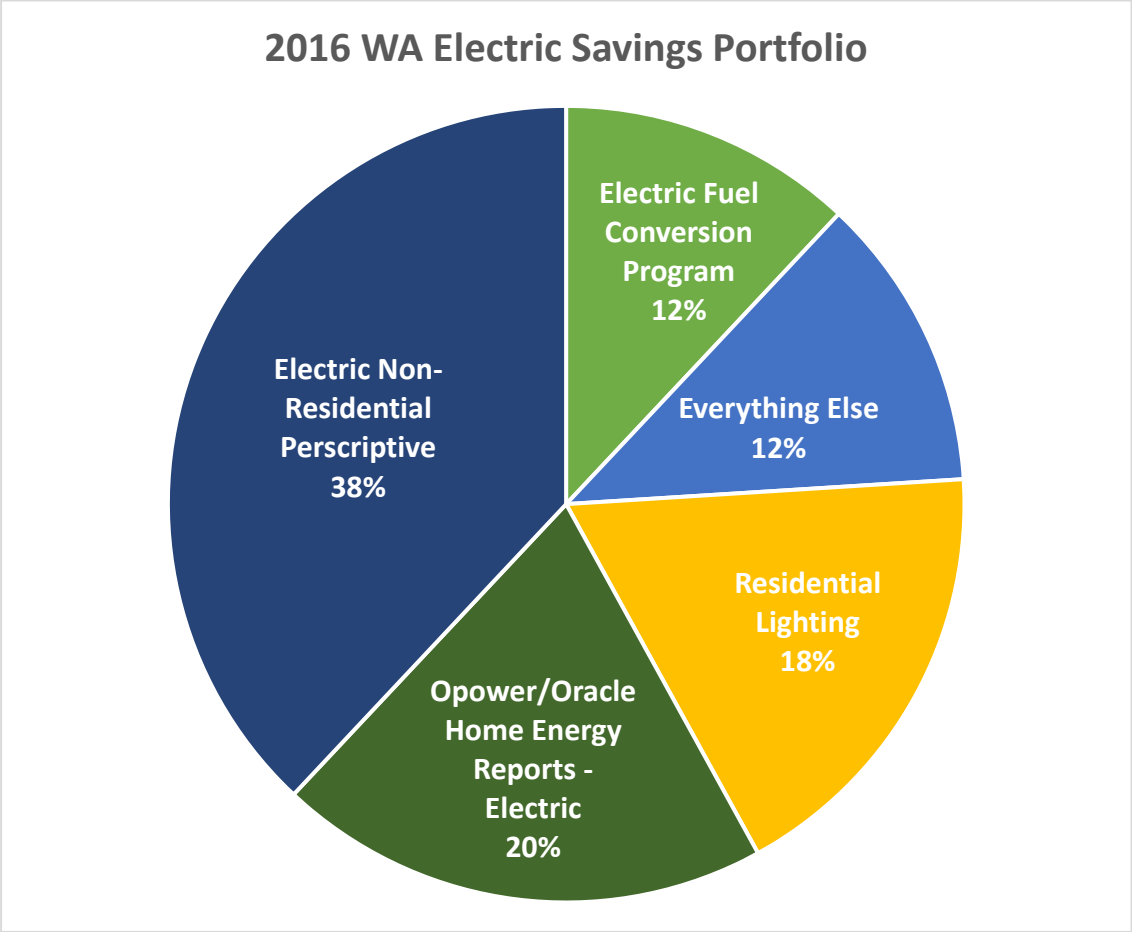
**Figure ES-1: Washington Electric Energy Savings[1]**




Of Avista's overall Electric savings portfolio, Non-Residential Prescriptive programs obtained 38% of the savings in 2016. This program, combined with Opower/Oracle Home Energy Reports, Residential Lighting, and Fuel Conversions, realized 88% of the overall savings for 2016. See figure ES-2 for an illustration of these metrics.

[1] For the purpose of comparing the 2014-2016 trend analysis data, please note that the savings numbers for 2014 are unverified gross, 2015 is verified gross, and 2016 is adjusted reported gross.

**Figure ES-2: 2016 Washington Electric Savings Portfolio**




Note: While Opower/Oracle Home Energy Reports continue to be a material part of Avista's savings portfolio, the savings recognized in 2016 are for the 2016-2017 biennial period. In 2017, there will be a small incremental adjustment to the 2016 savings amount. For additional Opower/Oracle information, see Section 4.1.8.

# 2 Cost-Effectiveness

The 2016 Demand-Side Management (DSM) Annual Report summarizes the Company's annual energy efficiency achievements of its DSM programs.

Cost-effectiveness was reviewed using four of the five California Standard Practice Tests including the Total Resource Cost (TRC), Program Administrator Cost (PAC), Participant, and Rate Impact Measure (RIM) tests. For this annual report, Sections 2.1 through 2.3 present the cost-effectiveness of Avista's DSM programs based on gross verified savings (utilizing evaluation findings and locked unit energy savings (UES) values as applicable) and methods consistent with those laid out in the California Standard Practice Manual for Economic Analysis of Demand-Side Programs and Projects as modified by the Council. Shown below in Table 2-2 through Table 2-13 are results for these four California Standard Practice Tests - Total Resource Cost, Program Administrator Cost, Participant, and Rate Impact Measure for electric and natural gas. Table 2-1 summarizes the allocation of cost-effectiveness components as a cost or benefit to each cost-effectiveness test.

**Table 2-1: Cost-Effectiveness Component Inputs**

| Component | Program Administrator Cost Test (PACT) | Total Resource Cost (TRC) | Participant Cost Test (PCT) | Rate Impact Measure (RIM) |
|---|---|---|---|---|
| Utility Energy & Capacity Avoided Costs | **Benefit** | **Benefit** | | **Benefit** |
| Non-Utility Energy & Capacity Energy Costs | | **Benefit** | **Benefit** | |
| Non-Energy Benefit Impacts | | **Benefit** | **Benefit** | |
| Incremental Equipment and Installation Costs | | Cost | Cost | |
| Program Non-incentive (admin) Costs | Cost | Cost | | Cost |
| Incentive Payments | Cost | | **Benefit** | Cost |

The cost-effectiveness calculations only include non-energy benefits where the values are reasonably defensible and quantifiable for a limited number of measures, including water savings, equipment replacement and operation and maintenance benefits. The calculations also include health and human safety non-energy benefits (dollar for dollar) for the low-income programs. Non energy benefits not included, because they are not easily quantifiable, include benefits for arrearage, health/safety/comfort, system reliability, and site specific air emissions to

name a few. The evaluation team will include survey and on-site questions of participating customers to determine specific and demonstrable non-energy benefits as found and as applicable.

Included in Avista's cost effectiveness results are measures implemented for low-income households. In regards to these efforts, WAC 480-109-100(10) provides that:

> (a) A utility may fully fund low-income conservation measures that are determined by the implementing agency to be cost-effective consistent with the *Weatherization Manual* maintained by the department. Measures identified through the priority list in the *Weatherization Manual* are considered cost-effective. In addition, a utility may fully fund repairs, administrative costs, and health and safety improvements associated with cost-effective low-income conservation measures. (b) A utility may exclude low-income conservation from portfolio-level cost-effectiveness calculations. (c) A utility must count savings from low-income conservation toward meeting its biennial conservation target. Savings may be those calculated consistent with the procedures in the *Weatherization Manual*.

Low-Income conservation items have been separately identified from the Regular Income portfolio in the following cost effective results tables. For those items, the costs associated with low-income also includes amounts funded to the CAP agencies.

Cost effectiveness results within this report are based on adjusted reported savings. Energy savings reported by Avista's implementation team (both external and internal to Avista) were reviewed by the Company's external evaluator and adjusted for any major discrepancies in reporting. The savings estimates represent gross energy acquisition.

The "Residual TRC" is used to denote the difference between TRC benefits and costs. The term "Residual" is used in lieu of the term "Net" as not to be confused with TRC benefits and costs where Net to Gross adjustments have been applied.

Avoided costs used for the cost-effectiveness valuation of the 2016 natural gas programs are the avoided costs from the most recently filed electric and natural gas IRPs.

In summary, electric and natural gas gross TRC is 1.76 and 0.37, respectively. Electric and natural gas PAC test benefit-cost ratios are 2.79 and 1.28, respectively. Table 2-2 through Table 2-13 illustrate electric, natural gas, and combined fuel cost-effectiveness, respectively. Regular income includes all programs offered in the residential and nonresidential sectors (not including NEEA) and low-income includes all programs offered in the low-income sector.

## 2.1 Electric Cost Effectiveness Results

**Table 2-2: 2016 WA Electric Total Resource Cost (TRC) (Gross)**

| | Regular Income Portfolio | Low Income Portfolio | Overall Portfolio |
|---|---|---|---|
| Electric Avoided Costs | $51,152,153 | $683,365 | $51,835,518 |
| Natural Gas Avoided Costs | -$3,276,767 | -$65,888 | -$3,342,655 |
| Non-Energy Benefits | $627,818 | $152,301 | $780,119 |
| **TRC Benefits** | $48,503,204 | $769,778 | $49,272,982 |
| | | | |
| Non-Incentive Utility Costs | $4,047,818 | $142,354 | $4,190,172 |
| Customer Costs | $22,488,028 | $1,378,727 | $23,866,755 |
| **TRC Costs** | $26,535,846 | $1,521,081 | $28,056,927 |
| | | | |
| **TRC Ratio** | 1.83 | 0.51 | 1.76 |
| **Residual TRC Benefits** | $21,967,358 | -$751,303 | $21,216,055 |

**Table 2-3: 2016 WA Electric Program Administrator Cost (PAC) (Gross)**

| | Regular Income Portfolio | Low Income Portfolio | Overall Portfolio |
|---|---|---|---|
| Electric Avoided Costs | $51,152,153 | $683,365 | $51,835,518 |
| Natural Gas Avoided Costs | -$3,276,767 | -$65,888 | -$3,342,655 |
| **PAC Benefits** | $47,875,386 | $617,477 | $48,492,863 |
| | | | |
| Non-Incentive Utility Costs | $4,047,818 | $142,354 | $4,190,172 |
| Incentive Costs | $12,310,518 | $859,912 | $13,170,431 |
| **PAC Costs** | $16,358,337 | $1,002,266 | $17,360,603 |
| | | | |
| **PAC Ratio** | 2.93 | 0.62 | 2.79 |
| **Net PAC Benefits** | $31,517,049 | -$384,789 | $31,132,260 |

### Table 2-4: 2016 WA Electric Participant Cost (PCT) (Gross)

| | Regular Income Portfolio | Low Income Portfolio | Overall Portfolio |
|---|---|---|---|
| Electric Bill Reduction | $77,739,382 | $845,717 | $78,585,099 |
| Gas Bill Reduction | -$113,344 | -$3,412 | -$116,757 |
| Non-Energy Benefits | $627,818 | $152,301 | $780,119 |
| **Participant Benefits** | $78,253,856 | $994,606 | $79,248,462 |
| | | | |
| Customer Costs | $22,488,028 | $1,378,727 | $23,866,755 |
| Incentive Received | -$12,310,518 | -$859,912 | -$13,170,431 |
| **Participant Costs** | $10,177,509 | $518,815 | $10,696,324 |
| | | | |
| **Participant Ratio** | 7.69 | 1.92 | 7.41 |
| **Net Participant Benefits** | $68,076,347 | $475,791 | $68,552,137 |

### Table 2-5: 2016 WA Electric Rate Impact Measure (RIM) (Gross)

| | Regular Income Portfolio | Low Income Portfolio | Overall Portfolio |
|---|---|---|---|
| Electric Avoided Cost Savings | $51,152,153 | $683,365 | $51,835,518 |
| **Non-Participant Benefits** | $51,152,153 | $683,365 | $51,835,518 |
| | | | |
| Electric Revenue Loss | $77,739,382 | $845,717 | $78,585,099 |
| Non-Incentive Utility Costs | $4,047,818 | $142,354 | $4,190,172 |
| Customer Incentives | $12,310,518 | $859,912 | $13,170,431 |
| **Non-Participant Costs** | $94,097,719 | $1,847,983 | $95,945,702 |
| | | | |
| **RIM Ratio** | 0.54 | 0.37 | 0.54 |
| **Net RIM Benefits** | -$42,945,566 | -$1,164,618 | -$44,110,184 |

## 2.2 Natural Gas Cost Effectiveness Results

**Table 2-6: 2016 WA Natural Gas Total Resource Cost (TRC) (Gross)**

| | Regular Income Portfolio | Low Income Portfolio | Overall Portfolio |
|---|---|---|---|
| Natural Gas Avoided Costs | $3,496,094 | $182,677 | $3,678,771 |
| Electric Avoided Costs | $133,649 | $0 | $133,649 |
| Non-Energy Benefits | $0 | $417,653 | $417,653 |
| **TRC Benefits** | $3,629,743 | $600,330 | $4,230,073 |
| | | | |
| Non-Incentive Utility Costs | $267,886 | $8,028 | $275,914 |
| Customer Costs | $10,311,439 | $861,635 | $11,173,074 |
| **TRC Costs** | $10,579,325 | $869,663 | $11,448,988 |
| | | | |
| **TRC Ratio** | 0.34 | 0.69 | 0.37 |
| **Residual TRC Benefits** | -$6,949,582 | -$269,333 | -$7,218,915 |

**Table 2-7: 2016 WA Natural Gas Program Administrator Cost (PAC) (Gross)**

| | Regular Income Portfolio | Low Income Portfolio | Overall Portfolio |
|---|---|---|---|
| Natural Gas Avoided Costs | $3,496,094 | $182,677 | $3,678,771 |
| Electric Avoided Costs | $133,649 | $0 | $133,649 |
| **PAC Benefits** | $3,629,743 | $182,677 | $3,812,420 |
| | | | |
| Non-Incentive Utility Costs | $267,886 | $8,028 | $275,914 |
| Incentive Costs | $1,598,530 | $1,096,124 | $2,694,654 |
| **PAC Costs** | $1,866,416 | $1,104,152 | $2,970,568 |
| | | | |
| **PAC Ratio** | 1.94 | 0.17 | 1.28 |
| **Net PAC Benefits** | $1,763,327 | -$921,475 | $841,852 |

### Table 2-8: 2016 WA Natural Gas Participant (PCT) (Gross)

| | Regular Income Portfolio | Low Income Portfolio | Overall Portfolio |
|---|---|---|---|
| Gas Bill Reduction | $7,360,225 | $394,468 | $7,754,694 |
| Electric Bill Reduction | $28,851 | $0 | $28,851 |
| Non-Energy Benefits | -$1,215 | $417,653 | $416,437 |
| **Participant Benefits** | $7,387,861 | $812,121 | $8,199,982 |
| | | | |
| Customer Costs | $10,311,439 | $861,635 | $11,173,074 |
| Incentive Received | -$1,598,530 | -$1,096,124 | -$2,694,654 |
| **Participant Costs** | $8,712,909 | -$234,489 | $8,478,420 |
| | | | |
| **Participant Ratio** | 0.85 | N/A | 0.97 |
| **Net Participant Benefits** | -$1,325,048 | $1,046,611 | -$278,437 |

### Table 2-9: 2016 WA Natural Gas Rate Impact Measure (RIM) (Gross)

| | Regular Income Portfolio | Low Income Portfolio | Overall Portfolio |
|---|---|---|---|
| Gas Avoided Cost Savings | $3,496,094 | $182,677 | $3,678,771 |
| **Non-Participant Benefits** | $3,496,094 | $182,677 | $3,678,771 |
| | | | |
| Gas Revenue Loss | $7,360,225 | $394,468 | $7,754,694 |
| Non-Incentive Utility Costs | $267,886 | $8,028 | $275,914 |
| Customer Incentives | $1,598,530 | $1,096,124 | $2,694,654 |
| **Non-Participant Costs** | $9,226,641 | $1,498,621 | $10,725,262 |
| | | | |
| **RIM Ratio** | 0.38 | 0.12 | 0.34 |
| **Net RIM Benefits** | -$5,730,548 | -$1,315,943 | -$7,046,491 |

## 2.3 Combined Fuel Cost Effectiveness Results

**Table 2-10: 2016 WA Electric and Natural Gas Total Resource Cost (TRC) (Gross)**

| | Regular Income Portfolio | Low Income Portfolio | Overall Portfolio |
|---|---|---|---|
| Electric Avoided Costs | $51,285,803 | $683,365 | $51,969,167 |
| Natural Gas Avoided Costs | $219,326 | $116,790 | $336,116 |
| Non-Energy Benefits | $627,818 | $569,954 | $1,197,772 |
| **TRC Benefits** | $52,132,947 | $1,370,108 | $53,503,055 |
| | | | |
| Non-Incentive Utility Costs | $4,315,704 | $150,382 | $4,466,086 |
| Customer Costs | $32,799,467 | $2,240,362 | $35,039,829 |
| **TRC Costs** | $37,115,171 | $2,390,744 | $39,505,915 |
| | | | |
| **TRC Ratio** | 1.40 | 0.57 | 1.35 |
| **Residual TRC Benefits** | $15,017,776 | -$1,020,635 | $13,997,140 |

**Table 2-11: 2016 WA Electric and Natural Gas Program Administrator Cost (PAC) (Gross)**

| | Regular Income Portfolio | Low Income Portfolio | Overall Portfolio |
|---|---|---|---|
| Electric Avoided Costs | $51,285,803 | $683,365 | $51,969,167 |
| Natural Gas Avoided Costs | $219,326 | $116,790 | $336,116 |
| **PAC Benefits** | $51,505,129 | $800,154 | $52,305,283 |
| | | | |
| Non-Incentive Utility Costs | $4,315,704 | $150,382 | $4,466,086 |
| Incentive Costs | $13,909,049 | $1,956,036 | $15,865,085 |
| **PAC Costs** | $18,224,753 | $2,106,418 | $20,331,171 |
| | | | |
| **PAC Ratio** | 2.83 | 0.38 | 2.57 |
| **Net PAC Benefits** | $33,280,376 | -$1,306,264 | $31,974,112 |

### Table 2-12: 2016 WA Electric and Natural Gas Participant (PCT) (Gross)

| | Regular Income Portfolio | Low Income Portfolio | Overall Portfolio |
|---|---|---|---|
| Electric Bill Reduction | $77,768,233 | $845,717 | $78,613,950 |
| Gas Bill Reduction | -$84,493 | -$3,412 | -$87,905 |
| Non-Energy Benefits | $626,603 | $569,954 | $1,196,557 |
| **Participant Benefits** | $85,641,717 | $1,806,727 | $87,448,444 |
| | | | |
| Customer Costs | $32,799,467 | $2,240,362 | $35,039,829 |
| Incentive Received | -$13,909,049 | -$1,956,036 | -$15,865,085 |
| **Participant Costs** | $18,890,418 | $284,326 | $19,174,744 |
| | | | |
| **Participant Ratio** | 4.53 | 6.35 | 4.56 |
| **Net Participant Benefits** | $66,751,299 | $1,522,402 | $68,273,700 |

### Table 2-13: 2016 WA Electric and Natural Gas Rate Impact Measure (RIM) (Gross)

| | Regular Income Portfolio | Low Income Portfolio | Overall Portfolio |
|---|---|---|---|
| Avoided Cost Savings | $54,648,247 | $866,042 | $55,514,289 |
| **Non-Participant Benefits** | $54,648,247 | $866,042 | $55,514,289 |
| | | | |
| Revenue Loss | $85,099,608 | $1,240,186 | $86,339,793 |
| Non-Incentive Utility Costs | $4,315,704 | $150,382 | $4,466,086 |
| Customer Incentives | $13,909,049 | $1,956,036 | $15,865,085 |
| **Non-Participant Costs** | $103,324,360 | $3,346,604 | $106,670,964 |
| | | | |
| **RIM Ratio** | 0.53 | 0.26 | 0.52 |
| **Net RIM Benefits** | -$48,676,113 | -$2,480,562 | -$51,156,675 |

# 3 Washington I-937 Acquisition of Conservation

In January 2016, the Commission approved the Company's ten year Achievable Potential and Biennial Conservation Target. The Company's energy efficiency acquisition for the 2016-2017 Biennium is based upon a Conservation Potential Assessment (CPA) completed by a third-party consultant applying methodologies consistent with the Northwest Power and Conservation Council's (NWPCC) Sixth Power Plan. Avista's annual target as reported in the 2016 Business Plan is 54,977,744 kWh. In 2016, Avista acquired 71,572 MWh (adjusted reported gross savings) in Washington, or 130% percent of its annual target. (Table 3-2). Primary drivers for electric savings included the nonresidential prescriptive lighting, residential Home Energy Reports, and residential lighting efforts. Site-specific lighting and Small Business projects also contributed a significant amount to the overall savings contribution.

