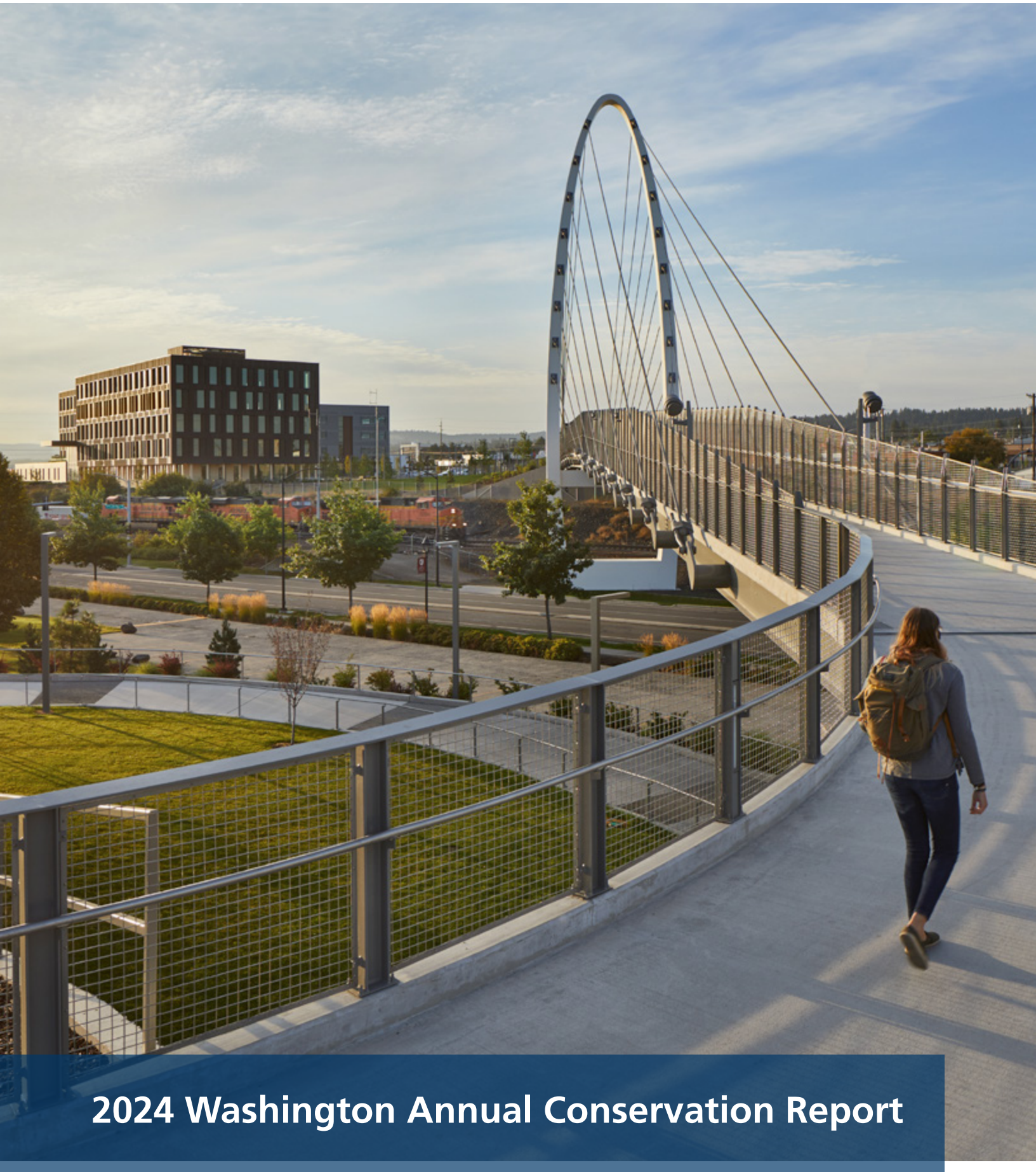

2024 Washington Annual Conservation Report

May 30, 2025

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All forward-looking statements contained in this document are based on underlying assumptions (many of which are based, in turn, upon further assumptions). These statements are subject to a variety of risks, uncertainties, and other factors. Most of these factors are beyond our control and may have a significant effect on our operations, results of operations, financial condition, or cash flows, which could cause actual results to differ materially from those anticipated in our statements.

Such risks, uncertainties, and other factors include, among others, those in our most recent annual report on Form 10-K, or quarterly report on Form 10-Q, filed with the Securities and Exchange Commission. Those reports are available on our website at avistacorp.com.

Front cover: Spokane, Washington

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES AND SUPPLEMENTS

INTRODUCTION

Spokane, Washington

INTRODUCTION

For nearly 50 years, Avista's efficiency programs have helped customers discover innovative ways to conserve energy, live more comfortably, operate businesses more efficiently, and save money. This 2024 *Annual Conservation Report* (*ACR*) provides a summary of Avista's efforts to support the energy needs of customers from Named Communities, as well as residential and commercial customers across the service territory. Energy efficiency continues to be a least-cost resource for the company, therefore Avista remains focused on pursuing all available conservation that is cost-effective, reliable, and feasible.

The 2024 *ACR* acknowledges the verified savings recognized by Avista for meeting the targets set forth in RCW 19.285.040(1) and is consistent with WAC 480-109-120(3), which outlines requirements for annual reporting.

FIGURE 1 – ELECTRIC AND NATURAL GAS SERVICE AREAS

EXECUTIVE SUMMARY

2024 was an incredibly strong year for energy efficiency, with programs achieving electric savings significantly beyond targets. These achievements built on the adaptive-management maneuvers implemented in early 2023 to encourage increased program participation. Avista's Midstream and Small Business Direct-Install Lighting programs continued to lead the portfolio in kWh savings. All programs sustained a focus on affordability and flexibility, with emphasis on customer-centered energy solutions.

Avista continued developing and implementing programs to meet goals outlined in the company's Clean Energy Implementation Plan (CEIP). This process included consulting with its Energy-Efficiency Advisory Group (EEAG) and Equity Advisory Group (EAG) to ensure that program design and outreach efforts supported equitable distribution of clean-energy benefits to customers. Non-energy impact (NEI) values continued to be identified and integrated into cost-effective calculations for the portfolio.

In addition to its portfolio of company and third party-implemented programs, Avista once again supported regional market transformation efforts through the Northwest Energy Efficiency Alliance (NEEA). Reported energy-conservation savings, cost-effectiveness, and other related data, however, are specific to local programs unless otherwise noted.

WASHINGTON ACHIEVEMENTS

TABLE 1 – ENERGY-EFFICIENCY SAVINGS AND COST-EFFECTIVENESS RESULTS

	Savings		Expenditures	Total Resource Cost	Utility Cost Test
Electric					
Electric Actuals (MWh)	45,018	$	31,825,612	1.44	1.43
ACP Goal/Budget	31,717	$	23,508,613		
Percent of Goal	**142%**		**135%**		
Natural Gas					
Natural Gas Actuals (Therms)	512,873	$	12,310,602	1.30	0.59
ACP Goal/Budget	952,930	$	9,549,869		
Percent of Goal	**54%**		**129%**		

- *Electric Conservation:* For 2024, savings from NEEA's programs added an additional 6,474 MWh, bringing the overall savings achieved to 51,492 MWh.
- *Natural Gas Conservation:* After including savings from NEEA's programs, the overall savings achieved in 2024 was 566,942 therms. Actual expenditures exceeded planned expenditures due to strong participation in the Residential Shell and Low-Income programs.

TABLE 2 – WASHINGTON ELECTRIC ACHIEVEMENTS

	Savings Achieved (MWh)
Commercial/Industrial	38,508
Residential	5,865
Low-Income	645
Total Local Program	**45,018**
NEEA	6,474
Total	**51,492**

TABLE 3 – WASHINGTON NATURAL GAS ACHIEVEMENTS

	Savings Achieved (Therms)
Commercial/Industrial	170,600
Residential	327,464
Low-Income	14,809
Total Local Program	**512,873**
NEEA	54,068
Total	**566,942**

For the 2024-25 biennium, Avista's Washington Energy Independence Act (EIA) penalty threshold is 47,635 MWh, which is derived from several target elements, including conservation potential from the company's conservation potential assessment (CPA) and excluding savings derived from the NEEA program. The utility-specific conservation goal is 50,804 MWh, which encompasses Avista's 5 percent decoupling commitment[1]. Table 4 summarizes the target calculation.

TABLE 4 – 2024–25 EIA TARGET

Category	MWh
Pro Rata Share of 10-Year Conservation Potential	63,374
EIA Target	**63,374**
Decoupling Penalty Threshold	3,169
Total Utility Conservation Goal	**66,543**
Excluded Programs (NEEA)	(15,739)
Utility-Specific Conservation Goal	**50,804**
EIA Penalty Threshold	**47,635**

In 2024, Avista met 89 percent of its electric biennial Utility-Specific Conservation Goal, achieving 45,018 MWh through conservation programs.

TABLE 5 – 2024 CONSERVATION ACHIEVED VS. EIA TARGET

	MWh
2024 Savings Achievements	45,018
Total Biennial Savings Achievements	**45,018**
2024-25 Utility-Specific Target	50,804
Utility-Specific Target Shortfall	**5,785**
Percent of Utility-Specific Target	**89%**

Avista's natural gas conservation target is set according to the company's 2024 natural gas *Integrated Resource Plan* (*IRP*). Based on this study, the conservation potential for the 2024-25 biennium was estimated to be 1,903,086 therms. During the 2024 program year, Avista's natural gas program achieved 566,942 therms, which is 30 percent of the two-year *IRP* target. The 2024 achievement includes savings from the NEEA portfolio and is consistent with the past two-year *IRP* cycle, in which Avista's programs were unable to achieve expected targets.

TABLE 6 – 2024 NATURAL GAS SAVINGS VS. IRP TARGET

	Therms
2024 Savings Achievements	566,942
Total Biennial Savings Achievements	**566,942**
2024-25 Savings Target	1,903,086
IRP Target Shortfall	**1,336,144**
Percent of IRP Target	**30%**

1) Docket UE-140188, Order 05.

Portfolio Trends

Avista achieved significantly higher-than-anticipated electric energy savings in 2024. Key drivers of this trend were enthusiastic participation in the Midstream and Small Business Direct-Install Lighting programs, particularly for residential measures. Substantial savings were also achieved through commercial Site-Specific and Prescriptive Lighting programs.

- The Small Business Direct-Install Lighting Program achieved over 40 percent of the kWh savings for the entire electric portfolio. This program remains extremely popular with customers and trade allies alike, for its simplicity and little to no out-of-pocket costs for customers.
- About a quarter of savings came from the Site-Specific Program, perhaps indicating some market recovery in the commercial segment, particularly for lighting upgrades.
- The Commercial Grocer Program also performed significantly higher than expected, as a national distributor entered the market and began leveraging Avista's incentives to generate customer projects. This distributor accounted for all Commercial Grocer rebates in 2024.
- Residential Midstream incentives carried the residential sector's electric savings achievements.

TABLE 7 – ENERGY-EFFICIENCY SAVINGS BY SECTOR – ELECTRIC

	Planned Savings (kWh)	Achieved Savings (kWh)	% of Plan Achieved
Commercial/Industrial	25,830,993	38,508,186	149%
Residential	4,458,711	5,864,988	132%
Low-Income	1,427,296	645,260	45%
Total	**31,717,000**	**45,018,433**	**142%**

Natural gas programs achieved less therms savings than anticipated in 2024. While residential programs reached about three-quarters of the goal, commercial programs achieved around one-third.

- The Low-Income Program achieved significantly higher savings than anticipated. Community Action Partnership (CAP) agencies were better able to address labor shortages over prior years, adeptly identifying and prioritizing customers with the most urgent need for weatherization.
- Residential programs were buoyed by very robust participation in the Midstream Program.
- The company continued to see diminished participation in commercial natural gas programs, as interest rates, inflation, and policy changes contributed to uncertainty, and pressure on capital expenditures remained high.

TABLE 8 – ENERGY-EFFICIENCY SAVINGS BY SECTOR – NATURAL GAS

	Planned Savings (Therms)	Achieved Savings (Therms)	% of Plan Achieved
Commercial/Industrial	514,483	170,600	33%
Residential	432,356	327,464	76%
Low-Income	6,091	14,809	243%
Total	**952,930**	**512,873**	**54%**

Expenditures

While the 2024 *Annual Conservation Plan* (*ACP*), filed with the Washington Utilities and Transportation Commission in November 2023, provides an expectation for operational planning, Avista is required to pursue all cost-effective measures as provided in the company's Tariff Schedules 90 and 190. Because of this requirement, variances may exist between planned and actual spending. For 2024, expenditures on conservation programs exceeded the anticipated budgets. On the electric side, program spending exceeded plan by 35 percent. This was largely in line with the 42 percent increase in savings achievement. On the natural gas side, program spending exceeded plan by 29 percent. This points to higher participation rates within Midstream, though lower-than-anticipated savings from natural gas furnaces meant that overall savings didn't increase over the plan. For more details on the Midstream Program's performance, please see the program-specific narrative on pages 21 and 30.

Table 9 provides a detailed comparison of budgeted to actual energy-efficiency expenditures by fuel type.

TABLE 9 – ANNUAL CONSERVATION PLAN BUDGET TO ACTUAL EXPENDITURES COMPARISON

	2024 Planned Expenses	2024 Actual Expenses
2024 Electric Planned vs Actual Expenses		
Incentives	$ 14,862,374	$ 23,045,236
Non-Incentives and Labor	$ 6,808,076	$ 6,895,378
MT, CPA, EM&V	$ 1,838,163	$ 1,884,998
Total Expenditures	**$ 23,508,613**	**$ 31,825,612**
2024 Natural Gas Planned vs Actual Expenses		
Incentives	$ 6,094,985	$ 10,287,709
Non-Incentives and Labor	$ 2,502,029	$ 1,441,647
MT, CPA, EM&V	$ 952,855	$ 581,247
Total Expenditures	**$ 9,549,869**	**$ 12,310,602**

COST-EFFECTIVENESS

To gauge cost-effectiveness, Avista's portfolio offerings are evaluated throughout implementation and at the conclusion of each program year. Tests determine whether a program is beneficial from the company's and customers' perspectives.

Avista's cost-effectiveness goal for the electric and natural gas program portfolios is a Total Resource Cost (TRC) and Utility Cost Test (UCT) above 1.00, indicating that benefits of the portfolio exceed the costs of implementing the programs.

TABLE 10 – PORTFOLIO COST-EFFECTIVENESS RESULTS – ELECTRIC

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
TRC	$ 45,268,242	$ 31,338,714	1.44
UCT	$ 38,215,623	$ 26,813,671	1.43

TABLE 11 – PORTFOLIO COST-EFFECTIVENESS RESULTS – NATURAL GAS

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
TRC	$ 12,045,255	$ 9,234,455	1.30
UCT	$ 6,685,960	$ 11,390,554	0.59

TARIFF RIDER BALANCES

At the start of 2024, the Washington electric and natural gas (aggregate) tariff rider balances were underfunded by roughly $10 million. Approximately $26.6 million in tariff rider revenue was collected to fund energy efficiency during the year, while around $44 million was expended to operate Avista's energy-efficiency programs. The $10 million underfunded balance comprises $8 million on the electric side and approximately $2 million for natural gas programs. Combined, these ending balances resulted in a net underfunded balance of $27.6 million by the end of the year.

Table 12 illustrates 2024 tariff rider activity by fuel type.

TABLE 12 – TARIFF RIDER ACTIVITY

	Electric	Natural Gas	Total
Beginning Balance (Underfunded)/Overfunded	**$ (8,007,695)**	**$ (2,025,090)**	**$ (10,032,785)**
Energy-Efficiency Funding Collected in 2024	$ 18,807,454	$ 7,769,515	$ 26,576,970
Total Funding Available in 2024	$ 10,799,759	$ 5,744,425	$ 16,544,185
Energy-Efficiency Expenditures	$ 31,825,612	$ 12,310,602	$ 44,136,214
Ending Balances (Underfunded)/Overfunded	**$ (21,025,853)**	**$ (6,566,177)**	**$ (27,592,030)**

One major driver of the company's substantial performance in 2024, especially on the electric side, was the realization of aggressive adaptive-management activities in pursuit of the high target for the 2022-2023 biennium. Those activities, which included launching the Midstream and Small Business Direct-Install Lighting programs, proved very effective in achieving higher savings. While savings rose significantly during the 2023 program year, these new programs saw that high rate persist throughout 2024.

EQUITY CONSIDERATIONS

Avista remains committed to ensuring that the benefits of clean energy are realized equitably, with a particular focus on Named Communities – where 58 percent of the company's residential electric customers reside[2]. In 2024, the company began tracking efficiency-program impacts therein, to better assess efficacy and inform improvements for these populations in particular.

2) Although the 2021-2025 CEIP leveraged the Washington State Department of Health's Environmental Health Disparities Map to identify Named Communities, the data in this report relies on census tract data from Justice40 maps. A decision was made to move to Justice40 for this report, since it is anticipated that the 2025-2029 CEIP will rely on Justice40 maps. Moving to Justice40 preemptively gives the energy-efficiency team a consistent baseline through both years of the current biennium, even though 2024 is the final year of the first CEIP, and 2025 will likely be the first year of the second CEIP.

These metrics for Named Communities included the gains from energy-efficiency incentives that directly benefited customers, the percentage of savings benefiting them, and the total NEIs received by their households – aligning with Customer Benefit Indicators (CBIs) in the company's CEIP. Program managers also considered barriers that may be inhibiting equitable access to each program, then took mitigation steps. Those efforts, as well as each program's specific metrics, are detailed in the program-by-program summaries within this *ACR*.

The numbers below reflect overall benefits to customers residing in census tracts that are designated Named Communities. While these tracts generally have high concentrations of people who are highly impacted or part of a vulnerable population, it is important to note that living within these areas does not always indicate these circumstances. Avista will consider these nuances as the company improves its methods of identifying individuals with the most significant need for assistance during the next biennium.

TABLE 13 – DISTRIBUTION OF SAVINGS, INCENTIVES, AND NON-ENERGY IMPACTS – ELECTRIC

Electric	Benefited Customers Outside of Named Communities	Benefited Named Communities	% Benefiting Named Communities
Incentives	$ 10,276,167	$ 9,970,296	49%
Savings (MWh)	25,145	19,873	44%
Non-Energy Impacts	$ 1,970,256	$ 1,260,801	39%

TABLE 14 – DISTRIBUTION OF SAVINGS, INCENTIVES, AND NON-ENERGY IMPACTS – NATURAL GAS

Natural Gas	Benefited Customers Outside of Named Communities	Benefited Named Communities	% Benefiting Named Communities
Incentives	$ 6,891,153	$ 3,305,763	32%
Savings (Therms)	350,987	161,886	32%
Non-Energy Impacts	$ 3,780,376	$ 910,324	19%

Named Communities Investment Fund

In 2024, Avista continued investing in non-cost-effective energy-efficiency projects to benefit highly impacted and vulnerable electric customers through its Named Communities Investment Fund (NCIF). Avista's NCIF oversight group maintained its evaluation of individual project eligibility based on alignment with the company's CBIs. By taking an individualized approach to each potential NCIF-funded project, Avista can recognize and accommodate the level of attention required for inclusion of organizations that might otherwise face significant barriers to participation.

All told, 24 projects were funded in 2024. While the NCIF application is available in both digital and paper formats, program managers actively foster relationships with various organizations. This engagement helps develop a shared understanding of equity goals in the clean-energy transformation and captures project ideas for Named Communities.

The 2024 NCIF supported implementation of many community-identified projects, while ensuring the participation of Named Communities in existing programs such as the multifamily program, shell upgrades, and lighting improvements. These resources provided tangible benefits to customers in Named Communities by enabling projects that may not have been feasible without NCIF support. More details on the company's NCIF activities are included later in this report.

Spokane Valley, Washington

COMMERCIAL/INDUSTRIAL SECTOR

Overview

Commercial/industrial customers are offered multiple pathways for participation in energy-efficiency programs. Avista's Midstream Program partners with distributors to ensure that the mix of HVAC, hot water, and food-service equipment available to contractors is energy-efficient. Prescriptive measures offer a simple approach for lighting and HVAC projects. Any savings measure not offered through Midstream or Prescriptive programs is eligible for consideration through the Site-Specific Program path. This path is for unique or complex projects that require custom savings calculations and technical assistance from Avista's energy engineers (such as compressed air, process equipment and controls, and comprehensive lighting retrofits). In certain instances, a performance-based approach is used.

In 2024, Avista continued its innovative Direct-Install Lighting Program for small businesses. This program offers low-cost to no-cost lighting upgrades to Schedule 11 and Schedule 12 customers, and it remained extremely popular with customers and trade allies alike.

Performance and Savings Goals

The commercial/industrial sector achieved 38,508 MWh, or 149 percent of the savings goal, while continuing to maintain a high level of cost-effectiveness for both the TRC and UCT. For natural gas programs, the commercial/industrial sector achieved 170,600 therms, or 33 percent of the sector savings goal of 514,483 therms. In addition to high interest rates and inflation, the natural gas sector continues to face significant headwinds, including an uncertain policy future and rising costs.

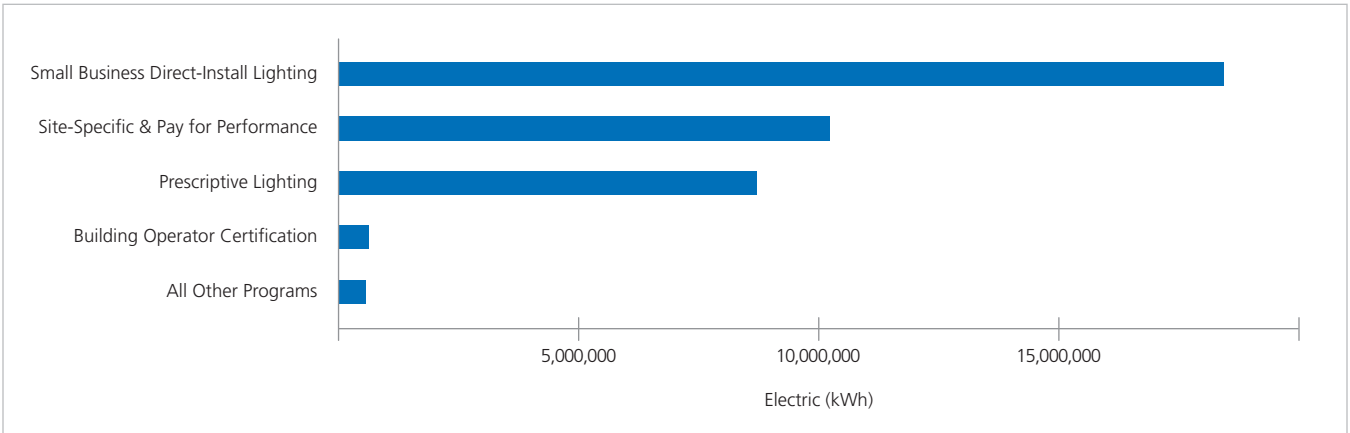
TABLE 15 – COMMERCIAL/INDUSTRIAL PROGRAM ACHIEVED SAVINGS – ELECTRIC

Program	Savings Goals (kWh)	Achieved Savings (kWh)	Percentage of Goal
Small Business Direct-Install Lighting	6,228,000	18,446,896	296%
Site-Specific & Pay for Performance	7,591,937	10,229,030	135%
Prescriptive Lighting	9,222,722	8,708,412	94%
Building Operator Certification	–	595,000	N/A
Midstream	528,117	358,297	68%
Shell	198,445	100,215	51%
Commercial Grocer	291	59,188	20340%
Green Motors Rewind	8,382	7,944	95%
Other Prescriptive Programs	70,159	3,204	5%
Compressed Air	53,600	–	0%
Active Energy Management	1,429,340	–	0%
Clean Buildings Accelerator	500,000	–	0%
Commercial/Industrial Total	**25,830,993**	**38,508,186**	**149%**

TABLE 16 – COMMERCIAL/INDUSTRIAL PROGRAM ACHIEVED SAVINGS – NATURAL GAS

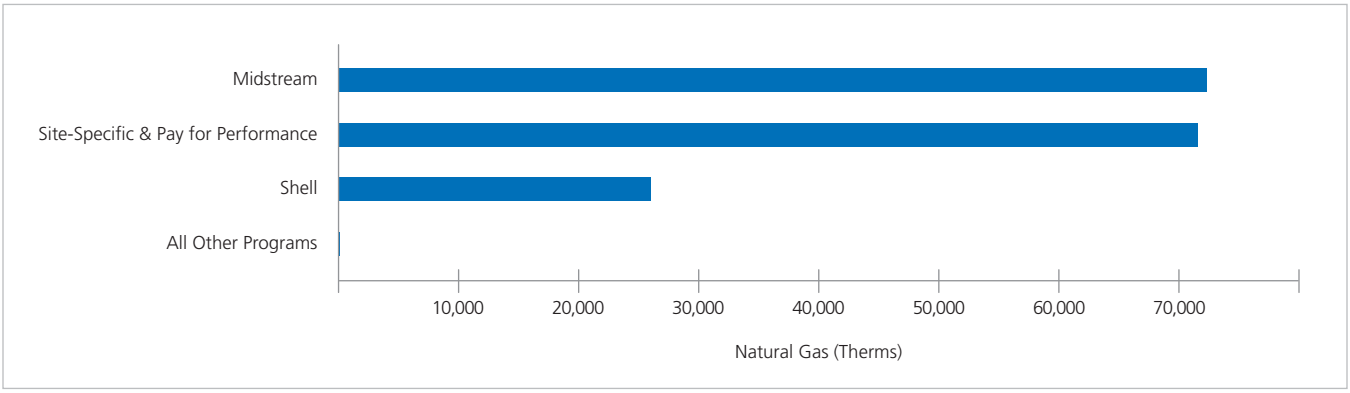
Program	Savings Goals (Therms)	Achieved Savings (Therms)	Percentage of Goal
Midstream	209,078	72,475	35%
Site-Specific & Pay for Performance	253,530	71,657	28%
Shell	37,810	26,244	69%
Other Prescriptive Programs	–	223	N/A
Clean Buildings Accelerator	14,065	–	0%
Commercial/Industrial Total	**514,483**	**170,600**	**33%**

FIGURE 2 – COMMERCIAL/INDUSTRIAL ELECTRIC ENERGY SAVINGS PORTFOLIO



As indicated in Figure 2, lighting measures accounted for the bulk of savings in the commercial/industrial segment through the Small Business Direct-Install Lighting Program, as well as through the Prescriptive Lighting Program. A portion of Site-Specific projects included lighting measures.

FIGURE 3 – COMMERCIAL/INDUSTRIAL NATURAL GAS ENERGY SAVINGS PORTFOLIO



The Midstream Program accounted for the most commercial/industrial natural gas savings, followed closely by the Site-Specific Program (which includes Pay for Performance projects). Prescriptive shell measures accounted for the large majority of additional savings.

Marketing

Avista continued a robust approach to commercial/industrial energy-efficiency marketing in 2024. Education and awareness campaigns were developed around ways to save energy, available rebate programs, and customer success stories. Messages were shared across multiple channels, including print, digital, search, streaming and broadcast, social media, email, website, newsletters, and more. Additionally, the company's regional account executives continued to play a significant role in building program awareness to increase engagement by managing business customer projects and relationships.

Avista's energy-efficiency rebate program ads were refreshed in 2024, allowing customers to engage with multiple messages. Because this customer segment holds vast potential for energy savings, a new industrial case study and several small-business project highlights were developed to highlight successful experiences. The company also leveraged existing case studies, such as Harvester Restaurant and Luxury Living, during major event sponsorship and broadcast media buys. Short stories were shared often across Avista social media channels, generating interest and engagement in rebate and direct-install programs. The purpose of these efforts was to engage the business audience in the energy-efficiency conversation, helping them see how their peers are benefiting from saving energy (with the help of Avista's programs).

Throughout the year, Avista reached out to business customers directly via email, offering energy-saving advice and helpful program information. For example, an email was sent to school districts to build awareness about the Department of Energy's Renew America's Schools program and Energy Champions Leading the Advancement of Sustainable Schools opportunities. Avista also continued its longstanding e-newsletter, *Energy Solutions*, directing business customers to energy-efficiency programs at myavista.com.

Avista hosted a fall open house on energy-efficiency programs, where program managers, energy engineers, and account executives welcomed commercial/industrial trade ally vendors and contractors. Energy-efficiency rebate programs and services were discussed and shared, with the intention that trade allies would further their participation on customers' behalf.

Power of Change

Notably, Avista developed a fresh creative approach to promoting energy efficiency in 2024, with the launch of a campaign called Power of Change. The campaign positions energy efficiency as an approachable way into the broader energy conversation, and messaging includes energy-saving tips and program promotion.

Power of Change is the first large-scale paid social media advertising campaign in Avista's history. The decision to enter the paid social media market was driven by changing customer communication preferences and demographics. Ads ran on Meta, X, LinkedIn, TikTok, and YouTube, in addition to digital display and streaming. The campaign was also leveraged in the company's sponsorship activations at local sporting events. Ads ran in six-week phases, with a total of six business ads per phase.

FIGURE 4 – COMMERCIAL/INDUSTRIAL POWER OF CHANGE ADS

Business Partner Program

The Business Partner Program (BPP) raises awareness of Avista's programs among rural small-business customers in Washington and Idaho, providing information on energy audits, budget billing plans, and energy-efficiency rebates. Due to the success of the BPP, the program expanded in the fall of 2023 to include both rural and urban small-business customers.

Through this program Avista continues to offer the Trade Ally Bid Program, in which various vendors (e.g., lighting, HVAC, window, and insulation) provide cost estimates to customers for energy-efficiency upgrades to their facilities.

Collaboration with trade ally partners enables Avista to offer customers energy assessments, walking them through the efficiency-incentive process and helping them obtain project bids. The Trade Ally Bid Program has empowered small-business customers who may lack the time, budget, or access to contractors to make improvements.

Cost-Effectiveness

Tables 17 and 18 show the commercial/industrial sector cost-effectiveness results by fuel type.

TABLE 17 – COMMERCIAL/INDUSTRIAL COST-EFFECTIVENESS RESULTS – ELECTRIC

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
TRC	$ 32,414,549	$ 23,235,881	1.40
UCT	$ 29,467,772	$ 20,113,970	1.47

TABLE 18 – COMMERCIAL/INDUSTRIAL COST-EFFECTIVENESS RESULTS – NATURAL GAS

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
TRC	$ 4,505,513	$ 1,617,394	2.79
UCT	$ 1,535,054	$ 1,144,354	1.34

Strong cost-effectiveness results for commercial/industrial natural gas programs are driven by highly cost-effective measures in the Midstream and Commercial Shell programs.

Verified Savings

As part of the Evaluation, Measurement, and Verification (EM&V) process, Avista's evaluators review reported savings provided by the company and adjust where necessary. Details of these adjustments are included in the impact evaluation reports appended to this report. In 2024, the electric portfolio reported savings of 38,642 MWh and achieved evaluated savings of 38,508 MWh, resulting in a realization rate of 99.7 percent. The natural gas portfolio reported 202,995 therms and achieved evaluated savings of 170,600 therms, resulting in an 84 percent realization rate.

Tables 19 and 20 illustrate the reported and evaluated savings and resulting realization rates. Each program's specific realization rates are discussed in the program-specific summaries later in this section.

TABLE 19 – COMMERCIAL/INDUSTRIAL VERIFIED SAVINGS BY PROGRAM – ELECTRIC

Program	Expected Savings (kWh)	Verified Savings (kWh)	Verified Realization Rate
Prescriptive Lighting	8,767,363	8,708,412	99.3%
Small Business Direct-Install Lighting	19,112,087	18,446,895	96.5%
Variable Frequency Drive	2,044	3,204	156.8%
Commercial Grocer	59,188	59,188	100.0%
Shell	35,272	100,215	284.1%
Green Motors Rewind	11,543	7,944	68.8%
Midstream	454,774	358,297	78.8%
Site-Specific	10,199,933	10,229,030	100.3%
Building Operator Certification	N/A	595,000	N/A
Commercial/Industrial Total	**38,642,204**	**38,508,186**	**99.7%**

- *Variable Frequency Drive realization rate of 156.8 percent:* Avista's evaluators found that savings estimates from the Regional Technical Forum (RTF) exceeded Avista's expected savings, resulting in higher-than-expected verified savings.
- *Shell realization rate of 284.1 percent:* Avista's evaluators found that the unit energy savings (UES) values utilized for expected savings did not align with the values in the Technical Reference Manual (TRM). Applying the correct UES values resulted in higher verified savings.
- *Green Motors realization rate of 68.8 percent:* Avista's evaluators found that savings estimates from the RTF were lower than Avista's expected savings, resulting in lower verified savings.
- *Midstream realization rate of 78.8 percent:* Although Avista worked with both the implementer and evaluators to align savings estimates with verification methodologies throughout 2024, Avista's evaluators found several product types for which they were unable to determine how expected savings were calculated. Program planning documents were reviewed and updated to utilize appropriate market practice baselines and savings estimates, but evaluators found these estimates were not applied consistently, resulting in lower verified savings. For more details, please see the program-specific narrative for the Midstream Program on page 21.

TABLE 20 – COMMERCIAL/INDUSTRIAL VERIFIED SAVINGS BY PROGRAM – NATURAL GAS

Program	Expected Savings (Therms)	Verified Savings (Therms)	Verified Realization Rate
HVAC	223	223	100.0%
Shell	26,244	26,244	100.0%
Midstream	93,374	72,475	77.6%
Site-Specific	83,154	71,657	86.2%
Commercial/Industrial Total	**202,995**	**170,600**	**84.0%**

- *Midstream realization rate of 77.6 percent:* Avista's evaluators found that several atypically large products were rebated in the instantaneous water heater and storage water heater categories. Program planning documents assume an average equipment size for savings calculations. When the evaluators applied engineering algorithms using actual equipment sizes to verify savings, they found lower verified savings.

Program-by-Program Summaries

Clean Buildings Accelerator Program

Description

Avista's Clean Buildings Accelerator Program helps customers comply with the Washington State Clean Buildings Performance Standard. Facilitated through a third-party implementer, the program uses a cohort model to help customers identify and activate energy savings. Participants enjoy a tailored approach to energy management, through coaching, building-specific scanning, and assistance with prioritizing efficiency actions.

Program Activities

The program's fourth cohort began work in 2024, with planned actions stretching into 2025. Participants in this cohort include two universities, a rehabilitation facility, a religious organization, a credit union, and a commercial property manager.

Equity Considerations

The program's content and approach are inherently adaptable and intended to work with participants wherever they are in the efficiency journey. Its no-cost nature removes this potential barrier, resulting in broad engagement. Additionally, the program identifies any no-cost or low-cost opportunities to achieve greater efficiency, reducing energy costs while working toward Clean Buildings compliance. For several participant organizations, reducing energy use/cost drives additional funding to core programs and services involving vulnerable populations. Of the 29 cohort participants to date, three (approximately 10 percent) represent rural school districts. A large mass-transit provider, nonprofit healthcare facility, and multi-site nonprofit organization have also participated, each serving Named Communities.

Commercial/Industrial Site-Specific Program

Description

Site-Specific (custom) incentives are available for many energy-efficiency projects that fall outside the parameters of Prescriptive or Midstream programs. These incentives apply to first-year energy savings (not behavioral modifications) and are offered for projects with measure-lives of 10 years or greater based on the simple payback of the individual project.

Avista's account executives help customers identify energy-efficiency and incentive opportunities in Site-Specific projects, including appliances, compressed air, industrial processes, non-prescriptive motors, shell, and lighting, with most projects focusing on shell and lighting.

The program also includes a Pay for Performance track, designed to pay commercial customers for implementing efficiency measures that are monitored at the meter level. Avista commercial customers participating in this track implement whole-building energy retrofits and receive a set incentive rate for measurable savings achieved over the course of three years, with incentive payments made at the end of each year.

TABLE 21 – COMMERCIAL/INDUSTRIAL SITE-SPECIFIC PROGRAM METRICS

Site-Specific – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		33
Overall kWh Savings		10,229,030
Incentive Spend	$	2,168,547
Non-Incentive Utility Costs	$	1,147,452
Washington Energy-Efficiency Rider Spend	$	3,315,999
Site-Specific – Natural Gas		**2024**
Participation, Savings, and Costs		
Conservation Projects		15
Overall Therms Savings		71,657
Incentive Spend	$	188,860
Non-Incentive Utility Costs	$	57,821
Washington Energy-Efficiency Rider Spend	$	246,681

Program Activities

The electric Site-Specific Program showed strong performance in 2024, achieving 135 percent of its kWh savings target of 7,586,631. Incentive spend was approximately 106 percent of the expected $2,038,400, indicating more cost-effective savings than anticipated. This upward savings trend was likely influenced by the stabilization of interest rates for program financing, as well as resolutions to supply chain disruptions that impacted the market throughout 2020-2022 and into 2023.

The natural gas program achieved 55 percent of target therms savings. This lower-than-expected result may reflect uncertainty over future natural gas fuel costs, hesitancy on the part of businesses to invest heavily in natural gas measures, or a shift in priorities for capital expenditures as the market begins to react to implementation of the Climate Commitment Act. In addition to the savings claimed in the table above, there are also 17 Pay for Performance projects currently contracted, all of which will complete in future years.

Program Changes

The program's longtime manager retired in 2024, and a new program manager was promoted internally. A modification was made to the Pay for Performance track, eliminating the minimum square-footage requirement. This change resulted in more participation by businesses with smaller square footages.

Equity Considerations

Through outreach efforts, several Site-Specific projects leveraged the NCIF program. This synergy let nonprofits and small businesses serving Named Communities access funding for efficiency programs that would otherwise be out of reach. The Pay for Performance pathway also allows customers to claim savings for building retrofits and equipment upgrades that may not be available through the Prescriptive or Site-Specific paths. This path is also more broadly accessible with the elimination of the minimum square-footage requirement.

TABLE 22 – COMMERCIAL/INDUSTRIAL SITE-SPECIFIC PROGRAM DISTRIBUTION OF INCENTIVES AND SAVINGS

	Percent of Incentives That Benefited Named Communities	Percent of Savings That Benefited Named Communities
Electric Program	20%	19%
Natural Gas Program	45%	57%

Commercial/Industrial Prescriptive Lighting Program

Description

The Prescriptive Lighting Program is intended to prompt commercial electric customers to increase the energy efficiency of their lighting equipment through direct financial incentives. This methodology indirectly supports the infrastructure and inventory necessary to ensure that installation of high-efficiency equipment is a viable option for customers. The measures included in the program include retrofits from fluorescent lamps and fixtures, high-intensity discharge (HID), directional, and incandescent can fixtures to more energy-efficient LED light sources and controls.

TABLE 23 – COMMERCIAL/INDUSTRIAL PRESCRIPTIVE LIGHTING PROGRAM METRICS

Prescriptive Lighting – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		65,290
Overall kWh Savings		8,708,412
Incentive Spend	$	2,628,344
Non-Incentive Utility Costs	$	844,893
Washington Energy-Efficiency Rider Spend	$	3,473,237

Program Activities

Business customers and trade allies continued to face inflation-related obstacles to energy-efficiency projects in 2024, and Avista continued its generous incentive rate structure for this program. Originally implemented in July 2021, these robust offerings help bridge the cost gap for our large customers and trade allies as they navigate rising costs in labor and materials. Since the launch of the Small Business Direct-Install Lighting Program in April 2023, overall project throughput and savings have declined in the Prescriptive Program as many customers are now directed to the enhanced program when eligible. However, 2024 remained a busy year for the program, which achieved 94 percent of its target of 9,222,722 kWh.

Equity Considerations

The Prescriptive approach streamlines the rebate process to make it easier for customers and vendors to participate. Declined Prescriptive projects are routinely assessed to determine better ways to communicate program guidelines and lessen the customer burden of providing complex project documentation. Additionally, through a review of all Site-Specific projects submitted in the previous year, the program adapts annually to offer common 1:1 measures that previously may not have been included. Over half of savings and incentives benefited customers in Named Communities in 2024.

TABLE 24 – COMMERCIAL/INDUSTRIAL PRESCRIPTIVE LIGHTING PROGRAM DISTRIBUTION OF INCENTIVES AND SAVINGS

	Percent of Incentives That Benefited Named Communities	Percent of Savings That Benefited Named Communities
Electric Program	56%	54%

Commercial/Industrial Prescriptive Non-Lighting Programs

This group of programs offers simple incentives for a wide variety of non-lighting measures. A description of each offering follows the table below.

TABLE 25 – COMMERCIAL/INDUSTRIAL PRESCRIPTIVE NON-LIGHTING PROGRAM METRICS

Prescriptive Non-Lighting – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		39
Overall kWh Savings		170,551
Incentive Spend	$	31,816
Non-Incentive Utility Costs	$	23,155
Washington Energy-Efficiency Rider Spend	$	54,971
Prescriptive Non-Lighting – Natural Gas		**2024**
Participation, Savings, and Costs		
Conservation Projects		26
Overall Therms Savings		26,467
Incentive Spend	$	183,754
Non-Incentive Utility Costs	$	274,371
Washington Energy-Efficiency Rider Spend	$	458,124

Green Motors Rewind Program

Description

A program to restore a motor to its original efficiency through repair/rewind; commonly called a "green rewind."

Program Activities

The regional program Green Motors Practices Group terminated in the fall of 2024, with Avista bringing it in-house and using the same format to remain consistent for customers. Participating service centers apply a $1-per-HP instant discount to the customer invoice, and Avista reimburses that rebate when the appropriate paperwork is submitted. This is a small program with historically low throughput, but it is being highlighted with the Power of Change advertising campaign.

Commercial Grocer Program

Description

A program designed to reduce energy use for customers with commercial refrigeration equipment.

Program Activities

National grocery chains submitted rebates for multiple stores. Due to the uniformity of refrigeration equipment in national chains, it is easier to retrofit and repair equipment across all stores when necessary. This is a small program with low throughput, but it is being highlighted with the Power of Change advertising campaign.

Commercial Insulation Program

Description

Avista commercial customers using an Avista primary heat source are eligible for incentives for bringing their insulation back up to code or better in wall, attic, or roof applications.

Program Activities

The program was highlighted in the Power of Change advertising campaign, which resulted in increased throughput.

Commercial Appliances and Controls

Description

A program designed for commercial customers to install smart thermostats, and a program for commercial clothes washers.

Program Activities

The Commercial Connected Smart Thermostat Program provides a $150 rebate to commercial customers installing a new smart thermostat on a primary heat source that is fueled by Avista. The Commercial Clothes Washer Program provides a $200 rebate for commercial customers installing an ENERGY STAR commercial clothes washer using an Avista water-heating source.

Equity Considerations

The Green Motors Rewind Program's instant-rebate process is streamlined to make it easier for customers to participate. Streamlined processes for the Commercial Grocer, Commercial Insulation, and Commercial Appliances and Controls programs also reduce barriers to participation by lessening the administrative burden. As noted in table 26 below, the distribution of benefits to members of Named Communities was particularly high for commercial appliance and control measures, as well as for commercial insulation electric measures.

TABLE 26 – COMMERCIAL/INDUSTRIAL PRESCRIPTIVE NON-LIGHTING PROGRAM DISTRIBUTION OF INCENTIVES AND SAVINGS

Program	Fuel	Percent of Incentives That Benefited Named Communities	Percent of Savings That Benefited Named Communities
Green Motors Rewind	Electric	25%	26%
Commercial Grocer	Electric	36%	36%
Commercial Insulation	Electric	58%	60%
Commercial Insulation	Natural Gas	18%	20%
Commercial Appliances and Controls	Electric	100%	100%
Commercial Appliances and Controls	Natural Gas	81%	79%

Small Business Direct-Install Lighting Program

Description

Small-business customers covered by rate schedules 11 and 12 are eligible through the Direct-Install Lighting Program to receive a number of benefits, including: a free facility lighting assessment to identify any potential upgrades needed; installation of low- to no-cost energy-saving measures (lamps, fixtures, and controls); and informational handouts.

TABLE 27 – SMALL BUSINESS DIRECT-INSTALL LIGHTING PROGRAM METRICS

Small Business Direct-Install Lighting – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		3,711
Overall kWh Savings		18,446,896
Incentive Spend	$	11,295,109
Non-Incentive Utility Costs	$	1,694,951
Washington Energy-Efficiency Rider Spend	$	12,990,060

Program Activities

The program was highly successful and exceeded expected savings for the year. While much of the participation has come from door-to-door marketing efforts among 25 participating trade allies, co-branded promotion postcards mailed directly to customers have also proven effective. Customer case studies posted on social media channels have been valuable in gaining customer trust and engagement, often leading to word-of-mouth referrals to neighboring businesses. Lastly, the Avista website has driven additional customer traffic by highlighting the enhanced incentives and enrollment opportunity.

Program Changes

Beginning in May 2024, as the program saw a significant increase in project throughput, the third-party implementer began site inspections on 5 percent of all projects based on a mindfully developed set of criteria.

Additionally, with the advancement of building code and lighting standards, along with ENERGY STAR discontinuing the certification of non-recessed downlight products, the program eliminated incentives on screw-base lamps while continuing to cover ENERGY STAR or Direct Load Control-listed products.

Equity Considerations

While small-business customers are traditionally underserved by energy-efficiency programs, the Direct-Install Lighting approach allows Avista to pay the incentive directly against the contractor's invoice, resulting in little to no upfront, out-of-pocket costs to the customer. Furthermore, in partnership with the NCIF, small businesses in Named Communities were eligible to receive any additional dollars needed to secure lighting projects. These elements of program design resulted in more than half of incentives and savings going to projects that benefited Named Communities in 2024.

TABLE 28 – SMALL BUSINESS DIRECT-INSTALL LIGHTING PROGRAM DISTRIBUTION OF INCENTIVES AND SAVINGS

	Percent of Incentives That Benefited Named Communities	Percent of Savings That Benefited Named Communities
Electric Program	56%	56%

Midstream Program

Description

Avista's Midstream Program incentivizes the purchase of high-efficiency commercial HVAC, water-heating, and food-service products and helps ensure these products are in stock when customers need them. The program involves working directly with distributors, who influence the majority of equipment sales in the region.

TABLE 29 – MIDSTREAM PROGRAM METRICS

Midstream – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		272
Overall kWh Savings		358,297
Incentive Spend	$	215,687
Non-Incentive Utility Costs	$	39,069
Washington Energy-Efficiency Rider Spend	$	254,756
Midstream – Natural Gas		**2024**
Participation, Savings, and Costs		
Conservation Projects		224
Overall Therms Savings		72,475
Incentive Spend	$	379,363
Non-Incentive Utility Costs	$	60,187
Washington Energy-Efficiency Rider Spend	$	439,550

Program Activities

Throughout 2024, Avista worked with its evaluators and the Midstream Program implementer to address low realization rates. In consultation with evaluators, the implementer reviewed and updated savings assumptions and methodologies across all measures in the program. In a billing analysis of several measures in the Midstream Program, Avista customers consistently outperformed the RTF baseline in terms of savings. However, because it was not feasible to perform billing analysis for all program measures, the evaluators recommended that the program continue to use the RTF as a baseline. Avista concurred, and in many cases, market practice baselines were brought into alignment with baseline values defined by the RTF. As a result of this work, realization rates for the commercial program improved across both electric and natural gas measures in 2024. Realization rates for electric savings improved from 73 percent in 2023 to 79 percent in 2024. Natural gas realization rates improved from 47 percent in 2023 to 78 percent in 2024.

Despite the improvement in 2024, evaluators found that some of the revised calculations were not applied as expected, leading to realization rates lower than 100 percent. In addition, some atypically large instantaneous water heaters and storage water heaters led to differences in expected versus verified natural gas savings.

Program Changes

Beginning in 2024, residential new construction Tier 1 heat pumps were no longer eligible for incentives, and commercial furnaces changed to a per-unit incentive structure. New commercial food-service measures eligible for discount include:

- Conveyor toasters
- Electric holding bins
- Natural gas and electric cooktops
- Rotisseries
- Soup wells
- Steam tables

Throughout 2024, the program was open to any interested distributor, and a handful of new distributors joined.

Equity Considerations

The Midstream approach is inherently more equitable than the traditional downstream rebate model, in that participation does not rely on customer knowledge of the program and products or on customer ability to complete documentation. Distributors work with their contractors to complete the required documents, and broad distributor participation helps ensure that program incentives are available throughout the service territory.

TABLE 30 – MIDSTREAM PROGRAM DISTRIBUTION OF INCENTIVES AND SAVINGS

	Percent of Incentives That Benefited Named Communities	Percent of Savings That Benefited Named Communities
Electric Program	60%	69%
Natural Gas Program	68%	61%

Building Operator Certification Program

Description

This national training and certification program helps participants develop skills in commercial building operation, with an emphasis on no-cost and low-cost solutions. Competency is demonstrated through project work involving the participants' own buildings and equipment.

TABLE 31 – BUILDING OPERATOR CERTIFICATION PROGRAM METRICS

Building Operator Certification – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		5
Overall kWh Savings		595,000
Incentive Spend	$	255
Non-Incentive Utility Costs	$	24,690
Washington Energy-Efficiency Rider Spend	$	24,945
Building Operator Certification – Natural Gas		**2024**
Participation, Savings, and Costs		
Conservation Projects		–
Overall Therms Savings		–
Incentive Spend	$	–
Non-Incentive Utility Costs	$	–
Washington Energy-Efficiency Rider Spend	$	–

Program Activities

Avista partnered with Building Potential (formerly the Northwest Energy Efficiency Council or NEEC) to bring a Building Operator Certification (BOC) training course to Eastern Washington. Avista also offered a discount on the course for customers managing commercial buildings.

Equity Considerations

The discount program is offered to all Avista commercial customers. In 2024, four participants were identified as managing buildings located in Named Communities. One participant sought and received a full scholarship through the NCIF. The scholarship was awarded due to the individual's employment with an organization that directly serves Named Communities. The training will empower participants to identify energy-savings opportunities, reducing energy burden and costs, and in some cases enabling additional funding for direct program services.

TABLE 32 – BUILDING OPERATOR CERTIFICATION PROGRAM PARTICIPANT DISTRIBUTION

	Percent of Participants Managing Buildings in Named Communities
Electric Program	80%

RESIDENTIAL SECTOR

Spokane Valley, Washington

RESIDENTIAL SECTOR

Overview

Avista's residential sector includes a wide variety of programs encouraging customers to save energy while living more comfortably in their homes. The portfolio is designed to ensure that the benefits of clean, efficient energy are distributed equitably throughout the company's Washington service territory. In addition to Prescriptive and Midstream program offerings, Avista launched a Multifamily Energy Excellence Program in late 2024. This new program assists building owners in conducting deep retrofits that can benefit renters of multifamily buildings, while also offering direct-install lighting upgrades and strategic energy-management services.

Over $8.8 million in rebates and direct benefits were provided in 2024 to Washington residential customers, offsetting costs and enabling desired upgrades. The combined energy savings achieved for all programs within the residential sector portfolio were 5,864,988 kWh and 327,464 therms.

TABLE 33 – RESIDENTIAL SAVINGS BY PROGRAM

Program	Electric Savings (kWh)	Natural Gas Savings (Therms)
Midstream	4,809,271	103,674
Shell	706,619	170,205
Smart Thermostat	140,231	53,280
ENERGY STAR/NEEM Manufactured Housing	68,605	–
Appliances	119,518	305
On-Bill Repayment	–	–
Home Energy Audit	20,743	–
Multifamily Energy Excellence Program	–	–
Residential Total	**5,864,988**	**327,464**

Marketing

Meeting customers where they are, with information that's valuable to them, drives Avista's energy-efficiency marketing strategies to increase awareness and engagement. Both markedly increased in 2024 through exposure on owned channels, including web pages, bill inserts, print and electronic newsletters, email, and social media. Additional audiences were reached through expanded print tactics and digital display and search ads.

Seasonal energy-savings education was shared throughout the year, with "summer cooling" and "winter bill" campaigns promoting easy energy-saving tips on social media, in Avista's newsletter, in digital and print advertising, and via direct email outreach. Digital ads and website content were translated into Spanish.

Digital and search ad campaigns ran throughout the year, also promoting Avista's various residential energy-efficiency rebate programs. Ad materials were refreshed and optimized through A/B testing, utilizing new imagery and a clarified call-to-action button.

Energy-efficiency awareness also built through messaging placed in multiple Avista sponsorship activities. Local sporting-event programs included energy-efficiency program ads and even energy-saving games for kids. Radio advertisements helped share DIY energy-saving tips.

At Home with Lisa

Many Avista customers live in older, energy-inefficient homes. Between 2020 and late 2024, the company partnered with Lisa, an Avista customer who bought her 1910 house because she loved its old-world character – then quickly discovered it was not very energy-friendly. Lisa wrote weekly features sharing her experience with simple do-it-yourself projects to improve her energy use and comfort. Avista expanded the "At Home with Lisa" series in 2022 to include a digital campaign using static ads and short videos. In the videos, Lisa walks viewers through her DIY projects, everything from thermostat control to mail slot fixes, hot water heater wrap to window plastic, door sweeps to insulated drapes. Two final "Lisa" videos were completed in early 2024, focusing on the benefits of Avista's Home Energy Audit Program and how it helped drive her decision to upgrade her windows and doors using Avista's energy-efficiency rebates. The "Lisa" series continues to be leveraged through Avista's owned communication channels, available to customers through the company's website, YouTube channel, and various direct mail or social media messages.

Power of Change

Building on the success of the "At Home with Lisa" series, Avista's Power of Change campaign included messages designed for residential customers. Also positioning energy efficiency as an accessible entry point to the broader energy conversation, the campaign's residential messages offer tips on low-cost ways to save energy that are delivered in a light-hearted and humorous tone. When relevant, residential programs are also promoted.

Residential ads ran on Meta, X, LinkedIn, TikTok, and YouTube, in addition to digital display and streaming. They were also leveraged in the company's sponsorships for local sporting events. Ads ran in six-week phases, with a total of six ads per phase.

FIGURE 5 – RESIDENTIAL POWER OF CHANGE ADS

Performance and Savings Goals

The electric program achieved 5,864,988 kWh in 2024. The natural gas program achieved 327,464 therms.

- The Midstream Program contributed the largest portion of savings for electric programs, far exceeding its goal. The program's performance was due to very high participation.
- Natural gas measures in the Midstream Program comprised the second-largest portion of therms savings.
- Prescriptive measures contributed the largest portion of therms savings and second largest kWh savings.

The residential segment achieved 132 percent of its kWh savings goal. Table 34 shows electric savings goals assigned to Avista's residential sector programs for 2024, as well as achieved savings and the goal portion represented.

TABLE 34 – RESIDENTIAL PROGRAM ACHIEVED SAVINGS – ELECTRIC

Program	Savings Goals (kWh)	Achieved Savings (kWh)	Percentage of Goal
Always-On	1,876,009	–	0%
Midstream	264,058	4,809,271	1821%
Prescriptive	1,160,543	1,034,974	89%
On-Bill Repayment	257,500	–	0%
Home Energy Audit	647,232	20,743	3%
Multifamily Energy Excellence Program	253,369	–	0%
Residential Total	**4,458,711**	**5,864,988**	**132%**

The natural gas segment of the portfolio achieved 76 percent of the goal for 2024. Table 35 shows savings goals assigned to Avista's residential sector programs, as well as verified savings and the goal percentage in 2024.

TABLE 35 – RESIDENTIAL PROGRAM ACHIEVED SAVINGS – NATURAL GAS

Program	Savings Goals (Therms)	Achieved Savings (Therms)	Percentage of Goal
Prescriptive	144,975	223,790	154%
Midstream	245,266	103,674	42%
On-Bill Repayment	8,788	–	0%
Home Energy Audit	16,736	–	0%
Multifamily Energy Excellence Program	16,591	–	0%
Residential Total	**432,356**	**327,464**	**76%**

The residential program aims to maximize inclusion of all customers while remaining cost-effective. For 2024, Avista's residential Prescriptive Program provided 6,668 rebates to 5,419 customers (customers can participate in more than one rebate at a time). Equity impacts for each program are included in the program summaries below.

FIGURE 6 – RESIDENTIAL ELECTRIC ENERGY SAVINGS PORTFOLIO

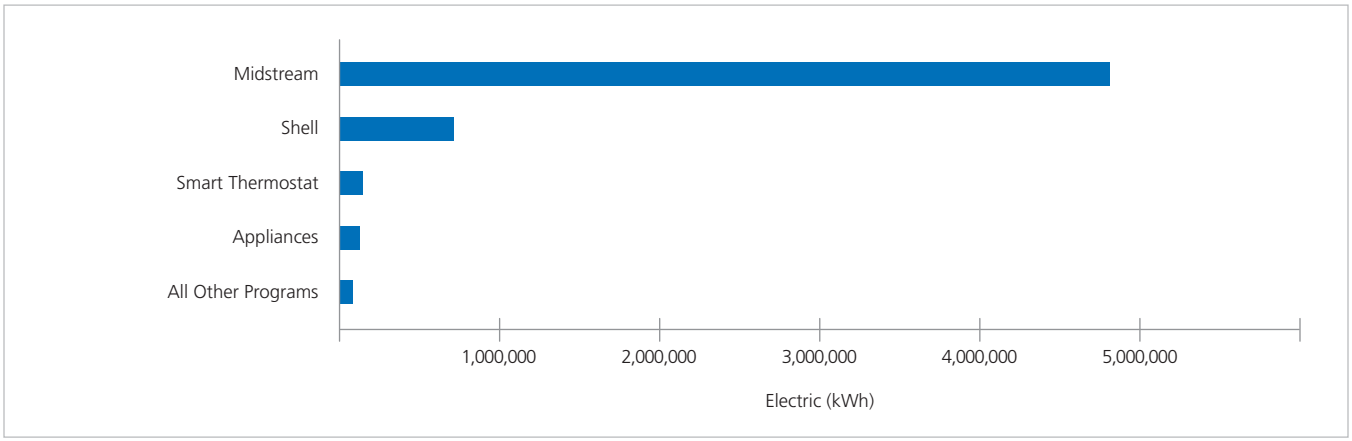
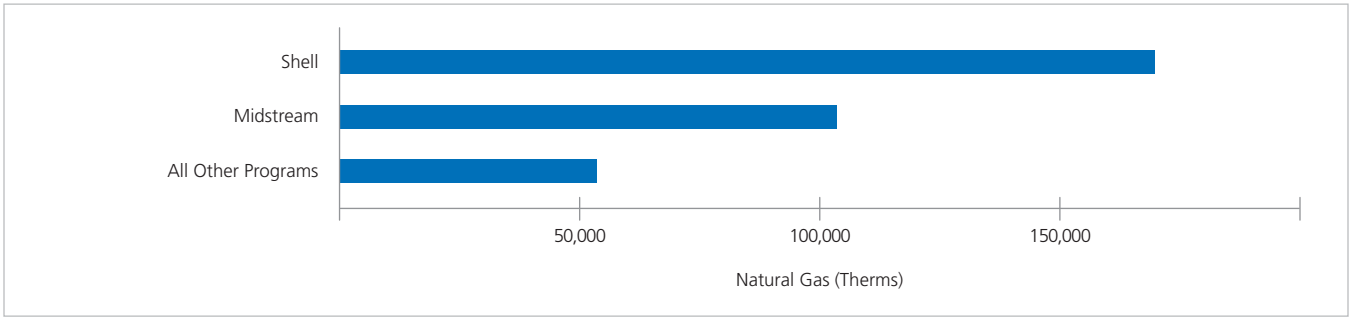


FIGURE 7 – RESIDENTIAL NATURAL GAS ENERGY SAVINGS PORTFOLIO



Cost-Effectiveness

Tables 36 and 37 show the residential sector cost-effectiveness results by fuel type.

TABLE 36 – RESIDENTIAL COST-EFFECTIVENESS RESULTS – ELECTRIC

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
TRC	$ 10,517,324	$ 6,126,319	1.72
UCT	$ 7,960,518	$ 4,723,187	1.69

TABLE 37 – RESIDENTIAL COST-EFFECTIVENESS RESULTS – NATURAL GAS

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
TRC	$ 7,267,297	$ 4,901,110	1.48
UCT	$ 4,912,832	$ 7,530,249	0.65

Verified Savings

As part of the EM&V process, Avista evaluators review reported savings provided by the company and adjust where necessary. Details of these adjustments are included in the impact evaluation reports appended to this report. In 2024, the residential electric portfolio reported savings of 5,286 MWh and achieved evaluated savings of 5,865 MWh, resulting in a realization rate of 111 percent. The natural gas portfolio reported 310,038 therms and achieved evaluated savings of 327,464 therms, resulting in a 106 percent realization rate.

Tables 38 and 39 illustrate the reported and evaluated savings and resulting realization rates. Each program's specific realization rate is discussed in the program-specific summaries later in this section.

TABLE 38 – RESIDENTIAL VERIFIED SAVINGS BY PROGRAM – ELECTRIC

Program	Expected Savings (kWh)	Verified Savings (kWh)	Verified Realization Rate
Shell	775,436	706,619	91.1%
ENERGY STAR/NEEM Manufactured Housing	79,472	68,605	86.3%
Appliances	392,255	259,749	66.2%
Midstream	4,038,576	4,809,271	119.1%
On-Bill Repayment	N/A	N/A	N/A
Home Energy Audit	N/A	20,743	N/A
Residential Total	**5,285,739**	**5,864,988**	**111.0%**

- *Appliances realization rate of 66.2 percent:* Avista's evaluators found that savings estimates in the TRM assumed the highest efficiency option while observed rebates did not meet required qualifications, resulting in lower-than-expected verified savings.

TABLE 39 – RESIDENTIAL VERIFIED SAVINGS BY PROGRAM – NATURAL GAS

Program	Expected Savings (Therms)	Verified Savings (Therms)	Verified Realization Rate
Shell	178,362	170,205	95.4%
ENERGY STAR/NEEM Manufactured Housing	N/A	N/A	N/A
Appliances	31,236	53,585	171.6%
Midstream	100,440	103,674	103.2%
Home Energy Audit	N/A	N/A	N/A
On-Bill Repayment	N/A	N/A	N/A
Residential Total	**310,038**	**327,464**	**105.6%**

- *Appliances realization rate of 171.6 percent:* Avista's evaluators found that savings identified from billing analysis exceeded expected savings, resulting in higher-than-expected verified savings.

Program-by-Program Summaries

Midstream Program

Description

Avista's Midstream Program incentivizes the purchase of high-efficiency commercial/residential HVAC and water-heating systems and commercial food-service products, and works to ensure these products are always in stock for customers. The program involves working directly with distributors, who influence the bulk of equipment sales in any given region.

