Energy Efficiency

AVISTA

Washington Natural Gas
Energy Efficiency
Annual Conservation Plan

2020

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Appendix Summary

I. EXECUTIVE SUMMARY

This Natural Gas Annual Conservation Plan (ACP or the Plan) is intended to be a continuous planning process for Avista's Natural Gas Energy Efficiency program. The Company is committed to maintain and enhance meaningful stakeholder involvement within this process. Over the course of the coming year, revisions and updates to the Plan are to be expected as part of adaptively managing the Energy Efficiency portfolio. Based on the 2018 Natural Gas Integrated Resource Plan (IRP), the Washington natural gas conservation potential for 2020 is 936,350 therms. The 2020 Annual Conservation Plan's ("ACP") expected acquisition is 937,402 therms. The cost-effectiveness of the portfolio is graphically represented in the figure below:

Figure 1: Portfolio Cost-effectiveness

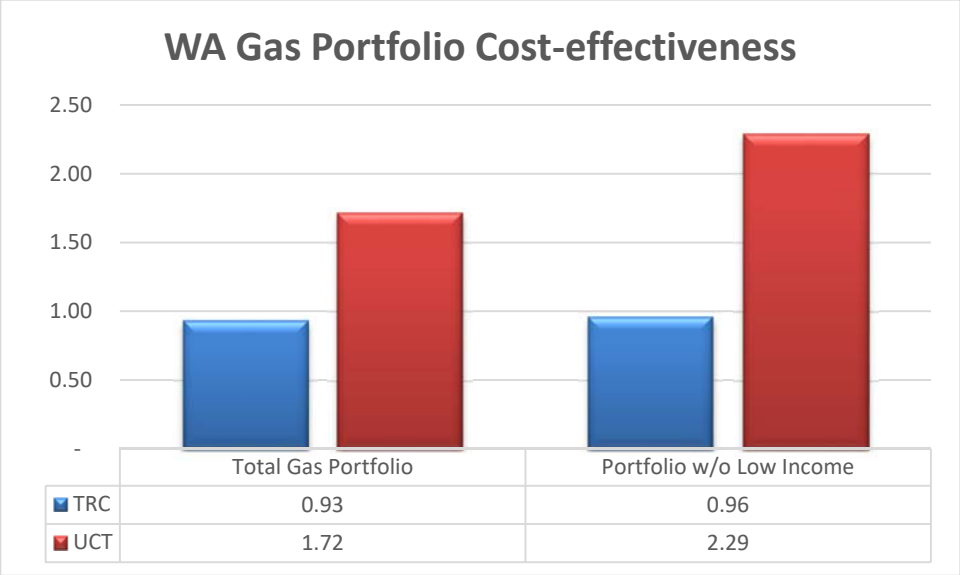


Table 1 below illustrates the savings and total budget per sector for the 2020 program year. Note that budgeted numbers below are inclusive of Non-Incentive Utility Costs (NIUC).

Table 1: Savings and Budget by Sector:

Washington Gas by Sector	Therms	Budget
Low Income	25,743	$ 1,664,688
Residential	642,933	$ 3,262,199
Non-Residential	268,727	$ 774,959
Total	937,402	$ 5,701,846

II. INTRODUCTION

The 2020 Annual Conservation Plan outlines Avista's conservation offerings, its approach to energy efficiency, and details on verifying and reporting savings. The Company's plan is based on two key principles. The first is to pursue all cost-effective kilowatt hours and therms by offering financial incentives for energy saving measures, with a simple financial payback of over one year. The second key principle is to use the most effective "mechanism" to deliver energy efficiency services to customers. These mechanisms are varied and include 1) prescriptive programs (or "standard offers" such as high efficiency appliance rebates), 2) site-specific or "customized" analyses at customer premises, 3) "market transformational," or regional, efforts with other utilities, 4) low-income weatherization services through local Community Action Partner agencies ("CAP" or "Agencies"), 5) low-cost/no-cost advice through a multi-channel communication effort, and 6) support for cost-effective appliance standards and building codes.

This "Annual Conservation Plan" is intended to be a continuous planning process. The Company is committed to maintaining and enhancing meaningful stakeholder involvement within this process. Over the course of the following year, revisions and updates to the plan are to be expected as part of adaptively managing the Energy Efficiency portfolio.

The Company's programs are delivered across a full customer spectrum. Virtually all Avista customers have had the opportunity to participate, and a great many have directly benefited from the program offerings. All customers are indirectly benefited through enhanced cost-efficiencies as a result of this portfolio approach.

The business planning process builds upon the electric and natural gas IRP and CPA processes. These processes are an overall resource planning process completed every two years that integrate energy efficiency and generation resources into a preferred resource scenario. It is the purpose of the business plan to create an operational strategy for reaching the aggregate targets identified within the IRP in a manner that is cost-effective and with due consideration to all aspects of customer value.

The annual planning process also leads to the identification of infrastructure and support needs such as:

- defining the necessary labor complement
- establishment of an annual budget
- review of and modification to the evaluation, measurement & verification (EM&V) plan

- identification of outreach requirements
- organization of a marketable customer-facing portfolio

The budgetary projections established within the Plan are applied in a separate mid-year process to revise the conservation tariff rider funding mechanisms contained within the Schedule 91 electric and Schedule 191 natural gas tariffs. The tariff rider surcharges are periodically adjusted with the objective of moving these balances toward zero.

III. KEY CONSIDERATIONS

a. Conservation Targets for Natural Gas Companies

Avista, along with other Washington Utilities offering natural gas service, will be required to establish a two-year natural gas target which includes the effect of greenhouse gas emissions. Per RCW 80.28.380, "Each gas company must identify and acquire all conservation measures that are available and cost-effective. Each company must establish an acquisition target every two years and must demonstrate that the target will result in the acquisition of all resources identified as available and cost-effective. The cost-effectiveness analysis required by this section must include the costs of greenhouse gas emissions established in RCW 80.28.395. The targets must be based on a conservation potential assessment prepared by an independent third party and approved by the commission. Conservation targets must be approved by order by the commission. The initial conservation target must take effect by 2022."

b. Washington House Bill 1257

The newly enacted House Bill 1257[1] ("HB 1257") issues new efficiency and reporting requirements for building and building operators that heat with natural gas and have a building size of over 50,000 square feet. Throughout 2020 and 2021, Avista will continue to work with outside stakeholders, members of its account executive team, representatives from Department of Commerce, and the Washington Commission to stay well informed on the rule making for HB 1257.

[1] Per RCW 19.27

c. Evaluation, Measurement and Verification Commitments

Within its Energy Efficiency portfolio, Avista incorporates EM&V activities to validate and report verified energy savings related to its energy efficiency measures and programs. EM&V protocols serve to represent comprehensive analyses and assessments necessary to supply useful information to management and stakeholders that adequately identifies the acquisition of energy efficiency attributable to Avista's conservation programs, as well as potential process improvements necessary to improve operations both internally and for customers. EM&V includes Impact and Process, and taken as a whole, are analogous with other industry standard terms such as Portfolio Evaluation or Program Evaluation.

A primary responsibility of Avista's EM&V resources is to support the ongoing activities of the third-party EM&V consultants and evaluators performing the various analyses required to substantiate the conservation acquisition, determine market saturation and penetration, and process evaluations. The 2020 EM&V budget provides for third-party EM&V services that provide an evaluation of 2020 program year portfolio, along with consolidating these findings with results obtained for reporting requirements associated with the Energy Independence Act (EIA) and the 2020-2021 biennium.

To support planning and reporting requirements, several guiding EM&V documents are maintained and published. This includes the Avista EM&V Framework, an annual EM&V Plan, and EM&V contributions within other Energy Efficiency and Avista corporate publications. Program-specific EM&V plans are created, as required, to inform and benefit the Energy Efficiency activities. These documents are reviewed and updated as necessary, serving to improve the processes and protocols for energy efficiency measurement, evaluation and verification.

EM&V efforts will also be applied to evaluating emerging technologies and applications in consideration of potential inclusion in the Company's energy efficiency portfolio. In the Electric Portfolio, Avista may spend up to 10 percent of its conservation budget on programs whose savings impact have not yet been measured if the overall portfolio of conservation passes the applicable cost-effectiveness test. These programs may include educational, behavior change and other types of investigatory or pilot projects. Specific activities can include product and application document reviews, development of formal evaluation plans, field studies, data collection, statistical analysis and solicitation of user feedback.

Avista and its customers benefit from regional activities and resources in the energy efficiency and conservation domain. To engage with and contribute to regional efforts, one Avista staff member has a voting role and a second member has a corresponding member role on the Regional Technical Forum (RTF) that serves as an advisory committee to the Northwest Power and Conservation Council (NPCC). The RTF is a primary source of information relating to the standardization of energy savings and measurement processes for electric applications in the Pacific Northwest. This knowledge base provides energy efficiency data, metrics, non-energy benefits and references that are suitable for inclusion in Avista's Technical Reference Manual (TRM) relating to acquisition planning and reporting. In addition, the Company engages with other Northwest utilities and NEEA in various pilot projects or subcommittee evaluations. Portions of the energy efficiency savings acquired through NEEA's programs within the region are attributable to Avista's portfolio.

Avista's commitment to the critical role of EM&V is supported by the Company's continued focus on the development of best practices for its processes and reporting. Application of the principles of the International Performance Measurement and Verification Protocol serves as the guidelines for measurement and verification plans applied to Avista programs. Additionally, the compilation of EM&V protocols released under the U.S. Department of Energy's Uniform Methods Project will be considered and applied where possible to support consistency and credibility of the reported results. The verification of a statistically significant number of projects is often extrapolated to verify and perform impact analysis on complete programs within reasonable standards of rigor and degree of conservatism. This process serves to ensure that Avista will manage its Energy Efficiency portfolio in a manner consistent with utility and public interests.

d. Cost-Effectiveness Metrics, Methodology and Objectives

The Company's planning approach aims to maximize cost-effective conservation acquired by analyzing the cost-effectiveness of each segment (residential, low income and non-residential) and how the measures within the programs contribute to the cost-effectiveness of that segment and eventually the individual portfolios. Non-energy impacts (NEIs) are a common topic of discussion in many energy evaluation circles and the Company is appreciative of the valuable work the RTF has done to quantify NEIs for the region. In this plan, where NEIs are calculated and the delivery method is consistent with what is required by the RTF, the calculated NEIs are included in the

appropriate cost-effectiveness tests (Total Resource Cost (TRC) and Participant Cost Test (PCT)). Since the RTF does not currently have Unit Energy Savings (UES) or NEI values for commercial lighting, a similar methodology is used to calculate the NEI value of efficient lighting measures that have longer measure lives than the baseline technology. The Company will continue to follow and participate in RTF activities around NEIs, and will include NEIs in the cost-effectiveness calculation when appropriate.

Details regarding how Avista applies the avoided costs and cost-effectiveness methodologies to the estimation of the 2020 portfolio are contained in Appendix C – Cost Effectiveness Methodology. The results of the TRC and Utility Cost Test (UCT) tests are summarized by program and portfolio in Appendix A – Program Plans.

e. Schedule 90 and 190 Revisions

Avista's electric Energy Efficiency operations are governed by Schedule 90 tariff requirements and natural gas Energy Efficiency operations are governed by Schedule 190. These tariffs (attached within Appendix D) detail the eligibility and allowable funding that the Company provides for energy efficiency measures. Though the tariff allows for considerable flexibility in how programs are designed and delivered and accommodates a degree of flexibility around incentives for prescriptive programs subject to reasonable justification, there remains the occasional need to modify the tariff to meet current and future market conditions and opportunities.

During the Spring 2019 Advisory Group meeting, Avista proposed modifications to its Energy Efficiency tariffs that would lift the three restrictions for incentive level settings from the Schedule 90 and Schedule 190 tariffs. These restrictions include:

1. Incentives are limited to $0.20 per first year kWh savings and $3 per first year Therm savings
2. Incentives are limited to 70% of the customer incremental cost of the measure installed.
3. Measures are restricted to a simple payback of 15 years or less.

The Company identified that for several measures in its portfolio, the number of customers participating in the program could be increased if the amount of the rebate was higher. However, a higher throughput could not be achieved because of the stated restrictions on the incentive amount. The Advisory Group found that the proposed changes had merit, and removing the

restrictions would allow Avista more flexibility in achieving the most throughput in their program at the lowest possible expense while maintaining a positive cost-effectiveness benefit to cost ratio.

While the removal of the restrictions were seen as an appropriate adjustment, the group acknowledged the importance of having incentive guidelines that would inform the Company's decisions on setting appropriate incentive levels. To address these comments, the Advisory Group agreed to include language within its Standard Operating Procedures (SOP), clarifying that these metrics would serve as the starting points from which incentive setting would be based.

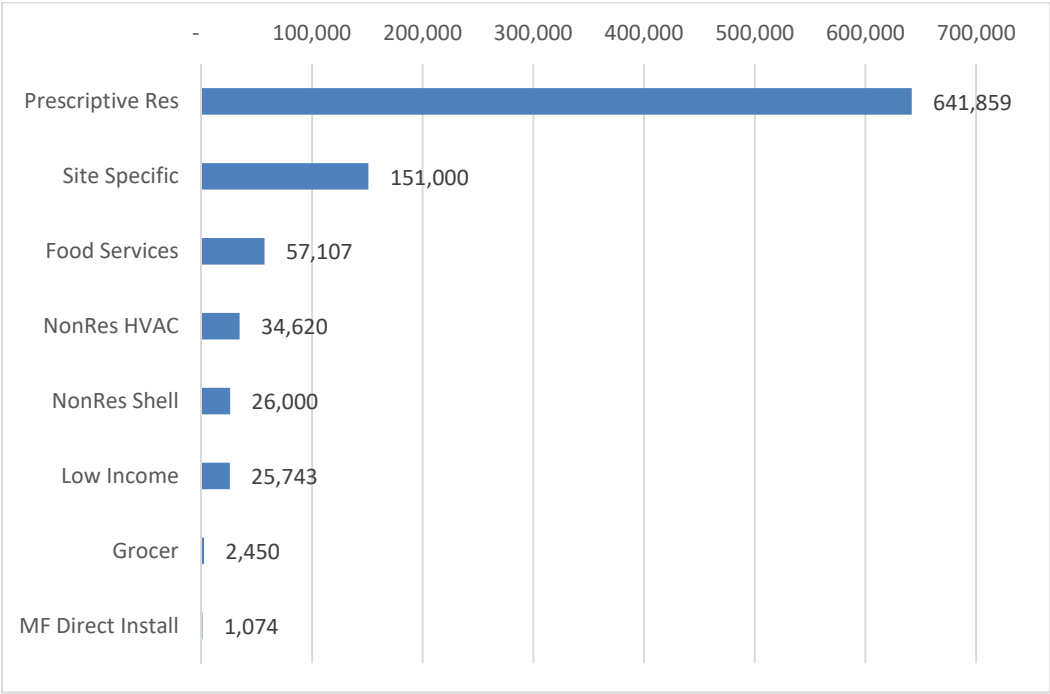
f. Schedule 91 and 191 Revisions

WAC 480-100-130(2) requires the utility to file on or before June 1st every year to "true up" the rider balance with an August 1st effective date. On May 21, 2019, the Company filed Docket No. UE-190406, revising schedule 91 to reflect a decrease in the customer rate collected to fund Avista's Energy Efficiency program; this filing was the fifth revision of Sheet 91A of the tariff rider. The chief reason for the revision was the Company's discontinuation of its Fuel Efficiency program beginning January 1st, 2020. This filing was approved by the Commission on July 26, 2019 and rates became effective on August 1, 2019.

IV. ENERGY EFFICIENCY PORTFOLIO OVERVIEW

Avista's Energy Efficiency portfolio is comprised of residential, low income and non-residential programs. For 2020, the Company anticipates approximately 937,402 therm savings from its program offerings. The figure below illustrates the major categories from which savings are achieved.

Figure 2: 2020 Therm Savings



a. Residential Portfolio Overview

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, augmented by other interventions such as our Multi-family Direct-Install program.

Prescriptive rebate programs use financial incentives to encourage customers to adopt qualifying energy efficiency measures. Customers must complete installation and apply for a rebate, submitting proper proof of purchase, installation and/or other documentation to Avista,

typically within 90 days from project completion. Customers can submit this form in hard copy and several prescriptive measures are also available to submit online at www.myavista.com.

Residential prescriptive programs typically cover single family homes up to a four-plex. For multifamily situations (five-plex or larger), owners/developers may choose to treat the entire complex with an efficiency improvement. In these unique cases, the projects are treated as a commercial project and are evaluated within the site-specific portfolio.

A measure-by-measure evaluation of the incremental contribution to the UCT test is the primary guidance in reaching decisions regarding eligibility for measures as well as overall cost-effectiveness of the portfolio. For electric, the TRC is applied. In the event that a previously offered measure is no longer cost-effective, the Company may initiate a transition plan to equitably treat customers who were in or about to commit to participating in the program. Typically a minimum 90-day notice is provided prior to the termination of a program.

b. Low Income Portfolio Overview

The Company utilizes the infrastructure of seven CAP agencies to deliver low income energy efficiency programs. The Agencies have the ability to income-qualify customers and have access to a variety of funding resources, including Avista funding, which can be applied to meet customer needs. The seven Agencies serving Avista's entire Washington service territory receive an aggregate annual funding of $2,350,000. The distribution of these funds is represented in the following table:

Table 2: 2020 Estimated Low Income Funding by CAP Agency

CAP Agency	County	Funding
SNAP	Spokane	$1,545,125
Rural Resources Community Action	Ferry, Lincoln, Pend Oreille, Stevens	$227,950
Community Action Center	Whitman	$171,550
Opportunities Industrialization Council	Adams, Grant	$88,125
Spokane Indian Housing Authority	Stevens County	$23,500
Washington Gorge Action Program	Klickitat, Skamania	$11,750
Community Action Partnership	Asotin	$282,000
	Total Low Income Funding	$2,350,000

The Agencies may spend their annual allocated funds on either electric or natural gas efficiency measures, at their discretion, as long as the home demonstrates a minimum level of the Avista fuel for space heating use. Agencies have included in their annual funding a 15% reimbursement for administrative costs. Health and human safety measures may also be completed with the amount spent on these improvements not to exceed 15% of the agency's total annual contract amount.

The list of measures offered is derived from the Department of Commerce's Weatherization Manual. To guide the agency toward projects that are most beneficial to the Company's energy efficiency efforts, an "Approved" list of measures is provided that allows for full reimbursement.

Higher costs per weatherized household over the same fixed amount of Low-Income funds available has over-time resulted in a decrease in low-income participation. An actual participant goal would be difficult to determine given that the number of treated homes depends upon the depth and cost of weatherization required by the participating homes. The CAP agencies receive other non-utility funds that they may also use to treat an Avista home. Washington CAP agencies typically weatherize between 200 and 250 homes in a given year with Avista funding.

In addition to the traditional Low-Income programs, Avista is partnering with CEEP (Community Energy Efficiency Program) to deliver energy efficiency offerings for hard-to-reach markets such as rental properties, homes with alternative heat and households that are considered low to moderate income. CEEP is a program that is unique to Washington State and was created by the Washington State Legislature in 2009. Initially funded by the American Recovery and Reinvestment Act, CEEP has developed into a mature program with support from the Washington State Capital Budget. The Washington State University Energy Program executes and manages the program to provide support to homeowners and small businesses across the state so they can make energy efficiency upgrades to existing residences and commercial buildings. CEEP has allocated up to $750,000 for projects in the Company's service territory which Avista has agreed to match. The primary focus of the CEEP funds is to target building improvements for multifamily housing that may include but are not limited to: improvements to HVAC systems and controls, building envelope, weatherization measures and lighting. A secondary initiative of the CEEP funding allocation is to convert income-qualified, single family, alternative heat homes (e.g.: oil and wood) to high efficiency electric space heat, or where available, to natural gas space heat.

Avista's $750,000 match has been included in the Company's 2020 budget as a line item under Avista's pilot programs.

c. Non-Residential Program Overview

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 homogenous in scope and uniform in their energy efficiency characteristics.

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 following the Company's guidelines and Standard Operating Procedures. Actual costs and savings are tracked, reported and available to the third-party impact evaluator. Many, but not all, of the prescriptive measures utilize RTF UES.

When the prescriptive path is not available, Avista offers nonresidential customers the opportunity to propose any energy efficiency project with documentable energy savings for technical review and potential incentive through the site-specific program. Multifamily residential developments may also be treated through the site-specific program when all or a large number of the residences and common areas are treated. The determination of incentive eligibility is based upon the projects individual characteristics as they apply to the Company's guidelines and SOPs.

The site-specific program has historically been one of the more cost-effective portions of the Energy Efficiency portfolio, and generates a substantial share of the energy savings. The year-to-year program performance can be somewhat variable due to the timing of large projects.

Program marketing relies heavily upon the Account Executive infrastructure and commercial and industrial energy efficiency outreach. Outreach includes print advertising, customer newsletters, customer meetings and vendor outreach. Account Executives have actively managed accounts, but are also available to any customer based upon the geographic location or industry, and serves as their liaison for all energy needs. A portion of the Account Executives effort is expended on coordinating the customer involvement in both the site-specific and prescriptive energy efficiency programs. The program delivery and engineering teams perform

additional outreach to customer groups and support program marketing, as well as serve their functions within the program implementation process.

The site-specific program savings can be difficult to predict due to the large nature of the projects, along with long sales cycles. General economy shifts may also impact customer willingness to fund efficiency improvements. Increases in process and eligibility complexity, increases in customer costs to participate beyond the capital investment, and costs for post measurement activities are kept in mind and managed in order to continue to successfully engage customers.

d. Regional Market Transformation

Avista's local Energy Efficiency portfolio seeks to influence the decision of customers towards the purchase of cost-effective energy efficiency products and services through a combination of incentives, awareness and addressing barriers to adoption. The local Energy Efficiency portfolio is intended to be permanent in nature, with the understanding that the specific programs and eligibility criteria will be revised over time in recognition of the changing marketplace, technologies and economics. Though these efforts can, and to a degree do, create permanent changes in how our customers make energy choices, it is generally not feasible for Avista to design local programs so as to influence markets that are often regional or national in scale.

Market transformation is an alternate approach to those markets and are defined interventions occurring for a finite period of time, utilizing strategically selected approaches to influence the energy market (customer, trade allies, manufacturers or combinations thereof) followed by an exit strategy. Successful market transformations permanently change the trajectory of markets in favor of more cost-effective energy efficiency choices, well beyond the termination of the active intervention.

Electric utilities within the northwest came together in 1997 to establish and fund a cooperative effort geared towards sustaining market transformation on a regional basis, with sufficient scale and diversity to deliver a portfolio capable of providing a cost-effective electric efficiency resource. That organization, NEEA, will enter its sixth funding cycle during 2020 for the 2020-2024 program years. Efforts are underway now to develop and finalized the 2020-2024 Business Plan. Avista has been an active participant and funder of this collaborative effort since its inception.

It is recognized that the future NEEA portfolio may not be as cost-effective as it has been in the past. NEEA's very successful residential lighting efforts, and many other ventures, are difficult to replicate. Nevertheless, there is little doubt that there are cost-effective opportunities that can only be achieved, or that are best achieved, through a regionally cooperative effort. Avista has a high degree of confidence that the NEEA portfolio will succeed, and that Avista's Washington customers continue to benefit from these efforts.

For 2020, the Company's portion of NEEA's Natural Gas budget is expected to be approximately $205,000 for Washington. The NEEA funding requirements are incorporated within the budget, but are considered to be supplementary expenditures outside of the scope of the current year's local portfolio. The NEEA portfolio has not been incorporated within either the acquisition projection or the cost-effectiveness of the 2020 local portfolio developed within this Plan.

As identified in the Company's BCP, Avista is investigating new Market Transformation efforts for Washington and Idaho customers within its service territory. This engagement will focus market transformation efforts towards energy efficiency measures and solutions that are specific to Eastern Washington and Northern Idaho. While larger Market Transformation efforts from NEEA focus on the region as a whole, this engagement will be complementary to those efforts. Avista will work with its advisory group as this engagement develops and will allow stakeholders to provide feedback.

V. AVISTA-SPECIFIC METHODOLOGIES AND ANALYTICAL PRACTICES

Over time, Avista has evolved approaches to calculating the various metrics applied within the planning effort to meet the needs of our portfolio and regulation. Care has been taken to ensure that these approaches are consistent with the intent of the Northwest Power and Conservation Council methodologies for the analysis of Energy Efficiency. Avista completes an Annual Conservation Report (ACR) in the spring of each year, based upon a retrospective review of actual results from the prior year. This process includes the calculation of each of the four basic standard practice tests (summarized in Appendix C – Summarization of Cost Effectiveness Methodology). Since the TRC and UCT tests are the basis for optimizing the portfolio (for reasons previously explained), the explanation of Avista's methodologies, for planning purposes, focus upon these two tests.

The calculation of portfolio cost-effectiveness excludes costs that are unrelated to the local Energy Efficiency portfolio in that particular year. Those excluded costs, termed "supplemental" costs in Avista's calculations, include:

- The funding associated with regional programs (NEEA)
- Cost to perform Conservation Potential Assessment studies
- Costs related to Evaluation, Measurement and Verification

Individual measures are aggregated into programs composed of similar measures. At the program level, non-incentive portfolio costs are allocated based upon direct assignment to the extent possible and costs are allocated based upon a programs share of portfolio avoided cost value acquisition when direct assignment is not possible. The result is a program-level TRC and UCT cost-effectiveness analysis that incorporates all of these allocated costs.

Since the costs and benefits associated with the adoption of a measure may accrue over time, it is necessary to establish a discount rate[2]. Future costs and benefits are discounted to the present value and compared for cost-effectiveness purposes. Generally, energy and non-energy benefits accrue over the measure life and costs are incurred up-front.

[2] During the late summer of 2016, the Company presented to the Advisory Group a proposal to use a real Weighted Average Cost of Capital (WACC), instead of a nominal figure. This suggestion received positive feedback, therefore a real discount rate was used. For 2020, the Company is using separate discount rates for residential and for non-residential. The non-residential rate will continue at the WACC while the residential discount rate is set at a rate equal to the daily Treasury Bill rate at 07.09.19.

The calculation of the TRC test benefits, to be consistent with Council methodologies, includes an assessment of non-energy impacts (both benefits and costs) accruing to the customer. These impacts most frequently include maintenance cost, water and sewer savings, and in the case of the low income program, inclusion of the cost of providing base case end-use equipment as part of a fully funded measure as well as the value of health and human safety funding (on a dollar-for-dollar basis).

For purposes of calculating TRC cost-effectiveness, any funding obtained from outside of Avista's customer population (generally through tax credits or state or federal administered programs) are not considered to be TRC costs. These are regarded as imported funds and from the perspective of Avista's customer population appropriate to the TRC test, are not costs borne by Avista customers. Co-funding of efficiency measures from state and federal programs for low-income programs applicable to a home that is also being treated with Avista funding is not incorporated within the program cost. This is consistent with permitting tax credits to offset customer incremental cost as described within the California Standard Practice Manual description of the TRC test.

Avista's Energy Efficiency portfolios are built from the bottom up, starting with the identification of prospective efficiency measures based upon the most recent CPA and augmented with other specific opportunities as necessary. Since potential assessments are only performed every two years and the inputs are locked many months in advance of filing the IRP itself, there is considerable time for movement in these inputs and the development of other opportunities.

VI. ANALYTICAL REVIEW OF MEASURES AND PROGRAMS

The annual planning process begins with a "blank slate" approach to maximizing the value of the Energy Efficiency portfolio to customers. The process ends when the portfolio meets or exceeds the desired objectives and goals. Within this section is a summary of the composition and performance of the planned 2020 portfolio.