Avista's target as filed in its 2016-17 BCP is 76,257 MWh (Table 3-1). Avista's estimated annual electric energy savings associated with NEEA's electric market transformation efforts are 6,220 MWh for 2016.

**Table 3-1 Avista Proposed 2016-2017 Biennial Conservation Target**

| Savings Category | Target 2016Savings (MWH) |
|---|---|
| **End-Use Efficiency Measures (CPA)** | **76,613** |
| Less NEEA | (6,220) |
| **End-Use Efficiency Measures Subtotal** | **70,393** |
| Plus Distribution Efficiency | 2,082 |
| Plus Generation Efficiency | 151 |
| 5% increase (decoupling) | 3,631 |
| **2016-2017 Proposed Biennial Conservation Target** | **76,257** |

**Table 3-2: 2016 Washington Electric Energy Savings (Adjusted Reported Gross)**

| Segment | kWh (Conservation + Conversions) | Conversions | I-937 kWh Total (Conservation Only) |
|---|---|---|---|
| Residential | 43,083,551 | 9,766,855 | 33,316,696 |
| Low Income | 546,066 | 273,628 | 272,438 |
| Nonresidential | 38,226,357 | 805,779 | 37,420,578 |
| **Subtotal** | **81,855,974** | **10,846,262** | **71,009,712** |
| Generation | 384,000 | - | 384,000 |
| Distribution | 177,990 | - | 177,990 |
| **Total** | **82,417,964** | **10,846,262** | **71,571,702** |

# 4 Programs

## 4.1 Residential

The Company's residential portfolio is composed of several approaches to engage and encourage customers to consider energy efficiency improvements within their home. Prescriptive rebate programs are the main component of the portfolio, but are augmented by a variety of other interventions. These include: upstream buy-down of low-cost lighting and water saving measures, select distribution of low-cost lighting and weatherization materials, direct-install programs and a multi-faceted, multichannel outreach and customer engagement effort.

Over $4.6 million in rebates were provided directly to Washington residential customers to offset the cost of implementing these energy efficiency measures. All programs within the residential portfolio contributed over 43,080 MWh and over 367,000 therms to the 2016 annual energy savings.

### 4.1.1 Program Changes

Program changes were made for the 2016-2017 Biennium, including the introduction of new programs, the discontinuation of programs and changes to eligibility or incentive levels of existing programs. Avista communicates the majority of program changes once the Annual Conservation Plan is finalized and typically makes the changes effective at the beginning of the year. Program changes are also made throughout the year as necessary, but mid-year changes are less typical.

For residential programs, rebate amounts were updated to reflect business planning analysis and to include inputs such as new unit energy savings (UES) and cost values. For changes that were effective January 1, 2016, Avista continued to accept rebate applications and honored incentive amounts through March 31, 2016 for 2015 measures (the 90 days allowed for a smooth transition when rebate programs change, allowing enough time for customers in the pipeline to complete their projects, yet closed out changes in a timely but balanced approach).

The following outlines additions, adjustments and discontinuations of residential programs and incentive levels beginning in 2016:

#### 4.1.1.1 Residential Program Discontinuations

The following measures and/or programs were discontinued from the residential portfolio:

- The Appliance Recycling Program was discontinued in June 2015.
- Electric 35-55 gallon water heater with 0.94EF or higher
- Natural gas water heater 40 gallon with 0.62 EF or higher
- Natural gas water heater 50 gallon with 0.60 EF or higher

#### 4.1.1.2 Residential Program Adjustments

Existing rebate amounts were increased, and savings values adjusted, beginning January 2016 for the following measures:

- High efficiency natural gas boiler and furnace incentive changed from $250 to $300. Savings of natural gas boiler updated to 102 therms from 93 therms.
- Natural gas tankless water heater with 0.82 EF or higher rebate amount changed from $130 to $180, savings updated from 57.85 to 58 therms.

Existing rebate amounts were decreased beginning January 2016 for the following measures:

- Windows decreased to $3.50per sqft from $4.00 per sqft
- Smart thermostat contractor install decreased to $70.00 from $100.00
- Smart Thermostat self-install decreased to $35.00 from $50.00

#### 4.1.1.3 Residential program additions

The following measure iterations were added to the residential portfolio in 2016:

- Electric to Natural Gas Direct Vent Wall Heater was added to the Fuel Efficiency Program at an incentive of $1,300
- Prescriptive duct sealing was added to the Shell program at $150 rebate for natural gas space heating.
- Prescriptive duct sealing with CO Detector was added to the Shell program at $200 rebate for natural gas space heating, single family only.

The remaining sub-sections outline each residential program offered in 2016 and the verified participation, incentives, energy savings, among other program achievements.

### 4.1.2 HVAC Program

Electric customers with electric home heat are eligible for a rebate for the installation of a variable speed motor on their forced air heating equipment ($100 rebate), or a conversion of electric straight resistance space heat to an air source heat pump ($900 rebate). Natural gas customers are eligible for a rebate for the installation of a high efficiency furnace or boiler ($300). Both electric and natural gas customers are also eligible for the installation of a smart thermostat. See Table 4-1 and Table 4-2 for 2016 first-year program participation, incentives received, and savings achieved.

### 4.1.3 Water Heat Program

The Water Heat Program offers a $180 incentive for a high efficiency natural gas tankless water heater, $7 buydown for Simple Steps, Smart Savings showerheads and $35 buydown for Simple Steps, Smart Savings clothes washers (reflected in point of purchase price). See Table 4-3 and Table 4-4 for 2016 first-year program participation, incentives received, and savings achieved.

### 4.1.4 ENERGY STAR HOMES

Avista customers with a certified ENERGY STAR Home or ENERGY STAR / ECORated Manufactured Home are eligible for a $1,000 or $800 rebate, respectively. Eligible homes must be all electric to qualify for these rebate levels. Alternatively, customers who subscribe to Avista electric service for lighting and appliances and natural gas service for space and water heating are eligible for a program rebate of $650 regardless of construction type. See Table 4-5 and Table 4-6 for 2016 first-year program participation, incentives received, and savings achieved.

### 4.1.5 Fuel Efficiency

The Fuel Efficiency Program offers incentives for converting existing straight resistance electric space heat to a natural gas furnace ($2,300 rebate); and/or converting their existing electric water heater to a natural gas water heater ($600 rebate). Homes that implement both the furnace and water heat conversions receive a $3,200 rebate. The program also offers an incentive for the conversion of electric to natural wall heaters ($1,300 rebate). See Table 4-7 for 2016 first-year program participation, incentives received, and savings achieved.

### 4.1.6 Residential Lighting

Avista continues to participate in the regional manufacturer buy-down of CFL lamps, specialty bulbs, LED bulbs, and showerheads through Northwest Energy Efficiency Alliance (NEEA) and its contactor and some self-directed giveaways. The Simple Steps showerhead savings are tallied under Avista's Water Heat program. See Table 4-8 for 2016 first-year program participation, incentives received, and savings achieved.

### 4.1.7 Shell

The primary measures included in the Shell Program are wall, attic, floor insulation, duct sealing, and window replacements. Incentives are offered per square foot and vary from $0.15/sf for insulation measures to $3.54/sf for windows. See Table 4-9 and Table 4-10 for 2016 first-year program participation, incentives received, and savings achieved.

### 4.1.8 Opower/Oracle Home Energy Reports

Avista launched a Home Energy Reports program in June 2013, targeting 48,300 Washington and high use electric customers. As of December, 2015, Avista had 31,936 customers still in the HER program. In January of 2016, Avista 'refilled' their existing Home Energy Reports Program by 16,369 customers bringing total distribution to approximately 48,305 electric customers in Washington that will receive home energy reports throughout the duration of the 2016-2017 biennium, unless they opt-out or move (Table 4-11). No one is allowed to opt-in. Eligibility for treatment included several criteria such as sufficient (2 year) billing history, enough peers to build comparison group, not in the control group, not a 'do not solicit' customer and high enough electric use to be cost-effectively treated. In an effort to reduce energy usage through behavioral changes, Home Energy Reports show personalized usage insights and energy saving tips. Customers also see a ranking of similar homes, comparison to themselves and a personal savings goal on the Reports. In addition to closely matching usage curves, the similar home comparisons are also based on the following four criteria; square footage, home type, heat type and proximity.

See Table 4-12 for 2016 first-year program participation, incentives received, and reported savings.

### 4.1.9 Customer Outreach

Avista's programs encourage the customer to take action through participation in currently available programs. Energy efficiency outreach efforts are varied and usually are a combination

of both broad reach and targeted media as well as attendance at local community events. Energy Efficiency is also featured throughout the year in Avista's "Connections" monthly newsletter, distributed with the bill and posted online.

#### 4.1.9.1 Residential Customer Outreach

Avista's residential outreach included the repeat of the popular broad reach media promotions "Efficiency Matters" (April-June). Bill inserts offered tips to manage energy use and a link to rebate offerings.

Although available to all customers, Avista conducts targeted outreach for low income and seniors. This outreach included five Energy Fairs in September and October – two were held in Spokane, and one each in Colville, WA, Spokane Valley, WA, and Cottonwood, ID. One of the Spokane Energy Fairs was part of a broader event, the Avista LIRAP Appointment Day which was a new event that promoted efficiency and assistance like other energy fairs but partnered with the local CAP agency, SNAP, to offer actual energy assistance appointments. Communications tactics used to increase awareness of the Energy Fairs included a direct mail, posters, emails, news releases, and print/ radio/ online advertising. In person outreach efforts also included mobile outreach such as numerous partnerships with local food banks as well as other venues and workshops at senior centers. Efforts included nearly 150 events in 2016 with over 13,000 customers reached.

In the summer and fall of 2016, Avista ran a new broad-reach campaign to increase awareness of and participation in energy efficiency programs for residential customers. The "Way to Save" campaign utilized TV, radio and online advertising to communicate low-cost/ no-cost energy savings tips and to promote the rebates we offer. Social media was utilized throughout the campaign to extend reach.

Avista continued to update and promote the online fuel cost calculator that helped customers understand the value of natural gas compared to other heating fuel types. We also leveraged local sponsorships to highlight "Energy Efficiency Night" at Spokane Chiefs hockey and Gonzaga University basketball games.

#### 4.1.9.2 Nonresidential Customer Outreach

In 2016 Avista had varied activities for commercial and industrial customers. Print ads and case studies featuring two of our large account customers ran in various local, regional, trade, and national (zoned) publications (September-December). We updated collateral and delivered via the commercial account executives to highlight the multifamily natural gas direct use program.

Targeted print advertising opportunities were utilized at local contractor associations that promoted residential programs as well as engaged developers.

We also continued our effort of building awareness of energy efficiency and programs through our electronic newsletter to commercial customers.

Avista tried more frequent updates in 2014 but transitioned to the current approach in 2016 that offers 1-2 in-person updates to contractors typically during the beginning of the year if major program changes occur. Typically these outreach efforts are targeted in two groups; HVAC dealers focused on primarily residential programs and outreach for lighting contractors and electricians focused on commercial lighting. We offered these in various locations throughout the service territory and through webinar to increase accessibility.

As opportunities arise, energy efficiency tips are provided to local media outlets. Typical topics include winter weather and summer heat energy efficiency tips. Avista provides updates to area vendors about program information through mailings and webinars who in turn pass that information on to their customers. The general awareness efforts successfully position Avista to actively pursue and react to these earned media opportunities.

These are the highlights of specific activities that are reinforced and compliment the ongoing outreach and messaging through the website, customer service reps, printed rebate forms, trainings, sponsorships, etc.

## Table 4-1: 2016 WA Electric HVAC Program Summary[2]

| Measure | Project Count | Incentives | kWh Savings | Therms Savings | kWh Avoided Costs | Therms Avoided Cost | Non-Energy Benefits | Customer Incremental Costs | Non-Incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| E Electric to Air Source Heat Pump | 84 | $74,309 | 413,700 | - | $319,744 | $0 | $0 | $560,895 | $26,335 |
| E Smart Thermostat DIY | 14 | $555 | 8,414 | - | $5,102 | $0 | $0 | $2,647 | $420 |
| E Smart Thermostat Paid Install | 34 | $2,457 | 20,434 | - | $12,391 | $0 | $0 | $25,265 | $1,021 |
| E Variable Speed Motor | 741 | $73,129 | 325,299 | - | $213,767 | $0 | $0 | $777,902 | $17,607 |
| **Total** | **873** | **$150,450** | **767,847** | **-** | **$551,004** | **$0** | **$0** | **$1,366,710** | **$45,383** |

## Table 4-2: 2016 WA Natural Gas HVAC Program Summary[2]

| Measure | Project Count | Incentives | kWh | Therms | kWh Avoided Costs | Therms Avoided Costs | Non-energy Benefits | Customer Incremental Costs | Non-incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| G Natural Gas Boiler | 21 | $6,561 | - | 2,142 | $0 | $13,972 | $0 | $192,311 | $402 |
| G Natural Gas Furnace | 2,263 | $707,371 | - | 233,089 | $0 | $1,520,392 | $0 | $1,470,234 | $43,795 |
| G Smart Thermostat DIY | 182 | $7,758 | - | 4,732 | $0 | $24,419 | $0 | $39,466 | $703 |
| G Smart Thermostat Paid Install | 312 | $25,858 | - | 8,112 | $0 | $41,861 | $0 | $202,115 | $1,206 |
| **Total** | **2,778** | **$747,549** | **-** | **248,075** | **$0** | **$1,600,644** | **$0** | **$1,904,125** | **$46,107** |

[2] All kWh and therm values reported in this table are gross, excluding the effect of applicable NTG ratios.

### Table 4-3: 2016 WA Electric Water Heat Program Summary[3]

| Measure | Project Count | Incentives | kWh | Therms | kWh Avoided Costs | Therms Avoided Costs | Non-energy Benefits | Customer Incremental Costs | Non-incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| Simple Steps Showerheads | 2,953 | $10,159 | 137,638 | - | $79,776 | $0 | $0 | $16,517 | $6,571 |
| Simple Steps Clothes Washers | 703 | $63,350 | 51,319 | - | $34,780 | $0 | $0 | $64,451 | $2,865 |
| E Electric Water Heater | 2 | $39 | 278 | - | $197 | $0 | $0 | $889 | $16 |
| **Total** | **3,658** | **$73,548** | **189,235** | **-** | **$114,753** | **$0** | **$0** | **$81,857** | **$9,452** |

### Table 4-4: 2016 WA Natural Gas Water Heat Program Summary[3]

| Measure | Project Count | Incentives | kWh | Therms | kWh Avoided Costs | Therms Avoided Costs | Non-energy Benefits | Customer Incremental Costs | Non-incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| Simple Steps Showerheads | 2,953 | $10,763 | - | 4,698 | $0 | $19,764 | $0 | $16,517 | $1,187 |
| G 40 Gallon Natural Gas Water Heater | 12 | $250 | - | 108 | $0 | $493 | $0 | $11,257 | $14 |
| G 50 Gallon Natural Gas Water Heater | 37 | $771 | - | 333 | $0 | $1,519 | $0 | $39,627 | $44 |
| G Tankless Water Heater | 396 | $74,179 | - | 22,968 | $0 | $83,064 | $0 | $455,873 | $2,393 |
| **Total** | **3,398** | **$85,963** | **-** | **28,107** | **$0** | **$104,840** | **$0** | **$523,274** | **$3,637** |

[3] All kWh and therm values reported in this table are gross, excluding the effect of applicable NTG ratios.

### Table 4-5: 2016 WA ENERGY STAR Homes Electric Program Summary[4]

| Measure | Project Count | Incentives | kWh Savings | Therms Savings | kWh Avoided Costs | Therms Avoided Cost | Non-Energy Benefits | Customer Incremental Costs | Non-Incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| E Energy Star Home - Manufactured, Furnace | 7 | $5,504 | 47,929 | - | $48,497 | $0 | $1,154 | $21,000 | $3,994 |
| E Energy Star Home-Manufactured, Heat Pump | 2 | $1,573 | 8,780 | - | $8,884 | $0 | $0 | $6,000 | $732 |
| Total | 9 | 7,077 | 56,709 | - | $57,381 | $0 | $1,154 | $27,000 | $4,726 |

### Table 4-6: 2016 WA ENERGY STAR Homes Natural Gas Program Summary[4]

| Measure | Project Count | Incentives | kWh | Therms | kWh Avoided Costs | Therms Avoided Costs | Non-energy Benefits | Customer Incremental Costs | Non-incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| G Energy Star Home - Natural Gas Only | 7 | $4,738 | - | 1,421 | $0 | $12,573 | $0 | $21,000 | $362 |
| **Total** | **7** | **$4,738** | **-** | **1,421** | **$0** | **$12,573** | **$0** | **$21,000** | **$362** |

[4] All kWh and therm values reported in this table are gross, excluding the effect of applicable NTG ratios.

### Table 4-7: 2016 WA Electric Fuel Conversion Program Summary[5]

| Measure | Project Count | Incentives | kWh | Therms | kWh Avoided Costs | Therms Avoided Costs | Non-energy Benefits | Customer Incremental Costs | Non-incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| E Electric To Natural Gas Fur & Wh | 421 | $1,323,498 | 6,754,103 | (300,594) | $6,351,029 | -$2,258,189 | $0 | $2,405,228 | $523,097 |
| E Electric To Natural Gas Wall Heater | 11 | $14,056 | 120,252 | (5,126) | $85,362 | -$25,825 | $0 | $49,240 | $7,031 |
| E Electric To Natural Gas Furnace | 171 | $385,282 | 2,054,052 | (85,158) | $1,931,469 | -$639,743 | $0 | $752,172 | $159,084 |
| E Electric To Natural Gas Water Heater | 208 | $122,668 | 838,448 | (44,928) | $595,183 | -$226,347 | $0 | $480,410 | $49,022 |
| **Total** | **811** | **$1,845,504** | **9,766,855** | **(435,806)** | **$8,963,044** | **-$3,150,104** | **$0** | **$3,687,051** | **$738,234** |

### Table 4-8: 2016 WA Electric Residential Lighting Program Summary[5]

| Measure | Project Count | Incentives | kWh | Therms | kWh Avoided Costs | Therms Avoided Costs | Non-energy Benefits | Customer Incremental Costs | Non-incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| Simple Steps LED | 529,611 | $1,019,118 | 11,537,258 | - | $8,073,287 | $0 | $0 | $1,384,471 | $664,950 |
| Simple Steps CFL | 255,832 | $203,537 | 3,432,945 | - | $1,730,704 | $0 | $0 | $411,953 | $142,548 |
| Customer Outreach LEDs (Residential) | 50 | $266 | 650 | - | $455 | $0 | $0 | $270 | $37 |
| **Total** | **785,493** | **$1,222,921** | **14,970,853** | **-** | **$9,804,446** | **$0** | **$0** | **$1,796,694** | **$807,535** |

[5]All kWh and therm values reported in this table are gross, excluding the effect of applicable NTG ratios.