TABLE 40 – MIDSTREAM PROGRAM METRICS

Midstream – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		2,657
Overall kWh Savings		4,809,271
Incentive Spend	$	1,126,050
Non-Incentive Utility Costs	$	1,956,353
Washington Energy-Efficiency Rider Spend	$	3,082,403
Midstream – Natural Gas		**2024**
Participation, Savings, and Costs		
Conservation Projects		2,924
Overall Therms Savings		103,674
Incentive Spend	$	1,980,750
Non-Incentive Utility Costs	$	302,072
Washington Energy-Efficiency Rider Spend	$	2,282,822

Program Activities

Throughout 2024, the program was open to any interested distributor, and a handful of new distributors joined.

Program Changes

Beginning in 2024, residential new construction Tier 1 heat pumps were no longer eligible for incentives, and commercial furnaces changed to a per-unit incentive structure.

Equity Considerations

The Midstream approach is inherently more equitable than the traditional downstream rebate model, as participation does not rely on customer knowledge of the program and products or customer ability to complete documentation. Distributors work with contractors to complete the required documents, and broad distributor participation helps ensure program incentives are available throughout the service territory.

TABLE 41 – MIDSTREAM PROGRAM DISTRIBUTION OF INCENTIVES AND SAVINGS

	Percent of Incentives That Benefited Named Communities	Percent of Savings That Benefited Named Communities
Electric Program	31%	28%
Natural Gas Program	19%	16%

Residential Home Energy Audit Program

Description

The Home Energy Audit Program offers customers a personalized in-home audit to identify opportunities for energy-efficient upgrades. After the audit, the customer receives a written Home Performance Report detailing the auditors' recommendations, estimated project costs, potential energy savings, directions for installation of some energy-saving measures, and handouts with follow-up information.

TABLE 42 – RESIDENTIAL HOME ENERGY AUDIT PROGRAM METRICS

Home Energy Audit – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		271
Overall kWh Savings		20,743
Incentive Spend	$	–
Non-Incentive Utility Costs	$	554
Washington Energy-Efficiency Rider Spend	$	554
Home Energy Audit – Natural Gas		**2024**
Participation, Savings, and Costs		
Conservation Projects		851
Overall Therms Savings		–
Incentive Spend	$	–
Non-Incentive Utility Costs	$	–
Washington Energy-Efficiency Rider Spend	$	–

Program Activities

This program remained extremely popular in 2024, resulting in a lengthy waiting list. The program currently conducts approximately 40 audits per week, roughly 25 percent more than in previous years.

Efforts to grow customer awareness and participation in the Home Energy Audit Program included several communication tactics. A new handout was developed for in-person outreach events. A second promotional video was created, highlighting the benefits of the program through the "At Home with Lisa" series. All Washington and Idaho residential customers received a bill insert in September, leading up to National Energy Awareness Month. Program information was also highlighted in Avista's customer newsletters, which accompany paper bills or are sent electronically to those with paperless billing. In addition, three direct emails were sent to households with higher-than-average energy usage.

While savings were identified for homes with electric heat, evaluators found no savings for natural-gas-heated homes. However, the program still significantly benefits customers by helping them identify opportunities to pursue efficiency upgrades.

Equity Considerations

The program accepts digital and paper applications and those submitted by phone. Bill inserts provided to all customers include the QR code to easily and instantly access the application. After an audit, paper handouts about the program are left to promote other opportunities, and these materials include contact information for the company's My Energy Discount Program as well as for CAP agencies offering low-income weatherization services.

TABLE 43 – RESIDENTIAL HOME ENERGY AUDIT PROGRAM DISTRIBUTION OF AUDITS

	Percent of Audits That Benefited Named Communities
Electric Program	26%
Natural Gas Program	20%

Residential Shell Program

Description

Avista encourages residential customers to improve the building envelope of their homes by adding insulation and storm windows and/or upgrading existing windows and exterior doors. For insulation projects, required contractor documentation includes an invoice and verification of the square footage of the space insulated and both pre- and post-installation R-values.

TABLE 44 – RESIDENTIAL SHELL PROGRAM METRICS

Shell – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		715
Overall kWh Savings		706,619
Incentive Spend	$	788,979
Non-Incentive Utility Costs	$	578,728
Washington Energy-Efficiency Rider Spend	$	1,367,707
Shell – Natural Gas		**2024**
Participation, Savings, and Costs		
Conservation Projects		3,274
Overall Therms Savings		170,205
Incentive Spend	$	4,536,752
Non-Incentive Utility Costs	$	437,087
Washington Energy-Efficiency Rider Spend	$	4,973,839

Program Activities

Participation in the Residential Shell Program, particularly for insulation measures in natural gas-heated homes, was very high in 2024. These rates were driven by aggressive marketing and communication from insulation contractors, who saw value in leveraging incentives to drive more installations. This increased participation, while positive for customers, also resulted in some customers contacting Avista with concerns about the quality of work. In response to these concerns, Avista hired a third-party inspector to conduct random insulation inspections. This quality control project will complete in 2025.

Program Changes

A new program manager was assigned in early 2024, as the prior program manager transitioned to management of commercial programs.

Equity Considerations

Avista allows customers to assign their payment directly to contractors, which reduces out-of-pocket costs for efficiency upgrades. In some cases, specifically for insulation programs, payment assignment can result in no out-of-pocket costs for customers. The program also accepts rebate applications in a variety of formats, including digital and paper. Avista staff is readily available to assist customers with applications by phone and email, as well as in-person visits to its office in Spokane, WA. For those unable to afford contractor installation fees, Avista provides a rebate for self-installed windows.

TABLE 45 – RESIDENTIAL SHELL PROGRAM DISTRIBUTION OF INCENTIVES AND SAVINGS

	Percent of Incentives That Benefited Named Communities	Percent of Savings That Benefited Named Communities
Electric Program	43%	49%
Natural Gas Program	21%	22%

Residential Smart Thermostat Program

Description

Smart thermostats automatically adjust heating and cooling temperature settings in the home for optimal performance. This program requires that the smart thermostat be connected to the customer's in-home Wi-Fi and have a smartphone application available to download or access via the internet. In 2024, the program was available for new construction and existing homes.

TABLE 46 – RESIDENTIAL SMART THERMOSTAT PROGRAM METRICS

Smart Thermostat – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		302
Overall kWh Savings		140,231
Incentive Spend	$	50,399
Non-Incentive Utility Costs	$	16,653
Washington Energy-Efficiency Rider Spend	$	67,052
Smart Thermostat – Natural Gas		**2024**
Participation, Savings, and Costs		
Conservation Projects		1,129
Overall Therms Savings		53,280
Incentive Spend	$	199,341
Non-Incentive Utility Costs	$	54,607
Washington Energy-Efficiency Rider Spend	$	253,949

Program Activities

The Smart Thermostat Program was promoted throughout the year as part of broader communications on residential rebates. Information appeared in bill inserts, *Connections* newsletters, social media posts, direct emails, and more. Digital and search ads helped drive customers to the program. In January, a smart thermostat was given away as part of a New Year's resolution challenge. Five days of energy-saving giveaways were promoted on social media.

Program Changes

A new program manager was assigned in early 2024, as the prior program manager transitioned to management of commercial programs.

Equity Considerations

To support efficiency upgrades for a diverse customer population in 2024, Avista offered smart thermostat rebates for DIY and contractor installs. Avista simplified this rebate for customers by providing a qualified product list of ENERGY STAR-certified smart thermostats.

TABLE 47 – RESIDENTIAL SMART THERMOSTAT PROGRAM DISTRIBUTION OF INCENTIVES AND SAVINGS

	Percent of Incentives That Benefited Named Communities	Percent of Savings That Benefited Named Communities
Electric Program	36%	37%
Natural Gas Program	16%	16%

Residential ENERGY STAR/NEEM Manufactured Housing Program

Description

Those eligible for the rebate are any Washington residential electric or natural gas customers who purchase a new ENERGY STAR manufactured home (as certified by the Northwest Energy-Efficient Manufactured Housing Program or NEEM) with Avista covering their space and water heating.

TABLE 48 – RESIDENTIAL ENERGY STAR/NEEM MANUFACTURED HOUSING PROGRAM METRICS

ENERGY STAR/NEEM Manufactured Housing – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		27
Overall kWh Savings		68,605
Incentive Spend	$	27,000
Non-Incentive Utility Costs	$	56,727
Washington Energy-Efficiency Rider Spend	$	83,727
ENERGY STAR/NEEM Manufactured Housing – Natural Gas		**2024**
Participation, Savings, and Costs		
Conservation Projects		–
Overall Therms Savings		–
Incentive Spend	$	–
Non-Incentive Utility Costs	$	–
Washington Energy-Efficiency Rider Spend	$	–

Program Activities

All homes incentivized through this program in 2024 utilized electric heat, an interesting trend that may be driven by the fact that a large majority of participating homes were in rural areas without access to natural gas infrastructure.

Program Changes

A new program manager was assigned in early 2024, as the prior program manager transitioned to management of commercial programs.

Equity Considerations

Offering incentives for new manufactured homes is an important equity consideration, because these homes are a lower-cost alternative to stick-built new construction and tend to be utilized more by rural customers. In 2024, Avista leveraged these rebates and the NCIF to offer incentive packages to three homes purchased by a Spokane nonprofit that helps low-income families access manufactured homes.

TABLE 49 – RESIDENTIAL ENERGY STAR/NEEM MANUFACTURED HOUSING PROGRAM DISTRIBUTION OF INCENTIVES AND SAVINGS

	Percent of Incentives That Benefited Named Communities	Percent of Savings That Benefited Named Communities
Electric Program	22%	23%
Natural Gas Program	N/A	N/A

Residential Appliances Program

Description

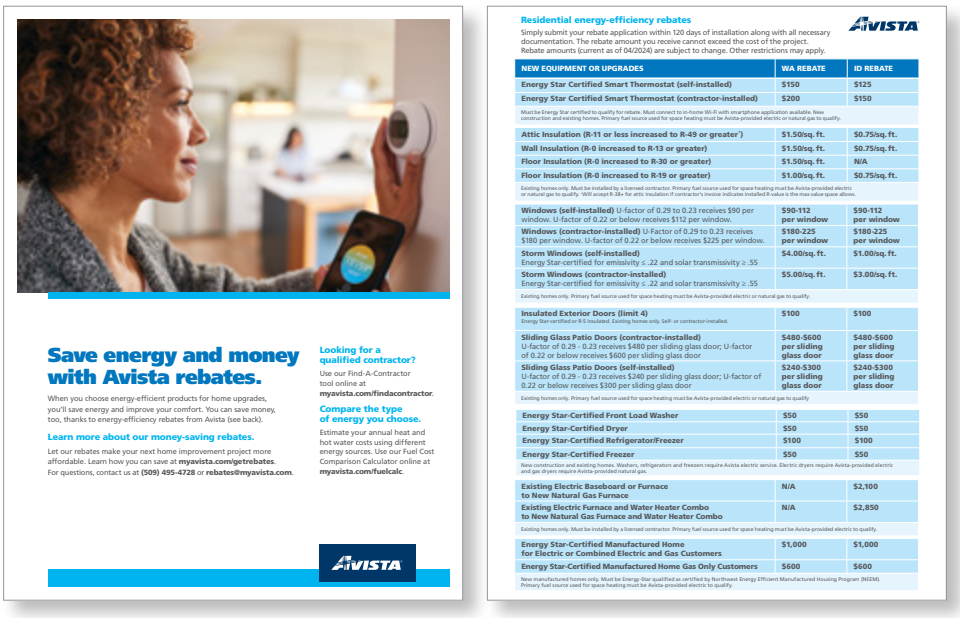
Avista has long offered incentives for high-efficiency appliances such as residential washers, dryers, and refrigerators through point-of-sale programs, Prescriptive paths, and other avenues. Prescriptive offerings include rebates for ENERGY STAR-certified appliances, including:

- front-load and top-load washers
- electric and natural gas dryers
- refrigerators/freezers
- freezers

TABLE 50 – RESIDENTIAL APPLIANCES PROGRAM METRICS

Appliances – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		1,058
Overall kWh Savings		119,518
Incentive Spend	$	74,370
Non-Incentive Utility Costs	$	31,374
Washington Energy-Efficiency Rider Spend	$	105,744
Appliances – Natural Gas		**2024**
Participation, Savings, and Costs		
Conservation Projects		155
Overall Therms Savings		305
Incentive Spend	$	7,350
Non-Incentive Utility Costs	$	290
Washington Energy-Efficiency Rider Spend	$	7,640

FIGURE 8 – RESIDENTIAL APPLIANCE PROGRAM FLYER



Save energy and money with Avista rebates.

When you choose energy-efficient products for home upgrades, you'll save energy and improve your comfort. You can save money, too, thanks to energy-efficiency rebates from Avista (see back).

Learn more about our money-saving rebates.

Let our rebates make your next home improvement project more affordable. Learn how you can save at **myavista.com/getrebates**. For questions, contact us at **(509) 495-4728** or **rebates@myavista.com**.

Looking for a qualified contractor?

Use our Find-A-Contractor tool online at **myavista.com/findacontractor**.

Compare the type of energy you choose.

Estimate your annual heat and hot water costs using different energy sources. Use our Fuel Cost Comparison Calculator online at **myavista.com/fuelcalc**.

Residential energy-efficiency rebates

Simply submit your rebate application within 120 days of installation along with all necessary documentation. The rebate amount you receive cannot exceed the cost of the project. Rebate amounts (current as of 04/2024) are subject to change. Other restrictions may apply.

NEW EQUIPMENT OR UPGRADES	WA REBATE	ID REBATE
Energy Star Certified Smart Thermostat (self-installed)	$150	$125
Energy Star Certified Smart Thermostat (contractor-installed)	$200	$150
Must be Energy Star certified to qualify for rebate. Must connect to in-home Wi-fi with smartphone application available. New construction and existing homes. Primary fuel source used for space heating must be Avista-provided electric or natural gas to qualify.		
Attic Insulation (R-11 or less increased to R-49 or greater*)	$1.50/sq. ft.	$0.75/sq. ft.
Wall Insulation (R-0 increased to R-13 or greater)	$1.50/sq. ft.	$0.75/sq. ft.
Floor Insulation (R-0 increased to R-30 or greater)	$1.50/sq. ft.	N/A
Floor Insulation (R-0 increased to R-19 or greater)	$1.00/sq. ft.	$0.75/sq. ft.
Existing homes only. Must be installed by a licensed contractor. Primary fuel source used for space heating must be Avista-provided electric or natural gas to qualify. *Will accept R-38+ for attic insulation if contractor's invoice indicates installed R-value is the max value space allows.		
Windows (self-installed) U-factor of 0.29 to 0.23 receives $90 per window. U-factor of 0.22 or below receives $112 per window.	$90-112 per window	$90-112 per window
Windows (contractor-installed) U-factor of 0.29 to 0.23 receives $180 per window. U-factor of 0.22 or below receives $225 per window.	$180-225 per window	$180-225 per window
Storm Windows (self-installed) Energy Star-certified for emissivity ≤ .22 and solar transmissivity ≥ .55	$4.00/sq. ft.	$1.00/sq. ft.
Storm Windows (contractor-installed) Energy Star-certified for emissivity ≤ .22 and solar transmissivity ≥ .55	$5.00/sq. ft.	$3.00/sq. ft.
Existing homes only. Primary fuel source used for space heating must be Avista-provided electric or natural gas to qualify.		
Insulated Exterior Doors (limit 4) Energy Star-certified or R-5 insulated. Existing homes only. Self- or contractor-installed.	$100	$100
Sliding Glass Patio Doors (contractor-installed) U-factor of 0.29 - 0.23 receives $480 per sliding glass door; U-factor of 0.22 or below receives $600 per sliding glass door	$480-$600 per sliding glass door	$480-$600 per sliding glass door
Sliding Glass Patio Doors (self-installed) U-factor of 0.29 - 0.23 receives $240 per sliding glass door; U-factor of 0.22 or below receives $300 per sliding glass door	$240-$300 per sliding glass door	$240-$300 per sliding glass door
Existing homes only. Primary fuel source used for space heating must be Avista-provided electric or natural gas to qualify		
Energy Star-Certified Front Load Washer	$50	$50
Energy Star-Certified Dryer	$50	$50
Energy Star-Certified Refrigerator/Freezer	$100	$100
Energy Star-Certified Freezer	$50	$50
New construction and existing homes. Washers, refrigerators and freezers require Avista electric service. Electric dryers require Avista-provided electric and gas dryers require Avista-provided natural gas.		
Existing Electric Baseboard or Furnace to New Natural Gas Furnace	N/A	$2,100
Existing Electric Furnace and Water Heater Combo to New Natural Gas Furnace and Water Heater Combo	N/A	$2,850
Existing homes only. Must be installed by a licensed contractor. Primary fuel source used for space heating must be Avista-provided electric to qualify.		
Energy Star-Certified Manufactured Home for Electric or Combined Electric and Gas Customers	$1,000	$1,000
Energy Star-Certified Manufactured Home Gas Only Customers	$600	$600
New manufactured homes only. Must be Energy-Star qualified as certified by Northwest Energy Efficient Manufactured Housing Program (NEEM). Primary fuel source used for space heating must be Avista-provided electric to qualify.		

Program Activities

For the electric program, 76 percent of savings came from clothes dryers and 18 percent from front-load washers, with all other measures accounting for the remaining 6 percent. For natural gas measures, 91 percent came from front-load washers and 7 percent from clothes dryers, with all other measures accounting for the remaining 2 percent.

Anecdotally, Avista has seen a marked increase in the number of all-in-one washer/dryer units submitted for rebate.

Program Changes

A new program manager was assigned in early 2024, as the prior program manager transitioned to management of commercial programs.

Equity Considerations

The program accepts rebate applications in a variety of formats, including digital and paper. Avista staff is readily available to assist customers with applications by phone and email, as well as in-person visits to its office in Spokane, Washington.

TABLE 51 – RESIDENTIAL APPLIANCES PROGRAM DISTRIBUTION OF INCENTIVES AND SAVINGS

	Percent of Incentives That Benefited Named Communities	Percent of Savings That Benefited Named Communities
Electric Program	21%	23%
Natural Gas Program	16%	17%

On-Bill Repayment Program

Description

The On-Bill Repayment (OBR) Program is a partnership between Avista and Puget Sound Cooperative Credit Union (PSCCU). The program enables residential and small-business customers in Washington to access Energy-Smart Loans through PSCCU for their energy-efficiency projects. PSCCU's personalized underwriting and low interest rates invite participants to reap immediate benefits from energy-efficiency upgrades. The loan payments are convenient: Installments are billed monthly as a line item on customers' Avista bills until the term of the loan is complete, or until Avista is otherwise instructed by PSCCU to remove the loan. Extra principal payments or early loan payoffs are made directly to PSCCU.

TABLE 52 – ON-BILL REPAYMENT PROGRAM METRICS

On-Bill Repayment – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		32
Overall kWh Savings		–
Incentive Spend	$	16,000
Non-Incentive Utility Costs	$	–
Washington Energy-Efficiency Rider Spend	$	16,000
On-Bill Repayment – Natural Gas		**2024**
Participation, Savings, and Costs		
Conservation Projects		24
Overall Therms Savings		–
Incentive Spend	$	12,000
Non-Incentive Utility Costs	$	–
Washington Energy-Efficiency Rider Spend	$	12,000

Program Activities

In 2024, the OBR Program enrolled 56 customers to obtain Energy-Smart Loans. Savings for measures completed through OBR are captured in the program where the measure resides; for example, savings related to window replacements are captured in the Residential Shell Program.

Program Changes

As costs increased in 2024, PSCCU raised the Uniform Commercial Code filing fee from $445 to $700.

Equity Considerations

The OBR Program makes financing arrangements available to customers who may not otherwise qualify for efficiency upgrades. Because Avista buys down interest rates on behalf of customers with lower credit scores, customers benefit from more favorable rates. Program participants reap immediate benefits from the upgrades. Loan payments are integrated into their monthly Avista bill, thereby reducing the administrative burden required to participate. These upgrades may also qualify for rebates through the Prescriptive residential rebate program.

TABLE 53 – ON-BILL REPAYMENT PROGRAM DISTRIBUTION OF BUYDOWNS

	Percent of Buydowns That Benefited Named Communities
Electric Program	35%
Natural Gas Program	33%

Multifamily Energy Excellence Program

Description

The Multifamily Energy Excellence Program (MEEP) replaced the long-running and successful Multifamily Direct-Install Program, which ended in late 2023. It offers three ways for multifamily building owners and renters to save energy: direct-install of energy-saving upgrades in units; "deep retrofit" building upgrades; and a track for operations and maintenance training and education.

Program Activities

MEEP was contracted in January 2024 and launched in June 2024. Initial program activities have focused on project recruitment. While no direct-install lighting was completed in 2024, two building "deep retrofits" were contracted in December and will be completed in 2025. The first cohort of the program's operations/maintenance track began in September 2024 and will be complete in the fall of 2025.

Equity Considerations

MEEP overcomes barriers to participation by making the enrollment process easy for owners of multifamily residential buildings, whereby building residents – who are often resource-constrained and have less access to energy-efficiency upgrades – can enjoy the reduction in energy burden. Program flyers are distributed in English and Spanish during direct-install projects, alerting customers to Avista's My Energy Discount Program. To support Avista's CEIP and address CBIs, NCIF funds are available to offset out-of-pocket costs to participating building owners in Named Communities, ensuring the efficiency projects are executed to help alleviate residential energy costs.

Colfax, Washington

LOW-INCOME SECTOR

Program-by-Program Summaries

Low-Income Program

Avista partners with seven Community Action Agencies (CAAs) and one Tribal Housing Authority to deliver energy-efficiency programs for low-income households throughout the company's service territory. These organizations have the necessary infrastructure to serve income-qualified customers. An annual funding amount of $4.25 million is allocated across all agencies based on meter count in the counties they serve. Agencies spend their contract amount at their discretion on either electric or natural gas efficiency measures. The annual funding allocation includes a 30 percent reimbursement for both administrative and program support costs. Agencies may also choose to allocate up to 30 percent of their funding for home repairs as well as other health and safety improvements.

TABLE 54 – LOW-INCOME PROGRAM METRICS

Low-Income – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		358
Overall kWh Savings		473,090
Incentive Spend	$	1,583,967
Non-Incentive Utility Costs	$	123,258
Washington Energy-Efficiency Rider Spend	$	1,707,226
Low Income – Natural Gas		**2024**
Participation, Savings, and Costs		
Conservation Projects		630
Overall Therms Savings		14,809
Incentive Spend	$	2,708,747
Non-Incentive Utility Costs	$	7,204
Washington Energy-Efficiency Rider Spend	$	2,715,951

For 2024, the Low-Income Program served 96 electric and 193 natural gas customers. Program participation is quantified in the number of installed units or square feet of installed insulation or windows.

Program Activities

In 2024, the program achieved 473,090 kWh of reported electric savings and 14,809 therms of natural gas savings. Tables 55 and 56 show Avista savings goals for the low-income sector for 2024, as well as the percentage of goals achieved.

TABLE 55 – LOW-INCOME PROGRAM ACHIEVED SAVINGS – ELECTRIC

Program	Savings Goals (kWh)	Achieved Savings (kWh)	Percentage of Goal
Low-Income	853,007	473,090	55%
Named Communities	574,288	172,169	30%
Low-Income Total	**1,427,295**	**645,260**	**45%**

TABLE 56 – LOW-INCOME PROGRAM ACHIEVED SAVINGS – NATURAL GAS

Program	Savings Goals (Therms)	Achieved Savings (Therms)	Percentage of Goal
Low-Income	6,091	14,809	243%
Low-Income Total	**6,091**	**14,809**	**243%**

Avista continued to reimburse the agencies for 100 percent of the cost of installing most energy-efficiency measures on the approved list (see Table 57). The program achieved very high natural gas savings in 2024, especially when compared to other natural gas programs. The factors contributing to the program's success are unclear. While CAAs consider factors such as energy-burden reduction, disability, and number of children in the home when prioritizing projects, they do not currently prioritize one heating fuel over another. Savings achievements across the electric and natural gas sectors can therefore be somewhat varied.

TABLE 57 – LOW-INCOME PROGRAM APPROVED MEASURE LIST

Electric Measures	Natural Gas Measures
Air infiltration	Air infiltration
Air-source heat pump	Attic insulation
Attic insulation (If R-19 or below, install R-39 or R-49, depending on attic space; Mobile Home: R-17 or below, use R-22, R-30, or maximum possible.)	Boiler (natural gas – 96 percent AFUE)
Doors (ENERGY STAR-rated)	Doors (ENERGY STAR-rated)
Door sweep	Duct insulation
Duct insulation	Duct sealing
Duct sealing	Door sweep
Floor insulation (If no insulation, fill cavity. If R-19 or below, R-30 or fill cavity; Mobile Home: fill cavity, R-22, or maximum possible.)	Floor insulation
LED lamps	Furnace (95 percent AFUE)
Wall insulation (Closed Cavity: If no insulation, no substantial contract, or thermal and pressure boundaries are not aligned, then dense pack. If open cavity, fill cavity).	Smart thermostat
Windows (ENERGY STAR-rated, U-factor .30)	Wall insulation
Windows – storm (low e-rated)	Water heater – (storage <55 gallon .65 EF)
Electric to air-source heat pump (9 HSPF)	Water heater – (tankless .82 EF)
Electric heat to ductless heat pump (10 HSPF)	Windows (ENERGY STAR-rated, U-factor .29)
Heat pump water heater (Tier 2-3)	Windows – storm (low e-rated)
Refrigerators (ENERGY STAR-rated)	
Smart thermostat	

While the agencies have been actively working with customers, many challenges persist, including reaching willing and eligible participants, addressing increased labor and material costs, and finding qualified people to fill vacant weatherization positions. While a few agencies were able to spend their funds in full, others did not have the same success. Avista will continue to collaborate with partner agencies to develop strategies to overcome these issues.

Deferred Maintenance Pilot: Avista developed a pilot program to overcome barriers to home weatherization either because of deferred maintenance or large repairs.[1] This program started in October 2024 and expired in December 2024 with a budget of $1 million distributed to the partner agencies, with a maximum deferred maintenance spend of up to $25,000 per customer. The pilot's goal was bringing a customer's home to pre-weatherization status, thereby qualifying them for further weatherization work. Qualified projects included replacing knob and tube wiring, full electrical rewiring or panel upgrade, roof repair or replacement, removal of asbestos or vermiculite, and other major projects that made homes weatherization-ready.

Avista continues to gather information about where these customer groups reside and how the weatherization message is best delivered. This occurs in a variety of ways, including advisory input from the company's EEAG and EAG, use of its Named Communities Map derived from the Washington State Department of Health's Environmental Health Disparities Map, and data analysis to locate Avista customers with a high energy burden.

Agency Workforce Training: Nationally, the weatherization field faces a shortage of trained professionals. To tackle this issue, Avista launched a pilot program in 2024 aimed at enhancing workforce training. The initiative focused on training CAAs and a local tribe in Eastern Washington. Avista collaborated with the Building Performance Center in Bellingham, WA, to conduct five week-long essential training sessions in Spokane and rural areas such as Colville and Yakima. This accessible training approach significantly improved workforce readiness in the weatherization field, benefiting Avista's partner agencies and low-income customers.

Customer Outreach

Customers often participate in the Low-Income Weatherization Program through referrals from Avista's partner CAAs, which also provide bill assistance. Further help and referrals for disabled, elderly, and low-income customers come from Avista's customer service and Customer Assistance Referral and Evaluation Services (CARES).

Additional referrals come from Avista's outreach events. The community and economic vitality department collaborates with energy-efficiency efforts to educate and support low-income customers, seniors, veterans, and individuals with disabilities. The outreach team engages these populations through workshops, community events, and mobile outreach, distributing materials focused on low- and no-cost energy efficiency and conservation. Key outreach strategies include:

- ***Workshops:*** Energy conservation workshops for senior and low-income Avista customers.
- ***Mobile Outreach:*** Avista energy-resource vans provide tips on energy management, bill payment options, and community resources.
- ***General Outreach:*** Information about available resources is disseminated through events, partnerships, and publications. This includes outlining bill-payment options and assistance programs in senior and low-income publications; presenting to target audiences; tabling at community events; and engaging in meetings with community organizations and partners, the Washington Equity Advisory Group, and stakeholders involved in the CEIP Public Participation Plan.

The outreach team dropped off energy-saving items and information at food banks, participated in mobile food bank drive-through events, and partnered with community-based organizations to provide home energy kits to their clients throughout 2024.

1) In compliance with UTC Dockets UE-220053, UG-220054 and UE-210854.

FIGURE 9 – LOW-INCOME PROGRAM WEATHERIZATION FLYERS

Equity Considerations

The program's primary goal is to serve and benefit identified populations by reducing their energy burdens, allowing them to allocate limited resources to other essential needs. The translation of program handouts into Spanish and the provision of Spanish-speaking staff at outreach events significantly increased program awareness and participation, especially among residents of Named Communities. Additionally, targeted presentations to seniors living on fixed incomes and other low-income customers proved effective in raising program awareness and demonstrating the support Avista can offer.

TABLE 58 – LOW-INCOME PROGRAM DISTRIBUTION OF INCENTIVES AND SAVINGS

	Percent of Incentives That Benefited Named Communities	Percent of Savings That Benefited Named Communities
Electric Program	44%	39%
Natural Gas Program	57%	60%

The table above shows the percentage of incentives and savings that benefited low-income households in census tracts designated Named Communities. It is important to note that by definition, all low-income households are considered highly impacted communities and/or vulnerable populations, even if they are not within a designated tract. The fact that many recipients of low-income weatherization services live outside these areas demonstrates that partner agencies are highly effective at identifying and serving customers with the greatest need.

Cost-Effectiveness

Tables 59 and 60 show the low-income sector cost-effectiveness results by fuel type. The TRC for low-income electric programs is quite high due to the extensive NEIs included in the program's TRC calculation. Some examples of NEI values included in this calculation are health and safety impacts, thermal comfort, and reduction in bad debt write-offs.

TABLE 59 – LOW-INCOME PROGRAM COST-EFFECTIVENESS RESULTS – ELECTRIC

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
TRC	$ 2,336,369	$ 1,976,514	1.18
UCT	$ 787,332	$ 1,976,514	0.40

TABLE 60 – LOW-INCOME PROGRAM COST-EFFECTIVENESS RESULTS – NATURAL GAS

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
TRC	$ 272,446	$ 2,715,951	0.10
UCT	$ 238,074	$ 2,715,951	0.09

Named Communities Investment Fund Implementation

The NCIF commits $2 million annually for non-cost-effective energy-efficiency projects benefiting highly impacted and vulnerable electric customers. The NCIF supports the company's CEIP CBIs and Specific Actions by making energy-efficiency investments in Named Communities to reduce energy burden, increase participation in company programs, improve health and safety, and enhance reliability for these customers.

TABLE 61 – NAMED COMMUNITIES INVESTMENT FUND PROGRAMS

Awardee/Payee	Project	Project Investment	Program to Which kWh Savings are Assigned
Ahana Multi-Ethnic Business Center	Window replacements	$ 14,646	NCIF
Building Operator Certification Training Scholarships	Building efficiency education	$ 3,790	N/A
Community Action Agencies Workforce Development	Workforce development training	$ 20,028	N/A
Cybergrants	NCIF online application	$ 5,552	N/A
Family Promise Service Center & Shelter	HVAC replacements	$ 168,022	Midstream
Gladish Community Center	HVAC replacements	$ 172,031	Midstream
Helping Captives Education Building	Window and HVAC replacements	$ 62,107	Midstream
Hill Ray Plaza Senior Housing Complex	Window replacements	$ 160,758	NCIF
KWEnergy Aeroseal Pilot	Air sealing rural manufactured/mobile homes	$ 683,133	NCIF
Lighting Projects for Nonprofits and Small Businesses	Lighting improvements	$ 83,881	Direct-Install and Site-Specific Lighting
SNAP Pacific Apartments Affordable Housing	Multiple measures for renovation	$ 244,967	NCIF
SNAP Pine Villa Affordable Housing	Multiple measures for renovation	$ 636,858	NCIF
Salem Arms	Window replacements	$ 63,538	Residential Rebates
St. Ann Corner Laundry	ENERGY STAR appliances, HVAC and windows	$ 43,669	Midstream
Springdale Food Pantry	Lighting and window replacements	$ 14,984	Site-Specific
Village Cohousing Works	Efficiency rebate and heat pump for new homeowners	$ 32,372	Residential Rebates
Westminster Church	Window replacements	$ 38,612	NCIF
NCIF Energy Efficiency Total		**$ 2,448,949**	

Program Activities

In 2024, the NCIF funded 24 projects that were mostly community-identified through applications or requests. Two projects focused on expanding staff knowledge of energy-efficiency practices. Window replacements were done at a multiethnic business association, and in rural communities at a church and senior affordable-housing complex.

Nonprofit-owned affordable-housing complexes received support for multiple efficiency measures. A homeless shelter and community center each received new HVAC systems. Heat pumps and high-efficiency appliances were provided to new low-income homeowners to meet the Department of Energy's Zero Energy Ready Home standards. A church received funding to replace a nonfunctioning HVAC system and establish free laundry for homeless individuals. One project created an online NCIF application to ensure equitable access for all interested parties.

While NCIF projects generally achieve energy savings, they are not required to be cost-effective. Where possible, NCIF resources are combined with existing efficiency programs to serve underserved and other identified groups. In these situations, to support program participation and benefit to a Named Community, the NCIF will fund project costs not covered by traditional rebates and incentives. In 2024, eight lighting-improvement projects benefited nonprofits.

These project costs were paid with a combination of NCIF and Direct-Install and Site-Specific lighting programs. Additionally, a food pantry in a rural community received lighting improvements, insulation, and new mini splits with support from various Avista programs. A few of the projects are featured at Avista Connect: myavista.com/NCIF.

Avista's evaluators verified savings for projects that participated in other rebate programs. For those overlapping projects, savings were assigned to the NCIF program according to the proportion of total project cost covered by NCIF funding. The 2024 verified savings totals are listed in the table below.

TABLE 62 – NAMED COMMUNITIES INVESTMENT FUND PROGRAM METRICS

Named Communities Investment Fund – Electric		2024
Participation, Savings, and Costs		
Conservation Projects		5
Overall kWh Savings		172,169
Incentive Spend	$	239,938
Non-Incentive Utility Costs	$	29,350
Washington Energy-Efficiency Rider Spend	$	269,288

Program Changes

At the May 2024 EEAG meeting, members unanimously supported use of the NCIF for natural-gas-to-electric HVAC conversions to replace end-of-life or end-of-use systems, with 10 members voting in favor and none opposed or neutral. The guidelines for awarding these conversions include customer choice, adherence to parameters from the Low-Income Weatherization manual where possible, assessment to ensure service capacity is not negatively impacted, and alignment with the Clean Energy Transformation Act (CETA) and the company's CEIP. Four projects received NCIF awards under new program guidelines.

Equity Considerations

The NCIF is evidence of Avista's commitment to ensuring all customers benefit from the transition to clean energy. Each proposed project is uniquely considered for alignment with Avista's CBIs and clean-energy objectives and impact for Named Communities.

The standard methods for promoting grant availability were conducted in 2024, and an additional dedicated effort was made by NCIF program managers to connect with hard-to-reach and underserved customers. Managers directly contacted various nonprofits with a focus on rural representation to raise awareness of the program and discuss how it might help each organization with its unique energy needs. Additionally, the application is available in digital and paper formats. A Spanish version is also available.

TABLE 63 – NAMED COMMUNITIES INVESTMENT FUND PROGRAM DISTRIBUTION OF INCENTIVES AND SAVINGS

	Percent of Incentives That Benefited Named Communities	Percent of Savings That Benefited Named Communities
Electric Program	88%	92%

Spokane, Washington

PILOT PROGRAMS

Program-by-Program Summaries

Building Energy IQ Pilot Program

Description

Formerly known as the Active Energy Management pilot, the Building Energy IQ (BEIQ) pilot program fully launched in 2022 for a three-year term, with 2024 as the last full year. The BEIQ pilot is a strategic energy-management program that focuses on the commercial sector in both Washington and Idaho. The final study report is planned for Q2 2025.

Program Activities

With 2024 being the last full year of the pilot, no new customers were added. Pilot participants included 11 customers having 16 buildings total, nine of which are in Washington. Teams from Avista and pilot partner Edo identified potential energy-conservation measures within these buildings and engaged building operators to implement them. This unfolded through regular monthly meetings, individualized project discussions, and annual performance reports, along with access to an online tool that customers and the pilot team used to track activities and performance.

Program Changes

Pilot energy savings are being analyzed by Avista's third-party EM&V contractor. After the final evaluation, Avista will determine if a full program offering is cost-effective and can be delivered more broadly. In the meantime, closeout activities for pilot participants were completed in Q1 2025.

Equity Considerations

During the pilot's recruitment phase, Avista's goal was to have a variety of commercial building types and sizes that represent the communities they serve. This goal was achieved with the inclusion of both public and private buildings represented by large and small office buildings, retail space, medical centers, hospitals, community centers, grocery stores, K-12 schools, and universities spanning the service area and encompassing both urban and rural settings.

Residential Always-On Behavioral Pilot Program

Description

To increase customer-facing value from the Washington Advanced Metering Infrastructure (AMI) deployment, Avista offered a targeted load-behavioral program using AMI-based non-intrusive load monitoring. By identifying the appliance-level always-on electricity loads within a residence, Avista can offer customers personalized information to better inform them of opportunities for energy savings.

Customers in the treatment group received an email each month that included information about their personalized always-on usage and costs, along with relevant energy-saving tips. In addition, customers were directed to the Avista website through a provided email link where they could explore online tools, including their full energy-use profile and opportunities to save.

Program Activities

Avista's Process Evaluation Report found that more than half of survey respondents remembered receiving an email alert from the Always-On Program, and the majority indicated that they at least skimmed through the content. Most respondents reported being satisfied with the number of updates provided and noted interest in learning about other energy usage and reduction tips to improve health and safety, maximize comfort, and increase the overall energy efficiency of their homes.

Program Changes

Going into phase two of the pilot, program eligibility remained mostly stable from the previous phase, which was implemented in 2022. Washington residential electric customers with active AMI meters and email addresses were eligible. The second phase of the program launched in July 2023 with 111,000 customers who were randomly assigned to one of two groups: treatment and control. The control group consisted of approximately 10 percent of all participants. The second phase of the Always-On pilot was sunset in July 2024 after receiving evaluation results similar to the first phase, which found the pilot to have no measurable achievement of energy savings.

However, the study did demonstrate that customers are receptive to receiving energy-saving tips and open to related information being delivered in an email format. Additionally, evaluators noted that the primary reason for no savings in the program is that Always-On loads make up a smaller portion of a typical customer's overall energy use than anticipated. This trend made it difficult to disaggregate energy loads for the purpose of identifying savings. These insights will be applied to future behavioral program designs.

Equity Considerations

Survey results and feedback from phase-one participants indicated that while customers wished to continue receiving monthly emails, they wanted tips on energy savings directly in the email rather than having to visit Avista's website. These requests were accommodated with an improved email format. Additionally, rather than require customers in this phase to have a long history of energy usage, new customers were welcome to participate.

Compressed Air Leak Detection Pilot Program

Description

A program to detect leaks in commercial compressed air systems, while offering incentives to repair leaks.

Program Activities

In April 2024 Avista terminated this program due to low participation, beginning a pilot mid-year to determine how to provide for leak detection and repair while offering a more positive customer experience and higher program enrollment. Through a partner vendor, customers were provided acoustic imaging scans and offered incentives to repair leaks. The pilot data will be analyzed to inform design of a future program.

Equity Considerations

Once customers were added to the pilot program, all processes were handled on their behalf, which reduced the administrative burden and thus barriers to participation. Customers simply needed to schedule scans and repairs.

Time-of-Use and Peak Time Rebate Pilot Programs

Description

Avista's pricing pilots known as Time-of-Use (TOU) and Peak Time Rebate (PTR) were launched on June 1, 2024 and will run for two years. A pilot progress report is planned for Q4 2025, with a final report planned for Q4 2026.

Program Activities

The pilot recruitment campaign began shortly after launch and will continue through May 2025.

One PTR event was called in July 2024 on one of the hottest days of the year. Most enrolled customers showed a usage reduction during the event's three-hour period and received a bill credit.

Program Changes

Day-ahead wholesale market prices have not necessitated PTR events to be scheduled based on economic reasons. Nor have there been system emergencies, such as system capacity constraints, to warrant scheduling PTR events. To maximize insights from the pilot, additional use-cases have been added for PTR event scheduling, including longer periods during extreme weather conditions, back-to-back events during extreme weather conditions, events to measure energy-reduction impacts during mild weather conditions, and events prior to a holiday.

TOU recruitment has been slow, but customer interest remains constant. Adapting the marketing message around the pilot opportunity to speak to unique customer groups is the 2025 focus through May. Enrollment closes June 1, 2025.

Equity Considerations

In Q4 2024, the pilot program information pages and TOU rate-comparison tool on Avista's website were updated to include Spanish.

Hybrid Heat Pump Pilot Program

Description

Launched mid-2024, this study evaluates customer impact and performance variability between cold-climate heat pumps and dual-fuel heat pumps in retrofit residential applications. The study period is two years, with the final report planned for Q1 2027.

Program Activities

In 2024, Avista issued a request for proposal (RFP) that resulted in hiring a local HVAC company to perform the equipment replacements and service work throughout the study term. Avista also hired an analytics company to perform all work related to EM&V. Concurrent recruitment was carried out to select 12 homes for the study sample.

Installation of replacement HVAC systems and associated monitoring equipment was completed mid-summer 2024, and the first participant survey was done that fall.

Program Changes

The study encountered cost overruns from the initial plan because of underestimating costs for both EM&V and equipment, as well as installation delays. The total estimated cost for the remainder of the study is $360,000.

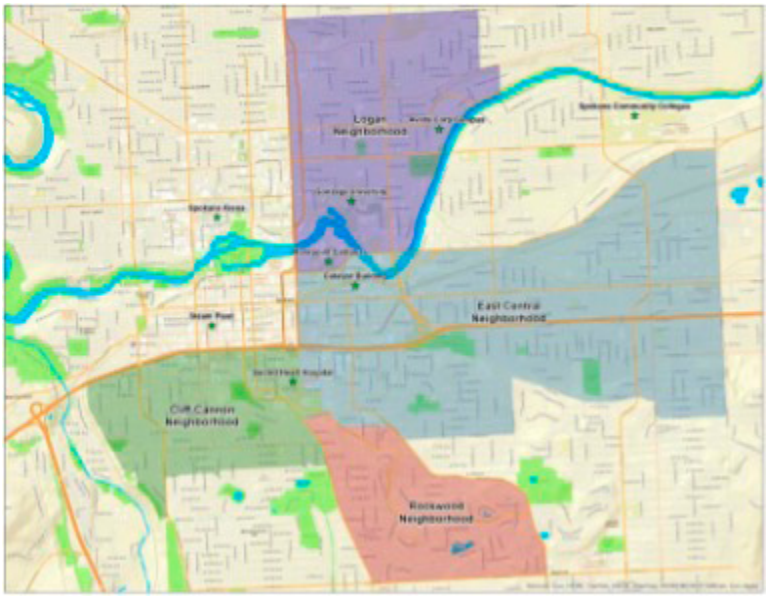
Equity Considerations

Identification of eligible homes for the study began with a database query to find potentially older HVAC systems that appeared to be failing. Newer and larger homes were filtered out. This approach had two benefits, the first being that age is the typical reason HVAC systems are replaced, and the second being that these customers could resultingly be motivated to participate in the pilot. In addition to the query yielding several homes for recruitment targeting in equity areas, Avista contacted community partners to help identify potential study candidates. These efforts resulted in two of the 12 study participants falling within Avista's Named Communities or enrolled in the bill-discount program.

Connected Communities

This five-year demonstration project is a partnership between Edo, Avista, McKinstry, Pacific Northwest National Laboratory (PNNL), and Urbanova. It is centered in several of Avista's Named Communities, including the East Central area, the Logan neighborhood, and the Cliff Cannon neighborhood – all of which are in Spokane, WA. The project explores and demonstrates clean, equitable products and solutions for commercial and residential customers to optimize grid utilization, increase resiliency, and reduce energy burden without compromising needs and comfort. It is funded through a grant from the Department of Energy, as well as partner contributions.

FIGURE 10 – CONNECTED COMMUNITIES



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REGIONAL MARKET TRANSFORMATION

Little Falls Dam, Spokane River, Washington

REGIONAL MARKET TRANSFORMATION

Avista's local energy-efficiency portfolio consists of programs and supporting infrastructure designed to enhance and accelerate the saturation of efficiency measures throughout its service territory. These aims are facilitated by financial incentives, technical assistance, program outreach, and education.

It is not feasible for Avista to independently have a meaningful impact on regional or national markets. Consequently, utilities within the Pacific Northwest have worked together through NEEA to address opportunities that are beyond the reach of individual utilities. Avista has been participating in and funding NEEA since it was founded in 1997.

Table 64 shows the 2024 NEEA savings and associated costs for Washington, which exclude internal administrative costs associated with participation in various NEEA activities and studies.

TABLE 64 – NEEA ENERGY SAVINGS AND PARTICIPATION COSTS

Fuel Type	2024 NEEA Energy Savings	2024 NEEA Participation Costs	Avista 2020-2024 Funding Share
Electric	6,474 MWh (0.74 aMW)	$ 1,585,015	3.95%
Natural Gas	63,544 Therms	$ 438,675	8.49%

Avista will continue to work closely with NEEA and other regional entities to identify overlapping priorities and objectives while simultaneously deploying a more thorough and customized market transformation strategy to its local market – including additional investment and direct coordination with the supply chain.

Electric Energy Savings Share

Values provided in NEEA's 2024 annual report represent the amounts allocated to Avista's service territory, which is a combination of site-based energy-savings data (where available) or an allocation of savings based on funding share. Using the latter approach, the funding share for Avista is split 70 percent for Avista Washington and 30 percent for Avista Idaho. The funding share for Avista varies by funding cycle and within each cycle if the funding composition changes.

Natural Gas Energy Savings Share

NEEA's costs include all expenditures for operations and value delivery; energy savings initiatives; investments in market training and infrastructure; stock assessments, evaluations, data collection, and other regional and program research; emerging technology research and development; and all administrative costs.

Avista's criteria for funding NEEA's market transformation portfolio calls for delivery of incrementally cost-effective resources beyond what could be acquired through Avista's local portfolio alone. Avista has historically communicated to NEEA the importance of delivering cost-effective resources to the company's service territory and remains confident that NEEA will continue to offer cost-effective electric market transformation for the foreseeable future. The company will remain active in the organizational oversight of NEEA, a critical step in ensuring that geographic equity, cost-effectiveness, and resource acquisition goals of market transformation are met.

Generation, Transmission, Distribution, and Internal Energy-Efficiency Projects and Initiative Summaries

Conservation Voltage Reduction

Avista implemented Conservation Voltage Reduction (CVR) on 106 feeders from 2012 through 2024. There were two CVR efforts during this time period. The first corresponded with the advent of the Avista Smart Grid and the associated Integrated Volt-Var Compensation (IVVC) in 2012. This dynamic regulator and capacitor bank control allowed for enhanced CVR. The second was the addition of AMI in 2019-2020, which allowed for additional CVR opportunities on IVVC-enabled feeders as well as manual CVR opportunities on non-IVVC enabled feeders, due to the endpoint visibility of all AMI meters in Washington.

There were no new feeders added to the CVR program in 2024. However, the MWh savings reported in the 2023 *ACR* (10,209 MWh for 2022 and 2023) continues to accumulate, as does the original CVR savings realized at the beginning of IVVC implementation.

New CVR opportunities continue to be explored by Distribution Engineering. Currently, non-CVR feeders can have their voltage control lowered for CVR purposes without mitigating efforts such as reconductoring or adding IVVC.

Distribution Reconductoring

Avista completed 12 major Distribution 13.2kV Line Reconductor projects in 2024, replacing nearly 10 miles of line. Typically these reconductor projects cut associated distribution losses by half, are capital-intense, and cannot be justified by efficiency alone. These projects were for additional capacity and reliability, as well as overhead-to-underground wildfire measures. The efficiency gained from these 12 projects will continue for the 40-plus-year life of the reconductor and will be determined by baselining the old conductor properties with the new and modeling the average yearly load losses for both.

Clean Buildings Act Compliance

In 2024, Avista completed an inventory and verified the square footage of all Avista-owned buildings within Washington state. Staff benchmarked the largest Tier 1 building in the portfolio and worked with the state's Department of Commerce to correct records. Additionally, Avista Facilities staff participated in the Clean Buildings Accelerator Program and began developing an Energy Management Plan and an Operations and Maintenance Plan ahead of the summer 2026 compliance deadline for the company's largest Tier 1 building.

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GLOSSARY OF TERMS

Palouse, Washington

GLOSSARY OF TERMS

active energy management (AEM): The implementation of continuous building monitoring to improve building performance in real time.

advanced metering infrastructure (AMI): Systems that measure, collect, and analyze energy usage from advanced devices such as electricity meters, natural gas meters, or water meters through various communication media on request or on a predetermined schedule.

advisory group: Avista's group of external stakeholders who comment about the company's energy-efficiency activities.

aMW: The amount of energy that would be generated by one megawatt of capacity operating continuously for one full year. Equals 8,760 MWhs of energy.

Annual Conservation Plan (ACP): An Avista-prepared resource document that outlines the company's conservation offerings and its approach to energy efficiency, as well as details on verifying and reporting savings.

Annual Conservation Report (ACR): An Avista-prepared resource document that summarizes its annual energy-efficiency achievements.

annual fuel utilization efficiency (AFUE): A measurement of how efficiently a furnace or boiler uses fuel.

avoided cost: An investment guideline describing the value of conservation and generation resource investments in terms of the cost of more expensive resources that would otherwise have to be acquired.

baseline: Conditions, including energy consumption, that would have occurred without implementation of the subject's energy-efficiency activity. Baseline conditions are sometimes referred to as "business-as-usual" conditions.

baseline efficiency: The energy use of the baseline equipment, process, or practice that is being replaced by a more efficient approach to providing the same energy service. It is used to determine the energy savings obtained by the more efficient approach.

baseline period: The period of time selected as representative of facility operations before an energy-efficiency activity takes place.

Biennial Conservation Plan (BCP): An Avista-prepared resource document that outlines Avista's conservation offerings and its approach to energy efficiency, as well as details on verifying and reporting savings for a two-year period.

Business Partner Program (BPP): An outreach effort designed to raise awareness of utility programs and services that can assist rural small-business customers in managing their energy bills.

British thermal unit (Btu): The amount of heat energy necessary to raise the temperature of one pound of water one degree Fahrenheit (3,413 Btu are equal to one kilowatt-hour).

busbar: The physical electrical connection between the generator and transmission system. Typically load on the system is measured at busbar.

capacity: The maximum power that a machine or system can produce or carry under specified conditions. The capacity of generating equipment is generally expressed in kilowatts or megawatts. In terms of transmission lines, capacity refers to the maximum load a line can carry under specified conditions.

Clean Energy Implementation Plan (CEIP): Introduced within a subsection of the Clean Energy Transformation Act, a CEIP must describe the utility's plan for making progress toward meeting the clean energy transformation standards while it continues to pursue all cost-effective, reliable, and feasible conservation and efficiency resources.

Clean Energy Transformation Act (CETA): Signed into law in 2019, the Clean Energy Transformation Act requires electric utilities to supply their Washington customers with 100 percent renewable or non-emitting electricity with no provision for offsets.

community action agency (CAA): General term for Community Action Programs, Community Action Agencies, and Community Action Centers that provide services such as low-income weatherization through federal and state and other funding sources (e.g., utility constitutions).

Community Energy Efficiency Program (CEEP): Created by the Washington State Legislature in 2009, CEEP encourages homeowners and small businesses across the state to make energy-efficiency retrofits and upgrades.

conservation: According to the Northwest Power Act, any reduction in electric power consumption because of increases in the efficiency of energy use, production, or distribution.

conservation potential assessment (CPA): An analysis of the amount of conservation available in a defined area. Provides savings amounts associated with energy-efficiency measures to input into the company's IRP process.

cost-effective: According to the Northwest Power Act, a cost-effective measure or resource must be forecast to be reliable and available within the time it is needed, and to meet or reduce electrical power demand of consumers at an estimated incremental system cost no greater than that of the least-costly, similarly reliable, and available alternative or combination of alternatives.

customer/customer classes: A category(ies) of customer(s) defined by provisions found in tariff(s) published by the entity providing service, approved by the PUC. Examples of customer classes are residential, commercial, industrial, agricultural, local distribution company, core, and non-core.

decoupling: In conventional utility regulation, utilities make money based on how much energy they sell. A utility's rates are set largely based on an estimation of costs of providing service over a certain time period, with an allowed profit margin, divided by a forecasted amount of unit sales over the same time period. If actual sales are as forecasted, the utility will recover all fixed costs and its set profit margin. If actual sales exceed the forecast, the utility will earn extra profit.

deemed savings: Primarily referenced as UES, an estimate of an energy savings for a single unit of an installed energy-efficiency measure that (a) has been developed from data sources and analytical methods that are widely considered acceptable for the measure and purpose, and (b) is applicable to the situation being evaluated.

demand: The load that is drawn from the source of supply over a specified interval of time (in kilowatts, kilovolt-amperes, or amperes). Also, the rate at which natural gas is delivered to or by a system, part of a system, or piece of equipment and expressed in cubic feet, therms, Btu or multiples thereof, for a designated period such as during a 24-hour day.

demand response (DR): A voluntary and temporary change in consumers' use of electricity when the power system is stressed.

demand-side management (DSM): The process of helping customers use energy more efficiently. Used interchangeably with energy efficiency and conservation, although conservation technically means using less while DSM and energy efficiency means using less while still having the same useful output of function.

direct load control (DLC): The means by which a utility can signal a customer's appliance to stop operations to reduce the demand for electricity. Such rationing generally involves a financial incentive for the affected customer.

discount rate: The rate used in a formula to convert future costs or benefits to their present value.

distribution: The transfer of electricity from the transmission network to the consumer. Distribution systems generally include the equipment to transfer power from the substation to the customer's meter.

end-use: A term referring to the final use of energy; it often refers to the specific energy services (e.g., space heating), or the type of energy-consuming equipment (e.g., motors).

Energy Efficiency Advisory Group (EEAG): A group that advises investor-owned utilities on the development of integrated resource plans and conservation programs.

Equity Advisory Group (EAG): Provides consultation for various endeavors across the company to ensure that all customers are benefiting from the transition to clean energy through the equitable distribution of energy and non-energy benefits and reduced energy burdens to vulnerable populations and highly impacted communities.

energy-efficiency measure: Refers to either an individual project conducted or technology implemented to reduce the consumption of energy at the same or an improved level of service. Often referred to as simply a "measure."

Energy Independence Act (EIA): Requires electric utilities serving at least 25,000 retail customers to use renewable energy and energy conservation.

energy use intensity (EUI): A metric – energy per square foot per year – that expresses a building's energy use as a function of its size or other characteristics.

evaluation: The performance of a wide range of assessment studies and activities aimed at determining the effects of a program (or portfolio) and understanding or documenting program performance, program-related markets and market operations, program-induced changes in energy-efficiency markets, levels of demand or energy savings, or program cost-effectiveness. Market assessment, monitoring and evaluation, and verification are aspects of evaluation.

Evaluation, Measurement, and Verification (EM&V): Term for evaluation activities at the measure, project, program, or portfolio level; can include impact, process, market, or planning activities. EM&V is distinguishable from Measurement and Verification (M&V), defined later.

ex ante savings estimate: Forecasted savings value used for program planning or savings estimates for a measure; Latin for "beforehand."

ex-post evaluated estimated savings: Savings estimates reported by an independent, third-party evaluator after the energy impact evaluation has been completed. If only the term "ex-post savings" is used, it will be assumed that it is referring to the ex-post evaluation estimate, the most common usage; from Latin for "from something done afterward."

external evaluators (a.k.a. third-party evaluators): Independent professional efficiency person or entity retained to conduct EM&V activities. Consideration will be made for those who are certified M&V professionals (CMVPs) through the Association of Energy Engineers (AEE) and the Efficiency Evaluation Organization (EVO).

generation: The act or process of producing electricity from other forms of energy.

Green Motors Practices Group (GMPG): A nonprofit corporation governed by electric motor service center executives and advisers whose goal is the continual improvement of the electric motor repair industry.

gross savings: The change in energy consumption or demand that results from adoption of energy-efficiency programs, codes, and standards and produces a long-lasting savings effect regardless of why they were enacted.

Heating, Ventilation, and Air-Conditioning (HVAC): Sometimes referred to as climate control, HVAC is particularly important in the design of medium to large industrial and office buildings where humidity and temperature must all be closely regulated while maintaining safe and healthy conditions within.

highly impacted community: designated by the Washington Department of Health, any census tract with an overall ranking of 9 or 10 on the Environmental Health Disparities map, or any census tract with tribal lands.

impact evaluation: Determination of the program-specific, directly or indirectly induced changes (e.g., energy or demand usage) attributable to an energy-efficiency program.

implementer: Avista employee whose responsibilities are directly related to operations and administration of energy-efficiency programs and activities, and who may have energy-savings targets as part of their goals or incentives.

incremental cost: The difference between the cost of baseline equipment or services and the cost of alternative energy-efficient equipment or services.

Integrated Resource Plan (IRP): An *IRP* is a comprehensive evaluation of future electric or natural gas resource plans. The *IRP* must evaluate the full range of resource alternatives to provide adequate and reliable service to a customer's needs at the lowest possible risk-adjusted system cost. These plans are filed with the state public utility commissions on a periodic basis.

International Performance Measurement and Verification Protocol (IPMVP): A guidance document with a framework and definitions describing the four M&V approaches; a product of the Energy Valuation Organization (www.evo-world.org).

investor-owned utility (IOU): A utility that is organized under state law as a corporation to provide electric power service and earn a profit for its stockholders.

kilowatt (kW): The electrical unit of power that equals 1,000 watts.

kilowatt-hour (kWh): A basic unit of electrical energy that equals one kilowatt of power applied for one hour.

line losses: The amount of electricity lost or assumed lost when transmitting over transmission or distribution lines. This is the difference between the quantity of electricity generated and the quantity delivered at some point in the electric system.

Low-Income Rate Assistance Program (LIRAP): LIRAP provides funding (collected from Avista's tariff rider) to CAAs for distribution to Avista customers who are least able to afford their utility bills.

measure (also energy-efficiency measure, or EEM): Installation of a single piece of equipment, subsystem or system, or single modification of equipment, subsystem, system, or operation at an end-use energy consumer facility, for the purpose of reducing energy or demand (and, hence, energy or demand costs) at a comparable level of service.

Measurement and Verification (M&V): A subset of program impact evaluation that is associated with the documentation of energy savings at individual sites or projects, using one or more methods that can involve measurements, engineering calculations, statistical analyses, or computer simulation modeling. M&V approaches are defined in the International Performance Measurement and Verification Protocol (available at www.evo-world.org).

megawatt (MW): The electrical unit of power that equals one million watts or one thousand kilowatts.

megawatt-hour (MWh): A basic unit of electrical energy that equals one megawatt of power applied for one hour.

Named Community: Represents areas within Avista's service territory considered to be a highly impacted community or vulnerable population.

net savings: The change in energy consumption or demand that is attributable to an energy-efficiency program. This change in energy use or demand may include, implicitly or explicitly, consideration of factors such as free drivers, non-net participants (free riders), participant and non-participant spillover, and induced market effects. These factors may be considered in how a baseline is defined or in adjustments to gross savings values.

non-energy benefit/non-energy impact (NEB/NEI): The quantifiable non-energy impacts (NEIs) associated with program implementation or participation; also referred to as non-energy benefits (NEBs) or co-benefits. Examples of NEIs include water savings, non-energy consumables, and other quantifiable effects. The value is most often positive, but may also be negative (e.g., the cost of additional maintenance associated with a sophisticated, energy-efficient control system).

Northwest Energy Efficiency Alliance (NEEA): A nonprofit organization that works to accelerate energy efficiency in the Pacific Northwest through the adoption of energy-efficient products, services, and practices.

Northwest Power and Conservation Council (NWPCC): An organization that develops and maintains both a regional power plan and a fish and wildlife program to balance the environmental and energy needs of the Pacific Northwest.

on-bill repayment/financing (OBR): A financing option in which a utility or private lender supplies capital to a customer to fund energy efficiency, renewable energy, or other generation projects. It's repaid through regular payments on an existing utility bill.

Participant Cost Test (PCT): The PCT measures quantifiable costs and benefits to the customer participating in a program – including, for example, the incentive paid by the utility under the program, as well as NEIs. Since many customers do not base their decision to participate in a program entirely on quantifiable variables, this test cannot be a complete measure of the benefits and costs of a program to a customer.

portfolio: Collection of all programs conducted by an organization. In the case of Avista, its portfolio includes electric and natural gas programs in all customer segments. Portfolio can also refer to a collection of similar programs addressing the market. In this sense of the definition, Avista has an electric portfolio and a natural gas portfolio with programs addressing the various customer segments.

Prescriptive: A prescriptive program is a standard offer of incentives for the installation of an energy-efficiency measure. Prescriptive programs are generally applied when the measures are employed in relatively similar applications.

process evaluation: A systematic assessment of an energy-efficiency program or program component for the purposes of documenting operations at the time of the examination, and identifying and recommending improvements to increase the program's efficiency or effectiveness for acquiring energy resources while maintaining high levels of participant satisfaction.

program: An activity, strategy, or course of action undertaken by an implementer. Each program is defined by a unique combination of program strategy, market segment, marketing approach, and energy-efficiency measure(s) included. Examples are a program to install energy-efficient lighting in commercial buildings and residential weatherization programs.

project: An activity or course of action involving one or multiple energy-efficiency measures at a single facility or site.

ratepayer impact (RIM): A cost-effectiveness test that measures how customer bills or rates are affected by the changes in utility revenues and operating costs caused by the program. This test indicates the direction and magnitude of the expected change in customer bills or rate levels. Lower values equate to less impact on customer bills.