The basis for incorporating a measure within a program being offered to customers are primarily, but not exclusively, an evaluation of the contribution of each individual measure to the portfolio cost-effectiveness. Factors other than cost-effectiveness that are considered in the measure status include consistency with other measures, the incentive relative to both the incremental and total customer cost, the marketability and expected customer satisfaction of the

measure and the element of uncertainty surrounding all of the inputs to the planning process. For purposes of reviewing the contributions of these programs, the portfolio is categorized as follows:

- Residential Programs
- Low Income Programs
- Non-Residential Prescriptive Programs
- Non-Residential Site Specific Programs

a. Residential Programs

Avista's Residential Energy Efficiency program is comprised of two main segments. The two programs include:

1. Residential Prescriptive
2. Multifamily Direct Install

Residential Prescriptive: Prescriptive measures do not require a pre-installation contract and offer a fixed incentive amount for eligible measures. Measures offered through prescriptive programs are evaluated based upon the typical application of that measure by program participants. Prescriptive measures are generally limited to those that are low cost, offer relatively homogenous performance across the spectrum of likely applications and would not significantly benefit from a more customized approach. Measure level data for the Residential Prescriptive programs, which includes TRC and UCT cost-effectiveness, can be found in Appendix A – Program Plans.

The 2020 natural gas residential prescriptive portfolio consists of the below programs:

- Prescriptive HVAC
- Prescriptive Shell
- Energy STAR Homes

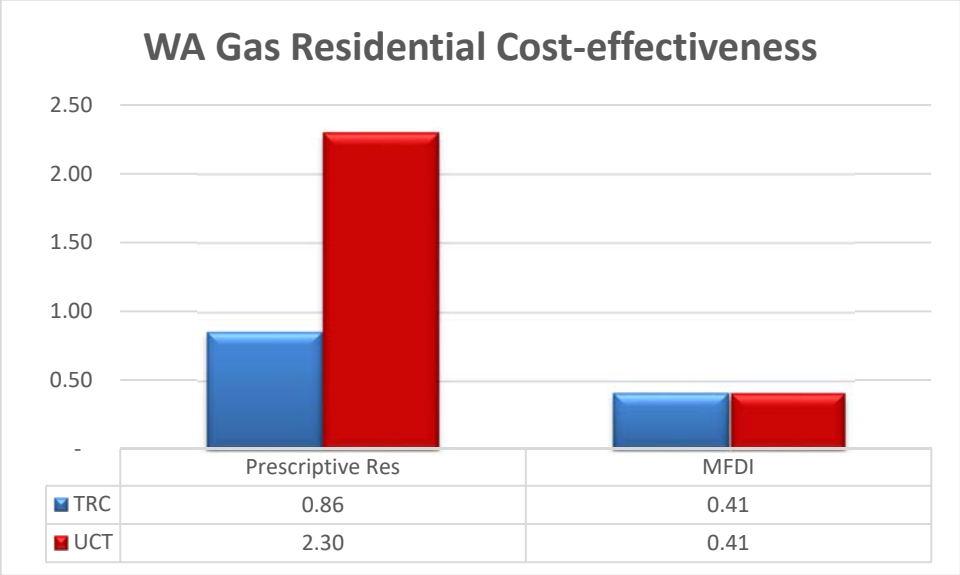
Measure level data for the Residential Prescriptive programs which includes TRC and UCT cost-effectiveness can be found in Appendix A – Program Plans.

Multifamily Direct Install Program: Through the Multifamily Direct Install Program, Avista provides free direct-install measures to multifamily residences (of five units or more) and common areas in its service territory. SBW Consulting, Inc., the program implementer, contacts the property managers and schedules appointments to conduct audits and install energy-saving products in all of the units and in common areas. These products include faucet aerators, showerheads, LED light bulbs, smart power strips, vending misers, and common area lighting retrofits. The implementer also conducts energy audits to identify other savings opportunities at

the property and to gauge the property manager's interest in other Avista program offerings. This program certainly serves the hard-to-reach customer segment as well as Avista's low and limited income population.

The program-by-program cost-effectiveness of the residential portfolio is graphically represented in the figure below:

Figure 3: Residential Programs Cost-Effectiveness



b. Low Income Programs

Avista's low income programs are offered in a cooperative effort with Community Action Partner agencies under annual contract to Avista. The funding contracts allow for considerable flexibility for the Agencies to deliver to each individual low-income client a mix of measures customized to that particular home. For purposes of establishing a projection of program performance for 2020, Avista has defined 30 electric and natural gas measures available to Washington CAPs. Additionally, the CAP agencies are permitted to expend up to 15% of their funding on health and human safety measures on homes receiving Avista-funded treatment. Additionally, CAP agencies may charge Avista up to 15% of the total installed cost of the measures for reimbursement of administrative costs.

The list of measures offered is derived from the Department of Commerce's Weatherization Manual. To guide the agency toward projects that are most beneficial to the

Company's energy efficiency efforts, an "Approved" list of measures is provided that allows for full reimbursement. Measures reimbursed at 100% have a TRC of 1.0 or better. Per WAC 480-109-100(10)(a), measures identified through the priority list in the Weatherization Manual are considered cost-effective. For efficiency measures with a TRC less than 1.0 and not included on the priority list, a "Rebate" that is equal to the Company's avoided cost of energy is provided as the reimbursement to the Agency.

Both the "Approved" and "Rebate" lists are made available to the Agencies during the contracting process so they are aware of the eligible measures and the designated amounts if applicable. Should the Agency have an efficiency opportunity that is not on the "Rebate" list, the Company will review each project individually to determine an appropriate funding amount. The Agencies may choose to utilize their Health and Human Safety allotment towards covering the full cost of the "Rebate" measure if they do not have other funding sources to cover the difference. In 2019, some measures, particularly weatherization, have decreased TRCs below 1.0, however, most are included on the Weatherization Manual priority list and therefore reimbursed at 100%.

Avista does not include the application of non-Avista co-funding for the installation of energy measures as a cost for purposes of calculating the TRC test. Avista defines two major non-energy benefits uniquely applicable to the low income program. These are:

1. End-use non-energy benefit - CAPs fund the entire cost of the installation of the measure in a customer home, not just the incremental cost of the higher efficiency value. To maintain consistency with how the utility is invoiced and with programmatic budgets, the Company includes the full invoiced cost within the TRC test. However, the energy efficiency value of the measure corresponds only to the incremental cost of the efficiency measure. Thus, Avista values the cost associated with the baseline end-use as a non-energy benefit being provided to the customer.
2. Health and human safety non-energy benefit - The 15% health and human safety allowance permitted under the Company's funding contracts with the CAP is assumed to create, on a dollar-for-dollar basis, a quantifiable non-energy benefit. It is assumed that the CAP would only make these investments in an individually reviewed home if the benefits were equal, or in excess of, the cost. Therefore, Avista recognizes a non-energy benefit for health and human safety expenses that is equal to the amount expended.

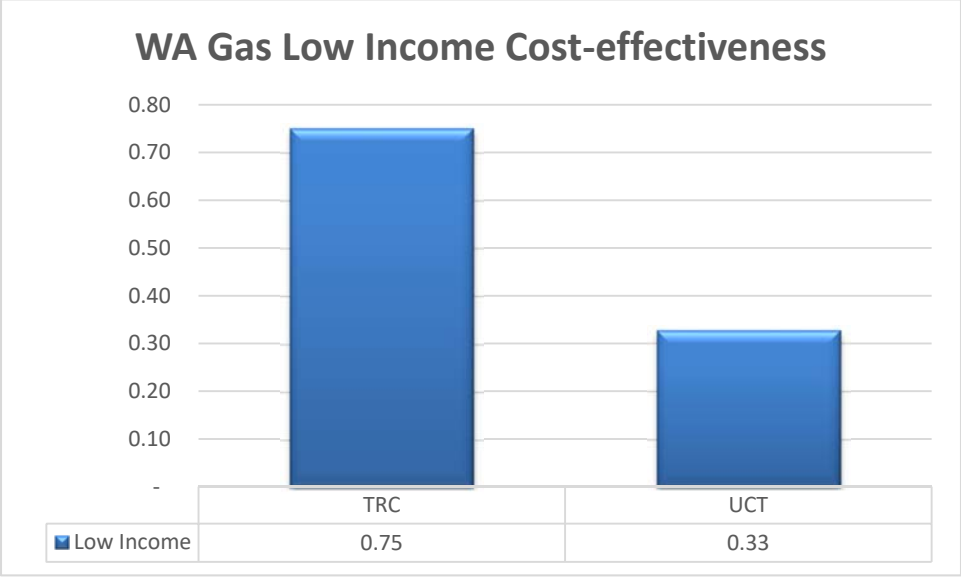
Other non-energy benefits associated with individual measures are quantified and included within the low income portfolio analysis in a similar manner to any other measure within the Avista Energy Efficiency portfolio.

The UCT is calculated based upon the authorized expenditure of Avista funds, whereas the TRC cost is based upon the cost of the installation without regard to how that cost is paid. Since the authorized expenditures for a measure are potentially less than the full cost, due to the cap on funding available for most measures at the value of the energy savings, the portfolio UCT costs are lower than the TRC cost. Both the UCT and TRC costs include all assigned and allocated non-incentive utility costs.

Since there are often multiple measures installed at the same time, and these measure packages frequently consist of similar measures, it is statistically difficult to separate the individual measure savings. As a result, Avista has developed adjusted engineering estimates of UES for this program that align with actual impact evaluations for participating homes. While there is confidence that the homes achieved a certain level of savings, it is difficult to determine an individual measure's contribution to the energy savings.

Figure 4 below identifies the TRC and UCT cost-effectiveness for the Low-Income programs.

Figure 4: Low Income Cost-Effectiveness



c. Non-Residential Prescriptive Programs

Nonresidential prescriptive programs are similar to residential prescriptive programs in that they do not require a pre-installation contract and offer a fixed incentive amount for eligible measures. Measures offered through prescriptive programs are evaluated based upon the typical application of that measure by program participants. Measures that are eligible through the prescriptive program are not eligible for the otherwise all-inclusive site-specific program. Prescriptive measures are generally limited to those that are low cost, offer relatively homogenous performance across the spectrum of likely applications and would not significantly benefit from a more customized approach.

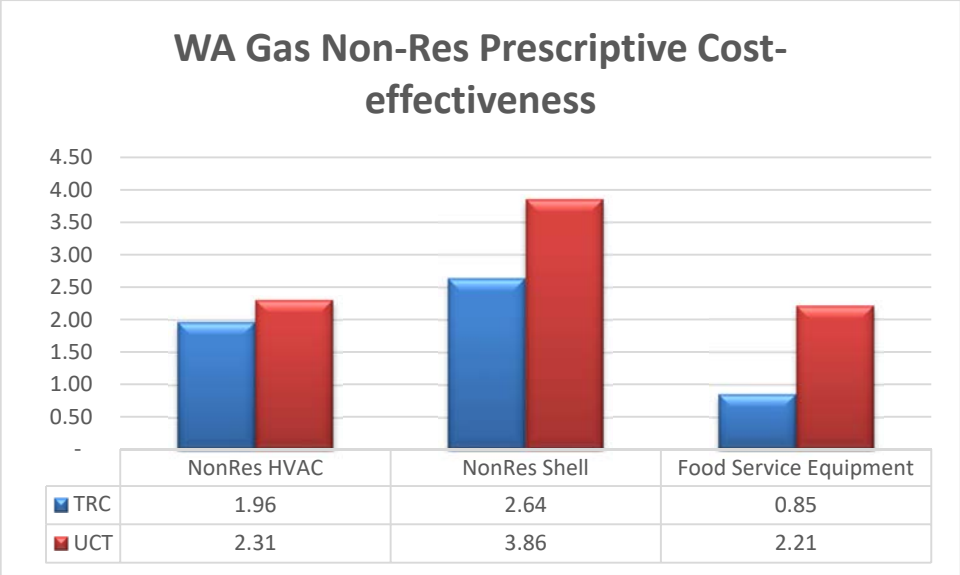
The Gas portfolio consists of the below non-residential prescriptive programs:

- Non-Residential HVAC
- Prescriptive Shell
- Food Services
- Grocer

Quantifiable non-energy benefits are included in the TRC calculation including, but not limited to, reductions in maintenance, water, and sewer and non-utility energy costs. All assigned and allocated non-incentive utility costs have been incorporated into the cost-effectiveness calculation.

Figure 5 identifies the cost-effectiveness for the Non-Residential Prescriptive Programs.

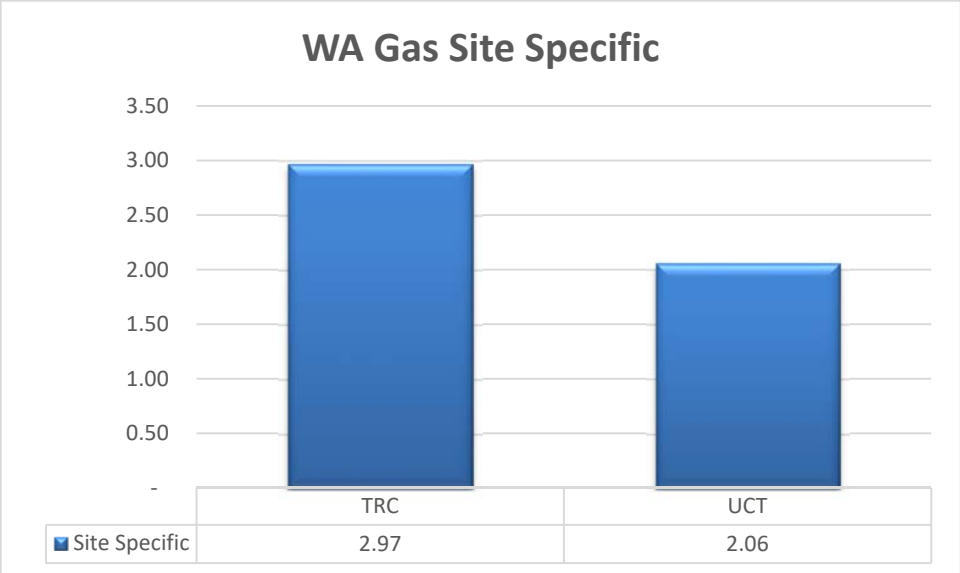
Figure 5: Non-Residential Prescriptive Programs Cost-Effectiveness



d. Non-Residential Site-Specific Program

Avista's site-specific program has historically been one of the largest and frequently one of the more cost-effective programs. Any measure with documentable and verifiable energy savings that is not otherwise covered by a prescriptive program is eligible for the site-specific program. The all-encompassing nature of the program has led to the participation of a number of projects that would not otherwise have been incorporated within the portfolio.

Figure 6: Site-Specific Program Cost-Effectiveness



VII. SECTOR COST-EFFECTIVENESS PROJECTIONS AND RELATED METRICS

Figure 7: Sector Portfolio Cost-Effectiveness

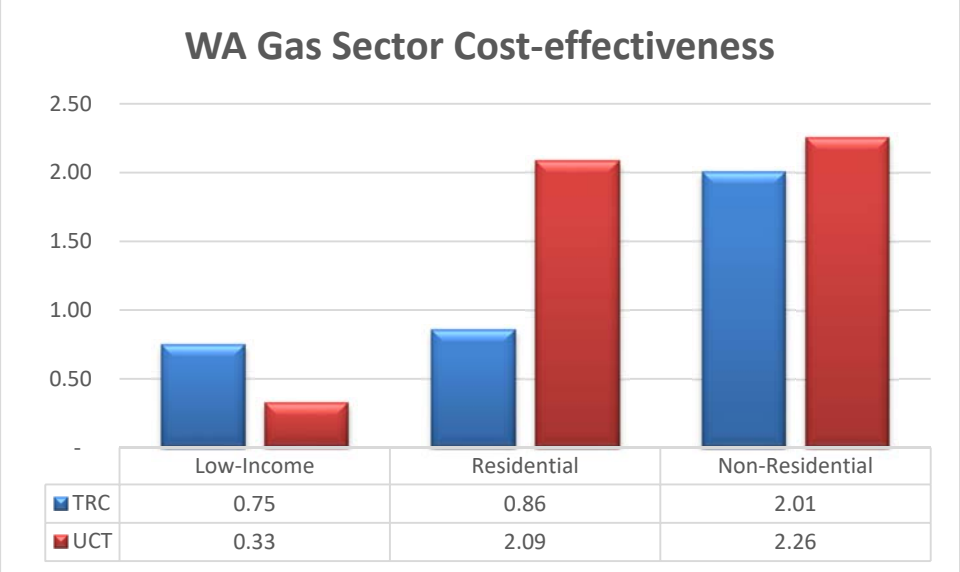


Figure 8: Sector Portfolio Savings

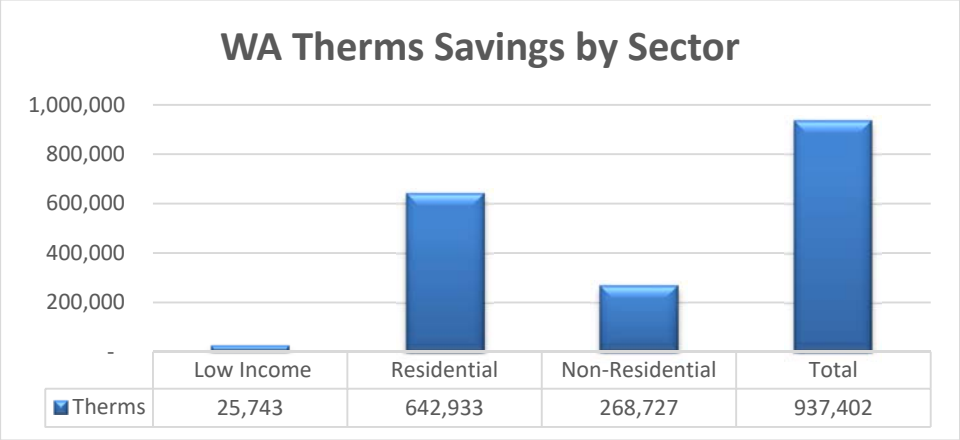
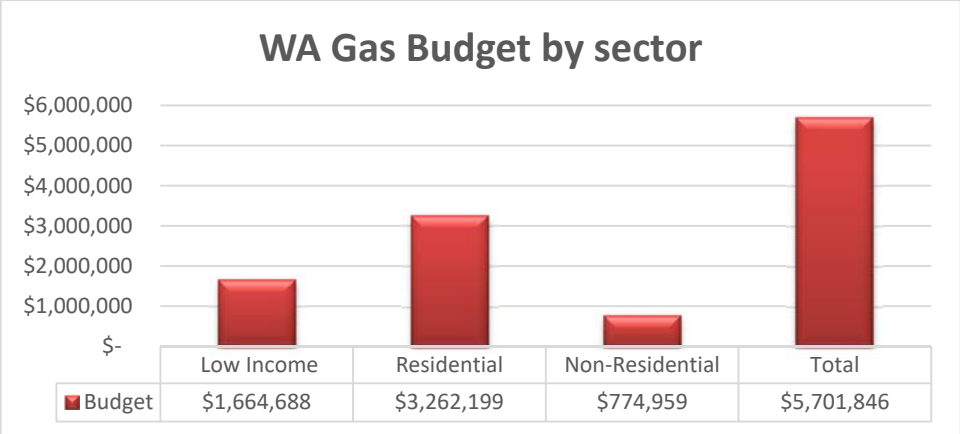


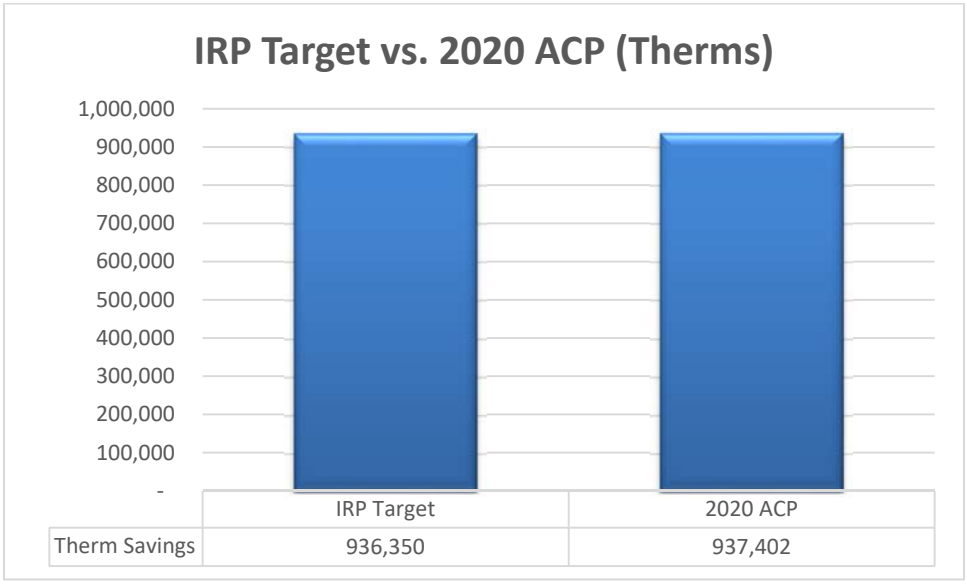
Figure 9: Sector Portfolio Budgeted Cost



a. Washington Natural Gas IRP Target acquisition

From the 2018 Natural Gas IRP the Washington natural gas conservation potential for 2020 is 936,350 therms. The 2020 Annual Conservation Plan's expected acquisition is 937,402 therms.

Figure 10: Local 2020 IRP Target vs. 2020 Annual Conservation Plan Goal



b. Energy Efficiency Labor Requirements

Projections of expected labor requirements by job classification are made by managers within the Energy Efficiency team. Labor is allocated to a class of programs it is done on the basis of the weighted value of benefits the program brings to the overall portfolio.

The expectations in 2020 indicate $3.06 million of fully loaded labor funding across electric and gas programs in both Washington and Idaho. This amount will fund 25 FTE (Full Time Equivalent) spread across 33 different individuals compared to 26 FTE spread across 33 individuals in 2019.

c. Overall Energy Efficiency Budget Projections

Based upon all of the preceding planning, a compilation of the total Energy Efficiency budget is assembled at the completion of the planning process. The placement of the budget compilation at the close of the process is consistent with Avista's commitment to achieve all cost-effective Energy Efficiency measures and to maximize the value of the portfolio without budgetary constraints. This process assumes that prudently incurred expenditures will be fully recoverable through the conservation tariff rider and that revisions in the tariff rider surcharge will be sufficiently timely so as to maintain a materially neutral tariff rider balance. Thus the budget is a product of the planning process and not a planning objective. The Company recognizes that customer demand and market factors exist outside of the budgeting process and that forecasted expenses may be higher or lower than actual results. The forecasted budget does not represent an expectation or commitment to limit expenses to the planned amounts.

The overall 2020 budget projection is summarized below. The table includes elements of the Energy Efficiency budget that have been designated as "supplemental" to indicate that they are unrelated to the current year operations and are not included in the cost-effectiveness calculation. These supplemental costs include the funding associated with regional programs (NEEA) and the cost to perform conservation potential assessment studies and evaluation measurement & verification.

Table 3: Summary of the 2020 Energy Efficiency Budget

	2020 Washington Gas Budget	Supplemental Budget	Non-Supplemental Budget
Total Incentives	$5,062,757	$0	$5,062,757
Administrative Labor	$154,230	$0	$154,230
Direct Benefit to Customer Labor	$60,302	$0	$60,302
Total non-labor/non-incentive	$914,557	$490,000	$424,557
Total	$6,191,846	$490,000	$5,701,846

The Company continues to track the proportion of total utility expenditures returned to customers in the form of direct incentives and benefits as a metric to guide the Company towards improved administrative efficiencies.

The amount included in the direct benefit figure includes not only the incentives paid to customers through monetary incentives for energy efficiency programs but also the engineering time that is spent on customized projects for energy efficiency participants. While labor costs are generally not included as a direct customer benefit, the inclusion of the Energy Efficiency Engineering team in an energy efficiency project provides the customer with access to a valuable resource for identifying and implementing energy saving measures at their home or business.

Table 4: Proportion of funds returned to customers through direct benefits

% of utility expenditures returned to customers via direct benefits	**82%**

The program-by-program details of the expected incentive expenditures for 2020 are provided in greater detail in Table 5. The direct incentive expenditures represent the estimated incentives that will be paid to customers directly or indirectly for participation in Energy Efficiency programs. The overall level of expense is highly correlated to program's throughput and energy acquisition and based on customer participation, the amounts are subject to change.

Table 5: Customer Direct Incentive Expenditure Detail

Program	Direct Incentive Expenditure
Washington Low-Income	$1,342,205
Residential Programs	
Res Prescriptive	$2,992,700
Multifamily Direct Install	$12,887
Simple Steps	$0
Non-Residential Programs	
NonRes HVAC	$96,000
NonRes Shell	$54,065
Food Services	$111,900
Site Specific	$453,000
Total Low Income Incentives	$1,342,205
Total Residential Incentives	$3,005,587
Total Non-Residential Incentives	$714,965
Total of all incentives	$5,062,757

The non-incentive expense, including both non-supplemental and supplemental expenditures, is detailed to a lower level of aggregation and broken out by portfolio in the table below. The allocation of these expenses is allocated by the percentage of value provided by each program. The policy regarding assigning costs is based upon the source of the requirement or justification for the expense and the portfolio benefiting from the outcome of that expense.

Table 6: Non-Incentive Utility Expense Detail

	Washington Gas Portfolio	Supplemental Budget	Non-Supplemental Budget
Third Party non-incentive payments	$303,831	$0	$303,831
Labor	$214,532	$0	$214,532
EM&V	$77,000	$77,000	$0
Memberships	$7,788	$0	$7,788
Customer Outreach	$60,993	$0	$60,993
Training/Travel	$350	$0	$350
Regulatory	$350	$0	$350
Studies and Research	$3,500	$0	$3,500
Software Implementation	$15,994	$0	$15,994
Conservation Potential Assessment	$7,000	$7,000	$0
General Implementation	$31,751	$0	$31,751
NEEA Fees	$406,000	$406,000	$0
Total	$1,129,089	$490,000	$639,089

VIII. STUDIES AND OTHER ITEMS

a. iEnergy DSM Enterprise Software Integration

During 2019, Avista began utilizing the iEnergy software platform for several functions. The DSM Central module will be used internally to process, and track Energy Efficiency projects. Commercial rebate submissions are the priority for inclusion to increase our access to the data elements collected. Residential project details may also begin to be migrated into the software if resources become available. In addition, the Trade Ally module will be used to improve communications with regional vendors, and installers. This program is a purpose-built, data management, analytics and customer engagement platform that assists utilities in managing their business processes. The platform includes an end-to-end management module that tracks and reports energy efficiency savings and expenses along with providing timely reporting for internal and external stakeholders.

b. Particulate Matter 2.5

Using a nationwide network of monitoring sites, EPA has developed ambient air quality trends for particle pollution, also called Particulate Matter (PM). $PM^{2.5}$ describes fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller. Under the Clean Air Act, EPA sets and reviews national air quality standards for PM. Avista has received results from ABT Consulting for the development of PM 2.5 non-energy values for offering wood burning on a measure BTU basis. Avista discussed these results with their Advisory Group at the Fall 2018 meeting to determine an agreed upon value for non-energy benefits. Consensus was reached to use the median values and take an average of the high and the low values which results in $0.0065 ($ per kWh of electricity saved) by ductless heat pump replacing zonal heat and $0.0041 ($ per kWh of electricity saved) by replacing zonal heat with natural gas furnaces.

c. Advanced Meter Infrastructure (AMI)

Avista's movement towards Advanced Meter Infrastructure (AMI) presents multiple opportunities for both the Company and its customers. One benefit to energy conservation is that customers will be able to receive faster feedback on their energy usage and have the opportunity to adapt their energy use based on the data received. AMI is currently being implemented in Avista's Washington service territory for both electric and natural gas customers. The implementation of AMI meters involves the removal of the existing analog meter and the replacement with a digital meter that provides functionality for high resolution read rates and automated communication protocols. Avista began the installation of AMI meters in its Washington service territory in September of 2018 and as of October 2019, is approximately 39% complete.