## Table 4-9: 2016 WA Electric Shell Program Summary

| Measure | Project Count | Incentives | kWh | Therms | kWh Avoided Costs | Therms Avoided Costs | Non-energy Benefits | Customer Incremental Costs | Non-incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| E Attic Insulation with Electric Heat | 27 | $4,464 | 22,375 | - | $28,105 | $0 | $954 | $27,862 | $2,315 |
| E Floor Insulation with Electric Heat | 4 | $793 | 3,305 | - | $3,108 | $0 | $141 | $3,704 | $256 |
| E Manuf Floor Insulation With Electric Heat | 1 | $256 | 1,794 | - | $1,687 | $0 | $0 | $1,182 | $139 |
| E Wall Insulation With Electric Heat | 9 | $2,353 | 14,225 | - | $13,376 | $0 | $254 | $8,729 | $1,102 |
| E Window Replc from Double Pane W Electric Heat | 113 | $46,478 | 247,857 | - | $233,065 | $0 | $0 | $555,420 | $19,196 |
| E Window Replc from Single Pane W Electric Heat | 141 | $51,699 | 530,912 | - | $499,228 | $0 | $0 | $620,261 | $41,119 |
| **Total** | **295** | **$106,044** | **820,468** | **-** | **$778,569** | **$0** | **$1,350** | **$1,217,157** | **$64,126** |

## Table 4-10: 2016 WA Natural Gas Shell Program Summary

| Measure | Project Count | Incentives | kWh | Therms | kWh Avoided | Therms Avoided Costs | Non-energy Benefits | Customer Incremental Costs | Non-incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| G Attic Insulation with Natural Gas Heat | 144 | $25,682 | - | 10,893 | $0 | $111,020 | $0 | $222,709 | $3,198 |
| G Floor Insulation with Natural Gas Heat | 10 | $1,594 | - | 461 | $0 | $4,700 | $0 | $7,665 | $135 |
| G Wall Insulation with Natural Gas Heat | 44 | $9,049 | - | 2,174 | $0 | $22,153 | $0 | $35,335 | $638 |
| G Window Replc with Natural Gas Heat | 866 | $358,935 | - | 76,015 | $0 | $774,726 | $0 | $5,189,756 | $22,316 |
| G Duct Sealing | 3 | $469 | - | 224 | $0 | $1,460 | $0 | $995 | $42 |
| G Duct Sealing + CO2 | 7 | $1,458 | - | 522 | $0 | $3,406 | $0 | $2,400 | $98 |
| Miscellaneous Measure | 26 | $2,466 | - | - | $0 | $0 | $0 | $2,368 | $0 |
| **Total** | **1,100** | **$399,653** | **-** | **90,289** | **$0** | **$917,465** | **$0** | **$5,461,228** | **$26,427** |

Note: All kWh and therm values reported in this table are gross, excluding the effect of applicable NTG ratios.

### Table 4-11: Opower/Oracle Participation Summary

| State | Initial 2016 Participating Customers |
|---|---|
| WA | 48,305 |

### Table 4-12: 2016 WA Electric Residential Opower/Oracle Program Summary

| Measure | Project Count | Incentives | kWh | Therms | kWh Avoided Costs | Therms Avoided Costs | Non-energy Benefits | Customer Incremental Costs | Non-incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| Opower/Oracle Home Energy Reports | 1 | $0 | 16,511,583 | - | $1,456,164 | $0 | $0 | $0 | $382,715 |

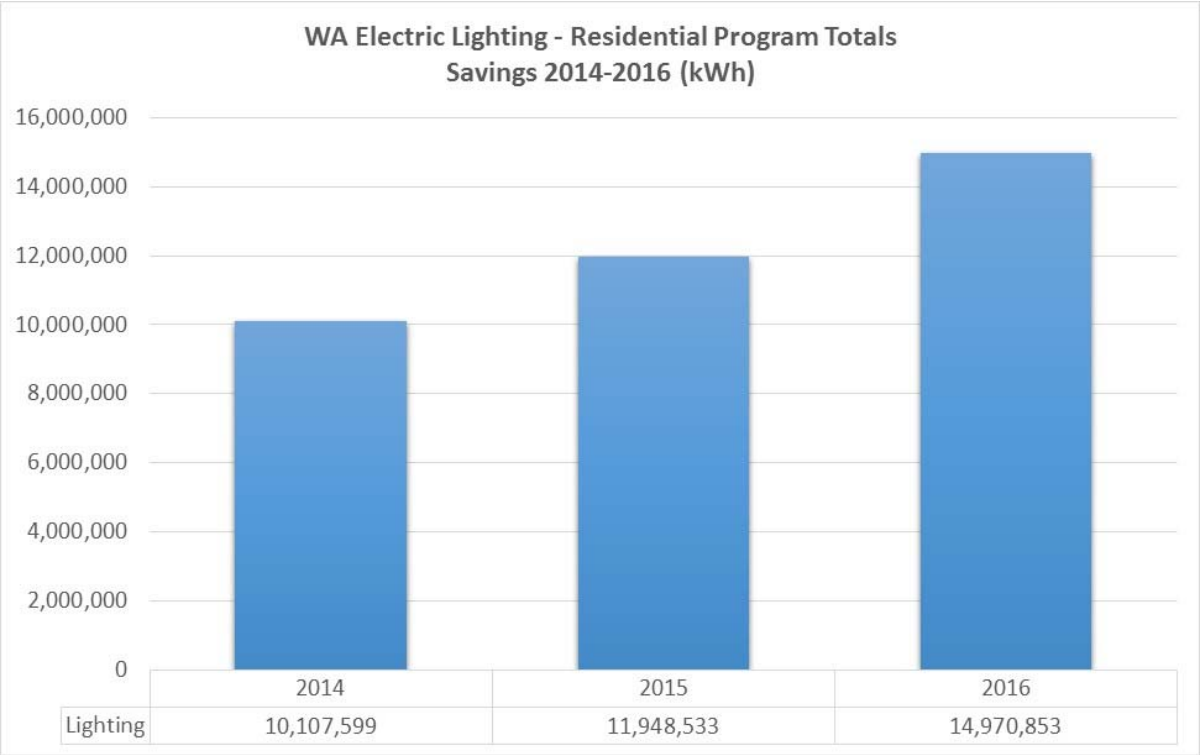
### 4.1.10 Residential Trend Analysis[6]

During 2016, the company's residential programs realized a 50% increase in savings from the previous year with the total savings increasing from 17,698,164 kWh in 2015 to 26,571,967 kWh in 2016[7]. The largest contributors to the 2016 overall savings were Avista's residential lighting and fuel efficiency programs.

#### 4.1.10.1 Residential Lighting

In 2016, the residential lighting program obtained 14,970,853 kWh of savings which represents 56% of the overall savings achieved by Avista's residential programs. This level of savings is 25% higher than the level of savings in the previous year (11,948,533 kWh in 2015). This is primarily due to the increased popularity of LED lighting which saw an increase of 84,695 units in 2015 to 529,611 units in 2016. With LED lighting becoming the dominant technology, the program saw a decline in CFL lighting purchases and the number of units decreased from 441,526 in 2015 to 255,832 in 2016. The below graph illustrates the trend of residential lighting between 2014 and 2016.

**Figure 4-1: Washington Electric Lighting Trend Analysis**



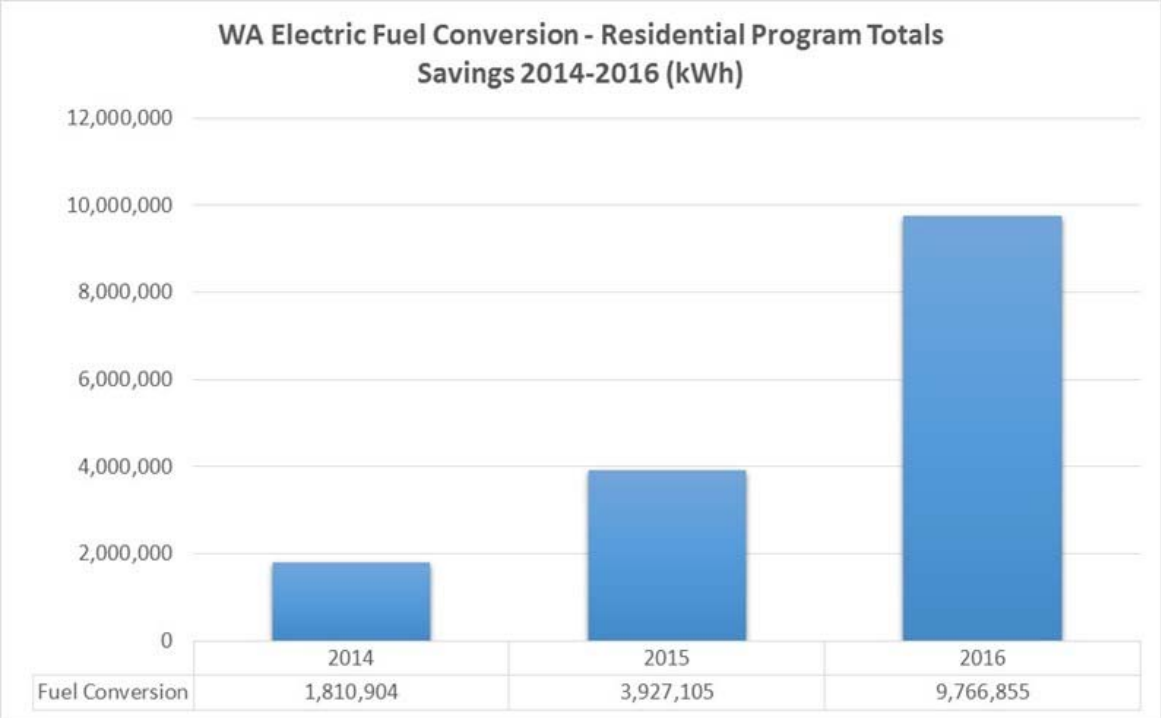

[6] For the purpose of comparing the 2014-2016 trend analysis data, please note that the savings numbers for 2014 are unverified gross, 2015 is verified gross, and 2016 is adjusted reported gross.

[7] Amounts exclude the Opower/Oracle Home Energy Reports of 13,625,855 KWh in 2015 and 16,511,583 in 2016 as those amounts are based on biennial savings.

#### 4.1.10.2 Residential Fuel Efficiency Program[8]

On September 16, 2014, Avista's fuel efficiency tariff was revised and increased incentives for electric to natural gas conversions. The electric to natural gas furnace conversions incentive increased from $900 to $2,300 which helped to increase the number of conversions from 191 in 2014 to 422 in 2015 and 811 in 2016[9]. The fuel efficiency program obtained 37% of the overall residential savings (9,766,855 kWh) in 2016 and also experienced savings growth of 249% from the previous year (3,927,105 kWh) in 2015. The below graph illustrates the trend in savings for the 2014-2016 periods.

**Figure 4-2: Washington Electric Fuel Conversion Trend Analysis**



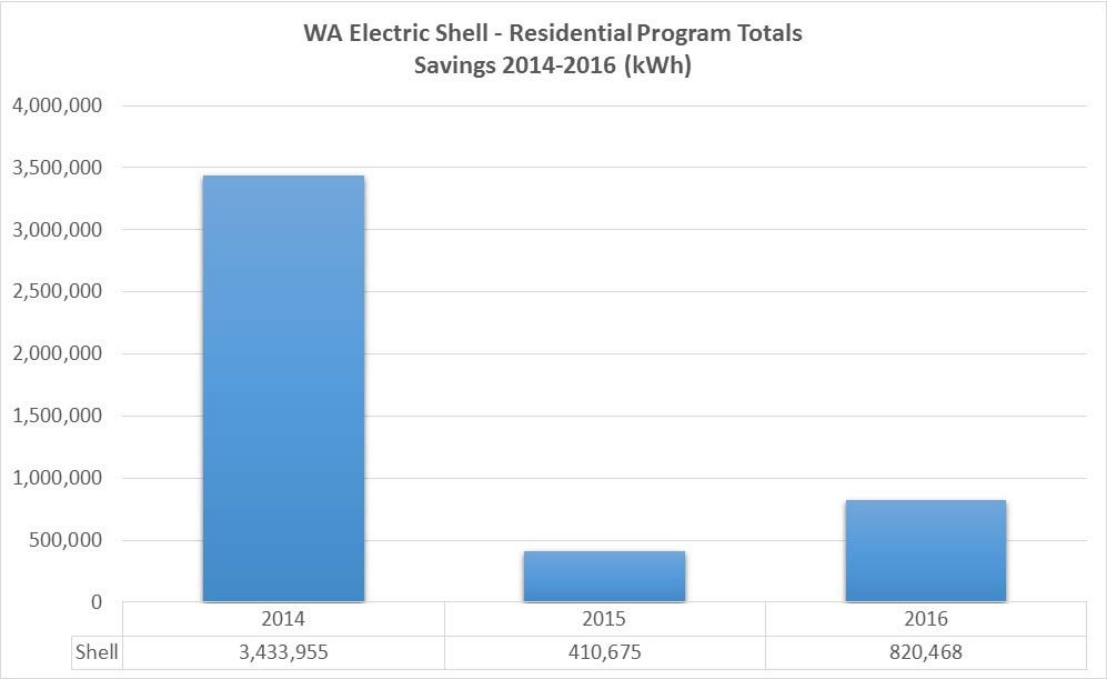

#### 4.1.10.3 Residential Shell Programs[8]

The residential shell program obtained residential savings of 820,468 kWh in 2016 which represents 3% of the overall savings in 2016. Although this is a sizable increase from 2015, in which the program obtained savings of 410,675 kWh, it represents a significant decrease from the 2014 level of savings which obtained 3,433,955 kWh. The below graph illustrates the changes to the shell program between 2014 and 2016.

[8] For the purpose of comparing the 2014-2016 trend analysis data, please note that the savings numbers for 2014 are unverified gross, 2015 is verified gross, and 2016 is adjusted reported gross.

[9] Includes furnace, furnace and water heater, and water heater programs.

**Figure 4-3: Washington Electric Shell Trend Analysis**



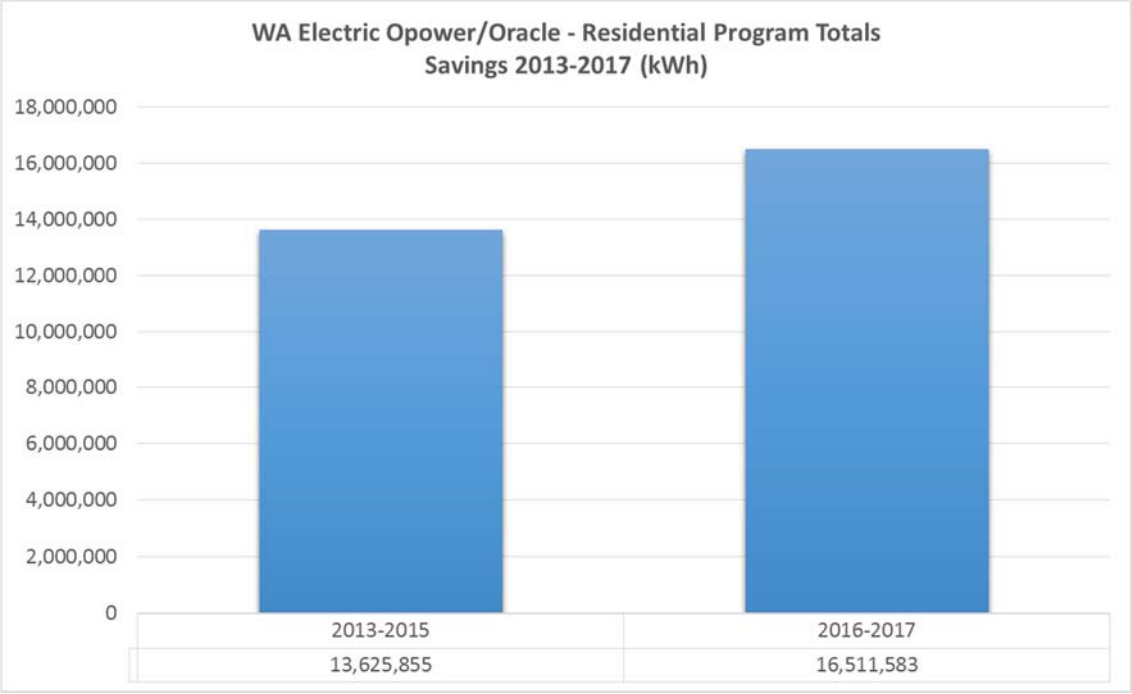

In 2014, the primary measures included in the Shell Program were wall, attic, and floor insulation and window replacements as well as testing, repair and sealing of ductwork on Avista heated homes. The largest component of the 2014 savings was Manufactured Home Duct Sealing, which accounted for 2,003,402 of the 3,433,955 kWh obtained. The Manufactured Home Duct Sealing was a temporary program that ran from October 2012 through June 2013 and again from January 2014 through November 2014.

#### 4.1.10.4 Opower/Oracle Home Energy Reports

Energy efficiency savings derived from Avista's behavior program continue to contribute a large percentage to the company's overall portfolio of savings. For 2016, the Opower/Oracle Home Energy Reports reported savings of 16,511,583 kWh. While this savings amount is recorded in 2016, it should be noted that the level of savings represents the amount that is estimated to be captured over the two year biennia of 2016-2017. While the 2017 savings may approximate the 2016 savings number, the incremental savings in 2017 is expected to be marginal as compared to the amount recorded in 2016.

Prior to the 2016-2017 biennium, the Home Energy Reports were conducted over a two and a half year span rather than its current two year span. The below graph illustrates the comparison of the prior two and half year program with the current two year program.

**Figure 4-4: Washington Electric Opower/Oracle Trend Analysis[10]**




## 4.2 Low Income

The Company leverages the infrastructure of six network Community Action Program (CAP) agencies and one tribal weatherization organization to deliver energy efficiency programs for the Company's low income residential customers in the Washington service territory. CAP agencies have resources to income qualify, prioritize and treat clients homes based upon a number of characteristics. In addition to the Company's annual funding, the agencies have other monetary resources that they can leverage when treating a home with weatherization or other energy efficiency measures. The agencies either have in-house or contract crews to install many of the efficiency measures of the program.

### 4.2.1 Program Changes

In 2016, the Company continued to reimburse Community Action Agencies for 100% of the cost of installation for most energy efficiency measures defined on the "Approved" list, and continued to offer an additional "Rebate List" of other energy efficiency measures. This rebate list allows the agencies to receive partial reimbursement for measures that are not as cost-effective as those on the Approved List (or found in the Washington Weatherization Manual's priority list) but are still necessary for the homes overall functionality. Measures found in Washington's Weatherization Manual priority list are deemed cost-effective for Washington CAP agencies and

[10] The 2013-2015 Opower/Oracle savings are based on evaluated savings. For the above 2016-2017, those amounts are based on reported savings. At the conclusion of the biennium, the 2016-2017 savings will be verified by the third-party evaluator.

100% funded regardless of whether or not they fell below a TRC of 1.0). The reimbursement amount is only equal to the avoided cost energy value of the improvement. This approach focuses the Agency towards installing measures that have the greatest cost-effectiveness, from the utility perspective, but still offers an opportunity to fund other measures if needed. To allow for additional flexibility, the agency may also choose to utilize their Health and Safety dollars to fully fund the cost of the measures on the Rebate list.