Regional Technical Forum of the Northwest Power and Conservation Council (RTF): A technical advisory committee to the NWPCC established in 1999 to develop standards to verify and evaluate energy-efficiency savings.

realization rate (RR): Ratio of ex ante reported savings to ex-post evaluated estimated savings. When realization rates are reported, they are labeled to indicate whether they refer to comparisons of (1) ex ante gross reported savings to ex-post gross evaluated savings, or (2) ex ante net reported savings to ex-post net evaluated savings.

reliability: When used in energy-efficiency evaluation, the quality of a measurement process that would produce similar results on (a) repeated observations of the same condition or event, or (b) multiple observations of the same condition or event by different observers. Reliability refers to the likelihood that the observations can be replicated.

reported savings: Savings estimates reported by Avista for an annual (calendar) period. These savings will be based on best available information.

request for proposal (RFP): Business document that announces and provides details about a project, as well as solicits bids from potential contractors.

retrofit: To modify an existing generating plant, structure, or process. The modifications are done to improve energy efficiency, reduce environmental impacts, or to otherwise improve the facility.

R-value or R-factor (resistance transfer factor): Measures how well a barrier, such as insulation, resists the conductive flow of heat.

Schedules 90 and 190: Rate schedules that show energy-efficiency programs.

Schedules 91 and 191: Rate schedules that are used to fund energy-efficiency programs.

sector(s): The economy is divided into four sectors for energy planning. These are the residential, commercial (e.g., retail stores, office and institutional buildings), industrial, and agriculture (e.g., dairy farms, irrigation) sectors.

Site-Specific: A commercial/industrial program offering individualized calculations for incentives upon any electric or natural gas efficiency measure not incorporated into a prescriptive program.

simple payback: The time required before savings from a particular investment offset costs, calculated by investment cost divided by value of savings (in dollars). For example, an investment costing $100 and resulting in a savings of $25 each year would be said to have a simple payback of four years. Simple paybacks do not account for future cost escalation or other investment opportunities.

spillover: Reductions in energy consumption or demand caused by the presence of an energy-efficiency program, beyond the program-related gross savings of the participants and without direct financial or technical assistance from the program. There can be participant or non-participant spillover (sometimes referred to as "free drivers"). Participant spillover is the additional energy savings that occur because of the program's influence when a program participant independently installs incremental energy-efficiency measures or applies energy-saving practices after having participated in the program. Non-participant spillover refers to energy savings that occur when a program non-participant installs energy-efficiency measures or applies energy-savings practices because of a program's influence.

Technical Reference Manual (TRM): An Avista-prepared resource document that contains Avista's (ex ante) savings estimates, assumptions and sources for those assumptions, guidelines, and relevant supporting documentation for its natural gas and electricity energy-efficiency prescriptive measures. This document is populated and vetted by the RTF and third-party evaluators.

total resource cost (TRC): A cost-effectiveness test that assesses the impacts of a portfolio of energy-efficiency initiatives regardless of who pays the costs or who receives the benefits. The test compares the present value of costs of efficiency for all members of society (including all costs to participants and program administrators) compared to the present value of all quantifiable benefits, including avoided energy supply and demand costs and non-energy impacts.

transmission: The act or process of long-distance transport of electric energy, generally accomplished by elevating the electric current to high voltages. In the Pacific Northwest, Bonneville operates most of the high-voltage, long-distance transmission lines.

unit estimated savings (UES): Defines the first-year kWh savings value for an energy-efficiency measure.

U-value or U-factor: The measure of a material's ability to conduct heat, numerically equal to one divided by the value of the material. Used to measure the rate of heat transfer in windows. The lower the U-factor, the better the window insulates.

uncertainty: The range or interval of doubt surrounding a measured or calculated value within which the true value is expected to fall within some degree of confidence.

utility cost test (UCT): One of the four standard practice tests commonly used to evaluate the cost-effectiveness of DSM programs. The UCT evaluates the cost-effectiveness based upon a program's ability to minimize overall utility costs. The primary benefits are the avoided cost of energy in comparison to the incentive and non-incentive utility costs.

variable frequency drive (VFD): A type of motor drive used in electromechanical drive systems to control AC motor speed and torque by varying motor input frequency and voltage.

verification: An assessment that the program or project has been implemented per the program design. For example, the objectives of measure installation verification are to confirm (a) the installation rate, (b) that the installation meets reasonable quality standards, and (c) that the measures are operating correctly and have the potential to generate the predicted savings. Verification activities are generally conducted during on-site surveys of a sample of projects. Project site inspections, participant phone and mail surveys, or implementer and consumer documentation review are typical activities associated with verification. Verification may include one-time or multiple activities over the estimated life of the measures. It may include review of commissioning or retro-commissioning documentation. Verification can also include review and confirmation of evaluation methods used, samples drawn, and calculations used to estimate program savings. Project verification may be performed by the implementation team, but program verification is a function of the third-party evaluator.

vulnerable population: Communities that experience a disproportionate cumulative risk from environmental burdens.

Washington Utilities and Transportation Commission (WUTC): A three-member commission appointed by the governor and confirmed by the state Senate, whose mission is to protect the people of Washington by ensuring that investor-owned utility and transportation services are safe, available, reliable, and fairly priced.

APPENDICES AND SUPPLEMENTS

49 Degrees North Ski Resort, Stevens County, Washington

APPENDIX A – EVALUATION APPROACH

Evaluation is a critical component of any successful energy-conservation program. Avista employs EM&V protocols to validate and report verified energy savings related to its energy-efficiency measures and programs. Protocols include the comprehensive analyses and assessments necessary to supply useful information to both management and stakeholders. (EM&V includes impact and process. Taken as a whole, it is analogous to industry-standard terms such as portfolio evaluation or program evaluation.)

Program evaluations are generally conducted by third-party EM&V firms, selected on a biennial basis through a competitive bidding process managed by Avista's supply chain management group. The scope of work for selected evaluators is defined and managed by the company's planning and analytics team. Third-party evaluators provide recommendations on specific programs and related processes in impact and process evaluation report outputs. Avista incorporates recommendations to improve program performance, enact changes, and make decisions to phase out programs and measures.

Recommendations from third-party evaluations and lessons learned throughout each program year are incorporated into Avista's annual business planning process to further refine program design and improve efficacy.

For 2024, Avista retained ADM to conduct impact and process evaluations of electric and natural gas programs in the utility's Washington program portfolio. Evaluations took a portfolio-wide approach to provide a benchmark against which future years can be compared. Impact and process evaluations for most programs were also completed at the program level, so that customer experience could be better delineated and realization rates understood.

Several guiding EM&V documents are maintained and published to support planning and reporting requirements. These include the Avista EM&V framework, an annual EM&V plan, and EM&V contributions within other demand-side management (DSM) and Avista corporate publications. Program-specific EM&V plans are created to inform and benefit the DSM activities. These documents are reviewed and updated as necessary to improve the processes and protocols for energy-efficiency measurement, evaluation, and verification.

EM&V efforts are also used to evaluate emerging technologies and applications for potential inclusion in Avista's energy-efficiency portfolio. In its electric portfolio, Avista may spend up to 10 percent of its conservation budget on programs whose savings impacts have not yet been measured if the overall conservation portfolio passes the applicable cost-effectiveness test. These programs may include investigatory projects, including those rooted in education and/or behavioral change. 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.

Both Avista and its customers benefit from activities and resources related to energy efficiency and conservation. To contribute to regional efforts, Avista's energy-efficiency engineering manager has a voting role on the RTF – the advisory committee to the Northwest Power and Conservation Council (NPCC) and a primary source of information regarding the standardization of energy savings and measurement processes for electric applications in the Pacific Northwest. This knowledge base provides Avista with energy-efficiency data, metrics, non-energy benefits, and references for inclusion in the company's TRM relating to acquisition planning and reporting. Avista also works with other Northwest utilities and the NEEA on several pilot projects and subcommittee evaluations, with portions of the energy-efficiency savings acquired through the latter's regional programs attributable to Avista's portfolio.

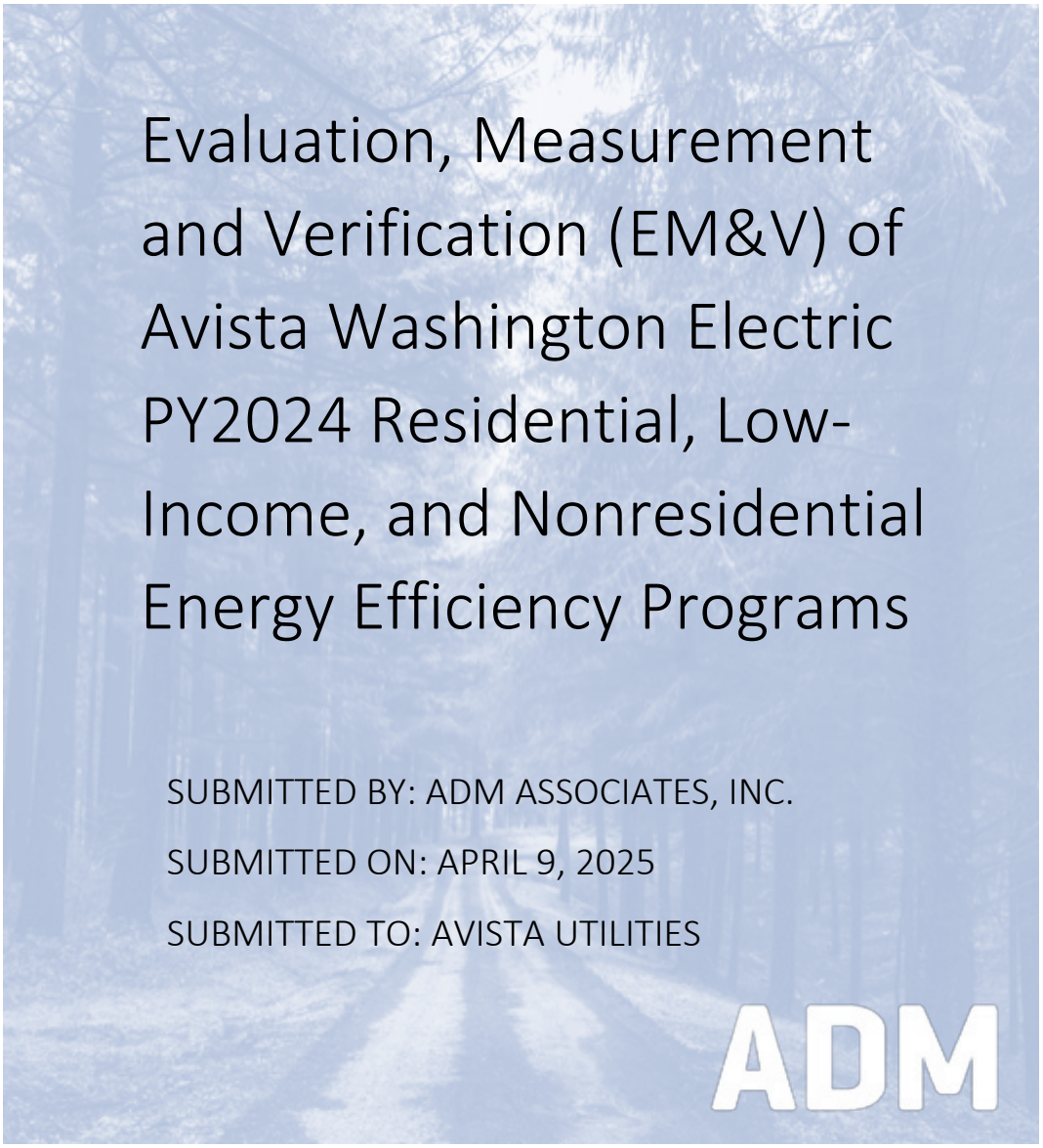

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Table of Contents

List of Tables

1. Executive Summary

This report is a summary of the Residential, Low-Income, and Nonresidential Electric Evaluation, Measurement, and Verification (EM&V) effort of the 2024 program year (PY2024) portfolio of programs for Avista Corporation (Avista) in the Washington service territory. The evaluation was administered by ADM Associates, Inc. (herein referred to as the "Evaluators").

1.1 Savings & Cost-Effectiveness Results

The Evaluators conducted an impact evaluation for Avista's Residential, Low-Income, and Nonresidential programs for PY2024. The Residential portfolio savings amounted to 5,864,973.87 kWh with a 110.96% realization rate. The Low-Income portfolio savings amounted to 172,169.49; however, this portfolio was not evaluated in PY2024 and therefore does not have a realization rate associated with the portfolio. The Nonresidential portfolio savings amounted to 38,508,185.79 kWh with a 99.65% realization rate. The Evaluators summarize the Residential, Low-Income, and Nonresidential portfolio verified savings in Table 1-1 through Table 1-3, respectively.

The Residential portfolio reflects a TRC value of 1.72 and a UCT value of 1.69. The Low-Income portfolio reflects a TRC value of 1.18 and a UCT value of 0.40. The Nonresidential portfolio reflects a TRC value of 1.40 and a UCT value of 1.47. This leads to a total Portfolio TRC of 1.44 and a UCT of 1.43. Table 1-4 summarizes the evaluated TRC and UCT values with each the Residential, Low-Income, and Nonresidential portfolios.

Table 1-1: Residential Verified Impact Savings by Program

Program	Expected Savings (kWh)	Verified Savings (kWh)	Verified Realization Rate	Total Costs
Shell	775,436.44	706,619.11	91.13%	$1,367,707.36
ENERGY STAR Homes	79,471.54	68,605.31	86.33%	$83,726.59
Appliances	392,255.00	259,749.44	66.22%	$172,796.19
Midstream	4,038,575.56	4,809,270.72	119.08%	$3,082,402.62
On Bill Repayment	NA	NA	NA	$16,000.00
Home Energy Audit	NA	20,743.25	NA	$554.12
Total	**5,285,738.54**	**5,864,987.84**	**110.96%**	**$4,723,186.88**

Table 1-2: Low-Income Verified Impact Savings by Program

Program	Expected Savings (kWh)	Verified Savings (kWh)	Verified Realization Rate	Total Costs
Low-Income	473,090.23	NA	NA	$1,707,225.81
NCIF	NA	172,169.49	NA	$269,288.24
Total	**473,090.23**	**172,169.49**	NA	**$1,976,514.04**

Table 1-3: Nonresidential Verified Impact Savings by Program

Program	Expected Savings (kWh)	Verified Savings (kWh)	Verified Realization Rate	Total Costs
Prescriptive Lighting	8,767,363	8,708,412.00	99.33%	$3,473,237.81
Small Business Lighting	19,112,087	18,446,895.00	96.52%	$12,990,060.61
VFD	2,044	3,203.98	156.75%	$617.46
Grocer	59,188	59,188.00	100.00%	$13,412.25
Shell	35,272	100,215.27	284.12%	$38,433.56
Green Motors Measure	11,543	7,944.00	68.82%	$2,508.23
Midstream	454,774	358,297.33	78.79%	$254,756.24
Site Specific	10,199,933	10,229,030.21	100.29%	$3,315,999.22
Building Operator Certification	NA	595,000.00	NA	$24,944.55
Total	**38,642,204**	**38,508,185.79**	**99.65%**	**$20,113,969.93**

In addition to the portfolio of existing programs, during PY2024 Avista also offered a Compressed Air Leak Detection Pilot, designed to identify and fix leaks in non-residential compressed air system. Details, methods and results, including cost-effectiveness testing results, can be found in Appendix C: Compressed Air Leak Detection Pilot, of this report.

Table 1-4: Cost-Effectiveness Summary

Sector	TRC			UCT		
	Benefits	Costs	B/C Ratio	Benefits	Costs	B/C Ratio
Residential	$10,517,324	$6,126,319	1.72	$7,960,518	$4,723,187	1.69
Residential Low Income	$2,336,369	$1,976,514	1.18	$787,332	$1,976,514	0.40
Nonresidential	$32,414,549	$23,235,881	1.40	$29,467,772	$20,113,970	1.47
Total	**$45,268,242**	**$31,338,714**	**1.44**	**$38,215,623**	**$26,813,671**	**1.43**

Table 1-5 summarizes the electric programs offered to residential, low-income, and nonresidential customers in the Washington Avista service territory in PY2024 as well as the Evaluators' evaluation tasks and impact methodology for each program.

Table 1-5: Impact Evaluation Activities by Program and Sector

Sector	Program	Database Review	Survey Verification*	Impact Methodology
Residential	Shell	✓		RTF UES
Residential	ENERGY STAR® Homes	✓		RTF UES
Residential	Appliances	✓		RTF UES, Billing Analysis
Residential	Midstream	✓		Engineering Algorithm with RTF Baseline Assumptions
Residential	On Bill Repayment	✓		Not Evaluated in 2024
Residential	Home Energy Audit	✓		Billing Analysis
Low-Income	Low-Income	✓		Not Evaluated in 2024
Low-Income	NCIF	✓		RTF UES
Nonresidential	Prescriptive Lighting	✓		Prescriptive Engineering Algorithms
Nonresidential	Small Business Lighting	✓		Prescriptive Engineering Algorithms
Nonresidential	HVAC	✓		Avista TRM
Nonresidential	Food Service Equipment	✓		RTF UES, Avista TRM
Nonresidential	Grocer	✓		RTF UES
Nonresidential	Shell	✓		Avista TRM
Nonresidential	Green Motors	✓		RTF UES
Nonresidential	Midstream	✓		RTF, TRM UES
Nonresidential	Site-Specific	✓		IPMVP

*No verification surveys were completed in PY2024. The Evaluators reference verification survey results from PY2023.

1.2 Conclusions and Recommendations

The following section details the Evaluators' conclusions and recommendations for each the Residential, Low-Income, and Nonresidential Portfolio program evaluations.

1.2.1 Conclusions

The following section details the Evaluator's findings resulting from the program evaluations for each the Residential Portfolio, Low-Income, and Nonresidential Portfolios.

1.2.1.1 Residential Programs

The Evaluators provide the following conclusions regarding Avista's Residential electric programs:

- The Evaluators found the Residential portfolio to demonstrate a total of 5,864,987.84 kWh with a realization rate of 110.96%. The Evaluators also conducted a cost-benefit analysis in order to estimate the Residential portfolio's cost-effectiveness. The resulting TRC value for this sector is 1.72 while the UCT value is 1.69. In cost effectiveness calculations, the Evaluators referenced Avista's Annual Conservation Report NEI values developed in 2023. Further details on cost-effectiveness methodology can be found in Appendix D.
- The Residential Portfolio impact evaluation resulted in a realization rate of 110.96% due to verified savings of 119.08% in the Midstream Program. The Evaluators utilized engineering algorithms to evaluate this program based on purchased equipment efficiency level. The

Evaluators also applied RTF market practice baseline equivalents to the engineering algorithms in order to maintain consistency with evaluation methods between the downstream and midstream programs, while taking into account the often higher efficiency values of the purchased equipment. In some cases, the implementer applied more efficient than necessary baselines for projects completed in PY2024. This led to an upward adjustment for a portion of the Midstream measures.

- The Evaluators conducted verification surveys for a random sample of customers who had participated in the residential prescriptive rebates programs in PY2023. Since there was not a process evaluation completed in PY2024 due to a change in evaluation cadence, the Evaluators applied the in-service rates determined from the PY2023 survey efforts to the PY2024 projects. The Evaluators calculated in-service rates for measures in which in-service rates are not typically 100% (clothes washers and dryers, smart thermostats, etc.). The Evaluators found that all surveyed measures responses indicated in-service rates of between 90 to 100%. These values were applied to impact analysis results to estimate verified savings through the programs.
- The **Midstream Program**, which contributes 76% of the expected savings, resulted in a realization rate of 119.06% whereas each of the other programs resulted in a combined 83% realization rate. The Midstream Program contributed to a 28% increase in the overall residential sector, which displayed a realization rate of 110.96% overall.
- In the **Shell Program**, the lack of granularity in the Avista TRM data lead to a low realization rate for attic insulation, wall insulation and window measures. The expected savings also appeared to use a value of 1.86 kWh per square foot for attic savings calculations while the RTF UES defines savings by heating zone and heating type, and aligns closer with the value of 0.6 kWh per square foot based on participating home characteristics. The same discrepancy was identified in multifamily home shell measures. Similarly, the difference between RTF savings and the Avista TRM value for window replacements is drastic, with the RTF indicating much lower savings for the window replacements, based on U-values. The Evaluators recommend that Avista ensure that the correct RTF UES values are used to calculate expected savings and that Avista incorporates more granularity by climate zone, heating type, and U-value savings into Avista's TRM. In addition to the discrepancy in applied unit energy savings values, the Evaluators identified many discrepancies in the documentation provided in terms of square footage and unit quantity verification which caused savings to deviate from 100%. These differences, similar to the conclusions in the previous impact evaluation report, led to an overall realization rate of 91.13% for the Shell Program.
- In the **ENERGY STAR Homes Program**, the Evaluators found that realization rates differed from 100% due to the application of heating zone and cooling zone via the RTF, which the Avista TRM lacks. In addition, the Evaluators found that realization rates differed from 100% due to savings value application. Program application forms frequently lacked information about home primary and secondary space and water heating type as well as heating and cooling zones. The Evaluators recommend updating the Avista measure savings database to match the primary heating type for dual fuel households and heating and cooling zones reflected in the RTF

workbooks. In addition, the Evaluators recommend updating the document data aggregation to provide consistent database values between database and the provided rebate forms (primary heating type) and determine if the customer is an Avista electric and/or gas customer before providing an incentive for dual fuel.

- In the **Appliances Program**, the Evaluators note that Avista TRM defines appropriate unit energy savings for the fridge-freezer and upright freezer measures. The Evaluators found the program verified savings resulted in a 66.22% realization rate due to a variety of conclusions. The Evaluators found that although most refrigerator/freezer models met ENERGY STAR requirements, the expected savings values applied to each refrigerator/freezer was the ESME-rated UES defined by the RTF, which is significantly higher than ENERGY STAR-qualified products. This led to a low realization rate for these measure categories. Additionally, the Avista TRM currently assigns smart thermostats rebated through the program the highest available option defined by the RTF workbook. However, this efficiency option does not align with project-level documents. The Evaluators also found that eight smart thermostat projects did not qualify based on RTF UES requirements due to lack of occupancy sensors. The Evaluators recommend Avista update the smart thermostat and refrigerator/freezer expected savings to align with observed efficiency products rebated through the program rather than the highest efficiency option or highest savings value option defined by the RTF.
- The **Midstream Program** displayed a 119.08% realization rate in PY2024. This is a large improvement compared to the PY2023 impact evaluation result for this program. The Evaluators reviewed the implementer expected savings values along with verified tracking data to estimate net adjusted program savings for those measures. In order to calculate verified savings, the Evaluators utilized industry-standard engineering algorithms using purchased equipment efficiency values and RTF-defined market practice baseline values, where appropriate. The Evaluators concluded that the implementers correctly estimated expected savings values for a portion of the projects and incorrectly defined above market practice efficiency baseline for a portion of projects, leading to a realization rate larger than 100%. The Evaluators recommend incorporating appropriate baselines for each project, reflecting the RTF market practice baseline present in the year in which the project was installed.
- In PY2024, the Evaluators successfully identified **Home Energy Audit Program** participant impacts through a billing analysis. The billing analysis incorporated the census of participants in Washington and Idaho. The Evaluators then extrapolated household-level savings to the weighted number of full-year participants in PY2024, after removing double counted savings from other Avista program participation. These impacts summarize the educational and behavioral impacts offered through the program audits and expert contractor communications. The Evaluators estimated a total of 168 kWh impacts for each home that receives a home energy audit through the program.

1.2.1.2 Low-Income Programs

The Evaluators provide the following conclusions regarding Avista's Low-Income electric programs:

- The Evaluators found the Low-Income Program displayed an expected savings value of 473,090.23 kWh. Additionally, the Evaluators verified 172,169.49 kWh impacts through the NCIF Program. The Evaluators do not define a realization rate for this portfolio, as the Low-Income Program was not evaluated in PY2024, and the NCIF Program did not have defined expected savings. The Evaluators conducted a cost-benefit analysis in order to estimate the Low-Income portfolio's cost-effectiveness. The resulting TRC value for this sector is 1.18 while the UCT value is 0.40. The Low-Income portfolio is not expected to meet cost-effectiveness but are implemented in order to provide energy efficiency benefits to low-income customers. In cost effectiveness calculations, the Evaluators referenced Avista's Annual Conservation Report NEI values developed in 2023. Further details on cost-effectiveness methodology can be found in Appendix D.
- The Evaluators did not complete an impact evaluation for the **Low-Income Program**. Instead, impact evaluation is planned for the PY2025 evaluation cycle.
- The Evaluators verified 172,169.49 kWh impacts through the **NCIF Program**, which funds projects completed in named communities that cover project costs that exceed available residential and nonresidential incentives through downstream programs offered by Avista. The Evaluators estimated impacts for this program by portioning verified project-level savings by the proportion of costs covered by the NCIF fund versus the downstream program in which costs are split.

1.2.1.3 Nonresidential Programs

The Evaluators provide the following conclusions regarding Avista's Nonresidential electric programs:

- The Evaluators found the Non-Residential portfolio to demonstrate a total of 38,508,185.79 kWh with a realization rate of 99.65%.
- The Evaluators also conducted a cost-benefit analysis in order to estimate the Non-Residential portfolio's cost-effectiveness. The resulting TRC value for this sector is 1.40 while the UCT value is 1.47. Further details on cost-effectiveness methodology can be found in Appendix D.
- The verified savings for the **Prescriptive Lighting Program** is 8,708,412 kWh with a realization rate of 99.33%. Two factors affected the overall realization rate: The first is that annual hours in expected savings calculations were calculated using 365 days/year, which does not account for leap years. Verified savings calculations developed hours using 365.25 days/year, slightly raising realization. However, claimed savings calculations did not include in-service rates. The Evaluators used the RTF Midstream Lighting workbooks and assigned ISRs according to lamp/fixture type, resulting in slightly lower verified savings than expected.
- The verified savings for the **Small Business Lighting Program** is 18,446,895 kWh with a realization rate of 96.52%. For measures without occupancy sensors, realization is ±1% of expectations, with any differences likely due to rounding. For measures with occupancy sensors, the Evaluators found that expected savings were calculated by applying the occupancy sensor reduction factor both the operating hours and the connected load of the lighting retrofit, slightly

'double counting' savings. To account for occupancy sensor savings in verified calculations, the Evaluators applied the 32% reduction to the operation of the post-install equipment, then added this value to the retrofit savings, resulting in slightly lower verified savings.

- The verified savings for the **HVAC VFD Program** is 3,204 kWh with a realization rate of 156.75%. The Evaluators were not able to determine the source of expected savings, however verified savings were sourced from the RTF and were specific to the VFD applications.
- Verified savings for the **Grocer Program** is 59,188 kWh with a realization rate of 100.00%
- Verified savings for the **Shell Program** is 100,215 kWh with a realization rate of 284.12%.
- The verified savings for the **Green Motor Rewind Program** is 7,944 kWh with a realization rate of 68.82%. The Evaluators were not able to determine the source of expected savings, however verified savings were sourced from the RTF and were specific to the motor applications.
- The verified savings for the **Midstream Program** is 358,297 kWh with a realization rate of 78.79%.

  Adjusted savings come from the program planning workbooks used by program implementors. Results show that these values were not applied to tracking data as originally intended.

  Verified savings for food service equipment was taken from RTF workbooks and are specific to the equipment configuration(s). Expected savings came from UES in the program implementation workbook. This workbook did not contain supporting calculations for these measures, precluding determining how these estimates resulted in significantly different estimates from the RTF.
- The **Site-Specific Program** in total displays a realization rate of 100.29% with 10,229,030 kWh verified electric energy savings in the Washington service territory. Below are brief explanations of differences between claimed and verified savings for projects with realization rates that are not 100%.
  - **SSOP_119744 –** Ex ante calculations used an average LPD, 0.83, higher than what the commercial energy code required at the time the building permit was approved, 0.66, resulting in higher verified savings.
  - **SSOP_132019** – Verified savings were measured with a whole-facility billing analysis. Measured savings were lower than calculated ex-ante savings.
  - **SSLP_135911 –** Verified lighting hours of operation were slightly higher than the estimate used in expected savings calculations.
- The **Building Operator Certification Program** in total contributed to 595,000 kWh of verified savings across the five facilities managers that completed building operator certifications in the past five years.

1.2.2 Recommendations

The following section details the Evaluator's recommendations resulting from the program evaluations for each the Residential Portfolio, Low-Income, and Nonresidential Portfolios.

1.2.2.1 Residential Programs

The Evaluators offer the following recommendations regarding Avista's Residential electric programs:

- The Evaluators found a handful of instances in which the rebated equipment did not meet the program minimum requirements for efficiency, or did not meet the measure specifications defined by the RTF to achieve expected savings claimed by Avista. The Evaluators recommend Avista check the source AHRI documentation and product level documentation to verify efficiency prior to incentivizing installation of the measure and assigning expected savings.
- In the **Shell Program**, the Evaluators recommend Avista assign window savings by square foot of window rather than quantity of windows. Additionally, the Evaluators recommend Avista incorporates expected heating type for window UES values in order to align with RTF projected UES values. The Evaluators recommend that Avista ensure that the correct RTF UES values are used to calculate expected savings and that Avista incorporate more granularity by climate zone, heating type, and U-value savings into Avista's TRM. In addition, the Evaluators identified many discrepancies in the documentation provided in terms of square footage and unit quantity verification which caused savings to deviate from 100%. The Evaluators recommend updating the document data aggregation to provide consistent database values between database and the provided rebate forms (primary heating type, heating and cooling zones) and determine if the customer is an Avista electric and/or gas customer before providing an incentive for dual fuel.
- In the **ENERGY STAR Homes Program**, the Evaluators found that realization rates differed from 100% due to the application of heating zone and cooling zone via the RTF, which the Avista TRM lacks. The Evaluators recommend updating the Avista measure savings database to match the primary heating type for dual fuel households and heating and cooling zones reflected in the RTF workbooks.
- In the **Appliances Program**, two sampled smart thermostat rebates included equipment that did not meet RTF measure specifications to receive verified savings through the RTF workbooks, which the Avista TRM savings values are drawn from. The Evaluators recommend providing a qualified product list for customers to ensure purchased smart thermostat meets program requirements. In addition, the Evaluators recommend Avista verify each program rebate to verify qualifications after rebates are submitted.
- For the **Midstream Program**, the Evaluators concluded that the implementers correctly estimated expected savings values for a portion of the projects and incorrectly defined above market practice efficiency baseline for a portion of projects, leading to a realization rate larger than 100%. The Evaluators recommend incorporating appropriate baselines for each project, reflecting the RTF market practice baseline present in the year in which the project was installed.

1.2.2.2 Low-Income Programs

The Evaluators offer the following recommendations regarding Avista's Low-Income electric programs:

- The Evaluators do not provide any additional recommendations for the Low-Income Program or the NCIF Program.

1.2.2.3 Non Residential Programs

The Evaluators offer the following recommendations regarding Avista's Nonresidential electric programs:

- Within the **Shell Program**, multipliers used in expected savings development should be changed to those in the Avista TRM.
- Within the **Prescriptive Lighting Program,** collect space HVAC configuration information and use interactive HVAC effects factors when calculating prescriptive lighting savings for interior spaces, as well as in-service rates applied to all lamps and fixtures.
- For the **Small Business Lighting Program**:
    - Report savings from lighting retrofits and sensor installation separately.
    - Specify the type of control method employed.
    - In tracking data, denote the wattage controlled by each installed occupancy sensor.
    - If possible, record building type, vintage and HVAC configuration to calculate and include additional savings resulting from HVAC interactive effects.
- For the **Midstream Program**:
    - Administrators should verify that UES and savings multipliers are applied consistently across measures. The Evaluators found that in many cases program planning estimates could not replicate claimed savings.

2. General Methodology

The Evaluators performed an impact evaluation on each of the programs summarized in Table 1-5. The Evaluators used the following approaches to calculate energy impact defined by the International Performance Measurement and Verification Protocols (IPMVP)[1] and the Uniform Methods Project (UMP)[2]:

- Simple verification (web-based surveys)
- Document verification (review project documentation)
- Deemed savings (RTF UES and Avista TRM values)
- Whole facility billing analysis (IPMVP Option C)
- Appropriate IPMVP Option (for Site-Specific, depending on project)

The Evaluators completed the above impact tasks for each the electric impacts and the natural gas impacts for projects completed in the Washington Avista service territory. For the purposes of this report, only the Washington Electric impacts are quantified and reported.

The M&V methodologies are program-specific and determined by previous Avista evaluation methodologies as well as the relative contribution of a given program to the overall energy efficiency impacts. Besides drawing on IPMVP, the Evaluators also reviewed relevant information on infrastructure, framework, and guidelines set out for EM&V work in several guidebook documents that have been published over the past several years. These include the following:

- Northwest Regional Technical Forum (RTF)[3]
- National Renewable Energy Laboratory (NREL), United States Department of Energy (DOE) The Uniform Methods Project (UMP): Methods for Determining Energy Efficiency Savings for Specific Measures, April 2013[4]
- International Performance Measurement and Verification Protocol (IPMVP) maintained by the Efficiency Valuation Organization (EVO) with sponsorship by the U.S. Department of Energy (DOE)[5]

The Evaluators kept data collection instruments, calculation spreadsheets, and monitored/survey data available for Avista records.

2.1 Glossary of Terminology

As a first step to detailing the evaluation methodologies, the Evaluators have provided a glossary of terms to follow:

[1] https://www.nrel.gov/docs/fy02osti/31505.pdf
[2] https://www.nrel.gov/docs/fy18osti/70472.pdf
[3] https://rtf.nwcouncil.org/measures
[4] Notably, The Uniform Methods Project (UMP) includes the following chapters authored by ADM. Chapter 9 (Metering Cross-Cutting Protocols) was authored by Dan Mort and Chapter 15 (Commercial New Construction Protocol) was Authored by Steven Keates.
[5] Core Concepts: International Measurement and Verification Protocol. EVO 100000 – 1:2016, October 2016.

- **Deemed Savings** – An estimate of an energy savings outcome (gross savings) for a single unit of an installed energy efficiency measure. This estimate (a) has been developed from data sources and analytical methods that are widely accepted for the measure and purpose and (b) are applicable to the situation being evaluated.
- **Expected Savings** – Calculated savings used for program and portfolio planning purposes.
- **Adjusted Savings** – Savings estimates after database review and document verification has been completed using deemed unit-level savings provided in the Avista TRM. It adjusts for such factors as data errors and installation rates.
- **Verified Savings** – Savings estimates after the unit-level savings values have been updated and energy impact evaluation has been completed, integrating results from billing analyses and appropriate RTF UES and Avista TRM values.
- **Gross Savings** – The change in energy consumption directly resulting from program-related actions taken by participants in an efficiency program, regardless of why they participated.
- **Free Rider** – A program participant who would have implemented the program measure or practice in absence of the program.
- **Net-To-Gross** – A factor representing net program savings divided by gross program savings that is applied to gross program impacts to convert them into net program load impacts.
- **Net Savings** – The change in energy consumption directly resulting from program-related actions taken by participants in an efficiency program, with adjustments to remove savings due to free ridership.
- **Non-Energy Benefits** – Quantifiable impacts produced by program measures outside of energy savings (comfort, health and safety, reduced alternative fuel, etc.).
- **Non-Energy Impacts** – Quantifiable impacts in energy efficiency beyond the energy savings gained from installing energy efficient measures (reduced cost for operation and maintenance of equipment, reduced environmental and safety costs, etc.).

2.2 Summary of Approach

This section presents our general cross-cutting approach to accomplishing the impact evaluation of Avista's Residential, Low-Income, and Nonresidential programs listed in Table 1-5. The Evaluators start by presenting our general evaluation approach. This chapter is organized by general task due to substantial overlap across programs.

The Evaluators outline the approach to verifying, measuring, and reporting the residential portfolio impacts as well as cost-effectiveness and summarizing potential program and portfolio improvements. The primary objective of the impact evaluation is to determine ex-post verified net energy savings.

Our general approach for this evaluation considers the cyclical feedback loop among program design, implementation, and impact evaluation. Our activities during the evaluation estimate and verify annual energy savings and identify whether a program is meeting its goals. These activities are aimed to provide guidance for continuous program improvement and increased cost effectiveness for the 2025 and 2026 program years.

The Evaluators employed the following approach to complete impact evaluation activities for the programs. The Evaluators define major approaches to determining net savings for Avista's programs:

- A *Deemed Savings* approach involves using stipulated savings for energy conservation measures for which savings values are well-known and documented. These prescriptive savings may also include an adjustment for certain measures, such as lighting measures in which site operating hours may differ from RTF values.
- A *Billing Analysis* approach involves estimating energy savings by applying a linear regression to measured participant energy consumption utility meter billing data. Billing analyses included billing data from nonparticipant customers. This approach does not require on-site data collection for model calibration. This approach aligns with the IPMVP Option C.
- A *Semi-Custom* approach, used for the Prescriptive Lighting program, where savings are quantified by a standard engineering algorithm with key performance parameter(s), such as pre/post wattage, quantity and annual hours of use. This approach aligns with IPMVP Option A.
- A *Custom* approach, used for the Site-Specific program, involves selecting the appropriate IPMVP option to apply to the specific measure or project. Typically, this is Option A as most projects in the program are lighting retrofits, however Options B, C and D are also employed, depending upon the project. Specific methods are discussed in each site report.

The Evaluators accomplished the following quantitative goals as part of the impact evaluation:

- Verify savings with 10% precision at the 90% confidence level;
- Where appropriate, apply the RTF to verify measure impacts; and
- Where available data exists, conduct billing analysis with a suitable comparison group to estimate measure savings.
- Used IPMVP analysis methods for custom projects.

For each program, the Evaluators calculated adjusted savings for each measure based on the Avista TRM and results from the database review. The Evaluators calculated verified savings for each measure based on the RTF UES, Avista TRM, or billing analysis in combination with the results from document review. For the HVAC, Water Heat, and Fuel Efficiency, Small Home & MF Weatherization, and Appliances programs, the Evaluators also applied in-service rates (ISRs) from verification surveys.

The Evaluators assigned methodological rigor level for each measure and program based on its contribution to the portfolio savings and availability of data.

The Evaluators analyzed billing data for all electric measure participants in the Water Heat, HVAC, Small Home & MF Weatherization, Appliances, and Low-Income programs. The Evaluators applied billing analysis results where statistically significant to determine evaluated savings only for measures where savings could be isolated (that is, where a sufficient number of participants could be identified who

installed only that measure). Program-level realization rates for the HVAC Program incorporates billing analysis results for some measures.

2.2.1 Database Review

At the outset of the evaluation, the Evaluators reviewed the databases to ensure that each program tracking database conforms to industry standards and adequately tracks key data required for evaluation.

Measure-level net savings were evaluated primarily by reviewing measure algorithms and values in the tracking system to assure that they are appropriately applied using the Avista TRM. The Evaluators then aggregated and cross-checked program and measure totals.

The Evaluators reviewed program application documents for a sample of incented measures to verify the tracking data accurately represents the program documents. The Evaluators ensured the home installed measures that meet or exceed program efficiency standards.

2.2.2 Verification Methodology

In this section, the Evaluators summarize the verification methods used to ensure project-level details were indeed completed and to the efficiency levels detailed in the program-level tracking data.

2.2.2.1 Sampling Methodology

The Evaluators summarize the methods for each verification effort:

- Sampling methodology for most programs
- Sampling methodology for the Site-Specific Program
- Document-based verification
- Survey-based verification
- On-site visits

2.2.2.2 Sampling Methodology for Most Programs

The Evaluators verified a sample of participating households for detailed review of the installed measure documentation and development of verified savings. The Evaluators verified tracking data by reviewing invoices and surveying a sample of participant customer households. The Evaluators also conducted a verification survey for program participants.

The Evaluators used the following equations to estimate sample size requirements for each program and fuel type. Required sample sizes were estimated as follows:

Equation 2-1: Sample Size for Infinite Sample Size

$$n = \left(\frac{Z \times CV}{d}\right)^2$$

Equation 2-2: Sample Size for Finite Population Size

$$n_0 = \frac{n}{1 + \left(\frac{n}{N}\right)}$$

Where,

- n = Sample size
- Z = Z-value for a two-tailed distribution at the assigned confidence level.
- CV = Coefficient of variation
- d = Precision level
- N = Population

For a sample that provides 90/10 precision, *Z* = 1.645 (the critical value for 90% confidence) and *d* = 0.10 (or 10% precision). The remaining parameter is *CV*, or the expected coefficient of variation of measures for which the claimed savings may be accepted. A *CV* of .5 was assumed for residential programs due to the homogeneity of participation[6], which yields a sample size of 68 for an infinite population. Sample sizes were adjusted for smaller populations via the method detailed in Equation 2-2.

2.2.2.3 Sampling Methodology for the Site-Specific Program

For the Site-Specific program, Simple Random Sampling is not an effective sampling methodology as the CV values observed in business programs are typically very high because the distributions of savings are generally positively skewed. Often, a relatively small number of projects account for a high percentage of the estimated savings for the program.

To address this situation, we use a sample design for selecting projects for the M&V sample that considers such skewness. With this approach, we select several sites with large savings for the sample with certainty and take a random sample of the remaining sites. To improve precision, non-certainty sites are selected for the sample through systematic random sampling. That is, a random sample of sites remaining after the certainty sites have been selected is selected by ordering them according to the magnitude of their savings and using systematic random sampling. Sampling systematically from a list that is ordered according to the magnitude of savings ensures that any sample selected will have some units with high savings, some with moderate savings, and some with low savings. Samples cannot result that have concentrations of sites with atypically high savings or atypically low savings. Specific sampling characteristics are shown in the Site-Specific section of this report.

The following sections describe the Evaluator's methodology for conducting document-based verification and survey-based verification.

[6] Assumption based off California Evaluation Framework:

https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy/Energy_Programs/Demand_Side_Management/EE_and_Energy_Savings_Assist/CAEvaluationFramework.pdf

2.2.2.4 Document-Based Verification

The Evaluators requested rebate documentation for a subset of participating customers. These documents included invoices, rebate applications, pictures, and AHRI certifications for the following programs.

- Shell Program (Residential)
- ENERGY STAR® Homes Program
- Appliances Program
- Midstream Program (Residential)
- Low-Income Program
- NCIF Program
- Prescriptive Lighting Program
- HVAC Program (Nonresidential)
- Food Service Equipment Program
- Grocer Program
- Shell Program (Nonresidential)
- Green Motor Rewind Program
- Midstream Program (Nonresidential)
- Building Operator Certification

This sample of documents was used to cross-verify tracking data inputs. In the case the Evaluators found any deviations between the tracking data and application values, the Evaluators reported and summarized those differences in the Database Review sections presented for each program.

The Evaluators developed a sampling plan that achieves a sampling precision of ±10% at 90% statistical confidence – or "90/10 precision" – to estimate the percentage of projects for which the claimed savings are verified or require some adjustment.

The Evaluators developed the following samples for each program's document review using Equation 2-1 and Equation 2-2. The Evaluators ensured representation in each state and fuel type for each measure.

Table 2-1: Document-based Verification Samples and Precision by Program

Sector	Program	Electric Population	Sample (With Finite Population Adjustment)*	Precision at 90% CI
Residential	Shell	715	73	90% ± 9.13%
Residential	ENERGY STAR® Homes	27	21	90% ± 9.62%
Residential	Appliances	1,360	89	90% ± 8.43%
Residential	Midstream	2,656	2,656	90% ± 0%
Low-Income	Low-Income	358	NA	NA
Nonresidential	Prescriptive Lighting	497	60	90% ± 9.97%
Nonresidential	VFD	1	1	90% ± 0%
Nonresidential	Grocer	15	13	90% ± 8.62%
Nonresidential	Shell	6	6	90% ± 0%
Nonresidential	Green Motors Measure	5	5	90% ± 0%
Nonresidential	Midstream	245	54	90% ± 9.90%
Nonresidential	Site Specific	33	15	90% ± 4.25%

*Assumes sample size of 68 for an infinite population, based on *CV* (coefficient of variation) = 0.5, *d* (precision) = 10%, *Z* (critical value for 90% confidence) = 1.645.
** The Site-Specific Program sample is chosen via a random stratified sample and does not include the FPC. However, it is included in this table for illustrative and informative purposes

The table above represents the number of rebates in Washington service territory only (does not include Idaho rebate samples). The Evaluators ensured representation of state and fuel type in the sampled rebates for document verification.

2.2.2.5 Survey-Based Verification

The Evaluators conducted survey-based verification for the Appliances Program in PY2023. Due to change in process evaluation cadence, the Evaluators utilized the response results from PY2023 in the PY2024 impact evaluation efforts. A process evaluation will be completed in PY2025 for all programs.

The primary purpose of conducting a verification survey is to confirm that the measure was installed and is still currently operational and whether the measure was early retirement or replace-on-burnout.

The Evaluators summarize the final sample sizes shown in Table 2-2 for the Residential Appliance and Nonresidential Lighting Programs for the Washington Electric Avista projects. The Evaluators developed a sampling plan that achieved a sampling precision of ±5.52% at 90% statistical confidence for residential ISRs estimates at the measure-level during web-based survey verification. The Evaluators developed a sampling plan that achieved a sampling precision of ±4.20% at 90% statistical confidence for non-residential ISRs estimates at the measure-level during web-based survey verification.

Table 2-2: Survey-Based Verification Sample and Precision by Program

Sector	Program	Population	Respondents	Precision at 90% CI
Residential	Appliances	1,132	186	90% ± 5.52%
Non-Residential	Lighting	744	80	90% ± 4.20%

The Evaluators implemented a web-based survey to complete the verification surveys. The Evaluators contacted all customers in the programs listed in the table above with the goal of reaching 90/10 precision, however, all efforts were exhausted to reach these customers and therefore these programs

do not display 90/10 precision at the program-level for in-service rate calculations. For programs in which this goal was not met, the Evaluators assumed in-service rates of 100%.

The findings from these activities served to estimate ISRs for each measure surveyed. These ISRs were applied to verification sample desk review rebates towards verified savings, which were then applied to the population of rebates. The measure-level ISRs resulting from the survey-based verification are summarized in Section 2 for residential impact evaluation application.

2.2.2.6 On-Site Visits

For sampled projects in the Site-Specific program, the Evaluators conducted onsite visits to the facilities to verify installation, collected facility characteristic and collected any data needed to conduct savings calculations. In WA, a total of 7 visits were conducted to verify electric measures. Further details are available in the Site-Specific chapter.

2.2.3 Impact Evaluation Methodology

The Evaluators employed the following approach to complete impact evaluation activities for the programs. The Evaluators define two major approaches to determining net savings for Avista's programs:

- Deemed Savings
- Billing Analysis (IPMVP Option C)

The Site-Specific program also employed various IPMVP options, deepening upon the project and measure, and is discussed separately as it differs in approach from the approaches used in the remainder of the portfolio. In the following sections, the Evaluators summarize the general guidelines and activities followed to conduct the deemed savings and billing analysis approach.

In the following sections, the Evaluators summarize the general guidelines and activities followed to conduct each of the above analyses.

2.2.3.1 Deemed Savings

This section summarizes the deemed savings analysis method the Evaluators employed for the evaluation of a subset of measures for each program. The Evaluators completed the validation for specific measures across each program using the RTF unit energy savings (UES) values, where available. The Evaluators ensured the proper measure unit savings were recorded and used in the calculation of Avista's ex-ante measure savings. The Evaluators requested and used the technical reference manual Avista employed during calculation of ex-ante measure savings (Avista TRM). The Evaluators documented any cases where recommended values differed from the specific unit energy savings workbooks used by Avista.

In cases where the RTF has existing unit energy savings (UES) applicable to Avista's measures, the Evaluators verified the quantity and quality of installations and applied the RTF's UES to determine verified savings.

2.2.3.2 Billing Analysis

This section describes the billing analysis methodology employed by the Evaluators as part of the impact evaluation and measurement of energy savings for measures with sufficient participation. The Evaluators performed billing analyses with a matched control group and utilized a quasi-experimental method of producing a post-hoc control group. In program designs where treatment and control customers are not randomly selected at the outset, such as for downstream rebate programs, quasi-experimental designs are required.

For the purposes of this analysis, a household is considered a treatment household if it has received a program incentive. Additionally, a household is considered a control household if the household has not received a program incentive. To isolate measure impacts, treatment households are eligible to be included in the billing analysis if they installed only one measure during the 2024 program year. Isolation of individual measures is necessary to provide valid measure-level savings. Households that installed more than one measure may display interactive energy savings effects across multiple measures that are not feasibly identifiable. Therefore, instances where households installed isolated measures are used in the billing analyses. In addition, the pre-period identifies the period prior to measure installation while the post-period refers to the period following measure installation.

The Evaluators utilized propensity score matching (PSM) to match nonparticipants to similar participants using pre-period billing data. PSM allows the evaluators to find the most similar household based on the customers' billed consumption trends in the pre-period and verified with statistical difference testing.

After matching based on these variables, the billing data for treatment and control groups are compared, as detailed in IPMVP Option C. The Evaluators fit regression models to estimate weather-dependent daily consumption differences between participating customer and nonparticipating customer households.

Cohort Creation

The PSM approach estimates a propensity score for treatment and control customers using a logistic regression model. A propensity score is a metric that summarizes several dimensions of household characteristics into a single metric that can be used to group similar households. The Evaluators created a post-hoc control group by compiling billing data from a subset of nonparticipants in the Avista territory to compare against treatment households using quasi-experimental methods. This allowed the Evaluators to select from a large group of similar households that have not installed an incented measure. With this information, the Evaluators created statistically valid matched control groups for each measure via seasonal pre-period usage. The Evaluators matched customers in the control group to customers in the treatment group based on nearest seasonal pre-period usage (e.g., summer, spring, fall, and winter) and exact 3-digit zip code matching (the first three digits of the five-digit zip code). After matching, the Evaluators conducted a *t*-test for each month in the pre-period to help determine the success of PSM.

While it is not possible to guarantee the creation of a sufficiently matched control group, this method is preferred because it is likely to have more meaningful results than a treatment-only analysis. Some examples of outside variables that a control group can sufficiently control for are changes in economies

and markets, large-scale social changes, or impacts from weather-related anomalies such as flooding or hurricanes.

After PSM, the Evaluators ran the following regression models for each measure:

- Fixed effect Difference-in-Difference (D-n-D) regression model (recommended in UMP protocols)[7]
- Random effects post-program regression model (PPR) (recommended in UMP protocols)
- Gross billing analysis (treatment only)

The second model listed above (PPR) was selected because it had the best fit for the data, identified using the adjusted R-squared. Further details on regression model specifications can be found below.

Data Collected

The following lists the data collected for the billing analysis:

1. Monthly billing data for program participants (treatment customers)
2. Monthly billing data for a group of non-program participants (control customers)
3. Program tracking data, including customer identifiers, address, and date of measure installation
4. National Oceanic and Atmospheric Administration (NOAA) weather data between January 1, 2023 and December 31, 2024)
5. Typical Meteorological Year (TMY3) data

Billing and weather data were obtained for program year 2024 and for one year prior to measure install dates (2023).

Weather data was obtained from the nearest weather station with complete data during the analysis years for each customer by mapping the weather station location with the customer zip code.

TMY weather stations were assigned to NOAA weather stations by geocoding the minimum distance between each set of latitude and longitude points. This data is used for extrapolating savings to long-run, 30-year average weather.

Data Preparation

The following steps were taken to prepare the billing data:

1. Gathered billing data for homes that participated in the program.
2. Excluded participant homes that also participated in the other programs, if either program disqualifies the combination of any other rebate or participation.
3. Gathered billing data for similar customers that did not participate in the program in evaluation.
4. Excluded bills missing address information.
5. Removed bills missing fuel type/Unit of Measure (UOM).
6. Removed bills missing usage, billing start date, or billing end date.

[7] National Renewable Energy Laboratory (NREL) Uniform Methods Project (UMP) Chapter 17 Section 4.4.7.

7. Remove bills with outlier durations (<9 days or >60 days).
8. Excluded bills with consumption indicated to be outliers.
9. Remove duplicate bills and any bills with overlapping billing periods. If two billing periods overlapped, the bill with a start date that matched the previous bill's end date was included and the other bill was excluded. For example, if overlapping bill 1 had a 02/19/2024 start date, overlapping bill 2 had a 02/25/2024 start date, and the previous bill had a 02/19/2024 end date, overlapping bill 2 would be removed. If there was no previous bill, the overlapping bill with the earlier start date was included and the other overlapping bill was removed.
10. Calendarized bills (recalculates billing dates, usage, and total billed days such that bills begin and end at the start and end of each month).
11. Obtained weather data from nearest NOAA weather station using 5-digit zip code per household.
12. Computed Heating Degree Days (HDD) and Cooling Degree Days (CDD) for a range of setpoints. The Evaluators assigned a setpoint of 65°F for both HDD and CDD. The Evaluators tested and selected the optimal temperature base for HDDs and CDDs based on model *R*-squared values.
13. Removed measure cohorts without at least 75 treatment customers.
14. Selected treatment customers with only one type of measure installation during the analysis years and combined customer min/max install dates with billing data (to define pre- and post-periods).
15. Restricted to treatment customers with install dates in specified range (typically January 1, 2024 through June 30, 2024) to allow for sufficient post-period billing data.
16. Restricted to control customers with usage less than or equal to two times the maximum observed treatment group usage. This has the effect of removing control customers with incomparable usage relative to the treatment group.
17. Removed customers with incomplete post-period bills (<6 months).
18. Removed customers with incomplete pre-period bills.
19. Restricted control customers to those with usage that was comparable with the treatment group usage.
20. Created a matched control group using PSM and matching on pre-period seasonal usage and zip code.

Regression Models

The Evaluators ran the following models for matched treatment and control customers for each measure with sufficient participation. For net savings, the Evaluators selected either Model 1 or Model 2. The model with the best fit (highest adjusted R-squared) was selected. The Evaluators utilized Model 3 to estimate gross energy savings.

Model 1: Fixed Effects Difference-in-Difference Regression Model

The following equation displays the first model specification to estimate the average daily savings due to the measure.

Equation 2-3: Fixed Effects Difference-in-Difference (D-n-D) Model Specification

$$ADC_{it} = \alpha_0 + \beta_1(Post)_{it} + \beta_2(Post \times Treatment)_{it} + \beta_3(HDD)_{it} + \beta_4(CDD)_{it} + \beta_5(Post \times HDD)_{it} + \beta_6(Post \times CDD)_{it} + \beta_7(Post \times HDD \times Treatment)_{it} + \beta_8(Post \times CDD \times Treatment)_{it} + \beta_9(Month)_t + \beta_{10}(Customer\ Dummy)_i + \varepsilon_{it}$$

Where,

- *i* = the *i*th household
- *t* = the first, second, third, etc. month of the post-treatment period
- ADC_{it} = Average daily usage reading *t* for household *i* during the post-treatment period
- $Post_{it}$ = A dummy variable indicating pre- or post-period designation during period *t* at home *i*
- $Treatment_i$ = A dummy variable indicating treatment status of home *i*
- HDD_{it} = Average heating degree days (base with optimal Degrees Fahrenheit) during period *t* at home *i*
- CDD_{it} = Average cooling degree days (base with optimal Degrees Fahrenheit) during period *t* at home i *(if electric usage)*
- $Month_t$= A set of dummy variables indicating the month during period *t*
- $Customer\ Dummy_i$ = a customer-specific dummy variable isolating individual household effects
- ε_{it} = The error term
- α_0= The model intercept
- β_{1-10} = Coefficients determined via regression

The Average Daily Consumption (ADC) is calculated as the total monthly billed usage divided by the duration of the bill month. β_2 represents the average change in daily usage in the post-period between the treatment and control group and β_7 and β_8 represent the change in weather-related daily consumption in the post-period between the groups. Typical monthly and annual savings were estimated by extrapolating the β_7 and β_8 coefficients with Typical Meteorological Year (TMY) HDD and CDD data. However, in the case of gas usage, only the coefficient for HDD is utilized because CDDs were not included in the regression model.

The equation below displays how savings were extrapolated for a full year utilizing the coefficients in the regression model and TMY data. TMY data is weighted by the number of households assigned to each weather station.

Equation 2-4: Savings Extrapolation

$$Annual\ Savings = \beta_2 * 365.25 + \beta_7 * TMY\ HDD + \beta_8 * TMY\ CDD$$

Model 2: Random Effects Post-Program Regression Model

The following equation displays the second model specification to estimate the average daily savings due to the measure. The post-program regression (PPR) model combines both cross-sectional and time series data in a panel dataset. This model uses only the post-program data, with lagged energy use for the same calendar month of the pre-program period acting as a control for any small systematic differences between the treatment and control customers; in particular, energy use in calendar month *t* of the post-program period is framed as a function of both the participant variable and energy use in the same calendar month of the pre-program period. The underlying logic is that systematic differences between treatment and control customers will be reflected in the differences in their past energy use, which is highly correlated with their current energy use. These interaction terms allow pre-program usage to have a different effect on post-program usage in each calendar month.

The model specification is as follows:

Equation 2-5: Post-Program Regression (PPR) Model Specification

$$\begin{aligned} ADC_{it} = \alpha_0 &+ \beta_1(Treatment)_i + \beta_2\,(PreUsageSpring)_i + \beta_3(PreUsageSummer)_i \\ &+ \beta_4(PreUsageFall)_i + \beta_5(PreUsageWinter)_i + \beta_6(Month)_t \\ &+ \beta_7(Month \times PreUsageSpring)_{it} + \beta_8(Month \times PreUsageSummer_{)it} \\ &+ \beta_9(Month \times PreUsageFall)_{it} + \beta_{10}(Month \times PreUsageWinter)_{it} + \beta_{11}(HDD)_{it} \\ &+ \beta_{12}(CDD)_{it} + \beta_{13}(Treatment \times HDD)_{it} + \beta_{14}(Treatment \times CDD)_{it} + \varepsilon_{it} \end{aligned}$$

Where,

- *i* = the *i*th household
- *t* = the first, second, third, etc. month of the post-treatment period
- ADC_{it} = Average daily usage for reading *t* for household *i* during the post-treatment period
- $Treatment_i$ = A dummy variable indicating treatment status of home *i*
- $Month_t$ = Dummy variable indicating month of month *t*
- $PreUsageSpring_i$ = Average daily usage in the spring months across household *i*'s available pre-treatment billing reads
- $PreUsageSummer_i$ = Average daily usage in the summer months across household *i*'s available pretreatment billing reads
- $PreUsageFall_i$ = Average daily usage in the fall months across household *i*'s available pretreatment billing reads
- $PreUsageWinter_i$ = Average daily usage in the winter months across household *i*'s available pre-treatment billing reads
- HDD_{it} = Average heating degree days (base with optimal Degrees Fahrenheit) during period *t* at home *i*
- CDD_{it} = Average cooling degree days (base with optimal Degrees Fahrenheit) during period *t* at home i *(if electric usage)*
- ε_{it} = Customer-level random error
- α_0= The model intercept for home *i*
- β_{1-14} = Coefficients determined via regression

The coefficient β_1 represents the average change in consumption between the pre-period and post-period for the treatment group and β_{13} and β_{14} represent the change in weather-related daily consumption in the post-period between the groups. Typical monthly and annual savings were estimated by extrapolating the β_{13} and β_{14} coefficients with Typical Meteorological Year (TMY) HDD and CDD data.

The equation below displays how savings were extrapolated for a full year utilizing the coefficients in the regression model and TMY data.

Equation 2-6: Savings Extrapolation

$$Annual\ Savings = \beta_1 * 365.25 + \beta_{13} * TMY\ HDD + \beta_{14} * TMY\ CDD$$

Model 3: Gross Billing Analysis, Treatment-Only Regression Model

The sections above detail the Evaluator's methodology for estimating net energy savings for each measure. The results from the above methodology report net savings due to the inclusion of the counterfactual comparison group. However, for planning purposes, it is useful to estimate gross savings for each measure. To estimate gross savings, the Evaluators employed a similar regression model; however, only including participant customer billing data. This analysis does not include control group billing data and therefore models energy reductions between the pre-period and post-period for the measure participants (treatment customers).

To calculate the impacts of each measure, the Evaluators applied linear fixed effects regression using participant billing data with weather controls in the form of Heating Degree Days (HDD) and Cooling Degree Days (CDD). The following equation displays the model specification to estimate the average daily savings due to the measure.

Equation 2-7: Treatment-Only Fixed Effects Weather Model Specification

$$ADC_{it} = \alpha_0 + \beta_1(Post)_{it} + \beta_2(HDD)_{it} + \beta_3(CDD)_{it} + \beta_4(Post \times HDD)_{it} + \beta_5(Post \times CDD)_{it} + \beta_6(Customer\ Dummy)_i + \beta_7(Month)_t + \varepsilon_{it}$$

Where,

- *i* = the *i*th household
- *t* = the first, second, third, etc. month of the post-treatment period
- ADC_{it} = Average daily usage for reading *t* for household *i* during the post-treatment period
- HDD_{it} = Average heating degree days (base with optimal Degrees Fahrenheit) during period *t* at home *i*
- CDD_{it} = Average cooling degree days (base with optimal Degrees Fahrenheit) during period *t* at home *i (if electric usage)*
- $Post_{it}$ = A dummy variable indicating pre- or post-period designation during period *t* at home *i*
- $Customer\ Dummy_i$ = a customer-specific dummy variable isolating individual household effects
- ε_{it} = Customer-level random error
- α_0= The model intercept for home *i*

- β_{1-7} = Coefficients determined via regression

The results of the treatment-only regression models are gross savings estimates. The gross savings estimates are useful to compare against the net savings estimates. However, the treatment-only models are unable to separate the effects of national or regional events like a pandemic, recession, or weather event. Therefore, the results from this additional gross savings analysis are unable to reflect actual typical year savings. However, for planning purposes, these estimates may be useful.

Billing Heating Load Estimation

In addition to the regression based IPMVP Option C billing analysis, the Evaluators also employed a heating load estimation billing analysis. Heating load estimation is a prime methodology for estimating savings associated with space heating measures such as furnaces. This methodology follows IPMVP Option A, in which the estimation of a key parameter is used to calculate savings. The heating load estimation methodology follows the same data collection and data preparation steps outlined in the previous sections. However, instead of ending with a regression analysis, post-period billing data are used to estimate customer heating load, which is used as an input in a deemed savings formula to calculate energy savings.

The first step in heating load estimation is calculating TMY3 weather normalized average daily consumption. To do so, customer-specific regressions are run to determine the effect of daily HDD on average daily consumption. This is a straightforward regression of the form:

Equation 2-8: Heating Load Regression

$$ADC_i = \alpha_0 + \beta_1 (HDD)_i$$

Where,

- *i* = the *i*th household
- ADC_i = Average daily usage for household *i* during the post-treatment period
- HDD_i = Average heating degree days (base with optimal Degrees Fahrenheit) at home *i*
- β_1 = Coefficient determined via regression

This regression is run separately for each customer to determine β_1, impact of HDD on average daily consumption (i.e., the change in Therms usage per HDD). From there, β_1 multiplied by HDD is subtracted from ADC and $\beta_1$multiplied by TMY3_HDD is added back to ADC to calculate TMY3 weather normalized average daily consumption. The actual HDD attributable Therms usage is subtracted from average daily consumption and the TMY_HDD attributable Therms are added back in, as outlined in the following equation.