AMI has the potential to provide multiple benefits to Avista customers. Chief among these benefits are an improved understanding of how they use energy and subsequently, how that energy use impacts their Avista bill.

In coordination with multiple departments internally, Avista was able to deliver the first customer facing functionality to leverage AMI data. Specifically, Avista delivered a new feature on its website, myavista.com on May 1st, 2019 that calculates a customers projected bill based on their average daily usage. This feature is made possible by leveraging daily AMI meter reads that we were not able to obtain prior to the implementation of the AMI project. Customers now also

have the ability to 'drill down' to view five minute interval data which allows them to understand their energy usage profile in more detail. Our goal is to better inform our customers of their energy usage throughout the billing period subsequently giving them an opportunity to reduce their usage to lower their monthly bill.

Additionally, Avista officially kicked off a project that will send proactive notifications to customers when their user defined budget threshold is projected to be exceeded. Customers will be able to log into myavista.com or call customer service to define a budget threshold (e.x. $125.00) and if the 'projected bill amount' is predicted to exceed the that, then Avista will send an email or text alerting the customer, thus giving them an opportunity to adjust their usage to lower their monthly bill. This functionality is planned to be delivered in Q1 of 2020.

IX. CONCLUSION AND CONTACT INFORMATION

This 2020 Annual Conservation Plan represents program efforts by the Company in order to achieve its expected eligible acquisition savings for the 2020 program year. For additional supporting information please see the corresponding appendices:

Appendix A: Program Plans
Appendix B: Evaluation, Measurement and Verification Plan
Appendix C: Summarization of Cost-Effectiveness Methodology
Appendix D: Schedule 90 and 190, Washington
Appendix E: Program Summary

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Appendix A:

2020 Program Plans

I. LOW INCOME PORTFOLIO

a. Low Income Program

General Program Description:
The Company utilizes the infrastructure of six Community Action Partner (CAP) agencies and one Tribal Housing Authority to deliver low income energy efficiency programs (aka Weatherization). The CAPs have the ability to income-qualify, generate referrals through their energy assistance efforts, and have access to a variety of weatherization funding sources which can be utilized to best meet the customer's home energy needs. The seven agencies serving Avista's entire Washington service territory receive an aggregate annual funding amount of $2,350,000.

Program Implementation:
The agencies are allowed to spend their annual allocated funds on either electric or natural gas efficiency measures. The home must demonstrate a minimum level of electric or natural gas energy use for space heating to be eligible for the Avista funds. The agencies are authorized to use 15% of their funds for administration cost reimbursement. The Company also permits the agency to use up to 15% of their contract to fund health and safety improvements. Health and safety spend is at the agency's discretion and offers flexibility in preserving the integration of the improvements that have been installed in the home.

Below is the funding allocation by Agency and the county(ies) they serve:

2020 Low Income Funding by CAP Agency

CAP Agency	County	Funding
Spokane Neighborhood Action Partners (SNAP)	Spokane	$1,545,125
Rural Resources Community Action	Ferry, Lincoln, Pend Oreille, Stevens	$227,950
Community Action Center	Whitman	$171,550
Opportunities Industrialization Council	Adams, Grant	$88,125
Spokane Indian Housing Authority	Stevens County	$23,500
Community Action Council Lewis Mason Thurston Counties	Klickitat, Skamania	$11,750
Community Action Partnership	Asotin	$282,000
		Total $2,350,000

The 2020 plan will continue with a budget allocation of $2,350,000 and will fully fund the majority of energy efficiency electric and natural gas improvements. These include utility approved measures as well as those contained in the Washington State Department of Commerce Weatherization Manual, July 2019 Edition. The list of the 2020 Approved Measures can be found in the table below:

2020 Approved Measures - Washington

Electric Efficiency Measures	Natural Gas Efficiency Measures
Air infiltration	Air infiltration
Duct Sealing	Duct sealing
Attic insulation	Attic insulation
Duct insulation	Duct insulation
Floor insulation	Floor insulation
Wall insulation	Wall insulation
Energy Star rated doors	Energy Star rated doors
Electric to ductless heat pump	Energy Star window
Electric to air source heat pump	High efficiency furnace (95% AFUE)
Heat pump water heater (0-54 gal 1.8 EF)	High efficiency water heater <= 55 Gal (.82 EF)
LED's (6-Pack)	High efficiency boiler (96% AFUE)

The 2020 plan will be the first year that income eligible customers will not be able to switch the home's electric heating system to natural gas. The agencies may still consider a heating efficiency improvement from baseboard or cadet heating to ductless or air source heat pump. Also available is an equipment improvement if the natural gas furnace is not functioning appropriately.

The agencies may choose to utilize their Health and Safety allocation towards covering the full cost of the "Rebated" measure if they do not have other funding sources to fill in the difference. The list of the 2020 Fully Funded and Qualified Rebate measures can be found in the table below:

2020 Rebates – Fully Funded and Rebated

Washington - LI Electric - 2020				
Measure Description	**Est Units**	**Unit of Measure**	**Funding**	**Measure Cost**
E AIR INFILTRATION	30,000	SQFT	Fully Fund	$1.72
E ENERGY STAR RATED DOORS	30	Unit	Fully Fund	$608.53
E ENERGY STAR REFRIGERATOR	10	Unit	Fully Fund	$520.51
Windows	1,500	SQFT	Fully Fund	$12.36
E HE AIR HPUMP	10	Unit	Fully Fund	$2,078.82
E INS - CEIL/ATTIC	35,000	SQFT	Fully Fund	$1.81
E INS - DUCT	10,000	SQFT	Fully Fund	$2.83
E INS - FLOOR	35,000	SQFT	Fully Fund	$2.93
E INS - WALL	10,000	SQFT	Fully Fund	$2.03
Duct sealing	10	Unit	Fully Fund	$394.00
Ductless Heat Pump w FAF	10	Unit	Fully Fund	$4,103.00
Ductless Heat Pump (displace Zonal)	10	Unit	Fully Fund	$4,103.00

Tier2-3 Anysize HPWH	10	Unit	Rebate	$697.39
Elec Res --> Heat Pump	20	Unit	Fully Fund	$5,461.54
Outreach LEDs	10,000	Unit	Fully Fund	$1.10
Washington - LI Natural Gas - 2020				
Measure Description	**Est Units**	**Unit of Measure**	**Funding**	**Measure Cost**
G AIR INFILTRATION	90	SQ FT	Fully Fund	$1,030.10
G ENERGY STAR DOORS	70	Unit	Fully Fund	$1,113.52
G ENERGY STAR WINDOWS	5,116	SQ FT	Fully Fund	$21.14
G HE FURNACE AFUE 95%	25	Unit	Fully Fund	$3,717.70
G HE WH < 55 Gal	100	Unit	Fully Fund	$2,803.15
G INS - CEIL/ATTIC	130,000	SQ FT	Fully Fund	$2.46
G INS - DUCT	653	SQ FT	Fully Fund	$8.01
G INS - FLOOR	50,000	SQ FT	Fully Fund	$4.48
G INS - WALL	50,000	SQ FT	Fully Fund	$2.37
G duct sealing	10	Unit	Fully Fund	$793.95
HEALTH & HUMAN SAFETY	1	Unit	Fully Fund	$0.10
Tankless Water Heater (<=55 Gal)	10	Unit	Fully Fund	$573.00
HE Boiler AFUE 96%	10	Unit	Fully Fund	$894.11

2020 Program Planning

The majority of the measures will receive full funding while natural gas tankless and heat pump water heaters will be rebated the amount equal to the avoided cost of energy. The Company will continue in the same vein as 2019 implementation by reimbursing the Agencies the full cost of the measures that appear on the State Priority List as presented in the Washington State Department of Commerce Weatherization Manual, July 2019 edition. These measures apply to both electric and natural gas heated homes and include insulation for attic, floor, wall, air infiltration and LED lamps.

Measures that are not on the State Priority or are not cost effective by utility measurements will be reimbursed at the amount of the Company's avoided cost of energy savings.

Agencies are encouraged to work with the Company when considering the installation of energy efficiency opportunities that are not found on either the Approved or the Rebate list.

Avista Program Manager: Renee Coelho

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

b. CEEP – Community Energy Efficiency Program

The Community Energy Efficiency Program was created from the Washington State Legislature in 2009 to encourage residential and commercial customers to make energy efficiency improvements. The CEEP pilot was funded by the U.S. Department of Energy's State Energy Program and the American Recovery and Reinvestment Act. CEEP partners are selected by a competitive request for proposals and independent review committee.

As the CEEP pilot wrapped up in March 2012, CEEP partner organizations had already helped thousands of Washington residents and small business owners save significant energy and money. To leverage this community investment, the Washington State Legislature continues to authorize WSU Energy Program with additional funding from the capital budget and Avista has been a recipient of these funds since 2014.

The Company is currently discussing continuing the CEEP partnership for the 2020-21 funding year that involves energy efficiency improvements for multifamily housing; fuel switch from alternative heat (wood, oil, propane) to heat pump; and efficiency improvements for small businesses in rural communities. The funding allocation from CEEP is proposed for $750,000 which the Company will match as well as provide in-kind support for program administration.

II. RESIDENTIAL PORTFOLIO

a. Residential Appliance Program

General Program Description:

The residential appliance program helps promote the use of high efficiency appliances for residential customers. Currently, Avista will offer incentives for the purchase and use of High Efficiency Front Load Washers and Vented Energy Star Clothing Dryers. For the time being, the incentive is available for electric only, however the company will continue to evaluate the program going forward

Program Eligibility:

The Front Load Washer incentive requires that customers purchase and install a High Efficiency washer with a CEE Tier of 1 or 2 or has an Energy Star designation. The dryer measure must be Energy Star designated.

Avista Program Manager: Camille Martin

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

Incentive Revisions for 2020:

Service	Measure Description	2019	2020
Electric	Front Load Washer	$ -	$ 50.00
Electric	Vented Energy Star Clothing Dryer	$ -	$ 20.00

b. Residential ENERGY STAR Homes Program

General Program Description:

The ENERGY STAR Certified Manufactured Homes program helps homebuyers easily identify manufactured homes that are significantly more energy efficient than standard construction in the marketplace. As code requirements have become more rigorous and builder practices have become more efficient, EPA has periodically modified the guidelines to ensure that certified manufactured homes represent a meaningful improvement over non-labeled manufactured homes.

Program Implementation:

The Energy Star Manufactured Home program promotes to manufactured home builders and homeowners a sustainable, low operating cost, environmentally friendly structure as an alternative to traditional home construction. In Washington, Avista offers both electric and natural gas energy efficiency programs and as a result structures the program to account for homes where either a single fuel or both fuels are utilized for space and water heating needs. The Company continues to support the regional program to encourage sustainable building practices.

The current customer descriptions of the programs with primary program requirements are available on the ENERGY STAR®/ECO-Rated Manufactured Homes Rebate form.

Program Eligibility and incentives:

Any Washington and Idaho residential electric customer (Schedule 1) with a certified Energy Star/ECO-Rated Manufactured Home that is all electric is eligible. Any Washington residential electric customer (Schedule 1) with a certified Energy Star Manufactured Home that has Avista electric for lights and appliances and Avista residential natural gas (Schedule 101) for space and water heating is eligible.

Incentive Revisions for 2020:

Service	Measure Description	2019	2020
Electric	E ESTAR HOME - MANUF, ELEC/DF	$ 650.00	$ 800.00
Gas	E STAR HOME - GAS ONLY	$ 200.00	$ 400.00

A certified Energy Star Manufactured Home with Avista electric or both Avista electric and natural gas service provides energy savings beyond code requirements for space heating, water heating, shell, lighting and appliances. Space heating equipment can be either electric forced air or electric heat pump in Washington and Idaho; or a natural gas furnace in Washington. This rebate may not be combined with other Avista individual measure rebate offers (e.g.: high efficiency water heaters).

Avista Program Manager: Camille Martin

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

c. Residential HVAC Program

General Program Description:

The HVAC program encourages residential customers to select a high efficiency solution when making energy upgrades to their home. This prescriptive rebate approach issues payment to the customer after the measure has been installed. Energy Efficiency marketing efforts build considerable awareness of opportunities in the home and drive customers to the website for rebate information. Vendors generate participants in the program as they use the rebate as a sales tool for their services. Utility website promotion, vendor training, retail location visits and presentations at various customer events throughout the year are some of the other communication methods that encourage program participation.

Overall, residential customers continue to respond well to the program. High efficiency natural gas furnace provides the largest portion of the gas savings for the residential portfolio.

Program Eligibility and incentives:

On December 31, 2019, the variable speed motor (VSM's) rebate will discontinue due to code changes. In the past, Washington electric customers (Schedule 1) who heated their homes with Avista natural gas or electric had been eligible for a rebate for the installation of a variable speed motor on their forced air heating equipment or for converting their electric straight resistance space heat to an air source heat pump.

Any Washington residential natural gas customers (Schedule 101) who heat their homes with natural gas may be eligible for a rebate for the installation of a high efficiency natural gas furnace or boiler. High efficiency natural gas furnaces and boilers must have an Annual Fuel Utilization Efficiency (AFUE) of 90% or greater. Avista also added a rebate for a 90% or greater Wall Heater measure for 2020 which will have a rebate level similar to other high efficiency natural gas offerings.

Electric heat to natural gas conversions (including natural gas + water heat) and Line Extension Allowance Program (LEAP) will be ending December 31, 2019. Avista will continue to offer upgrades

to electric heat. Avista will review energy usage as part of the program eligibility requirements; customer must demonstrate a heating season electricity usage of 10,000 kWh and less than 340 therms for replacement of electric straight resistance to air source heat pump and ductless heat pump. Ductless heat pumps must be 9.0 HSPF or greater.

Avista Program Manager: Camille Martin

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

Incentive Revisions for 2020:

Service	Measure Description	2019	2020
Electric/Gas	Web Tstat Elec DIY	$ 60.00	$ 75.00
Electric/Gas	Web Tstat Elec Cont	$ 75.00	$ 100.00
Electric	ELEC RESISTANCE TO ASHP	$ 700.00	$ 1,100.00
Electric	VARIABLE SPEED MOTOR ASHP	$ 80.00	$ -
Electric	VARIABLE SPEED MOTOR FURNACE	$ 80.00	$ -
Electric	Ductless Heat Pump (displace zonal)	$ 500.00	$ 400.00
Gas	NG FURNACE/BOILER 90% AFUE	$ 300.00	$ 450.00
Gas	NG Wall Heater 90% AFUE	$ -	$ 450.00

d. Residential Water Heat Program

General Program Description:

Program Eligibility and incentives:

Washington electric customers (Schedule 1) who heat their homes with Avista electric or natural gas may be eligible for a rebate for the installation of a high efficiency Heat Pump Water Heater, Tankless Water Heater or Gas High Efficiency Water Heater. Natural gas tankless water heaters must have an efficiency of ≥0.82 Uniform Efficiency factor (UEF). ≤ 55 Gallon tanked natural gas water heater requires an efficiency of ≥ 0.65 UEF. Heat pump water heaters must have an efficiency of ≥1.8 UEF. Supporting documentation required for participation includes but may not be limited to: copies of project invoices and AHRI certification.

Incentive Revisions for 2020:

Service	Measure Description	2019	2020
Electric	Heat Pump Water Heater (Anysize Ave Tier 2/3)	$ 215.00	$ 215.00
Gas	G TANKLESS WH (0.82+)	$ 215.00	$ 400.00
Gas	G HE Water Heaters (<= 55)	$ 60.00	$ 100.00

Efficiencies for space and water heating equipment are verified according to the contractor invoice or Air-Conditioning, Heating, and Refrigeration Institute (AHRI).

Avista Program Manager: Camille Martin

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

e. Residential Shell Program

General Program Description:

The shell program encourages residential customers to improve their home's shell or exterior envelope with upgrades to windows, storm windows, and insulation. This prescriptive rebate approach issues payment to the customer after the measure has been installed. Energy Efficiency marketing efforts build considerable awareness of opportunities in the home and drive customers to the website for rebate information. Vendors generate participants in the program as they use the rebate as a sales tool for their services. Utility website promotion, vendor training, retail location visits and presentations at various customer events throughout the year are some of the other communication methods that encourage program participation.

Program Eligibility and incentives:

Washington residential electric (Schedule 1) and natural customers who heat their homes with Avista electric or natural gas are eligible to apply with the required usage ≥8,000 kWh or ≥ 340 therms.

Incentive Revisions for 2020:

Service	Measure Description	2019	2020
Electric/Gas	ELEC WINDOWS SP/MDP --> <0.30 U	$ 3.00	$ 4.00
Electric/Gas	ElEC Storm Windows	$ 2.00	$ 3.00
Electric/Gas	Wall Insulation R0->=R11+	$ 0.40	$ 0.75
Electric/Gas	Floor Insulation R0->=R19	$ 0.20	$ 0.75
Electric/Gas	Attic Insulation R11->=R49	$ 0.45	$ 0.75

Storm windows (interior/exterior) must be new, the same size as existing window, not in direct contact with existing window, and exterior windows low-e coating must be facing the interior of the home. Glazing material emissivity must be less than .22 with a solar transmittance greater than .55.

Windows must have a u-factor rating of .30 or lower.

Avista Program Manager: Camille Martin

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

f. Multifamily Hard to Reach Program – Direct Install

General Program Description:

Through the Multifamily Direct Install Program, Avista provides free gas and electric direct-install measures to multifamily residences (of five units or more) and common areas in its service territory. This program targets the hard to reach market of customers who rent rather than own their property and the property managers/owners of the properties. This program offers direct install measures to owners of multifamily buildings in order to make energy efficient improvements. Products included in the program are listed below.

Products included in program:

- Site audit
- Various LED Lamps
- Energy Efficient Shower Heads
- Energy Efficient Faucet Aerators
- Vending Misers for Common Spaces
- Smart Power Strips

Program Implementation: SBW Consulting is contracted by Avista Utilities to administer the direct installation of energy efficiency measures at customer sites.

Avista Program Manager: Greta Zink

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

III. NON-RESIDENTIAL PORTFOLIO

a. Non-Residential Prescriptive Lighting Program

General Program Description:

This program is intended to prompt commercial electric customers to increase the energy-efficiency of their lighting equipment through direct financial incentives. It indirectly supports the infrastructure and inventory necessary to ensure that the installation of high-efficiency equipment is a viable option for the customer.

There is opportunity for lighting improvements in commercial facilities and in an effort to streamline the process and make it easier for customers and vendors to participate in the program we developed a prescriptive approach in 2004. This program provides for many common retrofits to receive a pre-determined incentive amount. Incentive amounts are calculated using a baseline average for existing wattages and the average replacement wattages from the previous year's project data. Energy savings claimed are calculated based on actual customer run times using the averages as calculated for incentive amounts.

The prescriptive lighting program makes it easier for customers, especially smaller customers and vendors, to participate in the program. The measures included in the Prescriptive Lighting Program include fluorescent lamps and fixtures, HID, MR16 and incandescent can fixture retrofits to more energy efficient LED light sources and controls. In anticipation of the increased efficiency standards set forth in EISA and Washington House Bill 1444, incentives for incandescent lamp replacements will be discontinued in 2020.

Program Implementation:
The key drivers to delivering on the objectives of this program are the direct incentives to encourage customer interest, marketing efforts to drive customers to the program and ongoing work with trade allies to ensure that customer demand can be met.

Key to the success of this program is clear communication to lighting supply houses, distributors, electricians and customers on incentive requirements and forms. The Avista website is also a channel to communicate program requirements and highlight opportunities for customers. Avista's regionally based Account Executives (AEs) are a key part of delivering the Prescriptive Lighting Program to commercial and industrial customers. Any changes typically include advance notice of 90 days to submit under the old requirements and/or incentive levels. This usually includes at a minimum, direct mail communication to trade allies as well as internal forms and website updates.

Program Eligibility:
This program is applicable to commercial or industrial facilities with electric service provided by Avista with rate schedules 011 or above.

Avista Program Manager: Rachelle Humphrey

Key Avista Support Staff: Lorri Kirstein, Tom Lienhard, Colette Bottinelli

Measures and Incentives: As Illustrated in Table 1 of Appendix A

Evaluation Measurement and Verification Plan: As defined within Avista's EM&V Plan contained in Appendix B.

Incentive Revisions for 2020:

Program	Measure Description	2019	2020
Exterior Lighting	25 watt fixture	$ 60.00	$ 65.00
Exterior Lighting	30 watt fixture	$ 80.00	$ 85.00
Exterior Lighting	50 watt fixture	$ 125.00	$ 130.00
Exterior Lighting	100 watt fixture	$ 130.00	$ 130.00
Exterior Lighting	100 watt NC fixture	$ 130.00	$ 130.00
Exterior Lighting	140 watt fixture - Ext	$ 140.00	$ 160.00
Exterior Lighting	140 watt NC fixture	$ 140.00	$ 160.00
Exterior Lighting	160 watt fixture	$ 180.00	$ 195.00
Exterior Lighting	160 watt NC fixture	$ 250.00	$ 195.00
Exterior Lighting	175 watt fixture - Ext	$ 255.00	$ 280.00
Exterior Lighting	300 watt fixture - Ext	$ 450.00	$ 490.00
Exterior Lighting	400 watt fixture - Ext	$ 610.00	$ 610.00
Exterior Lighting	Sign Lighting	$ 17.00	$ 22.00
Interior Lighting	6-9 watt LED lamp	$ 8.00	$ -
Interior Lighting	10-13 watt LED lamp	$ 8.00	$ -
Interior Lighting	10-13 watt LED lamp	$ 8.00	$ -
Interior Lighting	14-20 watt LED lamp	$ 8.00	$ -
Interior Lighting	12-20 watt LED Fixture Retrofit	$ 20.00	$ -
Interior Lighting	50-60 watt LED fixture	$ 55.00	$ -
Interior Lighting	140 watt fixture/Lamp - Int	$ 155.00	$ 125.00
Interior Lighting	175 watt fixture/Lamp - Int	$ 205.00	$ 185.00
Interior Lighting	400 watt fixture/Lamp - Int	$ 460.00	$ 270.00
Interior Lighting	2-9 watt MR16	$ 8.00	$ 5.50
Interior Lighting	5-6 watt MR16	$ 10.00	$ -
Interior Lighting	7-9 watt MR16 lamp	$ 10.00	$ -
Interior Lighting	Occ Sensors	$ 40.00	$ 25.00
Interior Lighting	T5HO TLED	$ 15.00	$ 12.50
Interior Lighting	T8 TLED	$ 6.50	$ 6.50
Interior Lighting	U-Bend	$ 8.00	$ 10.00
Interior Lighting	2x2 fixtures	$ 30.00	$ 20.00
Interior Lighting	2x4 fixtures	$ 45.00	$ 28.00
Interior Lighting	LLLC Fixture	$ -	$ 35.00
Interior Lighting	8' T8 TLED	$ 13.00	$ 11.50

b. Non-Residential HVAC Program

General Program Description:
Installing energy efficient heating equipment reduces a customer's operating costs and saves energy. This program offers direct incentives for installing high efficient natural gas HVAC equipment. The HVAC program encourages customers to select a high efficiency solution when making energy upgrades to their businesses. This prescriptive rebate approach issues payment to the customer after the measure has been installed. Eligibility guidelines for participation include but may not be limited to: confirmation of natural gas space heating usage, copies of project invoices and AHRI documentation. This program is applicable to non-residential customers in Washington with Avista natural gas as their primary heat source who install qualified new natural gas equipment.

Program Implementation:
This is a prescriptive program with six measures being offered. Customers must return to Avista a completed rebate form, invoices and an AHRI certificate within 90 days after the installation has been completed. Avista will send an incentive check to the customer (or their designee) generally within six to eight weeks. Rebates will not exceed the total amount on the customer invoice. Each rebate will be qualified and processed within iEnergy to determine the savings and incentive amount. The key drivers to delivering on the objectives of the program are the direct incentives to fuel customer interest, marketing efforts, account executives to drive customers to the program, and ongoing work with trade allies. The Avista Website is also used to communicate program requirements, incentives and forms.

Incentive Revisions for 2020:

Service	Measure Description	2019	2020
Gas	Single stage Furnace <225 kBtu .90-.95 AFUE	$ 8.50	$ 5.00

Avista Program Manager: Greta Zink

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

c. Non-Residential Site-Specific Program

General Program Description:
The site specific program is a major component in our commercial/industrial portfolio. Customers receive technical assistance and incentives in accordance with Schedule 90 and Schedule 190 in Washington and Idaho. Our program approach strives for a flexible response to energy efficiency projects that have demonstrable kWh/Therm savings within program criteria. The majority of site specific kWh/Therm savings are comprised of custom lighting projects that do not fit the prescriptive path, appliances, compressed air, HVAC, industrial process, motors, shell measures and natural gas

multifamily market transformation. The site specific program is available to all non-residential retail electric and/or gas customers in Washington and Idaho. The site specific program typically brings in the largest portion of savings to the overall energy efficiency portfolio.

Program Implementation:

This program will offer an incentive for any qualifying electric or gas energy saving measure that has a simple payback which is less than the life of the measure being installed.

The incentive is capped at seventy percent of the customer incremental cost. The key drivers to delivering on the objectives of the program include; the direct incentives to encourage customer interest, marketing efforts, account executives whose input and assistance can drive customers to the program, and ongoing work with trade allies to ensure that customer demand can be met. The Avista Website is also used to communicate program requirements, incentives and forms.

Avista Program Manager: Lorri Kirstein, Tom Lienhard, site-specific engineering

Measures, Incentives and Budget: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

d. Non-Residential Prescriptive Shell Program

General Program Description:
The Commercial Insulation program encourages non-residential customers to improve the envelope of their building by adding insulation. This may make a business more energy efficient and comfortable. This prescriptive rebate approach issues payment to the customer after the measure has been installed. Eligibility guidelines for participation include, but may not be limited to: confirmation of electric or natural gas heating usage, invoices and insulation certificate. Pre and/or post inspection for insulation may occur as necessary throughout the year. The program offers incentives to non-residential (Schedule 11, 21, 25) customers who have an electric primary heat source or a non-residential (Schedule 101, 111 121) natural gas primary heat source provided by Avista in Washington who install qualified insulation measures in their business are eligible to apply for this program.

Program Implementation:
All customer-facing aspects of this program are prescriptive based. Customers must return to Avista a completed rebate form within 90 days after the installation has been completed. Avista will send an incentive check to the customer (or their designee) generally within six to eight weeks. Rebates will not exceed the total amount on the customer invoice. Each rebate will be qualified and processed within iEnergy to determine the savings and incentive. The key drivers to delivering on the objectives of the program are the direct incentives to fuel customer interest, marketing efforts, account executives to drive customers to the program, and ongoing work with trade allies. The Avista Website is also used to communicate program requirements, incentives and forms.

Avista Program Manager: Greta Zink

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

Incentive Revisions for 2020:

Service	Measure Description	2019	2020
Electric/Gas	Less than R11 attic insulation (E/G) to R30-R44 Attic Insulation	$ 0.20	$ 0.50
Electric/Gas	Less than R11 attic insulation (E/G) to R45+ Attic Insulation	$ 0.25	$ 0.60
Electric/Gas	Less than R11 roof insulation (E/G) to R30+ Roof Insulation	$ 0.25	$ 0.40
Electric/Gas	Less than R4 wall insulation (E/G) to R11-R18 Wall Insulation	$ 0.40	$ 0.35
Electric/Gas	Less than R4 wall insulation (E/G) to R19+ Wall Insulation	$ 0.45	$ 0.45

e. Non-Residential Prescriptive HVAC VFD Program

General Program Description:
This program is intended to prompt the customer to increase the energy efficiency of their HVAC fan or pump applications with variable frequency drives through direct financial incentives. This prescriptive rebate approach issues payment to the customer after the measure has been installed. Eligibility guidelines for participation include, but may not be limited to: confirmation of electric usage, invoices and verification of HP of motor. Any non-residential (Schedule 11, 21, 25) Avista electric customer installing qualified equipment is eligible for this program.