### 4.2.2 2016 Program Details

Eligible efficiency improvements are similar to those offered under the traditional residential rebate programs, as well as mirroring a variety of the same measures found on the state program priority list. An Avista approved measure list is provided to the agencies in an attempt to manage the cost-effectiveness of the low income program from a utility perspective (see Table 4-13). The agencies are given discretion to spend their allotted funds on either electric or natural gas efficiency improvement based on the need of the clients The program includes improvements to insulation, infiltration, ENERGY STAR® doors and refrigerators along with fuel conversion from electric resistance space and water heat to natural gas. Avista's funding covers the full cost of the improvement from the Approved Measures list.

**Table 4-13: 2016 Low Income Program Approved Measure List**

| Electric Measures | Natural Gas Measures |
|---|---|
| • Air infiltration<br>• Duct sealing<br>• ENERGY STAR doors<br>• ENERGY STAR windows<br>• High efficiency air source heat pump (8 HSPF)<br>• Electric to air source heat pump<br>• Insulation for attic, walls, floors, and ducts | • Air infiltration<br>• Duct sealing<br>• ENERGY STAR doors<br>• ENERGY STAR windows<br>• High efficiency furnace (90% AFUE)<br>• Insulation for attic, walls, floors, and ducts<br>**Fuel Conversion Measures**<br>• Electric to natural gas furnace<br>• Electric to natural gas furnace and water heat |

Along with the Approved Measure List, Avista has also established a "Rebate List" of eligible measures. The Rebate List allows the agencies to receive funding for other measures that are not as cost-effective as those on the Approved List but are still necessary for the homes overall functionality. This measure list is outlined in Table 4-14.

**Table 4-14: 2016 Low Income Program Rebate Measure List**

| Electric Measures | Natural Gas Measures |
|---|---|
| • High efficiency water heaters (0.93 EF)<br>• ENERGY STAR refrigerators<br>• Ductless Heat Pumps | • High efficiency water heaters (0.62 EF)<br>**Fuel Conversion Measures**<br>• Electric to natural gas water heater |

Individually, the annual contract for each agency allows them to spend their annually allotted funds on either natural gas or electric efficiency measures at their discretion, and charge a 15 percent administration fee towards the cost of each measure. In addition, up to 15 percent of their annual funding allocation may be used towards Health and Safety improvements in support of energy efficiency measures installed in the home. It is at the agencies' discretion whether or not to utilize their funds for health and safety and other home repairs to ensure the habitability of the home where the energy efficiency improvements were installed. Refer to Table 4-16 and Table 4-17 for low income program participation and savings details for the 2016 program year.

In partnership with the Company's Demand-Side Management efforts, Avista's Consumer Affairs department conducts conservation education and outreach for our low income, senior and vulnerable customers. The company reaches the target population through workshops, energy fairs, mobile and general outreach. Each of these methods include demonstrations and distribution of low-cost and no-cost materials with a focus on energy efficiency, conservation tips and measures, and information regarding energy assistance that may be available through agencies. Low income and senior outreach goals increase awareness of energy assistance programs such as the Avista Low Income Rate Assistance Program (LIRAP) in Washington and the Low Income Home Energy Assistance Program (LIHEAP) and Project Share.

The company has recognized the following educational strategies as efficient and effective activities for delivering the energy efficiency and conservation education and outreach:

- Energy Conservation workshops for groups of Avista customers where the primary target audiences are seniors and low income participants.
- Energy Fairs where attendees can receive information about low cost/no cost methods to weatherize their home; this information is provided in demonstrations and limited samples. In addition, fair attendees can learn about billing assistance and demonstrations of the online account and energy management tools. Community partners that provide services to low income populations and support to increase personal self-sufficiency are invited, at no cost, to host a booth to provide information about their services and how to access them.
- Mobile Outreach is conducted through the Avista Energy Resource Van (ERV) where visitors can learn about effective tips to manage their energy use, bill payment options and community assistance resources. In Washington alone, ERV visited 22 senior centers, 28 food bank distribution centers, and 37 general outreach events as well as supporting 3 energy fairs in 2016.

General Outreach is accomplished by providing energy management information and resources at events (such as resource fairs) and through partnerships that reach our target populations. General Outreach also includes bill payment options and assistance resources in senior and low income publications. In 2016, Avista participated in 143 events including workshops, energy fairs, mobile outreach events, and general outreach partnerships and events reaching over 13,000 individuals. Table 4-15 is an overview of different activities by type in WA.

**Table 4-15: 2016 WA Low Income Outreach Event and Bulb Giveaway Summary**

| Description | Number of Events/Activities | Contacts | CFLs | LEDs |
|---|---|---|---|---|
| Energy Fairs | 3 | 835 | - | 835 |
| Outreach | 37 | 5,563 | 48 | 3,259 |
| Mobile | 28 | 2,745 | - | 2,759 |
| Workshops | 22 | 619 | 70 | 629 |
| **Total** | **90** | **9,762** | **118** | **7,482** |

## Table 4-16: WA 2016 Electric Low-Income Measures Summary[11]

| Measure | Project Count | Incentives | kWh Savings | Therms Savings | kWh Avoided Costs | Therms Avoided Cost | Non-Energy Benefits | Customer Incremental Costs* | Non-Incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| Customer Outreach CFLs (Low Income) | 118 | $2,145 | 1,770 | - | $558 | $0 | $0 | $3,159 | $116 |
| Customer Outreach LEDs (Low Income) | 7,237 | $349,425 | 95,212 | - | $49,426 | $0 | $0 | $514,613 | $10,296 |
| CFL Bulbs | 66 | $174 | 701 | - | $221 | $0 | $0 | $294 | $46 |
| E Energy Star Refrigerator | 5 | $1,738 | 2,475 | - | $2,514 | $0 | $0 | $2,944 | $524 |
| E To G Furnace Conversion | 54 | $165,688 | 174,554 | (6,246) | $219,256 | -$46,919 | $81,000 | $280,618 | $45,674 |
| E To G H20 Conversion | 57 | $111,964 | 83,479 | (4,262) | $61,602 | -$18,969 | $28,500 | $189,629 | $12,832 |
| E To Heat Pump Conversion | 6 | $16,935 | 15,595 | - | $16,333 | $0 | $0 | $28,682 | $3,402 |
| E Air Infiltration | 55 | $43,638 | 19,498 | - | $20,421 | $0 | $0 | $73,907 | $4,254 |
| E Duct Sealing | 916 | $2,078 | 5,864 | - | $6,218 | $0 | $0 | $3,520 | $1,295 |
| E Energy Star Doors | 30 | $10,234 | 7,538 | 194 | $16,213 | $2,079 | $21,660 | $30,402 | $3,469 |
| E Energy Star Windows | 90 | $31,544 | 19,274 | - | $41,456 | $0 | $21,141 | $53,424 | $8,636 |
| E HE Water Heater | 2 | $113 | 162 | - | $103 | $0 | $0 | $191 | $22 |
| E Ins - Attic | 36,403 | $45,823 | 16,015 | - | $34,446 | $0 | $0 | $77,608 | $7,176 |
| E Ins - Duct | 214 | $1,783 | 7,534 | - | $7,264 | $0 | $0 | $3,020 | $1,513 |
| E Ins - Floor | 47,789 | $70,715 | 80,435 | 1,241 | $173,005 | $13,299 | $0 | $173,908 | $36,624 |
| E Ins - Wall | 10,728 | $5,916 | 15,960 | 986 | $34,328 | $10,567 | $0 | $28,158 | $7,615 |
| **Total** | **103,770** | **$859,912** | **546,066** | **(8,086)** | **$683,365** | **-$39,943** | **$152,301** | **$1,464,077** | **$143,494** |

[11] All kWh and therm values reported in this table are gross, excluding the effect of applicable NTG ratios.

*Customer incremental costs are the incremental measure cost absent any incentive. Therefore, the values should not be zero for the low income program. These incremental values are used in cost-effectiveness calculations.

**Table 4-17: 2016 WA Natural Gas Low-Income Measures Summary[12]**

| Measure | Project Count | Incentives | kWh | Therms | kWh Avoided Costs | Therms Avoided Costs | Non-energy Benefits | Customer Incremental Costs* | Non-incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| G Air Infiltration | 101 | $169,295 | - | 1,478 | $0 | $10,041 | $0 | $130,216 | $441 |
| G HE Furnace | 28 | $141,336 | - | 1,720 | $0 | $11,686 | $19,534 | $108,711 | $514 |
| G HE WH 50G | 1 | $193 | - | 17 | $0 | $81 | $0 | $148 | $4 |
| G Duct Sealing LI | 950 | $7,158 | - | 450 | $0 | $3,057 | $0 | $5,506 | $134 |
| G Energy Star Doors | 61 | $63,791 | - | 646 | $0 | $6,923 | $44,042 | $49,066 | $304 |
| G Energy Star Windows | 124 | $98,570 | - | 4,500 | $0 | $48,230 | $29,128 | $75,817 | $2,120 |
| G INS - Attic | 74,005 | $219,244 | - | 1,658 | $0 | $17,769 | $0 | $168,634 | $781 |
| G INS - Duct | 582 | $5,912 | - | 238 | $0 | $1,487 | $0 | $4,547 | $65 |
| G INS - Floor | 45,461 | $215,417 | - | 3,598 | $0 | $38,555 | $0 | $165,691 | $1,694 |
| G INS - Wall | 26,011 | $88,342 | - | 1,764 | $0 | $18,903 | $0 | $67,950 | $831 |
| **Total** | **147,324** | **$1,009,259** | **-** | **16,069** | **$0** | **$156,732** | **$92,704** | **$776,285** | **$6,888** |

*Customer incremental costs are the incremental measure cost absent any incentive. Therefore, the values should not be zero for the low income program. These incremental values are used in cost-effectiveness calculations.

[12] All kWh and therm values reported in this table are gross, excluding the effect of applicable NTG ratios.

## 4.3 Nonresidential

The nonresidential energy efficiency market is delivered through a combination of prescriptive and site-specific offerings. Any measure not offered through a prescriptive program is automatically eligible for treatment through the site-specific program, subject to the criteria for participation in that program. Prescriptive paths for the nonresidential market are preferred for measures that are relatively small and uniform in their energy efficiency characteristics.

In 2016, more than 1,800 prescriptive and site specific nonresidential projects were incented. Additionally, the Small Business program installed over 14,000 measures. Avista's tariff rider funded more than $9.0 million for energy efficiency incentives in nonresidential and small business applications. Nonresidential programs realized over 48,700 MWh and 162,000 therms in annual first-year energy savings. Table 4-19 through Table 4-24 provide detail on the electric, natural gas, and dual fuel nonresidential programs.

### 4.3.1 Program Changes

Program changes made at the beginning of 2016 to the nonresidential programs include the addition of new program offerings and changes to eligibility or incentive levels. Avista communicates the majority of program changes once the Business Plan is finalized and those changes become effective at the beginning of the year. In addition, some program changes are made throughout the year as necessary but these are less typical.

For nonresidential programs, rebates were updated to reflect business planning analysis to include inputs such as new unit energy savings (UES) and cost values. Changes were effective January 1, 2016 and Avista accepted rebate applications through March 31, 2016 for 2015 measures and amounts. This 90 day grace period allows for a smooth transition when rebate programs change to allow enough time for customers in the pipeline to complete their projects yet close out changes in a timely but balanced approach.

The following sections outline additions, adjustments and discontinuations of nonresidential programs and incentive levels beginning in 2016.

#### 4.3.1.1 Nonresidential Program New Offerings

In 2016 Avista added the following:

- Refer to Table 4-18 below for lighting measure changes
- AirGuardian Program is being offered for rotary screw air compressors 15 HP or higher

- Food Service Equipment Program
    - Electric Griddles $505
    - Natural Gas Griddles $88

#### 4.3.1.2 Nonresidential Program Discontinuations

The following programs/measures were discontinued during the 2016 program year:

- Power Management for PC Networks
- Commercial Clothes Washers
- Refer to table below for lighting measure changes

#### 4.3.1.3 Nonresidential Program Adjustments

The following adjustments in program requirements or incentive levels were made to the nonresidential programs beginning January 2016.

Increases to existing rebates were made for the following measures:

- Refer to Table 4-18 below for lighting
- Commercial Insulation Program
    - Wall Insulation to at least R11 up to R18 $0.40 per square foot
    - Wall Insulation to at least R19 or greater $0.45 per square foot

Decreases to existing rebates were made for the following measures:

- Refer to Table 4-18 below for lighting

***COMMERCIAL SITE-SPECIFIC INCENTIVES***

- For projects and measures that do not fit into one of Avista's prescriptive commercial rebates, Avista offers site-specific (custom) incentives. Projects must be evaluated prior to purchasing or installing the equipment, to determine if an incentive is available based on eligibility requirements.
- Electric incentives will continue to be offered in both Idaho and Washington. If approved, electric incentives for eligible projects will be up to 20 cents per kWh for projects with a simple payback less than 15 years. Incentives will be capped at 70% of incremental project costs.
- Natural gas incentives will continue to be offered in Washington and will also be offered in Idaho. Natural gas incentives for eligible projects will be up to $3.00 per therm for projects with a simple payback of less than 15 years. Incentives will be capped at 70% of incremental project costs. As referenced above, beginning in 2016, natural gas projects with a simple payback of over 15 years will not be eligible for incentives. If projects are to be considered in place prior to January 1st, 2016 they must be submitted to Avista immediately for evaluation and contracted prior to 4/1/2016.

## Table 4-18: 2016 Commercial Lighting Program Changes

| Lighting | 2015 Incentive | 2016 Incentive | Program Changes |
|---|---|---|---|
| Exterior 70-90 watt HID to 15-25 watt DLC approved LED Fixture or Retrofit Kit | $55 | $55 | Changed wattage requirement. DLC qualified products only. NO screw in. |
| Exterior 90-100 watt HID to 20-30 watt DLC approved LED Fixture or Retrofit Kit | $75 | $75 | Changed wattage requirement. DLC qualified products only. NO screw in. |
| Exterior 150 watt HID to 25-50 watt DLC approved LED Fixture or Retrofit Kit | $130 | $130 | Changed wattage requirement. DLC qualified products only. NO screw in. |
| Exterior 175 watt HID to 30-79 watt DLC approved LED Fixture or Retrofit Kit | $135 | $135 | Changed wattage requirement. DLC qualified products only. NO screw in. |
| Exterior 250 watt HID to 80-140 watt DLC approved LED Fixture or Retrofit Kit | $145 | $145 | Changed wattage requirement. DLC qualified products only. NO screw in. |
| Exterior 320 watt HID to 100-160 watt DLC approved LED Fixture or Retrofit Kit | $180 | $180 | Changed wattage requirement. DLC qualified products only. NO screw in. |
| Exterior 400 watt HID to 100-175 watt DLC approved LED Fixture or Retrofit Kit | $255 | $255 | Changed wattage requirement. DLC qualified products only. NO screw in. |
| Exterior 1000 watt HID to 300-400 watt DLC approved LED Fixture or Retrofit Kit | Site Specific | $615 | Added to the incentives form. DLC qualified products only. NO screw in. |
| Exterior 250 watt HID to 80-140 watt DLC approved LED Canopy Fixture or Retrofit Kit | $155 | $160 | Changed wattage requirement. DLC qualified products only. NO screw in. Must have ≥ 4 and all canopy fixtures installed for incentive. |
| Exterior 320 watt HID to 100-160 watt DLC approved LED Canopy Fixture or Retrofit Kit | $250 | $250 | Changed wattage requirement. DLC qualified products only. NO screw in. Must have ≥ 4 and all canopy fixtures installed for incentive. |
| Exterior 400 watt HID to 100-175 watt DLC approved LED Canopy Fixture or Retrofit Kit | $325 | $325 | Changed wattage requirement. DLC qualified products only. NO screw in. Must have ≥ 4 and all canopy fixtures installed for incentive. |
| Exterior –New Construction-175 watt HID to 30-79 watt DLC approved LED Fixture | $135 | $125 | Decreased Incentive. Changed wattage requirement. DLC qualified products only. NO screw in. |
| Exterior –New Construction-250 watt HID to 80-100 watt DLC approved LED Fixture | $145 | $145 | Changed wattage requirement. DLC qualified products only. NO screw in. |
| Exterior-New Construction- 320- 400 watt HID to 100-175 watt DLC LED Fixture | $180 | $180 | Changed wattage requirement. DLC qualified products only. NO screw in. |
| Exterior-Sign Retrofit-T12's to LED | $17/Ft² | $17/Ft² | Required ≥40,000 hour LED life and at least five year warranty. Count only 1 side of Sign. |
| Interior 250 watt HID to 80-140 watt DLC approved LED Fixture | Site Specific | $165 | Added. Must run ≥ 80 hours per week. DLC qualified products only. |
| Interior 400 watt HID to 100-175 watt DLC approved LED Fixture | Site Specific | $265 | Added. Must run ≥ 80 hours per week. DLC qualified products only. |
| Interior 1000 watt HID to 300-400 watt DLC approved LED Fixture | Site Specific | $615 | Added. Must run ≥ 80 hours per week. DLC qualified products only. |
| Interior 250 HID to 4-Lamp HP T8 or 2-Lamp T5 Fixture | $90 | $175 | Increased Incentive. T8's must use HP T8's and 25-28 watt Lamps. HP T8's go to www.cee1.org for QPL. |