Equation 2-9: Normalized Average Daily Consumption

$$NADC_i = ADC_i - \beta_1 * (HDD)_i + \beta_1 * (TMY\_HDD)_i$$

Where,

- *i* = the *i*th household

- $NADC_i$ = TMY normalized average daily usage for household *i* during the post-treatment period
- β_1 = Customer-specific Therms usage per HDD
- ADC_i = Average daily usage for household *i* during the post-treatment period
- HDD_i = Average heating degree days (base with optimal Degrees Fahrenheit) at home *i*
- TMY_HDD_i = Average TMY heating degree days at home *i*

Once TMY normalized average daily usage is calculated, the penultimate step to heat load estimation is calculating customer baseload usage. Customer baseload usage represents the energy customers use for non-heating needs, such as a gas stove or dryer. For gas heating measures, customer baseload usage can be calculated as the average NADC across June, July, and August. Customer-specific baseload usage is then subtracted from NADC and to determine customer daily heating load.

Customer heating loads are then used in the following deemed savings equation to calculate the annual savings associated with gas furnace installation.

Equation 2-10: Gas Furnace Savings

$$Savings_i = 365 * HL_i * (\frac{1}{Base_i} - \frac{1}{Eff_i})$$

Where,

- *i* = the *i*th household
- $Savings_i$ = Annual Therms savings for household *i* based on post-treatment period billing data
- 365 = Days in the year
- HL_i = Customer-specific daily heating load for household *i*
- $Base_i$ = Baseline furnace efficiency at home *i*, which is assumed to be 85.5% per the RTF Gas Furnace UES Measure[8]
- Eff_i = Installed furnace efficiency at home *i*, which is assumed to be 95%

2.2.4 Net-To-Gross

The Northwest RTF UES measures do not require NTG adjustments as they are built into the deemed savings estimates. In addition, billing analyses with counterfactual control groups, as proposed in our impact methodology, does not require a NTG adjustment, as the counterfactual represents the efficiency level at the current market (i.e. the efficiency level the customer would have installed had they not participated in the program).

2.2.5 Cost-Effectiveness Tests

The Evaluators calculated each program's cost-effectiveness, avoided energy costs, and implementation costs. The Evaluators used our company-developed cost-effectiveness tool to provide cost-effectiveness

[8] https://rtf.nwcouncil.org/measure/residential-gas-furnaces/

assessments for the Residential, Low-Income, and Nonresidential Portfolio by program, fuel type, program year, and measure, for each state.

As specified in this solicitation, the Evaluators determined the economic performance with the following cost-effectiveness tests:

- Total Resource Cost (TRC) test;
- Utility Cost Test (UCT);
- Participant Cost Test (PCT); and
- Rate Impact Measure (RIM).

2.2.6 Non-Energy Benefits

The Evaluators used the non-energy impact (NEI) values estimated and filed in Avista's 2022 Annual Conservation Plan. Measures with quantified NEBs include residential insulation, high efficiency windows, air source heat pumps, and ductless heat pumps.

In addition to the residential NEBs, the Evaluators applied the end-use non-energy benefit and health and human safety non-energy benefit to the Low-Income Program. The Evaluators understand that the two major non-energy benefits referenced above are uniquely applicable to the Low-Income Program. The Evaluators applied those benefits to the program impacts as well as additional non-energy benefits associated with individual measures included in the program. The Evaluators incorporated additional NEBs to the impact evaluation, as applicable. Additional details on the non-energy benefits applied can be found in Section 9.2.

3. Residential Impact Evaluation Results

The Evaluators completed an impact evaluation on Avista's Residential portfolio to verify program-level and measure-level energy savings for PY2024. The following sections summarize findings for each electric impact evaluation in the Residential Portfolio in the Washington service territory. The Evaluators used data collected and reported in the tracking database, online application forms, Avista TRM, RTF, and billing analysis of participants and nonparticipants to evaluate savings. This approach provided the strongest estimate of achieved savings practical for each program, given its delivery method, magnitude of savings, number of participants, and availability of data. Table 3-1 summarizes the Residential verified impact savings by program. Table 3-2 summarizes the Residential portfolio's cost-effectiveness.

Table 3-1: Residential Verified Impact Savings by Program

Program	Expected Savings (kWh)	Verified Savings (kWh)	Verified Realization Rate
Shell	775,436.44	706,619.11	91.13%
ENERGY STAR Homes	79,471.54	68,605.31	86.33%
Appliances	392,255.00	259,749.44	66.22%
Midstream	4,038,575.56	4,809,270.72	119.08%
On Bill Repayment	NA	NA	NA
Home Energy Audit	NA	20,743.25	NA
Total Res	**5,285,738.54**	**5,864,987.84**	**110.96%**

Table 3-2: Residential Portfolio Cost-Effectiveness Summary

Sector	TRC			UCT		
	Benefits	Costs	B/C Ratio	Benefits	Costs	B/C Ratio
Residential	$10,517,324	$6,126,319	1.72	$7,960,518	$4,723,187	1.69

In PY2024, Avista completed and provided incentives for residential electric measures in Washington and reported total electric energy savings of 5,864,987.84 kWh. The Midstream and Shell Programs contribute 91% of total expected savings to the Residential Portfolio and met at least 87% of savings goals based on reported savings leading to an overall achievement of 110.96% of the expected savings for the residential programs. The Evaluators estimated the TRC value for the Residential portfolio is 1.72 while the UCT value is 1.69. Further details of the impact evaluation results by program are provided in the sections following.

3.1 Simple Verification Results

The Evaluators surveyed 2,229 unique customers that participated in Avista's residential energy efficiency program from October 2022 and in December 2023 using an email survey approach. The Evaluators did not complete surveying efforts in the PY2024 evaluation and therefore referenced simple verification responses from the PY2023 impact evaluation.

The Evaluators surveyed customers that received rebates for Water Heat, HVAC, Small Home & MF Weatherization, Appliance, and Midstream Programs in PY2023. For the purposes of this report, the results for the Appliance Program are summarized.

Table 3-3: Summary of Survey Response Rate

Population	Respondents
Initial email contact list	8,262
Invalid or bounced	416
Invalid or bounced email (%)	5.0%
Invitations sent (unique valid)	7,846
Completions	2,229
Response rate (%)	28.4%

3.1.1 In-Service Rates

The Evaluators calculated in-service rates of installed measures from simple verification surveys deployed to program participants for the Appliances Programs. The Evaluators asked participants if the rebated equipment is currently installed and working, in addition to questions about the new equipment fuel type. The Evaluators achieved 5.5% precision across the Washington electric programs surveyed for the electric measures in Avista's service territory, summarized in Table 3-4. When mixing survey-level responses between Idaho and Washington, the Evaluators achieved 4.3% precision (Table 3-5).

Table 3-4: State-Specific Simple Verification Precision by Program

Sector	Program	State-Specific Population	State-Specific Respondents	State-Specific Precision at 90% CI
Residential	Appliances	1,132	181	±5.5%

Table 3-5: Mixed State-Specific Simple Verification Precision by Program

Sector	Program	Mixed State-Specific Population	Mixed State-Specific Respondents	Mixed State-Specific Precision at 90% CI
Residential	Appliances	1,688	298	±4.3%

As previously stated, the Evaluators contacted all customers in the Appliance Program with the goal of reaching 90/10 precision. Because the Appliance Program met 90/10 precision in the state of Washington, the Evaluators applied in service rates appropriate by the state service territory, as summarized in the table below.

Table 3-6: Appliance Program ISRs by Measure

Measure	State-level Respondents	State-level ISR	Mixed State-level Respondents	Mixed State-level ISR	ISR Methodology
E Energy Star Certified Refrigerator and Refrigerator-Freeze	72	96%	113	97%	State-specific ISR
E Energy Star Certified Upright Freezer	10	100%	22	100%	State-specific ISR
E Energy Star Rated Clothes Dryer	51	100%	81	99%	State-specific ISR
E Energy Star Rated Front Load Washer	31	100%	48	100%	State-specific ISR
E Energy Star Rated Top Load Washer	17	100%	25	100%	State-specific ISR

These ISR values were utilized in the desk reviews for each of the measures listed above in order to calculate verified savings. Additional insights from the survey responses are summarized in Appendix B.

3.2 Program-Level Impact Evaluation Results

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Residential sector in the section below.

3.2.1 Shell Program

The Shell Program provides incentives to customers for improving the integrity of the home's envelope with upgrades to windows and storm windows. Rebates are issued after the measure has been installed for insulation and window measures. Participating homes must have electric or natural gas heating and itemized invoices including measure details such as insulation levels, window values, and square footage. In order to be eligible for incentive, the single-family households, including fourplex or less, must demonstrate an annual electricity usage of at least 8,000 kWh or an annual gas usage of at least 340 Therms. Primary Multifamily homes with shared interior walls including apartments, duplexes, townhomes, and condos have no minimum usage requirement. Seasonal and recreational homes are not eligible. This program includes free manufactured home duct sealing implemented by UCONS. Table 3-7 summarizes the measures offered under this program.

Table 3-7: Shell Program Measures

Measure	Description	Impact Analysis Methodology
E Attic Insulation With Electric Heat	Attic insulation for homes heated with electricity	RTF UES
E Energy Star Certified Insulated Door	Replace door with ENERGY STAR rated door in homes heated with electricity	RTF UES
E Floor Insulation With Electric Heat	Floor insulation for homes heated with electricity	RTF UES
E Sliding Glass Doors with Electric Heat	High efficiency sliding glass door replacement for homes heated with electricity	RTF UES
E Wall Insulation With Electric Heat	Wall insulation for homes heated with electricity	RTF UES
E Window DIY Replc With Electric Heating	High-efficiency double pane window replacement for homes heated with electricity installed by home owner	RTF UES
E Window Replc from Single Pane W Electric Heat	High-efficiency double pane window replacement for homes heated with electricity installed by contractor	RTF UES
E Multifamily Attic Insulation With Electric Heat	Attic insulation for homes heated with electricity	RTF UES
E Multifamily Energy Star Certified Insulated Door	Replace door with ENERGY STAR rated door in homes heated with electricity	RTF UES
E Multifamily Floor Insulation With Electric Heat	Floor insulation for homes heated with electricity	RTF UES
E Multifamily Sliding Glass Doors with Electric Heat	High efficiency sliding glass door replacement for homes heated with electricity	RTF UES
E Multifamily Wall Insulation With Electric Heat	Wall insulation for homes heated with electricity	RTF UES

Measure	Description	Impact Analysis Methodology
E Multifamily Window DIY Replc With Electric Heating	High-efficiency double pane window replacement for homes heated with electricity installed by home owner	RTF UES
E Multifamily Window Replc from Single Pane W Electric Heat	High-efficiency double pane window replacement for homes heated with electricity installed by contractor	RTF UES

The following table summarizes the adjusted and verified electric energy savings for the Shell Program impact evaluation.

Table 3-8: Shell Program Verified Electric Savings

Measure	PY2024 Participation	Expected Savings (kWh)	Adjusted Savings (kWh)	Verified Savings (kWh)	Verified Realization Rate
E Attic Insulation With Electric Heat	153	285,363.06	285,363.06	169,774.09	59.49%
E Energy Star Certified Insulated Door	34	37,600.00	37,600.00	37,600.00	100.00%
E Floor Insulation With Electric Heat	10	7,027.74	6,216.85	5,169.33	73.56%
E Sliding Glass Doors with Electric Heat	30	13,561.80	13,561.80	7,777.04	57.35%
E Wall Insulation With Electric Heat	23	38,666.32	38,666.32	40,781.35	105.47%
E Window DIY Replc With Electric Heating	22	14,877.50	8,397.41	8,349.01	56.12%
E Window Replc from Single Pane W Electric Heat	268	275,565.36	190,942.18	171,036.64	62.07%
E Multifamily Attic Insulation With Electric Heat	16	13,206.96	24,083.28	11,779.32	89.19%
E Multifamily Energy Star Certified Insulated Door	7	6,400.00	6,400.00	6,400.00	100.00%
E Multifamily Floor Insulation With Electric Heat	1	1,837.44	728.64	1,891.24	102.93%
E Multifamily Sliding Glass Doors with Electric Heat	50	16,295.69	16,295.69	6,774.55	41.57%
E Multifamily Wall Insulation With Electric Heat	2	8,051.20	4,203.20	9,076.29	112.73%
E Multifamily Window DIY Replc With Electric Heating	4	5,205.72	3,570.64	16,748.60	321.73%
E Multifamily Window Replc from Single Pane W Electric Heat	95	51,777.65	43,030.90	213,461.64	412.27%
Total	**715**	**775,436.44**	**679,059.96**	**706,619.11**	**91.13%**

The Shell Program displayed verified savings of 706,619.11 kWh with a realization rate of 91.13% against the expected savings for the program. The following table summarizes the incentive and non-incentive costs associated with the program.

Table 3-9: Shell Program Costs by Measure

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
E Attic Insulation With Electric Heat	$230,086.50	$140,378.40	$370,464.90
E Energy Star Certified Insulated Door	$4,700.00	$29,266.55	$33,966.55
E Floor Insulation With Electric Heat	$13,415.50	$4,274.28	$17,689.78
E Sliding Glass Doors with Electric Heat	$20,160.00	$4,442.64	$24,602.64
E Wall Insulation With Electric Heat	$40,498.61	$33,720.22	$74,218.83
E Window DIY Replc With Electric Heating	$10,880.00	$6,903.42	$17,783.42
E Window Replc from Single Pane W Electric Heat	$356,000.00	$141,422.35	$497,422.35
E Attic Insulation With Electric Heat	$18,420.00	$9,739.78	$28,159.78
E Energy Star Certified Insulated Door	$800.00	$5,291.87	$6,091.87
E Floor Insulation With Electric Heat	$1,584.00	$1,563.78	$3,147.78
E Sliding Glass Doors with Electric Heat	$25,440.00	$3,869.97	$29,309.97
E Wall Insulation With Electric Heat	$1,952.00	$7,504.77	$9,456.77
E Window DIY Replc With Electric Heating	$1,195.45	$13,848.65	$15,044.10
E Window Replc from Single Pane W Electric Heat	$63,847.00	$176,501.63	$240,348.63
Total	**$788,979.06**	**$578,728.30**	**$1,367,707.36**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Shell Program in the section below.

3.2.1.1 Database Review & Verification

The following sections describe the Evaluator's database review and document verification findings for the Shell Program.

3.2.1.2 Database Review & Document Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Shell Program. The Evaluators selected a random subset of rebate applications to cross-verify tracking data inputs, summarized in Section 2.2.2.4.

The Evaluators reviewed each measure number of units, square footage, and insulation where available. Not all of the rebated projects provided sufficient documentation to verify each of the specifications that the Evaluators reviewed such as number of units for windows and square footage quantities for insulation measures.

The Evaluators found 7 window projects that contained discrepancies with square footage and quantity. For example, one of the projects were found to have 4 windows, but the ex-ante calculations provided the amount of savings for 7.5 windows. Additionally, the Evaluators found that three of the sampled wall insulation projects did not provide documentation that specified the R-Value and square footage associated with the measure.

The Evaluators used the Avista TRM to determine adjusted savings and RTF UES values for verified savings. The Evaluators found that verified attic insulation, wall insulation, and window measure savings were lower than expected savings primarily due to the differences between the categories applied in the Avista TRM prescriptive savings values and the more detailed categories present with unique RTF UES

values associated with unique heating type, R-values and climate zone. The lack of granularity in the Avista TRM data led to a low realization rate for attic insulation and window measures.

The Evaluators found no duplicate rebates in the project data and therefore did not remove any rebates from verified savings.

3.2.1.3 Verification Surveys

In PY2023, the Evaluators conducted a verification survey for the Energy Star door measure and found that the in-service rate was 100%. Since a verification survey was not completed in PY2024, the Evaluators applied this in service rate to the appropriate projects in PY2024. The Evaluators did not conduct verification surveys for the other measures in the Shell Program since weatherization measures historically have high verification rates.

3.2.1.4 Impact Analysis

This section summarizes the verified savings results for the Shell Program. The Evaluators calculated verified savings for the electric measures using the RTF workbook in place at the time the savings goals for the program were finalized. The Evaluators calculated adjusted savings for each measure using the active Avista TRM values and verified tracking data. These UES values were applied to a random sample of participants, with verification of project documents such as rebate applications to verify installation, quantity, and efficiency of the equipment.

3.2.1.5 Verified Savings

The Shell Program in total displays a realization rate of 91.13% with 706,619.11 kWh verified electric energy savings in the Washington service territory, as displayed in Table 3-8.

The realization rate for the electric savings in the Shell Program deviates from 100% due primarily to the differences between the categories applied in the Avista TRM prescriptive savings values and the more detailed categories present with unique RTF UES values.

The E Window Replc With Natural Gas Heat and E Window DIY Replc With Electric Heat measures deviated from 100% because there were discrepancies in the documentation provided in terms of square footage and unit quantity verification. Many rebate forms only provided the window type and the price whereas the square footage of the heated area as well as the quantity of windows greatly affects the realization rate. The Evaluators made assumptions for some of these discrepancies based on the documentation provided.

The Attic Insulation measure realization rate for single-family dwellings deviates from 100% because the RTF assigns unit savings determined by heating zone and heating type. The RTF verified savings result in per unit square footage kWh impacts between 0.52 and 2.16, while the Avista TRM assigns a value of 1.86 kWh per square foot, regardless of heating type. The realization rate deviates further because the majority of homes that participated in attic insulation retrofits displayed zonal heating type. Therefore, the average verified kWh saved per square foot among participants is closer to 0.6 than 1.86. The same was found for multi-family homes. The Evaluators recommend Avista update the Avista TRM value to reflect participation home characteristics.

The Single Family Floor Insulation measure deviates from 100% in realization primarily due to the Avista TRM assigning 0.69 kWh per unit for floor insulation with gas heating while the RTF assigns a value of 0.57 kWh per unit. The Evaluators found that the ex-ante calculations could potentially be using inflated square footage values of the entire home instead of the heated areas.

In conclusion, the Evaluators found that weatherization measures such as insulation and windows had the lowest verified realization rates in the Shell program in PY2024. In addition to the discrepancy in applied unit energy savings values, the Evaluators identified many discrepancies in the documentation provided in terms of square footage and unit quantity verification which caused savings to deviate from 100%.

3.2.2 ENERGY STAR® Homes Program

The ENERGY STAR® Homes Program provides rebates for homes within Avista's service territory that attain an ENERGY STAR® certification. This program incentivizes for ENERGY STAR® Eco-rated homes. Table 3-10 summarizes the measures offered under this program.

Table 3-10: ENERGY STAR® Homes Program Measures

Measure	Description	Impact Analysis Methodology
G ENERGY STAR Home - Manufactured, Gas Only	ENERGY STAR-rated manufactured home with natural gas	RTF UES
E ENERGY STAR Home - Manufactured, Electric Only	ENERGY STAR-rated manufactured home with electric furnace	RTF UES
E ENERGY STAR Home - Manufactured, Gas & Electric	ENERGY STAR-rated manufactured home with gas and electric	RTF UES

The following table summarizes the verified electric energy savings for the ENERGY STAR® Homes Program impact evaluation.

Table 3-11: ENERGY STAR® Homes Program Verified Electric Savings

Measure	PY2024 Participation	Expected Savings (kWh)	Adjusted Savings (kWh)	Verified Savings (kWh)	Verified Realization Rate
WA-ElectricE Energy Star Home - Manufactured, Gas & Electric	1	3,022.00	3,022.00	24.33	0.81%
WA-ElectricE Energy Star Home - Manufactured, Electric Only	26	76,449.54	79,682.33	68,580.98	89.71%
Total	**27**	**79,471.54**	**82,704.33**	**68,605.31**	**86.33%**

The ENERGY STAR® Homes Program displayed verified savings of 68,605.31 kWh with a realization rate of 86.33% against the expected savings for the program. The following table summarizes the incentive and non-incentive costs associated with the program.

Table 3-12: ENERGY STAR® Homes Program Costs by Measure

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
WA-ElectricE Energy Star Home - Manufactured, Gas & Electric	$1,000.00	$20.12	$1,020.12
WA-ElectricE Energy Star Home - Manufactured, Electric Only	$26,000.00	$56,706.47	$82,706.47
Total	**$27,000.00**	**$56,726.59**	**$83,726.59**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the ENERGY STAR® Homes Program in the section below.

3.2.2.1 Database Review & Verification

The following sections describe the Evaluator's database review and document verification findings for the ENERGY STAR® Homes Program.

3.2.2.2 Database Review & Document Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the ENERGY STAR® Homes Program. The Evaluators selected a random subset of rebate applications to cross-verify tracking data inputs, summarized in Section 2.2.2.4.

The Evaluators found no duplicate rebates in the project data and therefore did not remove any rebates from verified savings. The Evaluators found all Energy Star Home Program rebates to have project documentation with the associated NEEM Certification.

The Evaluators found all three "Gas & Electric" manufactured homes have gas space and water heating. While the homes certainly seem to have electric components (e.g., an ES qualified dishwasher), gas is the primary fuel suggesting "Gas Only" might be the more appropriate assignment.

3.2.2.3 Verification Surveys

The Evaluators did not conduct verification surveys for the ENERGY STAR® Homes Program.

3.2.2.4 Impact Analysis

This section summarizes the verified savings results for the ENERGY STAR® Homes Program. The Evaluators calculated verified savings for the electric measures using the RTF workbook in place at the time the savings goals for the program were finalized. These RTF UES values were applied to a random sample of participants, with verification of project documents such as rebate applications to verify installation, quantity, and efficiency of the equipment.

3.2.2.5 Verified Savings

The Evaluators reviewed the Avista TRM values along with verified tracking data to estimate adjusted program savings for each of the ENERGY STAR® Homes measures. In addition, the Evaluators reviewed and applied the current RTF UES values for each measure along with verified tracking data to estimate net program savings.

The ENERGY STAR® Homes Program in total displays a realization rate of 86.33%% with 68,605.31 kWh verified electric energy savings in the Washington service territory, as displayed in Table 3-11. The realization rate for the electric savings in the ENERGY STAR® Homes Program deviates from 100% due to the categorical differences between the applied Avista TRM prescriptive savings value and the more detailed RTF UES categories.

The realization for the E ENERGY STAR® Home – Manufactured, Electric Only measure is lower than 100% because the expected savings that were claimed do not take heating zones and cooling zones into account, which does not align with the RTF values by heating and cooling zone. The Evaluators assigned electric savings from the RTF associated with the appropriate heating and cooling zones rather than defaulting to an average value across all zones. The Evaluators recommend updating Avista measure savings to reflect heating zone-specific RTF measure savings rather than averaging savings from heating zones together.

The realization for the E ENERGY STAR® Home – Manufactured, Gas & Electric measure is low because the expected savings employed an additive methodology between a gas-heated home and an electric-

heated home for the electric savings. However, the Evaluators reviewed the RTF and determined manufactured home electric savings for a fully natural gas heated home would be closer to the savings a gas heated home with electricity would save. The Evaluators verified that all dual fuel homes were heated primarily with natural gas. Therefore, the Evaluators assigned electric savings from the RTF associated with a fully natural gas-heated home using the appropriate heating zone.

The realization for the E ENERGY STAR® Home – Manufactured, Gas & Electric measure in PY2024 was 100% because the Evaluators verified that the primary heating system for the dual fuel homes was electric. Therefore, they save energy closer to the fully electric heated home. In PY2024, this was the opposite: the Evaluators found 100% of the dual fuel homes had gas heating, therefore the homes displayed 1% RR for electric and 158% RR for gas savings)

The Evaluators did not conduct a verification survey for the ENERGY STAR® Homes Program and therefore did not adjust verified savings with an ISR.

3.2.3 Appliances Program

The Appliances Program is a residential prescriptive program that offers incentives for customers to upgrade their existing clothes washers/dryers, refrigerators/freezers, and smart thermostats to ENERGY STAR-rated products. Primary Multifamily homes with shared interior walls including apartments, duplexes, townhomes, and condos have no minimum usage requirement. Seasonal and recreational homes are not eligible.

This section summarizes the impact results of the evaluation results for the Appliances Program. Table 3-13 summarizes the measures offered under this program.

Table 3-13: Appliances Program Measures

Measure	Description	Impact Analysis Methodology
E Energy Star Certified Refrigerator and Refrigerator-Freeze	ENERGY STAR-certified refrigerator or refrigerator with freezer for residential homes	RTF UES
E Energy Star Certified Upright Freezer	ENERGY STAR-certified standard or compact freezers for residential homes	RTF UES
E Energy Star Rated Clothes Dryer	ENERGY STAR-certified clothes dryer for residential homes	RTF UES
E Energy Star Rated Front Load Washer	ENERGY STAR-certified front loading clothes washer for residential homes	RTF UES
E Energy Star Rated Top Load Washer	ENERGY STAR-certified top loading clothes washer for residential homes	RTF UES
E Smart Thermostat DIY with Electric Heat	ENERGY STAR-certified Smart Thermostat with DIY install for residential homes	RTF UES
E Smart Thermostat Paid Install with Electric Heat	ENERGY STAR-certified Smart Thermostat with Paid Install for residential homes	RTF UES

The following table summarizes the verified electric energy savings for the Appliances Program impact evaluation.

Table 3-14: Appliances Program Verified Electric Savings

Measure	PY2024 Units	Expected Savings (kWh)	Adjusted Savings (kWh)	Verified Savings (kWh)	Realization Rate
E Energy Star Certified Refrigerator and Refrigerator-Freeze	443	54,560.00	57,040.00	4,286.91	7.86%
E Energy Star Certified Upright Freezer	50	3,015.00	4,522.50	962.53	31.92%
E Energy Star Rated Clothes Dryer	310	87,314.00	87,314.00	90,551.90	103.71%
E Energy Star Rated Front Load Washer	186	21,720.00	21,720.00	21,717.99	99.99%
E Energy Star Rated Top Load Washer	39	962.00	0.00	0.00	0.00%
E Smart Thermostat DIY with Electric Heat	108	81,641.00	69,978.00	58,302.94	71.41%
E Smart Thermostat Paid Install with Electric Heat	117	88,382.00	78,561.78	49,518.43	56.03%
E Multifamily Energy Star Certified Refrigerator and Refrigerator-Freeze	18	2,108.00	2,108.00	238.78	11.33%
E Multifamily Energy Star Certified Upright Freezer	1	67.00	67.00	10.56	15.76%
E Multifamily Energy Star Rated Clothes Dryer	3	870.00	866.41	838.33	96.36%
E Multifamily Energy Star Rated Front Load Washer	7	840.00	840.00	839.92	99.99%
E Multifamily Energy Star Rated Top Load Washer	0	0.00	0.00	0.00	NA
E Multifamily Smart Thermostat DIY with Electric Heat	75	49,400.00	49,400.00	31,578.82	63.92%
E Multifamily Smart Thermostat Paid Install with Electric Heat	2	1,300.00	1,300.00	831.02	63.92%
E Multifamily Line Voltage Smart Thermostat Electric Baseboard	1	76.00	76.00	71.30	93.82%
Total	**1,360**	**392,255.00**	**373,793.69**	**259,749.44**	**66.22%**

The Appliances Program displayed verified savings of 259,749.44 kWh with a realization rate of 66.22% against the expected savings for the program. The following table summarizes the incentive and non-incentive costs associated with the program.

Table 3-15: Appliances Program Costs by Measure

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
E Energy Star Certified Refrigerator and Refrigerator-Freeze	$44,000.00	$1,279.37	$45,279.37
E Energy Star Certified Upright Freezer	$2,300.00	$335.31	$2,635.31
E Energy Star Rated Clothes Dryer	$14,900.00	$22,839.43	$37,739.43
E Energy Star Rated Front Load Washer	$9,050.00	$6,361.68	$15,411.68
E Energy Star Rated Top Load Washer	$1,850.00	$0.00	$1,850.00
E Smart Thermostat DIY with Electric Heat	$14,998.69	$6,923.78	$21,922.47
E Smart Thermostat Paid Install with Electric Heat	$23,600.00	$5,880.57	$29,480.57
E Energy Star Certified Refrigerator and Refrigerator-Freeze	$1,700.00	$71.26	$1,771.26
E Energy Star Certified Upright Freezer	$50.00	$3.68	$53.68
E Energy Star Rated Clothes Dryer	$150.00	$211.45	$361.45
E Energy Star Rated Front Load Washer	$350.00	$246.03	$596.03
E Energy Star Rated Top Load Washer	$0.00	$0.00	$0.00
E Smart Thermostat DIY with Electric Heat	$11,400.00	$3,750.15	$15,150.15
E Smart Thermostat Paid Install with Electric Heat	$400.00	$98.69	$498.69
E Multifamily Line Voltage Thermostat Electric Baseboard	$20.00	$26.10	$46.10
Total	**$124,768.69**	**$48,027.50**	**$172,796.19**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for Appliances Program in the section below.

3.2.3.1 Database Review & Verification

The following sections describe the Evaluator's database review and document verification findings for the Appliances Program.

3.2.3.2 Database Review & Document Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Appliance Program. The Evaluators selected a random subset of rebate applications to cross-verify tracking data inputs, summarized in Section 2.2.2.4.

The rebate application form sufficiently collects all required RTF measure specification details. All rebate applications and tracking data contained appropriate AHRI documentation or model numbers to verify model specifications. The Evaluators were able to verify the models for RTF specifications for most projects. For projects in which the model number was missing or not listed on the ENERGY STAR qualified product list, the Evaluators imputed these values based on the closest relative.

The Evaluators found that three of the sampled refrigerator/freezer measures were ESME-rated. Although most models met ENERGY STAR Requirements, the expected savings values applied to each refrigerator/freezer was the ESME-rated UES defined by the RTF, which is significantly higher than ENERGY STAR-qualified products. This led to a low realization rate for these measure categories. The Evaluators found that eight smart thermostat projects did not qualify based on Energy Star requirements.

The Evaluators found no duplicate rebates in the project data and therefore did not remove any rebates from verified savings.

3.2.3.3 Verification Surveys

In PY2023, the Evaluators randomly selected a subset of participant customers to survey for simple verification of installed measure described in Section 2.2.2.5. The Evaluators included questions such as:

- What type of clothes washer/dryer did this clothes washer/dryer replace?
- Is your home space heating with electricity or natural gas?
- Was the previous equipment functional?
- Is the newly installed equipment still properly functioning?

The responses to this verification survey in 2023 were used to calculate ISRs for the measures offered in the Appliances Program in 2023 and were subsequently used to quantify ISRs in 2024. The responses to these additional questions can be found in Appendix B.

Table 3-16 displays the ISRs for each of the Appliances measures for the Washington electric territory alone, completed in PY2023. The ISRs resulted in 5.03% precision at the 90% confidence interval for the program.

Table 3-16: Appliances Verification Survey ISR Results

Measure	Number of Rebates	Number of Survey Completes	Precision at 90% Confidence	In-Service Rate
E Energy Star Certified Refrigerator and Refrigerator-Freeze	483	72	90% ± 5.03%	96%
E Energy Star Certified Upright Freezer	58	10		100%
E Energy Star Rated Clothes Dryer	320	51		100%
E Energy Star Rated Front Load Washer	186	31		100%
E Energy Star Rated Top Load Washer	85	17		100%
E Smart Thermostat DIY with Electric Heat	79	15		100%
E Smart Thermostat Paid Install with Electric Heat	178	29		100%
E Multifamily Energy Star Certified Insulated Door	5	0		100%
E Multifamily Energy Star Certified Refrigerator and Refrigerator-Freeze	12	1		100%
E Multifamily Energy Star Rated Clothes Dryer	16	0		100%
E Multifamily Energy Star Rated Front Load Washer	9	0		100%
E Multifamily Energy Star Rated Top Load Washer	4	0		100%
E Multifamily Line Voltage Thermostat Electric Baseboard	1	0		100%
E Multifamily Smart Thermostat DIY with Electric Heat	3	0		100%
E Multifamily Smart Thermostat Paid Install with Electric Heat	5	0		100%
E Multifamily Energy Star Certified Upright Freezer	0	No Participation		100%*

*Assume 100% ISR due to lack of participation in PY2023 survey efforts

The Evaluators applied the ISRs listed in Table 3-16 to each rebate to quantify verified savings for each measure, as appropriate.

3.2.3.4 Impact Analysis

This section summarizes the verified savings results for the Appliances Program. The Evaluators calculated verified savings for the electric measures using the RTF workbook in place at the time the savings goals for the program were finalized.

3.2.3.5 Verified Savings

The Evaluators reviewed the Avista TRM values along with verified tracking data to estimate net adjusted program savings for those measures. The Appliances Program displayed 66.22% realization with 259,749.44 kWh saved, as displayed in Table 3-14.

The program verified savings resulted in a realization rate of less than 100% largely due to low savings attributed to E Energy Star Certified Refrigerator and Refrigerator-Freeze and E Energy Star Certified Upright Freezer projects. All fridge-freezer projects were verified to be ENERGY STAR-qualified, but not ENERGY STAR Most Efficient (ESME) qualified. The low realization rate for the fridge-freezer measure is due to the difference in RTF savings value between ENERGY STAR fridge-freezers (about 45kWh/year) and ESME fridge-freezers (about 124 kWh). Avista TRM references the Standard Size Refrigerator and Refrigerator-Freezer - Side-mounted Freezer - ESME at 124 kWh/year savings, but the Evaluators found that no rebated fridges met this requirement, and therefore lower RTF savings were applied.

Similarly, for the upright freezer measure, all projects were verified to be ENERGY STAR-qualified, but not ESME-qualified. The low realization rate is due to the difference in Avista TRM and RTF savings values. The RTF assigns ENERGY STAR freezers 18 kWh/unit, while ESME freezers are assigned 67 kWh/unit. The Avista TRM references the Standard Size Freezer - Upright – ESME savings at 67 kWh/year savings. However, because the Evaluators found that no freezers met the ESME qualifications, the lower ENERGY STAR savings values were applied to each project.

Lastly, two sampled thermostat models were found to not qualify based on RTF Connected Thermostat minimum requirements. The Evaluators assigned 0 kWh savings for these projects, therefore providing a downward adjustment on verified savings. The expected savings for a Smart Thermostat measure was defined as 749 kWh in the Avista TRM, which is in line with the RTF savings for a Smart Thermostat using an electric Air Source Heat Pump with direct install and resistance optimization in heating zone 2; however, the expected savings were also applied to projects verified to have electric forced-air furnace, which the RTF UES assigns lower savings (195.36 kWh per Smart Thermostat). Therefore, a portion of the smart thermostat verified savings were lower than the expected savings claimed for the measure.

3.2.4 Midstream Program (Residential)

Avista converted several residential and nonresidential measures from a downstream delivery channel to a midstream delivery channel via local distributors. As Avista notes, midstream approaches have proven successful in other parts of the Pacific Northwest, as well as nationally.

The Midstream Program currently offers midstream incentives to residential customers for measures such as:

- Residential heat pump water heaters (retrofit & new construction)
- Residential split unitary equipment (retrofit & new construction)
- Residential mini split systems (retrofit & new construction)

The residential midstream measures and impact evaluation results are presented in this section. This change in delivery channel, from downstream to midstream, seems to have expanded the benefits gained by Avista residential customers.

This section summarizes the estimated savings Avista has calculated for the Midstream Program. Table 3-17 summarizes the measures offered under this program.

Table 3-17: Midstream Program Measures

Measure	Description	Impact Analysis Methodology
E Heat Pump Water Heater (New Construction)	New Construction High efficiency heat pump water heater installation	Engineering Algorithm with RTF Current Practice Baseline Adjustments
E Heat Pump Water Heater (Retrofit)	Retrofit High efficiency heat pump water heater installation	
E Mini Split (New Construction)	New Construction mini split Air Source Heat Pump installation	
E Mini Split (Retrofit)	Retrofit mini split Air Source Heat Pump installation	
E Split Unitary Equipment (New Construction)	New Construction split Air Source Heat Pump installation	
E Split Unitary Equipment (Retrofit)	Retrofit split Air Source Heat Pump installation	

The following table summarizes the estimated electric energy savings for the Midstream Program impact evaluation.

Table 3-18: Midstream Program Verified Electric Savings

Measure	PY2024 Units	Expected Savings (kWh)	Verified Savings (kWh)	Realization Rate
E Heat Pump Water Heater (New Construction)	484	771,662.45	771,662.45	100.00%
E Heat Pump Water Heater (Retrofit)	18	28,615.30	28,615.30	100.00%
E Mini Split (New Construction)	970	1,094,395.53	1,451,688.83	132.65%
E Mini Split (Retrofit)	314	646,541.63	810,631.96	125.38%
E Split Unitary Equipment (New Construction)	112	272,909.41	274,319.14	100.52%
E Split Unitary Equipment (Retrofit)	759	1,224,451.24	1,472,353.03	120.25%
Total	**2,657**	**4,038,575.56**	**4,809,270.72**	**119.08%**

The Midstream Program displayed estimated savings of 4,809,270.72 kWh with a realization rate of 119.08%. The following table summarizes the incentive and non-incentive costs associated with the program.

Table 3-19: Midstream Program Costs by Measure

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
E Heat Pump Water Heater (New Construction)	$97,400.00	$210,582.11	$307,982.11
E Heat Pump Water Heater (Retrofit)	$11,700.00	$7,808.95	$19,508.95
E Mini Split (New Construction)	$480,800.00	$629,329.96	$1,110,129.96
E Mini Split (Retrofit)	$180,450.00	$351,421.72	$531,871.72
E Split Unitary Equipment (New Construction)	$56,300.00	$118,921.67	$175,221.67
E Split Unitary Equipment (Retrofit)	$299,400.00	$638,288.22	$937,688.22
Total	**$1,126,050.00**	**$1,956,352.62**	**$3,082,402.62**

The Evaluators describe the impact evaluation tasks completed for this program in the subsections below.

3.2.4.1 Database Review & Verification

The following sections describe the Evaluator's database review and document verification findings for the Midstream Program.

3.2.4.2 Database Review & Document Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Midstream Pilot. The Evaluators selected a subset of rebates to cross-verify tracking data inputs, summarized in in Section 2.2.2.4.

The Evaluators found all 46 selected rebates documented the information necessary to accurately characterize savings for the program within the Washington electric service territory. The Evaluators verified the model number, efficiency, quantity, and RTF UES values necessary to calculate verified savings. The Midstream tracking data is tracked and delivered separately from the remaining residential portfolio, often demonstrating extensive detail on product characteristics.

3.2.4.3 Verification Surveys

The Evaluators did not conduct verification surveys for the Midstream Program in PY2024 due to the nature of the midstream delivery channel; customers are not aware that they are participating in the program because they are not required to fill out a downstream rebate application.

3.2.4.4 Impact Analysis

This section summarizes the verified savings results for the Midstream Program. The Evaluators attempted to conduct a billing analysis for each measure with sufficient participation. For measures in which billing analysis was not feasible or displayed inconclusive results, the Evaluators evaluated verified savings for the measure through the Regional Technical Forum workbooks in place at the time of the biennium plan for the Midstream Program.

The Evaluators note that the expected savings workbook values from the implementer vary slightly from the RTF UES for each of the measures. For this reason, it is expected that the realization rate will portray discrepancies between the expected and verified savings.

The Evaluators estimated verified savings using RTF UES workbooks in the RTF's residential sector.

3.2.4.5 Billing Analysis

The Evaluators did not identify statistically significant savings for these measures through a billing analysis and therefore used engineering algorithms with RTF baselines to estimate verified savings through the program.

3.2.4.6 Verified Savings

The Evaluators reviewed the implementer expected savings values along with verified tracking data to estimate net adjusted program savings for those measures. In order to calculate verified savings, the Evaluators utilized industry-standard engineering algorithms using purchased equipment efficiency values and RTF-defined market practice baseline values, where appropriate. The Midstream Program displayed 119.08% realization with 4,809,270.72 kWh saved, as displayed in Table 3-18. The Evaluators concluded that the implementers correctly estimated expected savings values for a portion of the projects, and incorrectly defined above market practice efficiency baseline for a portion of projects. The Evaluators recommend incorporating appropriate baselines for each project, reflecting the RTF market practice baseline present in the year in which the project was installed.

3.2.5 Home Energy Audit Program

The Residential Home Energy Audit Program is designed to educate and generate interest in efficiency in general and, more specifically, in Avista's portfolio of residential energy efficiency and renewable-energy programs. The Evaluators completed a billing analysis of the census of participants to identify the educational impact of the program on customers' energy usage behaviors while removing savings claimed and verified from other program participation. The following table summarizes the verified electric energy savings for the Home Energy Audit Program impact evaluation.

Table 3-20: Home Energy Audit Program Verified Electric Savings

Measure	PY2024 Participation	Expected Savings (kWh)	Adjusted Savings (kWh)	Verified Savings (kWh)	Verified Realization Rate
Home Energy Audit	271	NA	NA	20,743.25	NA
Total	**271**	**NA**	**NA**	**20,743.25**	**NA**

The Home Energy Audit Program displayed verified savings of 20,743.25 kWh. Avista did not estimate claimed savings for this program, and therefore the realization rate is not applicable to the program. The following table summarizes the incentive and non-incentive costs associated with the program.

Table 3-21: Home Energy Audit Program Costs by Measure

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
Home Energy Audit	$0.00	$554.12	$554.12
Total	**$0.00**	**$554.12**	**$554.12**

The Evaluators summarize the program-specific impact analysis activities, results, conclusions, and recommendations for the Home Energy Audit Program in the section below.

3.2.5.1 Database Review & Verification

The following sections describe the Evaluator's database review and document verification findings for the Home Energy Audit Program.

3.2.5.2 Database Review & Document Verification

Before conducting the billing analysis, the Evaluators conducted a database review for the Home Energy Audit Program. The Evaluators reviewed the list of participants of the Home Energy Audit Program in PY2024. The Evaluators identified participating customers with electric service in the Washington service territory. The Evaluators found no duplicate participants in the project data and found that program data appropriately reflected customer rate information.

3.2.5.3 Verification Surveys

The Evaluators did not conduct verification surveys for the Home Energy Audit Program in PY2024.

3.2.5.4 Impact Analysis

This section summarizes the verified savings results for the Home Energy Audit Program. ADM conducted the following impact evaluation methodologies to estimate verified net energy savings in the Residential Home Energy Audit Program:

- Billing Analysis with counterfactual group (IPMVP Option C)

This program provides direct install measures to customers. The Avista auditor may provide recommendations for improvements that may be rebated through Avista's programs. In addition, the Avista auditor may also provide recommendations for home improvements that Avista does not currently incent for. Therefore, in order to capture this combination of effects, ADM conducted a billing analysis with a counterfactual group selected via propensity score matching. The methodology used to select the quasi-experimental counterfactual group and the methodology for linear regression billing analysis are summarized in further detail in Section 2.2.3.2: Billing Analysis.

The measures rebated by the customer through other Avista channels were removed from the average household billing analysis results, in order to remove double counting effects.

Due to the participation rate, the Evaluators included Washington Electric, Washington Gas, Idaho Electric, and Idaho gas participants in the census billing analysis, which reflect statistically significant electric impacts for the program. The Evaluators then removed double counted savings by removing verified downstream rebate impacts from the billing analysis regression results. These resulting energy savings values per household were applied to the census of participants, weighted to reflect the number of customers with full year program participation.

3.2.5.5 Verified Savings

The Evaluators conducted a census billing analysis to estimate the impacts of the education efforts of the Home Energy Audit Program. The table below provides annual savings per customer for the Home Energy Audit Program after removing double counted savings from other downstream programs. Total double counted program savings was estimated to be 2,711.66 kWh, or approximately 11% of observed savings through billing analysis. After removing double counted savings from program impacts reflected in the regression model, the total program savings was verified to be 20,743.25, or 168.18 kWh per customer per year, or 1.66% of annual electric household consumption.

Table 3-22: Double Counted Savings Removed, Home Energy Audit Program

Treatment Customers	Weighted Treatment Customers	Annual Savings per Customer, Regression Estimate (kWh)	Program Impacts Regression Model (kWh)	Program Double Counted Savings (kWh)	Program Verified Savings (kWh)
271	123	212.91	23,454.90	2,743.66	**20,743.25**

The Evaluators provide additional detail on the billing analysis completed for this program in Appendix A.

3.2.6 On Bill Repayment Program

The On-Bill Repayment/Financing Program provides on-bill repayment/financing programs for residential and small business customers. Avista's on-bill repayment (OBR)/financing program returned as an offering after a half decade hiatus. In 2023 Avista started offering customers access to OBR through its partner the Puget Sound Cooperative Credit Union (PSCCU). OBR, through PSCCU, offers lower rate loans for energy-efficient projects to homeowners and business owners that can be more easily tracked and paid back through their monthly utility bill. OBR is not intended for customers who qualify for Avista's Low-Income Weatherization program and that can therefore be served directly through the partnering community action agencies.

Avista does not claim energy savings for OBR, as the savings associated with any measure installed using OBR financial support is claimed through the relevant and native Avista program. However, Avista intends to claim additional educational and behavioral impacts through the OBR Program.

During the PY2024 impact evaluation, the Evaluators did not conduct an impact evaluation for the On Bill Repayment Program. The Evaluators intend to conduct an impact evaluation of this program in PY2025, as it is a "low risk" program. However, the Evaluators summarize the estimated electric energy savings and costs through the program in the tables below.

Table 3-23: On Bill Repayment Program Claimed Electric Savings

Measure	PY2024 Participation	Expected Savings (kWh)	Adjusted Savings (kWh)	Verified Savings (kWh)	Realization Rate
On Bill Repayment	32	NA	NA	NA	NA
Total	**32**	**NA**	**NA**	**NA**	**NA**

Avista does not quantify expected savings for the OBR Program. The following table summarizes the incentive and non-incentive costs associated with the program.

Table 3-24: On Bill Repayment Program Claimed Costs by Measure

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
On Bill Repayment	$16,000.00	$0.00	$16,000.00
Total	**$16,000.00**	**$0.00**	**$16,000.00**

4. Low-Income Impact Evaluation Results

The Low-Income Program delivers energy efficiency measures to low-income residential customers in its Washington service territory with a partnership with five network Community Action Agencies ("Agencies") and one tribal weatherization organization. The Agencies qualify income to prioritize and treat households based on several characteristics. In-house or contract crews install approved program measures. In addition, the Agencies have access to other monetary resources which allow them to weatherize a home or install additional energy efficiency measures.

The Evaluators completed an impact evaluation on Avista's Named Communities Investment Fund (NCIF). However, the Low-Income Program will be evaluated in PY2025. For the purposes of this report, the expected savings claimed by Avista are summarized in this section for both the Low-Income Program and the NCIF Program.

The following sections summarize findings for each electric impact evaluation in the Low-Income Portfolio in the Washington service territory. The Evaluators used data collected and reported in the tracking database, online application forms and RTF values to evaluate verified savings. This approach provided the strongest estimate of achieved savings practical for each program, given its delivery method, magnitude of savings, number of participants, and availability of data. Table 4-1 summarizes the Low-Income expected and verified impact savings by program. Table 4-2 summarizes the Low-Income portfolio cost-effectiveness results.

Table 4-1: Low-Income Verified Impact Savings by Program

Program	Expected Savings (kWh)	Verified Savings (kWh)	Verified Realization Rate
Low-Income	473,090.23	NA	NA
NCIF	NA	172,169.49	NA
Total	**473,090.23**	**172,169.49**	**NA**

Table 4-2: Low-Income Portfolio Cost-Effectiveness Summary

Sector	TRC			UCT		
	Benefits	Costs	B/C Ratio	Benefits	Costs	B/C Ratio
Low Income	$2,336,369.08	$1,976,514.04	1.18	$787,332.40	$1,976,514.04	0.40

In PY2024, Avista completed and provided incentives for NCIF Program electric projects in Washington and achieved total electric energy savings of 172,169.49 kWh. The Evaluators estimated the TRC value for the Low-Income portfolio is 1.18 while the UCT value is 0.40. Further details of the impact evaluation results by program are provided in the sections following.

4.1 Program-Level Impact Evaluation Results

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Low-Income Sector in the section below.

4.1.1 Low Income Program

The Low-Income Program delivers energy efficiency measures to low-income residential customers in its Washington service territory with a partnership with five network Community Action Agencies ("Agencies") and one tribal weatherization organization. The Agencies qualify income to prioritize and treat households based on several characteristics. In-house or contract crews install approved program measures. In addition, the Agencies have access to other monetary resources which allow them to weatherize a home or install additional energy efficiency measures.

Avista provides CAP agencies with the following approved measure list, which are reimbursed in full by Avista. Avista also provides a rebate list of additional energy saving measures the CAP agencies are able to utilize which are partially reimbursed. Table 4-3 summarizes the measures offered under this program.

Table 4-3: Low-Income Program Measures

Measure	Impact Analysis Methodology
E Air Infiltration	Avista TRM
E Air Source Heat Pump	
E Attic Insulation With Electric Heat	
E Conversion to Air Source Heat Pump	
E Conversion to Ductless Heat Pump	
E Deferred Maintenance Pilot	
E Door Sweep	
E Duct Insulation	
E Duct Sealing	
E Energy Star Certified Refrigerator and Refrigerator-Freeze	
E Exterior Doors	
E Floor Insulation With Electric Heat	
E Health Safety and Repair	
E Lighting	
E Smart Thermostat Paid Install with Electric Heat	
E Wall Insulation With Electric Heat	
E Window Replc from Single Pane W Electric Heat	

In PY2024, the Evaluators did not conduct an impact evaluation of the Low Income Program, as it is considered "low risk". An impact evaluation for this program is planned for PY2025. However, the Evaluators summarize the estimated electric energy savings and costs through the program in the tables below.

Table 4-4: Low-Income Program Claimed Electric Savings

Measure	PY2024 Participation	Expected Savings (kWh)	Adjusted Savings (kWh)	Verified Savings (kWh)	Realization Rate
E Air Infiltration	47	37,735.36	NA	NA	NA
E Attic Insulation With Electric Heat	21	10,508.52	NA	NA	NA
E Duct Sealing	5	3,549.65	NA	NA	NA
E Floor Insulation With Electric Heat	20	25,902.63	NA	NA	NA
E Wall Insulation With Electric Heat	10	13,485.78	NA	NA	NA
E Window Replc from Single Pane W Electric Heat	55	22,587.49	NA	NA	NA
E Energy Star Certified Refrigerator and Refrigerator-Freeze	1	39.00	NA	NA	NA
E Conversion to Air Source Heat Pump	40	289,372.00	NA	NA	NA
E Conversion to Ductless Heat Pump	20	60,324.60	NA	NA	NA
E Deferred Maintenance Pilot	11	0.00	NA	NA	NA
E Door Sweep	1	28.76	NA	NA	NA
E Duct Insulation	12	1,361.44	NA	NA	NA
E Exterior Doors	36	8,097.00	NA	NA	NA
E Health Safety and Repair	62	0.00	NA	NA	NA
E Lighting	17	98.00	NA	NA	NA
Total	**358**	**473,090.23**	**NA**	**NA**	**NA**

The Low-Income Program displayed estimated savings of 473,090.23 kWh expected savings for the program. The following table summarizes the incentive and non-incentive costs associated with the program.

Table 4-5: Low-Income Program Claimed Costs by Measure

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
E Air Infiltration	$94,956.98	$8,072.57	$103,029.55
E Attic Insulation With Electric Heat	$40,830.32	$5,077.66	$45,907.98
E Duct Sealing	$2,964.18	$985.27	$3,949.45
E Floor Insulation With Electric Heat	$76,129.26	$12,516.02	$88,645.28
E Wall Insulation With Electric Heat	$19,057.27	$6,516.26	$25,573.53
E Window Replc from Single Pane W Electric Heat	$320,987.66	$10,914.16	$331,901.82
E Energy Star Certified Refrigerator and Refrigerator-Freeze	$1,354.90	$8.64	$1,363.54
E Conversion to Air Source Heat Pump	$504,766.09	$61,904.19	$566,670.28
E Conversion to Ductless Heat Pump	$148,329.79	$12,905.00	$161,234.79
E Deferred Maintenance Pilot	$85,415.99	$0.00	$85,415.99
E Door Sweep	$455.00	$0.45	$455.45
E Duct Insulation	$9,609.69	$657.84	$10,267.53
E Exterior Doors	$76,188.60	$3,683.00	$79,871.60
E Health Safety and Repair	$201,951.74	$0.00	$201,951.74
E Lighting	$969.85	$17.42	$987.27
Total	**$1,583,967.32**	**$123,258.49**	**$1,707,225.81**

4.1.2 NCIF Program

Avista made $2 million available annually for new energy efficiency projects in Named Communities for each of the last two years of the initial CEIP four-year period. This body of funding is used specifically to address obstacles to participation in efficiency programs for members of Named Communities. This program is called the Named Community Investment Fund (NCIF) Program. With this new program, Avista's goals focus on reducing energy burdens; increasing engagement in company programs, health, and safety benefits; and enhancing customer reliability. In addition to working with the CAP Agencies included in the Low-Income Program, this program also incorporates non-profit organizations as well.

Avista offers a mix of rebates and fully funded measures. Through program implementation, this mix may change, as Avista further engages with its advisory groups and customers to maximize program benefits.

Table 4-6 summarizes the programs offered under this program along with the impact evaluation method for each program.

Table 4-6: Named Community Investment Fund Program Impact Methods

Funding Category	Measures	Impact Analysis Methodology
Community Identified Projects	Educational	RTF UES
Residential Weatherization Incentives (Manufactured Homes Weatherization and Health & Safety and Single Family Weatherization)	Weatherization measures (windows, attic insulation, floor insulation, wall insulation, ENERGY STAR doors) and safety measures	RTF UES
Nonresidential Incentives for Business and Organizations Serving Named Communities	Site-specific incentives and C&I incentives	RTF UES
Building Operator Certification Incentives	Provides incentives for building energy managers receiving training for completion of a Building Operator Certification	WUTC approved BOC's energy savings impacts[9]

In PY2024, the NCIF Program funded several projects in the Single Family Weatherization, Nonresidential Incentives, and Building Operator Certification Incentives. The Evaluators identified program savings for NCIF by parsing downstream verified incentives in each the Residential Shell Program, Residential Appliances Program, Residential ENERGY STAR Homes Program, Nonresidential Prescriptive Lighting Program, Nonresidential Small Business Lighting Program, and Nonresidential Site-Specific Program by proportion of total project cost covered by NCIF funding.

The Evaluators present the following NCIF verified impact evaluation results as well as costs administered through the program.

[9] https://www.theboc.info/wp-content/uploads/2020/08/2020-BOC-Energy-Savings-FAQ_1.0.pdf

Table 4-7: NCIF Program Verified Electric Savings

Measure	PY2024 Participation	Expected Savings (kWh)	Verified Savings (kWh)	Realization Rate
NCIF (Residential)	2	NA	14,594.21	NA
NCIF (Nonresidential)	3	NA	157,575.28	NA
NCIF (Nonresidential Building Operator Certification)	0	NA	0.00	NA
Total	5	**NA**	**172,169.49**	**NA**

The NCIF Program displayed verified savings of 172,169.49 kWh. The following table summarizes the incentive and non-incentive costs associated with the program.

Table 4-8: NCIF Program Costs by Measure

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
NCIF (Residential)	$95,908.01	$2,599.49	$98,507.50
NCIF (Nonresidential)	$140,240.39	$26,750.35	$166,990.74
NCIF (Nonresidential Building Operator Certification)	$3,790.00	$0.00	$3,790.00
Total	**$239,938.40**	**$29,349.84**	**$269,288.24**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for NCIF Program in the section below.

4.1.2.1 Database Review & Verification

The following sections describe the Evaluator's database review and document verification findings for the NCIF Program.

4.1.2.2 Database Review & Document Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the NCIF. The Evaluators selected the census of rebate applications to cross-verify tracking data inputs. The Evaluators note that all necessary information was present for each NCIF incented project to verify ex-post savings.

4.1.2.3 Verification Surveys

The Evaluators did not conduct verification surveys for the NCIF Program.

4.1.2.4 Impact Analysis

This section summarizes the verified savings results for the NCIF Program. The Evaluators calculated verified savings for NCIF residential measures using the RTF UES for each measure as appropriate. For the Site-Specific projects, verified savings were estimated through the methodology presented in the native program section, Section 5.3.8. Finally, for the BOC certification, verified savings were estimated through the independent study by Navigant[10], indicating annual savings of roughly 119,000 kWh per active building operator.

[10] https://www.theboc.info/pdf/Eval-E11-223_LTMT.pdf

4.1.2.5 Verified Savings

The NCIF residential efforts contributed to 14,594.21 kWh of verified savings through the NCIF Program. The NCIF nonresidential efforts contributed to 157,575.28 kWh of verified savings through the NCIF Program. The NCIF Program in total displays 0.00 kWh verified electric energy savings in the Washington service territory, as displayed in Table 4-7.

5. Nonresidential Impact Evaluation Results

The Evaluators completed an impact evaluation on Avista's Non-Residential portfolio to verify program-level and measure-level energy savings for PY2024. The following sections summarize findings for each electric impact evaluation in the Non-Residential Portfolio in the Washington service territory. The Evaluators used data collected and reported in the tracking database, online application forms, Avista TRM, RTF, IPMVP, supplemental sources and billing analysis of participants to evaluate savings. This approach provided the strongest estimate of achieved savings practical for each program, given its delivery method, magnitude of savings, number of participants, and availability of data. Table 5-1 summarizes the Non-Residential verified impact savings by program. In addition to the portfolio of existing programs, during PY2024 Avista also offered a Compressed Air Leak Detection Pilot, designed to identify and fix leaks in non-residential compressed air system. Details, methods and results, including cost-effectiveness testing results, can be found in Appendix D of this report. These results are not included in program summaries, including Table 5-1 and Table 5-2.

Table 5-2 summarizes the Non-Residential portfolio's cost-effectiveness.

Table 5-1:Non-Residential Verified Impact Savings by Program

Program	Expected Savings (kWh)	Verified Savings (kWh)	Verified Realization Rate
Prescriptive Lighting	8,767,363	8,708,412	99.33%
Small Business Lighting	19,112,087	18,446,895	96.52%
VFD	2,044	3,203	156.75%
Grocer	59,188	59,188	100.00%
Shell	35,272	100,215	284.12%
Green Motors Measure	11,543	7,944	68.82%
Midstream	454,774	358,297	78.8%
Site Specific	10,199,933	10,229,030	100.29%
Building Operator Certification	NA	595,000	NA
Total	**38,642,204**	**38,508,184**	**99.65%**

In addition to the portfolio of existing programs, during PY2024 Avista also offered a Compressed Air Leak Detection Pilot, designed to identify and fix leaks in non-residential compressed air system. Details, methods and results, including cost-effectiveness testing results, can be found in Appendix D of this report. These results are not included in program summaries, including Table 5-1 and Table 5-2.

Table 5-2:Non-Residential Portfolio Cost-Effectiveness Summary

Program	TRC			UCT		
	Benefits	Costs	B/C Ratio	Benefits	Costs	B/C Ratio
Nonresidential	$32,414,549	$23,235,881	1.40	$29,467,772	$20,113,970	1.47

In PY2024, Avista completed and provided incentives for non-residential electric measures in Washington and reported total electric energy savings of 38,508,184 kWh. All programs except the Prescriptive Lighting Program and Midstream Program exceeded savings claims based on reported savings, leading to an overall achievement of 99.65% of the expected savings for the non-residential programs. The Evaluators estimated the TRC value for the Non-Residential portfolio is 1.40 while the

UCT value is 1.47. Further details of the impact evaluation results by program are provided in the sections following.

5.1 Database & Document Verification

Before conducting the impact analyses, the Evaluators conducted a database review for all prescriptive programs. This process began with the selection of representative samples from each program. The Evaluators developed a sampling plan that achieves a sampling precision of ±10% at 90% statistical confidence – or "90/10 precision" – for document verification. Details about sampling methods can be found in 2.2.1 Database Review and details about the verification process can be found in Section 2.2.2.4. From these sample sizes random projects were selected for a comparison between the equipment specifications listed in program tracking data and the manufacture's specifications. These documents included invoices, rebate applications, pictures, AHRI certificates and DLC screenshots and similar types of documents for the following programs: When verifying HVAC equipment specifications, the program tracking was compared with information listed on AHRI certificates.

- Lighting
- HVAC (VFD) Program
- Food Service Equipment Program
- Grocer Program
- Shell Program
- Green Motors Program
- Midstream Program

In the case the Evaluators found any deviations between the tracking data and application values, the Evaluators reported and summarized those differences in the measure sections.

To access Prescriptive Lighting ISRs the Evaluators conducted a survey of program participants in PY2023. During PY2023 a total of 744 projects included a contact email, of which 80 were unique. Customers with a valid email were sent the survey via an email invitation, followed a week later by a follow-up reminder to those who had not responded. The Evaluators asked participants if the rebated equipment is currently installed and working, in addition to questions about HVAC configurations. All respondents reported that their rebated equipment was currently installed and operating. Because the Evaluators did not conduct a process evaluation or survey efforts in PY2024, the Evaluators utilized the response results from the PY2023 survey efforts for projects rebated in PY2024.

For the Site-Specific program, the Evaluators conducted 7 on-site visits to verify full installation and equipment operation as described in the project scope, as well as collect any data necessary for analyses. This is discussed further in the Site-Specific chapter.

Below, Table 5-3 shows representative sample sizes and achieved precision in verification sampling of Avista's Washington service territory.

Table 5-3: Document Verification

Program	Population	Verification Sample Size	Precision at 90% CI
Prescriptive Lighting	497	163	90% ± 9.97%
VFD	1	1	90% ± 0%
Grocer	15	14	90% ± 8.62%
Shell	6	6	90% ± 0%
Green Motors	5	5	90% ± 0%
Midstream	245	54	90% ± 9.90%[11]

5.2 Survey and On-Site Verification

Unlike Residential measures, non-residential measures typically have a 100% installation rate or a deemed in-service rate (ISR) included in RTF and Avista TRM UES. The two exceptions to this are Prescriptive Lighting measures and customs projects, such as those in the Site-Specific programs. Verification for these programs was addressed in two ways: survey verification and on-site verification, described in the subsections below.

5.2.1 Prescriptive Lighting Verification

To access Prescriptive Lighting ISRs, the Evaluators conducted a survey of program participants in PY2023. The Evaluators utilize the responding results from this survey effort for PY2024. The Evaluators will conduct this effort again in PY2025. A total of 744 projects included a contact email, of which 80 were unique. Customers with a valid email were sent the survey via an email invitation, followed a week later by a follow-up reminder to those who had not responded.