Program Implementation:
All customer-facing aspects of this program are prescriptively based. Customers must return to Avista a completed rebate form within 90 days after the installation has been completed. Avista will send an incentive check to the customer (or their designee) generally within six to eight weeks. Rebates will not exceed the total amount on the customer invoice. Each rebate will be qualified and processed within iEnergy to determine the savings and incentive. All VFD projects are IV'd before the check is issued. The key drivers to delivering on the objectives of the program are the direct incentives to fuel customer interest, marketing efforts, account executives to drive customers to the program, and ongoing work with trade allies. The Avista Website is also used to communicate program requirements, incentives and forms.

Avista Program Manager: Greta Zink

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

f. Non-Residential Food Services Program

General Program Description:
This program offers incentives for commercial customers who purchase or replace food service equipment with Energy Star or higher equipment. This equipment helps them save money on energy costs. This prescriptive rebate approach issues payment to the customer after the measure has been installed. Eligibility guidelines for participation include, but may not be limited to: confirmation of electric or natural gas usage, invoices and equipment data. Any non-residential (Schedule 11, 21, 25) Avista electric customer and any non-residential (Schedule 101,111, 121) Avista natural gas customer in Washington installing qualifying equipment is eligible for this program.

Program Implementation:
All customer-facing aspects of this program are prescriptively based. Customers must return to Avista a completed rebate form within 90 days after the installation has been completed. Avista will send an incentive check to the customer (or their designee) generally within six to eight weeks. Rebates will not exceed the total amount on the customer invoice. Each rebate will be qualified and processed within iEnergy to determine the savings. The key drivers to delivering on the objectives of the program are the direct incentives to fuel customer interest, marketing efforts, account executives to drive customers to the program, and ongoing work with trade allies. The Avista Website is also used to communicate program requirements, incentives and forms.

Avista Program Manager: Greta Zink

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

Incentive Revisions for 2020:

Service	Measure Description	2019 Incentive	2020 Incentive
Electric	Efficient hot food holding cabinet, Double Size NEW	$ 1,000.00	$ -
Electric	Refrigerator - Glass Door, 15 to 29.9 cuft Federal Standard to ENERGY STAR Refrigerator - Glass Door, 15 to 29.9 cuft	$ 52.80	$ -
Electric	Refrigerator - Glass Door, 30 to 49.9 cuft Federal Standard to ENERGY STAR Refrigerator - Glass Door, 30 to 49.9 cuft	$ 114.40	$ -
Electric	Refrigerator - Glass Door, 50 or greater cuft Federal Standard to ENERGY STAR Refrigerator - Glass Door, 50 or greater cuft	$ 118.00	$ -
Electric	Refrigerator - Glass Door,< 15 cuft Federal Standard to ENERGY STAR Refrigerator - Glass Door, < 15 cuft	$ 33.20	$ -
Electric	Refrigerator - Solid Door, < 15 cuft Federal Standard to ENERGY STAR Refrigerator - Solid Door,< 15 cuft	$ 46.20	$ -

Electric	Refrigerator - Solid Door, 15to 29.9 cuft Federal Standard to ENERGY STAR Refrigerator - Solid Door, 15 to 29.9 cuft	$ 53.60	$ -
Electric	Refrigerator - Solid Door, 30 to 49.9 cuft Federal Standard to ENERGY STAR Refrigerator - Solid Door, 30 to 49.9 cuft	$ 51.00	$ -
Electric	Refrigerator - Solid Door, 50 or greater cuft Federal Standard to ENERGY STAR Refrigerator - Solid Door, 50 or greater cuft	$ 84.40	$ -
Electric	Freezer - Energy Star Glass Door - 15 to 29.9 cu.ft.	$ 125.20	$ -
Electric	Freezer - Energy Star Glass Door - 30 to 49.9 cu.ft	$ 242.40	$ -
Electric	Freezer - Energy Star Glass Door - 50 cu.ft. and greater	$ 319.60	$ -
Electric	Freezer - Energy Star Glass Door - Less than 15 cu.ft.	$ 89.20	$ -
Electric	Freezer - Energy Star Glass Door Chest Freezer	$ 62.00	$ -
Electric	Freezer - Energy Star Solid Door Chest Freezer	$ 46.60	$ -
Electric	Freezer - Solid Door, < 15 cuft Federal Standard to ENERGY STAR Freezer - Solid Door, < 15 cuft	$ 43.00	$ -
Electric	Freezer - Solid Door, 15-29.9 cuft Federal Standard to ENERGY STAR Freezer - Solid Door, 15-29.9 cuft	$ 72.00	$ -
Electric	Freezer - Solid Door, 30 ≤ V < 49.9 cuft Federal Standard to ENERGY STAR Freezer - Solid Door, 30 ≤ V < 49.9 cuft	$ 92.40	$ -
Electric	Freezer - Solid Door, 50 ≤ cuft Federal Standard to ENERGY STAR Freezer - Solid Door, 50 ≤ cuft	$ 148.20	$ -
Electric	12 ft reach-in walk in case wo door to new door wo case (hvac and refrigeration)	$ 2,440.40	$ -

g. Non-Residential Green Motors Program

General Program Description:

The Green Motors Initiative is to organize, identify, educate, and promote member motor service centers to commit to energy saving shop rewind practices, continuous energy improvement and motor driven system efficiency. Green Motors Program Group launched the Green Motors Initiative in 2008 to work with northwest regional utilities and other sponsoring organizations to provide incentives, through GMPG's member motor centers, for qualifying motors meeting the GMPG's standards. Avista joined this effort in offering the program to electric customers who participate in the green rewind program from 15 HP (horsepower) to 5,000 HP industrial motors. This program provides an opportunity for Avista customers to participate in a regional effort. Without this program, this market is difficult for us to reach as a local utility. Any commercial (Schedule 11, 21, 25,) Avista electric customer that does a qualified industrial green motors rewind is eligible for this program. Incentives are paid as a credit off the invoice at the time of the rewind. A $1 per HP incentive goes to the customer and a $1 per HP incentive is paid to the service center.

Program Implementation:

The Green Motors Initiative is a third party program that handles the measures from inception to rebate payment. There is an admin fee based on the kWh savings for Green Motors Partners. The incentive is split between the service center and the customer. The customer receives their incentive as an immediate discount off their bill. The Energy Efficiency Program Management team oversees the contract, monitors the program and does input for savings and incentive information. The Avista Website is also used to communicate program requirements, incentives and forms.

Avista Program Manager: Greta Zink

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

h. Non-Residential AirGuardian Program

General Program Description:
The AirGuardian program is a third party delivered turnkey program for direct install compressed air and facility efficiency. The program targets compressed air users in Avista's Washington service territory. The direct install will be a compressed air leak reduction device which will generate energy savings by reducing the impact of compressed air leaks during off hour periods. While on site, a leak detection audit will also be conducted. Any commercial (Schedule 11, 21, 25) Avista electric customer installing qualified equipment is eligible for this program.

Program Implementation:
The AirGuardian program is turnkey delivered by 4 Sight Energy Group LLC. The target market for the direct installation of AirGuardian devices are small and medium sized businesses using rotary screw compressors of at least 15 HP. We anticipate participants to be machine shops, tire and auto body shops, small manufacturers and others using compressed air for production and tools. These facilities represent a prime opportunity for implementation of other energy efficiency measures too. The account executives are also providing customer referrals with permission from the customers. This program is available to all non-residential retail electric customers with compressed air. The Energy Efficiency Program Management team monitors the contract, inputs the monthly results and runs analysis on program measures. Account executives drive customers to the program. The Avista Website is also used to communicate program requirements, incentives and forms.

Avista Program Manager: Greta Zink

Measures and Incentives: *As illustrated in Table 1 of Appendix* A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

i. Non-Residential Fleet Heat Program

General Program Description:
Vehicle fleet operators use heating devices to heat vehicle engine blocks in cold weather. Maintaining the block temperature eases starting, reduces internal wear, and minimizes fuel consumption due to idle warm up time. Typically block heaters use 110 Volt single phase resistive elements, with no on-board controls. Heating operation is dependent solely on either the driver or fleet maintenance staff to energize the heaters as needed. In the Inland Northwest it appears many fleet operators energize vehicle heaters between October 31st and April 1st whenever the vehicle is off-shift. This 24 hour 7 day a week operation prevents freeze up and hard starting conditions, but may incur extra energy consumption and costs heating the engine block in conditions when heating is not needed. There is currently a technology available that adds logic and sensor points to control heater operation. This technology, called a thermocord, adds the ability to sense and measure block coolant temperature and ambient Outside Air Temperature (OAT). With this information the heater will only be energized when the OAT drops below a temperature set-point and the engine mounted thermostat is calling for heat. Any commercial (Schedule 11, 21, 25) Avista electric customer installing qualified equipment is eligible for this program.

Program Implementation:
The process for the program is that Avista customers fill out an order/rebate form with the specifics of their fleet vehicles. When that form is submitted to Avista, that information is recorded and passed on to the vendor for processing. The customer pays the vendor for the cost of the thermocord and the vendor will deliver the product directly to the customer. The customer will be responsible for installation. The vendor will notify Avista when the product has been delivered and Avista will perform an installation verification within 30 days of install. Upon installation inspection, Avista will reimburse the customer for the costs of the cords. The key drivers to delivering on the objectives of the program are the direct incentives to fuel customer interest, marketing efforts and account executives to drive customers to the program, and ongoing work with trade allies to ensure that customer demand can be met. The Avista Website is also used to communicate program requirements, incentives and forms.

Avista Program Manager: Greta Zink

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

j. Non-Residential Grocer Program

General Program Description:

The Grocer program is intended to prompt the customer to increase the energy efficiency of their refrigerated cases and related grocery equipment through direct financial incentives. This year we will

be offering this program in two ways. We will offer measures with RTF deemed savings values on a prescriptive basis and measures that are not RTF approved on a Site Specific basis. Refrigeration often represents the primary electricity expense in a grocery store or supermarket. Although the potential for savings is high, it is often overlooked because of the technical aspect of the equipment. Any commercial (Schedule 11, 21, 25) Avista electric customer installing qualified equipment is eligible for this program.

Program Implementation:
Outreach efforts will occur through Avista Account Executives, industry contacts and contractor relationships. This program is available to all non-residential retail electric customers with refrigeration facilities. For prescriptive incentives, customers must return to Avista a completed rebate form within 90 days after the installation has been completed. Avista will send an incentive check to the customer (or their designee) generally within six to eight weeks. Rebates will not exceed the total amount on the customer invoice. Each rebate will be qualified and processed within iEnergy to determine the savings and incentive. For site specific projects, the process will be followed just like any other site specific project. The key drivers to delivering on the objectives of the program are the direct incentives to fuel customer interest, marketing efforts, account executives to drive customers to the program, and ongoing work with trade allies. The Avista Website is also used to communicate program requirements, incentives and forms.

Avista Program Manager: Greta Zink and Lorri Kirstein

Measures and Incentives: As illustrated in Table 1 of Appendix A.

Evaluation, Measurement and Verification Plan: As defined within the Company's EM&V Plan contained within Appendix B.

Incentive Revisions for 2020:

Service	Measure Description	2019 Incentive	2020 Incentive
Electric	Gaskets for Medium Temp Reach-in Glass Doors	$ 25.00	$ 40.00
Electric	Strip Curtains for Convenience Store Walk-in Freezers	$ 5.00	$ 35.00
Electric	Add doors to Open Medium Temp Cases	$ 253.60	$ 106.60

IV. Table 1: Measure level summary of unit throughput, incentives and cost-effectiveness – Electric

Program	Measure Description	2020 Incentive	WA Units	Est. Sub TRC	Est. Sub UCT
Residential Prescriptive	Web Tstat Elec DIY	$75.00	200	2.55	8.16
Residential Prescriptive	Web Tstat Elec Cont	$100.00	200	2.08	6.12
Residential Prescriptive	ELEC RESISTANCE TO ASHP	$1,100.00	125	1.52	5.21
Residential Prescriptive	ELEC WINDOWS --> <0.30 U	$4.00	50,000	1.02	5.11
Residential Prescriptive	E ESTAR HOME - MANUF, ELEC/DF	$800.00	50	2.11	5.41
Residential Prescriptive	ElEC Storm Windows	$3.00	5,000	2.57	4.40
Residential Prescriptive	Ductless Heat Pump (displace zonal)	$400.00	125	0.73	4.80
Residential Prescriptive	Heat Pump Water Heater (Anysize Ave Tier 2/3)	$215.00	200	1.10	3.22
Residential Prescriptive	Wall Insulation R0->=R11+	$0.75	20,000	2.86	4.90
Residential Prescriptive	Floor Insulation R0->=R19+	$0.75	20,000	1.47	2.45
Residential Prescriptive	Attic Insulation less than R11 to R49	$0.75	50,000	3.05	4.29
Residential Prescriptive	Front Load Washer	$50.00	100	4.05	1.82
Residential Prescriptive	Vented Energy Star Clothing Dryer	$20.00	100	3.25	3.32
Low-Income Program	E AIR INFILTRATION	$1.72	30,000	1.29	0.48
Low-Income Program	E ENERGY STAR RATED DOORS	$608.53	30	1.60	0.56
Low-Income Program	E ENERGY STAR REFRIGERATOR	$520.51	10	0.97	0.08
Low-Income Program	Windows	$12.36	1,500	0.39	0.24
Low-Income Program	E HE AIR HPUMP	$2,078.82	10	0.41	1.00
Low-Income Program	E INS - CEIL/ATTIC	$1.81	35,000	0.51	0.46
Low-Income Program	E INS - DUCT	$2.83	10,000	1.69	1.69
Low-Income Program	E INS - FLOOR	$2.93	35,000	1.01	0.77
Low-Income Program	E INS - WALL	$2.03	10,000	1.70	1.34
Low-Income Program	Duct sealing	$394.00	10	1.88	1.88
Low-Income Program	Ductless Heat Pump w FAF	$4,103.00	10	1.05	0.78
Low-Income Program	Ductless Heat Pump (displace Zonal)	$4,103.00	10	0.63	0.47

Program	Measure Description	2020 Incentive	WA Units	Est. Sub TRC	Est. Sub UCT
Low-Income Program	Tier2-3 Anysize HPWH	$697.39	10	0.50	0.50
Low-Income Program	Elec Res --> Heat Pump	$5,461.54	20	1.24	0.88
Low-Income Program	Outreach LEDs	$1.10	10,000	14.81	5.33
Interior Pres Lighting	12-20 watt LED Fixture Retrofit	$20.00	400	2.37	3.62
Interior Pres Lighting	140 watt fixture/Lamp - Int	$125.00	800	1.56	2.27
Interior Pres Lighting	175 watt fixture/Lamp - Int	$185.00	1,000	1.71	2.48
Interior Pres Lighting	400 watt fixture/Lamp - Int	$270.00	100	3.17	4.57
Interior Pres Lighting	2-9 watt MR16	$5.50	100	3.27	4.71
Interior Pres Lighting	Occ Sensors	$25.00	250	1.00	3.66
Interior Pres Lighting	T5HO TLED	$12.50	14,000	2.63	3.82
Interior Pres Lighting	T8 TLED	$6.50	80,000	1.76	3.37
Interior Pres Lighting	U-Bend	$10.00	2,500	1.00	2.36
Interior Pres Lighting	2x2 fixtures	$20.00	500	0.48	2.40
Interior Pres Lighting	2x4 fixtures	$28.00	2,000	0.57	2.26
Interior Pres Lighting	8' T8 TLED	$11.50	1,500	1.12	2.28
Interior Pres Lighting	LLLC Fixture	$35.00	50	1.78	3.82
Exterior Pres Lighting	25 watt fixture	$65.00	100	2.63	2.82
Exterior Pres Lighting	30 watt fixture	$85.00	300	2.11	2.88
Exterior Pres Lighting	50 watt fixture	$130.00	475	2.46	2.90
Exterior Pres Lighting	100 watt fixture	$130.00	2,200	3.30	2.92
Exterior Pres Lighting	100 watt NC fixture	$130.00	400	1.86	3.17
Exterior Pres Lighting	140 watt fixture - Ext	$160.00	250	2.72	3.17
Exterior Pres Lighting	140 watt NC fixture	$160.00	225	1.96	2.85
Exterior Pres Lighting	160 watt fixture	$195.00	150	1.80	3.27
Exterior Pres Lighting	160 watt NC fixture	$195.00	150	1.89	2.81
Exterior Pres Lighting	175 watt fixture - Ext	$280.00	1,700	2.58	2.82
Exterior Pres Lighting	300 watt fixture - Ext	$490.00	425	1.86	2.81

Program	Measure Description	2020 Incentive	WA Units	Est. Sub TRC	Est. Sub UCT
Exterior Pres Lighting	400 watt fixture - Ext	$610.00	300	2.34	3.19
Exterior Pres Lighting	Sign Lighting	$22.00	14,600	8.38	2.24
Prescriptive Shell	Less than R11 attic insulation (E/E) to R30-R44 Attic Insulation	$0.50	50,000	1.60	2.43
Prescriptive Shell	Less than R11 attic insulation (E/E) to R45+ Attic Insulation	$0.60	50,000	1.92	2.76
Prescriptive Shell	Less than R11 roof insulation (E/E) to R30+ Roof Insulation	$0.40	50,000	2.61	4.05
Prescriptive Shell	Less than R4 wall insulation (E/E) to R11-R18 Wall Insulation	$0.35	50,000	5.50	9.59
Prescriptive Shell	Less than R4 wall insulation (E/E) to R19+ Wall Insulation	$0.45	50,000	7.53	10.87
Green Motors	15 HP Industrial	$30.00	2	1.24	5.18
Green Motors	20 HP Ind	$40.00	-	1.49	5.20
Green Motors	25 HP Ind	$50.00	-	1.91	6.08
Green Motors	30 HP Ind	$60.00	-	1.87	5.46
Green Motors	40 HP Ind	$80.00	1	1.78	4.77
Green Motors	50 HP Ind	$100.00	1	1.73	4.11
Green Motors	60 HP Ind	$120.00	-	1.55	3.60
Green Motors	75 HP Ind	$150.00	3	1.47	2.96
Green Motors	100 HP Ind	$200.00	4	1.57	2.93
Green Motors	125 HP Ind	$250.00	1	1.81	2.71
Green Motors	150 HP Ind	$300.00	2	1.94	2.69
Green Motors	200 HP Ind	$400.00	-	2.13	2.67
Green Motors	250 HP Ind	$500.00	2	2.01	2.59
Green Motors	300 HP Ind	$600.00	-	2.37	2.57
Green Motors	350 HP Ind	$700.00	-	2.64	2.57
Green Motors	400 HP Ind	$800.00	1	2.68	2.55
Green Motors	450 HP Ind	$900.00	-	2.75	2.55
Green Motors	500 HP Ind	$1,000.00	1	2.84	2.55
Green Motors	600 HP Ind	$1,200.00	1	2.55	2.88
Green Motors	700 HP Ind	$1,400.00	-	2.72	2.86
Green Motors	800 HP Ind	$1,600.00	-	2.79	2.86
Green Motors	900 HP Ind	$1,800.00	-	2.84	2.85
Green Motors	1000 HP Ind	$2,000.00	-	2.92	2.84
Green Motors	1250 HP Ind	$2,500.00	-	2.94	2.73
Green Motors	1500 HP Ind	$3,000.00	-	3.07	2.73
Green Motors	1750 HP Ind	$3,500.00	-	3.13	2.71
Green Motors	2000 HP Ind	$4,000.00	-	3.17	2.70
Green Motors	2250 HP Ind	$4,500.00	-	3.25	2.69

Program	Measure Description	2020 Incentive	WA Units	Est. Sub TRC	Est. Sub UCT
Green Motors	2500 HP Ind	$5,000.00	-	3.30	2.68
Green Motors	3000 HP Ind	$6,000.00	-	3.36	2.66
Green Motors	3500 HP Ind	$7,000.00	-	3.54	2.66
Green Motors	4000 HP Ind	$8,000.00	-	3.63	2.66
Green Motors	4500 HP Ind	$9,000.00	-	3.78	2.65
Green Motors	5000 HP Ind	$10,000.00	-	3.93	2.65
Washington Fleet Heat	Washington Fleet Heat	$520.50	50	7.95	7.95
Variable Frequency Drives	Prescriptive VFDs - HVAC Cooling Pump	$130.00	250	3.61	5.55
Variable Frequency Drives	Prescriptive VFDs - HVAC Fan	$130.00	250	3.38	5.20
Variable Frequency Drives	Prescriptive VFDS - HVAC Heating Pump or combo	$130.00	250	5.81	8.94
Grocer	On-Demand Commercial Overwrapper	$300.00	5	2.24	2.29
Grocer	LT Case: T12 to LP LED Inside Lamp	$10.00	100	2.20	3.11
Grocer	MT Case: T12 to LP LED Inside Lamp	$10.00	100	1.80	2.55
Grocer	MT Case: T8 to LED Inside Lamp	$10.00	400	1.10	1.56
Grocer	LT Case: T8 to LP LED Inside Lamp	$10.00	100	1.33	1.89
Grocer	T12 to LP LED Outside Lamp	$7.00	200	1.54	3.12
Grocer	T8 to LP LED Outside Lamp	$7.00	200	0.93	1.88
Grocer	MT Case: 2 T8 to 1 High Power LED Inside Lamp	$18.00	1	1.51	1.93
Grocer	MT Case: 2 T12 to 1 High Power LED Inside Lamp	$18.00	1	2.39	3.04
Grocer	LT Case: 2 T8 to 1 High Power LED Inside Lamp	$18.00	1	1.85	2.36
Grocer	LT Case: 2 T12 to 1 High Power LED Inside Lamp	$18.00	1	2.91	3.71
Grocer	MT Case: 2 T8 to 1 High Power LED Outside Lamp	$10.00	1	1.29	2.96
Grocer	MT Case: 2 T12 to 1 High Power LED Outside Lamp	$10.00	1	2.04	4.67
Grocer	Anti-Sweat Heater Controls - Low Temp	$40.00	50	3.29	3.95
Grocer	Anti-Sweat Heater Controls - Med Temp	$40.00	50	2.34	2.81
Grocer	Gaskets for Low Temp Reach-in Glass Doors	$40.00	10	0.34	0.94
Grocer	Gaskets for Medium Temp Reach-in Glass Doors	$40.00	10	0.43	0.96
Grocer	Gaskets for Walk-in Freezer - Main Door	$65.00	10	0.43	0.82
Grocer	Gaskets for Walk-in Cooler - Main	$25.00	10	0.37	1.26
Grocer	Evap motors: shaded pole to ECM in Walk-in - Greater than 23 watts	$140.00	10	3.13	6.16
Grocer	Evap motors: shaded pole to ECM in Walk-in - less than 23 watts	$140.00	10	1.35	2.65
Grocer	Evap motors: shaded pole to ECM in Display Case	$55.00	10	4.62	7.93
Grocer	Floating Head Pressure for Single Compressor Systems, LT Condensing Unit	$100.00	1	1.77	5.44
Grocer	Floating Head Pressure for Single Compressor Systems, LT Remote Condenser	$100.00	1	2.67	4.36

Program	Measure Description	2020 Incentive	WA Units	Est. Sub TRC	Est. Sub UCT
Grocer	Floating Head Pressure for Single Compressor Systems, MT Condensing Unit	$100.00	1	1.19	4.82
Grocer	Floating Head Pressure for Single Compressor Systems, MT Remote Condenser	$100.00	1	1.40	3.01
Grocer	Evaporator Fan ECM Motor Controller - Walk-In - Medium Temp - >23 Watt - 2 or more motors/controller	$35.00	1	1.07	5.78
Grocer	Evaporator Fan ECM Motor Controller - Walk-In - Low Temp - >23 Watt - 3 or more motors/controller	$35.00	1	1.04	4.60
Grocer	Evaporator Fan ECM Motor Controller - Walk-In - Low Temp - ≤ 23 Watt - 7 or more motors/controller	$35.00	1	1.28	2.16
Grocer	Strip Curtains for Convenience Store Walk-in Freezers	$5.00	1	0.24	0.49
Grocer	Strip Curtains for Restaurant Walk-in Freezers	$5.00	1	1.00	2.03
Grocer	Strip Curtains for Supermarket Walk-in Coolers	$5.00	10	0.95	1.93
Grocer	Strip Curtains for Supermarket Walk-in Freezers	$5.00	10	4.14	8.41
Grocer	Add doors to Open Medium Temp Cases	$106.60	50	1.13	4.08
Grocer	Cases - Low Temp Coffin to High Efficiency Reach-in	$214.80	-	8.14	3.18
Grocer	Cases - Low Temp Open to Reach-in	$334.80	-	3.77	3.18
Grocer	Cases - Low Temp Reach-in to High Efficiency Reach-in	$192.60	50	2.17	3.18
Grocer	Cases - Medium Temp Open Case to New High Efficiency Open Case	$44.40	-	1.60	3.18
Grocer	Cases - Medium Temp Open Case to New Reach In	$117.00	50	4.21	3.18
Grocer	Special Doors with Low/No ASH for Low Temperature Reach-in	$340.00	-	12.24	3.18
Grocer	Advanced Floating Controls: Floating Head and Suction Pressure with Balanced Port Valves	$47.68	-	0.38	3.18
Grocer	Advanced Floating Controls: Floating Head and Suction Pressure with Electronic Expansion Valves (EEXVs)	$135.36	-	1.07	3.18
Grocer	Advanced Floating Controls: Increase Suction Temperature with Electronic Expansion Valves (EEXVs)	$40.72	-	0.32	3.18
Grocer	Efficient Compressors - Low Temperature	$159.60	-	1.77	3.18
Grocer	Floating Head Pressure Control - Air Cooled	$66.40	5	4.08	3.18
Grocer	Floating Head Pressure Control - Evap Cooled	$141.60	5	8.69	3.18
Grocer	Floating Head Pressure Control w/ VFD- Air Cooled	$183.00	5	2.91	3.18
Grocer	Multiplex - Compressors - Air-cooled Condenser	$393.60	-	2.43	3.18
Grocer	Multiplex - Compressors - Evaporative Condenser	$393.60	-	2.43	3.18
Grocer	Multiplex - Controls - Floating suction pressure - air cooled condenser	$45.40	-	1.35	3.18
Grocer	Multiplex - Controls - Floating suction pressure - evaporative condenser	$46.20	-	1.38	3.18