| Lighting | 2015 Incentive | 2016 Incentive | Program Changes |
|---|---|---|---|
| Interior 250 HID to 4-Lamp HP T8 or 2-Lamp T5 Fixture plus OC Sensors | $120 | $205 | Increased Incentive. T8's must use HP T8's and 25-28 watt Lamps. HP T8's go to www.cee1.org for QPL. |
| Interior 400 HID to 4-Lamp T5 Fixture | $120 | $155 | Increased Incentive. |
| Interior 400 HID to 6-Lamp T8 Fixture | $120 | $175 | Increased Incentive. T8's must use HP T8's and 25-28 watt Lamps. HP T8's go to www.cee1.org for QPL. |
| Interior 400 HID to 8-Lamp T8 Fixture | $125 | $145 | Increased Incentive. T8's must use HP T8's and 25-28 watt Lamps. HP T8's go to www.cee1.org for QPL. |
| Interior 40 watt Incandescent to 6-10 watt Energy Star Rated LED Lamp | $10 | $15 | Increased Incentive. Energy Star Rated LED Lamp only. |
| Interior 60 watt Incandescent to 9-13 watt Energy Star Rated LED Lamp | $12 | $10 | Decreased Incentive. Energy Star Rated LED Lamp only. |
| Interior 75 watt Incandescent to 9-16 watt Energy Star Rated LED Lamp | $15 | $10 | Decreased Incentive. Energy Star Rated LED Lamp only. |
| Interior 100 watt Incandescent to 12-20 watt Energy Star Rated LED Lamp | $15 | $25 | Increased Incentive. Energy Star Rated LED Lamp only. |
| Interior Over 150 watt Incandescent to 2x4 DLC approved LED Fixture | Site Specific | $85 | Added to Incentive form. DLC approved LED Fixtures only. |
| Interior Over 150 watt Incandescent to HP T8 Fixture | $40 | $0 | Discontinued from the Incentive Form. Can be evaluated Site Specifically. |
| Interior 20 watt MR16 to 2-4 watt Energy Star Rated LED MR16 Lamp | $10 | $15 | Increased Incentive. Energy Star Rated LED Lamp only. |
| Interior 35 watt MR16 to 4-6 watt Energy Star Rated LED MR16 Lamp | $11 | $16 | Increased Incentive. Energy Star Rated LED Lamp only. |
| Interior 50 watt MR16 to 6-9 watt Energy Star Rated LED MR16 Lamp | $12 | $13 | Increased Incentive. Energy Star Rated LED Lamp only. |
| Interior 75-100 watt Incandescent Can Light to 12-20 watt Energy Star LED Can Light Fixture | $30 | $45 | Increased Incentive. Energy Star Rated LED Can Light Fixture Retrofit only. |
| Interior 32 watt CFL Can Light to 12-20 watt Energy Star LED Can Light Kit | Site Specific | $15 | Added to the Incentive Form. . Energy Star Rated LED Can Light Fixture/ Retrofit only. |
| Interior No Occupancy Sensor to Occupancy Sensor that controls greater than 170 watts | $30 | $45 | Increased Incentive. |
| Interior 4-Foot 4-Lamp T12/T8 Fixture to DLC Qualified 2x4 Fixture | Site Specific | $40 | Added to Form. DLC Qualified Fixture Only. Must operate ≥ 80 hrs. per week. |
| Interior 4-Foot 4-Lamp T12/T8 Fixture to 4-Lamp HP T8 Fixture or Retrofit Kit | Site Specific | $15 | Added to form. T8's must use HP T8's and 25-28 watt Lamps. HP T8's go to www.cee1.org for QPL. ≥80 hrs./week |
| Interior 4-Foot 4-Lamp T12/T8 Fixture to 3-Lamp HP T8 Fixture or Retrofit Kit | $32 | $30 | Decreased Incentive. T8's must use HP T8's and 25-28 watt Lamps. HP T8's go to www.cee1.org for QPL. ≥80 hrs./week |
| Interior 4-Foot 4-Lamp T12/T8 Fixture to 2-Lamp HP T8 Fixture or Retrofit Kit | $35 | $50 | Increased Incentive. T8's must use HP T8's and 25-28 watt Lamps. HP T8's go to www.cee1.org for QPL. ≥80 hrs./week |
| Interior 4-Foot 3-Lamp T12/T8 Fixture to DLC Qualified LED 2x4 Fixture | $60 | $30 | Decreased Incentive. DLC approved LED Fixtures only. ≥80 hrs./week |
| Interior 4-Foot 3-Lamp T12/T8 Fixture to 2-Lamp HP T8 Fixture or Retrofit Kit | $15 | $30 | Increased Incentive. T8's must use HP T8's and 25-28 watt Lamps. HP T8's go to www.cee1.org for QPL. ≥80 hrs./week |

| Lighting | 2015 Incentive | 2016 Incentive | Program Changes |
|---|---|---|---|
| Interior 4-Foot 2-Lamp T12/T8 Fixture to 1-Lamp HP T8 Fixture or Retrofit Kit | $13 | $20 | Increased Incentive. T8's must use HP T8's and 25-28 watt Lamps. HP T8's go to www.cee1.org for QPL. ≥80 hrs./week |
| Interior 4-Foot 2-Lamp T12/T8 Fixture to DLC Qualified LED 2x4 Fixture | Site Specific | $20 | Added to Form. DLC approved LED Fixtures only. ≥80 hrs./week |
| Interior 4-Foot T12/T8 Lamps to TLED's- DLC Qualified 8-15 watt TLED Lamps only | Site Specific | $15 | Added to Form. DLC approved TLED Lamps only. TLED Types A, B, C and D. |
| Interior 4-Foot T12/T8 Lamps to TLED's- DLC Qualified 16-23 watt TLED Lamps only | Site Specific | $10 | Added to Form. DLC approved TLED Lamps only. TLED Types A, B, C and D can be used. |
| Interior 8-Foot 4-Lamp T12/T8 Fixture to 8-Foot 4-Lamp or 4-Foot 8-Lamp HP T8 Fixture | $54 | $0 | Discontinued from the Incentive form. Can be evaluated Site Specifically. |
| Interior 8-Foot 2-Lamp T12/T8 Fixture to DLC Qualified LED 2x4 Fixture | $80 | $50 | Decreased Incentive. DLC approved LED Fixtures only. ≥80 hrs./week |
| Interior 8-Foot 1-Lamp T12/T8 Fixture to DLC Qualified LED 1x4 Fixture | $40 | $20 | Decreased Incentive. DLC approved LED Fixtures only. ≥80 hrs./week |

The remaining sub-sections outline the nonresidential prescriptive and site specific program paths offered in 2016 and the 2016 Small Business program. The verified participation, incentives, energy savings, etc for each measure offered in the programs is outlined in Table 4-19 through Table 4-24.

### 4.3.2 Prescriptive Path

Prescriptive paths do not require pre-project contracting, as the site-specific program does, and thus lend themselves to streamlined administrative and marketing efforts. Incentives are established for these prescriptive programs by applying the incentive formula contained within Schedules 90 and 190 to a prototypical installation. Actual costs and savings are tracked, reported and available to the third-party impact evaluator. When applicable, the prescriptive measures utilize RTF unit energy savings. See Table 4-19 and Table 4-20 for 2016 first-year program participation, incentives received, and savings achieved.

### 4.3.3 Site Specific Path

Site specific is the most comprehensive offering of the nonresidential segment. Avista's Account Executives work with nonresidential customers to provide assistance in identifying energy efficiency opportunities. Customers receive technical assistance in determining potential energy and cost savings as well as identifying and estimating incentives for participation. Site specific incentives are capped at seventy percent of the incremental project cost for all projects with simple paybacks of less than 15 years. All projects must have a measure life of 10 years or more. Site specific projects include appliances, compressed air, HVAC, industrial process, motors (non-prescriptive), shell and lighting, with the majority being HVAC, lighting and shell.

See Table 4-21 and Table 4-22 for 2016 first-year program participation, incentives received, and savings achieved.

### 4.3.4 Small Business Program

The Small Business (SB) program is administered by SBW consulting and is a direct installation/audit program providing customer energy-efficiency opportunities by: (1) directly installing appropriate energy-saving measures at each target site, (2) conducting a brief on-site audit to identify customer opportunities and interest in existing Avista programs, and (3) providing materials and contact information so that customers are able to follow up with additional energy efficiency measures under existing programs. This program is only available to customers who receive electric and/or natural gas service under Rate Schedule 11 in Washington and Idaho. Schedule 11 customers typically use less than 250,000 kWh per year. See Table 4-23 and Table 4-24 for 2016 first-year program participation, incentives received, and savings achieved.

Direct-install measures include:

- Faucet aerators
- Showerheads
- Pre-rinse spray valves
- Screw-in LED's
- Smart power strips
- CoolerMisers
- VendingMisers

### 4.3.5 Prescriptive Lighting Adjustment to Reported Savings

The evaluation team conducted document reviews and onsite verification activities on a sample of 2016 nonresidential projects. Based on these activities, the evaluation team calculated an interim realization rate of 71% for the prescriptive lighting measures. One of the factors behind this realization rate is based on the evaluation team's review of TLED measures incented in the 2016 program year.

Specifically, in the 2016 program year, Avista offered two prescriptive lighting measures for TLEDs:

- 1-Lamp T12/T8 Fixture to 1-Lamp LED 8W to 15W, incentivized at $15 per lamp
- 1-Lamp T12/T8 Fixture to 1-Lamp LED 16W to 23W, incentivized at $10 per lamp

As early project applications were submitted, Avista became aware that TLED lamps were labeled under a lower wattage than their DLC product specifications. TLED lamps were found in the market with a labeled wattage of 14-15W, while the Design Lights Consortium (DLC) testing indicated that these lamps consume 17-18W. The evaluation team believes that this

discrepancy is because TLED lamp power consumption is subject to different ballast configurations. Thus, a TLED in a low ballast factor (LBF) ballast may only consume 14W, but in a normal ballast factor (NBF) ballast, the same lamp uses 17W. The DLC maintains performance data for its certified lamps as tested with a 0.89 ballast factor.

An issue was identified where program guidelines required DLC listed lamps and customers were selecting lamps based on the DLC listing. Early on in 2016 some customers who installed DLC listed lamps were paid a lower incentive based on the DLC listed wattage rather than the lamp labeled wattage. Avista agreed that this could be confusing to customers who met the written program requirements of installing DLC listed lamps and applied for incentives based on the lamp's listed wattage. Avista clarified that customers should be paid based on the wattage printed on the lamp packaging. Avista communicated clarifications to customers and vendors regarding measure eligibility recognizing that some DLC listed TLEDs may have the same wattage on both the TLED lamp and packaging as well as the DLC listed wattage and some may differ. This potential delta along with other energy savings data such as hours of use would be evaluated by the evaluation team.

After the 2016 year had ended, the evaluation team applied a realization rate to the total savings associated with these measures. Because Avista has adjusted the savings associated with this measure for the 2017 program year, the evaluation team believes that the final realization rate for the 2016-2017 evaluation period will increase. In addition, the measure category remains cost-effective on a Total Resource Cost (TRC) basis with the application of the 71% realization rate for the 2016 program year.

## Table 4-19: 2016 WA Electric Nonresidential Prescriptive Measures Summary[13]

| Measure | Project Count | Incentives | kWh Savings | Therms Savings | kWh Avoided Costs | Therms Avoided Cost | Non-Energy Benefits | Customer Incremental Costs | Non-Incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| PSC Lighting Exterior | 295 | $615,796 | 3,372,743 | - | $1,440,711 | $0 | $58,083 | $1,559,816 | $97,293 |
| PSC Lighting Interior | 1,134 | $6,143,532 | 25,590,010 | - | $14,948,321 | $0 | $567,231 | $7,359,884 | $1,009,476 |
| PSC Insulation | 10 | $693 | 7,674 | - | $5,154 | $0 | $0 | $3,124 | $348 |
| PSC Food Service Equipment | 36 | $7,685 | 72,029 | - | $24,549 | $0 | $0 | $217,474 | $1,658 |
| PSC Green Motors Rewind | 9 | $3,350 | 33,651 | - | $10,772 | $0 | $0 | $59,760 | $727 |
| PSC Motor Controls HVAC | 6 | $16,900 | 140,890 | - | $70,624 | $0 | $0 | $95,883 | $4,769 |
| ESG PSC Case Lighting | 63 | $137,149 | 862,310 | - | $208,194 | $0 | $0 | $185,558 | $22,485 |
| ESG PSC Cases | 4 | $20,631 | 228,026 | - | $353,537 | $0 | $0 | $57,698 | $23,875 |
| ESG PSC Controls | 9 | $27,146 | 151,659 | - | $71,029 | $0 | $0 | $76,540 | $4,797 |
| ESG PSC Motors | 6 | $5,320 | 55,404 | - | $25,989 | $0 | $0 | $5,639 | $1,755 |
| PSC Fleet Heat | 2 | $841 | 16,000 | - | $5,184 | $0 | $0 | $1,041 | $350 |
| AirGuardian | 3 | $6,176 | 25,735 | - | $8,762 | $0 | $0 | $6,176 | $592 |
| **Total** | **1,577** | **$6,985,220** | **30,556,130** | **-** | **$17,172,827** | **$0** | **$625,314** | **$9,628,593** | **$1,168,124** |

[13] All kWh and therm values reported in this table are gross, excluding the effect of applicable NTG ratios.

## Table 4-20: 2016 WA Natural Gas Nonresidential Prescriptive Measures Summary[14]

| Measure | Project Count | Incentives | kWh Savings | Therms Savings | kWh Avoided Costs | Therms Avoided Cost | Non-Energy Benefits | Customer Incremental Costs | Non-Incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| PSC Food Service Equipment | 56 | $72,477 | - | 36,786 | $0 | $164,051 | $0 | $312,269 | $36,477 |
| PSC Commercial HVAC | 39 | $39,406 | - | 18,057 | $0 | $102,322 | $0 | $529,732 | $22,752 |
| PSC Insulation | 12 | $12,724 | - | 7,432 | $0 | $53,236 | $0 | $57,637 | $11,837 |
| ESG PSC Cases | 2 | $17,414 | - | 8,461 | $0 | $47,945 | $0 | $29,101 | $10,661 |
| **Total** | **109** | **$142,022** | **-** | **70,736** | **$0** | **$367,554** | **$0** | **$928,740** | **$81,727** |

[14] All kWh and therm values reported in this table are gross, excluding the effect of applicable NTG ratios.

## Table 4-21: 2016 WA Electric Nonresidential Site Specific Measures Summary[15]

| Measure | Project Count | Incentives | kWh Savings | Therms Savings | kWh Avoided Costs | Therms Avoided Cost | Non-Energy Benefits | Customer Incremental Costs | Non-Incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| SS HVAC Combined | 9 | $91,574 | 679,707 | - | $1,646,844 | $0 | $0 | $560,736 | $91,914 |
| SS Industrial Process | 6 | $73,017 | 477,332 | - | $1,381,163 | $0 | $0 | $278,208 | $77,086 |
| SS Lighting Exterior | 26 | $87,635 | 536,945 | - | $480,166 | $0 | $0 | $202,219 | $26,799 |
| SS Lighting Interior | 63 | $456,564 | 2,772,786 | - | $6,932,421 | $0 | $0 | $1,223,127 | $386,914 |
| SS Appliances | 2 | $6,958 | 61,424 | - | $30,229 | $0 | $0 | $47,707 | $1,687 |
| SS HVAC Heating | 2 | $4,549 | 21,885 | - | $14,431 | $0 | $0 | $193,736 | $805 |
| SS Multifamily Fuel Conversion | 6 | $632,085 | 805,779 | (36,109) | $319,219 | -$122,623 | $0 | $996,364 | $17,816 |
| SS Multifamily | 1 | $400 | 2,443 | - | $1,023 | $0 | $0 | $3,315 | $57 |
| SS Shell | 15 | $36,404 | 267,113 | - | $192,296 | $0 | $0 | $442,786 | $10,732 |
| ESG SS Case Doors | 2 | $10,495 | 120,191 | - | $291,927 | $0 | $0 | $80,374 | $16,293 |
| ESG SS Cases | 3 | $12,816 | 120,114 | - | $231,445 | $0 | $0 | $29,648 | $12,917 |
| ESG SS Lighting | 1 | $1,401 | 35,707 | - | $111,865 | $0 | $0 | $2,002 | $6,243 |
| **Total** | **136** | **$1,413,898** | **5,901,426** | **(36,109)** | **$11,633,028** | **-$122,623** | **$0** | **$4,060,222** | **$649,265** |

[15] All kWh and therm values reported in this table are gross, excluding the effect of applicable NTG ratios.

### Table 4-22: 2016 WA Gas Nonresidential Site Specific Measures Summary[16]

| Measure | Project Count | Incentives | kWh Savings | Therms Savings | kWh Avoided Costs | Therms Avoided Cost | Non-Energy Benefits | Customer Incremental Costs | Non-Incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| SS Appliances | 1 | $819 | - | 378 | $0 | $2,142 | $0 | $8,400 | $476 |
| SS HVAC Combined | 8 | $101,594 | - | 33,433 | $0 | $188,955 | $0 | $600,388 | $42,015 |
| SS HVAC Heating | 9 | $32,524 | - | 16,904 | $0 | $109,449 | $0 | $571,543 | $24,336 |
| SS Industrial Process | 1 | $11,884 | - | 6,303 | $0 | $35,717 | $0 | $26,668 | $7,942 |
| SS Shell | 11 | $14,194 | - | 5,106 | $0 | $37,118 | $0 | $160,266 | $8,253 |
| SS Lighting Interior | 1 | $1,376 | - | 709 | $0 | $3,804 | $0 | $4,928 | $846 |
| ESG SS Case Doors | 2 | $21,709 | - | 9,382 | $0 | $53,164 | $0 | $183,827 | $11,821 |
| ESG SS Cases | 2 | $1,543 | - | 1,430 | $0 | $8,043 | $0 | $6,233 | $1,788 |
| **Total** | **35** | **$185,643** | **-** | **73,645** | **$0** | **$438,392** | **$0** | **$1,562,253** | **$97,478** |

### Table 4-23: 2016 WA Electric Nonresidential Small Business Summary[16]

| Measure | Project Count | Incentives | kWh Savings | Therms Savings | kWh Avoided Costs | Therms Avoided Cost | Non-Energy Benefits | Customer Incremental Costs | Non-Incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| SB Appliances | 786 | $124,212 | 370,393 | - | $80,361 | $0 | $0 | $124,212 | $4,485 |
| SB Lighting | 9,842 | $217,163 | 875,198 | - | $540,576 | $0 | $0 | $217,163 | $30,171 |
| SB Audit | 6,148 | $155,774 | - | - | $0 | $0 | $0 | $155,774 | $0 |
| **Total** | **16,776** | **497,149** | **1,245,591** | **-** | **$620,938** | **$0** | **$0** | **$497,149** | **$34,656** |

## Table 4-24: 2016 WA Gas Nonresidential Small Business Measures Summary[16]

| Measure | Project Count | Incentives | kWh Savings | Therms Savings | kWh Avoided Costs | Therms Avoided Cost | Non-Energy Benefits | Customer Incremental Costs | Non-Incentive Utility Costs |
|---|---|---|---|---|---|---|---|---|---|
| SS Water Heat | 3,664 | $32,964 | 523,210 | 17,994 | $133,649 | $54,624 | $0 | $34,968 | $12,146 |
| **Total** | **3,664** | **$32,964** | **523,210** | **17,994** | **$133,649** | **$54,624** | **$0** | **$34,968** | **$12,146** |

[16] All kWh and therm values reported in this table are gross, excluding the effect of applicable NTG ratios.

### 4.3.6 Non-Residential Trend Analysis[17]

During 2016, total non-residential savings increased by 95% from the previous year with the total savings increasing from 19,595,084 kWh in 2015 to 38,226,357 kWh in 2016 (18,631,273 kWh change). The largest contributor to the overall savings for 2016 was a result of the company's prescriptive interior lighting program which obtained 25,590,010 kWh or 67% of overall non-residential savings.

Figure 4-5 below summarizes the savings achieved for the 2014-2016 annual periods highlighting Non-Residential Lighting's impact on overall savings. Note that the amounts for Prescriptive Interior Lighting have been adjusted as per the discussion in section 4.3.3.

As compared to the prior years' results, the 2016 prescriptive interior lighting program obtained ten times the amount of savings it obtained in the prior two years. This is largely due to the increase in customer adoption of TLEDs. For 2015, Avista obtained 2,306,243 kWh of savings and 2,130,153 kWh of savings in 2014. These amounts are represented by the yellow bars in Figure 4-5.