The Evaluators asked participants if the rebated equipment is currently installed and working, in addition to questions about HVAC configurations. The Evaluators achieved ±4.20% precision across the Prescriptive Lighting Program in Avista's Washington service territory, summarized in Table 5-4.

Table 5-4: Survey Verification

Program	Population	Respondents	Precision at 90% CI
Prescriptive Lighting	744	80	90% ± 4.20%

All respondents reported that their rebated equipment was currently installed and operating.

5.2.2 Site-Specific Verification

For the Site-Specific program, the Evaluators conducted 7 on-site visits to verify full installation and equipment operation as described in the project scope, as well as collect any data necessary for analyses. This is discussed further in the Site-Specific chapter.

[11] 9.90% is the minimum program-level precision achieved. Typically, actual verification took place in a measure-by-measure basis, with census verification for each measure, greatly exceeding (more precise) than 9.90%.

Table 5-5: On-Site Verification

Program	Population	Sampled	On-Site Visits
Site-Specific	33	15	7

5.3 Program-Level Impact Evaluation Results

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Non-Residential sector in the section below.

5.3.1 Prescriptive Lighting Program

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 customers.

In an effort to streamline the process and make it easier for customers and vendors to participate in the program, Avista developed a prescriptive approach for commercial/industrial customers in 2004. This program provides for many common retrofits to receive a pre-determined incentive amount. 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 retrofits from fluorescent lamps and fixtures, HID, directional, and incandescent can fixtures to more energy-efficient LED light sources and controls. Table 5-6 summarizes the measures offered under this program.

Table 5-6: Prescriptive Lighting Program Measures

Location	Measure	Savings Source
Interior	LED tubes	Prescriptive Calculations with RTF and Custom Inputs
	LED U-Bend	
	LED W reduction	
	LED Downlamps/Directional	
	Linear LED Fixtures	
	HID LED fixtures/lamps	
	Occupancy Sensors	
	LLLC Fixtures	
Exterior	HID LED fixtures/lamps	
	Sign Lighting	

Prescriptive Lighting Program impact evaluation results by measure are summarized in Table 5-7.

Table 5-7: Prescriptive Lighting Program Verified Electric Savings

Measure	Measure Count	Expected Savings (kWh)	Adjusted Savings (kWh)	Verified Savings (kWh)	Realization Rate
>= 150W Incandescent to <= 30W LED Fixture	492	260,687	260,687	260,687	100.0%
>= 42W CFL to <= 20W LED Fixture	1,086	209,027	209,027	209,027	100.0%

1000 watt HID Fixture to 400 watt or less LED Fixture	28	93,669	93,669	93,669	100.0%
175-watt HID Fixture to 75-watt or less LED Fixture	33	7,826	7,826	7,826	100.0%
2, 3, 4-Lamp T12/T8 Fixture to LED Qualified 2x4 Fixture	2,994	839,464	839,464	839,464	100.0%
20-50 watt MR16 to MR16 LED 2-9 watt	59	6,792	6,113	6,113	90.0%
250-watt HID Fixture to 140-watt or less LED Fixture	84	40,571	40,571	40,571	100.0%
2-Lamp T12/T8 Fixture to LED Qualified 1x4 Fixture	537	55,518	55,518	55,518	100.0%
2-Lamp T12/T8 Fixture to LED Qualified 2x2 Fixture	1,020	123,313	123,313	123,313	100.0%
400 watt HID Fixture to 175 watt or less LED Fixture	870	888,701	888,701	888,701	100.0%
65W Incandescent to <= 10 watt LED Fixture	68	10,972	10,972	10,972	100.0%
75-100 watt Incandescent Can to less than 20 watt LED Fixture Retrofit	751	162,902	162,902	162,902	100.0%
Ceiling or Fixture Occupancy sensor with built-in relays	664	107,010	107,010	107,010	100.0%
DLC Qualified LLLC Fixture	3,455	351,667	351,668	351,668	100.0%
Four Pin Base CFL to 17 watt or less Plug in LED	311	16,155	14,539	14,539	90.0%
T12/T8 (2') Lamp to 1-Lamp less than 13 watt T8 TLED	1,435	22,818	22,430	22,430	98.3%
T12/T8 (3') Lamp to 1-Lamp less than 17 watt T8 TLED	202	8,136	7,998	7,998	98.3%
T12/T8 (4') Lamp to 1-Lamp less than 23 watt T8 TLED	34,715	1,921,549	1,888,883	1,888,883	98.3%
T12/T8 8' Fixture to 90 watt or less 8' LED fixture	403	150,929	148,363	148,363	98.3%
T12/T8 Eight-Foot to LED	816	91,091	89,543	89,543	98.3%
T12/T8 U-Bend to less than 23 watt T8 LED	352	19,268	18,941	18,941	98.3%
T5HO (4') 4-Lamp to 135 watt of less LED Fixture	419	227,606	223,737	223,737	98.3%
T5HO (4') 6-Lamp to 165 watt of less LED Fixture	638	591,449	581,394	581,394	98.3%
T5HO Lamp to 1-Lamp less than 29 watt T5HO TLED	2,320	258,190	253,801	253,801	98.3%
TLED (4') Lamp to TLED (4') Lamp with 5 watt or more reduction	3,449	36,030	35,417	35,417	98.3%
Wall Switch Occupancy Sensor	92	12,550	12,550	12,550	100.0%
1000 watt HID Fixture to 400 watt or less LED Fixture or Retrofit (Ext)	58	193,609	193,609	193,609	100.0%
150 watt HID Fixture to 50 watt or less LED Fixture or Retrofit (Ext)	136	96,744	96,744	96,744	100.0%
1500 watt HID Fixture to 600 watt or less LED Fixture or Retrofit (Ext)	8	41,964	41,964	41,964	100.0%

175 watt HID Fixture to 100 watt or less LED Fixture (Ext, NC)	26	14,955	14,955	14,955	100.0%
175 watt HID Fixture to 100 watt or less LED Fixture or Retrofit (Ext)	130	80,529	80,529	80,529	100.0%
200 watt HID Fixture to 140 watt or less LED Fixture or Retrofit (Ext)	30	15,912	15,912	15,912	100.0%
250 watt HID Fixture to 140 watt or less LED Fixture (Ext, NC)	13	8,743	8,743	8,743	100.0%
250 watt HID Fixture to 140 watt or less LED Fixture or Retrofit (Ext)	254	192,587	192,587	192,587	100.0%
320 and 400 watt HID Fixture to 160 or less watt LED Fixture (Ext, NC)	80	72,307	72,307	72,307	100.0%
320 watt HID Fixture to 160 watt or less LED Fixture or Retrofit (Ext)	136	141,625	141,625	141,625	100.0%
400 watt HID Fixture to 175 watt or less LED Fixture or Retrofit (Ext)	702	1,025,529	1,025,529	1,025,529	100.0%
575 watt HID Fixture to 300 watt or less LED Fixture or Retrofit (Ext)	4	6,332	6,332	6,332	100.0%
70-89 watt HID Fixture to 25 watt or less LED Fixture or Retrofit (Ext)	62	19,446	19,446	19,446	100.0%
750 watt HID Fixture to 300 watt or less LED Fixture or Retrofit (Ext)	2	4,717	4,717	4,717	100.0%
90-100 watt HID Fixture to 30 watt or less LED Fixture or Retrofit (Ext)	96	38,055	38,055	38,055	100.0%
Sign Lighting	6,260	300,418	300,321	300,321	100.0%
Total	**65,290**	**8,767,363**	**8,708,412**	**8,708,412**	**99.3%**

The following table summarizes the incentive and non-incentive costs associated with the program.

Table 5-8: Lighting Prescriptive Lighting Program Costs by Measure

Measure	Measure Count (Savings Units)	Total Electric Incentives	Measure Costs	Total Costs
>= 150W Incandescent to <= 30W LED Fixture	492	$41,820	$23,953	$65,773
>= 42W CFL to <= 20W LED Fixture	1086	$21,003	$19,206	$40,209
1000 watt HID Fixture to 400 watt or less LED Fixture	28	$16,800	$8,607	$25,407
175-watt HID Fixture to 75-watt or less LED Fixture	33	$2,700	$719	$3,419
2, 3, 4-Lamp T12/T8 Fixture to LED Qualified 2x4 Fixture	2994	$224,122	$77,132	$301,255
20-50 watt MR16 to MR16 LED 2-9 watt	59	$531	$562	$1,093
250-watt HID Fixture to 140-watt or less LED Fixture	84	$20,526	$3,728	$24,253
2-Lamp T12/T8 Fixture to LED Qualified 1x4 Fixture	537	$21,472	$5,101	$26,573
2-Lamp T12/T8 Fixture to LED Qualified 2x2 Fixture	1020	$40,680	$11,330	$52,010

400 watt HID Fixture to 175 watt or less LED Fixture	870	$242,196	$81,656	$323,852
65W Incandescent to <= 10 watt LED Fixture	68	$3,740	$1,008	$4,748
75-100 watt Incandescent Can to less than 20 watt LED Fixture Retrofit	751	$48,241	$14,968	$63,209
Ceiling or Fixture Occupancy sensor with built-in relays	664	$47,802	$15,450	$63,252
DLC Qualified LLLC Fixture	3455	$501,751	$32,312	$534,063
Four Pin Base CFL to 17 watt or less Plug in LED	311	$4,755	$1,336	$6,091
T12/T8 (2') Lamp to 1-Lamp less than 13 watt T8 TLED	1435	$8,415	$2,061	$10,476
T12/T8 (3') Lamp to 1-Lamp less than 17 watt T8 TLED	202	$2,222	$735	$2,957
T12/T8 (4') Lamp to 1-Lamp less than 23 watt T8 TLED	34715	$476,587	$173,556	$650,143
T12/T8 8' Fixture to 90 watt or less 8' LED fixture	403	$35,978	$13,632	$49,610
T12/T8 Eight-Foot to LED	816	$20,730	$8,227	$28,957
T12/T8 U-Bend to less than 23 watt T8 LED	352	$5,273	$1,740	$7,014
T5HO (4') 4-Lamp to 135 watt of less LED Fixture	419	$50,280	$20,558	$70,838
T5HO (4') 6-Lamp to 165 watt of less LED Fixture	638	$131,800	$53,420	$185,220
T5HO Lamp to 1-Lamp less than 29 watt T5HO TLED	2320	$67,277	$23,320	$90,597
TLED (4') Lamp to TLED (4') Lamp with 5 watt or more reduction	3449	$14,675	$3,254	$17,929
Wall Switch Occupancy Sensor	92	$1,564	$1,812	$3,376
1000 watt HID Fixture to 400 watt or less LED Fixture or Retrofit (Ext)	58	$49,918	$21,094	$71,012
150 watt HID Fixture to 50 watt or less LED Fixture or Retrofit (Ext)	136	$8,280	$10,540	$18,820
1500 watt HID Fixture to 600 watt or less LED Fixture or Retrofit (Ext)	8	$10,400	$4,572	$14,972
175 watt HID Fixture to 100 watt or less LED Fixture (Ext, NC)	26	$4,420	$1,629	$6,049
175 watt HID Fixture to 100 watt or less LED Fixture or Retrofit (Ext)	130	$23,220	$8,774	$31,994
200 watt HID Fixture to 140 watt or less LED Fixture or Retrofit (Ext)	30	$3,600	$1,734	$5,334
250 watt HID Fixture to 140 watt or less LED Fixture (Ext, NC)	13	$2,025	$953	$2,978
250 watt HID Fixture to 140 watt or less LED Fixture or Retrofit (Ext)	254	$56,290	$20,983	$77,273
320 and 400 watt HID Fixture to 160 or less watt LED Fixture (Ext, NC)	80	$20,000	$7,878	$27,878
320 watt HID Fixture to 160 watt or less LED Fixture or Retrofit (Ext)	136	$36,756	$15,430	$52,187

400 watt HID Fixture to 175 watt or less LED Fixture or Retrofit (Ext)	702	$262,199	$111,734	$373,932
575 watt HID Fixture to 300 watt or less LED Fixture or Retrofit (Ext)	4	$1,600	$690	$2,290
70-89 watt HID Fixture to 25 watt or less LED Fixture or Retrofit (Ext)	62	$4,218	$2,119	$6,337
750 watt HID Fixture to 300 watt or less LED Fixture or Retrofit (Ext)	2	$1,498	$514	$2,012
90-100 watt HID Fixture to 30 watt or less LED Fixture or Retrofit (Ext)	96	$9,600	$4,146	$13,746
Sign Lighting	6259.81	$81,380	$32,721	$114,101
Total	**65,290**	**$2,628,344**	**$844,893**	**$3,473,238**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Prescriptive Lighting Program in the section below.

5.3.1.1 Database Review & Document Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Prescriptive Lighting Program. The Evaluators review all rebate applications to cross-verify tracking data inputs, summarized in Section 3. Data points checked between project applications and program tacking including quantity, pre/post wattages, model qualification, cost, facility type and hours. Below, Table 5-9 shows the project population, the number of projects checked and the overall precision.

Table 5-9: Prescriptive Lighting Program Verification Precision

Population	Sampled	Precision
497	60	90% ± 9.97%

Below, Table 5-10 shows the count of discrepancies found between program tracking and project-level data.

Table 5-10: Prescriptive Lighting Program Verification Findings

Count Correction	Location Correction	Hours Correction	Wattage Correction
0	0	0	4

Within tracking data, four projects had ‘existing’ and ‘proposed’ wattage reversed entries reversed.

5.3.1.2 Impact Analysis

The Evaluators calculated verified savings by using a standard engineering algorithm:

$$kWh_{savings} = \sum \left(\left[N_{fixt(i)} \times \frac{W_{fixt(i)}}{1000} \right]_{pre} - \left[N_{fixt(i)} \times \frac{W_{fixt(i)}}{1000} \right]_{post} \right) \times AOH \times ISR$$

Where:

Nfixt(i), pre = Pre-retrofit number of fixtures of type i
Nfixt(i), post = Post-retrofit number of fixtures of type i
Wfixt(i), pre = Rated wattage of pre-retrofit fixtures of type i (Standard Wattage Table developed from RTF materials)
Wfixt(i), post = Rated wattage of post-retrofit fixtures of type i (Varies). Self-reported, verified.

AOH = Annual operating hours for specified space type (Varies). Self-reported. Reported weekly hours were divided by seven, then multiplied by 365.25.
ISR = The In-Service Rate, based on type. RTF estimates. See Table 5-11 below.

Table 5-11: Lighting In-Service Rates

Type	ISR
Linear	98.3%
Pin-based	90.0%
Fixture	100.0%[12]

ISRs are taken from the RTF. In the previous program year, the Evaluators conducted surveys of 208 program participants and asked participants if the rebated equipment was installed and operating. The response rate was too low to obtain statistically significant results, but corroborated RTF estimates.

5.3.1.3 Verified Savings

The verified savings for the program is 8,708,412 kWh with a realization rate of 99.3%, as displayed in Table 5-7. Claimed savings calculations did not include in-service rates. The Evaluators used the RTF Midstream Lighting work books and assigned ISRs according to the rates shown above in Table 5-11, resulting in slightly lower verified savings than expected.

[12] Unlike lamps, the RTF does not provide ISRs for dedicated fixtures. Due to the lower likelihood of integral fixture being stored, combined with survey responses from program participants, the ISR for efficient fixtures is 100%.

5.3.2 Small Business Lighting Program

The Small Business Lighting Program is a non-residential direct install lighting program implemented by Resource Innovations. The program offers lighting and controls assessments, equipment and installation for commercial customers on rate schedules 11 or 12.

To participate, businesses fill out a request on the Avista website and then are contacted by a program partner. An on-site assessment is scheduled to identify potential lighting and sensor upgrades needed and eligibility is verified. Measures are then installed at low/no cost to the participant and incentivized at $0.40 - $0.65/kWh.

Table 5-12 summarizes the measures offered under this program.

Table 5-12: Small Business Lighting Program Measures

Measure	Savings Source
LED Fixture - replacing FLT12, 400W - 1000W w & w/o OS	Prescriptive Calculations with Custom Inputs
LED Fixture - replacing FLT5: 2ft to 8ft, 14W - 54W w & w/o OS	
LED Fixture - replacing FLT8: 2ft to 8ft, 17W - 59W w & w/o OS	
LED Fixture - replacing Halogen/Incandescent lamp, 150W - 1500W w & w/o OS	
LED Fixture - replacing Halogen/Incandescent lamp, 20-150W w & w/o OS	
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, < 100W	
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 100W - 250W w & w/o OS	
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 320W - 400W w & w/o OS	
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 400W - 1000W w & w/o OS	
LED Fixture - replacing T12: 2ft - 8ft, 34W - 80W w & w/o OS	
LED Replacement Lamp - replacing CFL Screw-in/Pin-based, 8W - 40W	
LED Replacement Lamp - replacing FLT12: 2ft to 8ft, 34W - 80W w & w/o OS	
LED Replacement Lamp - replacing FLT5: 2ft to 8ft, 17W - 54W w & w/o OS	
LED Replacement Lamp - replacing FLT8: 2ft to 8ft, 17W - 59W w & w/o OS	
LED Replacement Lamp - replacing Halogen/Incandescent lamp, 150-1500W	
LED Replacement Lamp - replacing Halogen/Incandescent lamp, 20-150W w & w/o OS	
LED Replacement Lamp - replacing Metal Halide/High Pressure Sodium lamp, < 100W	
LED Replacement Lamp - replacing Metal Halide/High Pressure Sodium lamp, 100W - 250W	
LED Replacement Lamp - replacing Metal Halide/High Pressure Sodium lamp, 320W - 400W	
ALED Replacement Lamp - replacing Metal Halide/High Pressure Sodium lamp, 400W - 1000W	
LED Retrofit Kit - replacing CFL, 8W - 40W	
LED Retrofit Kit - replacing FLT12, 400W - 1000W w & w/o OS	
LED Retrofit Kit - replacing FLT12: 2ft to 8ft, 34W - 80W w & w/o OS	
LED Retrofit Kit - replacing FLT5: 2ft to 8ft, 14W - 54W w & w/o OS	
LED Retrofit Kit - replacing FLT8: 2ft to 8ft, 17W - 59W w & w/o OS	
LED Retrofit Kit - replacing Halogen/Incandescent lamp, 20-150W	
LED Retrofit Kit – replacing Halogen/Incandescent lamp, 20-150W w & w/o OS	
LED Retrofit Kit - replacing Halogen/Incandescent lamp, 20-150W with OCC w & w/o OS	
LED Retrofit Kit - replacing Metal Halide/High Pressure Sodium lamp, < 100W	
LED Retrofit Kit - replacing Metal Halide/High Pressure Sodium lamp, 100W - 250W	
LED Retrofit Kit - replacing Metal Halide/High Pressure Sodium lamp, 320W - 400W	
LED Retrofit Kit - replacing Metal Halide/High Pressure Sodium lamp, 400W - 1000W	

Small Business Lighting Program impact evaluation results by measure are summarized in Table 5-13.

Table 5-13: Small Business Lighting Program Verified Electric Savings

Measure	Count of Projects	Expected Savings (kWh)	Adjusted Savings (kWh)	Verified Savings (kWh)	Realization Rate
LED Fixture - replacing CFL Screw-in/Pin-based, 8W - 40W	21	76,450	76,450	76,450	100.0%

LED Fixture - replacing FLT12, 400W - 1000W	143	614,952	614,952	614,952	100.0%
LED Fixture - replacing FLT12, 400W - 1000W with OCC	165	1,630,018	1,522,259	1,522,259	93.4%
LED Fixture - replacing FLT5: 2ft to 8ft, 14W - 54W	14	87,053	87,053	87,053	100.0%
LED Fixture - replacing FLT5: 2ft to 8ft, 14W - 54W with OCC	67	871,118	883,617	883,617	101.4%
LED Fixture - replacing FLT8: 2ft to 8ft, 17W - 59W	232	967,272	980,408	980,408	101.4%
LED Fixture - replacing FLT8: 2ft to 8ft, 17W - 59W with OCC	266	2,368,635	2,220,174	2,220,174	93.7%
LED Fixture - replacing Halogen/Incandescent lamp, 150W - 1500W	48	187,986	187,986	187,986	100.0%
LED Fixture - replacing Halogen/Incandescent lamp, 150W - 1500W with OCC	6	766,189	580,732	580,732	75.8%
LED Fixture - replacing Halogen/Incandescent lamp, 20-150W	645	1,605,487	1,609,174	1,609,174	100.2%
LED Fixture - replacing Halogen/Incandescent lamp, 20-150W with OCC	59	128,759	103,459	103,459	80.4%
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, < 100W	23	38,180	39,800	39,800	104.2%
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 100W - 250W	257	543,883	543,883	543,883	100.0%
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 100W - 250W with OCC	4	18,973	18,721	18,721	98.7%
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 320W - 400W	68	575,673	575,814	575,814	100.0%
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 320W - 400W with OCC	8	153,549	150,626	150,626	98.1%
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 400W - 1000W	161	1,342,281	1,344,886	1,344,886	100.2%
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 400W - 1000W with OCC	16	220,360	197,012	197,012	89.4%
LED Fixture - replacing T12: 2ft - 8ft, 34W - 80W	46	213,630	213,630	213,630	100.0%
LED Fixture - replacing T12: 2ft - 8ft, 34W - 80W with OCC	52	398,677	302,028	302,028	75.8%
LED Replacement Lamp - replacing CFL Screw-in/Pin-based, 8W - 40W	16	56,810	56,810	56,810	100.0%

LED Replacement Lamp - replacing FLT12: 2ft to 8ft, 34W - 80W	305	941,975	941,975	941,975	100.0%
LED Replacement Lamp - replacing FLT12: 2ft to 8ft, 34W - 80W with OCC	12	74,195	57,815	57,815	77.9%
LED Replacement Lamp - replacing FLT5: 2ft to 8ft, 17W - 54W	38	145,400	145,400	145,400	100.0%
LED Replacement Lamp - replacing FLT8: 2ft to 8ft, 17W - 59W	393	1,946,960	1,946,998	1,946,998	100.0%
LED Replacement Lamp - replacing FLT8: 2ft to 8ft, 17W - 59W with OCC	31	94,031	72,224	72,224	76.8%
LED Replacement Lamp - replacing Halogen/Incandescent lamp, 150-1500W	7	30,643	30,652	30,652	100.0%
LED Replacement Lamp - replacing Halogen/Incandescent lamp, 20-150W	354	1,593,883	1,594,465	1,594,465	100.0%
LED Replacement Lamp - replacing Halogen/Incandescent lamp, 20-150W with OCC	5	2,958	2,241	2,241	75.8%
LED Replacement Lamp - replacing Metal Halide/High Pressure Sodium lamp, < 100W	5	24,289	24,289	24,289	100.0%
LED Replacement Lamp - replacing Metal Halide/High Pressure Sodium lamp, 100W - 250W	22	104,742	104,742	104,742	100.0%
LED Replacement Lamp - replacing Metal Halide/High Pressure Sodium lamp, 320W - 400W	1	2,922	2,922	2,922	100.0%
ALED Replacement Lamp - replacing Metal Halide/High Pressure Sodium lamp, 400W - 1000W	9	159,185	159,185	159,185	100.0%
LED Retrofit Kit - replacing CFL, 8W - 40W	2	6,231	6,231	6,231	100.0%
LED Retrofit Kit - replacing FLT12, 400W - 1000W	3	13,716	13,716	13,716	100.0%
LED Retrofit Kit - replacing FLT12, 400W - 1000W with OCC	12	146,936	116,002	116,002	78.9%
LED Retrofit Kit - replacing FLT12: 2ft to 8ft, 34W - 80W	7	52,340	52,340	52,340	100.0%
LED Retrofit Kit - replacing FLT12: 2ft to 8ft, 34W - 80W with OCC	6	78,247	59,278	59,278	75.8%
LED Retrofit Kit - replacing FLT5: 2ft to 8ft, 14W - 54W with OCC	1	22,548	17,082	17,082	75.8%
LED Retrofit Kit - replacing FLT8: 2ft to 8ft, 17W - 59W	13	82,096	82,096	82,096	100.0%
LED Retrofit Kit - replacing FLT8: 2ft to 8ft, 17W - 59W with OCC	20	171,792	157,266	157,266	91.5%
LED Retrofit Kit - replacing Halogen/Incandescent lamp, 20-150W	26	71,462	71,462	71,462	100.0%
LED Retrofit Kit – replacing Halogen/Incandescent lamp, 20-150W	90	366,500	366,541	366,541	100.0%

LED Retrofit Kit - replacing Halogen/Incandescent lamp, 20-150W with OCC	1	6,116	6,116	6,116	100.0%
LED Retrofit Kit – replacing Halogen/Incandescent lamp, 20-150W with OCC	4	7,146	5,413	5,413	75.7%
LED Retrofit Kit - replacing Metal Halide/High Pressure Sodium lamp, < 100W	14	41,250	42,381	42,381	102.7%
LED Retrofit Kit - replacing Metal Halide/High Pressure Sodium lamp, 100W - 250W	10	35,067	35,067	35,067	100.0%
LED Retrofit Kit - replacing Metal Halide/High Pressure Sodium lamp, 320W - 400W	1	12,397	12,397	12,397	100.0%
LED Retrofit Kit - replacing Metal Halide/High Pressure Sodium lamp, 400W - 1000W	2	11,125	11,125	11,125	100.0%
Total	**3,711**	**19,112,087**	**18,446,896**	**18,446,896**	**96.5%**

The following table summarizes the incentive and non-incentive costs associated with the program.

Table 5-14: Small Business Lighting Program Costs by Measure

Measure	Measure Count (Savings Units)	Total Electric Incentives	Measure Costs	Total Costs
LED Fixture - replacing CFL Screw-in/Pin-based, 8W - 40W	497	$49,347	$7,024	$56,371
LED Fixture - replacing FLT12, 400W - 1000W	1,537	$399,203	$56,503	$455,707
LED Fixture - replacing FLT12, 400W - 1000W with OCC	2,833	$1,128,323	$139,869	$1,268,192
LED Fixture - replacing FLT5: 2ft to 8ft, 14W - 54W	212	$56,584	$7,999	$64,583
LED Fixture - replacing FLT5: 2ft to 8ft, 14W - 54W with OCC	1,506	$637,726	$81,189	$718,915
LED Fixture - replacing FLT8: 2ft to 8ft, 17W - 59W	3,571	$624,383	$90,083	$714,466
LED Fixture - replacing FLT8: 2ft to 8ft, 17W - 59W with OCC	5,537	$1,722,849	$203,996	$1,926,845
LED Fixture - replacing Halogen/Incandescent lamp, 150W - 1500W	204	$123,380	$17,273	$140,652
LED Fixture - replacing Halogen/Incandescent lamp, 150W - 1500W with OCC	282	$514,880	$53,359	$568,239
LED Fixture - replacing Halogen/Incandescent lamp, 20-150W	4,663	$1,035,403	$147,855	$1,183,258
LED Fixture - replacing Halogen/Incandescent lamp, 20-150W with OCC	301	$93,611	$9,506	$103,117

LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, < 100W	195	$24,789	$3,657	$28,445
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 100W - 250W	949	$351,562	$49,973	$401,535
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 100W - 250W with OCC	28	$13,705	$1,720	$15,425
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 320W - 400W	419	$371,759	$52,907	$424,667
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 320W - 400W with OCC	158	$104,204	$13,840	$118,044
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 400W - 1000W	707	$865,078	$123,572	$988,650
LED Fixture - replacing Metal Halide/High Pressure Sodium lamp, 400W - 1000W with OCC	189	$152,483	$18,102	$170,585
LED Fixture - replacing T12: 2ft - 8ft, 34W - 80W	493	$137,898	$19,629	$157,527
LED Fixture - replacing T12: 2ft - 8ft, 34W - 80W with OCC	636	$283,273	$27,751	$311,024
LED Replacement Lamp - replacing CFL Screw-in/Pin-based, 8W - 40W	1,318	$22,690	$5,220	$27,910
LED Replacement Lamp - replacing FLT12: 2ft to 8ft, 34W - 80W	10,402	$371,068	$86,551	$457,619
LED Replacement Lamp - replacing FLT12: 2ft to 8ft, 34W - 80W with OCC	616	$32,810	$5,312	$38,122
LED Replacement Lamp - replacing FLT5: 2ft to 8ft, 17W - 54W	1,658	$56,896	$13,360	$70,256
LED Replacement Lamp - replacing FLT8: 2ft to 8ft, 17W - 59W	28,521	$774,573	$178,896	$953,468
LED Replacement Lamp - replacing FLT8: 2ft to 8ft, 17W - 59W with OCC	1,133	$45,578	$6,636	$52,214
LED Replacement Lamp - replacing Halogen/Incandescent lamp, 150-1500W	22	$13,375	$2,816	$16,192
LED Replacement Lamp - replacing Halogen/Incandescent lamp, 20-150W	5,947	$627,856	$146,504	$774,360
LED Replacement Lamp - replacing Halogen/Incandescent lamp, 20-150W with OCC	24	$1,686	$206	$1,892
LED Replacement Lamp - replacing Metal Halide/High Pressure Sodium lamp, < 100W	108	$9,716	$2,232	$11,948
LED Replacement Lamp - replacing Metal Halide/High Pressure Sodium lamp, 100W - 250W	197	$41,837	$9,624	$51,461
LED Replacement Lamp - replacing Metal Halide/High Pressure Sodium lamp, 320W - 400W	2	$1,167	$268	$1,436
ALED Replacement Lamp - replacing Metal Halide/High Pressure Sodium lamp, 400W - 1000W	75	$64,276	$14,626	$78,903

LED Retrofit Kit - replacing CFL, 8W - 40W	25	$2,804	$573	$3,376
LED Retrofit Kit - replacing FLT12, 400W - 1000W	29	$6,172	$1,260	$7,432
LED Retrofit Kit - replacing FLT12, 400W - 1000W with OCC	205	$73,860	$10,659	$84,519
LED Retrofit Kit - replacing FLT12: 2ft to 8ft, 34W - 80W	115	$23,553	$4,809	$28,362
LED Retrofit Kit - replacing FLT12: 2ft to 8ft, 34W - 80W with OCC	120	$39,756	$5,447	$45,203
LED Retrofit Kit - replacing FLT5: 2ft to 8ft, 14W - 54W with OCC	20	$11,047	$1,570	$12,616
LED Retrofit Kit - replacing FLT8: 2ft to 8ft, 17W - 59W	338	$36,943	$7,543	$44,486
LED Retrofit Kit - replacing FLT8: 2ft to 8ft, 17W - 59W with OCC	461	$97,318	$14,450	$111,768
LED Retrofit Kit - replacing Halogen/Incandescent lamp, 20-150W	307	$32,755	$6,566	$39,321
LED Retrofit Kit – replacing Halogen/Incandescent lamp, 20-150W	1,349	$164,710	$33,679	$198,389
LED Retrofit Kit - replacing Halogen/Incandescent lamp, 20-150W with OCC	31	$3,975	$562	$4,537
LED Retrofit Kit – replacing Halogen/Incandescent lamp, 20-150W with OCC	37	$4,251	$497	$4,748
LED Retrofit Kit - replacing Metal Halide/High Pressure Sodium lamp, < 100W	200	$18,562	$3,894	$22,456
LED Retrofit Kit - replacing Metal Halide/High Pressure Sodium lamp, 100W - 250W	85	$15,780	$3,222	$19,002
LED Retrofit Kit - replacing Metal Halide/High Pressure Sodium lamp, 320W - 400W	8	$4,649	$1,139	$5,788
LED Retrofit Kit - replacing Metal Halide/High Pressure Sodium lamp, 400W - 1000W	10	$5,006	$1,022	$6,029
Total	**78,280**	**$11,295,109**	**$1,694,951**	**$12,990,061**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Small Business Lighting Program in the section below.

5.3.2.1 Impact Analysis

The Evaluators calculated verified savings by using standard engineering algorithms:

5.3.2.2 Lighting Fixtures

$$kWh_{savings} = \sum \left(\left[N_{fixt(i)} \times \frac{W_{fixt(i)}}{1000} \right]_{pre} - \left[N_{fixt(i)} \times \frac{W_{fixt(i)}}{1000} \right]_{post} \right) \times AOH \times ISR$$

Where:

Nfixt(i), pre = Pre-retrofit number of fixtures of type i
Nfixt(i), post = Post-retrofit number of fixtures of type i
Wfixt(i), pre = Rated wattage of pre-retrofit fixtures of type i (Standard Wattage Table developed from RTF materials)
Wfixt(i), post = Rated wattage of post-retrofit fixtures of type i (Varies). Self-reported, verified.
AOH = Annual operating hours for specified space type (Varies). Self-reported. Reported weekly hours were divided by seven, then multiplied by 365.25.
ISR = The In-Service Rate. Due to the DI delivery channel, this is assumed to be 100%.

5.3.2.3 Occupancy Sensors

$$kWh_{savings} = \left[N_{fixt(i)} \times \frac{W_{fixt(i)}}{1000}\right]_{post} \times AOH \times reduction$$

Where:

Nfixt(i), post = Post-retrofit number of fixtures of type i
Wfixt(i), post = Rated wattage of post-retrofit fixtures of type i (Varies). Self-reported, verified.
AOH = Annual operating hours for specified space type (Varies). Self-reported.
reduction = The reduction in operating hours as a result of the installation of occupancy sensors, 32%for fixture/ceiling mounted sensors.

5.3.2.4 Verified Savings

The verified savings for the program is 18,466,895 kWh with a realization rate of 96.5%, as displayed in Table 5-13. For measures without occupancy sensors, realization is ±1% of expectations, with any differences likely due to rounding. For measures with occupancy sensor, the Evaluators found that expected savings were calculated by applying the occupancy sensor reduction factor both the operating hours and the connected load of the lighting retrofit, slightly 'double counting' savings. To account for occupancy sensor savings in verified calculations, the Evaluators applied the 32% reduction to the operation of the post-install equipment, then added this value to the retrofit savings, resulting in slightly lower verified savings.

5.3.2.5 Recommendations for Future Program Cycles

- Report savings from lighting retrofits and sensor installation separately.
- Specify the type of control method employed.
- In tracking data, denote the wattage controlled by each installed occupancy sensor.
- If possible, record building type, vintage and HVAC configuration to calculate and include additional savings resulting from HVAC interactive effects.

5.3.3 Prescriptive HVAC VFD Program

The Prescriptive HVAC Variable Frequency Drive Program is intended to prompt customers to increase the energy efficiency of their HVAC fan or pump applications with a Variable Frequency Drive (VFD) retrofit. Adding a VFD to HVAC systems is an effective tool for cutting operating costs, improving overall system performance, and reducing wear and tear on motors. The prescriptive rebate approach issues payment to the customer after the measure has been installed. Commercial customers who use Avista electricity and apply the VFD to the eligible fan or pump measures are eligible for this program.

The Prescriptive HVAC Variable Frequency Drive Retrofit Program is offered to retrofit VFDs on existing HVAC equipment. Customers must submit a completed rebate form, invoices, and documentation to verify the horsepower of the motor on which the VFD was installed within 90 days of installation. This program is promoted by trade allies, Avista account executives, the Avista website, and Avista marketing efforts. The website is also used to communicate program requirements, incentives, and forms.

Table 5-15 summarizes the measures rebated in PY2024 under this program.

Table 5-15: Prescriptive HVAC VFD Program Measures

Measure	Impact Analysis Methodology
HVAC Cooling Pump	RTF VSD 3.0
HVAC Fan	RTF VSD 3.0
HVAC Heating Pump or Combo	RTF VSD 3.0

The following table summarizes the verified electric energy savings for the Prescriptive HVAC VFD Program impact evaluation.

Table 5-16: Prescriptive HVAC VFD Program Verified Electric Savings

Measure	PY2024 Participation (Projects)	Expected Savings (kWh)	Adjusted Savings (kWh)	Verified Savings (kWh)	Realization Rate
VFD on Supply/Exhaust Fan	1	2,044	3,204	3,204	156.8%
Totals	**1**	**2,044**	**3,204**	**3,204**	**156.8%**

The following table summarizes the incentive and non-incentive costs associated with the program.

Table 5-17: Prescriptive HVAC VFD Program Costs by Measure

Measure	Measure Count	Measure Count (Horsepower)	Total Electric Incentive	Measure Costs	Total Costs
VFD on Supply/Exhaust Fan	11	2	$400	$217	$617
Totals	**11**	**2**	**$400**	**$217**	**$617**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Prescriptive HVAC VFD Program in the section below.

5.3.3.1 Database Review & Document Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Prescriptive HVAC VFD Program. The Evaluators review all rebate applications to cross-verify tracking data inputs, summarized in Section 3. Verification of project documents included data points such as quantity, motor

horsepower, installation location and costs of the equipment. Table 5-18 shows the project population, the number of projects checked and the overall precision.

Table 5-18: Prescriptive HVAC VFD Program Verification Precision

Population	Sampled	Precision
1	1	0.0%

The Evaluators did not find any deviations between project applications and program tracking data.

The Evaluators found all rebate equipment met or exceeded the measure efficiency requirements for the Prescriptive HVAC VFD Program.

5.3.3.2 Impact Analysis

This section summarizes the verified savings results for the Prescriptive HVAC VFD Program. The Evaluators calculated verified savings for VFD measures using the RTF VSD 3.0. Specific application and horsepower were taken into account when selecting verified savings estimates. RTF deemed savings estimates are larger than those assumed in Avista tracking data, resulting higher-than-expected verified savings.

5.3.3.3 Verified Savings

The Evaluators reviewed and applied the RTF values to verified tracking data to estimate net program savings for this measure. The verified savings for the program is 3,204 kWh with a realization rate of 156.8%, as displayed in Table 5-16.

5.3.4 Grocer Program

This program offers incentives to customers who increase the energy efficiency of their refrigerated cases and related grocery equipment. Refrigeration often represents the primary electricity expense in a grocery store or supermarket. The prescriptive rebate approach issues payment to the customer after the measure has been installed. Commercial customers who use Avista fuel for the measure applied for are eligible.

Customers must submit a completed rebate form and invoice within 90 days after the installation has been completed. This program is promoted by trade allies, Avista account executives, the Avista website, and Avista marketing efforts. The website is also used to communicate program requirements, incentives, and forms.

Table 5-19 summarizes the measures rebated in PY2024 under this program.

Table 5-19: Grocer Program Measures

Measure	Impact Analysis Methodology
Refrigerator Case Lighting	RTF EUS
ASH Controls	RTF EUS
Door Gaskets	Avista TRM UES
Floating Head Pressure Controls	RTF EUS
Strip Curtains	RTF EUS
Walk-In ECM Controllers	RTF EUS
ECMs on Evaporator Fans	Avista TRM UES
ECM Replacing Evaporator PS and PSC	RTF EUS
Refrigerator Case Lighting	RTF Commercial Grocery Display Case Lighting v1.2
ASH Controls	RTF EUS
Door Gaskets	RTF EUS
Floating Head Pressure Controls	RTF EUS
Strip Curtains	RTF EUS

The following table summarizes the verified electric energy savings for the Grocer Program impact evaluation.

Table 5-20: Grocer Program Verified Electric Savings

Measure	PY2024 Participation (Projects)	Expected Savings (kWh)	Adjusted Savings (kWh)	Verified Savings (kWh)	Realization Rate
Strip Curtains	2	8,800	8,800	8,800	100.0%
ECM Replacing Evaporator PS and PSC	15	50,388	50,388	50,388	100.0%
Total	**17**	**59,188**	**59,188**	**59,188**	**100.0%**

The following table summarizes the incentive and non-incentive costs associated with the program.

Table 5-21: Grocer Program Costs by Measure

Measure	Measure Count	Total Electric Incentives	Non-Incentive Costs	Total Costs
Strip Curtains	88	$880	$986	$1,866
ECM Replacing Evaporator PS and PSC	59	$5,900	$5,646	$11,546
Totals:	**151**	**$6,780**	**$6,632**	**$13,412**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Grocer Program in the section below.

5.3.4.1 Database Review & Document Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Grocer Program. The Evaluators review all rebate applications to cross-verify tracking data inputs, summarized in Section 3. Data points checked between project applications and program tracking data including measure specification, quantity and cost values.

Table 5-22 shows the project population, the number of projects checked and the overall precision.

Table 5-22: Verification Precision

Population	Sampled	Precision
17	17	0.0%

The Evaluators found all rebate equipment met or exceeded the measure efficiency requirements for the Grocer Program.

5.3.4.2 Impact Analysis

This section summarizes the verified savings results for the Prescriptive Food Service Equipment Program. The Evaluators calculated verified savings for the food service measures using RTF UES in place at the time the savings goals for the program were finalized. Final verified savings were calculated by applying the appropriate UES to a census of measures.

5.3.4.3 Verified Savings

The Evaluators reviewed and applied the appropriate UES values to verified tracking data to estimate program savings for these measures. The verified savings for the program is 59,188 kWh with a realization rate of 100.00%, as displayed in Table 5-21.

5.3.5 Prescriptive Shell Program

The Commercial Prescriptive Shell Program offers incentives to commercial customers who improve the envelopes of their existing buildings by adding insulation, which may make a business more energy-efficient and comfortable. This prescriptive rebate approach issues payment to the customer after the measure has been installed by a licensed contractor. Commercial customers must have an annual heating footprint for a fuel provided by Avista.

Customers must submit a completed rebate form, invoices, and an insulation certificate within 90 days after the installation has been completed. Avista will send incentive checks to customers or their designees after each project is approved. This program is promoted by trade allies, Avista account executives, the Avista website, and Avista marketing efforts. The website is also used to communicate program requirements, incentives, and forms.

Table 5-23 summarizes the measures rebated in PY2024 under this program.

Table 5-23: Prescriptive Shell Program Measures

Measure	Impact Analysis Methodology
Attic Insulation	Avista TRM UES
Roof Insulation	Avista TRM UES
Wall Insulation	Avista TRM UES

The following table summarizes the verified electric energy savings for the Prescriptive Shell Program impact evaluation.

Table 5-24: Prescriptive Shell Program Verified Electric Savings

Measure	PY2024 Participation (Projects)	Expected Savings (kWh)	Adjusted Savings (kWh)	Verified Savings (kWh)	Realization Rate
Attic =< R11 to R30-R44	2	419	5,192	4,744	1132.22%
Attic =< R11 to R45+	12	21,200	47,011	43,016	202.91%
Wall =< R4 to R11-R19	2	9,900	25,047	12,973	131.04%
Wall =< R4 to 19+	2	2,908	33,579	30,648	1053.92%
Roof =< R11 to R30+	2	844	8,835	8,835	1046.80%
Totals	**16**	**35,272**	**119,663**	**100,215**	**284.12%**

The following table summarizes the incentive and non-incentive costs associated with the program.

Table 5-25 Prescriptive Shell Program Costs by Measure

Measure	Measure Count (Square Feet Installed)	Incentive Costs	Non-Incentive Costs	Total Costs
Attic =< R11 to R30-R44	5,090	$153	$749	$902
Attic =< R11 to R45+	33,821	$18,452	$6,792	$25,244
Wall =< R4 to R11-R19	8,882	$3,440	$2,048	$5,488
Wall =< R4 to 19+	8,170	$332	$4,840	$5,172
Roof =< R11 to R30+	6,496	$232	$1,395	$1,627
Totals	**62,459**	**$22,609**	**$15,825**	**$38,434**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Prescriptive Shell Program in the section below.

5.3.5.1 Database Review & Document Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Prescriptive Shell Program. The Evaluators review all rebate applications to cross-verify tracking data inputs, summarized in Section 3. Data points checked between project applications and program tracking data include R-levels, square footage of installation, HVAC configuration and measure cost values. Below, Table 5-26 shows the project population, the number of projects checked and the overall precision.

Table 5-26: Prescriptive Shell Program Verification Precision

Population	Sampled	Precision
16	16	0.0%

In one project, the Evaluators found both the beginning R and final R values differed between the application and the program tracking data. After correction, no adjustments to savings were necessary.

The Evaluators found all rebate equipment met or exceeded the measure efficiency requirements for the Prescriptive Shell Program.

5.3.5.2 Impact Analysis

This section summarizes the verified savings results for the Prescriptive Shell Program. The Evaluators calculated verified savings for the insulation measures using the 2022 Avista TRM, in place at the time the savings goals for the program were finalized. Final verified savings were calculated by applying the appropriate UES to a census of measures.

5.3.5.3 Verified Savings

The Evaluators reviewed and applied the appropriate UES values to verified tracking data to estimate program savings for these measures. The verified savings for the program is 100,215 kWh with a realization rate of 284.1%, as displayed in Table 5-24.

Upon analysis, the Evaluators found that UES used to develop claimed savings did not correspond to UES found in the 2022 Avista TRM[13]. For this measure, savings is given by multiplying a savings factor by the square feet of insulation installed. Using correct multipliers resulted in higher verified savings. Table 5-27 below shows the measure, the claimed savings UES and the verified (TRM) UES multipliers.

Table 5-27: Prescriptive Shell Program Ex Ante and Ex Post Savings Multipliers

Measure	Claimed Savings Multiplier	Adjusted and Verified Savings Multiplier
Attic =< R11 to R30-R44	0.09	1.02
Attic =< R11 to R30-R45	0.93	1.02
Attic =< R11 to R45+	0.13	1.39
Attic =< R11 to R45+	1.26	1.39
Roof =< R11 to R30+	0.13	1.36
Wall =< R4 to R11-R19	0.27	2.82
Wall =< R4 to 19+	0.39	4.11

[13] These measures did not have kWh savings entries in the 2024 Avista TRM, so the evaluation was carried out using 2022 Avista TRM.

5.3.6 Green Motors Program

The Green Motors Program ensures quality rewinding that results in the motor maintaining its original efficiency, which is commonly called a "green rewind." The Green Motors Practices Group (GMPG) is a non-profit organization that identifies, promotes, and verifies only excellent member motor service centers. These companies are committed to consistently producing repair/rewinds that retain or improve reliability and efficiency and provide on-site motor driven systems assistance.

The incentive for this program is $1 per HP of the motor being rewound, up to $10,000 for 5,000 HP, and is taken directly off the customer bill at the service center. There is also a $1 per HP fee paid to the service center for participating.

Table 5-28 summarizes the measures rebated in PY2024 under this program.

Table 5-28: Green Motors Program Measures

Measure	Impact Analysis Methodology
Motor Rewind (Industrial)	RTF Ind_and_Ag_GreenMotorRewind_v3_1

The following table summarizes the verified electric energy savings for the Green Motors Program impact evaluation.

Table 5-29: Green Motors Program Verified Electric Savings

Motor Horsepower	PY2024 Participation (Projects)	Expected Savings (kWh)	Adjusted Savings (kWh)	Verified Savings (kWh)	Realization Rate
75	1	1,305	871	871	66.7%
100	1	1,723	1,150	1,150	66.7%
125	2	3,980	2,639	2,639	66.3%
300	1	4,535	3,284	3,284	72.4%
Totals	**5**	**11,543**	**7,944**	**7,944**	**68.8%**

The following table summarizes the incentive and non-incentive costs associated with the program.

Table 5-30: Green Motors Program Costs by Measure

Measure	Measure Count	Incentive Costs	Total Non-Incentive Costs	Total Costs
Motor Rewind	725	$2,027	$481	$2,508
Totals	**725**	**$2,027**	**$481**	**$2,508**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Green Motors Program in the section below.

5.3.6.1 Database Review & Document Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Green Motors Program. The Evaluators review all rebate applications to cross-verify tracking data inputs, summarized in Section 3. Data points checked between project applications and program tacking including operating hours, RPM, motor horsepower and measure cost values.

Table 5-31 shows the project population, the number of projects checked and the overall precision.

Table 5-31: Green Motors Program Verification Precision

Population	Sampled	Precision
5	5	0.0%

The Evaluators found all rebate equipment met or exceeded the measure efficiency requirements for the Green Motors Program.

5.3.6.2 Impact Analysis

The Evaluators reviewed and applied the appropriate UES values from the RTF to verified tracking data to estimate program savings for these measures. The Evaluators found that expected savings were sourced from the 2022 Avista TRM. RTF estimates from the same measures average 48% lower than TRM values. Final verified savings were calculated by applying the appropriate UES to a census of measures.

5.3.6.3 Verified Savings

The verified savings for the program is 7,944 kWh with a realization rate of 68.8%, as displayed in Table 5-29. The RTF UES estimates used in verified savings average 48% lower than TRM UES for the same measures, resulting in lower verified savings.

5.3.7 Midstream Program (Non-Residential)

Avista designed the Midstream Program to shift the onus of applying for rebates from end-use customers to distributors. Not only does this reduce customers'/contractors' administrative burden (i.e., no need to submit paperwork tracking energy efficient installations), but it is also anticipated to increase high-efficiency equipment options at competitive prices. Midstream rebates provide an immediate discount on eligible products, which appear as a line item on customer invoices. Starting on July 1, 2024, the Midstream Program replaced Avista's residential and commercial downstream space-heating and water-heating programs as well as the commercial food service equipment rebate program.

Through the Midstream Program, Avista seeks to achieve three overall objectives:

- Provide greater long-term, cost-effective savings for residential and commercial customers alike
- Reduce Avista's administrative burden in processing space-heating, water-heating, and commercial kitchen equipment applications
- Accelerate the market transformation of energy-efficient equipment

The Midstream Program provides bought-down equipment to both Residential and Commercial entities. This chapter discusses and presents results only for non-residential measures. Table 5-32 summarizes the measures rebated in PY2024 under this program.

Table 5-32: Non-Residential Midstream Program Measures

End Use	Measure	Impact Analysis Methodology
Food Service	Combination Oven	RTF Combination Ovens
	Convection Oven	RTF Convection Ovens
	Dishwasher	ENERGY STAR CFS Calculator
	Hot Food Holding Bin	CA eTRM HFHB
	Hot Food Holding Cabinet	RTF HFHC
	Ice Machine	RTF Ice Machines
	Steamer	RTF Steamers
HVAC	Mini/Multi Split	Engineering Algorithm
	Packaged Unitary Equipment	Engineering Algorithm
	Split Unitary Equipment	Engineering Algorithm
	Water Source Heat Pump	Engineering Algorithm
Other	Ultra-Low Temperature Freezer	CA eTRM Ultra Low Temp Freezers

The following table summarizes the verified electric energy savings for the Midstream Program impact evaluation.

Table 5-33: Non-Residential Midstream Program Verified Electric Savings

Measure	PY2024 Participation (Units)	Expected Savings (kWh)	Verified Savings (kWh)	Realization Rate
Combination Oven	1	3,868	6,428	166.2%
Convection Oven	12	19,448	17,947	92.3%
Dishwasher	9	41,551	45,620	109.8%
Hot Food Holding Bin	6	17,604	5,868	33.3%
Hot Food Holding Cabinet	6	6,096	6,098	100.0%
Ice Machine	14	2,952	2,952	100.0%
Mini/Multi Split	129	145,001	112,341	77.5%
PTAC	7	68,354	32,433	47.4%
Heat Pumps	15	15,373	19,114	124.3%
Steamer	2	32,216	18,833	58.5%
Ultra-Low Temperature Freezer	6	22,632	22,632	100.0%
Water Source Heat Pump	65	79,680	68,030	85.4%
Totals	**272**	**454,774**	**358,297**	**78.8%**

The following table summarizes the incentive and non-incentive costs associated with the program.

Table 5-34: Non-Residential Midstream Program Costs by Measure

Measure	Measure Unit Count	Incentive Costs	Total Non-Incentive Costs	Total Costs
Combination Oven	1	$1,100	$427	$1,527
Convection Oven	12	$13,650	$961	$14,611
Dishwasher	9	$20,240	$3,652	$23,892
Hot Food Holding Bin	6	$3,390	$470	$3,860
Hot Food Holding Cabinet	6	$3,300	$284	$3,584
Ice Machine	14	$4,100	$158	$4,258
Mini/Multi Split	129	$74,250	$15,903	$90,153
PTAC	7	$43,875	$2,979	$46,854
Heat Pumps	15	$7,050	$2,706	$9,756
Steamer	2	$5,200	$1,009	$6,209
Ultra-Low Temperature Freezer	6	$7,800	$2,120	$9,920
Water Source Heat Pump	65	$31,733	$8,401	$40,133
Totals	**272**	**$215,687**	**$39,069**	**$254,756**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Midstream Program in the section below.

5.3.7.1 Database Review & Document Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Midstream Program. Due to the program delivery pathway, the Program does not include project applications. For this program, the Evaluators examined a representative sample of projects to ensure that program tracking data accurately reflected measure characteristics used in assessing savings. Data points checked include equipment configurations, capacities and efficiency levels.

Table 5-35 shows the project population, the number of projects checked and the overall precision.

Table 5-35: Non-Residential Midstream Program Verification by Measure

Measure	Population	Sampled
Combination Oven	1	1
Convection Oven	12	11
Dishwasher	9	9
Hot Food Holding Bin	6	6
Hot Food Holding Cabinet	6	6
Ice Machine	14	13
Mini/Multi Split	103	37
PTAC	7	7
Heat Pumps (Split/Packaged)	14	12
Steamer	2	2
Ultra-Low Temperature Freezer	6	6
Water Source Heat Pump	65	55

The Evaluators found all rebate equipment met or exceeded the measure efficiency requirements for the Midstream Program and no substantive equipment specifications differed from those in the tracking data.

5.3.7.2 Impact Analysis

Once verification was completed, to estimate program savings for these measures the Evaluators reviewed and applied the appropriate UES values from the Regional Technical Forum (RTF). If a measure was not covered by the RTF, then a UES from the Avista TRM was used as the source for verified savings, followed by the California eTRM (CA eTRM) as a third appropriate source. Unit energy savings values were taken from measure package versions in place at the time of program planning.

Verified savings for food service equipment was taken from RTF and eTRM workbooks and is specific to the equipment configuration(s).

Savings for Mini/Multi Splits, Package/Unitary/Split HVAC Equipment and Water Source Heat Pumps was calculated using standard engineering algorithms, with equipment-specific inputs for capacity and efficiency, and EFLH values from the Midstream planning workbook. Savings calculations for storage and tankless water heaters were carried out in the same way, using actual equipment specifications and prescriptive water use estimates for each building type, based on regional use data.

5.3.7.3 Verified Savings

The verified savings for the program is 358,297 kWh with a realization rate of 78.8%, as displayed in Table 5-33. Below, the Evaluators discussed measures whose realization rates differ significantly from 100%:

- **Hot Food Holding Bins:** Assumed per-unit savings were 5,868 kWh each. Verified savings per the CA eTRM are only 978 kWh each (for the specific configuration), leading to a very low realization rate.
- **Convection Ovens:** One project claimed savings for two units, despite only one measure quantity, resulting in slightly lower verified savings.

- **Combination Ovens:** Expected savings for the project were 3,868 kWh, however the RTF-specified UES is 6,428 kWh, resulting in higher verified savings.
- **PTAC:** The Evaluators were unable to determine how expected savings were calculated. Using identical methodology to program planning materials, the Evaluators calculated 'expected' savings which would yield near 100% realization rates, but claimed savings estimates did not correspond with any known method for determining savings. Simply put, claimed savings were roughly twice the results of using other methods.
- **Split and Packaged Heat Pumps:** The Evaluators were unable to determine how expected savings were calculated. Using identical methodology to program planning materials, the Evaluators calculated 'expected' savings which would yield near 100% realization rates, but claimed savings estimates did not correspond with any known method for determining savings. Simply put, claimed savings were roughly half the results of using other methods.
- **Steamers:** Expected savings calculations assumed 7-12 pan capacities but verified capacities were 3-6, resulting in lower verified savings.

  Water Source HPs: The Evaluators were unable to determine how expected savings were calculated. Using identical methodology to program planning materials, the Evaluators calculated 'expected' savings which would yield near 200% realization rates.

5.3.8 Site-Specific Program

The Site-Specific Program provides calculated incentives to support the installation of qualifying energy efficiency equipment at commercial/industrial sites. These projects typically have a higher degree of complexity than the traditional prescriptive offerings and rely on custom calculations of savings and incentive levels. Examples of these projects include process improvements, upgrades to specialized equipment used in manufacturing, lighting installations that rely on specialized controls, and other measures designed around the customer's specific needs.

Avista's Site-Specific Program is a major component in its non-residential electric offerings. The program approach strives for a flexible response to energy efficiency projects that have demonstrable kWh savings within program criteria. The majority of site-specific kWh savings are composed of custom lighting projects and custom HVAC, envelope, and industrial process load projects that do not fit the prescriptive path. The Site-Specific Program is available to all commercial/industrial retail electric customers and typically brings in the largest portion of savings to the overall energy efficiency portfolio.

The following table summarizes the verified electric energy savings for the Site-Specific Program impact evaluation.

Table 5-36: Site-Specific Program Verified Electric Savings

Type of Project	PY2024 Participation	Expected Savings (kWh)	Verified Savings (kWh)	Verified Realization Rate
Lighting	20	9,453,242	9,468,116	100.2%
Non-Lighting	13	746,691	760,914	101.9%
Totals	**33**	**10,199,933**	**10,229,030**	**100.3%**

The Site-Specific Program displayed verified savings of 10,229,030 kWh with a realization rate of 100.3% against the expected savings for the program.

Table 5-37: Site-Specific Program Costs

Type of Project	Incentive Costs	Non-Incentive Costs	Total Costs
Lighting	$1,997,683	$1,062,096	$3,059,779
Non-Lighting	$170,864	$85,356	$256,221
Totals	**$2,168,547**	**$1,147,452**	**$3,315,999**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Site-Specific Program in the section below.

5.3.8.1 Sample Design

Unlike other non-residential programs, completing a census review of all Site-Specific projects is not feasible. To ensure accurate verified savings estimates, the Evaluators developed a sample of representative sites to inspect using the Stratified Random Sampling procedure detailed in Section 2.2.2.3. This procedure provides 90% confidence and +/- 10% precision with a significantly reduced sample than random sampling would require, by selecting the highest saving facilities with certainty, thereby minimizing the variance that non-sampled sites can contribute to the overall results.

The participant population for the Site-Specific Program was divided into five strata. Table 5-38 summarizes the strata boundaries and sample frames for the Site-Specific Program.

Table 5-38: Site-Specific Program Sample Design

Statistic Description	Stratum 1	Stratum 2	Stratum3	Stratum 4	Stratum 5	Totals
Strata boundaries (kWh)	< 20,000	20,001 - 150,000	150,001 - 200,000	200,001 - 500,000	> 500,001	
Number of projects	11	9	4	5	4	**33**
Total kWh savings	73,130	812,658	663,969	1,157,588	7,492,588	**10,199,933**
Average kWh Savings	6,648	90,295	165,992	231,518	1,873,147	**309,089**
Standard deviation of kWh savings	6,509	46,098	15,956	28,512	2,584,045	**1,958,742**
Coefficient of variation	0.811	0.511	0.096	0.079	1.380	**3.260**
Final design sample	**3**	**2**	**2**	**4**	**4**	**15**

All (four) sites with savings exceeding 500,000 kWh were also specifically selected for verification and analysis. The verified sampling precision achieved from this sample is 4.24% at 90%.

5.3.8.2 Project Document Review and On-Site Visits

Once representative projects were selected, the Evaluators obtained all project-related documentation for review. These documents typically included equipment specification sheets, building characteristics, calculators, invoices, project photos and trending data. This information allowed the Evaluators to replicate claimed savings estimates and develop M&V plans to be used in assessing verified savings and collecting on-site data.

Using project-specific M&V plans, the Evaluators visited sampled to verify measure installation and operating parameters, as well as building parameters such as square footage and HVAC configurations. The Evaluators were able to conduct visits at 7 of the 15 sampled projects where claimed savings exceeded 1,000,000 kWh or there was an uncertain aspect to savings calculations, in which case the data was collected on site to verify the input.

5.3.8.3 Impact Approaches

The majority of sampled projects were lighting projects and could be analyzed using standard savings algorithms. Below, the two equations show the algorithms used in calculating savings from lighting projects.

$$kWh_{savings} = \sum \left(\left[N_{fixt(i)} \times \frac{W_{fixt(i)}}{1000} \right]_{pre} - \left[N_{fixt(i)} \times \frac{W_{fixt(i)}}{1000} \right]_{post} \right) \times AOH \times IEF$$

$$kW_{savings} = \sum \left(\left[N_{fixt(i)} \times \frac{W_{fixt(i)}}{1000} \right]_{pre} - \left[N_{fixt(i)} \times \frac{W_{fixt(i)}}{1000} \right]_{post} \right) \times CF \times IEF$$

Where:

$N_{fixt(i)}$, pre = Pre-retrofit number of fixtures of type i
$N_{fixt(i)}$, post = Post-retrofit number of fixtures of type i
$W_{fixt(i)}$, pre = Rated wattage of pre-retrofit fixtures of type i (Standard Wattage Table developed from RTF materials)
$W_{fixt(i)}$, post = Rated wattage of post-retrofit fixtures of type i (Taken from project spec sheets)
CF = Peak demand coincidence factor (calculated from verified operating schedules)
AOH = Annual operating hours for specified space type (Varies. Collected during M&V site visits)
IEF = Site-Specific Interactive effects factor specific to building and Site-Specific configuration (developed from RTF materials)

For non-lighting projects, specific methodology varies between IPMVP Options A-C and is described as needed in individual site reports.

5.3.8.4 Site-Level Realization

Adjusted and verified savings were developed for each sampled site. The realization rates for sites within each stratum were then applied to the non-sampled sites within their respective stratum. Table 5-39 presents realization at the site level, with Table 5-40 presenting results at the stratum and program levels.

Table 5-39: Site-Specific Expected, Adjusted and Verified kWh Savings by Project

Project ID	Expected kWh Savings	Adjusted kWh Savings	Verified kWh Savings	Realization Rate
SSOP_131434	1,140	1,140	1,140	100.0%
SSOP_119744	8,421	8,421	14,024	166.5%
SSOP_132019	2,744	2,744	1,828	66.6%
SSLP_125942	128,010	128,010	128,010	100.0%
SSLP_135911	137,986	137,986	138,611	100.5%
SSOP_120505	150,893	150,893	150,555	99.8%
SSLP_121238	183,126	183,126	183,126	100.0%
SSLP_81648	208,303	208,303	208,303	100.0%
SSLP_81644	230,871	230,871	230,871	100.0%
SSLP_121225	235,469	235,469	235,469	100.0%
SSOP_129892	258,751	258,751	258,751	100.0%
SSLP_140540	518,492	518,492	518,492	100.0%
SSLP_141283	551,164	551,164	551,164	100.0%
SSLP_80737	675,037	675,037	675,037	100.0%
SSLP_116231	5,747,895	5,747,895	5,747,895	100.0%
Totals:	**9,038,300**	**9,038,300**	**9,043,276**	**100.1%**

Table 5-40: Site-Specific Summary of Overall kWh Savings by Sample Stratum

Stratum	Expected kWh Savings	Adjusted kWh Savings	Verified kWh Savings	Realization Rate
1	73,130	73,130	100,986	138.1%
2	812,658	812,658	814,571	100.2%
3	663,969	663,969	663,297	99.9%
4	1,157,588	1,157,588	1,157,588	100.0%
5	7,492,588	7,492,588	7,492,588	100.0%
Total	**10,199,933**	**10,199,933**	**10,229,030**	**100.3%**

The overall PY2024 Site-Specific Program in total displays a total of 10,229,030 kWh verified electric energy savings in the Washington service territory, as displayed in Table 5-40.