Program	Measure Description	2020 Incentive	WA Units	Est. Sub TRC	Est. Sub UCT
Grocer	Multiplex - Efficient/oversized Air-cooled Condenser for Multiplex	$412.20	-	12.28	3.18
Grocer	Multiplex - Efficient/oversized Water-cooled Condenser for Multiplex	$310.00	-	9.24	3.18
Grocer	VFD - Condenser Fan Motors - Air Cooled	$186.00	20	3.10	3.18
Grocer	VFD - Condenser Fan Motors - Evap Cooled	$186.00	20	3.10	3.18
Food Services	0.81 to 1.00 GPM electric pre-rinse sprayer	$50.00	1	5.02	1.76
Food Services	3 pan electric steamer	$1,300.00	1	46.02	2.09
Food Services	4 pan electric steamer	$1,700.00	1	2.56	2.14
Food Services	5 pan electric steamer	$2,200.00	1	2.54	2.04
Food Services	6 pan electric steamer	$2,600.00	1	9.24	2.06
Food Services	10 or larger pan electric steamer	$3,200.00	1	3.68	2.80
Food Services	Efficient combination oven (>= 16 pan and <= 20 pan) electric	$1,000.00	3	8.71	1.66
Food Services	Efficient combination oven (>= 6 pan and <= 15 pan) electric	$1,000.00	3	3.84	1.53
Food Services	Efficient Electric convection oven full size	$200.00	1	2.09	1.69
Food Services	Efficient hot food holding cabinet, 1/2 size	$300.00	1	2.48	2.32
Food Services	Efficient hot food holding cabinet, full size	$575.00	1	2.07	2.16
Food Services	Efficient hot food holding cabinet, Double Size	$1,000.00	1	0.90	2.27
Food Services	Electric fryer (Large Vat Size)	$175.00	1	1.64	2.39
Food Services	Standard Efficiency Appliance to H.E. electric griddle, 70% effic. or better	$250.00	1	0.85	3.39
Food Services	High temp electric hot water dishwasher	$750.00	3	5.08	2.84
Food Services	Low temp electric hot water dishwasher	$750.00	3	6.62	2.62
Food Services	Standard Efficiency Appliance to Energy Star ice maker, air cooled, ice making head, 200 to 399 lbs./day capacity	$80.00	1	1.39	3.21
Food Services	Standard Efficiency Appliance to Energy Star ice maker, air cooled, ice making head, 400 to 599 lbs./day capacity	$115.00	1	1.71	3.03
Food Services	Standard Efficiency Appliance to Energy Star ice maker, air cooled, ice making head, 600 to 799 lbs./day capacity	$160.00	1	1.97	2.71
Food Services	Standard Efficiency Appliance to Energy Star ice maker, air cooled, ice making head, 800 to 999 lbs./day capacity	$200.00	1	0.58	0.37
Food Services	Standard Efficiency Appliance to Energy Star ice maker, air cooled, ice making head, under 200 lbs./day capacity	$35.00	1	1.28	11.64
AirGuardian	Washington Air Guardian	$1,440.00	7	1.82	1.82

V. Table 2: Measure level summary of unit throughput, incentives and cost-effectiveness – Natural Gas

Program	Measure Description	2020 Incentive	WA Units	Est. Sub TRC	Est. Sub UCT
Residential Prescriptive	G Windows Single Pane <0.30 U-value	$4.00	70,000	0.56	3.14
Residential Prescriptive	G Windows Dual Pane <0.30 U-value	$1.50	70,000	0.25	3.84
Residential Prescriptive	G Web Tstat Gas DIY	$75.00	600	0.68	2.17
Residential Prescriptive	G Web Tstat Gas Cont	$100.00	1,200	0.55	1.62
Residential Prescriptive	NG FURNACE 90%	$450.00	4,500	1.39	2.54
Residential Prescriptive	NG Wall Furnace (Wall Heater) 90%	$450.00	5	0.44	1.95
Residential Prescriptive	G TANKLESS WH (0.82+)	$400.00	700	0.65	1.68
Residential Prescriptive	NG Storm Windows	$3.00	500	0.47	1.54
Residential Prescriptive	E STAR HOME - GAS ONLY	$400.00	5	0.91	4.80
Residential Prescriptive	G HE Water Heaters (<= 55)(.65 or greater)	$100.00	250	0.43	1.36
Residential Prescriptive	G Wall Insulation	$0.75	35,000	1.22	2.25
Residential Prescriptive	G Floor Insulation	$0.75	30,000	1.10	1.93
Residential Prescriptive	G Attic Insulation	$0.75	50,000	1.67	2.89
Residential Prescriptive	NG BOILER 96% AFUE	$450.00	50	0.33	2.12
Low-Income	G AIR INFILTRATION	$1,030.10	90	0.09	0.09
Low-Income	G ENERGY STAR DOORS	$1,113.52	70	1.21	0.21
Low-Income	G ENERGY STAR WINDOWS	$21.14	5,116	1.61	0.28
Low-Income	G HE FURNACE AFUE 95%	$3,717.70	25	1.19	0.19
Low-Income	G HE WH < 55 Gal	$2,803.15	100	1.01	0.01
Low-Income	G INS - CEIL/ATTIC	$2.46	130,000	0.91	0.91
Low-Income	G INS - DUCT	$8.01	653	0.21	0.21
Low-Income	G INS - FLOOR	$4.48	50,000	0.39	0.39
Low-Income	G INS - WALL	$2.37	50,000	0.57	0.57
Low-Income	G duct sealing	$793.95	10	0.28	0.28
Low-Income	Tankless Water Heater (<=55 Gal)	$573.00	10	1.29	1.29
Low-Income	HE Boiler AFUE 96%	$894.11	10	2.29	1.29
NR HVAC	Gas Boiler <300kBtu .85-.89 AFUE	$5.00	1,000	1.00	2.46
NR HVAC	Gas Boiler <300kBtu .90+ AFUE AFUE	$9.00	3,000	1.35	2.21
NR HVAC	Multistage Furnace <225 kBtu .90-.95 AFUE	$11.00	1,000	2.96	2.32
NR HVAC	Multistage Furnace <225 kBtu .95+ AFUE	$13.00	1,000	2.72	2.25
NR HVAC	Singlestage Furnace <225 kBtu .90-.95 AFUE	$5.00	2,500	2.99	3.99
NR HVAC	Singlestage Furnace <225 kBtu .95+ AFUE	$11.00	2,500	2.96	2.32
NR Shell	Less than R11 attic insulation (E/G) to R30-R44 Attic Insulation	$0.50	20,000	1.17	1.78

Program	Measure Description	2020 Incentive	WA Units	Est. Sub TRC	Est. Sub UCT
NR Shell	Less than R11 attic insulation (E/G) to R45+ Attic Insulation	$0.60	20,000	1.49	2.14
NR Shell	Less than R11 roof insulation (E/G) to R30+ Roof Insulation	$0.40	30,000	1.92	2.98
NR Shell	Less than R4 wall insulation (E/G) to R11-R18 Wall Insulation	$0.35	30,000	3.91	6.82
NR Shell	Less than R4 wall insulation (E/G) to R19+ Wall Insulation	$0.45	30,000	5.49	7.94
Food Service	0.81 to 1 GPM gas pre-rinse sprayer	$50.00	15	0.33	0.61
Food Service	3 pan gas steamer	$1,300.00	1	1.20	1.72
Food Service	4 pan gas steamer	$1,700.00	1	1.20	1.75
Food Service	5 pan gas steamer	$2,200.00	1	1.20	1.69
Food Service	6 pan gas steamer	$2,600.00	1	1.20	1.72
Food Service	10 or larger pan gas steamer	$3,200.00	1	2.71	3.64
Food Service	Efficient combination oven (>= 16 pan and <= 20 pan) gas	$1,000.00	3	0.37	2.12
Food Service	Efficient combination oven (>= 6 pan and <= 15 pan) gas	$1,000.00	3	0.30	1.71
Food Service	Efficient convection oven full size	$700.00	5	0.33	2.72
Food Service	H.E. gas convection oven, 40% effic. or better	$700.00	2	2.33	2.33
Food Service	Gas rack oven	$2,000.00	5	0.72	1.77
Food Service	Energy Star 50% effic.gas fryer	$1,000.00	75	1.02	2.55
Food Service	H.E. gas griddle, 40% effic. or better	$250.00	5	0.91	1.78
Food Service	High temp gas hot water dishwasher	$300.00	5	0.69	1.73
Food Service	Low temp gas hot water dishwasher	$300.00	5	0.95	2.36

Appendix B:

2020 Evaluation, Measurement and Verification Plan

Avista Utilities

2020 Energy Efficiency Evaluation, Measurement and Verification Annual Plan

I. Contents

2020 Energy Efficiency Evaluation, Measurement and Verification Annual Plan

II. Background

The Company's 2020 Energy Efficiency Evaluation Measurement and Verification (EM&V) Annual Plan, in combination with the Avista EM&V Framework, is intended to identify the evaluation, measurement and verification activities planned to be performed in 2020 in order to adequately inform and assess energy efficiency programs provided by Avista for its customers in Washington and Idaho. This evaluation effort is not only to verify savings estimates of the 2019 program year, but is to be used to enhance program design and improve the marketing and delivery of future programs. This document also provides the projected 2020 EM&V budget.

III. Overview

Avista's 2020 EM&V Annual Plan identifies evaluation activities intended to be performed during 2020 on the 2019 energy efficiency portfolio. For Washington, the evaluation of 2018 acquisition will be consolidated with results from the 2019 evaluation to satisfy biennial reporting requirements associated with Washington's Energy Independence Act (EIA), also known as I-937. The scope of this Plan is consistent with prior evaluation plans as presented to Avista's Advisory Group. A comprehensive EM&V overview and definitions are included in Avista's EM&V Framework, a companion document to this Plan.

A key consideration integrated into this Plan is the role of the independent third-party evaluator that will perform the majority of evaluation planning, tasks, analysis, and external reporting as coordinated by Avista DSM Staff. Cadmus is the current evaluator for the 2018-2019 biennium and an evaluator for the next biennium is unknown at the time of this writing.

The following details the key aspects of this Plan:

- The Company continues to pursue a portfolio approach for Impact Analysis, insuring a comprehensive annual review of all programs, to the degree necessary, based on the

magnitude of savings and uncertainty of the related unit energy savings (UES) values and magnitude of claimed energy efficiency acquisition relative to the portfolio.

- Inherent in the impact analysis for 2018, a locked UES list identifying a significant number of UES values is available to leverage through verification rather than fundamental impact analysis, however this list of UES is reevaluated as part of the Company's normal and reoccurring savings value analysis. Measures will also be updated to reflect "best science" from other sources as well, primarily the RTF.
- Portfolio impact evaluations will be conducted for all electric and natural gas programs in Washington and Idaho. For programs with a majority of savings or particular aspects of interest, such as a high level of uncertainty, detailed impact evaluations using protocols from the Uniform Methods Project, International Performance Measurement and Verification Protocol (IPMVP) and other industry-standard techniques for determining program-level impacts will be used. Billing analyses will be incorporated as appropriate.
- Electric energy efficiency acquisition achieved during 2018 will contribute to the biennial savings acquisition for EIA compliance, which will complete its fifth biennium at the end of 2019.[1]
- A final evaluation of the electric programs deployed during 2018 and 2019 will be initiated prior to the end of 2019 in order to meet the June 1, 2020, filing deadline in Washington.
- The evaluation will provide energy efficiency acquisition results with 90% precision with a 10% confidence interval. Discrete measures may be represented by reduced precision and wider confidence, such as 80% with a 20% confidence interval, but must support the required portfolio criteria of 90%/10%.
- This planning document will not be construed as pre-approval by the Washington or Idaho Commissions.
- Evaluation resources will be identified through the development of the 2020 evaluation work plan in conjunction with the independent, third-party evaluator. Primary segments will include:
  - Residential
    - The impact analysis will consider the portfolio of measures provided to residential customers during the program year. Evaluation effort will be focused on measures that contribute significant portfolio savings and allow consolidation and grouping of similar measures to facilitate the evaluation.
  - Low Income
    - For the impact analysis, billing analysis on the census of measures, including conversions, will be conducted. In addition, a comparison group, possibly consisting of Low Income Home Energy Assistance Program

[1] Washington Initiative 937 was approved by voters on November 7, 2006. Codified as RCW 19.285 and WAC 480-109, the energy efficiency aspects of this law became effective on January 1, 2010.

(LIHEAP) or Low Income Rate Assistance Program (LIRAP) participants, may be incorporated into the analysis if possible.

- Non-Residential
  - Interviews of Avista staff and third-party implementers will be conducted, along with customer surveys, tracking databases, marketing materials and quality assurance documents.

- Consideration will be made recognizing most of Avista's current portfolio of electric energy efficiency offerings has been in place since 1995 and natural gas programs available since 2001.
- A Process Evaluation report will be delivered as part of the 2019 Energy Efficiency Annual Conservation Report which addresses program considerations for that program year.

IV. External EM&V Budget for Evaluations

For 2020, the total budget for external evaluation is estimated to be $1,100,000 on a total system basis. The following table identifies evaluation activities and allocations that are anticipated for 2020. The Washington and Idaho expenses include evaluation activities for both electric and natural gas fuel types.

Individual Evaluations	Evaluation Type	Contractor	Budget (System)	WA expense	ID expense
2018-2019 Electric and Natural Gas Portfolio	Impact	Cadmus	$280,000	$196,000	$84,000
2020 Electric and Natural Gas Portfolio	Impact and Process	Cadmus	$700,000	$490,000	$210,000
Electric and Natural Gas DSM Operations (or components of)[2]	Process	Cadmus	$120,000	$84,000	$36,000
Total Budget for Individual Evaluations			**$1,100,000**	**$770,000**	**$330,000**

V. Overall 2020 EM&V Budget

The table below captures the individual evaluations specifically identified in the previous table in aggregate and augments them with the associated expenses necessary to manage EM&V activities,

[2] Process evaluation efforts may be directed to a further investigate past process evaluation findings rather than perform a new portfolio evaluation.

perform internal EM&V evaluations, acquire physical EM&V equipment and actively participate in and fund the activities of the Regional Technical Forum (RTF).

Activity	Budget (WA/ID system)	Internal budget	Total budget	WA expense	ID expense
Individual evaluations previously specified	$1,100,000	$10,000	$1,090,000	$763,000	$327,000
Regional Technical Forum dues	$105,000	$0	$105,000	$73,500	$31,500
Total	**$1,205,000**	**$10,000**	**$1,215,000**	**$836,500**	**$358,500**
Expected total DSM budget	$27,556,714			$19,629,694	$7,927,019
EM&V as a % of total DSM budget[3]	**4.4%**			**4.3%**	**4.5%**

VI. EM&V External Evaluation Contract

Avista will continue its engagement with Cadmus for measurement, and verification activities associated with the demand side management portfolio as executed by Avista during the 2020 and 2021 program years. After the 2020-2021 biennium, Avista will submit a request for proposal for the EM&V engagement.

VII. Summary of Individual Evaluations

Provided below is a summary of each of the external evaluation activities anticipated to occur in 2020. All savings estimates, calculations, assumptions and recommendations will be the work product of the independent evaluator in conjunction with the respective portfolio impact, process, or market evaluation component. The final evaluation plan provided by Cadmus will also be included in this plan as an appendix.

[3] While EM&V expenditures will be directly assigned where appropriate, this illustrates the anticipated allocation of estimated EM&V expenditures

2018-2019 Electric and Natural Gas Portfolio Impact Evaluation

The electric and natural gas portfolio impact evaluation will be performed by Cadmus, an independent third party evaluator that was selected through a competitive bidding process. Based on the evaluator's work plan, performance data and supporting information may be derived from primary consumption data collected in the field, site audits, phone surveys, billing analysis, and other methods identified to effectively quantify the energy performance of the energy efficiency measure.

Similar to prior evaluations, billing analyses is to be conducted to identify the electric and natural gas impacts of the Low Income Program based on a census of program participants to estimate savings by state, fuel type, and overall program levels. For this evaluation cycle, savings estimates will be evaluated through a combined approach of billing and engineering analysis, as well as developing net savings estimates by measuring the effects of a comparison group.

If possible, a Low Income comparison group study may be used to evaluate this specific program activity. There are two feasible approaches for selecting this comparison group. One method would be to identify nonparticipants from data on Avista customers that receive energy assistance payments such as LIHEAP or LIRAP, who have not participated in the low income program. A second method would be to consider using future program participants. The best approach will be identified as the timeline and available data are considered.

Additional participant phone surveys may be conducted to provide a better understanding of certain topics, such as primary and secondary heating sources, equipment functionality prior to replacement, customer behaviors and take-back effects, participant non-energy benefits and other building or equipment characteristics.

For nonresidential, site and metering visits on prescriptive and site specific projects will support project verification and gather necessary data to validate energy savings and engineering calculations. Sample sizes for each type of fuel will be based on the combined two-year (2018-2019) projected project count. Prior evaluations may inform sampling rates to effectively reduce the sample size in measure categories with less uncertainty, and increase the sampling for those measures with greater variation.

2019 Portfolio Process Evaluation

To identify program changes and areas of interest, brief interviews will be employed to gather relevant information. Key participants in the interview process will include Avista staff, and as appropriate, third-party implementation staff and trade allies.

The independent third-party evaluator will review communication and participant materials for critical program documents that have new or updated materials, including program tracking databases, marketing materials and trade ally materials. The program materials will be evaluated against industry best practices for their adequacy, clarity, and effectiveness. Where appropriate, feedback will be provided to support the development of new or enhancement of existing program materials.

Participant and nonparticipant surveys will be conducted in 2019 and 2020 for both residential and nonresidential segments and be used to assess differences in customer experiences, effectiveness of programs and materials available for customers and trade allies. Participant and nonparticipant surveys will focus on the decisions, attitudes, barriers, and behaviors regarding Avista's programs and efficient equipment/measure installations as well as supplement past spillover research.

Cadmus Evaluation Plan

As part of Cadmus' contractual requirements they provided an overall detailed evaluation plan for 2018-2019. That plan will be included attached to this EM&V plan.

2020-2021 Electric and Natural Gas Portfolio Impact Evaluation

Avista will continue its engagement with Cadmus for the 2020-2021 biennium. After that time, Avista will began to solicit bids for the evaluation of the 2022-2023 biennium and will work with the Advisory Group to finalize the selection of the next external evaluator.

Avista Utilities 2018–2019 Evaluation Work Plan

March 30, 2018

Avista Utilities
1411 East Mission Avenue
Spokane, WA 99252

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CADMUS

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CADMUS

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Introduction and Goals

Avista Utilities contracted with Cadmus to evaluate its portfolios of residential, non-residential, and low-income demand-side management (DSM) programs during the 2018–2019 cycle. As identified in Avista's Request for Proposals (RFP), primary goals for the evaluation are these:

- Independently verify, measure and document energy savings impacts from each of electric and natural gas energy efficiency programs, or for program categories representing consolidated small-scale program offerings, from January 1, 2018, through December 31, 2019
- Analytically substantiate the measurement of those savings
- Calculate the cost-effectiveness of the portfolio and component programs
- Identify program improvements, if any
- Identify possible future programs

Evaluation, measurement, and verification (EM&V) research will also support the following:

- Avista's development of a best-of-class evaluation infrastructure for its DSM programs
- Communicate with and provide timely information to the stakeholder group (particularly the Avista Energy-Efficiency Advisory Group and Technical Committee)

In its original proposal to Avista, Cadmus presented a general approach to conducting the overall evaluation. We have prepared this evaluation work plan to reflect the programs as we understand them based on final (Washington) and draft (Idaho) plans for 2018 as well as the project kickoff. We anticipate further revisions to this work plan after additional discussions with program staff. Because the programs could change during the evaluation period, we may further revise the proposed evaluation approaches. We view the evaluation plan as a living document, which can change in response to program modifications throughout the 2018–2019 cycle.

This document presents proven methods to conduct full impact and process evaluations for Avista's three sector portfolios (low-income, residential, and non-residential). The plans address 16 individual programs across the portfolios.

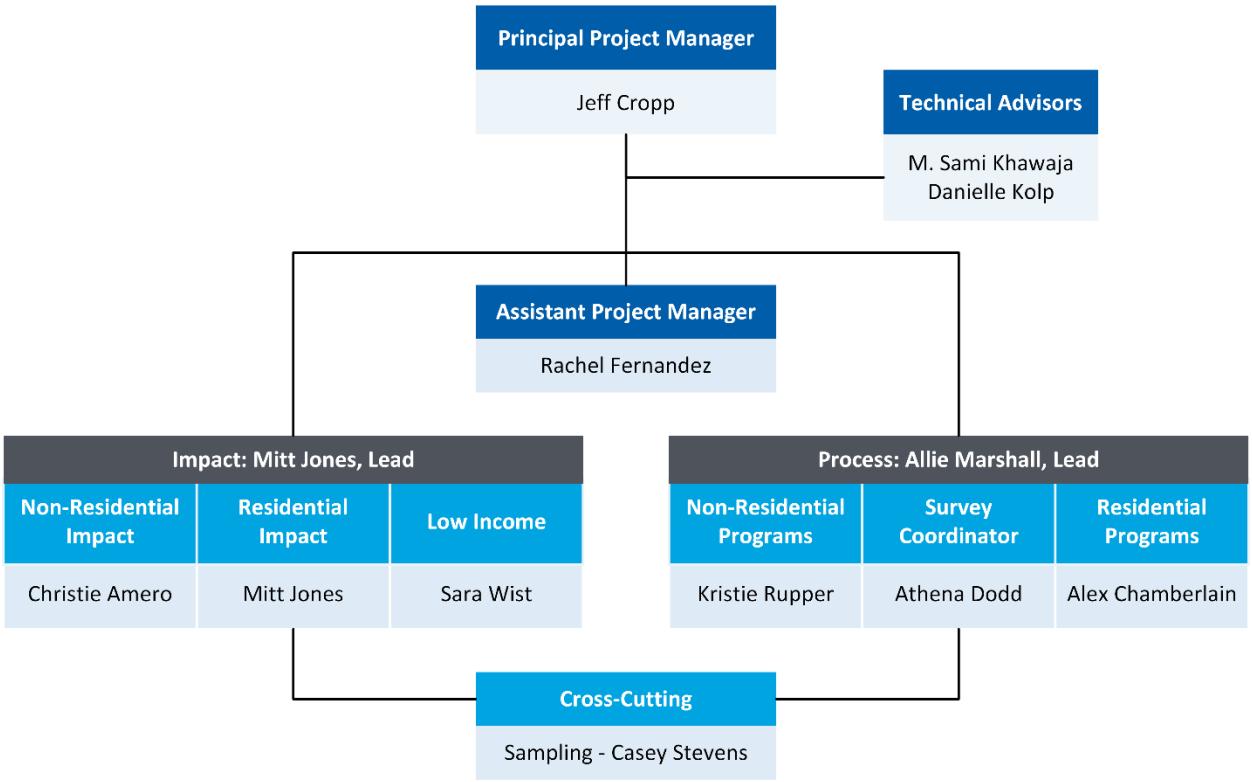
The following chapter summarizes the overall evaluation effort, followed by a chapter providing details of cross-cutting evaluation tasks (that is, general descriptions of the EM&V approaches applied as appropriate across individual programs). The remainder of this document addresses program-specific evaluation plans.

Evaluation Work Plan Overview

Evaluation Team

The Cadmus evaluation team is organized as shown in Figure 1.

Figure 1. Cadmus Evaluation Team Organizational Chart



Timeline and Deliverables

The overall timeline presented in Table 1 broadly depicts progress for each of the work tasks. The work plans for each program cluster include their own specific evaluation timelines. Deliverable reports associated with work tasks are specified in the *Communication and Reporting* section.

Table 1. 2018-2019 Task and Deliverable Schedule

Task	2018				2019				2020	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Kickoff Meeting										
Work Plan										
Project Management										
Advisory Group Meetings, as needed										
Residential NTG/Verification Surveys										
Non-Residential NTG/Verification Surveys										
Non-Residential On-Site M&V and Analysis										
Residential Modeling and Billing Analysis										
Low Income Billing Analysis										
Cost-Effectiveness Analysis										
Document and Database Review										
Avista and Implementer Interviews										
Participant Surveys and Interviews (Process)										
Contractor Interviews										
Quarterly Reports										
Semiannual Reports										
Annual Reports										
Electric Impact Memos and Reports										
Natural Gas Impact Memos and Reports										
Process Memo and Report										

Communication and Reporting

Avista expects multiple communication and reporting activities to be performed as part of this evaluation effort.

Communication

Cadmus will design our project communications based on the following recommendations:

- The Avista DSM Planning and Analytics team should serve as the lead contact for all evaluation aspects (impact and process) and, for contract purposes, is the client. Amber Gifford of the DSM Planning and Analytics team will serve as the contract manager and primary contact for the Cadmus team.
- The Avista DSM Planning and Analytics team may work with the Cadmus team to facilitate incorporation of Avista's implementation team's input into the final product. Avista may encourage the implementation team to actively participate in the evaluations, seeking to deliver the best product possible, consistent with the evaluation's independent character.
- Avista would likely prefer to have a DSM Planning and Analytics team member present (in person, by phone, or copied on e-mails) during any interactions between the Cadmus team and Avista's DSM implementation team.

Cadmus expects to hold biweekly conference calls with the Avista DSM Planning and Analytics team. These calls will provide updates about the project's status and issues. *Ad hoc* calls may be required to

address specific project issues and activities. Cadmus anticipates attending and occasionally facilitating in-person, telephone, or web-based meetings in addition to regular and *ad hoc* project meetings and a final close-out meeting.

Throughout the evaluation process, Cadmus will remain highly engaged with Avista's regional stakeholders, participating as requested in DSM Advisory Group and Technical Committee meetings. We anticipate providing the following support to Avista through these meetings:

- Presenting evaluation plans
- Presenting interim or final results on energy savings, realization rates, and cost-effectiveness
- Acting as a technical resource to explain the details of evaluation methodology and the rationale behind the methods employed for Avista
- Exploring opportunities for new or expanded techniques to evaluate programs or inform program design

Reporting

The Cadmus team plans the following reporting activities:

- ***Monthly memos.*** Provided in conjunction with monthly invoices to the Avista contract manager, these reports will include the following:
  - Summary of accomplishments during the previous month
  - The current month's activities/plans, including any outstanding data requests
  - Variances in schedule and budget, including any necessary explanations
  - Any issues or concerns to be addressed (along with Cadmus-proposed solutions)
- **Ad hoc *reports*** will document problems, resolutions, and urgent issues, as they arise.
- ***Quarterly reports.*** Beginning in May 2018, these reports will document project status over the previous three months, progress toward completing milestones for each deliverable, percentage toward completion by deliverable and task, percentage of budget spent to date, preliminary findings, and any other relevant information.
- ***Semiannual reports.*** Beginning in September 2018, these reports will expand on the quarterly reports with a focus on preliminary estimates of energy savings results from the previous six months and cost-effectiveness by program.
- ***Annual reports.*** As specified in the RFP, annual reporting for this project will consist of the following Cadmus team deliverables:
  - 2018 program year electric impact evaluation memorandums for Washington by April 15, 2019, and for Idaho by April 30, 2019
  - 2018 program year DSM Annual Report and Cost Effectiveness Analysis for Washington by April 15, 2019, and for Idaho by April 30, 2019
  - 2018 program year natural gas impact evaluation memorandums for Washington and Idaho by May 15, 2019

- 2018 program year process evaluation statement of effort with notable observations and recommendations by June 1, 2019
- Combined 2018-2019 process evaluation report by April 15, 2020
- Combined 2018–2019 electric impact evaluation report for Washington by April 15, 2020, and for Idaho by April 30, 2020
- 2019 program year DSM Annual Report and Cost Effectiveness Analysis for Washington by April 15, 2020, and for Idaho by April 30, 2020
- 2019 program year natural gas impact evaluation reports for Washington and Idaho by May 15, 2020

For these annual reports, we will prepare a comprehensive outline and ask Avista for comments and approval. The final reports will describe our data collection and process methods, present the results of the analysis and summarize findings, draw conclusions, and recommend possible improvements. We will include data collection instruments used for the process evaluation as appendices to the final report.

Overview of Evaluation Methods

Cadmus will apply the methods described below to develop findings that will determine the impacts and cost-effectiveness of Avista's programs and guide the development of current and future programs.

Impact Evaluation Methods

Our analyses will use standard engineering approaches such as those defined by the International Performance Measurement and Verification Protocols (IPMVP) and the Uniform Methods Project (UMP). We will employ the following primary methods:

- Simple verification (phone, on-line, or on-site)
- Energy calculation models
- Metering (IPMVP A and B)
- Whole building billing analysis (IPMVP Option C)
- Simulation modeling (IPMVP Option D)

Table 2 summarizes the impact evaluation data collection and analysis activities by program. We will conduct the low-income and residential billing analyses in early 2020. We will conduct the online, phone, and on-site measurement and verification activities on a quarterly basis in both 2018 and 2019 to obtain a reasonable sample from each program year to provide early feedback to Avista.