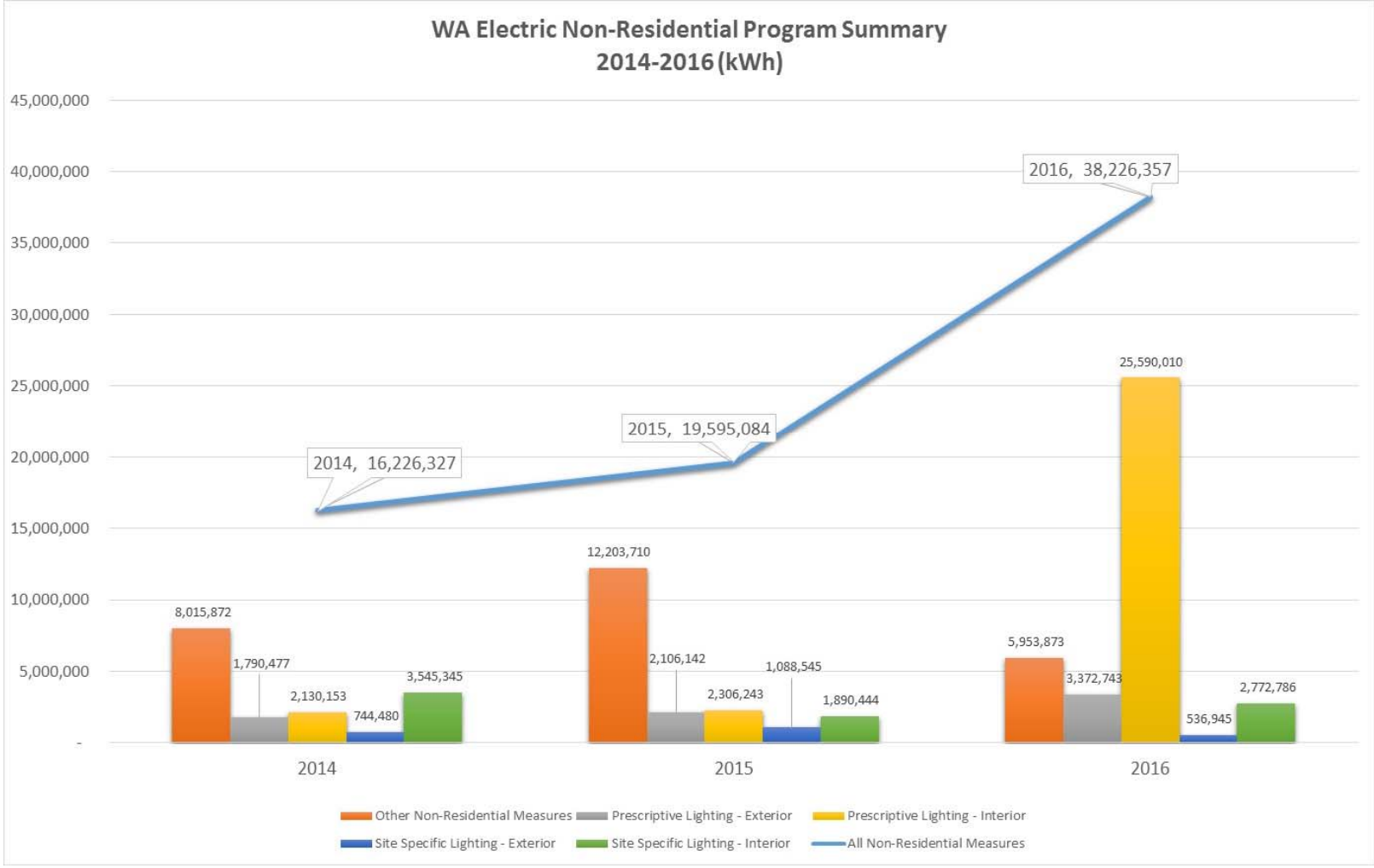
Other Non-Residential Measures, which are identified in Figure 4-5 by the orange bars, make up 33% of the overall savings. These amounts realized a 51% decrease going from 12,203,710 kWh in 2015 to 5,953,873 kWh in 2016. The individual programs and measures included in other programs for 2016 include Small Business Lighting (875,198 kWh), Energy Star Grocers Prescriptive Case Lighting (862,310 kWh), Site Specific Multifamily Fuel Conversions (805,779 kWh) and Site Specific HVAC Combined (679,707 kWh).

In 2015, the largest contributors to this category included Site Specific HVAC Combined (3,841,100 kWh), Site Specific Industrial Process (2,253,867 kWh), and Site Specific Energy Smart – Industrial (788,517 kWh). For 2014, the largest contributors were Site Specific HVAC Combined (2,078,792 kWh), Site Specific Industrial Process (2,928,361 kWh) and Prescriptive Energy Smart – Case Lighting (753,714 kWh).

The amount of conservation derived from these Other Non-Residential Measures decreased in 2016. However, in Avista's experience, market trends in their service territory suggest that customers focused heavily on lighting installations in 2016 versus other capital investments.

17 For the purpose of comparing the 2014-2016 trend analysis data, please note that the savings numbers for 2014 are unverified gross, 2015 is verified gross, and 2016 is adjusted reported gross.

## Figure 4-5: Washington Electric Non-Residential Trend Analysis[18]




18 Please note that the savings numbers for 2014 are unverified gross, 2015 is verified gross, and 2016 is adjusted reported gross.

# 5 Evaluation, Measurement, and Verification (EM&V)

Nexant, Inc., in partnership with Research Into Action, (the evaluation team) was retained as the Company's external evaluator to independently measure and verify the portfolio energy savings for the 2016-2017 biennium period.

The following sections outline the major recommendations from the impact and process evaluation reports completed for the 2014-2015 portfolio of programs and notes what changes were made to the 2016-2017 Avista programs as a result of these evaluations.

## 5.1 Process Evaluation Summary

Conclusions and recommendations from Avista's 2014-2015 process evaluation[19] report and subsequent implementation actions taken by Avista are summarized below.

### 5.1.1 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:

[19] Avista 2012-2013 Process Evaluation Report, The Cadmus Group, Inc., May 15, 2014.

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 via events for contractors, such as local trade association meetings, to further educate contractors and nudge them to cross-promote the rebate programs to their customers. Additionally, training can help contractors up-sell high efficiency equipment through the program by improving their understanding of and ability to sell high efficiency solutions. For example, Avista could support contractors attending NEEA's 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.

   ***Status*:** We have in the past offered quarterly updates to contractors and attempted to further engage them. There was limited engagement in the additional events and we have focused on 1-2 per year with high engagement at outreach early in the year where we reiterate program guidelines, updates and changes. We have established a web page for contractors where they can go for reference materials. We have broadened our communication of program changes sending both HVAC and Electrical (Lighting) as well as residential and non-residential in order to avoid gaps in communicating with contractors. We have discussed co-op marketing opportunities and are evaluating such opportunities with internal stakeholders.

   Some other outreach efforts include our Questline newsletter which is available to businesses and vendors alike. It provides regular updates on energy related issues and Avista programs. Our commercial and industrial outreach has centered on case studies that provide customers and vendors a starting point for proposing energy efficiency measures. We have also underwritten vendor training and are active in related groups like BOMA and NEEA lighting efforts.

**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.***

***Status*:** Avista continues to cross-promote additional programs in our small business effort where we emphasize additional opportunities and have seen additional throughput. Work with marketing as they evaluate Customer Relationship Management (CRM) software solutions that can enable us to track customer participation in different programs and cross-promote additional offerings. We also continue to utilize our existing direct mail channels such as the customer newsletter and bill inserts.

***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.***

***Status*:** In 2014 and 2015 we utilized direct mail to promote our electric to natural gas conversion rebate. In 2016, energy efficiency was included via direct mail in our Connections customer newsletter as part of our, "Efficiencies Matter" and "Way to Save" Campaigns; we also utilize bill inserts to extend our message as appropriate.

### 5.1.2 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.[20] 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

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

performance. Avista could begin by targeting businesses that the Small Business Program has identified as still having T12s.

> ***Status*:** Currently, Avista has prescriptive incentives for electric commercial customers for replacing T12's or T8 lamps with Tubular LEDs (TLEDs). To replace T12 lamps with TLEDs, the customer will need to replace the T12 ballast with a LED driver or a ballast that supports the TLED lamp. This incentive is extremely popular and does not require additional marketing, at this time. Lighting contractors have been heavily marketing these incentives and numerous customers are changing out their lamps. Avista also has prescriptive commercial lighting incentives for replacing T12's Fixtures with new or retrofit High Performance T8 (using low wattage T8 lamps-25 or 28 watt) or DLC qualified LED fixtures. It was found to be cost effective only for lighting with run times greater than 80 hours per week. This limits the business marketing audience-electric commercial customer that would qualify for this incentive. Target marketing only to the business customer that qualifies would be difficult.
>
> It is believed that many customers with existing T12's fixtures are most likely rate Schedule 11's. Avista currently has a Small Business program that is treating those customers and cross-promoting other opportunities like lighting. Avista is also piloting additional lighting (T12 replacements) for this customer segment as an expansion of the current program.
>
> Questline Newsletter is another avenue to let Avista electric commercial customers know about Avista's incentives for T12 conversions and other energy efficient lighting incentives.

***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.

> ***Status*:** Avista currently markets to lighting vendors through Avista Commercial Lighting update newsletters and vendor outreach workshops about the T12 lamp conversions. The lighting vendors and contractors have been responsive and market the T12/T8 lamp replacement to TLED lamp conversions and many customers are taking advantage of the incentives.

***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.

> ***Status*:** This was considered but upon further review we chose to continue to just use the RTF UES even if it might be slightly conservative given some longer runtime commercial applications.

### 5.1.3 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,[21] retailers are transitioning away from CFLs to LEDs,[22] and the federal government and regulators are mandating higher efficiency standards for bulbs and other energy efficient technologies.[23] 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,[24] and The Northwest Power and

[21] 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

[22] 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/

[23] 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.

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

Conservation Council has identified both of these measure types as promising technologies in the recently adopted Seventh Power Plan.[25]

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.[26]

   ***Status*:** The business planning process includes an annual review of expected savings and cost-effectiveness for residential measures. We ensured that ductless heat pumps and heat pump water heating technologies received additional review as we didn't currently have incentives. We are planning incentives for both in 2017. Also we have added upstream buydown opportunities for water heating savings in both low flow showerheads and clothes washers.

**Conclusion: 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.[27]

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.

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

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

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

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.

***Status*:** Renters are a difficult market due to the split incentive issue where landlords are hesitant to make capital improvements where the return is to the renter rather themselves. Our billing system does not have the ability to break down customers by single family, manufactured home and multifamily. There are some manual analysis that could be done to query customers with landlord agreements but it is a manual process at this time. We have worked with renters who inquire about energy efficiency programs and have had some success with certain programs, like electric to natural gas conversions where landlords have taken advantage of rebates that currently cover a significant portion of the retrofit and while the energy savings accrue to the renter it's an obvious and lower than otherwise out of pocket improvement to the property.

We also tailor our outreach efforts with our energy fairs and mobile outreach to include low-cost improvements that most renters can do within their rental agreement such as rope-caulk, window kits and v-seal.

## 5.2 Impact Evaluation Summary

### 5.2.1 Nonresidential Programs

#### 5.2.1.1 Site Specific Program

**Conclusion**: The Site Specific program constitutes more than 60% of the program electric energy shares. Within the last 2 years, Avista has increased their level of quality assurance and review on projects that participate through the program. The evaluation team's analysis resulted in a 99% realization rate for the Site Specific program. The strong realization rate indicates that Avista's internal process for project review, savings estimation, and installation verification are working to produce high quality estimates of project impacts.

**Recommendation**: The evaluation team recommends that Avista continue to operate this program with the current level of rigor. For interior lighting projects, Avista should consider applying the interactive factors deemed by the RTF to quantify the interactive effects between lighting retrofits and their associated HVAC systems. More specifically, for interior lighting projects, Avista assumes a standard interactive factor of 7.7% for buildings with air conditioning. The RTF's values for interactive factors vary depending on heating and cooling system types and building type. For some building types, especially those that tend to participate in the Site Specific program, the RTF's interactive factors are higher than Avista's factor.

> ***Status*:** We are in the process of changing our interactive effect values for both prescriptive lighting and site specific lighting. The RTF updated values in March 2016 and those will be reflected in our documents by November 1, 2016. As of March 17, 2017, the above described status update has been carried out.

**Recommendation**: While the impact from the Commercial Windows and Insulation measures under the Site Specific program are minimal, Avista should further review its algorithm for cooling season savings achieved by window replacements. The algorithm that Avista currently uses may be overstating the impacts of these replacements on air condition energy consumption.

***Status*:** We changed the cooling impact to match the evaluation team's estimates.

**Conclusion**: The Site Specific program constitutes more than 80% of the program natural gas energy shares. Within the last 2 years, Avista has increased their level of quality assurance and review on projects that participate through the program. The evaluation team's analysis resulted in an 86% realization rate for the Site Specific program.

**Recommendation**: The evaluation team recommends that Avista incentivize more of the larger, high impact natural gas projects under its 'performance path' processes. Natural gas projects are more often suited to performance verification via utility billing analysis than their electric counterparts because fewer building end uses are served by natural gas. Incentivizing projects based on proven performance would mitigate the inherent uncertainty in savings estimates generated prior to project installation and improve Avista's realization rate for this program.

***Status*:** While we understand that performance measurement will make for better realization rates, we are unsure of the impact on savings making customers wait 6-15 months for payment would cause. Because of this we will wait for the 2016 impact reports to made a decision on what to put in performance of the gas projects.

#### 5.2.1.2 Prescriptive Lighting Program

**Conclusion**: The Prescriptive Lighting program is the second largest program in Avista's nonresidential portfolio, constituting more than 20% of the energy savings. The evaluation team's analysis resulted in a 99% realization rate for the Prescriptive Lighting program, indicating that Avista's reported energy savings for this program are accurate.

**Recommendation**: The evaluation team recommends that Avista continue to operate this program with the current level of rigor. Avista should consider applying the interactive factors deemed by the RTF to quantify the interactive effects between interior lighting retrofits and their associated HVAC systems. More specifically, for interior lighting projects, Avista assumes a standard interactive factor of 7.7% for buildings with air conditioning. The RTF's values for interactive factors vary depending on heating and cooling system types and building type. For some building types, especially those that tend to participate in the Site Specific program, the RTF's interactive factors are higher than Avista's factor.

***Status*:** See answer above in 5.2.1.1

#### 5.2.1.3 Natural Gas Prescriptive Programs

**Conclusion**: Avista reported participation in four prescriptive natural gas programs in 2014-2015: Food Service Equipment, Commercial Windows & Insulation, Natural Gas HVAC, and

Commercial Water Heaters. Strong realizations rates for each of these programs indicate that the Avista's deemed savings estimates for these measures are accurate and appropriate.

**Recommendation**: The evaluation team recommends that Avista continue to operate these programs with the current level of rigor.

> ***Status*:** We appreciate the evaluation and we will continue the programs in the same manner we currently operate them.

#### 5.2.1.4 EnergySmart Grocer Program

**Conclusion**: Avista's EnergySmart Grocer program is successfully providing retail and restaurant customers with an avenue to upgrade their refrigeration equipment. Participation in the program includes both prescriptive and custom projects. The evaluation team's review of projects in the program resulted in a realization rate of 90%. For prescriptive projects, the evaluation team determined that RTF deemed savings values were being appropriately applied in most cases. However, low project-level realization rates for custom projects, which tend to be larger in size than prescriptive projects, are driving the program realization rate downward.

**Recommendation**: Avista should consider more internal review of energy savings estimates submitted by vendors for custom projects under this program. Alternatively, Avista could consider tracking custom projects under the Site Specific program with other projects of similar size and complexity.

> ***Status***: In 2016, we began treating EnergySmart Grocer Site Specific measures the same way we treat our own.

#### 5.2.1.5 Electric Prescriptive Non-Lighting Other Programs

**Conclusion**: Avista reported 2014-2015 participation in six other prescriptive programs. Of these, the HVAC Motor Controls program is the largest, constituting 65% of the energy savings for this group. The evaluation team's review of projects in these programs resulted in a 54% realization rate. Cases of ineligible VFD projects receiving incentives were cause of the low realization rate for these programs.

**Recommendation**: Avista should revise the HVAC Motor Controls program to include more verification of motor eligibility status. More emphasis should be placed on confirming motor application and duty status to ensure compliance with the program's existing eligibility requirements. More specifically, Avista should place specific emphasis on ensuring VFDs are installed in a manner that saves energy (i.e. not just as "soft starters") and that incentivized VFDs serve primary-duty motors.

> ***Status*:** To address this issue the VFD incentive application now includes two additional check boxes stating "VFD is for control and not for a soft start" and "There are not 2 VFD's on the same fluid flow system."

#### 5.2.1.6 Small Business Program

**Conclusion**: Reported savings for faucet aerators were found to be conservatively low based upon the evaluation team's secondary research. The realization rates for faucet aerators were 126% for electric savings and 204% for natural gas savings.

**Recommendation:** It is recommended that the modified deemed savings values utilized by the evaluation team be adopted by the program for future reporting purposes.

> ***Status*:** The modified deemed savings values have been updated and are included in the 2017 business plan.

**Conclusion:** The reported deemed savings value for pre-rinse spray valves associated with electric water heat was found to be slightly higher than the average determined through secondary research. The program is currently using a reported electric energy savings value of 1,338 kWh. The average saving values recommended by the evaluation team is approximately 1,229 kWh.

**Recommendation:** It is recommended that the electric deemed savings value reported by the evaluation team for the pre-rinse spray valve measure be utilized for future reporting purposes. No modifications are recommended for the deemed therm savings value currently being used by the program.

> ***Status*:** We have adjusted our average savings values.

**Conclusion:** Reported savings for faucet aerators were found to be conservatively low based upon our secondary research. The realization rate for faucet aerators was 204% for natural gas savings.

**Recommendation:** It is recommended that the modified deemed savings values utilized by the evaluation team in our adjusted savings analysis be adopted by the program for future reporting purposes.

> ***Status*: See answer above in 5.2.1.6**

### 5.2.2 Residential Programs

The following subsections outline key conclusions and recommendations for several of the residential programs.

#### 5.2.2.1 Appliance Recycling

**Conclusion:** The evaluation team found that the reported deemed savings value (per recycled unit) for the program was lower than estimated gross savings valued from prior studies. Avista may have aligned their deemed savings values close to the RTF deemed savings values, but it is important to understand that the RTF is reporting a value that accounts for net market effects (i.e. free ridership).

**Recommendation**: If Avista choses to offer an appliance recycling program in the future, it is recommended that a clear distinction between gross and net savings values is noted if Avista reports the most current RTF values.

> ***Status*:** Avista discontinued its appliance recycling program in the middle of 2015 and is not planning on offering this program due to newer refrigerator and freezer vintages having greatly reduced savings.

**Conclusion:** The evaluation team found discrepancies when comparing Avista's reported participation counts against the implementer reported values. The evaluation team believes that one reason for the discrepancies could be due to overlapping reporting periods and the way participants are reported and tracked.

**Recommendation**: Avista should consider tracking the customer account number in addition to the name/address. It would be easier to track account numbers back to billing database records than the name /address fields, which are easier misspelled, and often formatted differently.

> ***Status*:** See answer above in 5.2.2.1

#### 5.2.2.2 HVAC Program

**Conclusion:** The evaluation team found, through billing regression analysis, a relatively low realization rate for the Air Source Heat Pump measures (RR of 48.5%).

**Recommendation:** The evaluation team recommends Avista reexamine the assumptions relating to annual per-home consumption and savings estimates in homes receiving ASHP installations. In addition, to help better understand the baseline for the ASHP replacement, Avista could consider requesting that contractors and customers provide a better description of the replaced unit.

> ***Status*:** Previously, Avista had been using a figure from a previous evaluation and has since updated the value to match the RTF UES, which is more in line with the evaluated results. As a result high efficiency ASHPs were not cost-effective for 2016 and were discontinued. Customers may switch from electric straight resistance to either natural gas or an ASHP but the stand alone new or replacement HE ASHP is no longer available.

**Conclusion:** For the analysis of the Smart Thermostat measure, only five homes had sufficient post-retrofit billing data to estimate electric savings. Therefore, the evaluation team applied a 100% realization rate to the reported savings due to the small population.

**Recommendation:** Given the inconclusive analysis results for this measure driven by data limitations, the evaluation team recommends Avista revisit the analysis of this measure in late 2016 - early 2017 when a full year of post-installation billing data is available for several hundred rebate recipients.

> ***Status*:** We are revisiting this with the 2016 data.

**Conclusion**: During the desk review process, the evaluation team found that the installed efficiency for the majority of the furnace replacements was higher than the program minimum-required efficiency level, which resulted in a greater than 100% realization rate. The evaluation team was unable to determine a conclusive value for the baseline efficiency of the replaced furnaces based on project documentation review and the participant surveys.