5.3.8.5 Discussion of Non-100% Realization in Sampled Projects

Below are brief explanations of differences between claimed and verified savings for projects with realization rates that are not 100%.

- **SSOP_119744 –** Ex ante calculations used an average LPD, 0.83, higher than what the commercial energy code required at the time the building permit was approved, 0.66, resulting in higher verified savings.
- **SSOP_132019** – Verified savings were measured with a whole-facility billing analysis. Measured savings were lower than calculated ex-ante savings.
- **SSLP_135911 –** Verified lighting hours of operation were slightly higher than the estimate used in expected savings calculations, resulting in increased kWh savings.

5.3.9 Building Operator Certification

The C&I Building Operator Certification Program is being offered by Avista in the 2024-2025 biannual period. This program is offered to encourage building operator certified (BOC) credentialed operators to save electricity and natural gas in buildings they manage while reducing electrical demand. The BOC program has consistently produced positive documented energy savings and has proved to be cost effective. Third party evaluators have assessed and documented the BOC's energy savings impacts[14].

The Evaluators used the BOC independent impact evaluation completed by NEEA, approved by the Washington Utilities and Transportation Commission to estimate verified electric impacts for the program.

Table 5-41 summarizes the electric measures offered under this program and corresponding impact M&V methodology source, for each building operator certification completed in PY2024.

Table 5-41: Building Operator Certification Program UES Sources

Measure	Impact Analysis Savings Section(s)
Building Operator Certification – Electric	WUTC approved BOC's energy savings impacts[15]
Building Operator Certification – Natural Gas	

The independent study by Navigant[16] indicates annual savings of roughly 119,000 kWh per operator. The assumed measure life is five years, meaning that the methodology assigns savings for five years beginning in the year of certification for each operator. If a student receives a Level 2 certification or a certification renewal, then the measure life extends for five years from the most recent date of certification. The WUTC approved BOC document stipulates "Active building operator refers to building operators who have obtained a new certification or renewed a previous certification within the past 5 years". The Evaluators applied these third-party results to each building operator who has completed a certification within the past 5 years. The following table summarizes the verified electric energy savings for the BOC Program impact evaluation.

Table 5-42: BOC Program Verified Electric Savings

Measure	PY2024 Participation	Expected Savings (kWh)	Adjusted Savings (kWh)	Verified Savings (kWh)	Realization Rate
Building Operator Certification	5	595,000	595,000	595,000	100.0%
Total	5	**595,000**	**595,000**	**595,000**	**100.0%**

The following table summarizes the incentive and non-incentive costs associated with the program.

Table 5-43: BOC Program Costs by Measure

Measure	Participant Count	Total Incentive Costs	Total Non-Incentive Costs	Total Costs
Building Operator Certification	5	$255	$24,690	$24,945
Total	**5**	**$255**	**$24,690**	**$24,945**

[14] https://www.theboc.info/wp-content/uploads/2020/08/2020-BOC-Energy-Savings-FAQ_1.0.pdf
[15] https://www.theboc.info/wp-content/uploads/2020/08/2020-BOC-Energy-Savings-FAQ_1.0.pdf
[16] https://www.theboc.info/pdf/Eval-E11-223_LTMT.pdf

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the BOC Program in the section below.

5.3.9.1 Database Review & Document Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the BOC Program. The Evaluators reviewed all incented course and non-course applications, completion dates, and results. The Evaluators found a total of two building operator certifications were completed in 2024, and one building operator completed a non-certification course with incentives from Avista. Because funding for one of the building operator certifications and one non-certification course, the savings from these two completions were claimed and verified under the NCIF Program.

5.3.9.2 Verified Savings

The Evaluators reviewed and applied the appropriate NEEA electric impacts approved by the WUTC estimate customer-level and program-level savings for this program. The verified savings for the program is 595,000 kWh with a realization rate of 100.00%, as displayed in Table 5-42.

6. Appendix A: Billing Analysis Results

This appendix provides additional details on the billing analyses conducted for each program.

6.1 Home Energy Audit Program

The results of the billing analysis for the Home Energy Audit are provided below. Table 6-1 shows customer counts for customers considered for billing analysis (i.e. customers present in each the Washington Electric, Washington Gas, Idaho Electric, and Idaho Gas service territories) and identifies measures that met the requirements for a billing analysis. A billing analysis was completed for measures that had at least 75 customers with single-measure installations. This ensured that measures would have a sufficient sample size after applying PSM data restrictions (e.g. sufficient pre- and post-period data). The billing analysis included participants in Washington and Idaho service territories to acquire the maximum number of customers possible. The billing analysis on individual measures resulted in statistically significant electric impacts. The following section reports the combined analysis.

Table 6-1: Measures Considered for Billing Analysis, Home Energy Audit Program

Measure	Measure Considered for Billing Analysis	Number of Customers w/ Isolated-Measure Installations*	Sufficient Participation for Billing Analysis
Home Energy Audit	✓	1,505*	✓

*This count includes rebates from Washington and Idaho

The Evaluators were successful in creating a matched cohort for each of the measures with sufficient participation. Customers were matched on zip code (exact match) and their average pre-period seasonal usage, including summer, fall, winter, and spring for each control and treatment household. The Evaluators were provided a considerable pool of control customers to draw upon, as shown in Table 6-2. Also shown in Table 6-2, are the impact of various restrictions on the number of treatment and control customers that were included in the final regression model. The "Starting Count" displays the beginning number of customers available prior to applying the data restrictions, while the "Ending Count" displays the number of customers after applying data restrictions and final matching.

Table 6-2: Cohort Restrictions, Home Energy Audit Program

Measure	Data Restriction	# of Treatment Customers	# of Control Customers
Home Energy Audit	Starting Count	1,505	50,000
	Install Date Range: January 1, 2022 to June 30, 2024	1,427	49,766
	Incomplete Post-Period Bills (<6 months) and incomplete Pre-Period Bills (<9 months)	636	41,717
	Ending Count (Matched by PSM)	633	1,198

For the combined measures, the covariate balance shows moderate differences between the treatment and control groups before and after matching. Control usage seems to be substantially lower than

treatment usage before matching; however, after running PSM, treatment and control groups are very similar on aggregate.

The Evaluators performed three tests to determine the success of PSM:

1. *t*-test on pre-period usage by month
2. Joint chi-square test to determine if any covariates are imbalanced
3. Standardized difference test for each covariate employed in matching

All tests confirmed that PSM performed well for each measure. The t-test displayed no statistically significant differences at the 95% level in average daily consumption between the treatment and control groups for any month in the pre-period.

Table 6-3 provides results for the *t*-test on pre-period usage between the treatment and control groups after matching for the Shell program. The P-Value is over 0.05 for each month except January, meaning pre-period usage between treatment and control groups is similar at the 95% confidence level.

Table 6-3: Pre-period Usage T-test for Home Energy Audit Program Washington and Idaho

Month	Average Daily Usage (kWh), Control	Average Daily Usage (kWh), Treatment	T Statistic	Std Error	P-Value	Reject Null?
Jan	38.80	36.55	2.07	1.20	0.04	Yes
Feb	35.51	33.94	1.57	1.14	0.12	No
Mar	30.35	29.54	0.96	0.99	0.34	No
Apr	24.98	24.24	0.87	0.89	0.38	No
May	21.46	21.32	0.15	0.72	0.88	No
Jun	22.69	23.05	-0.50	0.80	0.62	No
Jul	26.92	27.56	-0.66	0.99	0.51	No
Aug	25.68	25.81	-0.11	0.93	0.91	No
Sep	21.36	20.73	0.88	0.78	0.38	No
Oct	24.25	22.96	1.58	0.91	0.12	No
Nov	33.05	31.29	1.42	1.38	0.16	No
Dec	37.71	35.44	1.55	1.60	0.12	No

Table 6-4 provides customer counts for customers in the final regression model, weighted by full program year participation. That is, if a customer received a home energy audit on July 1, 2024, the savings applied to the customer is half of the full impact displayed from the regression analysis after double counted savings removal.

Table 6-4: Weighted Participants, Home Energy Audit Program

Measure	# of Treatment Customers	Weighted Customers
Washington Electric	271	123
Idaho Electric	120	56
Washington Gas	851	411
Idaho Gas	263	130
Total	**1,505**	**721**

The table below provides annual savings per customer for the Home Energy Audit Program for the PPR model. The PPR model was selected for ex post savings because it provided the best fit for the data (highest adjusted R-squared). Savings are statistically significant at the 90% level for the combined measures but the adjusted R-squared shows the model provided a poor fit for the data.

Table 6-5: Regression Savings, Home Energy Audit Program

Annual Savings per Customer (kWh)	Adjusted R-Squared	Model
212.91	0.81	PPR

The table below provides annual savings per customer for the Home Energy Audit Program after removing double counted savings from other downstream programs. Total double counted program savings was estimated to be 2,711.66 kWh, or approximately 11% of observed savings through billing analysis. After removing double counted savings from program impacts reflected in the regression model, the total program savings was verified to be 20,743.25, or 168.18 kWh per customer per year, or 1.66% of annual electric household consumption.

Table 6-6: Double Counted Savings Removed, Home Energy Audit Program

Treatment Customers	Weighted Treatment Customers	Annual Savings per Customer, Regression Estimate (kWh)	Program Impacts Regression Model (kWh)	Program Double Counted Savings (kWh)	Program Verified Savings (kWh)
271	123	212.91	23,454.90	2,711.66	20,743.25

7. Appendix B: Summary of Survey Respondents

This section summarizes additional insights gathered from the simple verification surveys deployed by the Evaluators for the impact evaluation of Avista's Residential and Low-Income Programs in PY2023. Because a simple verification survey was not completed in PY2024, the Evaluators utilized the response results from PY2023 for the PY2024 project completion in-service rates.

Survey respondents confirmed installing between one and three measures that were rebated by Avista, displayed in Table 7-1. This table is missing information from 29 low-income, CEEP, and MFDI survey respondents who neither indicated the number nor type of measures they received.

Table 7-1: Type and Number of Measures Received by Respondents

Measure Category	Total	Percent
No Measures	304	13.8%
One Measure	1218	55.4%
Two Measures	440	20.0%
Three Measures	171	7.8%
Four Measures	47	2.1%
Five or more measures	20	0.9%
HVAC	289	13.1%
Water Heater	136	6.2%
Smart Thermostat	515	23.4%
Clothes Washer	297	13.5%
Clothes Dryer	189	8.6%

The Evaluators asked respondents to provide information regarding their home, as displayed in Table 7-2. Similar to the previous impact evaluation findings, the majority of respondents noted owning a single-family home between 1,000 and 3,000 square feet with central air conditioning.

Table 7-2: Survey Respondent Home Characteristics[17]

Question	Response	Percent
Do you rent your home? (n=755)	Own	93.8%
	Rent	1.9%
	Own and rent to someone else	1.3%
	I don't know	0.1%
	Prefer not to answer	2.9%
Which of the following best describes your home? (n=755)	Single-family house detached	86.0%
	Single-family house attached to one or more other houses	2.3%
	Mobile or manufactured home	8.2%
	Apartment with 2 to 4 units	0.8%
	Apartment with 5+ units	0.3%
	Other	1.4%
	I don't know	0.2%
	Prefer not to answer	0.7%
Does your home have central air conditioning? (n=755)	Yes	72.6%
About how many square feet is your home? (n=629)	Less than 1,000ft^2	6.6%
	1,000-1,999ft^2	42.4%
	2,000-2,999ft^2	32.3%
	3,000-3,999ft^2	13.5%
	4,000ft^2 or more	5.2%
When was your home built? (n=719)	Before 1950	20.0%
	1950 to 1959	10.3%
	1960 to 1969	6.6%
	1970 to 1979	15.3%
	1980 to 1989	7.7%
	1990 to 1999	15.3%
	2000 to 2009	13.2%
	2010 to 2019	4.7%
	2020 to Present	5.6%
	I don't know	1.1%
	Prefer not to answer	0.2%

[17] Four contractors or construction companies were not asked these questions.

8. Appendix C: Compressed Air Leak Detection Pilot

The Compressed Air Line Leak Detection Pilot Program offers direct installation of a programmable line Leak Detection Pilot device that will automatically detect leaks in a compressed air line. This line Leak Detection Pilot technology works by eliminating demand on the air compressor from air leaks or timer drains. The program applicant performs a pre and post logging around the install date to capture and quantify kWh savings.

Commercial customers who use Avista electricity to operate rotary screw compressors of at least 15 horsepower that are not turned off daily are eligible for this program. Customers must submit a completed application form, invoice and the pre and post logging report summarizing kWh savings and photos of actual install along with the compressor nameplate within 90 days are eligible to receive up to $0.20/verified kWh savings.

8.1 Impact Analysis

Before conducting the impact analysis, the Evaluators conducted a document review for the Compressed Air Leak Detection Pilot projects. Documents for all five projects included a report compiled by program implementors including printouts from test equipment for each leak repaired, metrics of the leak, compressor operating hours and other equipment characteristics, as well as a summary of the overall savings for the site. Scans of invoices were also included in project documentation. Compressor efficiency and compressor horsepower were not included in expected savings documentation; however, the Evaluators were able to obtain this information for four of the five sites through an additional data request.

To calculate verified savings, the Evaluators performed engineering reviews of four of the five projects. Compressed Air Leak Detection impact methodology is not covered by the RTF so was taken from the Illinois TRM 12.0 Vol.2 Section 4.7.13, Compressed Air Leak Repair, to perform engineering analyses of each leak repaired.

Table 8-1: Compressed Air Leak Detection Pilot Impact Methodology

Measure	Impact Analysis Methodology
Compressed Air Leak Repair	Illinois TRM 12.0 Vol.2 Section 4.7.13

The specific algorithm and explanation of inputs is shown below:

$$kWh_{savings} = \left(\frac{N_{leaks} \times CFM_{leaks} \times hours \times C_{aircomp} \times control\ factor}{hp_{typical}}\right) \times hp_{real}$$

Where:

N_{leaks} = Number of leaks repaired

CFM_{leaks} = CFM loss per leak

$hours$ = Compressor hours of operation

$C_{aircomp}$ = Compressor efficiency

$control\ factor$ = Efficiency Factors per control type for air compressors

$hp_{typical}$ = Nominal horsepower of a typical air compressor

hp_{real} = Total hp of real compressors.

8.2 Verified Savings

The following table summarizes the verified electric energy savings for the Compressed Air Leak Detection Pilot impact evaluation expected and verified savings by project.

Table 8-2: Compressed Air Leak Detection Pilot Verified Electric Savings

Project Number	Expected Savings (kWh)	Verified Savings (kWh)	Realization Rate
1	1,938	6,495	335.2%
2	37,810	60,962	161.2%
3	72,360	72,360	100.0%[18]
4	29,066	17,433	60.0%
5	1,873	3,205	171.1%
Totals	**143,047**	**160,455**	**112.2%**

The verified savings for the program are 160,455 kWh with a realization rate of 112.2%.

8.3 Recommendations

For any future Compressed Air Leak Detection Pilot sites, information regarding air compressor make and model should also be collected and included in project materials. This information is used to determine compressor efficiency and horsepower.

[18] For this site, the Evaluators were not able to obtain specific information regarding compressor performance, necessary to complete savings calculations, thus this site was not analyzed.

9. Appendix D: Cost-Effectiveness Testing Results

The Evaluators estimated the cost-effectiveness for the Avista Residential, Low-Income, and Nonresidential Sectors using evaluated savings results, economic inputs provided by Avista, and incremental costs and non-energy impacts from the RTF or Avista's Annual Conservation Plan. The table below presents the cost-effectiveness results for the PY2024 portfolio.

Table 9-1: Cost-effectiveness Results

Program	TRC	UCT	RIM	PCT	TRC Net Benefits
Residential	1.72	1.69	0.71	3.06	$4,391,006
Residential Low Income	1.18	0.40	0.30	N/A*	$359,855
Nonresidential	1.40	1.47	0.59	3.21	$9,178,668
Total	**1.44**	**1.43**	**0.60**	**N/A***	**$13,929,529**
***Low Income is offered at no cost to participants; PCT is not calculable.**					

9.1 Approach

The California Standard Practice Model was used as a guideline for the calculations. The cost-effectiveness analysis methods that were used in this analysis are among the set of standard methods used in this industry and include the Utility Cost Test (UCT)[19], Total Resource Cost Test (TRC), Ratepayer Impact Measure Test (RIM), and Participant Cost Test (PCT). All tests weigh monetized benefits against costs. These monetized amounts are presented as NPV evaluated over the lifespan of the measure. The benefits and costs differ for each test based on the perspective of the test. The definitions below are taken from the California Standard Practice Manual.

- The TRC measures the net costs of a demand-side management program as a resource option based on the total costs of the program, including both the participants' and the utility's costs.
- The UCT measures the net costs of a demand-side management program as a resource option based on the costs incurred by the program administrator (including incentive costs) and excluding any net costs incurred by the participant. The benefits are similar to the TRC benefits. Costs are defined more narrowly.
- The PCT is the measure of the quantifiable benefits and costs to the customer due to participation in a program. Since many customers do not base their decision to participate in a program entirely on quantifiable variables, this test cannot be a complete measure of the benefits and costs of a program to a customer.
- The RIM test measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program. Rates will go down if the change in revenues from the program is greater than the change in utility costs. Conversely, rates or bills will go up if revenues collected after program implementation are less than the total costs incurred by the utility in implementing the program. This test indicates the direction and magnitude of the expected change in customer bills or rate levels.

[19] The UCT is also referred to as the Program Administrator Cost Test (PACT).

A common misperception is that there is a single best perspective for evaluation of cost-effectiveness. Each test is useful and accurate, but the results of each test are intended to answer a different set of questions. The questions to be addressed by each cost test are shown in the table below.[20]

Table 9-2: Questions Addressed by the Various Cost Tests

Cost Test	Questions Addressed
Participant Cost Test (PCT)	▪ Is it worth it to the customer to install energy efficiency?
	▪ Is it likely that the customer wants to participate in a utility program that promotes energy efficiency?
Ratepayer Impact Measure (RIM)	▪ What is the impact of the energy efficiency project on the utility's operating margin?
	▪ Would the project require an increase in rates to reach the same operating margin?
Utility Cost Test (UCT)	▪ Do total utility costs increase or decrease?
	▪ What is the change in total customer bills required to keep the utility whole?
Total Resource Cost Test (TRC)	▪ What is the regional benefit of the energy efficiency project (including the net costs and benefits to the utility and its customers)?
	▪ Are all of the benefits greater than all of the costs (regardless of who pays the costs and who receives the benefits)?
	▪ Is more or less money required by the region to pay for energy needs?

Overall, the results of all four cost-effectiveness tests provide a more comprehensive picture than the use of any one test alone. The TRC cost test addresses whether energy efficiency is cost-effective overall. The PCT, UCT, and RIM address whether the selection of measures and design of the program are balanced from the perspective of the participants, utilities, and non-participants. The scope of the benefit and cost components included in each test are summarized in the table below.[21]

Table 9-3: Benefits and Costs Included in Each Cost-Effectiveness Test

Test	Benefits	Costs
PCT (Benefits and costs from the perspective of the customer installing the measure)	▪ Incentive payments ▪ Bill Savings ▪ Applicable tax credits or incentives	▪ Incremental equipment costs ▪ Incremental installation costs

[20] http://www.epa.gov/cleanenergy/documents/suca/cost-effectiveness.pdf
[21] Ibid.

Test	Benefits	Costs
UCT (Perspective of utility, government agency, or third party implementing the program	■ Energy-related costs avoided by the utility ■ Capacity-related costs avoided by the utility, including generation, transmission, and distribution	■ Program overhead costs ■ Utility/program administrator incentive costs
TRC (Benefits and costs from the perspective of all utility customers in the utility service territory)	■ Energy-related costs avoided by the utility ■ Capacity-related costs avoided by the utility, including generation, transmission, and distribution ■ Additional resource savings ■ Monetized non-energy benefits	■ Program overhead costs ■ Program installation costs ■ Incremental measure costs
RIM (Impact of efficiency measure on non-participating ratepayers overall)	■ Energy-related costs avoided by the utility ■ Capacity-related costs avoided by the utility, including generation, transmission, and distribution	■ Program overhead costs ■ Lost revenue due to reduced energy bills ■ Utility/program administrator installation costs

9.2 Non-Energy Benefits

Non-energy Benefits (NEBs) were sourced from the 2022 Annual Conservation Plan developed by Avista. NEBs included avoided illness from air pollution, avoided calls to the utility, avoided fires/insurance damage, and other impacts relative to energy efficiency upgrades offered to customers in each of Avista's programs.

9.3 Economic Inputs for Cost Effectiveness Analysis

The Evaluators used the economic inputs provided by Avista for the cost benefit analysis. Avista provided the Evaluators with avoided costs on the following basis:

- Hourly avoided commodity costs
- Modifications for the Clean Premium
- Avoided capacity costs
- Avoided transmission
- 10% Conservation Adder
- Line losses
- Discount rate (after tax Weighted Average Cost of Capital)

The values were aggregated to provide a single benefit multiplier on a kWh basis for every hour of the year (8,760). Savings by measure were then parsed out to the following load shapes provided by Avista:

- Residential Space Heating
- Residential Air Conditioning
- Residential Lighting
- Residential Refrigeration
- Residential Water Heating
- Residential Dishwasher
- Residential Washer/Dryer
- Residential Furnace Fan
- Residential Miscellaneous
- Nonresidential Compressed Air
- Nonresidential Cooking
- Nonresidential Space Cooling
- Nonresidential Exterior Lighting
- Nonresidential Space Heating
- Nonresidential Water Heating
- Nonresidential Interior Lighting
- Nonresidential Miscellaneous
- Nonresidential Motors
- Nonresidential Office Equipment
- Nonresidential Ventilation

The Evaluators in addition created a Residential Heat Pump load shape by weighting the relative magnitude of cooling versus heating savings from a heat pump and assigning these to weight the Residential Space Heating and Residential Air Conditioning load shapes.

9.4 Results

The tables below outline the results for each test, for both the programs and the portfolio as a whole. Summations may differ by $1 due to rounding.

Table 9-4: Cost-Effectiveness Results by Sector

Sector	TRC	UCT	RIM	PCT
Residential	1.72	1.69	0.71	3.06
Residential Low Income	1.18	0.40	0.30	N/A*
Nonresidential	1.40	1.47	0.59	3.21
Total	**1.44**	**1.43**	**0.60**	**N/A***
*Low Income is offered at no cost to participants; PCT is not calculable.				

Table 9-5: Cost-Effectiveness Benefits by Sector

Program	TRC Benefits	UCT Benefits	RIM Benefits	PCT Benefits
Residential	$10,517,324	$7,960,518	$7,960,518	$10,649,876
Residential Low Income	$2,336,369	$787,332	$787,332	$2,729,388
Nonresidential	$32,414,549	$29,467,772	$29,467,772	$62,444,501
Total	**$45,268,242**	**$38,215,623**	**$38,215,623**	**$75,823,765**

Table 9-6: Cost-Effectiveness Costs by Sector

Program	TRC Costs	UCT Costs	RIM Costs	PCT Costs
Residential	$6,126,319	$4,723,187	$11,175,698	$3,485,929
Residential Low Income	$1,976,514	$1,976,514	$2,639,960	$1,823,906
Nonresidential	$23,235,881	$20,113,970	$49,881,949	$19,461,670
Total	**$31,338,714**	**$26,813,671**	**$63,697,607**	**$24,771,506**

Table 9-7: Cost-Effectiveness Net Benefits by Sector

Program	TRC Net Benefits	UCT Net Benefits	RIM Net Benefits	PCT Net Benefits
Residential	$4,391,006	$3,237,332	-$3,215,180	$7,163,947
Residential Low Income	$359,855	-$1,189,182	-$1,852,627	$905,482
Nonresidential	$9,178,668	$9,353,802	-$20,414,177	$42,982,831
Total	**$13,929,529**	**$11,401,952**	**-$25,481,984**	**$51,052,259**

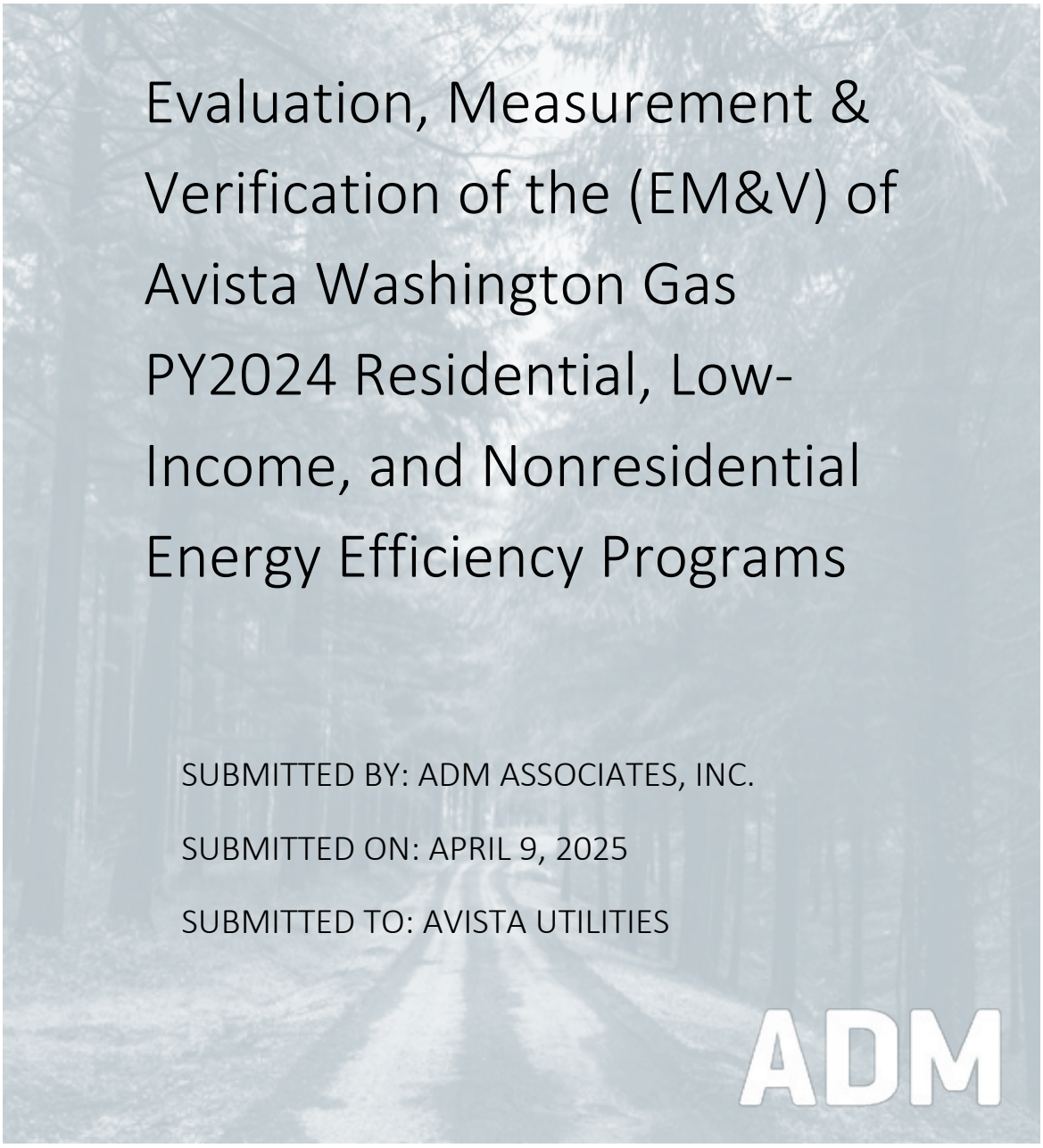

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TABLE OF CONTENTS

TABLE OF TABLES

1 Executive Summary

This report is a summary of the Residential, Low-Income, and Nonresidential Natural Gas Evaluation, Measurement, and Verification (EM&V) effort of the 2024 program year (PY2024) portfolio of programs for Avista Corporation (Avista) in the Washington service territory. The evaluation was administered by ADM Associates, Inc. (herein referred to as the "Evaluators").

1.1 Savings & Cost-Effectiveness Results

The Evaluators conducted an impact evaluation for Avista's Residential, Low-Income, and Nonresidential programs for PY2024. The Residential portfolio savings amounted to 327,464.09 Therms with a 105.6% realization rate. The Low-Income portfolio savings amounted to 14,809.24 Therms; however, the Evaluators did not conduct an impact evaluation for this sector and present the savings claimed for reporting purposes. The Nonresidential portfolio savings amounted to 170,600 Therms with an 84.0% realization rate. The Evaluators summarize the Residential, Low-Income, and Nonresidential portfolio verified savings in Table 1-1 through Table 1-3, respectively.

The Residential portfolio reflects a TRC value of 1.48 and a UCT value of 0.65. The Low-Income portfolio reflects a TRC value of 0.10 and a UCT value of 0.09. The Nonresidential portfolio reflects a TRC value of 2.79 and a UCT value of 1.34. This led to a total Portfolio TRC of 1.30 and a UCT of 0.59. Table 1-4 summarizes the evaluated TRC and UCT values with each the Residential, Low-Income, and Nonresidential portfolios.

Table 1-1: Residential Verified Impact Savings by Program

Program	Expected Savings (Therms)	Verified Savings (Therms)	Verified Realization Rate	Total Costs
Shell	178,362.37	170,205.19	95.43%	$4,973,838.53
ENERGY STAR Homes	NA	NA	NA	NA
Appliances	31,235.82	53,585.00	171.55%	$261,588.58
Midstream	100,439.64	103,673.90	103.22%	$2,282,822.01
Home Energy Audit	NA	NA	NA	NA
On Bill Repayment	NA	NA	NA	$12,000.00
Total	**310,037.83**	**327,464.09**	**105.62%**	**$7,530,249.11**

Table 1-2: Low-Income Verified Impact Savings by Program

Program	Expected Savings (Therms)	Verified Savings (Therms)	Verified Realization Rate	Total Costs
Low-Income	14,809.24	NA	NA	$2,715,951.04
Total	**14,809.24**	**NA**	**NA**	**$2,715,951.04**

Table 1-3: Nonresidential Verified Impact Savings by Program

Program	Expected Savings (Therms)	Verified Savings (Therms)	Verified Realization Rate	Total Costs
HVAC	223	223	100.0%	$2,792.30
Shell	26,244	26,244	100.0%	$455,331.74
Site Specific	93,374	72,475	77.6%	$439,549.63
Midstream	83,154	71,657	86.2%	$246,680.65
Total	**202,995**	**170,600**	**84.0%**	**$1,144,354.32**

Table 1-4: Cost-Effectiveness Summary

Sector	TRC			UCT		
	Benefits	Costs	B/C Ratio	Benefits	Costs	B/C Ratio
Residential	$7,267,296.58	$4,901,109.86	1.48	$4,912,831.79	$7,530,249.11	0.65
Low-Income	$272,445.99	$2,715,951.04	0.10	$238,074.20	$2,715,951.04	0.09
Nonresidential	$4,505,512.53	$1,617,394.45	2.79	$1,535,053.84	$1,144,354.32	1.34
Total	**$12,045,255.09**	**$9,234,455.34**	**1.30**	**$6,685,959.83**	**$11,390,554.47**	**0.59**

Table 1-5 summarizes the gas programs offered to residential and low-income customers in the Washington Avista service territory in PY2024 as well as the Evaluators' evaluation tasks and impact methodology for each program.

Table 1-5: Impact Evaluation Activities by Program and Sector

Sector	Program	Database Review	Survey Verification	Impact Methodology
Residential	Shell	✓		Avista TRM/RTF UES
Residential	ENERGY STAR® Homes	✓		Avista TRM/RTF UES
Residential	Appliances	✓		Avista TRM/RTF UES/Billing Analysis
Residential	Midstream	✓		Engineering algorithm with RTF baseline adjustments
Low-Income	Low-Income	✓		Not evaluated in PY2024
Nonresidential	HVAC	✓		RTF, Avista TRM
Nonresidential	Shell	✓		Avista TRM
Nonresidential	Midstream	✓		RTF, Avista TRM
Nonresidential	Site-Specific	✓		IPMVP Options

1.2 Conclusions and Recommendations

The following section details the Evaluators' conclusions and recommendations for the Residential Portfolio, Low-Income Portfolio, and Nonresidential Portfolio program evaluations.

1.2.1 Conclusions

The following section details the Evaluator's findings resulting from the program evaluations for the Residential Portfolio, Low-Income Portfolio, and Nonresidential Portfolio.

1.2.1.1 Residential Programs

The Evaluators provide the following conclusions regarding Avista's Residential natural gas programs:

- The Evaluators found the **Residential** portfolio to demonstrate a total of 327,464.09 Therms with a realization rate of 105.62%. The Evaluators also conducted a cost-benefit analysis in order to estimate the Residential portfolio's cost-effectiveness. The resulting TRC value for this sector is 1.48 while the UCT value is 0.65. Further details on cost-effectiveness methodology can be found in Appendix B.
- The **Residential Portfolio** impact evaluation resulted in a realization rate of 105.62% due to improvements in the **Midstream Program** estimation of savings by resolving PY2023 recommendations for the program implementer to incorporate RTF-implemented market practice baseline. The Evaluators utilized engineering algorithms to evaluate this program based on purchased equipment efficiency level. The Evaluators also applied RTF market practice baseline equivalents to the engineering algorithms in order to maintain consistency with evaluation methods between the downstream and midstream programs, while taking into account the often-higher efficiency values of the purchased equipment. PY2024 results show a marked improvement in expected savings calculations methodology from the previous year. The Evaluators recommend Avista and the Midstream Program implementer continue incorporating Regional Technical Forum market practice baseline to estimate regional savings through the program. Additionally, the Appliance Program displayed 171.55% realization rate due to smart thermostat billing analysis indicating higher than expected savings for the measure, the largest contributor to savings for the Appliance Program.
- The **Shell Program**, which contributes 57.52% of the expected savings, resulted in a realization rate of 95.43% whereas each of the other programs resulted in a combined 111.19% realization rate. The Shell Program contributed to a 14% decrease in the overall residential sector, which displayed a realization rate of 105.62%.
- In PY2023, the Evaluators conducted verification surveys via web survey to collect information from customers who participated in the **Appliance Program**. For the purposes of this report, the PY2023 survey response results were used to estimate in-service rate adjustments in the PY2024 evaluation, as survey efforts were not completed in PY2024. The Evaluators collected information including the functionality of the efficient equipment, and the functionality of the replaced equipment. The Evaluators calculated in-service rates for the measures within these programs in order to apply findings to the verified savings results for each program. The Evaluators will conduct a full survey effort in PY2025, once per biennium.
- The **Shell Program** displayed verified savings of 170,205.19 Therms with a realization rate of 95.43% against the expected savings for the program. The realization rate for the natural gas savings in the Shell Program deviates from 100% due primarily to the differences between the categories applied in the

Avista TRM prescriptive savings values and the more detailed categories present with unique RTF UES values associated with heating type and climate zone. In addition, missing verified R-values, square footage, and appropriate measure of units (square footage) from sampled projects led to variation in realization rate for each measure type.

- The **ENERGY STAR Homes Program** displayed no participation in PY2024 and therefore no impact evaluation was conducted on the program.
- The **Appliance Program** displayed a realization rate of 171.55% with 53,585.00 Therms saved in PY2024. The realization rate for the natural gas savings in the Appliance Program is greater than 100% due to the billing analysis conducted for smart thermostats, the largest contributor to savings through the Appliance Program. However, the Evaluators also note discrepancies between the Avista TRM and RTF UES Savings values for smart thermostats and errors with the clothes washer defined claimed savings.
- The **Midstream Program** displayed 103.22% realization with 103,673.90 Therms saved. This shows a marked improvement in expected savings calculations methodology from the previous year. The Evaluators reviewed the Energy Solutions implementer expected savings values along with verified tracking data to estimate net adjusted program savings for those measures. To calculate verified savings, the Evaluators utilized industry-standard engineering algorithms using purchased equipment efficiency values and RTF-defined market practice baseline values, where appropriate.
- The **Home Energy Audit Program** was evaluated by attempting a census billing analysis to estimate the impacts of the education efforts of the Home Energy Audit Program. However, this effort did not result in statistically significant natural gas impacts. The Evaluators recommend re-attempting a billing analysis in PY2025 with extended participant data.

1.2.1.2 Low Income Programs

The Evaluators provide the following conclusions regarding Avista's Low-Income natural gas programs:

- The Evaluators did not complete an impact evaluation of the Low-Income Program in PY2024 and therefore do not estimate verified savings for the program or sector. However, for reporting purposes, the Evaluators summarize Avista's claimed savings for the program in PY2024 and conducted a cost-benefit analysis in order to estimate the Low-Income portfolio's cost-effectiveness. The resulting TRC value for this sector is 0.10 while the UCT value is 0.09. These values are expected, as the Low-Income portfolio is not expected to meet cost-effectiveness but is implemented in order to provide energy efficiency benefits to low-income customers. Further details on cost-effectiveness methodology can be found in Appendix B: Cost Benefit Analysis Results.

1.2.1.3 Nonresidential Programs

The Evaluators provide the following conclusions regarding Avista's Non-Residential natural gas programs:

- The Evaluators found the **Non-Residential** portfolio to demonstrate a total of 170,600 Therms with a realization rate of 84.0%. The difference can be attributed to projects in the Site-Specific Program showing higher levels of measured savings than were expected using ex ante calculations.
- The Evaluators also conducted a cost-benefit analysis in order to estimate the Non-Residential portfolio's cost-effectiveness. The resulting TRC value for this sector is 2.79 while the UCT value is 1.34. Further details on cost-effectiveness methodology can be found in Appendix B: Cost Benefit Analysis Results.

- The verified savings for the **HVAC Program** are 223 Therms with a realization rate of 100.00%
- The verified savings for the **Shell** program are 26,244 Therms with a realization rate of 100.0%.
- The verified savings for the **Midstream** program are 71,657 Therms with a realization rate of 86.2%.
- The **Site-Specific Program** in total displays a realization rate of 77.6% with 72,475 Therms verified natural gas energy savings in the Washington service territory. Billing analyses were conducted for all sampled sites. Results from five sites were statistically significant and recorded as verified savings. For all sites with non-100% realization, measured savings from billing analyses differed from calculated expected savings.
    - SSOP_131434 – Measured savings are lower than ex ante predictions.
    - SSOP_136670 – Measured savings are lower than ex ante predictions.
    - SSOP_110572 – Measured savings are higher than ex ante predictions.
    - SSOP_113688 – Measured savings are lower than ex ante predictions.
    - SSOP_113685 – Measured savings are lower than ex ante predictions.

1.2.2 Recommendations

The following section details the Evaluator's recommendations resulting from the program evaluations for the Residential Portfolio, Low-Income Portfolio, and Nonresidential Portfolio.

1.2.2.1 Residential Programs

The Evaluators offer the following recommendations regarding Avista's Residential natural gas programs:

- The Evaluators found a handful of instances in which the rebated equipment did not meet the program minimum requirements for efficiency. The Evaluators recommend Avista check the source AHRI documentation and product level documentation to verify efficiency prior to incentivizing installation of the measure. For example, eight of the smart thermostats did not qualify for RTF savings.
- In the **Shell Program**, the Evaluators found that verified attic insulation, wall insulation, and window measure savings displayed varying realization rates at the project level primarily due to the differences between the categories applied in the Avista TRM prescriptive savings values. The more detailed categories present in the RTF define values associated with unique heating type, R-values and climate zone. The lack of granularity in the Avista TRM and misalignment with average participant characteristics led to a low realization rate for attic insulation, floor insulation, and window measures. The Evaluators recommend Avista update the Avista TRM value to reflect a weighted average of participation home characteristics. The Evaluators also found that some window measures contained discrepancies in unit quantity and attic insulation projects that did not clearly provide R-Values in the documentation provided. Additionally, three window projects did not provide sufficient documentation to verify square footage or even the quantity of windows and two sliding glass door projects were found to claim the same kWh and Therms savings values at 16.7. Based on these findings, the Evaluators recommend Avista verify the project meets the insulation or efficiency requirements through documentation provided in project applications and request additional information if the original documentation does not summarize the efficiency and square footage of the project being completed. The Evaluators also recommend Avista conduct measure-level verification efforts to ensure proper fuels are being claimed in the tracking datasets.

- In the **Appliances Program**, the Evaluators recommend Avista update the clothes dryer Avista TRM value to correctly assign 1.60 Therms savings for the measure, as reflected in the RTF. Currently, the Avista TRM reflects 2.72 Therms/unit. Additionally, The Evaluators recommend Avista update the front load clothes washer Avista TRM value to correctly convert 119.99 kWh/unit to 2.40 Therms/unit. Currently, the Avista TRM reflects 6.03 Therms/unit.
- The Evaluators note that the RTF defines an annual savings of 11.7 Therms for all gas smart thermostat measure specifications defined in the Connected Thermostats RTF workbook. Although this finding did not impact the realization rate of the program in PY2024 due to statistically significant savings identified for smart thermostats through the billing analysis method, the Evaluators recommend Avista update the assumed claimed savings values to the Avista TRM to ensure this discrepancy in savings for future smart thermostat incentives does not occur in the future.
- The Evaluators also found two sampled smart thermostat models that do not meet the minimum RTF qualifications for savings, although Avista had assigned the maximum savings value to these projects. The Evaluators recommend Avista verify each smart thermostat model meets the RTF requirements for regional savings compared to the market practice baseline or provide a list of qualified products for customers to select when participating in this program.
- The Evaluators recommend Avista and the Midstream Program implementer continue incorporating Regional Technical Forum market practice baseline to estimate regional savings through the **Midstream Program**. Because downstream measures of the same category are similarly evaluated by comparing against market practice baseline in the Pacific Northwest, the Evaluators deem this counterfactual scenario is relevant for a midstream delivery channel offering incentives for the same equipment and recommend this methodology to estimate and evaluate the measures moving forward.
- The Evaluators recommend re-attempting a billing analysis in PY2025 for the **Home Energy Audit Program** with extended participant data.

1.2.2.2 Low Income Programs

The Evaluators offer the following recommendations regarding Avista's Low-Income natural gas programs:

- The Evaluators did not complete an evaluation for the Low Income Program in PY2024 and therefore do not have any recommendations currently.

1.2.2.3 Nonresidential Programs

The Evaluators offer the following recommendations regarding Avista's Nonresidential natural gas programs:

- For the **Midstream Program**:
    - The Evaluators found that all measures claimed savings were calculated based on assumed average equipment sizing, whereas verified savings calculations were carried out using standard engineering algorithms. Although relative magnitudes of savings per project generally aligned with algorithm-based results, the Evaluators recommend the program implementers adjust assumed average sizing to better reflect program participant purchasing behaviors.

2 General Methodology

The Evaluators performed an impact evaluation on each of the programs summarized in Table 1-5. The Evaluators used the following approaches to calculate energy impact defined by the International Performance Measurement and Verification Protocols (IPMVP)[1] and the Uniform Methods Project (UMP)[2]:

- Simple verification (web-based surveys)
- Document verification (review project documentation)
- Deemed savings (RTF UES and Avista TRM values)
- Whole facility billing analysis (IPMVP Option C)
- Appropriate IPMVP Option (for Site-Specific, depending on project)

The Evaluators completed the above impact tasks for each of the natural gas impacts for projects completed in the Washington Avista service territory.

The M&V methodologies are program-specific and determined by previous Avista evaluation methodologies as well as the relative contribution of a given program to the overall energy efficiency impacts. Besides drawing on IPMVP, the Evaluators also reviewed relevant information on infrastructure, framework, and guidelines set out for EM&V work in several guidebook documents that have been published over the past several years. These include the following:

- Northwest Regional Technical Forum (RTF)[3]
- National Renewable Energy Laboratory (NREL), United States Department of Energy (DOE) The Uniform Methods Project (UMP): Methods for Determining Energy Efficiency Savings for Specific Measures, April 2013[4]
- International Performance Measurement and Verification Protocol (IPMVP) maintained by the Efficiency Valuation Organization (EVO) with sponsorship by the U.S. Department of Energy (DOE)[5]

The Evaluators kept data collection instruments, calculation spreadsheets, and monitored/survey data available for Avista records.

2.1 Glossary of Terminology

As a first step to detailing the evaluation methodologies, the Evaluators have provided a glossary of terms to follow:

- **Deemed Savings** – An estimate of an energy savings outcome (gross savings) for a single unit of an installed energy efficiency measure. This estimate (a) has been developed from data sources and

[1] https://www.nrel.gov/docs/fy02osti/31505.pdf

[2] https://www.nrel.gov/docs/fy18osti/70472.pdf

[3] https://rtf.nwcouncil.org/measures

[4] Notably, The Uniform Methods Project (UMP) includes the following chapters authored by ADM. Chapter 9 (Metering Cross- Cutting Protocols) was authored by Dan Mort and Chapter 15 (Commercial New Construction Protocol) was Authored by Steven Keates.

[5] Core Concepts: International Measurement and Verification Protocol. EVO 100000 – 1:2016, October 2016.

analytical methods that are widely accepted for the measure and purpose and (b) are applicable to the situation being evaluated.

- **Expected Savings** – Calculated savings used for program and portfolio planning purposes.
- **Adjusted Savings** – Savings estimates after database review and document verification has been completed using deemed unit-level savings provided in the Avista TRM. It adjusts for such factors as data errors and installation rates.
- **Verified Savings** – Savings estimates after the updated unit-level savings values have been updated and energy impact evaluation has been completed, integrating results from billing analyses and appropriate RTF UES and Avista TRM values.
- **Gross Savings** – The change in energy consumption directly resulting from program-related actions taken by participants in an efficiency program, regardless of why they participated.
- **Free Rider** – A program participant who would have implemented the program measure or practice in absence of the program.
- **Net-To-Gross** – A factor representing net program savings divided by gross program savings that is applied to gross program impacts to convert them into net program load impacts.
- **Net Savings** – The change in energy consumption directly resulting from program-related actions taken by participants in an efficiency program, with adjustments to remove savings due to free ridership.
- **Non-Energy Benefits** – Quantifiable impacts produced by program measures outside of energy savings (comfort, health and safety, reduced alternative fuel, etc.).
- **Non-Energy Impacts** – Quantifiable impacts in energy efficiency beyond the energy savings gained from installing energy efficient measures (reduced cost for operation and maintenance of equipment, reduced environmental and safety costs, etc.).

2.2 Summary of Approach

This section presents our general cross-cutting approach to accomplishing the impact evaluation of Avista's Residential, Low-Income, and Nonresidential programs listed in Table 1-5. The Evaluators start by presenting our general evaluation approach. This chapter is organized by general task due to the overlap across programs.

The Evaluators outline the approach to verifying, measuring, and reporting the residential portfolio impacts as well as cost-effectiveness and summarizing potential program and portfolio improvements. The primary objective of the impact evaluation is to determine ex-post verified net energy savings. On-site verification and equipment monitoring was not conducted during this impact evaluation.

Our general approach for this evaluation considers the cyclical feedback loop among program design, implementation, and impact evaluation. Our activities during the evaluation estimate and verify annual energy savings and identify whether a program meets its goals. These activities are aimed at providing guidance for continuous program improvement and increased cost effectiveness for the 2024 and 2025 program years.

The Evaluators employed the following approach to complete impact evaluation activities for the programs. The Evaluators define three major approaches to determining net savings for Avista's programs:

- A *Deemed Savings* approach involves using stipulated savings for energy conservation measures for which savings values are well-known and documented. These prescriptive savings may also include

an adjustment for certain measures, such as lighting measures in which site operating hours may differ from RTF values.

- A *Billing Analysis* approach involves estimating energy savings by applying a linear regression to measured participant energy consumption utility meter billing data. Billing analyses included billing data from nonparticipant customers. This approach does not require on-site data collection for model calibration. This approach aligns with the IPMVP Option C.
- A *Custom* approach, used for the Site-Specific program involves selecting the appropriate IPMVP option to apply to the specific measure or project. Typically, this is Option A as most projects in the program are lighting retrofits, however Options B, C and D are also employed, depending upon the project. Specific methods are discussed in each site report.

The Evaluators accomplished the following quantitative goals as part of the impact evaluation:

- Verify savings with 10% precision at the 90% confidence level;
- Where appropriate, apply the RTF to verify measure impacts; and
- Where available data exists, conduct billing analysis with a suitable comparison group to estimate measure savings.
- Use IPMVP analysis methods for custom projects.

For each program, the Evaluators calculated adjusted savings for each measure based on the Avista TRM and results from the database review. The Evaluators calculated verified savings for each measure based on the RTF UES, Avista TRM, or billing analysis in combination with the results from document review. For some downstream measures, the Evaluators also applied in-service rates (ISRs) from verification surveys.

The Evaluators assigned methodological rigor level for each measure and program based on its contribution to the portfolio savings and availability of data.

The Evaluators analyzed billing data for all natural gas measure participants in residential downstream measures. The Evaluators applied billing analysis results to determine evaluated savings only for measures where savings could be isolated (that is, where a sufficient number of participants could be identified who installed only that measure). Program-level realization rates incorporate billing analysis results for measures that were determined to display statistically significant savings.

2.2.1 Database Review

At the outset of the evaluation, the Evaluators reviewed the databases to ensure that each program tracking database conforms to industry standards and adequately tracks key data required for evaluation.

Measure-level net savings were evaluated primarily by reviewing measure algorithms and values in the tracking system to ensure that the Avista TRM was appropriately utilized to develop ex-ante savings estimates. The Evaluators then aggregated and cross-checked program and measure totals.

The Evaluators reviewed program application documents for a sample of incented measures to verify the tracking data accurately represents the program documents. The Evaluators ensured participants installed measures that met or exceeded program efficiency standards.

2.2.2 Verification Methodology

In this section, the Evaluators summarize the verification methods used to ensure projects were completed at the efficiency levels detailed in the program-level tracking data.

2.2.2.1 Sampling Methodology

The Evaluators summarize the methods for each verification effort:

- Sampling methodology for most programs
- Sampling methodology for the Site-Specific Program
- Document-based verification
- Survey-based verification
- On-site visits

2.2.2.2 Sampling Methodology

The Evaluators verified a sample of participating projects for detailed review of the installed measure documentation and development of verified savings. The Evaluators verified tracking data by reviewing invoices and surveying a sample of participant customer households/businesses. The Evaluators also conducted a verification survey for program participants.

The Evaluators used the following equations to estimate sample size requirements for each program and fuel type. Required sample sizes were estimated as follows:

Equation 2-1: Sample size for infinite sample size

$$n = \left(\frac{Z \times CV}{d}\right)^2$$

Equation 2-2: Sample Size for Finite Population Size

$$n_0 = \frac{n}{1 + \left(\frac{n}{N}\right)}$$

Where,

- n = Sample size
- Z = Z-value for a two-tailed distribution at the assigned confidence level.
- CV = Coefficient of variation
- d = Precision level
- N = Population

For a sample that provides 90/10 precision, *Z* = 1.645 (the critical value for 90% confidence) and *d* = 0.10 (or 10% precision). The remaining parameter is *CV*, or the expected coefficient of variation of measures for which the claimed savings may be accepted. A *CV* of .5 was assumed for residential programs due to the homogeneity of

participation[6], which yields a sample size of 68 for an infinite population. Sample sizes were adjusted for smaller populations via the method detailed in Equation 2-2.

2.2.2.3 Sampling Methodology for the Site-Specific Program

For the Site-Specific program, Simple Random Sampling is not an effective sampling methodology as the CV values observed in business programs are typically very high because the distributions of savings are generally positively skewed. Often, a relatively small number of projects account for a high percentage of the estimated savings for the program.

To address this situation, we use a sample design for selecting projects for the M&V sample that considers such skewness. With this approach, we select several sites with large savings for the sample with certainty and take a random sample of the remaining sites. To improve precision, non-certainty sites are selected for the sample through systematic random sampling. That is, a random sample of sites remaining after the certainty sites have been selected is selected by ordering them according to the magnitude of their savings and using systematic random sampling. Sampling systematically from a list that is ordered according to the magnitude of savings ensures that any sample selected will have some units with high savings, some with moderate savings, and some with low savings. Samples cannot result in concentrations of sites with atypically high savings or atypically low savings. Specific sampling characteristics are shown in the Site-Specific section of this report.

2.2.2.4 Document-Based Verification

The Evaluators requested rebate documentation for a subset of participating customers. These documents included invoices, rebate applications, pictures, and AHRI certifications for the following programs.

- Shell Program (Residential)
- ENERGY STAR® Homes Program
- Appliances Program
- HVAC Program (Nonresidential)
- Food Service Equipment Program
- Shell Program (Nonresidential)

This sample of documents was used to cross-verify tracking data inputs. In the case the Evaluators found any deviations between the tracking data and application values, the Evaluators reported and summarized those differences in the Database Review sections presented for each program in Section 3.2 and 5.2.

The Evaluators developed a sampling plan that achieves a sampling precision of ±10% at 90% statistical confidence – or "90/10 precision" – to estimate the percentage of projects for which the claimed savings are verified or require some adjustment.

[6] Assumption based off California Evaluation Framework: https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy/Energy_Programs/Demand_Side_Management/EE_and_Energy_Savings_Assist/CAEvaluationFramework.pdf

The Evaluators developed the following samples for each program's document review using Equation 2-1 and Equation 2-2. The Evaluators ensured representation in each state and fuel type for each measure.

Table 2-1: Document-Based Verification Samples and Precision by Program

Sector	Program	Gas Population	Sample (With Finite Population Adjustment)*	Precision at 90% CI
Residential	Shell	715	73	90% ± 9.13%
Residential	ENERGY STAR® Homes	27	21	90% ± 8.62%
Residential	Appliances	1,360	89	90% ± 8.43%
Residential	Midstream	2,656	2,656	90% ± 0%
Low-Income	Low-Income	358	NA	NA
Non-Residential	HVAC	11	11	90% ± 0%
Non-Residential	Shell	15	15	90% ± 0%
Non-Residential	Midstream	217	52	90% ± 9.97%[7]
Non-Residential	Site-Specific	15	8	90% ± 9.64%

*Assumes sample size of 68 for an infinite population, based on *CV* (coefficient of variation) = 0.5, *d* (precision) = 10%, *Z* (critical value for 90% confidence) = 1.645.

** The Site-Specific Program sample is chosen via a random stratified sample and does not include the FPC. However, it is included in this table for illustrative and informative purposes.

The table above represents the number of rebates in both Washington service territory alone. The Evaluators ensured representation of state and fuel type in the sampled rebates for document verification.

2.2.2.5 Survey-Based Verification

In PY2023, the Evaluators conducted survey-based verification for the Water Heat, HVAC, Small Home & MF Weatherization, and Appliances Programs. The primary purpose of conducting a verification survey is to confirm that the measure was installed and is still currently operational and whether the measure was early retirement or replace-on-burnout. This effort was completed for Avista's programs in PY2023. For the purposes of this report, the Appliances Program respondent results are summarized here and are used to incorporate in-service rates into the verified savings results for the Appliances Program.

The Evaluators summarize the final sample sizes shown in Table 2-2 for the Appliances Program for the Washington Gas Avista projects. The Evaluators developed a sampling plan that achieved a sampling precision of ±9.6% at 90% statistical confidence for ISRs estimates at the program-level during web-based survey verification. These results include the Washington and Idaho natural gas service territory. Further detail is presented in Section 3.1.

Table 2-2: Survey-Based Verification Sample and Precision by Program

Sector	Program	Population	Respondents	Precision at 90% CI
Residential	Appliances	309	60	90% ± 9.6%

The Evaluators implemented a web-based survey to complete the verification surveys. The findings from these activities served to estimate ISRs for each measure surveyed. These ISRs were applied to verification sample

[7] 9.97% is the minimum program-level precision achieved. Typically, actual verification took place in a measure-by-measure basis, with census verification for each measure, greatly exceeding (more precise) than 9.97%.

desk review rebates towards verified savings, which were then applied to the population of rebates. The measure-level ISRs resulting from the survey-based verification are summarized in Section 5.2.4.

2.2.2.6 On-Site Visits

For sampled projects in the Site-Specific program, the Evaluators conducted onsite visits to the facilities to verify installation, collected facility characteristics and collected any data needed to conduct savings calculations. In WA, a total of three visits were conducted to verify natural gas measures. Further details are available in the Site-Specific Program chapter.

2.2.3 Impact Evaluation Methodology

The Evaluators employed the following approach to complete impact evaluation activities for the programs. The Evaluators define three major approaches to determining net savings for Avista's programs:

- Deemed Savings
- Billing Analysis (IPMVP Option C)
- Billing Heating Load Estimation (IPMVP Option A)

The Site-Specific program also employed various IPMVP options, deepening upon the project and measure, and is discussed separately as it differs in approach from the approaches used in the remainder of the portfolio. In the following sections, the Evaluators summarize the general guidelines and activities followed to conduct the deemed savings and billing analyses approaches.

2.2.3.1 Deemed Savings

This section summarizes the deemed savings analysis method the Evaluators employed for the evaluation of a subset of measures for each program. The Evaluators completed the validation for specific measures across each program using the RTF unit energy savings (UES) values, where available. The Evaluators ensured the proper measure unit savings were recorded and used in the calculation of Avista's ex-ante measure savings. The Evaluators requested and used the technical reference manual Avista employed during calculation of ex-ante measure savings (Avista TRM). The Evaluators documented any cases where recommended values differed from the specific unit energy savings workbooks used by Avista.

In cases where the RTF has existing unit energy savings (UES) applicable to Avista's measures, the Evaluators verified the quantity and quality of installations and applied the RTF's UES to determine verified savings. For gas measures, this applies to the Therms penalties found in electric measures in the RTF.

2.2.3.2 Billing Analysis

This section describes the billing analysis methodology employed by the Evaluators as part of the impact evaluation and measurement of energy savings for measures with sufficient participation. The Evaluators performed billing analyses with a matched control group and utilized a quasi-experimental method of producing a post-hoc control group. In program designs where treatment and control customers are not randomly selected at the outset, such as for downstream rebate programs, quasi-experimental designs are required.

For the purposes of this analysis, a household is considered a treatment household if it has received a program incentive. Additionally, a household is considered a control household if the household has not received a program incentive. To isolate measure impacts, treatment households are eligible to be included in the billing

analysis if they installed only one measure during the 2024 program year. Isolation of individual measures is necessary to provide valid measure-level savings. Households that installed more than one measure may display interactive energy savings effects across multiple measures that are not feasibly identifiable. Therefore, instances where households installed isolated measures are used in the billing analyses. In addition, the pre-period identifies the period prior to measure installation while the post-period refers to the period following measure installation.

The Evaluators utilized propensity score matching (PSM) to match nonparticipants to similar participants using pre-period billing data. PSM allows the evaluators to find the most similar household based on the customers' billed consumption trends in the pre-period and verified with statistical difference testing.

After matching based on these variables, the billing data for treatment and control groups are compared, as detailed in IPMVP Option C. The Evaluators fit regression models to estimate weather-dependent daily consumption differences between participating customer and nonparticipating customer households.

2.2.3.3 Cohort Creation

The PSM approach estimates a propensity score for treatment and control customers using a logistic regression model. A propensity score is a metric that summarizes several dimensions of household characteristics into a single metric that can be used to group similar households. The Evaluators created a post-hoc control group by compiling billing data from a subset of nonparticipants in the Avista territory to compare against treatment households using quasi-experimental methods. This allowed the Evaluators to select from a large group of similar households that have not installed an incented measure. With this information, the Evaluators created statistically valid matched control groups for each measure via seasonal pre-period usage. The Evaluators matched customers in the control group to customers in the treatment group based on nearest seasonal pre-period usage (e.g., summer, spring, fall, and winter) and exact 3-digit zip code matching (the first three digits of the five-digit zip code). After matching, the Evaluators conducted a *t*-test for each month in the pre-period to help determine the success of PSM.

While it is not possible to guarantee the creation of a sufficiently matched control group, this method is preferred because it is likely to have more meaningful results than a treatment-only analysis. Some examples of outside variables that a control group can sufficiently control for are changes in economies and markets, large-scale social changes, or impacts from weather-related anomalies such as flooding or hurricanes.

After PSM, the Evaluators ran the following regression models for each measure:

- Fixed effect Difference-in-Difference (D-n-D) regression model (recommended in UMP protocols)[8]
- Random effects post-program regression model (PPR) (recommended in UMP protocols)
- Gross billing analysis (treatment only)

The second model listed above (PPR) was selected because it had the best fit for the data, identified using the adjusted R-squared. Further details on regression model specifications can be found below.

[8] National Renewable Energy Laboratory (NREL) Uniform Methods Project (UMP) Chapter 17 Section 4.4.7.

2.2.3.4 Data Collected

The following lists the data collected for the billing analysis:

1. Monthly billing data for program participants (treatment customers)
2. Monthly billing data for a group of non-program participants (control customers)
3. Program tracking data, including customer identifiers, address, and date of measure installation
4. National Oceanic and Atmospheric Administration (NOAA) weather data between January 1, 2023 and December 31, 2024)
5. Typical Meteorological Year (TMY3) data

Billing and weather data were obtained for program year 2024 and for one year prior to measure install dates (2023).

Weather data was obtained from the nearest weather station with complete data during the analysis years for each customer by mapping the weather station location with the customer zip code.

TMY weather stations were assigned to NOAA weather stations by geocoding the minimum distance between each set of latitude and longitude points. This data is used for extrapolating savings to PY2024 weather.