Table 2. PY 2018–2019 Natural Gas and Electric Impact Evaluation Activities

Sector	Program	Database/ Document Review	Phone Verification	Site Visits	Metering	Billing Analysis	Modeling
Residential	Simple Steps, Smart Savings™	✓					
	HVAC	✓	✓			✓	
	Shell	✓	✓			✓	
	Fuel Efficiency	✓	✓			✓	
	ENERGY STAR Homes	✓	✓				✓
	MF Direct Install	✓				✓	
Nonresidential	Interior Lighting	✓	✓	✓	TBD		
	Exterior Lighting	✓	✓	✓			
	Shell	✓	✓	✓		TBD	
	Green Motors	✓	✓	✓			
	Motor Control (VFD)	✓	✓	✓	TBD	TBD	
	Fleet Heat	✓	✓	✓			
	Food Service Equip.	✓	✓	✓			
	AirGuardian	✓	✓	✓	TBD		
	MFMT	✓	✓	✓			
	Site-Specific	✓		✓	✓	✓	✓
	EnergySmart Grocer	✓	✓	✓	TBD		
Low-Income	Low-Income	✓				✓	

Simple Verification

Cadmus will verify some prescriptive measures (particularly those with relatively small reported savings) on site, by phone, or through an on-line questionnaire to confirm that measures are installed in the reported quantity and operating in a manner consistent with deemed-savings assumptions. We will also verify recorded nameplate efficiency data against manufacturer's specifications. We will accept the reported savings without further investigation if we can confirm that these details match the assumptions used for Regional Technical Forum (RTF) or Avista technical reference manual (TRM) unit energy savings. If we identify inconsistencies, we will adjust the savings based on the equipment and operating parameters found at the site.

Engineering Calculation Models

For some nonresidential site-specific measures, Avista uses spreadsheets to calculate the estimated energy savings for a variety of measures based on relevant inputs, such as quantity, fixture wattage, square footage, efficiency value, HVAC system details, and location details. For each spreadsheet, we will review input requirements and outputs to determine if the approach is reasonable. We will discuss any concerns about the approach with Avista's implementation team and explain why we think a different method may yield more accurate results. Where applicable, we will update calculations using on-site verification data, energy management system (EMS) trend data, spot measurements, and metering data.

Metering Analysis (IPMVP Options A and B)

To estimate the relevant operational parameters needed to inform engineering calculation models, Cadmus will perform any necessary data logging for a period of days, weeks, or months. During the site visits, we will confirm relevant information such as installation of the efficient equipment, set points, sequence of operations, operating schedules, and ambient conditions. We will also estimate the baseline energy performance, according to program documentation, on-site conditions, facility interviews, and relevant energy code requirements.

After downloading the meter data, we will clean it—checking key fields for missing data, correcting bad data, and removing sites with insufficient data. We will flag anomalies and send them to a senior engineer who will determine if the data should be used, corrected, or excluded from the analysis. Next, we will analyze the key variables in the metering data using spreadsheet tools or Python.[1] We will use the resulting information to calculate savings (as input variables in an engineering model) or for comparison to consumption estimates.

Whole Building Analysis (IPMVP Option C)

Residential billing analysis. For programs in the residential portfolio, Cadmus will perform billing analyses to develop the most accurate estimate of energy and demand savings. Where practical, we will

[1] More information about Python software is available online at: https://www.python.org/

rely on consumption data analysis, targeting a census of participants, which will maximize accuracy by preventing sampling bias.

We will perform billing analyses to quantify the electric- and gas-savings impacts associated with several of the residential programs. For each of these program, we will test several different regression models, including household-level Princeton Score-Keeping Method (PRISM)-like models (aligned with IPMVP Option C), as well as fixed effects panel models (discussed in UMP protocols). Running several different regression models is an effective way to test the robustness of the savings estimates.

We will tailor our billing analysis approach and research design to each program. When conducting experimental and quasi-experimental design of a billing analysis, a control or comparison group should be selected that accurately represents the counterfactual and accounts for the naturally occurring changes in consumption. For most programs, we propose constructing a ***comparison*** group of nonparticipants who are similar to participants, either selected from future program periods or through matching (using preprogram energy consumption, demographics, or home characteristics). In the latter case, we would use a propensity-scoring model to match nonparticipants to similar participants and to test the validity of the matches. In a randomized experiment, participants are put into test and ***control*** groups at the outset.

Nonresidential billing analysis. Cadmus can use monthly billing or interval data to conduct site-specific regression analyses for nonresidential retrofit projects, particularly in the site-specific and HVAC-related prescriptive programs (for example, HVAC and shell). This analysis method is particularly useful for accurately assessing the energy savings from comprehensive retrofit projects, especially those involving custom HVAC or controls measures.

Using the pre- and post-modeling approach, Cadmus will develop retrofit-savings estimates for the sampled sites, accounting for cooling degree days (CDDs) and heating degree days (HDDs). We will match the participant-consumption data to the nearest weather station by zip code. We will then calculate the building balance-point temperature by correlating monthly energy use with monthly average temperature.

Cadmus will use the balance-point temperature to calculate the CDDs and HDDs then match that to the monthly billing data. We will use the resulting regression estimates to extrapolate average energy savings based on normalized weather conditions. (For this calculation, we will use typical meteorological year, 15-year normal weather averages from 1991–2005, which we will obtain from the National Oceanic and Atmospheric Administration.)

For each project, Cadmus will model the average daily consumption in kilowatt hours (kWh) and/or therms as a function of base load, HDDs and CDDs, and, where appropriate, daily production. For the evaluated sites, we will estimate two demand models—one for the pre-period and one for the post-period. We typically choose this methodology over a single standard-treatment-effects model to account for structural changes in demand that can occur with retrofits, such as changes in occupancy or usage patterns. We will then estimate the annual consumption based these values.

Simulation Model Analysis (IPMVP Option D)

Residential simulation model analysis. For the ENERGY STAR® Homes program, Cadmus anticipates that Avista relies on simulation models developed through Simplified Energy Enthalpy Model (SEEM) or REM/Rate. Home Energy Rating System (HERS) raters should inspect each home during construction to create an energy analysis model to estimate the home's energy savings, as compared to the reference home. These models predict savings for homes in comparison to state energy code.

We will review the inputs to the simulation models for a sample of homes to make sure the homes adhere to program requirements. We will first compare program-tracking records against the HERS raters' home characterizations in the simulation models to verify participation and appropriate incentive levels. Then we will utilize simulation model-predicted savings to compute the gross program electricity and gas energy savings.

Nonresidential simulation model analysis. In past years, Avista's implementation team relied extensively on eQuest models to estimate energy savings for complex site-specific HVAC projects. Cadmus will review and verify the savings calculated from simulation models for a portion of the projects. Our simulation approach, which is based on *in situ* observations and measurements, is calibrated to the best available energy-use indices. It entails the use of well-developed, sophisticated building-simulation tools, such as DOE-2, and follows methods described in the U.S. Department of Energy M&V Guideline and ASHRAE Guideline 14.[2,3]

We will obtain the existing as-built and baseline models, utility billing data, and any available documentation for each simulated measure project in the sample. Step one will be to conduct a side-by-side comparison of the existing baseline and as-built models. Because different versions of the same software (mainly eQuest and EnergyPlus) can return conflicting results, we will open models only in the software-build version in which they were developed.

Our goal for the on-site visit will be to gather all data necessary to improve and calibrate the model. Using our on-site data collection form and following our facility operator interview guide, we will verify all necessary assumptions and obtain any available EMS data needed to further inform the calibration process.

Following the site visit, Cadmus will update the model with the verified values. We will input verified values and actual meteorological year (AMY) weather data for the appropriate location and time period into the model then test statistical calibration, comparing model results with utility and metered data. In accordance with ASHRAE Guideline 14, we will target a monthly accuracy within a mean bias error (MBE) of ±5% and a coefficient of variation root mean square error (CVRMSE) of ±15%. We will make logical improvements, based on engineering judgment where anomalies are identified. In our analysis, we will

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2 U.S. Department of Energy. *M&V Guidelines: Measurement and Verification for Performance-Based Contracts (Version 4.0).* Available online at: http://energy.gov/sites/prod/files/2016/01/f28/mv_guide_4_0.pdf

3 ASHRAE. *Measurement of Energy, Demand, and Water Savings.* Atlanta, GA. 2014.

account for fluctuations, such as those from initial building commissioning or first-year occupancy changes.

Once the adjusted as-built model has achieved the accuracy requirements, the remaining steps are fairly straightforward. We will replace the AMY data used for calibration purposes with typical meteorological year (TMY) data. To develop the baseline model, we will back out the conservation measures based on incentive documentation, changes between existing models documented during the initial comparison, and any measure stipulations, such as code requirements. Unless instructed otherwise by Avista, we will calculate measure savings in the same order and manner suggested by the existing models and documentation (that is, first measure in, last measure out, and so on). We will determine savings by comparing results from the calibrated typical year as-built and baseline models.

Rolling Net-to-Gross

One of the most challenging questions in DSM evaluation in general is the assessment of what would have happened absent the program (the counterfactual). This poses many challenges, chief among them determining what participants would have done had they not participated in the program. The most common approach is to determine the net-to-gross (NTG) values of a program or an offering within a program through a self-reporting approach. However, this approach is problematic in that it requires inquiry into a hypothetical situation.

In the Northwest, many have argued that it is best to use market practice (current practice) as the baseline and thus avoid the self-reporting issue altogether. This approach is not without merit but has created its own difficulties. In areas outside the Northwest, the EM&V process assumes the baseline to be the least expensive legal option. This produces a *gross* estimate of savings. Later in the process, this may be discounted for what people may have done on their own (for example, exceeded the least expensive legal option for some reason) through a self-reported NTG value. Although this market practice does have its problems, it has become the standard, and many industry standard EM&V protocols are constructed around its logical flow.

The Northwest has created its own challenge through the market baseline approach. Through previous work with Avista, Cadmus knows that for measures using unit energy savings (UES) from the RTF, no NTG adjustment is necessary. For measures with no RTF UES, we will estimate and apply a NTG ratio.

Given the differing needs and definitions of “net” within Avista’s territory, Cadmus suggests using a rolling NTG analysis. NTG analyses, which estimate the influence of program activities on the customer’s decision to participate, often are conducted at the end of a program cycle. The information provided may be of little use to program managers because much time has elapsed since the program ran, the delivery has changed sufficiently to make the findings not applicable, or the program is not offered anymore.

Another concern with traditional NTG analysis is that the customer is asked a hypothetical—that is, what the customer would have done absent the program—and often has difficulty recalling the decision if

significant time has elapsed. It stands to reason that, although the question continues to be difficult to answer, the closer in time it is asked to the actual decision, the easier it will be to answer accurately.

In large commercial and industrial (C&I) evaluations, other questions are often asked related to the decision—for example, what was already considered, was anything similar ever done in the past, was the work budgeted for, was it discussed with anyone else. All of these questions are better asked as close as possible in time to the actual decision, that is, soon after participation.

A rolling NTG study will deliver near real-time feedback regarding freeridership rates. Using quarterly participation information, we will survey participants for freeridership with a mix of on-site, web-based, and phone surveys to minimize potential bias and maximize response rate.

We will analyze data in real-time and deliver quarterly freeridership summaries to Avista. Collecting these data concurrent with program implementation activities not only increases the data accuracy (for example, reduced recall bias), it also closes the feedback loop between customers, program managers, and evaluators to allow program managers to react to findings during the program year.

Table 3 shows the proposed sample sizes for the residential and non-residential participant surveys. As discussed above, different timing and survey samples can maximize the efficiency and quality of responses. The 585 surveys that will determine freeridership and spillover will be spread out across quarters of calendar year 2018 and 2019 beginning with 2Q 2018..

Table 3. NTG Survey Sampling

Program	Surveys
Residential Programs	
HVAC	150
ENERGY STAR Homes (builder surveys)	6
Shell	150
Fuel Efficiency	75
Non-Residential Programs	
Prescriptive	129
Site-Specific	52
Energy Smart Grocer	23
Total	**585**

Freeriders are defined as participants who would have purchased and installed measures without the support of the program. Participant spillover indicates additional unrebated measures that customers have installed due to program influence, and nonparticipant spillover is defined as installed measures without program participation but still resulting from Avista influence. The equation to calculate NTG is as follows:

$$NTG = 100\% - Freeridership + Participant\ Spillover + Nonparticipant\ Spillover$$

Freeridership

Cadmus will determine freeridership through the participant online and phone survey using a participant self-report approach. Before we field our survey, we will submit it to Avista for review and refinement of the freeridership questions and scoring methodology. Using the survey results, we will calculate a freeridership rate and, where appropriate, apply it to evaluated savings to estimate net gas and electric impacts attributed to programmatic effects. The standard survey battery we use for determining freeridership includes these questions:

- Would the participant have installed the same measures without the program?
- Would the participant have installed products that were just as energy-efficient without the program?
- Would the participant have installed the same quantity of item?
- Would the participant have installed the item within the same year, within two years, within five years, or in more than five years?

Participant and Nonparticipant Spillover

Participant spillover will also be gathered through the customer surveys. Spillover measures must satisfy the following conditions to be counted:

- The measure could not have received a rebate from Avista or another entity.
- Respondents must indicate that Avista programs positively influenced their decision to install the measure.

As with our last evaluation in 2013, we will add any spillover that can be attributed to measures using RTF savings values to produce a true net savings value and not merely a "net of freeridership" value.

Calculating Cost-Effectiveness

Cadmus will calculate and report the program's cost-effectiveness using evaluated savings, avoided energy costs, and actual incurred implementation costs. We will use Portfolio ProPlus to provide cost-effectiveness assessments by portfolio, program, fuel type, year, measure, and state level.

We will determine the economic performance of a program from five standard perspectives—a combination of the utility and program participants, the utility, program participants, all ratepayers (including nonparticipants). Cadmus will evaluate these perspectives using five cost-effectiveness tests—total resource cost (TRC) test, utility cost test (UCT), participant cost test (PCT), rate impact measure (RIM) test, and Resource Valuation Test (RVT).

We will populate a database with Avista's utility data common to all programs (such as discount rates, avoided costs, load shapes, and retail rates) so that we can maintain a consistent approach to cost-effectiveness valuation across all programs and portfolios.

Process Evaluation Methods

We designed the process evaluation approach based on past evaluation findings, as well as on the draft and final 2018 electric and natural gas Washington and Idaho Annual Conservation Plans (ACPs)

For all programs, our research methods will consider these four fundamental objectives:

- Assess program delivery channel and marketing methods
- Assess participant and market actor program journey including barriers to participation, satisfaction, and effectiveness of incentive levels
- Assess Avista and implementer staff experiences including organizational structure, communication, and program processes
- Document areas of success, challenge, and changes to the program

To address these research objectives, we will conduct implementation and customer research. Our implementation research will include a document and database review for each program, in-depth interviews with key Avista and implementation staff and with participating contractors. Our customer research will include participant surveys and interviews for customers, as well as builder, retailer and manufacturer interview for relevant programs (Figure 2). We discuss each of these research areas and the associated tasks in more detail below.

Figure 2. Process Evaluation Research Areas and Tasks

Table 4 shows the research areas by program and year confirmed during the kick off on January 17, 2018.

Table 4. PY 2018–2019 Process Evaluation Activities

Program Name	Implementation Research		Customer Research	
	2018	2019	2018	2019
Residential Portfolio				
ENERGY STAR Homes		✓		✓
HVAC	✓		✓	✓
Shell	✓		✓	
Fuel Efficiency	✓		✓	✓
Simple Steps Smart Savings		✓		✓
Multifamily Market Transformation		✓		✓
Multifamily Direct Install (Pilot)	✓		✓	
Low Income Portfolio				
Low Income		✓		
Non-Residential Portfolio				
EnergySmart Grocer		✓		
Site-Specific	✓		✓	✓
Prescriptive*	✓		✓	✓

*Prescriptive: Lighting, HVAC, Shell, Variable Frequency Drive (VFD), Food Service Equipment, Green Motors, AirGuardian, and Fleet Heat.

The next sections describe the task methods for each research area.

Implementation Research

Cadmus will assess program processes and provide timely and actionable recommendations for continuous implementation improvement by reviewing the database and program documentation and conducting interviews with program staff and contractors. Our reviews of key program documents and corresponding databases will inform what data we collect to meet the research objectives.

We anticipate conducting interviews with critical program staff, such as these:

- DSM Analytical Manger
- Direct of Policy
- Manger of Energy Solutions
- DSM Marketing Communications Manager
- Utility Resources Analyst
- Low Income Program manger
- Residential Program Manager(s)
- Non-Residential Program Manager(s)

We will also interview key third-party implementers, such as CLEAResult, the Green Motors Practices Group (GMPG), and the Community Action Partner (CAP) agencies.

Finally, for programs in which contractors play a vital role, we will conduct contractor interviews. Because contractors may provide services for more than one program, we will work with Avista to determine the appropriate target audience within each sector, such as high impact contractors.

Table 5 lists the implementation research by program.

Table 5. Implementation Research by Program

Program	Implementation Research			
	Implementer Interviews	Avista Interviews	Contractor Interviews	Document & Database Review
Residential Programs				
ENERGY STAR Homes		✓		✓
HVAC		✓	✓	✓
Shell		✓		✓
Fuel Efficiency		✓		✓
Simple Steps Smart Savings	✓	✓		✓
Multifamily Market Transformation		✓		✓
Multifamily Direct Install (Pilot)	✓	✓		✓
Low Income Programs				
Low Income	✓	✓		✓
Nonresidential Programs				
EnergySmart Grocer	✓	✓	✓	✓
Site-Specific		✓	✓	✓
Prescriptive Lighting		✓	✓	✓
Prescriptive HVAC		✓	✓	✓
Prescriptive Shell		✓	✓	✓
Prescriptive VFD		✓	✓	✓
Food Service Equipment		✓	✓	✓
Green Motors	✓	✓	✓	✓
AirGuardian	✓	✓	✓	✓
Fleet Heat	✓	✓	✓	✓

The following sections describe each of the implementation research tasks. Program-level details are provided in the *We will conduct in-depth interviews* with one manufacture and up to three retailers participating in the Simple Steps program, up to ten builders participating in the Multifamily Market Transformation program, and up to 10 participants of the Multifamily Hard-to-Reach pilot.

Individual Program Process Evaluation Activities section of this work plan.

Document and Database Review

Cadmus will review program materials—such as operation manuals, program theory and objectives documents, marketing plans, logic models, and the program website, as well as program databases—to gain a thorough understanding of the processes and identify trends in measures, savings, and overall performance. In our database review, we will also assess the accuracy and quality of program tracking data and its adherence to Avista's program and regulatory policies and will explore any anomalies in evaluation results. We propose to review the database once per program, within the two-year

evaluation period, so Avista has time to incorporate recommendations before assessing the database again.

We also will review Avista's most recent process and impact evaluation results to learn how Avista has incorporated earlier recommendations and to identify trends in program performance. We will apply our findings from the program document and database reviews to refine program-specific research objectives and develop data-collection instruments.

Avista Staff and Third-Party Implementer Interviews

Avista and its third-party implementers hold critical insight into program administration and delivery processes. Telephone interviews with these key stakeholders will focus on these topics:

- Program roles and responsibilities
- Program goals and objectives
- Program design and implementation
- Data tracking
- Program participation
- Marketing and outreach
- Program successes
- Market barriers
- Program impact on the market
- Future program changes including redesign

During the interview, we will be conscientious of staff members' time. Because we know they sometimes oversee multiple programs, our interview guides will avoid repetitive questions for programs with similar processes, such as data tracking. For example, we may cover all programs overseen by one or more staff members in one interview. We anticipate conducting five Avista program manager interview sessions and an additional three interviews with Avista senior DSM managers.

We will build on our early findings from the program staff interviews to focus the interviews with third-party staff about areas of interest, such as how the CAP agencies address decreasing participation in the Low Income program or how CLEAResult continues to spur manufacturer and retailer participation in the Simple Steps Smart Savings program.

Contractor Interviews

For many customers, contractors are an important source of program awareness and their involvement, cooperation, and understanding can be an indicator of program success. Cadmus proposes to conduct in-depth interviews to gain insights into contractors' motivations, experience, marketing strategies, how contractors identify customers, their standard business practices, knowledge about customer perceptions and experience, and perspectives on program processes, the program's influence on business, and the opportunities for improvement.

The exact number of interviews will depend on the number and type of contractors and overlap in participation across programs; however, for this work plan we estimate conducting up to nine residential and up to 30 non-residential contractor interviews. As discussed during the kick-off meeting and confirmed on February 8, 2017, we will concentrate the residential contractor interviews on the HVAC program. For all contractor interviews, we will consult with Avista program managers and account

executives to identify target contactors, such as those with a high impact and who serve customers participating in specific programs, as well as to ensure that communication to program contractors is coordinated.

Customer Research

As shown in Table 6, Cadmus will conduct online participant surveys, as well as interviews with participants where smaller populations exist.[4]

Table 6. Customer Research by Program

Program	Customer Research	
	Participant Surveys	Participant Interviews
Residential Programs		
HVAC	✓	
Shell	✓	
Fuel Efficiency	✓	
Simple Steps Smart Savings (Manufactures and Retailers)		✓
Multifamily Market Transformation (Builders)		✓
Multifamily Direct Install (Pilot)		✓
Non-Residential Programs		
Site-Specific	✓	
Prescriptive*	✓	

*Prescriptive: Lighting, HVAC, Shell, VFD, Food Service Equipment, Green Motors, AirGuardian, and Fleet Heat.

Participant Online Surveys and Interviews

Cadmus will prepare survey and interview guides for participants in all of Avista's programs except the EnergySmart Grocer and ENERGY STAR Homes programs. Questions will focus on topics that can help Avista understand trends in measure adoption and overall program performance and that gather critical data to inform the impact evaluation.

[4] As discussed in the kick off meeting, we will not conduct customer research for the ENERGY STAR Homes or EnergySmart Grocer programs under this scope of work.

Our participant survey and interview guides will gather critical insights into participants' program journey, such as these aspects:

- Program awareness
- How respondents learned about the program
- General program participation
- Reasons for participation
- Program benefits
- Program delivery experience
- Overall program satisfaction
- Satisfaction with Avista
- Current energy-efficient behaviors and purchases
- Participant freeridership and spillover
- Suggestions for program improvements including testing pilot program concepts

For all process evaluations, we will use an online survey, which involves emailing a link to the survey to a random sample of participating customers for whom an email address is available. Because online surveys can be administered at low costs, we could consider emailing the survey to all participants.

We typically recommend simple random sampling when the population is sufficiently large but will finalize the sampling plan according to the target sample sizes and expected response rates and after receiving comprehensive participant tracking data. For programs with unique populations (Simple Steps, Multifamily Market Transformation, and Multifamily Hard-to-Reach) we will conduct participant (manufacturer, retailers, builders, and small pilot populations) telephone interviews to allow for a greater range of topic exploration. See Table 10. Participant Survey Sample Design for Washington and Idaho CombinedTable 10 in the *Sampling Plans* section for sampling details.

Our team will follow these three practices to manage and implement high-quality data collection:

- **Data-collection instruments that conform to best practices.** Our team is dedicated to the quality and rigor of primary research. Project managers will review questionnaires to ensure they are consistent with best practices (for example, do not use double-barreled questions and use appropriate scales) and, whenever possible, use consistent questions across programs to enable trend analysis. We will provide all instruments to Avista for review prior to launch and will provide a final copy of the instrument with the final report.
- **Online survey coordinator for streamlined and efficient data collection.** We will designate a single survey coordinator who manages all survey activities to ensure consistent data collection across all research efforts and who is the primary contact for online programming and survey administration for our team. The coordinator will review each survey instrument, oversee the secure exchange of data with Avista and/or survey vendor, monitor data-collection results on a daily basis, and report progress to Avista and our team.
- **Expert survey oversight and quality assurance.** Cadmus' survey research specialists will supervise every step of survey programming, testing, and data-collection process. We always check programming for errors before fielding the survey to ensure skip patterns work as intended and that responses show the appropriate understanding of the survey questions.

Natural Gas and Electric Impact Evaluations

Cadmus will apply best practices based on our previous experience with Avista's programs and other portfolio evaluations to evaluate the natural gas and electric impacts for the relevant programs.

Impact Sampling Plan

Our approach to developing impact evaluation sampling plans is consistent with the methods described in the UMP. Specifically, we will include these guidelines in our approach:

- **Determine confidence and precision requirements for key metrics.** Within each program, our team will use key metrics to support our gross and net energy estimates for each program. For programs with more complex or comprehensive offerings, we typically expect variation between customers to be larger than for programs with fewer variables or more streamlined installations. We will rely on our experience evaluating Avista's programs to estimate the homogeneity or heterogeneity of the population of participants. When possible, we will design a sample for each program so that we can estimate the overall portfolio energy savings with 90% confidence and ±10% precision.
- **Develop the sample design.** We will apply sample designs including simple random sampling, stratified sampling, and cluster sampling and will employ the method most appropriate to the program and the population of interest. The optimal design depends on the homogeneity or heterogeneity of the population of participants within each program as well as any targeted research we plan to perform (that is, if we are particularly interested in evaluating savings for a particular measure or collection of measures, we will stratify accordingly to ensure ample sample sizes from that population). We will sample large projects with certainty, when the expected savings among them is expected to differ substantially from the rest of the population.
- **Calculate sample sizes.** We will calculate sample sizes based on the confidence and precision requirements, expected variation, sample design, and population size for each program. Sample sizes will be sufficient to estimate gross and net savings for each program and the portfolio as a whole.

For most residential program energy savings (except Simple Steps, Smart Savings and ENERGY STAR Homes), we will not need to identify a sample because we will conduct a billing analysis on the whole program population. However, we will conduct a random sample of residential program participants on a quarterly basis to determine measure verification rates and conduct NTG surveys.

For non-residential programs, Cadmus proposes a stratified sample design, with strata defined based on fuel type (electric and natural gas) and project savings. Within each program and fuel type, we will identify large- or small-savings projects and conduct site visits with a census of the largest-saving projects and a simple random sample of the small projects.

We will determine sample sizes for each program and fuel type. We will use a combined sample for because Avista programs are substantially the same in Washington and Idaho. Data obtained during site

visits will inform calculation of realization rates used to estimate population savings for each program and fuel type. We will report these results and the corresponding state-specific program savings results.

We determined sample sizes according to the most recent evaluation results, actual participant and project population sizes, additional stratification variables, and/or alternative sampling approaches (for example, probability proportional to size), with portfolio-level target confidence of 90% and precision of 10%. If possible, we will apply a finite correction to sample sizes to decrease the sample sizes. Table 7 shows the sample design for Washington and Idaho combined.

Table 7. Sample Design for Verification Surveys and Site Visits for Washington and Idaho Combined

Sector/ Evaluation Activity	Program	Fuel Type	Confidence	Precision	Expected Population Size*	Sample Size
Residential/ Verification Surveys	HVAC	Electric	90%	10%	4,000	75
		Natural Gas	90%	10%	10,000	75
	Shell	Electric	90%	10%	100	75
		Natural Gas	90%	10%	2,000	75
	Fuel Efficiency	Electric	90%	10%	N/A	N/A
		Natural Gas	90%	10%	3,000	75
	ENERGY STAR Homes	Electric	90%	10%	44	N/A
		Natural Gas	90%	10%	40	
Total Residential Verification Surveys			**90%**	**10%**		**428**
Non-Residential/Site Visits	Site-Specific	Electric	90%	20%	300	23
		Natural Gas	90%	20%	110	20
	EnergySmart Grocer	Electric	90%	20%	100	23
	Prescriptive Lighting	Electric	90%	20%	689	29
	Green Motors	Electric	90%	20%	20	10
	AirGuardian	Electric	90%	20%	20	10
	Fleet Heat	Electric	90%	20%	6	6
	Prescriptive VFD	Electric	90%	20%	18	12
	Prescriptive HVAC	Natural Gas	90%	20%	79	18
	Prescriptive Shell	Electric	90%	20%	49	11
		Natural Gas	90%	20%	54	13
	Food Service Equipment	Electric	90%	20%	52	10
		Natural Gas	90%	20%	68	10
Total Nonresidential Site Visits/Verification Surveys			**90%**	**10%**		**190**

*Population size is our best estimate of the number of residential program participants and nonresidential programs projects. We will update these and adjust sample sizes, based on 2018–2019 Avista program data across both states.