**Recommendation**: The evaluation team recommends that Avista conduct a more in-depth study in order to better understand the baseline for the furnace replacement measure.

> ***Status*:** We believe that it is best to simply change our savings numbers to 100% to match what is taking place in the field.

**Conclusion:** The evaluation team found a realization of 85% for the Smart Thermostat measure for gas savings. The findings are based on the analysis of 34 homes, which resulted in a wide margin of error in the results.

**Recommendation:** Given that the realization rate relatively close to 100% with a wide margin of error, the evaluation team does not recommend any changes to Avista's default savings assumption of 41 therms per device. The evaluation team recommends Avista revisit the smart thermostat analysis in 2017 once several hundred participants have a full year of post-installation billing data available and the billing analysis is capable of producing a more precise estimate.

> ***Status*:** We will revisit this with the 2016 data.

**Recommendation**: Avista currently rebates smart thermostats from multiple vendors. Nest, Honeywell, and Ecobee are the primary vendors in this space and represented the majority of rebates in 2014-2015. One recent study in the Pacific Northwest[28] have found different levels of savings between thermostat vendors so Avista may want to consider segmenting subsequent analyses by product or even limiting the products that qualify for rebates.

> ***Status*:** We will wait until additional studies come out.

#### 5.2.2.3 Water Heat

**Conclusion:** For showerheads distributed through the Simple Steps program, Avista allocates 50% of its reported savings to electric savings and 50% to natural gas savings to account for homes that have different water heating fuel types.

**Recommendation:** The evaluation team recommends Avista update this allocation assumption to be based on representative water heater fuel type saturation. These data are available through the Regional Building Stock Assessment study; however, we recommend Avista base the allocation on data specific to its territory.

[28] http://assets.energytrust.org/api/assets/reports/Smart_Thermostat_Pilot_Evaluation-Final_wSR.pdf

***Status*:** Avista has decided to continue to utilize the RTF figure for any water heating retail showerheads, which is nearly a 50/50 split.

**Conclusion:** Currently Avista is providing incentives for both tankless and storage gas water heaters at the federal minimum efficiency level. It is recommended that Avista set a higher EF as a program qualification.

**Recommendation:** It is recommended that Avista revisit program requirements for water heaters to ensure that incentives are based on efficiency levels that are greater than the federal minimum.

***Status*:** There are significant savings to tankless gas water heaters (compared to storage models) and we have eliminated incentives for storage gas water heaters.

#### 5.2.2.4 ENERGY STAR® Homes

**Conclusion:** The evaluation team initially attempted to use a difference-in-means approach to estimate savings for the ENERGY STAR® Homes program. However, due to the small number of ENERGY STAR® Homes participants and absent any detailed characteristics of the homes (e.g. square footage, single- vs. multi-family, etc.) a reliable non-program comparison group could not be attained. Therefore, the evaluation team collected Home Energy Rating System (HERS) Index scores for participating ENERGY STAR® Homes wherever available to conduct the impact analysis.

**Recommendation:** As more participants enter the program, the evaluation team recommends again attempting a difference-in-means approach to estimating the savings for the program, if sufficient data is available.

***Status*:** The ENERGY STAR Homes program leverages regional savings estimates, but Avista agrees with Nexant's approach to change their evaluation.

**Recommendation:** To aid future evaluation efforts, the evaluation team recommends including the HERS scores in the program tracking documents. In addition, for stick-built ENERGY STAR homes, application forms could ask for the RESNET Registry ID, which is now assigned as part of RESNET Archival of all HERS Rated or ENERGY STAR homes. This will ensure that the home has been certified third party and is recognized by RESNET, the certifying agency for ENERGY STAR.

***Status*:** This is a regional program effort and there are additional data points available that we could provide access to.

#### 5.2.2.5 Fuel Efficiency

**Conclusion**: The evaluation team conducted a billing regression analysis for the Fuel Efficiency participants and found realization rates of 60-70% for rebate projects that included the conversion of a home's heating system from electricity to natural gas. When regression coefficients were examined in detail, the evaluation team noted that the estimated reduction in

electric heating load was being offset by an increase in estimated base load within participating homes.

**Recommendation**: Because the rebate amounts and per-home savings from Fuel Efficiency are so large and the number of participants is relatively low, the evaluation team recommends Avista ask participating customers for details on any additional home renovations that were completed in parallel with the fuel conversion. Home improvement projects such as an addition, finishing a basement, or adding air conditioning can drastically change the consumption patterns within a home and render the assumed baseline inaccurate.

> ***Status***: Avista concurs with the findings and has chosen to utilize the newly evaluated fuel efficiency numbers for future program design. Interestingly a previous impact analysis found higher realization rates that resulted in the lock UES used most recently. The impact analysis aligns with anecdotal feedback from customers that the higher incentive is helping reach customers with less usage and shortening their payback to successfully encourage them to convert.

**Conclusion**: The evaluation team found that over half the homes receiving Fuel Efficiency rebates in 2014-2015 did not have a gas billing history with Avista prior to the conversion. These homes realized savings at a higher rate than homes that did have previous gas service.

**Recommendation**: The evaluation team recommends that Avista consider adding a field to the program tracking database that indicates the gas meter installation date or service start date of participating homes. This would more clearly delineate homes that were previously all electric and became dual-fuel around the same time as the Fuel Efficiency project, from homes that had been dual-fuel historically. Avista may also want to consider assuming a more conservative electric savings estimate for homes that had prior gas service because it's possible that the home was not 100% electrically heated prior to program participation.

> ***Status***: While the database may not be able to track the additional data points, Avista will look for opportunities to track and/or communicate greater detail for evaluation. Avista has chosen to utilize the newly evaluated fuel efficiency number for future program design.

**Conclusion**: The evaluation team found that almost half of all (ID and WA) Fuel Efficiency participants also received rebates for the installation of high efficiency natural gas equipment. This trend was limited to Washington as Idaho does not have rebates for high efficiency natural gas furnaces and water heaters.

**Recommendation**: Separating the upgrade of a home's heating system from electric resistance heat to a high efficiency natural gas furnace creates some accounting challenges that Avista way want to streamline in the future. The fuel conversion measure assumes the home installs a standard efficiency natural gas furnace and savings are calculated accordingly. The high efficiency furnace measure offered through Avista's HVAC program uses a standard efficiency furnace as the baseline and the installed high efficiency furnace as the efficient case. This

creates challenges for analysis of energy savings because the standard efficiency furnace never existed in over half of Washington homes. A possible solution would be to require that homes install a high efficiency furnace in order to receive a Fuel Efficiency rebate and consider the upgrade a single transaction rather than two. Specifically, instead of claiming a 500 therm penalty for the Fuel Efficiency measure and 100 therms of savings from the high efficiency furnace measure, Avista could claim the electric savings and a 400 therm penalty for an electric -> HE furnace measure.

> ***Status*:** Combining these would create regulatory accounting issues as the conversion incentive is an electric tariff and the high efficiency furnace is a natural gas tariff. The issue is the natural gas interactive effects of the conversion is an electric portfolio cost not a natural gas portfolio issue.

#### 5.2.2.6 Residential Lighting

**Conclusion:** Avista's deemed savings estimates, which were generally the same for all similar product types and not correlated to the bulb wattage, understated the savings found by the evaluation team. This was especially the case for Avista's CFL giveaway program.

**Recommendation:** The evaluation team recommends that Avista consider more detailed product type deemed values in an effort to be more closely aligned with the actual participating lamps. Simple Steps has shifted its program tracking to specific product types by lumen bins in accordance with the most current BPA UES measure list. Avista should consider using these higher resolution deemed value for internal reporting with the Simple Steps program and for use with internal residential lighting programs.

> ***Status*:** Avista will shift its Simple Steps tracking to align with the most recent RTF UES.

#### 5.2.2.7 Shell Program

**Conclusion:** The evaluation team found a low realization rate (38%) for shell rebate measures (windows and insulation). This findings indicates that reported savings values were too aggressive on average. The evaluation team compared the end-use shares estimated via regression analysis and found that only approximately 5,500 of the 13,000 kWh of average annual consumption in residential homes in Avista's service territory was assigned to heating and cooling load. Given this end-use share, the reported savings values claimed by Avista equate to a 25% reduction in HVAC loads.

**Recommendation:** The evaluation team recommends Avista examine planning assumptions about per-home consumption, end-use load shares, and percent reductions in heating and cooling loads from shell improvements. It may be that the percent reduction assumptions are sound, but they are being applied to an overstated assumption of the average electric HVAC consumption per home. Conversely, the assumed end-use shares may be accurate, but the end-use reduction percentage is inflated. This investigation should be conducted separately for electrically heated homes and dual fuel homes as the heating electric end-use share will be different.

***Status*:** Avista had been using older RTF numbers that corresponded to the time of the Conservation Potential Assessment. The current business plan is utilizing the most recent RTF numbers.

**Recommendation:** The evaluation team recommends Avista look at any recent saturation studies or end-use load research findings to see if there is a general shift in base load gas use that could potentially harm the savings from the Shell improvements when analyzed at the whole house level.

***Status*:** We will be using the RTFs SEEM values for estimating home loads.

#### 5.2.2.8 Opower Program

**Conclusion:** The evaluation team found that savings held fairly consistent during the 6 month interruption in Home Energy Report delivery. The finding reinforces Avista's decision to assume a multi-year measure life when calculating the cost-effectiveness of the Opower program.

**Recommendation:** The evaluation team recommends Avista examine the program delivery model in the 2016-2017 cycle. Given the fixed and volumetric nature of program costs, measure life assumptions, and mechanisms by which measured savings are counted toward goal achievement the evaluation team believes there are alternatives to the traditional delivery model that optimize program achievements relative to costs.

***Status*:** Avista will continue to utilize the same design for the 2016-2017 Home Energy Reports program, but will be looking at all options of Behavioral Program designs for 2018-2019.

#### 5.2.2.9 Low Income Program

**Conclusion:** The evaluation team found a high realization rate for the fuel conversion measures implemented through the Low Income program. One reason for the high RR could be due to the fact that Avista caps the reported savings value to 20% of the contractor estimated savings. In addition, the evaluation team found that the verified savings for these fuel conversion measures aligned closely with the verified savings found through the regular-income Fuel Conversion program.

**Recommendation:** The evaluation team recommends re-evaluating the current savings cap for fuel conversion projects. In addition, we recommend that Avista align assumptions for fuel switching savings for the Low Income and Fuel Efficiency programs.

***Status*:** Avista is re-evaluating the cap for low income savings claim. Based on past impact analysis savings were capped at 20% of the home. There should be a distinction between a cap for weatherization and conversions where savings could exceed 20%.

**Conclusion:** The verified savings for the gas conservation homes was very consistent with Avista's reported savings with a realization rate of 101%. Similar to the electric low-income fuel conversion findings, it appears that Avista's reported estimates of gas penalties from fuel conversion are understated, with the realization rate for the fuel conversion participants at over

400%. Although this result led to a significant adjustment in the low-income program, it is important to note that the verified savings results are similar to Avista's reported gas penalty in the Fuel Efficiency program on a per-home basis.

**Recommendation:** The evaluation team recommends that Avista align assumptions for fuel switching penalty savings for the Low Income and Fuel Efficiency programs.

***Status*:** We are no longer capping conversion savings estimates.

# 6 Generation and Distribution Efficiency

## 6.1 Generation

Avista completed a facility wide LED lighting retrofit at its Cabinet Gorge Hydro Electric Facility in 2016. The electrical system overall annual savings are 584 MWh of which 384 MWh are attributed to Washington.

## 6.2 Distribution

During 2016, Avista's Grid Modernization Team completed an upgrade of one Washington feeder with annual savings of 176 MWh.

The completion of the feeder upgrade is part of the continued Avista Distribution System Efficiencies Program that started in 2009. The program targets distribution efficiency by reconductoring smaller conductors with higher resistances to lower resistance larger conductors, replacing old transformers with high no-load losses to newer more efficient transformers, reducing the lengths of secondary districts and through VAR compensation.

Also in 2016, Avista's LED Change-Out Program successfully converted 8,096 High-Pressure Sodium (HPS) streetlights to Light Emitting Diode (LED) technology, resulting in an energy savings of 7.77 MWh in Washington and 1.99 MWh in Idaho.

Avista manages streetlights for many local and state government entities to provide street, sidewalk, and/or highway illumination for their streets by installing overhead streetlights. The primary driver for converting overhead streetlights from HPS lights to LED lights is the significant improvement in energy savings, lighting quality to customers, and resource cost savings. In all, the five year program will change out over 28,000 streetlights by end of 2019.

# 7 Regional Market Transformation

Avista's local energy efficiency portfolio consists of programs and supporting infrastructure designed to enhance and accelerate the saturation of energy efficiency measures through a combination of financial incentives, technical assistance, program outreach and education. It is not feasible for Avista to independently have a meaningful impact upon regional or national markets.

Consequently, utilities within the northwest have cooperatively worked together through the Northwest Energy Efficiency Alliance (NEEA) to address those opportunities that are beyond the ability or reach of individual utilities. Avista has been participating in and funding NEEA since the 1997 founding of the organization.

Table 7-1 show the NEEA forecast savings vs. actual savings and the associated costs.

**Table 7-1: NEEA Forecast vs Preliminary Actual Savings and Associated Costs for Avista**

| Fuel Type | Energy Savings 2016 Forecast | Energy Savings 2016 Draft-Final Reported (as of 03/01/2017) | 2016 Costs (as of 12/31/2016) |
|---|---|---|---|
| Electric | 1,945 MWh | 5,028 MWh | $1,384,907 |
| Natural Gas | n/a | n/a | $204,600 |

## 7.1 Avista Electric Energy Savings Share

All figures provided represent the amounts that are allocated to Avista service territory, either based on site-based energy savings data available or allocation of savings or spend based on funding share. Funding share for Avista varies by funding cycle. The funding allocation for Avista for 2016 is 4.03%.

NEEA is in process of finalizing the 2016 energy savings for all funders. The value provided above for 2016 Draft Annual Report is a draft figure and may change slightly with the final report that will be provided in May, 2017.

## 7.2 Avista Natural Gas Energy Savings Share

The Natural Gas 2015-2019 business plan does not forecast energy savings in the short-term of this cycle (2015-2019). The business plan is focused on building the portfolio of initiatives that will deliver savings in future years (anticipating 2019+).

## 7.3 2016 Costs

NEEA annual costs do not map directly to the annual energy savings for a given year. Due to the Market Transformation nature of NEEA's work, the energy savings investments are heavy up front, and the return (in the form of energy savings) lags by a few years or more. For instance, approximately 75% of the energy savings value delivered in 2016 are from initiatives for which the investment period was 2010-2014. This investment period has a forecasted energy stream that extends beyond 2019.

NEEA costs include all costs of NEEA operations and value delivery, including:

- Energy savings initiatives
- Investments in market training and infrastructure
- Stock assessments, evaluations, data collection, and other regional and program research
- Emerging technology research and development, and
- All administrative costs

Avista's criteria for funding NEEA's electric market transformation portfolio calls for the portfolio to deliver incrementally cost-effective resources beyond what could be acquired through the Company's local portfolio alone. Avista has historically communicated with NEEA the importance of NEEA delivering cost-effective resources to our service territory. The Company believes that NEEA will continue to offer cost-effective electric market transformation in the foreseeable future. Avista will continue to play an active role in the organizational oversight of NEEA. This will be critical to insure that geographic equity, cost-effectiveness and resource acquisition continue to be primary areas of focus.

# 8 Energy Efficiency Expenditures

During 2016, Avista incurred over $23.2 million in costs for the operation of electric and natural gas energy efficiency programs in Washington, with $19.6 million for electric energy efficiency and $3.6 million for natural gas energy efficiency. Of this amount, $1.6 million was contributed to the Northwest Energy Efficiency Alliance to fund regional market transformation ventures.

Seventy-one percent of expenditures were returned to ratepayers in the form of incentives or products (e.g. CFLs). During the 2016 calendar year, under $495 thousand, or 2.1 percent, was spent on evaluation in an effort to continually improve program design, delivery and cost-effectiveness.

Evaluation, as well as other implementation expenditures, can be directly charged to the appropriate state and/or segment(s). In cases where the work benefits multiple states or segments, these expenditures are charged to a “general” category and are allocated based on avoided costs for cost- effectiveness purposes.

The expenditures illustrated in the following tables represent actual payments incurred in the 2016 calendar year and often differ from the cost-effectiveness section where all benefits and costs associated with projects completing in 2016 are evaluated in order to provide matching of benefits and expenditures resulting in a more accurate look at cost-effectiveness.

Table 8-1 and Table 8-2 provide a summary of energy efficiency expenditures by fuel type.

**Table 8-1: Avista Electricity Energy Efficiency Expenditures (WA)***

| Segment | Incentives | Implementation | EM&V | NEEA | Total |
|---|---|---|---|---|---|
| Residential | $3,415,546 | $1,535,883 | $0 | $0 | $4,951,429 |
| Low Income | $859,912 | $27,118 | $0 | $0 | $877,030 |
| Nonresidential | $9,428,533 | $910,834 | $43 | $0 | $10,339,410 |
| Regional | $0 | $2,106 | $65,712 | $1,384,771 | $1,452,590 |
| General | $0 | $1,701,728 | $304,423 | $0 | $2,006,152 |
| **Total** | **$13,703,991** | **$4,177,670** | **$370,179** | **$1,384,771** | **$19,636,611** |

*Year-end accrual reversals for low income incentives for Washington electric and Idaho electric did not occur correctly, but the tariff rider balances for both are correct as of the end of January 2016. The expenditure charts match the financial accounting system, but for accuracy in the cost effectiveness tests $ 273,052.57 low income

incentive expenditures have been moved resulting in a decrease in Washington electric low income expenditures and an increase in Idaho electric low income expenditures.

### Table 8-2: Avista Natural Gas Energy Efficiency Expenditures (WA)

| Segment | Incentives | Implementation | EM&V | NEEA | Total |
|---|---|---|---|---|---|
| Residential | $1,243,926 | $75,890 | $0 | $0 | $1,319,815 |
| Low Income | $1,120,223 | $8,028 | $0 | $0 | $1,128,251 |
| Nonresidential | $360,628 | $191,351 | $0 | $0 | $551,980 |
| Regional | $0 | $0 | $9,468 | $204,600 | $214,068 |
| General | $0 | $250,278 | $115,262 | $0 | $365,540 |
| **Total** | **$2,724,777** | **$525,547** | **$124,730** | **$204,600** | **$3,579,653** |

# 9 Tariff Rider Balances

As of the start of 2016, the Washington electric and natural gas (aggregate) tariff rider balances were underfunded by $2,450,304. During 2016, $16.0 million in tariff rider revenue was collected to fund energy efficiency while $23.2 million was expended to operate energy efficiency programs. The $7.2 million under-collection of tariff rider funding resulted in a year-end balance of $9.7 million underfunded balance.

Table 9-1 illustrates the 2016 tariff rider activity by fuel type.

**Table 9-1 Tariff Rider Activity (2016)**

| | Electric | Natural Gas |
|---|---|---|
| Beginning Balance (Underfunded) | ($575,628) | ($1,874,675) |
| Energy Efficiency Funding | $11,929,191 | $4,043,365 |
| Net Funding of Operations | $11,353,563 | $2,168,690 |
| Energy Efficiency Expenditures | $19,636,611 | $3,579,653 |
| **Ending Balances (Underfunded)** | **($8,283,048)** | **($1,410,964)** |

# 10 Actual to Business Plan Comparison

For 2016 operations, Avista exceeded budgeted electric energy efficiency expenditures by $6.7 million, or 152%, and natural gas expenditures were less than budgeted by $55 thousand, or ninety-eight percent. The biggest driver of expenditures is incentives. This demand for incentives was slightly higher than anticipated and its impact resulted in the underfunding in the Washington electric programs. The Washington Natural Gas Portfolio incentives exceeded budget, however non-incentive costs were lower than planned resulting in excess overall. It is difficult to predict customer acceptance of programs, which affects the incentive expenditures. While the business plan provides an expectation for operational planning, Avista is required to incent all energy efficiency that qualifies under Schedules 90 and 190. Since customer incentives are the largest component of expenditures, customer demand can easily impact the funding level of the Tariff Riders.