2.2.3.5 Data Preparation

The following steps were taken to prepare the billing data:

1. Gathered billing data for homes that participated in the program.
2. Excluded participant homes that also participated in the other programs, if either program disqualifies the combination of any other rebate or participation.
3. Gathered billing data for similar customers that did not participate in the program in evaluation.
4. Excluded bills missing address information.
5. Removed bills missing fuel type/Unit of Measure (UOM).
6. Removed bills missing usage, billing start date, or billing end date.
7. Remove bills with outlier durations (<9 days or >60 days).
8. Excluded bills with consumption indicated to be outliers.
9. Remove duplicate bills and any bills with overlapping billing periods. If two billing periods overlapped, the bill with a start date that matched the previous bill's end date was included and the other bill was excluded. For example, if overlapping bill 1 had a 02/19/2024 start date, overlapping bill 2 had a 02/25/2024 start date, and the previous bill had a 02/19/2024 end date, overlapping bill 2 would be removed. If there was no previous bill, the overlapping bill with the earlier start date was included and the other overlapping bill was removed.
10. Calendarized bills (recalculate billing dates, usage, and total billed days such that bills begin and end at the start and end of each month).
11. Obtained weather data from nearest NOAA weather station using 5-digit zip code per household.
12. Computed Heating Degree Days (HDD) and Cooling Degree Days (CDD) for a range of setpoints. The Evaluators assigned a setpoint of 65°F for both HDD and CDD. The Evaluators tested and selected the optimal temperature base for HDDs and CDDs based on model *R*-squared values.

13. Removed measure cohorts without at least 50 treatment customers.
14. Selected treatment customers with only one type of measure installation during the analysis years and combined customer min/max install dates with billing data (to define pre- and post-periods).
15. Restricted to treatment customers with install dates in specified range (typically January 1, 2024 through June 30, 2024) to allow for sufficient post-period billing data.
16. Restricted to control customers with usage less than or equal to two times the maximum observed treatment group usage. This has the effect of removing control customers with incomparable usage relative to the treatment group.
17. Removed customers with incomplete post-period bills (<7 months).
18. Removed customers with incomplete pre-period bills.
19. Restricted control customers to those with usage that was comparable with the treatment group usage.
20. Created a matched control group using PSM and matching on pre-period seasonal usage and zip code.

2.2.3.6 Regression Models

The Evaluators ran the following models for matched treatment and control customers for each measure with sufficient participation. For net savings, the Evaluators selected either Model 1 or Model 2. The model with the best fit (highest adjusted R-squared) was selected. The Evaluators utilized Model 3 to estimate gross energy savings.

2.2.3.7 Model 1: Fixed Effects Difference-in-Difference Regression Model

The following equation displays the first model specification to estimate the average daily savings due to the measure.

Equation 2-3: Fixed Effects Difference-in-Difference (D-n-D) Model Specification

$$sADC_{it} = \alpha_0 + \beta_1(Post)_{it} + \beta_2(Post \times Treatment)_{it} + \beta_3(HDD)_{it} + \beta_4(CDD)_{it} + \beta_5(Post \times HDD)_{it} + \beta_6(Post \times CDD)_{it} + \beta_7(Post \times HDD \times Treatment)_{it} + \beta_8(Post \times CDD \times Treatment)_{it} + \beta_9(Month)_t + \beta_{10}(Customer\ Dummy)_i + \varepsilon_{it}$$

Where,

- *i* = the *i*th household
- *t* = the first, second, third, etc. month of the post-treatment period
- ADC_{it} = Average daily usage reading *t* for household *i* during the post-treatment period
- $Post_{it}$ = A dummy variable indicating pre- or post-period designation during period *t* at home *i*
- $Treatment_i$ = A dummy variable indicating treatment status of home *i*
- HDD_{it} = Average heating degree days (base with optimal Degrees Fahrenheit) during period *t* at home *i*
- CDD_{it} = Average cooling degree days (base with optimal Degrees Fahrenheit) during period *t* at home i *(if electric usage)*
- $Month_t$= A set of dummy variables indicating the month during period *t*
- $Customer\ Dummy_i$ = a customer-specific dummy variable isolating individual household effects
- ε_{it} = The error term

- α_0= The model intercept
- β_{1-10} = Coefficients determined via regression

The Average Daily Consumption (ADC) is calculated as the total monthly billed usage divided by the duration of the bill month. β_2 represents the average change in daily baseload in the post-period between the treatment and control group and β_7 and β_8 represent the change in weather-related daily consumption in the post-period between the groups. Typical monthly and annual savings were estimated by extrapolating the β_7 and β_8 coefficients with Typical Meteorological Year (TMY) HDD and CDD data. However, in the case of gas usage, only the coefficient for HDD is utilized because CDDs were not included in the regression model.

The equation below displays how savings were extrapolated for a full year utilizing the coefficients in the regression model and TMY data. TMY data is weighted by the number of households assigned to each weather station.

Equation 2-4: Savings Extrapolation

$$Annual\ Savings = \beta_2 * 365.25 + \beta_7 * TMY\ HDD + \beta_8 * TMY\ CDD$$

2.2.3.8 Model 2: Random Effects Post-Program Regression Model

The following equation displays the second model specification to estimate the average daily savings due to the measure. The post-program regression (PPR) model combines both cross-sectional and time series data in a panel dataset. This model uses only the post-program data, with lagged energy use for the same calendar month of the pre-program period acting as a control for any small systematic differences between the treatment and control customers; in particular, energy use in calendar month *t* of the post-program period is framed as a function of both the participant variable and energy use in the same calendar month of the pre-program period. The underlying logic is that systematic differences between treatment and control customers will be reflected in the differences in their past energy use, which is highly correlated with their current energy use. These interaction terms allow pre-program usage to have a different effect on post-program usage in each calendar month.

The model specification is as follows:

Equation 2-5: Post-Program Regression (PPR) Model Specification

$$\begin{aligned} ADC_{it} = {} & \alpha_0 + \beta_1(Treatment)_i + \beta_2\ (PreUsageSpring)_i + \beta_3(PreUsageSummer)_i + \beta_4(PreUsageFall)_i \\ & + \beta_5(PreUsageWinter)_i + \beta_6(Month)_t + \beta_7(Month \times PreUsageSpring)_{it} \\ & + \beta_8(Month \times PreUsageSummer_{)it} + \beta_9(Month \times PreUsageFall)_{it} \\ & + \beta_{10}(Month \times PreUsageWinter)_{it} + \beta_{11}(HDD)_{it} + \beta_{12}(CDD)_{it} \\ & + \beta_{13}(Treatment \times HDD)_{it} + \beta_{14}(Treatment \times CDD)_{it} + \varepsilon_{it} \end{aligned}$$

Where,

- *i* = the *i*th household
- *t* = the first, second, third, etc. month of the post-treatment period
- ADC_{it} = Average daily usage for reading *t* for household *i* during the post-treatment period
- $Treatment_i$ = A dummy variable indicating treatment status of home *i*
- $Month_t$ = Dummy variable indicating month of month *t*

- $PreUsageSpring_i$ = Average daily usage in the spring months across household *i*'s available pre-treatment billing reads
- $PreUsageSummer_i$ = Average daily usage in the summer months across household *i*'s available pretreatment billing reads
- $PreUsageFall_i$ = Average daily usage in the fall months across household *i*'s available pretreatment billing reads
- $PreUsageWinter_i$ = Average daily usage in the winter months across household *i*'s available pre-treatment billing reads
- HDD_{it} = Average heating degree days (base with optimal Degrees Fahrenheit) during period *t* at home *i*
- CDD_{it} = Average cooling degree days (base with optimal Degrees Fahrenheit) during period *t* at home i *(if electric usage)*
- ε_{it} = Customer-level random error
- α_0= The model intercept for home *i*
- β_{1-14} = Coefficients determined via regression

The coefficient β_1 represents the average change in consumption between the pre-period and post-period for the treatment group and β_{13} and β_{14} represent the change in weather-related daily consumption in the post-period between the groups. Monthly and annual savings were estimated by extrapolating the β_{13} and β_{14} coefficients with Typical Meteorological Year (TMY) HDD and CDD data.

The equation below displays how savings were extrapolated for a full year utilizing the coefficients in the regression model and TMY data.

Equation 2-6: Savings Extrapolation

$$Annual\ Savings = \beta_1 * 365.25 + \beta_{11} * TMY\ HDD + \beta_{12} * TMY\ CDD$$

2.2.3.9 Model 3: Gross Billing Analysis, Treatment-Only Regression Model

The sections above detail the Evaluator's methodology for estimating net energy savings for each measure. The results from the above methodology report net savings due to the inclusion of the counterfactual comparison group. However, for planning purposes, it is useful to estimate gross savings for each measure. To estimate gross savings, the Evaluators employed a similar regression model; however, only including participant customer billing data. This analysis does not include control group billing data and therefore models energy reductions between the pre-period and post-period for the measure participants (treatment customers).

To calculate the impacts of each measure, the Evaluators applied linear fixed effects regression using participant billing data with weather controls in the form of Heating Degree Days (HDD) and Cooling Degree Days (CDD). The following equation displays the model specification to estimate the average daily savings due to the measure.

Equation 2-7: Treatment-Only Fixed Effects Weather Model Specification

$$ADC_{it} = \alpha_0 + \beta_1(Post)_{it} + \beta_2(HDD)_{it} + \beta_3(CDD)_{it} + \beta_4(Post \times HDD)_{it} + \beta_5(Post \times CDD)_{it} + \beta_6(Customer\ Dummy)_i + \beta_7(Month)_t + \varepsilon_{it}$$

Where,

- *i* = the *i*th household

- *t* = the first, second, third, etc. month of the post-treatment period
- ADC_{it} = Average daily usage for reading *t* for household *i* during the post-treatment period
- HDD_{it} = Average heating degree days (base with optimal Degrees Fahrenheit) during period *t* at home *i*
- CDD_{it} = Average cooling degree days (base with optimal Degrees Fahrenheit) during period *t* at home *i (if electric usage)*
- $Post_{it}$ = A dummy variable indicating pre- or post-period designation during period *t* at home *i*
- $Customer\ Dummy_i$ = a customer-specific dummy variable isolating individual household effects
- ε_{it} = Customer-level random error
- α_0= The model intercept for home *i*
- β_{1-7} = Coefficients determined via regression

The results of the treatment-only regression models are gross savings estimates. The gross savings estimates are useful to compare the net savings estimates. However, the treatment-only models are unable to separate the effects of national or regional events like a pandemic, recession, or weather event. Therefore, the results from this additional gross savings analysis are unable to reflect actual typical year savings. However, for planning purposes, these estimates may be useful.

2.2.3.10 Billing Heating Load Estimation

In addition to the regression-based IPMVP Option C billing analysis, the Evaluators also employed a heating load estimation billing analysis. Heating load estimation is a prime methodology for estimating savings associated with space heating measures such as furnaces. This methodology follows IPMVP Option A, in which the estimation of a key parameter is used to calculate savings. The heating load estimation methodology follows the same data collection and data preparation steps outlined in Sections 2.2.3.4 and 2.2.3.5, respectively. However, instead of ending with a regression analysis, post-period billing data are used to estimate customer heating load, which is used as an input in a deemed savings formula to calculate energy savings.

The first step in heating load estimation is calculating TMY3 weather normalized average daily consumption. To do so, customer-specific regressions are run to determine the effect of daily HDD on average daily consumption. This is a straightforward regression of the form:

Equation 2-8: Heating Load Regression

$$ADC_i = \alpha_0 + \beta_1(HDD)_i$$

Where,

- *i* = the *i*th household
- ADC_i = Average daily usage for household *i* during the post-treatment period
- HDD_i = Average heating degree days (base with optimal Degrees Fahrenheit) at home *i*
- β_1 = Coefficient determined via regression

This regression is run separately for each customer to determine β_1, impact of HDD on average daily consumption (i.e., the change in Therms usage per HDD). From there, β_1 multiplied by HDD is subtracted from ADC and $\beta_1$multiplied by TMY3_HDD is added back to ADC to calculate TMY3 weather normalized average daily

consumption. The actual HDD attributable Therms usage is subtracted from average daily consumption and the TMY_HDD attributable Therms are added back in, as outlined in the following equation.

Equation 2-9: Normalized Average Daily Consumption

$$NADC_i = ADC_i - \beta_1 * (HDD)_i + \beta_1 * (TMY\_HDD)_i$$

Where,

- *i* = the *i*th household
- $NADC_i$ = TMY normalized average daily usage for household *i* during the post-treatment period
- β_1 = Customer-specific Therms usage per HDD
- ADC_i = Average daily usage for household *i* during the post-treatment period
- HDD_i = Average heating degree days (base with optimal Degrees Fahrenheit) at home *i*
- TMY_HDD_i = Average TMY heating degree days at home *i*

Once TMY normalized average daily usage is calculated, the penultimate step to heat load estimation is calculating customer baseload usage. Customer baseload usage represents the energy customers use for non-heating needs, such as a gas stove or dryer. For gas heating measures, customer baseload usage can be calculated as the average NADC across June, July, and August. Customer-specific baseload usage is then subtracted from NADC and to determine customer daily heating load.

Customer heating loads are then used in the following deemed savings equation to calculate the annual savings associated with gas furnace installation.

Equation 2-10: Gas Furnace Savings

$$Savings_i = 365 * HL_i * (\frac{1}{Base_i} - \frac{1}{Eff_i})$$

Where,

- *i* = the *i*th household
- $Savings_i$ = Annual Therms savings for household *i* based on post-treatment period billing data
- 365 = Days in the year
- HL_i = Customer-specific daily heating load for household *i*
- $Base_i$ = Baseline furnace efficiency at home *i*, which is assumed to be 85.5% per the RTF Gas Furnace UES Measure[9]
- Eff_i = Installed furnace efficiency at home *i*, which is assumed to be 95%

2.2.4 Net-to-Gross

The Northwest RTF UES measures do not require NTG adjustments as they are built into the deemed savings estimates. In addition, billing analyses with counterfactual control groups, as proposed in our impact methodology, does not require a NTG adjustment, as the counterfactual represents the efficiency level at current market (i.e. the efficiency level the customer would have installed had they not participated in the program).

[9] https://rtf.nwcouncil.org/measure/residential-gas-furnaces/

2.2.5 Cost-Effectiveness Tests

The Evaluators calculated each program's cost-effectiveness, avoided energy costs, and implementation costs. The Evaluators used our company-developed cost-effectiveness tool to provide cost-effectiveness assessments for the Residential, Low-Income, and Nonresidential Portfolio by program, fuel type, program year, and measure, for each state.

As specified in this solicitation, the Evaluators determined the economic performance with the following cost-effectiveness tests:

- Total Resource Cost (TRC) test;
- Utility Cost Test (UCT);
- Participant Cost Test (PCT); and
- Rate Impact Measure (RIM).

2.2.6 Non-Energy Benefits

The Evaluators used the non-energy impact (NEI) values estimated and filed in Avista's 2022 Annual Conservation Plan. Measures with quantified NEBs include residential insulation, high efficiency windows, air source heat pumps, and ductless heat pumps.

In addition to the residential NEBs, the Evaluators applied the end-use non-energy benefit and health and human safety non-energy benefit to the Low-Income Program. The Evaluators understand that the two major non-energy benefits referenced above are uniquely applicable to the Low-Income Program. The Evaluators applied those benefits to the program impacts as well as additional non-energy benefits associated with individual measures included in the program. The Evaluators incorporated additional NEBs to the impact evaluation, as applicable. Additional details on the non-energy benefits applied can be found in Appendix B.

3 Residential Impact Evaluation Results

The Evaluators completed an impact evaluation on Avista's Residential portfolio to verify program-level and measure-level energy savings for PY2024. The following sections summarize findings for each natural gas impact evaluation in the Residential Portfolio in the Washington service territory. The Evaluators used data collected and reported in the tracking database, online application forms, Avista TRM, RTF, and billing analysis of participants and nonparticipants to evaluate savings. This approach provided the strongest estimate of achieved savings practical for each program, given its delivery method, magnitude of savings, number of participants, and availability of data. Table 3-1 summarizes the Residential verified impact savings by program. Table 3-2 summarizes the Residential portfolio's cost-effectiveness.

Table 3-1: Residential Verified Impact Savings by Program

Program	Expected Savings (Therms)	Verified Savings (Therms)	Verified Realization Rate
Shell	178,362.37	170,205.19	95.43%
ENERGY STAR Homes	NA	NA	NA
Appliances	31,235.82	53,585.00	171.55%
Midstream	100,439.64	103,673.90	103.22%
Home Energy Audit	NA	NA	NA
On Bill Repayment	NA	NA	NA
Total Res	**310,037.83**	**327,464.09**	**105.62%**

Table 3-2: Residential Portfolio Cost-Effectiveness Summary

Sector	TRC			UCT		
	Benefits	Costs	B/C Ratio	Benefits	Costs	B/C Ratio
Residential	$7,267,296.58	$4,901,109.86	1.48	$4,912,831.79	$7,530,249.11	0.65

In PY2024, Avista completed and provided incentives for residential natural gas measures in Washington and achieved total natural gas savings of 327,464.09 Therms, leading to an overall achievement of 105.6% of the expected savings for the residential programs. The Evaluators estimated the TRC value for the Residential portfolio is 1.48 while the UCT value is 0.65. Further details of the impact evaluation results by program are provided in the sections following.

3.1 Simple Verification Results

In PY2023, the Evaluators surveyed 2,229 unique customers that participated in Avista's residential energy efficiency program from October 2022 and in December 2023 using an email survey approach. The Evaluators did not complete surveying efforts in the PY2024 evaluation and therefore referenced simple verification responses from the PY2023 impact evaluation.

The Evaluators surveyed customers that received rebates for Water Heat, HVAC, Small Home & MF Weatherization, Appliance, and Midstream Programs in PY2023. For the purposes of this report, the results for the Appliance Program are summarized.

Table 3-3: Summary of Survey Response Rate

Population	Respondents
Initial email contact list	8,262
Invalid or bounced	416
Invalid or bounced email (%)	5.0%
Invitations sent (unique valid)	7,846
Completions	2,229
Response rate (%)	28.4%

3.1.1 In-Service Rates

The Evaluators calculated in-service rates of installed measures from simple verification surveys deployed to program participants for the Water Heat, HVAC, Small Home & MF Weatherization, and Appliance Programs. Evaluators asked participants if the rebated equipment is currently installed and working, in addition to questions about the new equipment fuel type. The Evaluators achieved ±13.1% precision across the Appliance Program surveyed for the natural gas measures in Avista's Washington service territory, summarized in Table 3-4. When mixing survey-level responses between Idaho and Washington, the Evaluators achieved 9.6% precision (Table 3-5).

Table 3-4: State-Specific Simple Verification Precision by Program

Sector	Program	Population	Respondents	Precision at 90% CI
Residential	Appliances	194	33	90% ± 13.1%

Table 3-5: Mixed-State-Specific Simple Verification Precision by Program

Sector	Program	Population	Respondents	Precision at 90% CI
Residential	Appliances	309	60	90% ± 9.6%

The measure-level ISRs for the Appliance program, as determined by the verification survey, are presented in the following table.

Table 3-6: Appliance Program ISRs by Measure

Measure	State-level Respondents	State-level ISR	Mixed State-level Respondents	Mixed State-level ISR	ISR Methodology
G Energy Star Rated Clothes Dryer	4	100%	10	100%	Mixed state ISR
G Energy Star Rated Front Load Washer	15	100%	29	100%	Mixed state ISR
G Energy Star Rated Top Load Washer	14	100%	21	95%	Mixed state ISR

These ISR values were utilized in the desk reviews for the Appliance Programs in order to calculate verified savings in PY2024. Additional insights from the survey responses are summarized in Appendix A: Summary of Survey Respondents.

3.2 Program-Level Impact Evaluation Results

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Residential sector in the section below.

3.2.1 Shell Program

The Shell Program provides incentives to customers for improving the integrity of the home envelope with upgrades to windows and storm windows. Rebates are issued after the measure has been installed for insulation and window measures. Participating homes must have natural gas or natural gas heating and itemized invoices including measure details such as insulation levels, window values, and square footage. In order to be eligible for incentive, the single-family households, including fourplex or less, must demonstrate an annual electricity usage of at least 8,000 kWh or an annual gas usage of at least 340 Therms. Primary Multifamily homes with shared interior walls including apartments, duplexes, townhomes, and condos have no minimum usage requirement. Seasonal and recreational homes are not eligible. This program includes free manufactured home duct sealing implemented by UCONS. Table 3-7 summarizes the measures offered under this program.

Table 3-7: Shell Program Measures

Measure	Description	Impact Analysis Methodology
G Attic Insulation With Natural Gas Heat	Attic insulation for homes heated with natural gas	RTF UES
G Energy Star Certified Insulated Door	Energy Star door replacement for homes heated with natural gas	RTF UES
G Floor Insulation With Natural Gas Heat	Floor insulation for homes heated with natural gas	RTF UES
G Sliding Glass Doors DIY with Natural Gas Heat	High-efficiency sliding glass door replacement for homes heated with natural gas- installed by the homeowner	RTF UES
G Sliding Glass Doors with Natural Gas Heat	High-efficiency sliding glass door replacement for homes heated with natural gas- installed by a contractor	RTF UES
G Storm Windows with Natural Gas Heat	High-efficiency storm window replacement for homes heated with natural gas	RTF UES
G Wall Insulation With Natural Gas Heat	Wall insulation for homes heated with natural gas	RTF UES
G Windows DIY Replc With Natural Gas Heat	High-efficiency window replacement for homes heated with natural gas- installed by the homeowner	RTF UES
G Window Replc With Natural Gas Heat	High-efficiency window replacement for homes heated with natural gas- installed by a contractor	RTF UES
G Multifamily Attic Insulation With Natural Gas Heat	Attic insulation for homes heated with natural gas	RTF UES
G Multifamily Energy Star Certified Insulated Door	Energy Star door replacement for homes heated with natural gas	RTF UES
G Multifamily Floor Insulation With Natural Gas Heat	Floor insulation for homes heated with natural gas	RTF UES
G Multifamily Sliding Glass Doors DIY with Natural Gas Heat	High-efficiency sliding glass door replacement for homes heated with natural gas- installed by the homeowner	RTF UES
G Multifamily Sliding Glass Doors with Natural Gas Heat	High-efficiency sliding glass door replacement for homes heated with natural gas- installed by a contractor	RTF UES
G Multifamily Storm Windows with Natural Gas Heat	High-efficiency storm window replacement for homes heated with natural gas	RTF UES
G Multifamily Wall Insulation With Natural Gas Heat	Wall insulation for homes heated with natural gas	RTF UES
G Multifamily Window DIY Replc With Natural Gas Heat	High-efficiency window replacement for homes heated with natural gas- installed by the homeowner	RTF UES
G Multifamily Window Replc With Natural Gas Heat	High-efficiency window replacement for homes heated with natural gas- installed by a contractor	RTF UES

The following table summarizes the adjusted and verified natural gas savings for the Shell Program impact evaluation.

Table 3-8: Shell Program Verified Natural Gas Savings

Measure	PY2024 Participation	Expected Savings (Therms)	Adjusted Savings (Therms)	Verified Savings (Therms)	Verified Realization Rate
G Attic Insulation With Natural Gas Heat	1,702	118,311.04	118,311.04	103,111.30	87.15%
G Energy Star Certified Insulated Door	103	3,439.80	3,439.80	3,439.80	100.00%
G Floor Insulation With Natural Gas Heat	18	744.26	744.26	537.59	72.23%
G Sliding Glass Doors DIY with Natural Gas Heat	16	450.90	450.90	355.94	78.94%
G Sliding Glass Doors with Natural Gas Heat	195	3,924.50	3,924.50	6,445.75	164.24%
G Storm Windows with Natural Gas Heat	2	0.00	0.00	0.00	NA
G Wall Insulation With Natural Gas Heat	72	2,968.11	2,694.99	4,000.43	134.78%
G Window DIY Replc With Natural Gas Heat	101	2,536.25	2,121.67	2,502.31	98.66%
G Window Replc With Natural Gas Heat	1,007	43,074.59	46,798.76	39,714.91	92.20%
G Multifamily Attic Insulation With Natural Gas Heat	21	734.61	1,469.22	1,242.38	169.12%
G Multifamily Energy Star Certified Insulated Door	3	62.04	81.90	81.90	132.01%
G Multifamily Floor Insulation With Natural Gas Heat	2	120.00	137.28	174.82	145.68%
G Multifamily Sliding Glass Doors DIY with Natural Gas Heat	0	0.00	NA	NA	NA
G Multifamily Sliding Glass Doors with Natural Gas Heat	2	33.40	33.40	23.97	71.77%
G Multifamily Storm Windows with Natural Gas Heat	0	0.00	NA	NA	NA
G Multifamily Wall Insulation With Natural Gas Heat	6	558.99	621.10	1,624.99	290.70%
G Multifamily Window DIY Replc With Natural Gas Heat	0	0.00	NA	NA	NA
G Multifamily Window Replc With Natural Gas Heat	24	1,403.89	3,177.22	6,949.11	494.99%
Total	**3,274**	**178,362.37**	**184,006.04**	**170,205.19**	**95.43%**

The Shell Program displayed verified savings of 170,205.19 Therms with a realization rate of 95.43% against the expected savings for the program. The following table summarizes the incentive and non-incentive costs associated with the program.

Table 3-9: Shell Program Costs

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
G Attic Insulation With Natural Gas Heat	$2,954,126.72	$254,353.09	$3,208,479.81
G Energy Star Certified Insulated Door	$12,600.00	$7,866.27	$20,466.27
G Floor Insulation With Natural Gas Heat	$18,821.50	$9,163.70	$27,985.20
G Sliding Glass Doors DIY with Natural Gas Heat	$6,540.00	$7,723.96	$14,263.96
G Sliding Glass Doors with Natural Gas Heat	$114,960.00	$18,440.10	$133,400.10
G Storm Windows with Natural Gas Heat	$0.00	$0.00	$0.00
G Wall Insulation With Natural Gas Heat	$88,033.16	$9,868.19	$97,901.35
G Window DIY Replc With Natural Gas Heat	$36,757.70	$6,172.64	$42,930.34
G Window Replc With Natural Gas Heat	$1,222,764.75	$97,968.03	$1,320,732.78
G Multifamily Attic Insulation With Natural Gas Heat	$36,730.50	$3,064.67	$39,795.17
G Multifamily Energy Star Certified Insulated Door	$300.00	$202.03	$502.03
G Multifamily Floor Insulation With Natural Gas Heat	$2,970.94	$1,067.81	$4,038.75
G Multifamily Sliding Glass Doors DIY with Natural Gas Heat	$0.00	$0.00	$0.00
G Multifamily Sliding Glass Doors with Natural Gas Heat	$960.00	$46.03	$1,006.03
G Multifamily Storm Windows with Natural Gas Heat	$0.00	$0.00	$0.00
G Multifamily Wall Insulation With Natural Gas Heat	$9,146.72	$4,008.50	$13,155.22
G Multifamily Window DIY Replc With Natural Gas Heat	$0.00	$0.00	$0.00
G Multifamily Window Replc With Natural Gas Heat	$32,039.60	$17,141.93	$49,181.53
Total	**$4,536,751.59**	**$437,086.94**	**$4,973,838.53**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Shell Program in the section below.

3.2.1.1 Database Review & Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Shell Program. The Evaluators selected a random subset of rebate applications to cross-verify tracking data inputs, summarized in Section 2.2.2.4.

The Evaluators reviewed each measure number of units, square footage, and insulation where available. The Evaluators found 11 sampled attic insulation projects that did not clearly provide R-Values in the documentation provided. Additionally, 3 window projects did not provide sufficient documentation to verify square footage or even the quantity of windows and two sliding glass door projects were found to claim the same kWh and Therms savings values at 16.7. Based on these findings, the Evaluators recommend Avista verify the project meets the insulation or efficiency requirements through documentation provided in project applications and request additional information if the original documentation does not summarize the efficiency and square footage of the project being completed. The Evaluators also recommend Avista conduct measure-level verification efforts to ensure proper fuels are being claimed in the tracking datasets.

3.2.1.2 Verification Survey

The Evaluators conducted a verification survey for Energy Star doors and found an in-service rate of 100% in PY2023. The Evaluators applied the results of the PY2023 efforts to the verified savings estimates in PY2024. The Evaluators did not conduct verification surveys for the other measures in the Shell Program since weatherization measures historically have high verification rates.

3.2.1.3 Impact Analysis

This section summarizes the verified savings results for the Shell Program. The Evaluators calculated verified savings for the natural gas measures using the active Avista TRM values. The Evaluators calculated adjusted savings for each measure using the active Avista TRM values and verified tracking data. The Evaluators conducted a billing analysis for measures where participation allowed. These values were applied to a random sample of participants, with verification of project documents such as rebate applications to verify installation, quantity, and efficiency of the equipment.

3.2.1.4 Verified Savings

The Shell Program in total displays a realization rate of 95.43% with a verified natural gas savings of 170,198.57 Therms in the Washington service territory, as displayed in Table 3-8. The realization rate for the electric savings in the Shell Program deviates from 100% due primarily to the differences between the categories applied in the Avista TRM prescriptive savings values and the more detailed categories present with unique RTF UES values associated with heating type and climate zone. In addition, missing verified R-values, square footage, and quantity of units from sampled projects led to variation in realization rate for each measure type.

The G Window Replc With Natural Gas Heat measure deviated from 100% because there were many discrepancies in the documentation provided in terms of square footage and unit quantity verification. Many rebate forms only provided window type and the price whereas the square footage of the window area as well as the quantity of windows greatly affects the realization rate once RTF UES is applied. The Evaluators made assumptions for some of these discrepancies based on the documentation provided.

The sliding glass door measure displays a realization rate of 164.24% primarily because the RTF UES value does not align with the Avista TRM UES value, measure causing a significant increase in realization rate. The Single Pane to Class 30 Window measure specification defined by the RTF using a gas forced-air furnace measure in the RTF UES assigns a per square foot of 0.98 Therms in Heating Zone 2/3 and 0.64 Therms in Zone 1. Due to discrepancies in the documentation provided regarding square footage and window quantities, these values increased the realization rate for this measure. For the same reasons mentioned above, the single DIY sliding glass door project resulted in a 78.94% realization rate.

Similarly, the Evaluators found that verified attic insulation, wall insulation, and window measure savings displayed varying realization rates at the project level primarily due to the differences between the categories applied in the Avista TRM prescriptive savings values. The more detailed categories present in the RTF define values associated with unique heating type, R-values and climate zone. The lack of granularity in the Avista TRM and misalignment with average participant characteristics led to a low realization rate for attic insulation, floor insulation, and window measures. The Evaluators recommend Avista update the Avista TRM value to reflect a weighted average of participation home characteristics.

Lastly, the Evaluators found that some window measures contained discrepancies in unit quantity. This contributed to a lower realization rate.

The Evaluators found 11 sampled attic insulation projects that did not clearly provide R-Values in the documentation provided. Additionally, three window projects did not provide sufficient documentation to verify square footage or even the quantity of windows and two sliding glass door projects were found to claim the same kWh and Therms savings values at 16.7. Based on these findings, the Evaluators recommend Avista verify

the project meets the insulation or efficiency requirements through documentation provided in project applications and request additional information if the original documentation does not summarize the efficiency and square footage of the project being completed. The Evaluators also recommend Avista conduct measure-level verification efforts to ensure proper fuels are being claimed in the tracking datasets.

3.2.2 ENERGY STAR® Homes Program

The ENERGY STAR® Homes Program provides rebates for manufactured homes within Avista's service territory that attain an ENERGY STAR® certification. This program is incentivized for ENERGY STAR® Eco-rated homes. Table 3-10 summarizes the measures offered under this program.

Table 3-10: ENERGY STAR® Homes Program Measures

Measure	Description	Impact Analysis Methodology
E ENERGY STAR Home - Manufactured, Gas & Electric	ENERGY STAR-rated manufactured home with gas and electric	RTF UES

The Energy Star Homes Program did not have any natural gas projects rebated in the Washington Service Territory in PY2024.

3.2.3 Appliances Program

The Appliances Program is a residential prescriptive program that offers incentives for customers to upgrade their existing clothes washers and dryers to ENERGY STAR-rated clothes dryers and washers. Primary multifamily homes with shared interior walls including apartments, duplexes, townhomes, and condos have no minimum usage requirement to be eligible for this program. However, Avista defines seasonal and recreational homes as ineligible.

This section summarizes the impact results of the evaluation results for the Appliances Program. Table 3-11 summarizes the measures offered under this program.

Table 3-11: Appliances Program Measures

Measure	Description	Impact Analysis Methodology
G Energy Star Rated Clothes Dryer	ENERGY STAR-certified clothes dryer for residential homes	RTF UES
G Energy Star Rated Front Load Washer	ENERGY STAR-certified front-loading clothes washer for residential homes	RTF UES
G Energy Star Rated Front Load Washer	ENERGY STAR-certified top loading clothes washer for residential homes	RTF UES
G Smart Thermostat DIY with Natural Gas Heat	ENERGY STAR-certified Smart Thermostat with DIY install for residential homes	RTF UES
G Smart Thermostat Paid Install with Natural Gas Heat	ENERGY STAR-certified Smart Thermostat with Paid Install for residential homes	RTF UES
G Multifamily Energy Star Rated Clothes Dryer	ENERGY STAR-certified clothes dryer for residential MF homes	RTF UES
G Multifamily Energy Star Rated Front Load Washer	ENERGY STAR-certified front-loading clothes washer for residential MF homes	RTF UES
G Multifamily Energy Star Rated Top Load Washer	ENERGY STAR-certified top loading clothes washer for residential MF homes	RTF UES
G Multifamily Smart Thermostat DIY with Natural Gas Heat	ENERGY STAR-certified Smart Thermostat with DIY install for residential MF homes	RTF UES
G Multifamily Smart Thermostat Paid Install with Natural Gas Heat	ENERGY STAR-certified Smart Thermostat with Paid Install for residential MF homes	RTF UES

The following table summarizes the verified natural gas savings for the Appliance Program impact evaluation.

Table 3-12: Appliances Program Verified Natural Gas Savings

Measure	PY2024 Participation	Expected Savings (Therms)	Adjusted Savings (Therms)	Verified Savings (Therms)	Verified Realization Rate
G Energy Star Rated Clothes Dryer	21	38.08	38.08	22.40	58.82%
G Energy Star Rated Front Load Washer	116	693.45	693.45	276.00	39.80%
G Energy Star Rated Top Load Washer	15	13.35	0.00	0.00	0.00%
G Smart Thermostat DIY with Natural Gas Heat	446	12,174.48	12,174.48	21,807.99	179.13%
G Smart Thermostat Paid Install with Natural Gas Heat	666	17,848.80	16,798.87	30,693.43	171.96%
G Multifamily Energy Star Rated Clothes Dryer	1	2.72	2.72	1.60	58.82%
G Multifamily Energy Star Rated Front Load Washer	2	12.06	12.06	4.80	39.80%
G Multifamily Energy Star Rated Top Load Washer	0	0.00	0.00	0.00	#DIV/0!
G Multifamily Smart Thermostat DIY with Natural Gas Heat	13	346.32	346.32	595.54	171.96%
G Multifamily Smart Thermostat Paid Install with Natural Gas Heat	4	106.56	106.56	183.24	171.96%
Total	**1,284**	**31,235.82**	**30,172.54**	**53,585.00**	**171.55%**

The Appliance Program displayed verified savings of 53,585.00 Therms with a realization rate of 171.55% against the expected savings for the program. The following table summarizes the incentive and non-incentive costs associated with the program.

Table 3-13: Appliances Program Costs

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
G Energy Star Rated Clothes Dryer	$700.00	$19.11	$719.11
G Energy Star Rated Front Load Washer	$5,750.00	$264.98	$6,014.98
G Energy Star Rated Top Load Washer	$750.00	$0.00	$750.00
G Smart Thermostat DIY with Natural Gas Heat	$63,493.08	$21,394.87	$84,887.95
G Smart Thermostat Paid Install with Natural Gas Heat	$133,352.38	$32,389.69	$165,742.07
G Multifamily Energy Star Rated Clothes Dryer	$50.00	$1.36	$51.36
G Multifamily Energy Star Rated Front Load Washer	$100.00	$4.61	$104.61
G Multifamily Energy Star Rated Top Load Washer	$0.00	$0.00	$0.00
G Multifamily Smart Thermostat DIY with Natural Gas Heat	$1,695.98	$628.98	$2,324.96
G Multifamily Smart Thermostat Paid Install with Natural Gas Heat	$800.00	$193.53	$993.53
Total	**$206,691.44**	**$54,897.14**	**$261,588.58**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Appliance Program in the section below.

3.2.3.1 Database Review & Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Appliance Program. The Evaluators selected a random subset of rebate applications to cross-verify tracking data inputs, summarized in Section 2.2.2.4.

The Evaluators found all Appliances Program rebates to have project documentation with the associated model number and efficiency values in either the tracking data or the mail-in rebate applications provided. In addition, documents included AHRI certifications or model numbers necessary to verify AHRI certifications. This allowed Evaluators to easily verify model specifications and apply appropriate RTF UES savings.

3.2.3.2 Verification Survey

In PY2023, the Evaluators randomly selected a subset of participant customers to survey for simple verification of installed measure described in Section 2.2.2.5. The Evaluators included questions such as:

- What type of clothes washer/dryer did this clothes washer/dryer replace?
- Is your home's water heated with electricity, natural gas, or another fuel?
- Was the previous equipment functional?
- Is the newly installed equipment still properly functioning?

The responses to this verification survey conducted in PY2023 were used to calculate ISRs for the measures offered in the Appliance Program in PY2024. The responses to these questions can be found in Appendix A.

Table 3-14 displays the ISRs for each of the Appliances Program measures for Idaho and Washington natural gas territory combined, as the Washington-only territory responses did not meet 90/10 precision goals. The ISRs resulted in ±9.6% precision at the 90% confidence interval for the program.

Table 3-14: Appliances Verification Survey ISR Results

Measure	Number of Rebates*	Number of Survey Completes	Precision at 90% Confidence	In-Service Rate
G Energy Star Rated Clothes Dryer	21	10	90% ±9.6%	100%
G Energy Star Rated Top Load Washer	111	29		100%
G Energy Star Rated Front Load Washer	62	21		95%

Survey respondents described equipment as currently functioning, leading to a 95-100% ISR for all measures. The Evaluators applied the ISRs listed in Table 3-14 to each rebate to quantify verified savings for each measure.

3.2.3.3 Impact Analysis

This section summarizes the verified savings results for the Appliances Program. The Evaluators calculated verified savings for the remaining measures using active values from the Avista TRM workbook, RTF UES workbooks, and billing analysis. These values were applied to a random sample of participants, with verification of project documents such as rebate applications to verify installation, quantity, and efficiency of the equipment.

3.2.3.4 Billing Analysis

The results of the billing analysis for the Appliances Program are provided in this section. The methodology for the billing analysis is provided in Section 2.2.3.2. Table 3-15 displays customer counts for customers considered for billing analysis (i.e. customer with single-measure installations) and identifies measures that met the requirements for a billing analysis. The customers considered for Energy Star Rated Front Load Washer and Smart Thermostat with Natural Gas Heat billing analyses include customers in both Washington and Idaho service territories to gather the maximum number of customers possible for precise savings estimates.

Table 3-15: Measures Considered for Billing Analysis, Appliances Program

Measure	Measure Considered for Billing Analysis	Number of Customers w/ Isolated-Measure Installations*	Sufficient Participation for Billing Analysis
G Energy Star Rated Front Load Washer	✓	141*	✓
G Smart Thermostat with Natural Gas Heat	✓	1,083*	✓

*This count includes rebates from Washington and Idaho

The final number of customers in each treatment and control group are listed in *Table 3-16*.

The Evaluators performed three tests to determine the success of PSM:

1. *t*-test on pre-period usage by month
2. Joint chi-square test to determine if any covariates are imbalanced
3. Standardized difference test for each covariate employed in matching

All tests confirmed that PSM performed well for each measure and the Evaluators conducted a linear regression using the matched participant and nonparticipant monthly billing data.

Table 3-16 provides annual savings per customer for the G Smart Thermostat with Natural Gas Heat measure, including both single family and multifamily homes. The regression results for the G Energy Star Rated Front Load Washer measure were not statistically significant, therefore measure savings were not included. Model 2 (PPR) was selected as the final model for the Appliance Program as it provided the highest adjusted R-squared among the regression models. Savings are statistically significant at the 90% level and the adjusted R-squared shows the model provided an excellent fit for the data (adjusted R-squared ≥ 0.90).

Table 3-16: Measure Savings, Appliances Program

Measure	Treatment Customers	Control Customers	Annual Savings per Customer (Therms)	90% Lower CI	90% Upper CI	Adjusted R-Squared	Model
G Smart Thermostat with Natural Gas Heat	536	2,550	46	42	50	0.92	Model 2: PPR

The Evaluators found the G Smart Thermostat with Natural Gas Heat measure displayed a statistically significant verified savings value of 46 Therms per year. The Evaluators applied these estimated savings for single family and multifamily natural gas smart thermostat measures rebated through the program.

3.2.3.5 Verified Savings

The Appliance Program in total displays a realization rate of 171.55% with 53,585.00 therms verified natural gas savings in the Washington service territory, as displayed in Table 3-12. The realization rate for the natural gas savings in the Appliance Program deviates from 100% due to larger than expected household-level smart thermostat savings though billing analysis methods. However, the Evaluators note discrepancies between the Avista TRM and RTF UES Savings values for smart thermostats and errors with the clothes washer defined claimed savings.

The Evaluators recommend Avista update the clothes dryer Avista TRM value to correctly assign 1.60 Therms savings for the measure, as reflected in the RTF. Currently, the Avista TRM reflects 2.72 Therms/unit. Additionally, The Evaluators recommend Avista update the front load clothes washer Avista TRM value to correctly convert 119.99 kWh/unit to 2.40 Therms/unit. Currently, the Avista TRM reflects 6.03 Therms/unit. The combination of these adjustments contributed to the downward adjustment to verified savings for the program.

Lastly, the Evaluators found that about 98% of the PY2024 expected savings were attributed to Smart Thermostat measures in the Appliances program. The Evaluators conducted a billing analysis for this measure, combining single family and multifamily participants to ensure a robust sample. The Evaluators verified statistically significant savings for this measure at 46 Therms per unit. This savings value was applied to the population of smart thermostat rebates, which drove the realization rate to 171% For the program, compared to the claimed savings value of 26.64 Therms per unit from the Avista TRM.

The Evaluators note that the RTF defines an annual savings of 11.7 Therms for all gas smart thermostat measure specifications defined in the Connected Thermostats RTF workbook. Although this finding did not impact the realization rate of the program in PY2024 due to statistically significant savings identified for smart thermostats through the billing analysis method, the Evaluators recommend Avista update the assumed claimed savings values to the Avista TRM to ensure this discrepancy in savings for future smart thermostat incentives does not occur in the future.

The Evaluators also found two sampled smart thermostat models that do not meet the minimum RTF qualifications for savings, although Avista had assigned the maximum savings value to these projects. The Evaluators recommend Avista verify each smart thermostat model meets the RTF requirements for regional savings compared to the market practice baseline or provide a list of qualified products for customers to select when participating in this program.

3.2.4 Midstream Program

Avista converted several residential and nonresidential measures from a downstream delivery channel to a midstream delivery channel via local distributors in PY2023. The Evaluators conducted the second impact evaluation in PY2024 for this newer Program. The Midstream Program currently offers midstream incentives to residential customers for measures such as:

- Residential natural gas furnaces
- Residential natural gas tankless water heaters
- Residential natural gas storage tank water heaters
- Residential natural gas boilers

The nonresidential midstream measures and impact evaluation results are presented in Section 3.2.4. This change in delivery channel is seen as expanding the benefits gained from the consumer with respect to the midstream incentive design rather than the downstream incentive design, as well as how customers use this offering. This section summarizes the estimated savings Avista has calculated for the Midstream Program. Table 3-17 summarizes the measures offered under this program.

Table 3-17: Midstream Program Measures

Measure	Description	Impact Analysis Methodology
G Natural Gas Furnace	High efficiency natural gas furnace installation	Engineering algorithm with RTF baseline adjustments
G Natural Gas Boiler	High efficiency natural gas boiler installation	
G Natural Gas Storage Tank Water Heater	High efficiency natural gas storage tank water heater installation	
G Natural Gas Tankless Water Heater	High efficiency natural gas tankless water heater installation	

The following table summarizes the estimated electric energy savings for the Midstream Program impact evaluation.

Table 3-18: Midstream Program Verified Natural Gas Savings

Measure	PY2024 Units	Expected Savings (Therms)	Verified Savings (Therms)	Realization Rate
G Natural Gas Furnace	2,593	82,886.60	86,103.22	103.88%
G Natural Gas Boiler	26	1,957.26	2,008.76	102.63%
G Natural Gas Storage Tank Water Heater	11	388.20	431.08	111.05%
G Natural Gas Tankless Water Heater	294	15,207.58	15,130.83	99.50%
Total	**2,924**	**100,439.64**	**103,673.90**	**103.22%**

The Midstream Program displayed estimated savings of 103,673.90 Therms with a realization rate of 103.22%. The following table summarizes the incentive and non-incentive costs associated with the program.

Table 3-19: Midstream Program Costs by Measure

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
G Natural Gas Furnace	$1,815,400.00	$271,900.69	$2,087,300.69
G Natural Gas Boiler	$15,600.00	$3,774.02	$19,374.02
G Natural Gas Storage Tank Water Heater	$1,250.00	$626.35	$1,876.35
G Natural Gas Tankless Water Heater	$148,500.00	$25,770.95	$174,270.95
Total	**$1,980,750.00**	**$302,072.01**	**$2,282,822.01**

The Evaluators describe the impact evaluation tasks completed for this program in the subsections below.

3.2.4.1 Database Review & Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Midstream Pilot. The Evaluators selected a subset of rebates to cross-verify tracking data inputs, summarized in Section 2.2.2.4.

The Evaluators found the tracking data documented the information necessary to accurately characterize savings for the program within the Washington natural gas service territory. The Evaluators verified the model number, efficiency, quantity, and RTF UES baselines necessary to calculate verified savings for the census of rebated equipment in the program. The Midstream tracking data is tracked and delivered separately from the remaining residential portfolio, often demonstrating extensive detail on product characteristics.

3.2.4.2 Verification Survey

The Evaluators did not conduct verification surveys for the Midstream Program in PY2024 due to the nature of the midstream delivery channel; customers are not aware that they are participating in the program because they are not required to fill out a downstream rebate application.

3.2.4.3 Impact Analysis

This section summarizes the verified savings results for the Midstream Program. The Evaluators calculated verified savings by referencing industry standard engineering algorithms for these well-researched measures and incorporated Regional Technical Forum-defined market practice baselines from the appropriate RTF workbooks in place at the time of the biennium plan for the Midstream Program.

3.2.4.4 Verified Savings

The Evaluators reviewed the Energy Solutions implementer expected savings values along with verified tracking data to estimate net adjusted program savings for those measures. To calculate verified savings, the Evaluators utilized industry-standard engineering algorithms using purchased equipment efficiency values and RTF-defined market practice baseline values, where appropriate. The Midstream Program displayed 103.22% realization with 103,673.90 Therms saved, as displayed in *Table 3-18*. This shows a marked improvement in expected savings calculations methodology from the previous year. The Evaluators recommend Avista and the Midstream Program implementer continue incorporating Regional Technical Forum market practice baseline to estimate regional savings through the program. Because downstream measures of the same category are similarly evaluated by comparing against market practice baseline in the Pacific Northwest, the Evaluators deem this counterfactual scenario is relevant for a midstream delivery channel offering incentives for the same equipment and recommend this methodology to estimate and evaluate the measures moving forward.

3.2.5 Home Energy Audit Program

The Residential Home Energy Audit Program is designed to educate and generate interest in efficiency in general and, more specifically, in Avista's portfolio of residential energy efficiency and renewable-energy programs. The Evaluators completed a billing analysis of the census of participants to identify the educational impact of the program on customers' energy usage behaviors while removing savings claimed and verified from other program participation. The following table summarizes the verified natural gas energy savings for the Home Energy Audit Program impact evaluation.

Table 3-20: Home Energy Audit Program Verified Natural Gas Savings

Measure	PY2024 Participation	Expected Savings (Therms)	Adjusted Savings (Therms)	Verified Savings (Therms)	Verified Realization Rate
Home Energy Audit	851	NA	NA	NA	NA
Total	**851**	**NA**	**NA**	**NA**	**NA**

The Evaluators were unable to identify and estimate statistically significant natural gas savings in the participant population through observed billing data. Avista did not estimate claimed savings for this program, and therefore the realization rate is not applicable to the program. The following table summarizes the incentive and non-incentive costs associated with the program.

Table 3-21: Home Energy Audit Program Costs by Measure

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
Home Energy Audit	$0.00	$0.00	$0.00
Total	**$0.00**	**$0.00**	**$0.00**

The Evaluators summarize the program-specific impact analysis activities, results, conclusions, and recommendations for the Home Energy Audit Program in the section below.

3.2.5.1 Database Review & Verification

The following sections describe the Evaluator's database review and document verification findings for the Home Energy Audit Program.

3.2.5.2 Database Review & Document Verification

Before conducting the billing analysis, the Evaluators conducted a database review for the Home Energy Audit Program. The Evaluators reviewed the list of participants of the Home Energy Audit Program in PY2024. The Evaluators identified participating customers with natural gas service in the Washington service territory. The Evaluators found no duplicate participants in the project data and found that program data appropriately reflected customer rate information.

3.2.5.3 Verification Surveys

The Evaluators did not conduct verification surveys for the Home Energy Audit Program in PY2024.

3.2.5.4 Impact Analysis

This section summarizes the verified savings results for the Home Energy Audit Program.

ADM conducted the following impact evaluation methodologies to attempt to estimate verified net energy savings in the Residential Home Energy Audit Program:

- Billing Analysis with counterfactual group (IPMVP Option C)

This program provides direct install measures to customers. The Avista auditor may provide recommendations for improvements that may be rebated through Avista's programs. In addition, the Avista auditor may also provide recommendations for home improvements that Avista does not currently incent for. Therefore, in order to capture this combination of effects, ADM conducted a billing analysis with a counterfactual group selected via propensity score matching.

The measures rebated by the customer through other Avista channels were removed from the average household billing analysis results, in order to remove double counting effects. Due to the participation rate, the Evaluators included Washington Electric, Washington Gas, Idaho Electric, and Idaho gas participants in the census billing analysis. However, the Evaluators found the billing analysis did not result in statistically significant natural gas impacts for the program. This is likely due to high variance in participating household energy usage and combined with the small magnitude of potential behavioral savings, a large treatment group is often recommended to identify a small treatment effect. The Evaluators will attempt to estimate statistically significant savings through billing analysis in PY2025 using extended participant data.

3.2.5.5 Verified Savings

The Evaluators conducted a census billing analysis to estimate the impacts of the education efforts of the Home Energy Audit Program. However, this effort did not result in statistically significant natural gas impacts[10]. The Evaluators recommend re-attempting a billing analysis in PY2025 with extended participant data.

[10] The Evaluators successfully quantified electric impacts through the Home Energy Audit Program, reflected in the Washington Electric Impact Evaluation Report.

3.2.6 On Bill Repayment Program

The On-Bill Repayment/Financing Program provides on-bill repayment/financing programs for residential and small business customers. Avista's on-bill repayment (OBR)/financing program returned as an offering after a half decade hiatus. In 2023 Avista started offering customers access to OBR through its partner the Puget Sound Cooperative Credit Union (PSCCU). OBR, through PSCCU, offers lower rate loans for energy-efficient projects to homeowners and business owners that can be more easily tracked and paid back through their monthly utility bill. OBR is not intended for customers who qualify for Avista's Low-Income Program and that can therefore be served directly through the partnering community action agencies.

Avista does not claim energy savings for OBR, as the savings associated with any measure installed using OBR financial support are claimed through the relevant and native Avista program. However, Avista intends to claim additional educational and behavioral impacts through the OBR Program.

During the PY2024 impact evaluation, the Evaluators did not conduct an impact evaluation for the On Bill Repayment Program. The Evaluators intend to conduct an impact evaluation of this program in PY2025, as it is a "low risk" program. However, the Evaluators summarize the estimated natural gas energy savings and costs through the program in the tables below.

Table 3-22: On Bill Repayment Program Claimed Natural Gas Savings

Measure	PY2024 Participation	Expected Savings (Therms)	Adjusted Savings (Therms)	Verified Savings (Therms)	Realization Rate
On Bill Repayment	24	NA	NA	NA	NA
Total	**24**	**NA**	**NA**	**NA**	**NA**

Avista does not quantify expected savings for the OBR Program. The following table summarizes the incentive and non-incentive costs associated with the program.

Table 3-23: On Bill Repayment Program Claimed Costs by Measure

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
On Bill Repayment	$12,000.00	$0.00	$12,000.00
Total	**$12,000.00**	**$0.00**	**$12,000.00**

4 Low-Income Impact Evaluation Results

The Low-Income Program delivers energy efficiency measures to low-income residential customers in its Washington service territory with a partnership with five network Community Action Agencies ("Agencies") and one tribal weatherization organization. The Agencies qualify income to prioritize and treat households based on several characteristics. In-house or contract crews install approved program measures. In addition, the Agencies have access to other monetary resources which allow them to weatherize a home or install additional energy efficiency measures.

The Evaluators did not complete an impact evaluation on Avista's Low-Income Program. However, the Low-Income Program will be evaluated in PY2025. For the purposes of this report, the expected savings claimed by Avista is summarized in this section for the Low-Income Program. Table 4-1 summarizes the Low-Income verified impact savings by program. Table 4-2 summarizes the Low-Income portfolio cost-effectiveness results.

Table 4-1: Low-Income Impact Savings by Program

Program	Expected Savings (Therms)	Verified Savings (Therms)	Verified Realization Rate
Low-Income	14,809.24	NA	NA
Total	**14,809.24**	**NA**	**NA**

Table 4-2: Low-Income Portfolio Cost-Effectiveness Summary

Sector	TRC			UCT		
	Benefits	Costs	B/C Ratio	Benefits	Costs	B/C Ratio
Low Income	$272,445.99	$2,715,951.04	0.10	$238,074.20	$2,715,951.04	0.09

In PY2024, Avista completed and provided incentives for low-income gas measures in Washington for a total expected natural gas savings of 14,809.24 Therms. The Evaluators estimated the TRC value for the Low-Income portfolio is 0.10 while the UCT value is 0.09 based on these expected savings and Low-Income Program administrative costs. Further details of the measure-level claimed energy savings and costs are provided in the following section.

4.1 Low Income Program

As specified in the previous section, the Evaluators did not complete an impact evaluation on Avista's Low-Income Program. For the purposes of this report, the expected savings claimed by Avista is summarized in this section for the Low-Income Program. Table 4-3 summarizes the measures offered under this program.

Table 4-3: Low-Income Program Measures

Measure	Impact Analysis Methodology
G Air Infiltration	Not evaluated in PY2024
G Attic Insulation With Natural Gas Heat	
G Deferred Maintenance Pilot	
G Door Sweep	
G Duct Insulation	
G Duct Sealing	
G Exterior Doors	
G Floor Insulation With Natural Gas Heat	
G Health Safety and Repair	
G Natural Gas Furnace	
G Storm Windows with Natural Gas Heat	
G Tankless Water Heater	
G Wall Insulation With Natural Gas Heat	
G Window Replc With Natural Gas Heat	

Table 4-4 summarizes the claimed natural gas savings for the Low-Income Program.

Table 4-4: Low-Income Program Verified Natural Gas Savings

Measure	PY2024 Participation	Expected Savings (Therms)	Adjusted Savings (Therms)	Verified Savings (Therms)	Verified Realization Rate
G Air Infiltration	112	1,802.08	NA	NA	NA
G Attic Insulation With Natural Gas Heat	54	2,106.72	NA	NA	NA
G Deferred Maintenance Pilot	19	0.00	NA	NA	NA
G Duct Insulation	8	230.52	NA	NA	NA
G Duct Sealing	6	121.02	NA	NA	NA
G Exterior Doors	87	1,576.96	NA	NA	NA
G Floor Insulation With Natural Gas Heat	27	1,086.25	NA	NA	NA
G Health Safety and Repair	121	0.00	NA	NA	NA
G Natural Gas Furnace	45	3,309.75	NA	NA	NA
G Storm Windows with Natural Gas Heat	2	20.16	NA	NA	NA
G Wall Insulation With Natural Gas Heat	15	882.54	NA	NA	NA
G 50 Gallon Natural Gas Water Heater	9	69.66	NA	NA	NA
G Tankless Water Heater	9	598.50	NA	NA	NA
G Window Replc With Natural Gas Heat	116	3,005.08	NA	NA	NA
Total	**630**	**14,809.24**	**NA**	**NA**	**NA**

The following table summarizes the incentive and non-incentive costs associated with the program.

Table 4-5: Low-Income Program Costs

Measure	Incentive Costs	Non-Incentive Costs	Total Costs
G Air Infiltration	$227,052.80	$497.22	$227,550.02
G Attic Insulation With Natural Gas Heat	$153,323.89	$1,257.82	$154,581.71
G Deferred Maintenance Pilot	$301,899.95	$0.00	$301,899.95
G Duct Insulation	$22,829.54	$137.75	$22,967.29
G Duct Sealing	$10,487.08	$42.13	$10,529.21
G Exterior Doors	$178,213.99	$938.51	$179,152.50
G Floor Insulation With Natural Gas Heat	$99,941.32	$648.56	$100,589.88
G Health Safety and Repair	$621,784.96	$0.00	$621,784.96
G Natural Gas Furnace	$337,712.06	$1,129.52	$338,841.58
G Storm Windows with Natural Gas Heat	$13,798.05	$6.12	$13,804.17
G Wall Insulation With Natural Gas Heat	$37,171.76	$526.92	$37,698.68
G 50 Gallon Natural Gas Water Heater	$34,674.72	$19.04	$34,693.76
G Tankless Water Heater	$60,058.63	$204.25	$60,262.88
G Window Replc With Natural Gas Heat	$609,797.95	$1,796.48	$611,594.43
Total	**$2,708,746.70**	**$7,204.34**	**$2,715,951.04**

5 Nonresidential Impact Evaluation Results

The Evaluators completed an impact evaluation on Avista's Non-Residential portfolio to verify program-level and measure-level energy savings for PY2024. The following sections summarize findings for each natural gas impact evaluation in the Non-Residential Portfolio in the Washington service territory. The Evaluators used data collected and reported in the tracking database, online application forms, Avista TRM, RTF, IPMVP, supplemental sources and billing analysis of participants to evaluate savings. The approach selected for each program allowed for the strongest estimate of achieved savings practical for each program, dependent on each program's delivery method, magnitude of savings, number of participants, and availability of data. Table 5-1 summarizes the Non-Residential verified impact savings by program. Table 5-2 summarizes the Non-Residential portfolio's cost-effectiveness.

Table 5-1:Non-Residential Verified Impact Savings by Program

Program	Expected Savings (Therms)	Verified Savings (Therms)	Verified Realization Rate	Total Costs
HVAC	223	223	100.0%	$2,792.30
Shell	26,244	26,244	100.0%	$455,331.74
Midstream	93,374	72,475	77.6%	$439,549.63
Site Specific	83,154	71,657	86.2%	$246,680.65
Total	**202,995**	**170,600**	**84.0%**	**$1,144,354.32**

Table 5-2:Non-Residential Portfolio Cost-Effectiveness Summary

Program	TRC			UCT		
	Benefits	Costs	B/C Ratio	Benefits	Costs	B/C Ratio
Nonresidential	$4,505,512.53	$1,617,394.45	2.79	$1,535,053.84	$1,144,354.32	1.34

In PY202, Avista completed and provided incentives for non-residential natural gas measures in Washington and claimed total natural gas energy savings of 202,995 Therms. The Evaluators estimated a total of 170,600 Therms savings. All programs exceeded savings claims, leading to an overall achievement of 84.0% of the expected savings for the non-residential programs. The Evaluators estimated the TRC value for the Non-Residential portfolio is 2.79 while the UCT value is 1.34. Further details of the impact evaluation results by program are provided in the sections following.

5.1 Verification

Before conducting the impact analyses, the Evaluators conducted a database review for all prescriptive programs. This process began with the selection of representative samples from each program. The Evaluators developed a sampling plan that achieves a sampling precision of ±10% at 90% statistical confidence – or "90/10 precision" – for document verification. Details about sampling methods can be found in Section 2.2.2.2 and details about the verification process can be found in Section 2.2.2.4. From these sample sizes random projects were selected for a comparison between the equipment specifications listed in program tracking data and the manufacture's specifications. These documents included invoices, rebate applications, pictures, AHRI certificates and DLC screenshots and similar types of documents for the following programs: When verifying HVAC equipment specifications, the program tracking was compared with information listed on AHRI certificates.

- HVAC Program

- Food Service Equipment Program
- Shell Program
- Midstream Program
- Site-Specific Program

To access Prescriptive Lighting ISRs the Evaluators conducted a survey of program participants in PY2023. The Evaluators did not conduct surveying efforts in PY2024; therefore, the respondent results from PY2023 were utilized to finalize verified savings estimates for the programs listed above. Another verification survey effort will be conducted in PY2025 – at least once per biennium. For the purposes of this report, the PY2023 survey effort results are provided in this report.

A total of 744 projects included a contact email, of which 80 were unique. Customers with a valid email were sent the survey via an email invitation, followed a week later by a follow-up reminder to those who had not responded. The Evaluators asked participants if the rebated equipment is currently installed and working, in addition to questions about HVAC configurations. All respondents reported that their rebated equipment was currently installed and operating.

For the Site-Specific program, the Evaluators conducted 5 on-site visits to verify full installation and equipment operation as described in the project scope, as well as to collect any data necessary for analyses. This is discussed further in the Site-Specific chapter.

Below, Table 5-3 shows representative sample sizes and achieved precision in verification sampling of Avista's Washington service territory.

Table 5-3: Non-Residential Program-level Verification Precision

Program	Population	Sampled	Precision at 90% CI
HVAC	11	11	90% ± 0%
Shell	16	16	90% ± 0%
Midstream	217	52	90% ± 9.97%[11]
Site-Specific	15	8	90% ± 9.64%

5.2 Program-Level Impact Evaluation Results

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Residential sector in the section below.

[11] 9.97% is the minimum program-level precision achieved. Typically, actual verification took place in a measure-by-measure basis, with census verification for each measure, greatly exceeding (more precise) than 9.97%.

5.2.1 Prescriptive HVAC Program

The Prescriptive HVAC Program encourages customers to select highly efficient natural gas heating equipment solutions for their business. Installing high efficiency equipment helps lower operating costs and save energy. The prescriptive rebate approach issues payment to the customer after the measure has been installed. Most of the HVAC measure incentives previously offered through this program have transitioned to delivery through the Midstream Program. However, Avista still offers smart thermostat incentives through the HVAC downstream program.