As in the previous evaluations we have conducted for Avista, we do not believe site visits are necessary for residential participants and plan to use surveys to confirm verification of program records and savings. We will field the survey quarterly (discussed in greater detail in the *Rolling Net-to-Gross*

section), and the sample sizes will cover both program years. The state and fuel mix will be random for each program and proportional to the mix of gas and electric rebates for Washington and Idaho.

Impact Evaluation Activities by Program

Cadmus will conduct the verification activities in four waves and provide interim results on program progress to Avista after each semiannual wave. The four waves will occur in summer 2018, January 2019, summer 2019, and January 2020. The site visits and phone surveys will collect baseline data, operations data, and other information that inform the energy savings analyses.

The following sections describe each Avista program and the proposed impact evaluation activities.

Low Income Program

A group of seven CAP agencies delivers energy efficiency programs to low-income communities. With annual funding of $2,000,000, these CAP agencies qualify low-income customers, generate referrals through energy assistance efforts, and make funding resources available to meet customers' home energy needs.

As in the previous evaluation cycles, Cadmus will assess the energy savings of Avista's Low Income program using statistical billing analyses, which is industry best practice for estimating the impacts associated with whole-building programs, as noted in the UMP. In our experience, smaller program populations pose challenges in the analysis of billing data that could demonstrate more robust results given larger sample sizes. We will also develop fixed effects conditional-savings regression models, with paired pre- and post-participation months as needed, to estimate actual changes in energy consumption in participating homes from energy efficiency and behavioral improvements. We will populate the model using detailed installation data collected through the program tracking system for a census of available program participants.

Cadmus will also estimate home-specific performance by running multiple regression models similar to PRISM. If these models do not produce similar results, as we expect, we will use additional diagnostics to detect anomalies.

ENERGY STAR Homes Program

The ENERGY STAR Homes program offers 15% to 25% savings relative to state energy code requirements. The program relies on the partnership of Avista and other member utilities of the Northwest Energy Efficiency Alliance (NEAA) to develop and implement the program and train contractors to provide third-party verification of qualifying stick-built and manufactured homes. NEAA administers the program, and Avista pays the rebate for homes that successfully achieve the designation of ENERGY STAR Home or ENERY STAR/ECO-Rated Manufactured Home.[5]

[5] Cadmus understands that ENERY STAR Homes with electric heating built in Washington will not be eligible for rebate in 2018.

As noted in the *Impact Evaluation Methods* section, Cadmus will review program records and simulation model inputs for a sample of homes, which we estimate at 46. We will first compare program-tracking records against the HERS raters' home characterizations in the simulation models to verify participation and appropriate incentive levels. We will then use simulation model-predicted savings to compute the gross program electricity and gas energy savings. We will apply average program savings by HERS level to the program population to estimate overall program savings.

We will calculate the NTG ratio for Idaho through participant builder surveys to gather information about participant builder practices when not incented by the program (that is, building practices used for non-program homes represent the baseline for that particular builder). This contrasts with most other programs, which will rely on participant surveys to determine the NTG ratio. We will attempt to understand the extent to which participant builders construct homes outside the ENERGY STAR Homes program different than inside it. If we learn that participating builders construct homes above the baseline for nonparticipating homes, the NTG for those builders will be based on the difference in energy consumption between a non-program home and a program home. If non-program homes were built to the same standards as the simulation model baseline home, net savings would be equal to gross savings. We will weight results up to the population based on the number of homes built in Avista service territory by each builder contacted.

Residential HVAC Program

The Residential HVAC program encourages residential customers to choose high-efficiency home energy upgrade solutions. Avista offers incentives for such upgrades through the prescriptive rebates, which are paid to the customer after installation. Vendors' use of the rebate as a sales tool generates participants. The program is advertised through utility websites, vendor training sessions, and customer presentations at retail events.

Cadmus will conduct 70 document reviews to assess the quality of HVAC program tracking data (noting missing, duplicate, and out-of-range values) and will verify that values of key metrics are within expected limits. We will also review Avista's reported gross *ex ante* savings estimates and assumptions, particularly for increasingly significant equipment such as air source heat pump measures, and benchmark these against similar programs in the Northwest.

We will determine verified net savings using a billing analysis of participant and comparison groups where practical. If obtaining a comparison group for one or more of the measures or measure groups in the HVAC program groups proves infeasible, because of the difficulty of identifying a sufficient nonparticipating population using the same baseline equipment, we will estimate gross savings with the billing analysis for those measures and apply a separate NTG based on data from online surveys.

Residential Shell Program

Avista's Residential Shell program offers prescriptive rebates to encourage residential customers to improve the energy efficiency of their homes' shell by upgrading windows and storm windows. The

program is advertised through utility websites, vendor training sessions, and customer presentations at retail events.

As with the Residential HVAC program, Cadmus will conduct 70 document reviews to assess the quality of program tracking data. We will also review Avista's reported gross *ex ante* savings estimates and assumptions about per-home consumption and benchmark these against similar programs in the Northwest.

We will determine verified net savings using a billing analysis of participant and nonparticipant groups. We will estimate savings for each participant using two modeling approaches—monthly fixed effects panel modeling and customer-specific regression—and summarize the results by measure.

Residential Fuel Efficiency Program

The Residential Fuel Efficiency program encourages customers to convert their electric space and water heater to natural gas. Although natural gas is an efficient fuel choice with decreasing prices over the years, the cost of infrastructure continues to increase for the utility and the customer. However, for the 2018–2019 biennium, conversions to natural gas water heaters will no longer have a stand-alone rebate; Avista now combines the rebate for water heaters with conversions to natural gas furnaces.

Cadmus will assess the quality of program tracking data and review Avista's reported gross *ex ante* savings estimates and assumptions. We will use the most recent data from the Northwest Energy Efficiency Alliance (NEEA) Residential Building Stock Assessment (RBSA) to analyze the saturation of the water heater fuel type in the territory and update the allocation of energy savings to electric and natural gas accordingly. Cadmus recently completed site visits for the RBSA and is compiling the data for regional stakeholders. We will work with Avista to determine the most appropriate programs to which we can apply this new regional residential data and benchmark these against similar programs in the Northwest.

We will determine verified net savings using a billing analysis of participant and nonparticipant groups. We will estimate savings for each participant using two modeling approaches—monthly fixed-effects panel modeling and customer-specific regression—and will summarize results by measure type. We will also perform a gas billing analysis to better estimate the increase in the gas usage from fuel conversion.

Simple Steps, Smart Savings

Simple Steps, Smart savings, a collaborative program between Avista and Bonneville Power Administration, is designed to increase adoption of energy-efficient residential products, partly through influencing retail stocking practices and consumer purchasing. Residential customers are encouraged to purchase and install high-quality LEDs, light fixtures, and energy-efficient showerheads

For the Simple Steps, Smart Savings program, Cadmus will calculate *ex post* savings using RTF UES and primary data gathered by Avista's vendors regarding units sold.[6] Savings calculated using RTF UES can be considered net savings values because the RTF uses a market average baseline, which effectively accounts for freeridership. We will determine appropriate spillover values using primary or secondary research as necessary.

For any lighting measures without RTF UES, Cadmus will calculate savings using an annual savings algorithm with these variables—lamp wattage, delta watt multiplier, hours of use, days-per-year, waste heat factor, and in-service rate—and apply RTF assumptions where practical. This algorithm is derived from industry-standard engineering practices and is consistent with the methodology used by the RTF for calculating energy use and savings for residential lighting.

Multi-Family Hard to Reach Pilot

Cadmus will conduct document reviews on the census of projects installed through the pilot program through May 1, 2018. We will assess the quality of program tracking data (noting missing, duplicate, and out-of-range values) and will verify that values of key metrics are within expected limits. We will verify measure installation through an on-line survey with building managers and tenants, to the extent that contact information is available.

Cadmus will then compare the *ex post* measure savings for each project against the most recent 12 months of energy consumption to confirm the magnitude of savings is reasonable. We will request the most granular consumption data associated with each building. In the best case scenario, that would represent separate utility accounts for the multifamily common spaces and each individual living unit. In many cases, we anticipate one combined account for common spaces and living spaces.

We will aggregate the *ex post* energy savings associated with the appropriate level of billing data (e.g., full building, individual living areas), based on the granularity of information provided by the direct install vendor. We will calculate the portion of consumption that the direct install measures are expected to offset. We will then benchmark the portion of consumption expected as savings against similar measures and expected savings for other regional utilities, based on resources such as impact evaluations and resource potential studies.

We will provide Avista with *ex post* savings values by measure, along with our assessment of the reasonableness of the deemed savings assumptions relative to building energy consumption. We will also calculate the pilot program's cost-effectiveness.

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[6] Cadmus has noted that the Avista TRM provided during the RFP process stated that matching lumens ranges for measures in the Simple Steps, Smart Savings program were not found in the RTF measures. Based on the lumens ranges in the Avista 2018 DSM Annual Conservation Plan and version 5.2 of the RTF ResLighting workbook, it appears RTF lumens values will match Simple Steps, Smart Savings values and that RTF UES values will be available.

Non-Residential Site-Specific Program

The Non-Residential Site-Specific program is a core element of Avista's C&I portfolio because it brings in the largest portion of savings. The program provides flexible opportunities to achieve energy savings for measures that do not fit a prescriptive path. In the past, these projects have included compressed air, custom lighting, process improvement, and complex HVAC measures, among others. The Multifamily Market Transformation projects are also included within this program.

Cadmus will calculate participants' gross reductions in electricity and natural gas consumption using data collected through on-site visits, customer billing histories (as needed), and engineering models and calculations.

We will conduct site visits to all the largest projects (typically defined as greater than 500,000 kWh or 30,000 therms in expected savings) and a sample of smaller projects. The number of site visits will depend on actual enrollment and sample-size calculations, based on expected variability and the desired confidence and precision of evaluated savings. During the site visits, we will verify measure installations, collect baseline and equipment data, and identify addressable enrollment or installation issues. We will also examine new or emerging technologies that have been given incentives through the program because the newness of such measures may lead to more issues with installation or operation.

We will analyze gross program impacts using data collected from site visits and from tracking data. We will verify reported *ex ante* savings by recalculating energy savings using Excel spreadsheet analysis tools, site-specific data, and standard engineering analysis methods. Data may include savings calculations, manufacturers' specification sheets, and commissioning reports. We may also conduct regression analyses, as needed for measures whose savings impact cannot readily be evaluated through other means (for example, a comprehensive HVAC controls measure). Information collected during our site visits will determine if the sample projects reasonably address the measure's operating parameters and accurately reflect operating conditions.

Because we will not inspect all participant sites, we need a mechanism to extrapolate the difference between reported and evaluated to the population. To resolve this, we will apply a correction factor based on the realization rates to reported savings to calculate evaluated *ex post* gross savings. We will document the reasons and impacts on savings of all adjustments and will review these with Avista's implementation team during a presentation before committing results to the draft reports.

Non-Residential Prescriptive Programs

Avista implements these eight prescriptive programs that provide incentives directly to customers for a variety of measures supported by RTF UES or Avista's TRM:

- AirGuardian
- Fleet Heat
- Food Service
- HVAC
- Prescriptive Lighting
- Prescriptive Shell
- Prescriptive Variable Frequency Drive (VFD)

- Green Motors

Cadmus will first work with Avista to prioritize and review prescriptive measures in the TRM. We will identify those measures that have the most variance based on previous impact evaluation results. These measures may benefit from primary data collection and analysis during the 2018–2019 impact evaluation. This review requires in-depth knowledge and understanding about the specifics of each measure to ensure that the baseline and savings calculations reflected the best possible *ex ante* values for the region. Cadmus and Avista engineers will coordinate to ensure consistency in inputs and calculations and to ensure that the TRM uses the most up-to-date sources for Avista's engineering calculations. Additionally, our knowledge and understanding of federal minimum codes and standards will augment our review. Ultimately, we will provide recommendations for examined measures, including references, algorithms, and inputs.

Cadmus will design a sample for verification activities to include all prescriptive programs, with primary emphasis on those that contribute the most savings or represent the highest level of uncertainty. Although we anticipate that most participants will have installed lighting, our desk reviews, phone interviews, and site inspections will include lighting and non-lighting projects. Our sample will represent both distributions, and we will apply sampling weights accordingly as part of the correction factor.

We will conduct on-site inspections during the initial round of impact data collection to confirm Avista's quality-assurance processes have been maintained. This is particularly relevant for any new programs or those with updated program processes. If in these initial site visits, we find a high correlation between the reported and evaluated results, we will likely use less intrusive data collection methods, such as desk reviews and phone interviews with participants.

We will review project documents, verify assumptions, adjust reported calculations, and compute evaluated savings using Excel spreadsheet analysis tools or by approving installation rates for RTF measures with well-defined UES. We will derive baseline data from on-site visits, customer interviews, and Avista's program data. We will calculate evaluated savings using site visit data and standard engineering analysis practices. We will also calculate a realization rate based on sampled sites and will apply this rate to the project population to estimate program total evaluated savings.

As with the site-specific program, we will document all reasons and impacts on savings for adjustments and will review these with Avista's implementation team during a presentation before committing the results to the draft reports.

Non-Residential EnergySmart Grocer

The EnergySmart Grocer program is designed to provide customers with a comprehensive overview of their refrigeration systems and the savings that can be achieved by increasing the energy efficiency of their cases and grocery equipment. Through the program, customers are encouraged to increase energy efficiency through direct financial incentives. As a benefit, customers receive a no-cost audit of their facility's refrigeration, a detailed savings report, and technical assistance.

Like the non-residential prescriptive programs and others described above, Cadmus will review project documents, verify assumptions, adjust *ex ante* calculations, and compute *ex post* evaluated. We will collect baseline data and calculate *ex post* savings and realization rate. As with the site-specific program, we will document all reasons and impacts on savings of adjustments and review these with Avista's implementation team before committing results to the draft reports.

Real-Time Evaluation and Measurement

Cadmus will coordinate with Avista's implementation team to identify projects with both relatively large expected energy savings and relatively high uncertainty (for example, demand-controlled ventilation, multi-stage compressed air retrofit). In comparison, projects such as a large lighting retrofit may not require real-time EM&V because the savings should be relatively certain if the operating hours are well-characterized. Once Avista identifies the most likely projects for real-time EM&V, we will coordinate with implementation engineers and/or contractors to track project installation progress and estimate the completion date.

We will develop a site-specific M&V plan for each project. Our metering engineer will be prepared to travel to the site to install meters during a time frame estimated by Avista's implementation team. Upon meter removal, we will follow our standard analysis procedures for metered data. We will summarize our methodology and results for further discussion with Avista before finalizing the energy savings.

M&V for Advanced Metering Infrastructure (AMI)

Where relevant, Cadmus will conduct measurement and verification for projects with advanced metering infrastructure (AMI) data. This section describes our general approach for this type of analysis. We assume that electricity interval consumption data will be available for the pre-treatment, or *baseline*, and treatment, or *reporting,* periods.

The approach to calculating energy savings starts with building a predictive statistical model using baseline data, which includes baseline weather conditions and facility operating conditions as explanatory variables in the model. By applying the baseline model to the explanatory data measured during the reporting period, the model outputs represent the expected energy usage during the reporting period that would have occurred without the influence of the energy-saving measures. Therefore, subtracting the observed energy usage and predicted energy usage at each point in time results in the evaluated energy savings (adjusted for reporting period weather and facility operations).

Our proposed method has several advantages over other approaches:

- The method allows for ***flexible modeling*** of each facility's energy consumption. Because we conduct a separate analysis for each facility, it is possible to select a set of variables that are specific to that facility.
- Baseline models are ***uncontaminated*** by project treatment effects. Because the model is fit with baseline period data, the parameters of the adjusted baseline consumption reflect only baseline period operation.

- The model-building process is ***objective***. Because we rely on automated machine-learning to select the model variables, we can identify relevant variables affecting a facility's consumption from a larger set of candidate variables based on pre-determined criteria, which reduces time and the possibility for idiosyncratic analyst choice in building a model.
- The proposed approach is ***versatile, scalable, and cost-effective***. Much of the estimation can be automated and applied to a variety of commercial building types and samples with large numbers of facilities.

AMI M&V Analysis Details

Our proposed analysis approach has four main steps, which are described in the next sections—data collection and pre-processing, modeling, savings estimation, and reporting.

Data Collection and Pre-Processing

Cadmus will collect the following data for the evaluation:

- Interval data of facility energy consumption
- Project implementation data including installation dates, project description, and *ex ante* savings estimate
- Building systems data from the facility's energy management system (if available)
- Interval weather data from nearest weather station

Cadmus will then conduct a quality review of the raw data. This process involves a visual inspection by a domain expert and automated checks for max and min values, consumption per square footage, rates of change, completeness of the data, etc. Once the validity of the data is established, we will define the facility's baseline and reporting periods from documentation about the project implementation.

Modeling

Cadmus will develop models using these steps:

- **Identify candidate model inputs**. Cadmus will begin by plotting energy usage against all explanatory variables and identify trends. Trends identified from visual inspection will be linear, non-linear, or periodic; they will require evaluation in the context of Cadmus' physical understanding of the systems involved and experience modeling similar facilities. We will also consider derived variables, such as day of week or degree days, and will assess correlations of these inputs and interactive effects between variables.
- **Select model type**. Cadmus has applied a range of modeling techniques and methods and understands that the performance of an algorithm can depend on the dataset it is attempting to fit. Our approach is to select a class of models based on a specific use case and test various model types within that class for performance (that is, predictive accuracy, minimization of prediction error, minimal data requirements, etc.). Table 8 summarizes the collection of models we have used.

Table 8. Model Selection

Model Class	Model Type	Use Case
Linear	Single and multiple linear, ridge, Lasso regression	Low temporal resolution usage data, known physical relationships, observed linear trends
Time Series	Autoregressive integrated moving average (ARIMA), error term models, transfer functions	High temporal periodicity and seasonality, predicting future response
Bayesian	Decision trees, random forests, neural networks	Non-linear relationships, complex systems, large amounts of data

Model validation and testing. Cadmus will create a set of candidate models based on prior experience and understanding of energy-savings projects. We will rigorously evaluate these models against the facility-specific data, with the objective of choosing the best model in the energy-savings calculations. We will apply graphical analysis of the relationship between energy usage and possible explanatory variables as a starting point in selecting best model. We will then use evaluation of existing seasonality or temporal changes in selecting model types. In this initial step, we will consider using the model that is the simplest, has the fewest explanatory variables, and can be interpreted based on good engineering judgment.

To select a set of candidate models, Cadmus will test model prediction ability using a procedure that minimizes selection bias. We begin by randomly splitting the baseline period data into training and testing sets, giving us two datasets of independent variables and measured energy consumption. Models are fit to the training data, applied to the test data, and scored on bias, model fit, and prediction accuracy metrics, such as the mean prediction error, relative root mean-squared error of prediction, mean absolute percentage error of prediction, and the median and other percentiles of prediction errors, r-square, and Akaike information criterion (AIC).

Randomly splitting the data does introduce bias and to fully understand a model we repeat this process for each model a large number of times. These simulations build distributions of test statistics for each model that inform the selection of a final model.

Furthermore, we will identify patterns in the prediction errors by plotting or regressing the errors against variables such as hour of the day and day of the week. Also, we will investigate the evolution of errors over weeks and months to determine if there are prolonged trends that require further investigation.

Once a final model has been selected, Cadmus will fit that model to the entire set of baseline data. In the model validation and testing phase, we may find that several models provide relatively good fit and predictions. In this case, we will calculate energy savings using several models and provide the results to Avista. For any given model that is chosen during the validation and testing phase, we will calculate the uncertainty in energy savings obtained using the entire dataset.

Additionally, Cadmus expects that a variety of factors could confound the savings analysis. For example, a facility may undertake energy efficiency projects that are not funded through Avista during the reporting period. If these other projects are unaccounted for, it is likely that the estimate of electricity savings will be biased upward. Table 9 lists possible confounding factors and the strategies for addressing them.

Table 9. Potential Confounding Variables

Confounding Variable	Problem	Solution Strategy
Other energy efficiency projects	Unaccounted savings from other energy efficiency projects during the reporting period may bias the savings estimate.	Develop an engineering estimate of savings for the other project(s) and subtract validated savings estimates from Cadmus' regression-based estimate.
Floor space additions or changes in use of facility space	These changes can bias the savings estimates.	Cadmus will review project documentation and available energy management system data to identify significant changes. Cadmus may make engineering-based adjustments to the savings estimates or model energy intensity instead of consumption.

Savings Estimation

After developing a model, estimating savings is straightforward. Cadmus will fit the model to the baseline data and apply it to the conditions present during the reporting period, generating facility consumption at each interval, and subtract these estimates from the actual measured consumption. To calculate "typical year" savings, Cadmus fits a baseline model and a reporting period model, applies each of these models to TMY3 data, and takes the difference in the estimated energy consumption. Savings are provided on a per-site basis in each of these cases.

Conduct Process Evaluation Tasks and Reporting

In this section, Cadmus describes its program-specific research plan to assess Avista's administrative processes and delivery of DSM programs in Washington and Idaho and identify areas for improvements.

Sampling Plans

Cadmus will calculate sample sizes for each program and fuel type and based on participant and project population sizes, expected variation, and confidence and precision targets. We will select one combined sample for electric service because Avista programs are the same in Washington and Idaho. For this work plan, we have described the sample design and estimated sample sizes but can revise them according to actual participant and project population sizes if program data indicate these factors could improve the accuracy or precision of the sample.

In Table 10, we provide the finite survey sample sizes for each program and fuel type, determined based on target 90% confidence and 15% precision for each program and to far exceed 90% confidence and 10% precision for the portfolio overall with error ratios of 0.5 within program and fuel type. We will apply a finite population correction to the sample sizes to decrease the number of survey completes if possible.

Table 10. Participant Survey Sample Design for Washington and Idaho Combined

Program	Fuel Type	Estimated Population Size*	Survey Completes
HVAC	Electric	4,000	30
	Natural Gas	10,000	30
Shell	Electric	100	24
	Natural Gas	2,000	30
Fuel Efficiency	Natural Gas	3,000	30
Residential Total		**~19,100**	**144**
Site-Specific	Electric	300	28
	Natural Gas	110	24
Prescriptive Lighting	Electric	689	29
Prescriptive HVAC	Natural Gas	79	22
Prescriptive Shell	Electric	49	19
	Natural Gas	54	20
Prescriptive VFD	Electric	18	12
Food Service Equipment	Electric	52	20
	Natural Gas	68	21
Green Motors	Electric	20	10
AirGuardian	Electric	20	10
Fleet Heat	Electric	6	6
Non-Residential Total		**~1,465**	**247**
Portfolio Total		**~20,565**	**391**

***** Population size is the number of residential program participants and non-residential program projects. Note EnergySmart Grocer are not included as surveys for these programs are not part of this scope of work.

We will conduct in-depth interviews with one manufacture and up to three retailers participating in the Simple Steps program, up to ten builders participating in the Multifamily Market Transformation program, and up to 10 participants of the Multifamily Hard-to-Reach pilot.

Individual Program Process Evaluation Activities

This section describes the process evaluation activities by program. Although many of the process research activities are similar, such as reviewing program documents and tracking database to assess roles and responsibilities, marketing and outreach, participation trends, and informing subsequent interview and survey questions, the descriptions below note more program-specific focus areas.

Low Income Program Evaluation

The process evaluation of the Low Income program's design, delivery, and performance will include the following data-collection activities:

- **Review program documents and database** to assess how Avista and the CAP agencies conduct marketing and outreach focusing on how they strive to increase participation in hard-to-reach areas and data-tracking transparency.
- **Interview Avista staff** about coordination with and support of the CAPs overall and more specifically about measures selection including those that are not approved or on the State Priority Rebate List.
- **Interview (n=5) CAP agencies** to document their understanding of the program, including implementation challenges that lead to underspending, how CAP agencies allocate health and safety funding to help cover gas measures that are not cost-effective (that is, benefit-cost ratios are under 1.0 for the TRC or UCT).

ENERGY STAR Homes Program

The process evaluation of the ENERGY STAR Homes program's design, delivery, and performance will include the following data-collection activities:

- **Review program documents and database** to assess marketing and outreach efforts and participation trends.
- **Interview Avista staff** to document regional communication and coordination with NEEA and other partnering utilities that offer contractor training and third-party verification of qualifying projects, explore future iterations for the program such as Build it Green (currently offered in areas in WA and being expanded to additional areas) and the DOE's Zero Ready Home program, or other residential new construction certification or labeling programs.

Residential HVAC Program

The process evaluation of the HVAC program's design, delivery, and performance will include the following data-collection activities:

- **Review program documents and database** to assess participation trends, such as continuing trend of natural gas furnaces to provide a significant portion of gas savings.

- **Interview Avista staff** to discuss and document the inclusion of the energy-use component of program eligibility. Examine vendor training, rebate changes, and how visiting retailers and making presentations builds market awareness.
- **Interview participating contractors (n=9)**to assess program understanding, experience, and satisfaction, how contractors identify customers, use of rebates as a sales factor, customer awareness of the program prior to engaging the contractor, standard business practices, influence of the program on business, and of qualifying equipment offered.
- **Survey participating customers** to explore their experience, including application processing and influence of the contractor, continued levels of satisfaction, and marketing preferences.

Residential Shell Program

The process evaluation of the Residential Shell program's design, delivery, and performance will include the following data-collection activities:

- **Review program documents and database** to document tactics used to drive the customer to the website, rebate changes, and contractor engagement strategies.
- **Interview Avista staff** to discuss and document the energy-usage component of program eligibility. Examine vendor training, rebate changes, and how visiting retailers and making presentations builds market awareness.
- **Survey participating customers** to explore customer experience, including application processing and influence of contractor, satisfaction, and marketing preferences.

Residential Fuel Efficiency Program

The process evaluation of the Fuel Efficiency program's design, delivery, and performance will include the following data-collection activities:

- **Review program documents and database** to identify changes in eligibility requirements, rebate changes, and contractor support documentation.
- **Interview Avista staff** to confirm status of program in WA, document success and challenges of such items as confirming electric resistance heating and/or water heating for eligibility, no longer offering a stand-alone rebate for the conversion to a natural gas water heater, as well as other rebate changes. Examine vendor training, the role of retail location visits and presentations, and other efforts to build market awareness.
- **Survey participating customers** to explore awareness of fuel switching as an energy efficiency opportunity, motivation to participate, application processing, influence of contractor, satisfaction, and marketing preferences.

Simple Steps, Smart Savings

The process evaluation of the Simple Steps, Smart Savings program's design, delivery, and performance will include the following data collection activities:

- **Review program documents and database** to assess the roles and responsibilities of the implementer, manufacturer, retailer, and coordination with Bonneville Power Administration.
- **Interview Avista staff** to document the impact of rebate changes, engagement with internal stakeholders facilitating the implementation contract, and engagement with external stakeholders such as homeowners, landlords (renters), retailers, and contractor to increase participation.
- **Interview Implementer** to document program understanding, including coordination of program marketing, outreach to retailers, product tracking, development of measure costs and savings, and overall program experience, including satisfaction and suggestions for improvement.
- **Interview participating manufacturers** to document program understanding, participant motivation and experience, perceived impact of program on the market, and suggestions for improvement.
- **Interview participating retailers** to document program understanding, participant motivation and experience, including point-of-purchase marketing, impact of program on customer uptake of eligible products, and suggestions for improvement.