Table 10-1 provides detail on the budget to actual comparison of energy efficiency expenditures by fuel type.

**Table 10-1 Business Plan to Actual Comparison[29]**

| | Electric | Natural Gas |
|---|---|---|
| **Business Plan** | | |
| Incentives Budget | $7,741,192 | $1,828,459 |
| Non-incentives and Labor | $5,199,621 | $1,805,980 |
| **Total Budgeted Expenditures** | **$12,940,813** | **$3,634,439** |
| **Actual 2016 Expenditures** | | |
| Incentives | $13,703,991 | $2,724,777 |
| Non-incentives and Labor | $5,932,620 | $854,877 |
| **Total Actual Expenditures** | **$19,636,611** | **$3,579,653** |
| **Variance (Unfavorable)** | **($6,695,798)** | **$54,786** |

Note: "Non-incentive and Labor" includes all other implementation costs of the DSM program.

[29] Budget values are from 2016 Business Plan

# APPENDIX A

2016 Avista Washington Electric Impact Memorandum

# MEMORANDUM

May 31, 2017
Page count: 6

**To:** Dan Johnson, Amber Gifford; Avista

**From:** Lynn Roy; Nexant

**Re:** WA 2016 Electric Impact Memorandum

In 2016, Avista offered a suite of nonresidential, residential and low income programs to customers in their Washington service territory. The programs incented Avista's customers to purchase and implement energy savings measures in their homes and businesses through prescriptive rebates, buy-down offerings, direct installs, and site specific rebates. This memo outlines the adjusted reported electric savings values for the 2016 program year. Net-to-gross values have not been applied to the savings values, except in those cases where the deemed energy savings value is based on market baseline and therefore is a net value.

## Total 2016 Washington Electric Savings

The following table outlines the total reported and adjusted reported electric savings for the 2016 program year in Avista's Washington service territory, by nonresidential sector, residential sector, and low income sector. The reported savings values are from Avista's Saleslogix and Customer Care and Billing database and from data provided by third-party implementers not tracked in Avista's databases. The adjusted reported savings are calculated through the application of adjustment factors based on any discrepancies found during the evaluation team's review of the reporting databases. Savings are broken out by sector in the remainder of this memo.

Table 1: 2016 Total Reported and Adjusted Reported Gross Savings for Washington Electric

| Sector | Reported Savings (kWh) | Adjusted Reported Savings (kWh) |
|---|---|---|
| Nonresidential - Conservation | 47,872,836 | 37,420,578* |
| Nonresidential – Fuel Conversion | 805,779 | 805,779 |
| **Nonresidential Total** | **48,678,615** | **38,226,357** |
| Residential - Conservation | 33,306,263 | 33,316,696 |
| Residential - Fuel Conversion | 8,806,008 | 9,766,855 |
| **Residential Total** | **42,112,271** | **43,083,551** |
| Low Income - Conservation | 269,513 | 272,438 |
| Low Income - Fuel Conversion | 273,628 | 273,628 |
| **Low Income Total** | **543,141** | **546,066** |
| **Total Conservation** | **81,448,612** | **71,009,712** |
| **Total Fuel Conversion** | **9,885,415** | **10,846,262** |
| **Total Conservation + Fuel Conversion** | **91,334,027** | **81,855,974** |

*See page 3 for explanation on the difference between the reported and adjusted reported savings for the nonresidential-conservation savings values.

The Fuel Efficiency Program reports an interactive gas effect associated with the electric HVAC measures that are converted to gas measures. The negative savings are the negative avoided costs associated with the fuel conversions and are incorporated in the electric cost-effectiveness calculations. Table 2 summarizes the fuel conversion interactive therms by sector.

Table 2: 2016 Reported and Adjusted Reported Gross Fuel Conversions for Washington Electric

| Sector | Reported Savings (therms) | Adjusted Reported Savings (therms) |
|---|---|---|
| Nonresidential – Fuel Conversion | (36,109) | (36,109) |
| Residential - Fuel Conversion | (398,754) | (435,806) |
| Low Income - Fuel Conversion | (10,507) | (10,507) |
| **Total Fuel Conversion** | **(445,370)** | **(482,422)** |

## Nonresidential Savings

Table 2 outlines the reported and adjusted reported gross electric savings for the 2016 nonresidential programs in Avista's Washington service territory. An adjustment factor was applied to the reported savings to account for any errors found by the evaluation team.

**Table 3: 2016 Nonresidential Reported and Adjusted Reported Savings for Washington Electric**

| Program and Measure Category | Reported Savings (kWh) | Adjustment Factor | Adjusted Reported Savings (kWh) |
|---|---|---|---|
| AirGuardian | 25,735 | 100% | 25,735 |
| ESG PSC Case Lighting | 862,310 | 100% | 862,310 |
| ESG PSC Cases | 228,026 | 100% | 228,026 |
| ESG PSC Controls | 151,659 | 100% | 151,659 |
| ESG PSC Motors | 55,404 | 100% | 55,404 |
| ESG SS Case Doors | 120,191 | 100% | 120,191 |
| ESG SS Cases | 120,114 | 100% | 120,114 |
| ESG SS Lighting | 35,707 | 100% | 35,707 |
| PSC Fleet Heat | 16,000 | 100% | 16,000 |
| PSC Food Service Equipment | 72,029 | 100% | 72,029 |
| PSC Green Motors Rewind | 33,651 | 100% | 33,651 |
| PSC Insulation | 7,674 | 100% | 7,674 |
| PSC Lighting Exterior | 3,372,743 | 100% | 3,372,743 |
| PSC Lighting Interior | 36,042,267 | 71%* | 25,590,010 |
| PSC Motor Controls HVAC | 140,890 | 100% | 140,890 |
| SS Appliances | 61,424 | 100% | 61,424 |
| SS HVAC Combined | 679,707 | 100% | 679,707 |
| SS HVAC Heating | 21,885 | 100% | 21,885 |
| SS Industrial Process | 477,332 | 100% | 477,332 |
| SS Lighting Exterior | 536,945 | 100% | 536,945 |
| SS Lighting Interior | 2,772,786 | 100% | 2,772,786 |
| SS Multifamily | 2,443 | 100% | 2,443 |
| SS Multifamily - Fuel Conversion | 805,779 | 100% | 805,779 |
| SS Shell | 267,113 | 100% | 267,113 |
| Small Business | 1,768,801 | 100% | 1,768,801 |
| **Total** | **48,678,615** | **79%** | **38,226,357** |

*The evaluation team conducted document reviews and onsite verification activities on a sample of 2016 nonresidential projects. Based on these activities, the evaluation team calculated an interim realization rate of 71% for the prescriptive lighting measures. One of the factors behind this realization rate is based on the evaluation team's review of TLED measures incented in the 2016 program year.

Specifically, in the 2016 program year, Avista offered two prescriptive lighting measures for TLEDs:

- 1-Lamp T12/T8 Fixture to 1-Lamp LED 8W to 15W, incentivized at $15 per lamp

- 1-Lamp T12/T8 Fixture to 1-Lamp LED 16W to 23W, incentivized at $10 per lamp

As early project applications were submitted, Avista became aware that TLED lamps were labeled under a lower wattage than their DLC product specifications. TLED lamps were found in the market with a labeled wattage of 14-15W, while the Design Lights Consortium (DLC) testing indicated that these lamps consume 17-18W. The evaluation team believes that this discrepancy is because TLED lamp power consumption is subject to different ballast configurations. Thus, a TLED in a low ballast factor (LBF) ballast may only consume 14W, but in a normal ballast factor (NBF) ballast, the same lamp uses 17W. The DLC maintains performance data for its certified lamps as tested with a 0.89 ballast factor.

An issue was identified where program guidelines required DLC listed lamps and customers were selecting lamps based on the DLC listing. Early on in 2016 some customers who installed DLC listed lamps were paid a lower incentive based on the DLC listed wattage rather than the lamp labeled wattage. Avista agreed that this could be confusing to customers who met the written program requirements of installing DLC listed lamps and applied for incentives based on the lamp's listed wattage. Avista clarified that customers should be paid based on the wattage printed on the lamp packaging. Avista communicated clarifications to customers and vendors regarding measure eligibility recognizing that some DLC listed TLEDs may have the same wattage on both the TLED lamp and packaging as well as the DLC listed wattage and some may differ. This potential delta along with other energy savings data such as hours of use would be evaluated by the evaluation team.

After the 2016 year had ended, the evaluation team applied a realization rate to the total savings associated with these measures. Because Avista has adjusted the savings associated with this measure for the 2017 program year, the evaluation team believes that the final realization rate for the 2016-2017 evaluation period will increase. In addition, the measure category remains cost-effective on a Total Resource Cost (TRC) basis with the application of the 71% realization rate for the 2016 program year.

### Residential Savings

Table 3 outlines the reported and adjusted reported gross electric savings for the 2016 residential measures offered in Avista's Washington service territory. Savings are reported by measure type to align with the data utilized in the cost-effectiveness analysis. An adjustment factor was applied to the reported savings to account for any errors found by the evaluation team.

Table 4: 2016 Residential Reported and Adjusted Reported Gross Savings for Washington Electric

| Measure Type | Reported Savings (kWh) | Adjustment Factor | Adjusted Reported Savings (kWh) |
|---|---|---|---|
| E Attic Insulation With Electric Heat | 23,919 | 94% | 22,375 |
| E Electric To Air Source Heat Pump | 382,834 | 108% | 413,700 |
| E Electric To Natural Gas Furnace | 1,761,754 | 117% | 2,054,052 |
| E Electric To Natural Gas Furnace & Water Heat | 6,031,457 | 112% | 6,754,103 |
| E Electric To Natural Gas Wall Heater | 120,252 | 100% | 120,252 |
| E Electric To Natural Gas Water Heater | 892,545 | 94% | 838,448 |
| E Electric Water Heater | 220 | 126% | 278 |
| E Energy Star Home - Manufactured, Furnace | 47,929 | 100% | 47,929 |
| E Energy Star Home - Manufactured, Heat Pump | 8,780 | 100% | 8,780 |
| E Floor Insulation With Electric Heat | 5,568 | 59% | 3,305 |
| E Smart Thermostat DIY with Electric Heat | 8,761 | 96% | 8,414 |
| E Smart Thermostat Paid Install with Electric Heat | 20,400 | 100% | 20,434 |
| E Variable Speed Motor | 326,616 | 100% | 325,299 |
| E Wall Insulation With Electric Heat | 20,303 | 70% | 14,225 |
| E Window Replc from Double Pane W Electric Heat | 247,857 | 100% | 247,857 |
| E Window Replc from Single Pane W Electric Heat | 462,176 | 115% | 530,912 |
| G Attic Insulation With Natural Gas Heat | 1,116 | 0% | - |
| G Natural Gas Furnace | 3,302 | 0% | - |
| G Window Replc With Natural Gas Heat | 73,164 | 0% | - |
| E Manuf Floor Insulation With Electric Heat | 1,924 | 93% | 1,794 |
| Customer Outreach LEDs | 650 | 100% | 650 |
| Opower Home Energy Reports | 16,511,583 | 100% | 16,511,583 |
| Simple Steps CFL | 14,970,203 | 100% | 3,432,945 |
| Simple Steps LED | | | 11,537,258 |
| Simple Steps Showerheads | 137,638 | 100% | 137,638 |
| Simple Steps Clothes Washers | 51,319 | 100% | 51,319 |
| **Total** | **42,112,271** | **102%** | **43,083,551** |

## Low Income Savings

Table 4 outlines the reported and adjusted reported gross electric savings for the 2016 Low Income program in Avista's Washington service territory. Savings are reported by measure type to align with the data utilized in the cost-effectiveness analysis. An adjustment factor was applied to the reported savings to account for any errors found by the evaluation team.

Table 5: 2016 Low Income Reported and Adjusted Reported Savings for Washington Electric

| Measure Type | Reported Savings (kWh) | Adjustment Factor | Adjusted Reported Savings (kWh) |
|---|---|---|---|
| CFL Bulbs | 701 | 100% | 701 |
| E Air Infiltration | 19,498 | 100% | 19,498 |
| E Duct Sealing | 5,864 | 100% | 5,864 |
| E Energy Star Doors | 7,538 | 100% | 7,538 |
| E Energy Star Refrigerator | 2,475 | 100% | 2,475 |
| E Energy Star Windows | 19,274 | 100% | 19,274 |
| E HE Water Heater | 162 | 100% | 162 |
| E INS - Attic | 16,015 | 100% | 16,015 |
| E INS - Duct | 7,534 | 100% | 7,534 |
| E INS - Floor | 80,435 | 100% | 80,435 |
| E INS - Wall | 15,960 | 100% | 15,960 |
| E To G Furnace Conversion | 174,554 | 100% | 174,554 |
| E To G H20 Conversion | 83,479 | 100% | 83,479 |
| E To Heat Pump Conversion | 15,595 | 100% | 15,595 |
| Customer Outreach CFLs | 1,770 | 100% | 1,770 |
| Customer Outreach LEDs | 92,287 | 103% | 95,212 |
| **Total** | **543,141** | **101%** | **546,066** |

# APPENDIX B

2016 Avista Washington Natural Gas Impact Memorandum

# MEMORANDUM

May 2, 2017
Page count: 4

**To:** Dan Johnson, Amber Gifford; Avista

**From:** Lynn Roy; Nexant

**Re:** WA 2016 Natural Gas Impact Memorandum

In 2016, Avista offered a suite of nonresidential, residential and low income programs to customers in their Washington service territory. The programs incented Avista's customers to purchase and implement energy savings measures in their homes and businesses through prescriptive rebates, buy-down offerings, direct installs, and site specific rebates. This memo outlines the adjusted reported therm savings values for the 2016 program year. Net-to-gross values have not been applied to the savings values, except in those cases where the deemed energy savings value is based on market baseline and therefore is a net value.

## Total 2016 Washington Natural Gas Savings

The following table outlines the total reported and adjusted reported natural gas savings for the 2016 program year in Avista's Washington service territory, by nonresidential sector, residential sector, and low income sector. The reported savings values are from Avista's Saleslogix and Customer Care and Billing database and from data provided by third-party implementers not tracked in Avista's databases. The adjusted reported savings are calculated through the application of adjustment factors based on errors found in the reporting databases. Savings are broken out by sector in the remainder of this memo.

**Table 1: 2016 Total Reported and Adjusted Reported Gross Savings for Washington Natural Gas**

| Sector | Reported Savings (therms) | Adjusted Reported Savings (therms) |
|---|---|---|
| Nonresidential - Conservation | 160,355 | 162,375 |
| Residential - Conservation | 393,622 | 367,891 |
| Low Income - Conservation | 18,490 | 18,490 |
| **Total Conservation** | **572,467** | **548,756** |

## Nonresidential Savings

Table 2 outlines the reported and adjusted reported gross natural gas savings for the 2016 nonresidential programs in Avista's Washington service territory. An adjustment factor was applied to the reported savings to account for any errors found by the evaluation team.

**Table 2: 2016 Nonresidential Reported and Adjusted Reported Savings for Washington Natural Gas**

| Program and Measure Category | Reported Savings (therms) | Adjustment Factor | Adjusted Reported Savings (therms) |
|---|---|---|---|
| ESG PSC Cases | 8,461 | 100% | 8,461 |
| ESG SS Case Doors | 9,382 | 100% | 9,382 |
| ESG SS Cases | 1,430 | 100% | 1,430 |
| PSC Commercial HVAC | 18,057 | 100% | 18,057 |
| PSC Food Service Equipment | 36,786 | 100% | 36,786 |
| PSC Insulation | 7,432 | 100% | 7,432 |
| PSC Lighting Interior | -2,020 | 0% | 0 |
| SS Appliances | 378 | 100% | 378 |
| SS HVAC Combined | 33,433 | 100% | 33,433 |
| SS HVAC Heating | 16,904 | 100% | 16,904 |
| SS Industrial Process | 6,303 | 100% | 6,303 |
| SS Lighting Interior | 709 | 100% | 709 |
| SS Shell | 5,106 | 100% | 5,106 |
| Small Business | 17,994 | 100% | 17,994 |

## Residential Savings

Table 3 outlines the reported and adjusted reported gross natural gas savings for the 2016 residential measures offered in Avista's Washington service territory. Savings are reported by measure type to align with the data utilized in the cost-effectiveness analysis. An adjustment factor was applied to the reported savings to account for any errors found by the evaluation team.

Table 3: 2016 Residential Reported and Adjusted Reported Gross Savings for Washington Gas

| Measure Type | Reported Savings (therms) | Adjustment Factor | Adjusted Reported Savings (therms) |
|---|---|---|---|
| G Attic Insulation With Natural Gas Heat | 11,619 | 94% | 10,893 |
| G Duct Sealing | 224 | 100% | 224 |
| G Duct Sealing + CO2 | 522 | 100% | 522 |
| G Energy Star Home - Natural Gas Only | 1,421 | 100% | 1,421 |
| G Floor Insulation With Natural Gas Heat | 536 | 86% | 461 |
| G Natural Gas Boiler | 2,133 | 100% | 2,142 |
| G Natural Gas Furnace | 231,350 | 101% | 233,089 |
| G Smart Thermostat DIY with Natural Gas Heat | 4,867 | 97% | 4,732 |
| G Smart Thermostat Paid Install with Natural Gas Heat | 8,448 | 96% | 8,112 |
| G Tankless Water Heater | 22,968 | 100% | 22,968 |
| G Wall Insulation With Natural Gas Heat | 2,509 | 87% | 2,174 |
| G Window Replc With Natural Gas Heat | 101,887 | 75% | 76,015 |
| G 40 Gallon Natural Gas Water Heater | 106 | 102% | 108 |
| G 50 Gallon Natural Gas Water Heater | 334 | 100% | 333 |
| Simple Steps Showerheads | 4,698 | 100% | 4,698 |

## Low Income Savings

Table 4 outlines the reported and adjusted reported gross natural gas savings for the 2016 Low Income program in Avista's Washington service territory. Savings are reported by measure type to align with the data utilized in the cost-effectiveness analysis. An adjustment factor was applied to the reported savings to account for any errors found by the evaluation team.

**Table 4: 2016 Low Income Reported and Adjusted Reported Savings for Washington Gas**

| Measure Type | Reported Savings (therms) | Adjustment Factor | Adjusted Reported Savings (therms) |
|---|---|---|---|
| E Energy Star Doors | 194 | 100% | 194 |
| E INS - Floor | 1,241 | 100% | 1,241 |
| E INS - Wall | 986 | 100% | 986 |
| G Air Infiltration | 1,478 | 100% | 1,478 |
| G Duct Sealing | 450 | 100% | 450 |
| G Energy Star Doors | 646 | 100% | 646 |
| G Energy Star Windows | 4,500 | 100% | 4,500 |
| G HE Furnace | 1,720 | 100% | 1,720 |
| G HE WH 50G | 17 | 100% | 17 |
| G INS - Attic | 1,658 | 100% | 1,658 |
| G INS - Duct | 238 | 100% | 238 |
| G INS - Floor | 3,598 | 100% | 3,598 |
| G INS - Wall | 1,764 | 100% | 1,764 |