Multifamily Market Transformation

The process evaluation of the Multifamily Market Transformation program's design, delivery, and performance will include the following data collection activities:

- **Interview Avista staff** to document program design and delivery, roles and responsibilities confirm status of program in WA, identify program changes (delivery, rebates, etc.), and areas of success and challenges.
- **Interview Implementer** to document program understanding, including coordination of program marketing, outreach to retailers, product tracking, development of measure costs and savings, and overall program experience, including satisfaction and suggestions for improvement.
- **Interview participating builders (n=10)** to document their understanding of the program, experience including program influence on business practices, satisfaction, and suggestions for improvement

Multifamily Direct Install (Pilot)

The process evaluation of the Multifamily Direct Install pilot's design, delivery, and performance will include the following data collection activities:

- **Review program documents and database** to document the overarching topics described for all programs at the beginning of this process evaluation section including program processes, marketing efforts, and data tracking.
- **Interview Avista and implementer staff** to document pilot design including goal setting, delivery process, customer eligibility, incentive structure, and data tracking, as well as roles and responsibilities, areas of success, challenge, and if the pilot will transform into a full program.
- **Interview participating customers** to explore customer experience, including pilot awareness, satisfaction, energy efficiency actions, barriers to energy efficiency programs, and marketing preferences.

Non-Residential Site-Specific Program

The process evaluation of affect the Site-Specific program's design, delivery, and performance will include the following data-collection activities:

- **Review program documents and database** to assess clarity of roles and responsibilities including technical assistance, marketing and outreach (for example, multifamily), data-tracking transparency, and participation trends, including types of measures installed.
- **Interview Avista staff**, including account executives, to document program changes; areas of success; and challenges, such as the effectiveness of the Avista website to communicate program requirements, incentives, and rebate forms, engagement of the multifamily sector (new construction of five or more units), and how potential changes in rebate levels may affect the program as a critical driver of portfolio savings.
- **Interview participating contractors** to document standard business practices, program influence, identification of customers, timing of projects, and impact of potential change in rebate levels. For lighting specific contactors, we will also assess their awareness of higher efficient lighting to inform new marking approach to target the replacement of T12 lamps.
- **Survey participating customers** to explore customer experience, such as if the program successfully addresses the split-incentive challenge and encourages adoption of energy-efficient equipment and behaviors, satisfaction with contractors and key program components such as incentive levels and technical assistance, and marketing preferences.

Non-Residential EnergySmart Grocer Program

The process evaluation of the EnergySmart Grocer program's design, delivery, and performance will include the following data-collection activities:

- **Review program documents and database** to document the overarching topics described for all programs at the beginning of this process evaluation section including program processes, marketing efforts, and data tracking.

- **Interview Avista staff**, including account executives, to document program changes; areas of success; and challenges, such as coordination with implementer and contractors, and data tracking and reporting, such as the monthly analysis of program measures.
- **Interview Implementer** to document coordination of field energy analyst, use of Grocer Smart modeling, marketing and outreach, contractor support, project tracking and processing, and overall program experience, including satisfaction and suggestions for improvement.
- **Interview participating contractors** to document program understanding, experience, and satisfaction. Examine standard business practices, as well as the program influence on business, identification of customers, and suggestions for improvement.

Non-Residential Prescriptive Programs

For the purposes of this plan, and for efficiencies of scale, Cadmus suggests combining these non-residential programs under the term "prescriptive": Lighting, HVAC, Shell, VFD, Food Service Equipment, Green Motors, AirGuardian, and Fleet Heat. We plan to conduct the same process tasks for all programs with the addition of interviews for the three programs with third-party implementers. The process evaluation will include the following data-collection activities for each program:

- **Review program documents and database** as described for all of the programs at the beginning of this process evaluation section. We will examine program documents to assess the clarity of roles and responsibilities, including overlap between programs, identify marketing and outreach efforts, and review the database for data tracking transparency and participation trends.
- **Interview Avista staff,** including account executives, to document program eligibility, vendor training, efforts to build program specific and across program market awareness, rebate changes, and implementer and contractor communication and coordination.
- **Interview participating contractors** to document program understanding, experience, and satisfaction, including program communication. We will assess how contractors identify customers, use of rebate as a sales factor, level of customer program awareness prior to engaging the contractor, standard business practices, and program influence on business.
- **Survey participating customers** to explore experience with eligibility, application processing, communications with implementers and/or contractors (as appropriate), satisfaction, and marketing preferences.
- **Interview implementers** to document program understanding, roles and responsibilities, experience, satisfaction, and suggestions for improvement.
  - GreenMotors: Green Motor Program Group
  - AirGuardian: Sight Energy Group LLC

Budget and Level of Effort

Table 11 outlines the budget by major deliverable for EM&V of Avista's 2018–2019 DSM portfolio, with a not-to-exceed amount of $971,762.

Table 11. Budget for 2018-2019 DSM Portfolio Evaluation

Deliverables	Total Budget
Kickoff and Work Plan	$35,755
Impact Evaluations	$443,914
Process Evaluation	$188,463
Annual Reports with Cost-Effectiveness	$70,590
Meetings and Interim Reporting	$67,710
Project Management	$127,940
Multi-Family Direct Install Pilot	$37,390
Total	**$971,762**

Cadmus developed the budget with the following assumptions. Material changes or circumstances that result in a departure from these conditions may result in delays or additional costs to the project:

- This pricing assumes one round of client review and revision for every deliverable. To help ensure that the project schedule is maintained, we ask that Avista provide any comments on deliverables within 10 business days.
- This work plan describes Cadmus' data needs to support Avista's 2018–2019 DSM Programs. Our budget assumed that data requests from Avista will be fulfilled within a reasonable time and will require no more cleaning than is reasonable and customary for the industry. If we encounter unexpected issues with the data received (for example, if the data requires extensive cleaning or reformatting or research to complete missing data components) that will affect our ability to evaluate program impacts, this could cause additional effort not accounted for in the work plan. Cadmus will work with the appropriate department at Avista to identify these issues early in the evaluation process to avoid unnecessary delays or obstacles to the work plan.
- The pricing for data collection is based on target quotas for surveys and interviews, estimated by Cadmus to maximize this effort, and summarized in this proposal. However, we are glad to work with Avista to adjust the targets as needed to reduce project costs or better achieve evaluation objectives.

Table 12 provides an estimate of hours and portion of budget associated with the various tasks and preparation required for each deliverable.

Table 12. Cadmus Expected Level of Effort by Task

Task	Expected Hours	Portion of Total Hours
Kickoff Meeting	78	1%
Work Plan	109	2%
Project Management	646	11%
Advisory Group Meetings, as needed	84	1%
Residential NTG/Verification Surveys	143	2%
Non-residential NTG/Verification Surveys	141	2%
Non-residential On-Site M&V and Analysis	1,833	32%
Residential Modeling and Billing Analysis	479	8%
Low Income Billing Analysis	100	2%
Cost-Effectiveness Analysis	260	5%
Database Review	56	1%
Interviews and Material Review	156	3%
Process Surveys	107	2%
Customer Research Analysis	123	2%
Program Implementation Process Review	180	3%
Quarterly Reports	100	2%
Semiannual Reports	151	3%
Annual Reports	130	2%
Electric Impact Reports	411	7%
Natural Gas Impact Reports	206	4%
Process Memo and Report	231	4%

Appendix C:

Summarization of Cost-Effectiveness Methodology

Cost-Effectiveness Methodology

The cost-effectiveness evaluation of Avista's Energy Efficiency programs has been standardized to a significant degree in order to provide for greater transparency and understanding of the metrics. Avista has brought these standardized[1] approaches into the evaluation of the cost-effectiveness of our portfolio through a series of specific interpretations, approaches and policies. The summarization of these key guidelines provides a greater insight into the evaluation and how to interpret the results.

The cost-effectiveness of Energy Efficiency programs can be viewed from a variety of perspectives, each of which lead to a specific standardized cost-effectiveness test. The below outlines and describes the various perspectives.

1. The perspective of the entire customer class of a particular utility. This includes not only what they individually and directly pay for efficiency (through the incremental cost associated with higher efficiency options) but also the utility costs that they will indirectly bear through their utility bill. When looking at the full customer population, incentives are considered to be a transfer between ratepayers and not a cost for the overall ratepayer class. This perspective is represented in the total resource cost (TRC) test. Avista has included a 10% conservation credit to the TRC calculation adding a benefit to the overall cost effectiveness.

2. If the objective is to minimize the utility bill, without regard to costs borne by the customer outside of that which is paid through the utility bill, then cost-effectiveness simply comes down to a comparison of reduced utility avoided cost and the full cost (incentive and non-incentive cost) of delivering the utility program. This is the utility cost test (UCT) also known as the program administrator cost test (PAC).

3. A participating customer's view of cost-effectiveness is focused upon their reduced energy cost (at their retail rate). Avista also includes the value of any non-energy benefits that they may receive. Incentives received by the customer offset the incremental cost associated with the efficiency measure. This is the participant cost test (PCT). Since participation within utility programs is voluntary it could be asserted that well-informed participating customers are performing their own cost-effectiveness test based upon their own circumstances and voluntarily participate only to the extent that it is beneficial for them to do so.

4. A non-participating customer is impacted by a utility program solely through the impact upon their retail rate. Their usage, since they are a non-participant, is unaffected by the program. The impact of Energy Efficiency programs on the utility rate imposed upon these non-participating customers is the result of the reduced utility energy costs,

[1] California Standard Practice Manual: Economic Analysis of Demand Side Program and Projects

diminished utility revenues and the cost associated with the utility program. Since utility retail energy rates exceed the avoided cost under almost all scenarios (peak end-use load and a few other exceptions apply) the non-participant rarely benefits. This is the rate impact measure (RIM), also known as the non-participant test. The following table summarizes Avista's approach to calculating the four basic cost-effectiveness tests. The categorization and nomenclature have been worded so as to provide the clarity regarding each cost and benefit component. Please note that some of the values within the table below represent negative values.

Appendix C, Table 1: Summarization of Standard Practice Test Benefits and Costs

	TRC	UCT	PCT	RIM
Benefit components				
Avoided cost of utility energy	$	$		$
Value of non-utility energy savings	$		$	
Non-energy impacts	$		$	
Reduced retail cost of energy			$	
Cost components				
Customer incremental cost	$		$	
Utility incentive cost		$	-$	$
Utility non-incentive cost	$	$		$
Imported funds (tax credits, federal funding etc)	-$		-$	
Reduced retail revenues				$

A summary of some of the approaches by which Avista measures these values and how they are applied within Avista's evaluation of cost-effectiveness is contained below.

Avoided cost of utility energy: The avoided cost of electricity and natural gas is based upon the results of the most recent Integrated Resource Plan (IRP) to include the valuation of several avoided costs that are somewhat unique to energy-efficiency (e.g., distribution losses, the monetary cost of carbon etc.). The cost of electric transmission and distribution (T&D) capacity benefits was adjusted to align with the 7th Power Plan and a $26.48 per kW-yr for 20 year levelized cost was used to bring electricity into the Avista Balancing Area from the Mid-C Market.

The electric IRP provides 20 years of Mid-C prices for every hour of the year (8,760 hours) and system capacity benefits for generation and T&D. Different measures have different distribution of their savings of the year so to properly value the commodity portion for individual measures the 175,200 market prices (8,760 x 20) are multiplied by the individual load shapes yielding 23 different end use commodity avoided costs.

To calculate the capacity value an average of the percentage of savings on January weekdays between 7:00–12:00 and 18:00–23:00 was used to estimate the peak coincidence to be multiplied by that year's generation, transmission and distribution capacity benefits.

The commodity and capacity benefits are summed for each year and the combined avoided costs are increased to account for avoided line loss rates (6.1%).

The avoided cost of the natural gas IRP produces an annual and winter avoided therm value which an avoided delivery charge is added (represented by the demand portion of Schedule 150) to each.

The application of the avoided cost of energy to Energy Efficiency measures includes all interactive impacts upon the own fuel (e.g. interactive impacts upon electric consumption by electric programs) and cross fuel (e.g. interactive impacts upon natural gas usage as a result of an electric program). This includes the natural gas usage associated with electric to natural gas (fuel conversion) programs.

Value of non-utility energy: For forms of energy not provided by the utility, such as propane or wood fuel, and for which there is no Integrated Resource Plan valuation of the avoided cost, all savings are valued based upon the customers retail cost of energy.

Non-energy impacts: Impacts of efficiency measures unrelated to energy usage are incorporated into the appropriate standard practice tests to the extent that they can be reasonably quantified and externally represented to a rational but critical audience. The company is appreciative to the Regional Technical Forum (RTF) for the increased focus they have done on quantifying non-energy impacts. Savings most typically quantified are related to reductions in lighting maintenance, reduced replacement costs (LEDs vs. halogen) and water and sewer cost savings. Additionally when the Company pays the full cost of a measure within the low-income portfolio, and includes that full cost as a customer incremental cost, the value of the baseline measure is included as a non-energy benefit as a representation of the end-use service beyond the energy-efficiency impact. Those impacts that have been determined to be unquantifiable within reasonable standards of rigor consist of both benefits and costs. For example, the Company has not been able to quantify the value of comfort, preventing us from valuing the benefit of draft reduction from efficient windows, or the increased productivity due to lighting upgrades.

Reduced retail cost of energy: For the participant test it is the participating customers reduced retail cost of energy and not the utility avoided cost of energy that is relevant to that perspective.

Customer incremental cost: This represents the additional cost of an efficient measure or behavior above the baseline alternative. To the maximum extent possible the determination of customer incremental cost is based upon alternatives that are identical in all aspects other

than efficiency. When a clear comparison isn't possible an individualized adjustment is made to the extent possible.

Utility incentive cost: Direct financial incentives or the utility cost of physical products or services distributed to individual customers are transfer payments between participating and non-participating customers. The provision of program delivery services is not a transfer cost and is not incorporated into the definition of the utility incentive cost.

Utility non-incentive cost: These costs consist of all utility costs that are outside of the previously defined incentive costs. It typically consists of labor, EM&V, training, organizational memberships and so on.

Imported funds: Avista includes the value of imported funds (generally tax credits or governmental co-funding of programs) to be a reduction in the customer incremental cost of the measure for purposes of calculating the TRC Test and the Participant Test. These funds are acquired from entities outside the ratepayer population or the individual participant.

The alternative approach to treating imported funds as an offset to the customer incremental cost is to consider these funds to be a benefit. For purposes of Avista's cost-effectiveness objective (maximize residual net TRC benefit) there would be no mathematical difference between these two approaches.

Reduced retail revenues: For purposes of the RIM test the loss of retail revenue is a cost to the non-participating customer.

The means by which Avista's Energy Efficiency portfolio is defined for purposes of evaluation and cost allocation is also an important part of our methodology. The various definitions used to define the different levels of aggregation are explained below followed by an explanation of how these are applied in the allocation of costs.

Sub-Measure: A sub-measure is a component of a measure that cannot be coherently offered without aggregating it with other sub-measures. For example, an efficient three-pan fryer couldn't be offered as part of a sensible customer-facing program if the program did not also include two-pan and four-pan fryers. Avista may offer sub-measures that fail cost-effectiveness criteria if the overall measure is cost-effective. This is the only area where Avista permits the bundling of technologies for purposes of testing offerings against the cost-effectiveness screen. There are relatively few sub-measures meeting the criteria specified above within the portfolio.

Measure: Measures are stand-alone energy efficiency options. Consequently measures are generally expected to pass cost-effectiveness requirements barring justifiable exceptions. Exceptions include, but are not necessarily limited to, measures with

market transformation value not incorporated into the assessment of the individual measure, significant non-energy benefits that cannot be quantified with reasonable rigor and cooperative participation in larger regional programs.

Programs: Programs consist of one or more related measures. The relation among the measures may be based upon technology (e.g. an aggregation of efficient lighting technologies) or market segment (e.g. aggregation of efficient food service measures). The aggregation is generally performed to improve the marketability and/or management of the component measures.

Portfolio: Portfolios are composed of aggregations of programs. The aggregating factor will vary based upon the definition of the portfolio. The following portfolios are frequently defined in the course of Avista's Energy Efficiency reporting and management:

Customer segment portfolio: An aggregation of programs within a customer segment (e.g. low-income, residential, nonresidential).

Fuel portfolio: Aggregating electric or natural gas Energy Efficiency programs.

Regular vs. low income portfolios: Separating income qualified measures delivered through CAP agencies from the remainder of the portfolio.

Jurisdictional portfolio: Aggregating programs within either the Washington or Idaho jurisdiction.

Local or Regional portfolio: Aggregating all elements of the local Energy Efficiency portfolio vs. the regional market transformation portfolio.

Fuel/Jurisdictional portfolio: Aggregating all programs within a given fuel and jurisdiction (Washington electric, Washington natural gas, Idaho electric or the currently suspended Idaho natural gas portfolio).

Overall portfolio: Aggregating all aspects of the Washington and Idaho, electric and natural gas Energy Efficiency portfolio.

Methodology for Allocation of Energy Efficiency Costs

The Avista methodology for cost-allocation builds from the measure or sub-measure analysis to the program and ultimately portfolio analysis. At each level of aggregation those costs that are incremental at that stage are incorporated into the cost-effectiveness analysis. Incremental customer cost and benefits are fully incorporated into measure-level analysis. Utility costs (both labor and non-labor) are currently fully incorporated within the program level of aggregation based

upon previous Advisory Group discussions regarding the Company's ability to expand or contract the portfolio to meet acquisition target. Cost allocations are made based upon the expected adjusted BTU acquisition of the program, with adjustments by the relative avoided cost of electricity and natural gas (i.e. a kWh is a highly processed btu compared with an equivalent natural gas).

Generally little of the non-incentive utility cost (labor and non-labor) are allocated at the measure level with the exception of programs delivered through a third-party contractor where those costs are truly incremental. Other non-incentive utility costs are allocated at the program level in the belief that the addition or elimination of programs would lead to a change in the scale of the overall portfolio and that therefore these costs are incremental at the program level.

It should be noted that costs not associated with the delivery of local Energy Efficiency programs within the planned year are excluded from the cost-effectiveness calculations. These are termed "supplemental costs" and consist of:

- The funding associated with regional programs (NEEA)
- Cost to perform conservation potential assessment studies
- Funding of low-income educational outreach programs (ID)
- Idaho research funding and similar expenses unrelated to the planned local portfolio

Unit Energy Savings

The quantification of energy savings applicable towards achieving Washington EIA acquisition targets has been an ongoing topic of discussion since the effective date of the requirement. The company plan will create an annual locked Unit Energy Savings (UES) associated with the Technical Reference Manual (TRM) that will be updated on an annual basis. The savings will primarily be derived from the Regional Technical Forum (RTF) or previous impact evaluations.

For planning purposes the business plan has applied the same assumptions regarding UES to the Idaho portfolio as our best current estimate of savings. However, the retrospective Annual Conservation Report may displace these assumptions with the results of actual impact evaluations when available and appropriate.

Analytical Methodology Applicable to the Low Income Programs

Avista has developed several analytical methodologies that are specific to the evaluation needs of the low income portfolio. These include the (a) accommodation of incentive levels equal to the entire cost of the measure, including the cost of the baseline measure and (b) the treatment and quantification of the considerable non-energy benefits incorporated within the low income portfolio. Beyond these two rather significant analytical issues the treatment of the low income portfolio is similar to that applied to the other portfolios.

Except for the low income program, Avista does not typically fully fund the customer incremental cost and even less frequently the full installed cost of an end-use. For low income programs delivered with Avista funding in partnership with Community Action Program (CAP) agencies the participating customer may receive full funding of the end-use. There is a need to appropriately represent this expenditure within the overall Energy Efficiency expenditure budget, but at the same time it is necessary to recognize that only a portion of this expenditure is dedicated toward energy efficiency. The Company does so by recognizing the full expenditure as a cost but also recognizing that there is a non-energy benefit associated with the provision of base case end-use services. The full cost less this non-energy benefit is equal to the amount invested in energy efficiency. Thus the assessment of the cost-effectiveness of the energy efficiency investment is appropriately based upon the value of the energy savings of the efficient measure in comparison to this incremental cost. In situations where a measure might be found cost-effective under one fuel it will be reimbursed at the full cost for both fuels.

The Company has also defined the expenditure of non-energy health and safety funds as a non-energy benefit (on a dollar-for-dollar basis). This quantification is based upon the individual assessment of each of these expenditures by the CAP agency prior to the improvements being made. This approval process provides reasonable evidence that the improvements are worth, at a minimum, the amount that has been expended upon them through CAP agency funds.

As a consequence of these two assumptions the low income portfolio accrues considerable non-energy benefits.

The 15% administrative reimbursement permitted to the CAP agency is considered to be a component of the measure cost. This amount reimburses the CAP for back office costs that would, in a typical trade ally bid, be incorporated into the project invoice.

Appendix D:

Schedule 90 and 190, Washington

SCHEDULE 90 continued

the amount specified in section 4.1 below. This market transformation effort supports renewable energy measures in the residential and small commercial segments.

Market transformation ventures will be considered eligible for funding to the extent that they improve the adoption of electric efficiency measures that are not fully accepted in the marketplace. These market transformation efforts may include efforts funded through regional alliances or other similar opportunities.

4. FUNDING AND NONMONETARY ASSISTANCE

4.1 Funding

The Company shall offer incentives for projects based upon the incremental capital cost associated with the energy efficiency of the project. Energy savings are calculated using the current retail energy rates. (C) (C) (D) (D)

The Company shall pay an incentive up to a maximum of the incremental measure cost. The Company shall make adjustments to the percent of incremental cost paid to attempt to obtain the greatest energy savings at the lowest cost (N) (N)

Low Income measures that have a TRC of 1.0 or higher are incentivized at 100% of the project cost. For measures that have a TRC of less than 1, the project is incentivized at an amount equal to the present value of avoided cost.

Incentives for efficiency measures within the following categories shall not exceed 100% of the project cost:

(D) (D) (D)

SCHEDULE 90 continued

4.1.1 Energy efficiency programs delivered by community action agencies contracted by the Company to serve Low Income or vulnerable customer segments including agency administrative fees and health and human safety measures;

4.1.2 Low-cost electric efficiency measures with demonstrable energy savings (e.g. compact fluorescent lamps);

4.1.3 Programs or services supporting or enhancing local, regional or national electric efficiency market transformation efforts.

4.1.4 Prescriptive programs are guided by the typical application of that measure in accordance with the previously defined incentive structure. Incentive levels for these programs are based on market conditions at the time of program design and are not dependent on actual project cost relative to incentive caps. Incentives shall not exceed project costs.

4.1.5 Incentives for demand response programs shall not exceed 75% of the calculated capacity present value of the measure if and when an interruption event is triggered.

The Company will actively pursue electric efficiency opportunities that may not fit within the prescribed services and described in this tariff. In these circumstances the customer and the Company will enter into a site specific services agreement. (D)

4.2 Non-Monetary Assistance

Assistance without the granting of direct monetary incentives to the customer is available across all applicable segments and may be provided in various ways, that include, but are not limited to, the following:

4.2.1. **Educational**, training or informational activities that enhance electric efficiency. This may include technology or customer-segment specific seminars, literature, trade-show or community events, advertising or other approaches to increasing the awareness and adoption of resource efficient measures and behaviors.

4.2.2. **Financial** activities intended to reduce or eliminate the financial barriers to the adoption of electric efficiency measures. This may include programs intended to reduce the payment rate for resource efficiency measures, direct provision of leased or loaned funds or other approaches to financial issues with better than existing market terms and conditions.

SCHEDULE 190 - continued

4. FUNDING AND NONMONETARY ASSISTANCE

4.1 Funding

The Company shall offer incentives for projects based upon the incremental capital cost associated with the energy efficiency of the project. Energy savings are calculated using the current energy rates. (C) (C) (D) (D)

The Company shall pay an incentive up to a maximum of the incremental measure cost. The Company shall make adjustments to the percent of incremental cost paid to attempt to obtain the greatest energy savings at the lowest cost. (N) (N) (N) (D)

Low income measures that have a Total Resource Cost (TRC) of 1.0 or higher are incentivized at 100% of the project cost. For measures that have a TRC of less than 1, the project is incentivized at an amount equal to the present value of avoided cost.

Incentives for efficiency measures within the following categories shall not exceed 100% of the project cost:

4.1.1 Energy efficiency programs delivered by community action agencies contracted by the Company to serve Low Income or vulnerable customer segments including agency administrative fees and health and human safety measures;

4.1.2 Low-cost natural gas efficiency measures with demonstrable energy savings (e.g. rooftop unit service);

4.1.3 Programs or services supporting or enhancing local, regional or national natural gas efficiency market transformation efforts.

4.1.4 Prescriptive programs are guided by the typical application of that measure in accordance with the previously defined incentive structure. Incentive levels for these programs are based on market conditions at the time of the program design and are not dependent on actual project cost relative to incentive caps. Incentives shall not exceed project costs. (D) (D) (D)

SCHEDULE 190 - continued

Avista Corporation will actively pursue natural gas efficiency opportunities that may not fit within the prescribed services described in this tariff. In these circumstances the customer and Avista Corporation will enter into a site specific services agreement. (D)

4.2 Non-Monetary Assistance

Non-monetary assistance is service that does not involve the granting of direct monetary incentives to the customer. This type of assistance is available across all applicable segments. This assistance may be provided in various ways that include, but are not limited to, the following:

4.2.1. **Educational**, training or informational activities that enhance resource efficiency. This may include technology or customer-segment specific seminars, literature, trade-show booths, advertising or other approaches to increasing the awareness and adoption of resource efficient measures and behaviors.

4.2.2. **Financial** activities intended to reduce or eliminate the financial barriers to the adoption of resource efficiency measures. This may include programs intended to reduce the payment rate for resource efficiency measures, direct provision of leased or loaned funds or other approaches to financial issues by better than existing market terms and conditions.

4.2.3. **Product samples** may be provided directly to the customer when resource efficient products may be available to the utility at significantly reduced cost as a result of cooperative buying or similar opportunities.

4.2.4. **Technical Assistance** may consist of engineering, financial or other analysis provided to the customer by or under the direction of, Avista Corporation staff. This may take the form of design reviews, product demonstrations, third-party bid evaluations, facility audits, measurement and evaluation analysis or other forms of technical assistance that addresses the cost-effectiveness, technical applicability or end-use characteristics of customer alternatives.

Appendix E:

Program Summary

	2020		2019		Increase/(Decrease)	
Program:	Therms Savings	Estimated Budget	Therms Savings	Estimated Budget	Therms Savings	Estimated Budget
Low Income	25,743	$ 1,664,688	29,777	$ 882,863	(4,034)	$ 781,825
Low Income	25,743	$ 1,664,688	29,777	$ 882,863	(4,034)	$ 781,825
Residential Prescriptive	641,859	$ 3,249,126	464,519	$ 1,778,349	177,340	$ 1,470,777
Multifamily Direct Install	1,074	$ 13,073	8,120	$ 19,503	(7,046)	$ (6,430)
Simple Steps	-	$ -	16,765	$ 33,557	(16,765)	$ (33,557)
Residential	642,933	$ 3,262,199	489,404	$ 1,831,410	153,529	$ 1,430,789
Nonresidential HVAC	34,620	$ 104,236	28,827	$ 105,933	5,793	$ (1,697)
Prescriptive Shell	26,000	$ 62,292	11,170	$ 25,585	14,830	$ 36,706
Food Services	57,107	$ 121,058	58,654	$ 134,685	(1,547)	$ (13,626)
Site Specific	151,000	$ 487,373	108,296	$ 392,772	42,704	$ 94,600
Non-Residential	268,727	$ 774,959	206,947	$ 658,975	61,780	$ 115,984
WA NG Total Programs	937,402	$ 5,701,846	726,128	$ 3,373,248	211,275	$ 2,328,598
NEEA, CPA, EM&V	-	$ 490,000	-	$ 212,000	-	$ 212,000
Negative Impact of Non-Res Lighting	(96,775)	$ -	(151,811)		55,036	
WA Total Gas Budget	840,627	$ 6,191,846	574,316	$ 3,585,248	266,311	$ 2,540,598