Commercial customers who heat their facilities with Avista natural gas are eligible for this program. Customers must submit a completed rebate form, invoices, and an AHRI certificate within 90 days after the installation has been completed. Table 5-4 summarizes the measures rebated in PY2024 under this program.

Table 5-4: Prescriptive HVAC Program Measures

Measure	Impact Analysis Methodology
Smart Thermostats	Avista TRM UES

The following table summarizes the claimed, adjusted and verified Therms savings for the program.

Table 5-5: Prescriptive HVAC Program Verified Natural Gas Savings

Measure	PY2024 Participation (Projects)	Expected Therms Savings	Adjusted Therms Savings	Verified Therms Savings	Realization Rate
Smart Thermostat	11	223	223	223	100.0%
Totals	**11**	**223**	**223**	**223**	**100.0%**

The following table summarizes the incentive and non-incentive costs associated with the program.

Table 5-6: Prescriptive HVAC Program Costs by Measure

Measure	Measure Count	Total Natural Gas Incentive	Measure Costs	Total Costs
Smart Thermostat	11	$2,696.59	$95.71	$2,792
Total	**11**	**$2,696.59**	**$95.71**	**$2,792**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Prescriptive HVAC Program in the section below.

5.2.1.1 Database Review & Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Prescriptive HVAC Program. The Evaluators review all rebate applications to cross-verify tracking data inputs, summarized in Section 2.2.2.4. Verification of project documents included data points such as smart thermostat model number, smart thermostat capabilities, and smart thermostat costs.

Table 5-7 shows the project population, the number of unique projects checked and the overall precision.

Table 5-7: Prescriptive HVAC Program Verification Precision

Population	Sampled	Precision
11	11	±0.0%

The Evaluators did not find any substantive deviations between project applications and program tracking data except one instance: electric savings was claimed for a single smart thermostat project rebated through the Washington Gas program. At the request of Avista, these claimed savings were transferred from the Prescriptive Natural Gas program to the Prescriptive Electric HVAC program, where both claimed and verified savings are reported. The Evaluators found all rebate equipment met or exceeded the measure efficiency requirements for the Prescriptive HVAC Program.

5.2.1.2 Impact Analysis

This section summarizes the verified savings results for the Prescriptive VFD Program. The Evaluators calculated verified savings for furnace and boiler measures using the Avista TRM. Final verified savings were calculated by applying the appropriate TRM UES to a census of measures.

5.2.1.3 Verified Savings

The Evaluators reviewed and applied the current TRM UES values for the Smart Thermostat measure along with verified tracking data to estimate net program savings for this measure. The verified savings for the program is 223 Therms with a realization rate of 100%, as displayed in Table 5-5.

5.2.2 Prescriptive Shell Program

The Prescriptive Shell Program offers incentives to commercial customers that improve the envelope of their existing buildings by adding insulation, helping lower their energy bills, increase their facility energy efficiency, and increase comfort for the individuals working at the facility. Avista issues payment to the customer after the measure has been installed by a licensed contractor. Commercial customers must have a facility annual heating footprint of at least one year and have a primary heat source provided by Avista. This program is promoted by trade allies, Avista account executives, the Avista website, and Avista marketing efforts. Avista's website is also used to communicate program requirements, incentives, and forms.

Customers must submit a complete rebate form, invoices, and an insulation certificate within 90 days after the installation has been completed. Avista then sends incentive checks to customers or their designees after each project is approved. Table 5-8 summarizes the measures rebated in PY2024 under this program.

Table 5-8: Prescriptive Shell Program Measures

Measure	Impact Analysis Methodology
Attic Insulation	Avista TRM UES
Roof Insulation	Avista TRM UES
Wall Insulation	Avista TRM UES

The following table summarizes the claimed, adjusted and verified Therms savings for the program.

Table 5-9: Prescriptive Shell Program Verified Natural Gas Savings

Measure	PY2024 Participation (Projects)	Expected Therms Savings	Adjusted Therms Savings	Verified Therms Savings	Realization Rate
Attic =< R11 to R30-R44	7	9,343	9,343	9,343	100.0%
Attic =< R11 to R45+	7	2,608	2,608	2,608	100.0%
Wall =< R4 to R11-R19	1	289	289	289	100.0%
Wall =< R4 to 19+	7	13,225	13,225	13,225	100.0%
Roof =< R11 to R30+	2	780	780	780	100.0%
Total	**15**	**26,244**	**26,244**	**26,244**	**100.0%**

The following table summarizes the incentive and non-incentive costs associated with the program.

Table 5-10: Prescriptive Shell Program Costs by Measure

Measure	Measure Count (Square Feet Installed)	Incentive Costs	Non-Incentive Costs	Total Costs
Attic =< R11 to R30-R44	103,812	$103,659	$147,287	$250,946
Attic =< R11 to R45+	34,272	$24,387	$48,098	$72,485
Wall =< R4 to R11-R19	4,600	$1,160	$6,389	$7,549
Wall =< R4 to 19+	36,735	$45,586	$63,069	$108,655
Roof =< R11 to R30+	6,496	$6,264	$9,432	$15,696
Total	**185,915**	**$181,057**	**$274,275**	**$455,332**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Prescriptive Shell Program in the section below.

5.2.2.1 Database Review & Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Prescriptive Shell Program. The Evaluators reviewed all rebate applications to cross-verify tracking data inputs, summarized in Section 2.2.2.4. Data points checked alignment between project applications and program tracking data, which included R-values, square footage of installation, HVAC configuration and measure cost values. Below, Table 5-11 shows the project population, the number of unique projects checked and the overall precision.

Table 5-11: Prescriptive Shell Program Verification Precision

Population	Sampled	Precision
16	16	±0.0%

The Evaluators found all rebate equipment met or exceeded measure efficiency requirements for the Prescriptive Shell Program and there were no substantive deviations between program tracking data and project documents.

5.2.2.2 Impact Analysis

This section summarizes the verified savings results for the Prescriptive Shell Program. The RTF does not provide a current measure listing for the measures in this program. Therefore, the Evaluators calculated verified savings for the insulation measure using the Avista TRM. Final verified savings were calculated by applying the appropriate UES to a census of measures.

5.2.2.3 Verified Savings

The Evaluators reviewed and applied the current TRM UES values for the Attic and Wall Insulation measures to the verified tracking data to estimate net program savings for this measure. The verified savings for the program is 26,244 therms with a realization rate of 100.0%, as displayed in Table 5-9 Evaluators did not find any deviations from TRM UES.

5.2.3 Nonresidential Midstream Program

Avista designed the Midstream Program to shift the onus of applying for rebates from end-use customers to distributors. Not only does this reduce customers' and contractors' administrative burden by foregoing the need to submit paperwork tracking energy efficient installations, but it is also anticipated to increase high-efficiency equipment options at competitive prices. Midstream rebates provide an immediate discount on eligible products, which appear as a line item on customer invoices. Starting on July 1, 2023, the Midstream Program replaced Avista's residential and commercial downstream space-heating and water-heating programs as well as the commercial food service equipment rebate program.

Through the Midstream Program, Avista seeks to achieve three overall objectives:

- Provide greater long-term, cost-effective savings for residential and commercial customers alike
- Reduce Avista's administrative burden in processing space-heating, water-heating, and commercial kitchen equipment applications
- Accelerate the market transformation of energy-efficient equipment

The Midstream Program provides bought-down equipment to both Residential and Commercial entities. This chapter discusses and presents results only for the nonresidential measures. See Section 3.2.4 for the residential portion.

Table 5-12 summarizes the measures rebated in PY2024 under this program.

Table 5-12: Non-Residential Midstream Program Measures

End Use	Measure	Impact Analysis Methodology
Food Service	Combination Oven	RTF Combination Ovens
	Convection Oven	RTF Convection Ovens
	Dishwasher	ENERGY STAR CFS Calculator
	Fryer	RTF Fryers
	Rotisserie Oven	CA eTRM Rotisseries
	Steamer	RTF Steamers
HVAC	Boiler	Engineering Algorithm
	Furnace	Engineering Algorithm
	Instantaneous Water Heater	Engineering Algorithm
	Mini/Multi Split	Engineering Algorithm
	Storage Water Heater	Engineering Algorithm

The following table summarizes the verified electric energy savings for the Midstream Program impact evaluation.

Table 5-13: Non-Residential Midstream Program Verified Therms Savings

Measure	PY2024 Participation (units)	Expected Savings (Therms)	Verified Savings (Therms)	Realization Rate
Boiler	20	27,241	27,125	99.6%
Combination Oven	10	2,799	2,743	98.0%
Convection Oven	6	672	672	99.9%
Dishwasher	6	2,263	2,263	100.0%
Fryer	55	20,946	17,381	83.0%
Furnace	86	9,719	10,922	112.4%
Instantaneous Water Heater	19	16,870	3,065	18.2%
Rotisserie Oven	2	3,920	3,920	100.0%
Steamer	1	1,121	1,041	92.9%
Storage Water Heater	19	7,823	3,344	42.7%
Total	**224**	**93,374**	**72,475**	**77.6%**

The following table summarizes the incentive and non-incentive costs associated with the program.

Table 5-14: Non-Residential Midstream Program Costs by Measure

Measure	Measure Count	Incentive Costs	Total Non-Incentive Costs	Total Costs
Boiler	20	$119,328	$27,112.55	$146,441
Combination Oven	10	$35,500	$1,609.93	$37,110
Convection Oven	6	$7,350	$456.89	$7,807
Dishwasher	6	$2,350	$1,826.04	$4,176
Fryer	55	$66,150	$9,331.23	$75,481
Furnace	86	$79,994	$10,916.70	$90,911
Instantaneous Water Heater	19	$39,409	$3,063.59	$42,473
Rotisserie Oven	2	$6,200	$2,665.16	$8,865
Steamer	1	$2,800	$506.54	$3,307
Storage Water Heater	19	$20,282	$2,698.31	$22,980
Totals	**224**	**$379,363**	**$60,186.93**	**$439,550**

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Midstream Program in the section below.

5.2.3.1 Database Review & Verification

Before conducting the impact analysis, the Evaluators conducted a database review for the Midstream Program. Due to the program delivery pathway, the Program does not include project applications. For this program, the Evaluators examined a representative sample of projects to ensure that program tracking data accurately reflected measure characteristics used in assessing savings. Data points checked include equipment configurations, capacities, and efficiency levels.

Table 5-15 shows the project population, the number of projects checked and the overall precision.

Table 5-15: Non-Residential Midstream Program Verification by Measure

Measure	Population	Sampled
Boiler	20	18
Combination Oven	10	10
Convection Oven	6	6
Dishwasher	6	6
Fryer	55	38
Furnace	86	50
Instantaneous Water Heater	19	19
Rotisserie Oven	2	2
Steamer	1	1
Storage Water Heater	19	12

The Evaluators found all rebate equipment met or exceeded the measure efficiency requirements for the Midstream Program and no substantive equipment specifications differed from those in the tracking data.

5.2.3.2 Impact Analysis

Once verification was completed, to estimate program savings for these measures the Evaluators reviewed and applied the appropriate UES values from the RTF. If a measure was not covered by the RTF, the Evaluators used the savings value identifies in the Avista TRM for the appropriate measure. Otherwise, the California eTRM (CA eTRM) was utilized as a third appropriate source. Unit energy savings sourced from the RTF were taken from measure package versions in place at the time of program planning.

Verified savings for food service equipment was referenced from RTF and eTRM workbooks and is specific to the equipment configuration(s). Savings for boilers, furnaces and water heaters were calculated using standard engineering algorithms, with equipment-specific inputs for capacity and efficiency, and EFLH values from the Midstream planning workbook. Savings calculations for storage and tankless water heaters were carried out in a similar method, using verified equipment specifications and prescriptive water use estimates for each building type, based on regional use data.

5.2.3.3 Verified Savings

- **Instantaneous Water Heaters:** Claimed savings were calculated based on Therms saved per input BTUh (rated) of the equipment and assumed average equipment sizing, whereas verified savings calculations were carried out using standard engineering algorithms, which include actual equipment specifications and annual water use. Several projects were atypically large, resulting in lower verified savings than expected. Further, the Evaluators calculated a second set of savings (not reported) using methodology from program planning materials. These results yielded only 67% of savings expectations, however relative magnitudes of savings per project generally aligned with algorithm-based results.
- **Storage Water Heaters:** Similar to Instantaneous water heaters, claimed savings were calculated based on Therms saved per input BTUh (rated) of the equipment and assumed average equipment sizing, whereas verified savings calculations were carried out using standard engineering algorithms, which include verified equipment specifications and annual water use. Several projects were atypically large, resulting in slightly lower overall verified savings than expected. Further, Evaluators calculated a second set of savings (not reported) using methodology from program planning materials. These results yielded

96% of savings expectations, and relative magnitudes of savings per project generally aligned with algorithm-based results.

- **Fryers:** Expected savings were based on a general capacity category found in the RTF workbook, however the Evaluators used RTF UES workbooks to verify savings for this measure, which were specific to the equipment. The Evaluators applied the RTF capacity-specific UES to each project appropriately, which resulted in are slightly lower project-level savings than expected and claimed.
- **Steamers:** Expected savings calculations had assumed 7-12 pan capacities for steamers incentivized through the program; however, the Evaluators verified capacities of 3-6 pan, resulting in lower verified savings than expected and claimed.

5.2.4 Site-Specific Program

The Site-Specific Program provides calculated incentives to support the installation of qualifying energy efficiency equipment at commercial/industrial sites. These projects typically have a higher degree of complexity than the traditional prescriptive offerings and rely on custom calculations of savings and incentive levels. Examples of these projects include process improvements, upgrades to specialized equipment used in manufacturing, lighting installations that rely on specialized controls, and other measures designed around the customer's and facility's specific needs.

The program approach strives for a flexible response to energy efficiency projects that have demonstrable Therms savings within program criteria and are typically composed of custom HVAC, envelope, and industrial process load projects that do not fit the prescriptive path.

The following table summarizes the verified natural gas energy savings for the Site-Specific Program impact evaluation.

Table 5-16: Site-Specific Program Verified Natural Gas Savings

PY2024 Participation	Expected Therms Savings	Verified Therms Savings	Verified Realization Rate
15	83,154	71,657	86.2%

The Site-Specific Program displayed verified savings of 71,657 Therms with a realization rate of 86.2% against the expected savings for the program.

Table 5-17: Site-Specific Program Costs

Incentive Costs	Non-Incentive Costs	Total Costs
$188,859.86	$57,820.79	$246,681

The Evaluators summarize the program-specific and measure-specific impact analysis activities, results, conclusions, and recommendations for the Site-Specific Program in the sections below.

5.2.4.1 Database Review & Verification

Unlike other nonresidential programs, completing a census review of all Site-Specific projects is infeasible. To ensure accurate verified savings estimates, the Evaluators developed a sample of representative sites to inspect using the stratified random sampling procedure detailed in Section 2.2.2.3. This procedure provides 90% confidence and +/- 10% precision with a significantly reduced sample than random sampling would require, by selecting the highest saving facilities with certainty, thereby minimizing the variance that non-sampled sites can contribute to the overall results.

The participant population for the Site-Specific Program was divided into five strata. Table 5-18 summarizes the strata boundaries and sample frames for the Site-Specific Program.

Table 5-18: Site-Specific Program Sample Design

Statistic Description	Stratum 1	Stratum 2	Stratum3	Stratum 4	Totals
Strata boundaries (Therms)	< 1,000	1,001 - 4,000	4,001 - 10,000	>10,001	
Number of projects	5	4	4	2	**15**
Total Therms savings	1,945	9,083	31,163	40,963	**83,154**
Average Therms Savings	389	2,271	7,791	20,482	**5,544**
Standard deviation of Therms savings	197	919	2,240	28,512	**6,942**
Coefficient of variation	0.505	0.405	0.287	0.188	**1.252**
Final design sample	**3**	**2**	**2**	**2**	**9**

Two of the highest-savings sites, both in the fourth stratum, were also specifically selected for verification and analysis. Verified sampling precision met 90/10 precision goals, resulting in a precision of ±9.61% at 90%.

5.2.4.2 Project Document Review and On-Site Visits

Once representative projects were selected, the Evaluators obtained all project-related documentation for review. These documents typically included specification sheets, building characteristics, calculators, invoices, project photos and trending data. This information allowed the Evaluators to replicate claimed savings estimates and develop M&V plans to be used in assessing verified savings and collecting on-site data.

Using project-specific M&V plans, the Evaluators visited sampled facilities to verify measure installation and operating parameters, as well as building parameters such as square footage and HVAC configurations. The Evaluators were able to conduct visits to five of the eight sampled projects[12]. The remaining three sampled projects did not require site visits to accurately verify project-level savings.

5.2.4.3 Impact Analysis

Impact approaches varied by project but adhered to IPMVP Options A and C and used methods and inputs from established, reputable sources starting with the Regional Technical Forum, supplemented by the Illinois TRM 12.0. For five of the eight sampled sites, whole-facility billing analyses were feasible and provided statistically robust savings estimates. For the remaining site, prescriptive calculations were conducted.

5.2.4.4 Site-Level Realization

Adjusted and verified savings were developed for each sampled site. The realization rates for sites within each stratum were then applied to the non-sampled sites within their respective stratum to estimate program-level savings, weighted by facility characteristics. Table 5-19 presents realization at the site level, with program-level total verified savings due to the Site-Specific Program.

[12] Two projects were located at the same site.

Table 5-19: Site-Specific Expected, Adjusted and Verified Therms Savings by Project

Project ID	Expected Therms Savings	Adjusted Therms Savings	Verified Therms Savings	Realization Rate
SSOP_131434	248	248	200	80.6%
SSOP_136670	380	380	230	60.5%
SSOP_132019	1,143	1,143	1,143	100.0%
SSOP_117962	1,898	1,898	1,898	100.0%
SSOP_110572	9,082	9,082	11,956	131.6%
SSOP_113688	9,457	9,457	4,854	51.3%
SSOP_129892	17,765	17,765	17,765	100.0%
SSOP_113685	23,198	23,198	15,222	65.6%
Totals:	**63,171**	**63,171**	**53,268**	**84.3%**

5.2.4.5 Discussion of Non-100% Realization

Billing analyses were conducted for all sampled sites. Results from five sites were statistically significant and recorded as verified savings. For all sites with non-100% realization, measured savings from billing analyses differed from calculated expected savings.

- **SSOP_131434 –** Measured savings are lower than ex ante predictions.
- **SSOP_136670 –** Measured savings are lower than ex ante predictions.
- **SSOP_110572 –** Measured savings are higher than ex ante predictions.
- **SSOP_113688 –** Measured savings are lower than ex ante predictions.
- **SSOP_113685 –** Measured savings are lower than ex ante predictions.

5.2.4.6 Verified Savings

The Site-Specific Program in total displays a realization rate of 86.2% with 71,657 Therms verified natural gas energy savings in the Washington service territory, as displayed in Table 5-20.

Table 5-20: Site-Specific Impact Summary

Expected Therms Savings	Verified Therms Savings	Realization Rate
83,154	71,657	86.2%

6 Appendix A: Summary of Survey Respondents

This section summarizes additional insights gathered from the simple verification surveys deployed by the Evaluators for the impact evaluation of Avista's Residential and Low-Income Programs in PY2023. As detailed previously, the Evaluators utilized the response results from this survey effort to incorporate in-service rates into the PY2024 verified savings estimates. A full process evaluation and verification survey effort will be implemented in PY2025.

Survey respondents confirmed installing between one and three measures that were rebated by Avista, displayed in Table 6-1. This table is missing information from 29 low-income, CEEP, and MFDI survey respondents who neither indicated the number nor type of measures they received.

Table 6-1: Type and Number of Measures Received by Respondents

Measure Category	Total	Percent (n=305)
No Measures	304	13.8%
One Measure	1218	55.4%
Two Measures	440	20.0%
Three Measures	171	7.8%
Four Measures	47	2.1%
Five or more measures	20	0.9%
HVAC	289	13.1%
Water Heater	136	6.2%
Smart Thermostat	515	23.4%
Clothes Washer	297	13.5%
Clothes Dryer	189	8.6%

The Evaluators asked respondents to provide information regarding their home, as displayed in Table 6-2. Similar to previous impact evaluation findings, the majority of respondents noted owning a single-family home between 1,000-3,000 square feet with central air conditioning.

Table 6-2: Survey Respondent Home Characteristics[13]

Question	Response	Percent
Do you rent your home? (n=755)	Own	93.8%
	Rent	1.9%
	Own and rent to someone else	1.3%
	I don't know	0.1%
	Prefer not to answer	2.9%
Which of the following best describes your home? (n=755)	Single-family house detached	86.0%
	Single-family house attached to one or more other houses	2.3%
	Mobile or manufactured home	8.2%
	Apartment with 2 to 4 units	0.8%
	Apartment with 5+ units	0.3%
	Other	1.4%
	I don't know	0.2%
	Prefer not to answer	0.7%
Does your home have central air conditioning? (n=755)	Yes	72.6%
About how many square feet is your home? (n=629)	Less than 1,000ft^2	6.6%
	1,000-1,999ft^2	42.4%
	2,000-2,999ft^2	32.3%
	3,000-3,999ft^2	13.5%
	4,000ft^2 or more	5.2%
When was your home built? (n=719)	Before 1950	20.0%
	1950 to 1959	10.3%
	1960 to 1969	6.6%
	1970 to 1979	15.3%
	1980 to 1989	7.7%
	1990 to 1999	15.3%
	2000 to 2009	13.2%
	2010 to 2019	4.7%
	2020 to Present	5.6%
	I don't know	1.1%
	Prefer not to answer	0.2%

[13] Four contractors or construction companies were not asked these questions.

7 Appendix B: Cost Benefit Analysis Results

The Evaluators estimated the cost-effectiveness for the Avista Residential, Low-Income, and Nonresidential Portfolio using evaluated savings results, economic inputs provided by Avista, and incremental costs and non-energy impacts from the RTF. The table below presents the cost-effectiveness results for the PY2024 portfolio.

Table 7-1: Cost-Effectiveness Results

Sector	TRC	UCT	RIM	PCT
Residential	1.48	0.65	0.05	10.42
Residential Low Income	0.10	0.09	0.09	N/A*
Nonresidential	2.79	1.34	1.35	0.61
Total	**1.30**	**0.59**	**0.07**	**N/A***
***Low Income is offered at no cost to participants; PCT is not calculable.**				

7.1 Approach

The California Standard Practice Model was used as a guideline for the calculations. The cost-effectiveness analysis methods that were used in this analysis are among the set of standard methods used in this industry and include the Utility Cost Test (UCT)[14], Total Resource Cost Test (TRC), Ratepayer Impact Measure Test (RIM), and Participant Cost Test (PCT). All tests weigh monetized benefits against costs. These monetized amounts are presented as NPV evaluated over the lifespan of the measure. The benefits and costs differ for each test based on the perspective of the test. The definitions below are taken from the California Standard Practice Manual.

- The TRC measures the net costs of a demand-side management program as a resource option based on the total costs of the program, including both the participants' and the utility's costs.
- The UCT measures the net costs of a demand-side management program as a resource option based on the costs incurred by the program administrator (including incentive costs) and excluding any net costs incurred by the participant. The benefits are similar to the TRC benefits. Costs are defined more narrowly.
- The PCT is the measure of the quantifiable benefits and costs to the customer due to participation in a program. Since many customers do not base their decision to participate in a program entirely on quantifiable variables, this test cannot be a complete measure of the benefits and costs of a program to a customer.
- The RIM test measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program. Rates will go down if the change in revenues from the program is greater than the change in utility costs. Conversely, rates or bills will go up if revenues collected after program implementation is less than the total costs incurred by the utility in implementing the program. This test indicates the direction and magnitude of the expected change in customer bills or rate levels.

A common misperception is that there is a single best perspective for evaluation of cost-effectiveness. Each test is useful and accurate, but the results of each test are intended to answer a different set of questions. The questions to be addressed by each cost test are shown in the table below.[15]

[14] The UCT is also referred to as the Program Administrator Cost Test (PACT).
[15] http://www.epa.gov/cleanenergy/documents/suca/cost-effectiveness.pdf

Table 7-2: Questions Addressed by the Various Cost Tests

Cost Test	Questions Addressed
Participant Cost Test (PCT)	▪ Is it worth it to the customer to install energy efficiency?
	▪ Is it likely that the customer wants to participate in a utility program that promotes energy efficiency?
Ratepayer Impact Measure (RIM)	▪ What is the impact of the energy efficiency project on the utility's operating margin?
	▪ Would the project require an increase in rates to reach the same operating margin?
Utility Cost Test (UCT)	▪ Do total utility costs increase or decrease?
	▪ What is the change in total customer bills required to keep the utility whole?
Total Resource Cost Test (TRC)	▪ What is the regional benefit of the energy efficiency project (including the net costs and benefits to the utility and its customers)?
	▪ Are all of the benefits greater than all of the costs (regardless of who pays the costs and who receives the benefits)?
	▪ Is more or less money required by the region to pay for energy needs?

Overall, the results of all four cost-effectiveness tests provide a more comprehensive picture than the use of any one test alone. The TRC cost test addresses whether energy efficiency is cost-effective overall. The PCT, UCT, and RIM address whether the selection of measures and design of the program are balanced from the perspective of the participants, utilities, and non-participants. The scope of the benefit and cost components included in each test are summarized in the table below.[16]

The Evaluators used the economic inputs provided by Avista for the cost benefit analysis. Avista provided the Evaluators with avoided costs on the following basis:

- Hourly avoided commodity costs
- Modifications for the Clean Premium
- Avoided capacity costs
- Avoided transmission
- 10% Conservation Adder
- Line losses
- Discount rate (after tax Weighted Average Cost of Capital)

[16] Ibid.

Table 7-3: Benefits and Costs Included in Each Cost-Effectiveness Test

Test	Benefits	Costs
PCT (Benefits and costs from the perspective of the customer installing the measure)	■ Incentive payments ■ Bill Savings ■ Applicable tax credits or incentives	■ Incremental equipment costs ■ Incremental installation costs
UCT (Perspective of utility, government agency, or third party implementing the program	■ Energy-related costs avoided by the utility ■ Capacity-related costs avoided by the utility, including generation, transmission, and distribution	■ Program overhead costs ■ Utility/program administrator incentive costs
TRC (Benefits and costs from the perspective of all utility customers in the utility service territory)	■ Energy-related costs avoided by the utility ■ Capacity-related costs avoided by the utility, including generation, transmission, and distribution ■ Additional resource savings ■ Monetized non-energy benefits	■ Program overhead costs ■ Program installation costs ■ Incremental measure costs
RIM (Impact of efficiency measure on non-participating ratepayers overall)	■ Energy-related costs avoided by the utility ■ Capacity-related costs avoided by the utility, including generation, transmission, and distribution	■ Program overhead costs ■ Lost revenue due to reduced energy bills ■ Utility/program administrator installation costs

7.2 Non-Energy Benefits

Non-energy Benefits (NEBs) were sourced from the 2022 Annual Conservation Plan developed by Avista. NEBs included avoided illness from air pollution, avoided calls to the utility, avoided fires/insurance damage, and other impacts relative to energy efficiency upgrades offered to customers in each of Avista's programs.

- Residential measures with NEBs included air source heat pumps, ductless heat pumps, windows, and insulation measures.
- Low Income NEBs included the NEBs described for Residential as well as a dollar-for-dollar benefit adder for health and safety spending.

7.3 Results

The tables below outline the results for each test, for both the programs and the portfolio as a whole. Summations may differ by $1 due to rounding.

Table 7-4: Cost-Effectiveness Results by Sector

Sector	TRC	UCT	RIM	PCT
Residential	1.48	0.65	0.05	10.42
Residential Low Income	0.10	0.09	0.09	N/A*
Nonresidential	2.79	1.34	1.35	0.61
Total	**1.30**	**0.59**	**0.07**	**N/A***
***Low Income is offered at no cost to participants; PCT is not calculable.**				

Table 7-5: Cost-Effectiveness Benefits by Sector

Program	TRC Benefits	UCT Benefits	RIM Benefits	PCT Benefits
Residential	$7,267,297	$4,912,832	$4,917,203	$42,815,573
Residential Low Income	$272,446	$238,074	$238,573	$2,708,747
Nonresidential	$4,505,513	$1,535,054	$1,548,778	$751,976
Total	**$12,045,255**	**$6,685,960**	**$6,704,554**	**$46,276,296**

Table 7-6: Cost-Effectiveness Costs by Sector

Program	TRC Costs	UCT Costs	RIM Costs	PCT Costs
Residential	$4,901,110	$7,530,249	$98,074,282	$4,107,054
Residential Low Income	$2,715,951	$2,715,951	$2,715,951	$2,708,747
Nonresidential	$1,617,394	$1,144,354	$1,144,354	$1,225,016
Total	**$9,234,455**	**$11,390,554**	**$101,934,588**	**$8,040,817**

Table 7-7: Cost-Effectiveness Net Benefits by Sector

Program	TRC Net Benefits	UCT Net Benefits	RIM Net Benefits	PCT Net Benefits
Residential	$2,366,187	-$2,617,417	-$93,161,450	$38,708,519
Residential Low Income	-$2,443,505	-$2,477,877	-$2,477,877	$0
Nonresidential	$2,888,118	$390,700	$390,700	-$473,040
Total	**$2,810,800**	**-$4,704,595**	**-$95,248,628**	**$38,235,479**

APPENDIX D – 2024 COST-EFFECTIVENESS TABLES

Electric

Electric Portfolio

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
Total Resource Cost (TRC)	$ 45,268,242	$ 31,338,714	1.44
Utility Cost Test (UCT)	$ 38,215,623	$ 26,813,671	1.43
Ratepayer Impact (RIM)	$ 38,215,623	$ 63,697,607	0.60
Participant Cost Test (PCT)	$ 75,823,765	$ 24,771,506	N/A

Electric Portfolio (without Low-Income)

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
Total Resource Cost (TRC)	$ 42,931,873	$ 29,362,200	1.46
Utility Cost Test (UCT)	$ 37,428,290	$ 24,837,157	1.51
Ratepayer Impact (RIM)	$ 37,428,290	$ 61,057,647	0.61
Participant Cost Test (PCT)	$ 73,094,377	$ 22,947,599	3.19

Commercial/Industrial

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
Total Resource Cost (TRC)	$ 32,414,549	$ 23,235,881	1.40
Utility Cost Test (UCT)	$ 29,467,772	$ 20,113,970	1.47
Ratepayer Impact (RIM)	$ 29,467,772	$ 49,881,949	0.59
Participant Cost Test (PCT)	$ 62,444,501	$ 19,461,670	3.21

Residential

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
Total Resource Cost (TRC)	$ 10,517,324	$ 6,126,319	1.72
Utility Cost Test (UCT)	$ 7,960,518	$ 4,723,187	1.69
Ratepayer Impact (RIM)	$ 7,960,518	$ 11,175,698	0.71
Participant Cost Test (PCT)	$ 10,649,876	$ 3,485,929	3.06

Low-Income

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
Total Resource Cost (TRC)	$ 2,336,369	$ 1,976,514	1.18
Utility Cost Test (UCT)	$ 787,332	$ 1,976,514	0.40
Ratepayer Impact (RIM)	$ 787,332	$ 2,639,960	0.30
Participant Cost Test (PCT)	$ 2,729,388	$ 1,823,906	N/A

Natural Gas

Natural Gas Portfolio

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
Total Resource Cost (TRC)	$ 12,045,255	$ 9,234,455	1.30
Utility Cost Test (UCT)	$ 6,685,960	$ 11,390,554	0.59
Ratepayer Impact (RIM)	$ 6,704,554	$ 101,934,588	0.07
Participant Cost Test (PCT)	$ 46,276,296	$ 8,040,817	N/A

Natural Gas Portfolio (without Low-Income)

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
Total Resource Cost (TRC)	$ 11,772,810	$ 6,518,504	1.81
Utility Cost Test (UCT)	$ 6,447,886	$ 8,674,603	0.74
Ratepayer Impact (RIM)	$ 6,465,981	$ 99,218,636	0.07
Participant Cost Test (PCT)	$ 43,567,549	$ 5,332,070	8.17

Commercial/Industrial

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
Total Resource Cost (TRC)	$ 4,505,513	$ 1,617,394	2.79
Utility Cost Test (UCT)	$ 1,535,054	$ 1,144,354	1.34
Ratepayer Impact (RIM)	$ 1,548,778	$ 1,144,354	1.35
Participant Cost Test (PCT)	$ 751,976	$ 1,225,016	0.61

Residential

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
Total Resource Cost (TRC)	$ 7,267,297	$ 4,901,110	1.48
Utility Cost Test (UCT)	$ 4,912,832	$ 7,530,249	0.65
Ratepayer Impact (RIM)	$ 4,917,203	$ 98,074,282	0.05
Participant Cost Test (PCT)	$ 42,815,573	$ 4,107,054	10.42

Low-Income

Cost-Effectiveness Test	Benefits	Costs	Benefit/Cost Ratio
Total Resource Cost (TRC)	$ 272,446	$ 2,715,951	0.10
Utility Cost Test (UCT)	$ 238,074	$ 2,715,951	0.09
Ratepayer Impact (RIM)	$ 238,573	$ 2,715,951	0.09
Participant Cost Test (PCT)	$ 2,708,747	$ 2,708,747	N/A

APPENDIX E – 2024 EXPENDITURES BY PROGRAM

Program	Electric	Natural Gas	Total
Energy Efficiency			
Low-Income/CEEP			
Low-Income	$ 1,583,967	$ 2,708,747	$ 4,292,714
Named Communities Investment Fund	$ 239,938	$ –	$ 239,938
Residential			
Shell	$ 675,741	$ 4,454,604	$ 5,130,344
ENERGY STAR/NEEM Manufactured Housing Program	$ 27,000	$ –	$ 27,000
Multifamily Weatherization	$ 113,238	$ 82,148	$ 195,386
Appliances	$ 124,769	$ 206,691	$ 331,460
Midstream	$ 1,126,050	$ 1,980,750	$ 3,106,800
Home Energy Audit	$ –	$ –	$ –
On-Bill Repayment	$ 16,000	$ 12,000	$ 28,000
Commercial/Industrial			
Prescriptive Lighting	$ 2,628,344	$ –	$ 2,628,344
Small Business Direct-Install Lighting	$ 11,295,109	$ –	$ 11,295,109
HVAC	$ 400	$ 2,697	$ 3,097
Commercial Grocer	$ 6,780	$ –	$ 6,780
Shell	$ 22,609	$ 181,057	$ 203,666
Green Motors Rewind	$ 2,027	$ –	$ 2,027
Midstream	$ 215,687	$ 379,363	$ 595,050
Site-Specific	$ 2,168,547	$ 188,860	$ 2,357,407
Building Operator Certification	$ 255	$ –	$ 255
Energy Efficiency Total	**$ 20,246,461**	**$ 10,196,916**	**$ 30,443,378**
Market Transformation			
Northwest Energy Efficiency Alliance	$ 1,585,015	$ 438,675	$ 2,023,690
Market Transformation Total	**$ 1,585,015**	**$ 438,675**	**$ 2,023,690**
Other Programs and Activities			
General Implementation	$ 1,548,793	$ 120,912	$ 1,669,705
Labor Costs	$ 3,876,361	$ 582,333	$ 4,458,694
Marketing and Outreach	$ 653,797	$ 84,697	$ 738,495
Third-Party Implementation	$ 466,458	$ 405,696	$ 872,154
Pilot Programs	$ 296,124	$ 245,577	$ 541,701
EM&V/CPA	$ 302,008	$ 142,571	$ 444,579
Other	$ 51,820	$ 2,431	$ 54,251
Other Programs and Activities Total	**$ 7,195,361**	**$ 1,584,218**	**$ 8,779,579**
Grand Total	**$ 29,026,838**	**$ 12,219,809**	**$ 41,246,647**

APPENDIX F – 2024 ENERGY-EFFICIENCY ACTIVITY BY PROGRAM

	Electric				Natural Gas			
Energy-Efficiency Program	**Participants**		**Evaluated Savings (kWh)**	**Utility Cost**	**Participants**		**Evaluated Savings (Therms)**	**Utility Cost**
Low-Income								
Weatherization	218	Homes	123,257	$ 775,018	446	Homes	10,831	$ 1,660,368
HVAC	60	Units	349,697	$ 727,905	45	Units	3,310	$ 338,842
Water Heat	–	Units	–	$ –	18	Units	668	$ 94,957
Lighting	17	Units	98	$ 987	–	N/A	–	$ –
Health and Safety	62	HHS	–	$ 201,952	121	HHS	–	$ 621,785
ENERGY STAR Refrigerator	1	Units	39	$ 1,364	–	N/A	–	$ –
Named Communities Investment Fund	5	Projects	172,169	$ 269,288	–	N/A	–	$ –
Low-Income Total	**363**		**645,260**	**$ 1,976,514**	**630**		**14,809**	**$ 2,715,951**
Residential								
Shell	540	Units (Measures)	440,487	$ 1,036,148	3,216	Units (Measures)	160,108	$ 4,866,159.81
ENERGY STAR/NEEM Manufactured Housing Program	27	Homes	68,605	$ 83,727	–	Homes	–	$ –
Multifamily Weatherization	175	Units (Measures)	266,132	$ 331,559	58	Units (Measures)	10,097	$ 107,678.73
Appliances	1,360	Units (Measures)	259,749	$ 172,796	1,284	Units (Measures)	53,585	$ 261,588.58
Midstream	2,657	Units (Measures)	4,809,271	$ 3,082,403	2,924	Units (Measures)	103,674	$ 2,282,822.01
Home Energy Audit	271	Homes	20,743	$ 554	851	Homes	–	$ 0.00
On-Bill Repayment	32	Units (Measures)	–	$ 16,000	24	Units (Measures)	–	$ 12,000.00
Residential Total	**5,062**		**5,864,988**	**$ 4,723,187**	**8,357**		**327,464**	**$ 7,530,249.13**
Commercial/Industrial								
Prescriptive Lighting	65,290	Units (Measures)	8,708,412	$ 3,473,238	–	N/A	–	$ –
Small Business Direct-Install Lighting	3,711	Projects	18,446,896	$ 12,990,061	–	N/A	–	$ –
HVAC	1	Projects	3,204	$ 617	11	Projects	223	$ 2,792
Commercial Grocer	17	Projects	59,188	$ 13,412	–	Projects	–	$ –
Shell	16	Projects	100,215	$ 38,434	15	Projects	26,244	$ 455,332
Green Motors Rewind	5	Motor Rewind	7,944	$ 2,508	–	N/A	–	$ –
Midstream	272	Projects	358,297	$ 254,756	224	Projects	72,475	$ 439,550
Site-Specific	33	Projects	10,229,030	$ 3,315,999	15	Projects	71,657	$ 246,681
Building Operator Certification	5	Projects	595,000	$ 24,945.00	–	N/A	–	$ –
Commercial/Industrial Total	**69,350**		**38,508,186**	**$ 20,113,970.00**	**265**		**170,600**	**$ 1,144,355.00**
Energy-Efficiency Total	**74,775**		**45,018,433**	**$ 26,813,671**	**9,252**		**512,873**	**$ 11,390,555.15**

Memorandum

3/25/2025

TO: Nicole Hydzik, Director of Energy Efficiency, Avista Utilities; Meghan Pinch, Manager of Program Managers, Avista Utilities; Kim Boynton, Manager of Planning and Analytics, Avista Utilities

FROM: Christina Steinhoff, NEEA Principal Analyst

CC: Becky Walker, Chief Program Officer; Stephanie Rider; Director Portfolio Management, Data Strategy and External Reporting, Nathan Martinez, Director, Market Analytics, Research and Evaluation; Virginia Mersereau, Vice President of Corporate Strategy and Communications

SUBJECT: 2024 Annual Savings Report (Electric)

NEEA is an alliance of utilities and energy efficiency organizations that pools resources and shares risks to transform markets toward energy efficiency that benefits consumers in the Northwest. The alliance works together to accelerate the innovation and adoption of energy-efficient products, services, and practices in the Northwest. By pooling together regional resources, NEEA:

- Leverages relationships with the Department of Energy, trade allies, and national and regional manufacturers to identify and advance new efficient technologies, product designs, test procedures, product specifications and standards to increase the availability and demand for energy-efficient products, services and practices,
- Conducts research and energy use analysis, market characterization studies, and stock assessments to help the region identify the best efficiency opportunities and inform utilities resource planning efforts,
- Defines and executes program strategies to remove market barriers leading to increased adoption of the most energy efficient products available,
- Builds relationships with midstream supply chain partners such as distributors, retailers, and trade allies to collect regional data and build market capability and infrastructure to increase availability within the Northwest of the most efficient products,
- Gathers, cleans, and analyzes sales, shipment, and distributor data to track markets and inform regional investment decisions.

NEEA's end goal is to make energy efficiency a self-sustaining standard of practice in markets.

Utilities, energy efficiency administrators, and the Regional Technical Forum all benefit from NEEA's work through knowledge sharing, the development of new energy efficiency measures, and the resulting market changes leading to energy savings.

This memo reports savings for 2024 and provides a summary of the variance from the original forecast.

NEEA allocates the savings based on each utility's funding share[1] of NEEA's regional investment. The savings are above a common baseline established by the WA IOUs and are net of savings claimed through regional utility programs[2]. Appendix A documents NEEA's methodology to estimate savings. Details about baseline and technical assumptions are in the attached Excel spreadsheet.

Please contact Christina Steinhoff at csteinhoff@neea.org with any questions about this report.

2024 Savings Estimate

NEEA estimates that Avista Utilities' Washington savings from program measures is 0.51 aMW for 2024 (Table 1). These savings come from measures as part of a NEEA program but are not a part of a code or standard. NEEA estimates an additional 0.23 aMW of savings from codes and standards in 2024 for a total savings of 0.74 aMW. The residential code savings includes 0.06 aMW from heat pump water heaters builders use to comply with codes. NEEA facilitated the market introduction of heat pump water heaters in the Northwest, overcoming barriers and promoting early adoption. This effort built a strong foundation, enabling Washington to incorporate the measure into state code.[3] These code savings count toward the *2021 Power Plan* conservation targets.

[1] Funding share is the portion of NEEA budget provided by each stakeholder. NEEA calculates the shares using each electric funding utility's regional customer count and retail sales from the Energy Information Administration.
[2] Regional utility programs comprise programs run by the Bonneville Power Administration, the Energy Trust of Oregon and local utility programs. These programs provide NEEA an estimate of their annual incented units. NEEA multiplies savings rate and baseline saturation assumptions by the units to estimate local program savings. NEEA subtracts these values prior to reporting savings to its funders to avoid double counting.
[3] NMR Group, Inc. 2023. Heat Pump Water Heater Market Progress Evaluation Report #7.

Table 1: 2024 aMW Savings[4]

Program Measures	
Total	0.51
Residential	0.47
Commercial	0.04
Codes & Standards	
Total	0.23
New Construction (Codes)	0.20
Residential[5]	0.15
Commercial	0.05
Products (Standards)	0.03
Residential	0.01
Non-residential	0.02
All Programs	
Total	0.74

These are site-based, first-year savings. NEEA allocates the regional savings (Idaho, Montana, Oregon, and Washington) using funder shares. To avoid double counting savings, these values net out an estimate of savings the Bonneville Power Administration, the Energy Trust of Oregon and local utilities claim through their local programs.

Variance from Original Forecast (2024)

The 2024 savings are 7% lower than the forecast provided to Avista Utilities Washington in June 2023. This discrepancy is primarily due to the timing of the code component of the forecast. NEEA had assumed that the savings from new codes would occur sooner based on the states' original effective dates. However, both Washington and Oregon delayed their code effective dates, which moved the timing of the savings out. The sections below provide more details about variances for program measures and for codes and standards. The Summary worksheet in the attached spreadsheet shows calculations by product group.

Program Measures

Overall, NEEA's program measures are within 6% of its forecast. NEEA is seeing significant advancements and growth in adoption of energy efficiency in laundry, water heating, and commercial lighting controls. The follow sections provide highlights as well as explain the variance between the forecast and the actuals for 2024.

[4] The funders requested NEEA group savings as Program Measures, New Construction Codes, or Products Standards. Program Measures refers to energy savings from market transformation programs, where the savings associated with a change in an energy code or standard has been netted out, as requested by the funder. Codes and Standards refers to savings associated with either a Market Transformation program or adjacent market work covered by a state building energy code or a federal/state appliance standard where NEEA's market influence, technical knowledge and data are relevant and influence the proceedings.

[5] Approximately 0.06 aMW come from heat pump water heaters builders use to comply with codes.

Heat Pump Water Heaters

In May 2024, the Department of Energy published a final rule mandating a shift for most electric storage water heaters to heat pump technology by 2029. This milestone supports the transition of most of the electric water heating market to heat pump water heaters. In the meantime, NEEA continues to support the Northwest market in strengthening the workforce and engaging both regionally and nationally to identify barriers and solutions to increase adoption in areas and populations with low adoption rates. For example, NEEA created a hot water heater innovation prize to encourage heat pump designs that can fit the widest applications. NEEA's ongoing engagement is crucial for addressing market barriers and preparing the region to adopt and benefit from the new standard.

This positive momentum, and the adoption of the product as an option for builders to meet code requirements are great advancements for the program and the efficiency it will bring to Washington state. However, the 2024 above-code savings estimate is below NEEA's original forecast. Since creating the forecast in June 2023, NEEA collected information showing a higher-than-expected share of the installations as going into new construction as opposed to replacing existing units, and hence this growth is recognized in the codes savings category, which was not included in the Regional Technical Forum's workbook that NEEA references. Between 83-89 percent of new homes in Washington are installing heat pump water heaters, according to NEEA's code compliance evaluations.[6] NEEA assumes these installs fall under the code category. The savings from new construction installs are a part of the *2021 Power Plan* conservation targets but grouped under codes and standards in this report.

NEEA also suspects that its current savings estimate is conservative because of limited data on retail sales. NEEA will be adding Heat Pump Water Heaters to its Retail Products Portfolio Platform in 2025 to acquire more complete market data and to encourage increased stocking of Heat Pump Water Heaters in retail. Research shows that retail channel sales of water heaters are often installed to replace existing water heaters.[7]

Consumer Products

Laundry

The sales volume of residential laundry centers[8] has increased by 62% from 2023 to 2024 (41,000 regional sales in 2024), driven in large part by products that incorporate a heat pump dryer which make up 30% of the laundry center sales in 2024. NEEA influenced advancement of heat pump drying technology as part of its Super-Efficient Dryers program dating back to 2012. Additionally, the market share for ENERGY STAR dryers in the standalone market rose from approximately 45% to 47%. This change indicates an upward trend in market share growth for ENERGY STAR dryers. Previously, the year-over-year growth was less than 1%. The savings for laundry products increased by 23% from the forecast.

Televisions

NEEA is continuing to expand its data pipeline to effectively track the market adoption of ENERGY STAR version 9 televisions—a specification developed by NEEA and its partners. Using product test data that was

[6] Washington-Residential-Code-Evaluation.pdf

[7] NMR Group, Inc. 2023. Heat Pump Water Heater Market Progress Evaluation Report #7.

[8] A single product that does both washing and drying, either in the form of a connected, stacked machine or an all-in-one combo unit.

published in the California Energy Commission's Appliance Efficiency Database and sales data NEEA purchases for the Northwest region, the Retail Products Portfolio program can estimate that as much as 26% of the sales meet the ENERGY STAR criteria. NEEA's Retail Products Portfolio is now adding Televisions to its midstream program to increase certification levels and gather more market intelligence.

The 2024 savings are, however, 35% below NEEA's original forecast. NEEA provided the 2023 forecast before a comprehensive product test dataset using the NEEA-developed test procedure was available to match sales against. Starting in late 2024, a near comprehensive set of test data became available through the California Energy Commission's Appliance Efficiency Database. This dataset enables more complete matching of models to sales data which showed a lower share of the market that is meeting ENERGY STAR version 9 specifications than was assumed in the forecast. This market has significant upside in savings potential in 2025 and beyond.

Refrigerators

NEEA began engaging market actors in 2017 about the savings potential for refrigerators using advanced adaptive compressors that were not recognized in the Department of Energy's (DOE) test procedures. NEEA followed up with research and lab testing identifying the advantage of the technology. The results influenced ENEGY STAR to create an Emerging Tech Award for these refrigerators to encourage manufactures to adopt the new technology.[9] In 2024, NEEA continued work to influence the DOE on adopting the new test procedure.

ENERGY STAR has since phased out its Emerging Tech Award, which has made it more difficult to identify these units in NEEA's sales data. Without this information, NEEA had to reduce its savings estimate for efficient refrigerators by more than half from the original forecast. The Retail Products Portfolio program continues to work on strategies to get an alternative test procedure adopted and used. Meanwhile, NEEA is currently reviewing Consumer Reports product testing data on refrigerators to determine whether it can improve NEEA's understanding of the market share. NEEA is also engaging in an additional push in 2025 to try innovative ideas to engage partners and potentially build out a standalone Qualified Products List. Additional information could increase the savings NEEA reports to the WA IOUs for both 2024 and 2025.

Commercial Lighting Controls

NEEA added a manufacturer to the program that serves Montana and Idaho territories. Including these sales made a significant difference to total observed sales. NEEA works with manufacturers by partnering with manufacturer representatives to educate lighting specifiers, lighting engineers and installers the capabilities and value of luminaire level lighting controls. Recently, NEEA influenced the Illuminating Engineering Society Lighting Practice committee to add these controls to its Recommended Practice standard. Many lighting designers and building managers reference this standard when making lighting decisions. Overall, the adoption of luminaire level lighting controls was very strong in 2024 across the region. NEEA's dataset shows sales growth across all the manufacturers at or above 30-50% growth from 2023. The savings nearly tripled the original forecast.

[9] Apex. 2022. Refrigerator and Freezer Influence Assessment and Baseline Review.

Extended Motors-driven Products

NEEA added two new distributor partners to the XMP program expanding its data collection overall and possibly opening doors in the agricultural market throughout NEEA's region. The program provides midstream incentives to manufacturers' representatives to change stocking and promotion practices as well as works with partners to build awareness within targeted market segments and supports innovative training and promotional approaches.

The 2024 savings is approximately 22% lower than the original forecast. However, NEEA has yet to incorporate the data from its new partners into the analysis. As a result, the values could increase in the next report.

Codes and Standards

Many of NEEA's program measures become options for a code or standard. The most recent example being heat pump water heaters becoming an option to meet Washington code. At the request of the WA IOUs, NEEA tracks these savings separately. The 2024 savings estimate is below NEEA's original forecasts primarily because of the timing of the code effective date.

Both Oregon and Washington moved the effective date out for codes approved prior to the original savings forecast.[10] Oregon delayed the 2024 Oregon Energy Efficiency State Code because of bugs in the software supporting compliance with ASHRAE 90.1-2022. Washington reentered the code development process to review the language of the 2021 WSEC and avoid future lawsuits. Because the delays occurred after NEEA provided its original savings forecast, the savings for 2024 came in significantly lower than the original forecast. For example, single-family homes complying with the 2021 WSEC went from more than 9,000 homes in the forecast to just 2,500.

[10] NEEA allocated the savings based on the utility's funding share of NEEA, which matches the regional share of a combination of residential customer accounts (12.5%) and non-residential load (87.5%).

Appendix A: Methodology

Background

Avista Utilities Washington, Puget Sound Energy, and Pacific Power developed a joint approach[11] to calculate savings from NEEA initiatives. As part of the utilities' biennium savings updates, NEEA provides a two-year electric energy savings forecast. The utilities subtract the savings from their conservation forecast to develop their Biennium Conservation Target.

Savings Rates

This report uses:

- Savings rates and technical assumptions from the Regional Technical Forum (RTF) approved prior to September 1, 2023 for 2024 estimates and prior to October 2024 for 2025 estimates.
- If RTF savings rates are not available, the report uses savings rates from the *2021 Power Plan*.
- If those rates are not available, NEEA calculates savings rates based on the *2021 Power Plan* baseline assumptions.

Table 2The residential code savings includes 0.06 aMW from heat pump water heaters builders use to comply with codes. NEEA facilitated the market introduction of heat pump water heaters in the Northwest, overcoming barriers and promoting early adoption. This effort built a strong foundation, enabling Washington to incorporate the measure into state code. These code savings count toward the *2021 Power Plan* conservation targets.

Table 1 sources the savings rates.

Table 2: Savings Rate Sources for 2024-2025 Savings Report

Product	Savings Rate Source
Ductless Heat Pumps	The savings rates come from the Regional Technical Forum The 2024 assumptions for FAF come from version 4.0 updated in April 2022. The assumptions for single-family zonal-heated homes come from version 6.0 updated in April 2022.
Extended Motor Products	RTF. Jun 14, 2017. Efficient Pumps v 1.1 RTF. Aug 10, 2020. Circulator Pumps v 2.1
Heat Pump Water Heaters	The 2024 and 2025 assumptions come from version 6.2 updated in June 2022.
Manufactured Homes	RTF. 2022. ResMHNewHomesandHVAC_v5_0.xlsm.
Refrigerators	NEEA calculates the savings rate using the same methodology as the RTF (RTF. January 2019. Residential Refrigerators and Freezers v5.1). However, NEEA includes savings from ENERGY STAR's Emerging Tech Award in the ENERGY STAR Most Efficient category. NEEA updated the baseline

[11] The utilities agreed that NEEA would develop a Total Regional Savings estimate using baseline and technical assumptions from the most recent Power Plan. NEEA would remove estimated savings counted by the utilities, the Bonneville Power Administration and the Energy Trust of Oregon. NEEA would allocate the remaining savings to the utilities based on their NEEA funder share percentage.

	efficiency mix to match the 2021 sales weighted average efficiency mix. For more information go to neea.org→Portal Login→Savings Reports→Consumer Products.
Clothes Washers	RTF. 2020. ResClothesWashers_v7_1.xlsm.
Clothes Dryers	RTF. 2020. ResClothesDryers_v4.0.xlsm
Room Air Conditioners	NEEA calculation the savings using the sales weighted efficiency mix in 2021 as the baseline. For more information go to neea.org→Portal Login→Savings Reports→Consumer Products.
High Performance HVAC	Where available, installation-specific energy analysis is used to determine energy savings for observed units. Otherwise, energy savings rates established by Red Car Analytics (2022) are applied based on the characteristics of each installation. Red Car Analytics. 2022. Analysis of Expanded Efficiency Parameters for Very High Efficiency DOAS For more information go to neea.org→Portal Login→Savings Reports→HVAC
Luminaire Level Lighting Controls	NEEA uses the RTF Non-Residential Lighting Standard Protocol versions published in 2023 and 2025. The protocols reference estimates of hours of use and control savings fraction for Non-Residential applications analyzed in NonResidentialLighting_CSFandHOU_v2_2. NEEA assumes a 10% baseline to align with the 2021 Power Plan.
Televisions	NEEA has begun tracking the savings based on model-matching using purchased TV sales data for the Northwest and publicly available TV test data (tested by NEEA and other efficiency advocates in 2020-2022). The Savings rates are based on calculations reviewed by TRC Engineers in alignment with the 2021 Power Plan baseline period. Televisions: ENERGY STAR Version 9 Specification Influence Assessment and Baseline Assumptions Review

For comparison against the targets, NEEA updates the savings rates if:

- The RTF makes an update after Sept. 1 of the year prior to the Biennium (e.g. 2023) and before Oct. 1 of the first year of the biennium (e.g. 2024); then, NEEA will update the forecast for the second year (e.g. 2025) with the new RTF UES.
- NEEA updates the UES based on tracked units (e.g. commercial building type, installs by climate zone, fuel mix, etc.).
- NEEA finalizes savings analysis for a code or standard.

The attached spreadsheet contains sources and additional information regarding the savings rate calculations.

2024 Updates

NEEA updated its analysis for the 2021 WSEC. In doing so, NEEA pulled out savings tied to heat pump water heaters and applied the savings rates from the RTF's version 6.2 workbook, which was recommended by the Northwest Power and Conservation Council. NEEA used energy use analysis by Ecotope to estimate the remaining savings from code.[12]

Avoiding Double Counting

NEEA avoids reporting savings from units already counted through local utility programs by subtracting an estimate of the incentives associated with its Market Transformation efforts. NEEA surveys the Bonneville Power Administration, Energy Trust of Oregon and local utilities to estimate the overlap at a regional level and removes the utility's funder share of this overlap prior to reporting energy savings.

[12] Ecotope. 2025. WA-2021-SEEM-cleanresults-2. DRAFT; Ecotope. 2025. Measure_Analysis_2018_WSECR-results-2. DRAFT

Allocation

NEEA allocates the savings using funder shares. The shares vary based on the funding cycle. Savings from previous investments receive the previous funder share. Savings from current investments receive the current funder share. Table 3 shows the funder shares.

Table 3: Funder Share

Business Plan	Funding Share
2025-2029	4.07%
2020-2024	3.95%
2015-2019	4.04%

APPENDIX H – NEEA 2024 ANNUAL SAVINGS REPORT – NATURAL GAS

Memorandum

March 27, 2025

TO: Nicole Hydzik, Director of Energy Efficiency, Avista Utilities; Meghan Pinch, Manager of Program Managers, Avista Utilities; Kim Boynton, Manager of Planning and Analytics, Avista Utilities

CC: Becky Walker, Chief Program Officer; Stephanie Rider; Director Portfolio Management, Data Strategy and External Reporting, Nathan Martinez, Director, Market Analytics, Research and Evaluation; Virginia Mersereau, Vice President of Corporate Strategy and Communications

FROM: Christina Steinhoff, Principal Planning Analyst, NEEA

SUBJECT: Final 2024 Annual Natural Gas Savings Report

NEEA is an alliance of utilities and energy efficiency organizations that pools resources and shares risks to transform markets toward energy efficiency that benefits consumers and businesses in the Northwest. At its heart, NEEA is a collaborative organization that works with all parts of the market to enable efficient technology choices for consumers: gathering and analyzing data to inform both regional power planning and utility programs, leveraging its relationships with mid and upstream market actors like manufactures and retailers, and improving how products are tested and perform in real life applications. Activities include:

- Providing data and insights to understand how the market is responding to the technology solutions to inform resource planning and identify new opportunities and product options for energy efficiency.
- Providing Avista Utilities Washington with an up-to-date, neutral, and representative characterization of existing Northwest building stock and energy trends, which inform market transformation programs and identify opportunities for private sector investment.
- Leveraging trusted relationships with the supply chain to share insights on how well new technologies perform, save energy, and reduce waste.
- Aggregating and leveraging the power of the region to identify and vet emerging technologies and then create the market conditions necessary for them to take hold. The alliance also helps the regional capture natural gas energy savings through these voluntary interventions and by informing codes and standards that represent consumer and business needs.

NEEA is currently building its portfolio for natural gas energy efficiency programs.

This memo provides more information about:

1. **2024 savings estimate** based on the early market transformation work of NEEA in commercial and residential new construction as well as its new Efficient Rooftop Units program.
2. **Regional Gas Portfolio Update** highlighting work NEEA completed in 2024 to build out the gas portfolio.

Please contact Christina Steinhoff at csteinhoff@neea.org with any questions about this report.

2024 Savings Estimate

NEEA estimates Avista Utilities' Washington 2024 annual natural gas energy savings associated with its initiatives is 54,068 Annual Therms[1] (Table 1). The Efficient Rooftop Units program is still in early market development; so, no savings above baseline were tracked. The reportable savings are above a natural market baseline[2] and allocated based on an estimate of service territory shares (Appendix A).

Table 1: 2024 Annual Report Net Market Effects Savings* Estimates (Annual Therms)

Commercial	8,811
Efficient Rooftop Units**	-
Product Standards	2,962
New Construction (Codes)	5,849
Residential	45,258
New Construction (Codes)	45,258
Total	54,068

*Net Market Effects = Total Regional Savings - Local Program Savings - Baseline Savings

** The Efficient Rooftop Units program is early in NEEA's Market Development phase (Appendix B), resulting is limited savings above the natural market baseline. Savings will increase and the program's market influence increases.

Regional Gas Portfolio Update

NEEA is developing and advancing new energy efficiency measures to add to its savings portfolio. Annual gas savings will increase over time as programs in the portfolio advance into full-scale market development (Appendix B). Table 2 lists NEEA's expectations for gas savings. The following section provides more detail about the progress toward meeting these goals.

[1] The term Annual Therms refers to the fact that NEEA reports first-year savings only in order to represent a sustained reduction in load.

[2] NEEA estimates Baseline as the savings that would have occurred without NEEA, utility, and the Energy Trust of Oregon's market intervention.

Table 2: Savings Expectations

Program	Products	Status
Commercial New Construction	Specific proposals advanced in 2018 Washington State Energy Code & future codes	Savings phase out in 2025 with adoption of the 2021 WSEC as the code moves builders to choose electric options. NEEA is shifting focus to future code options for high performance gas technology such as gas water heaters and gas/electric combo heat pumps. NEEA will also conduct research to monitor changes in building practices over time.
Residential New Construction	Specific proposals advanced in 2018 Washington State Energy Code & future codes	
Efficient Rooftop Units (ERTU)	Efficient Rooftop Units (ERTU)	The program accelerates the adoption of efficient gas rooftop units in the like-for-like replacement market while working to influence the adoption of improved test procedures. NEEA is reporting savings from this program. In 2024, NEEA updated the specification to emphasize a fuel-neutral approach focusing on ERTU cabinet design and shell measures. This adjustment should help to gain better attention in the supply chain to secure commitments to this product and increase speed of market adoption
Standards	Commercial Kitchen Equipment (WA)	NEEA compiles critical market data and insights that inform voluntary local, state, and federal standards. No additional savings from new standards occurred in 2024.
Advanced Commercial Water Heating	Gas Heat Pump Water Heaters	The program moved into the Program Development stage of NEEA's Initiative Lifecycle (**Appendix B**) and is investing in research and field demonstrations that will inform market transformation strategy while validating the product performance and energy savings. NEEA will report any savings from field demonstration projects in 2025, with additional savings starting as early as 2026.
Gas High-efficiency Dedicated Outdoor Air Systems (DOAS)	Gas High-efficiency Dedicated Outdoor Air Systems (DOAS)	This program will focus on transforming the market for commercial gas hydronic systems. Due to the ability to build off the market relationships and progress made by the existing Very High Efficiency (VHE) DOAS program in the electric portfolio, NEEA is expecting to propose this program for advancement directly into the Market Development phase of the Lifecycle (**Appendix B**) in 2025.
Residential Dual-fuel Heating Ventilation and Air Conditioning (HVAC)	Dual-fuel system with a heat pump and gas furnace with controller	This program will be brought forward for consideration to advance to the Program Development phase of the Initiative Lifecycle (**Appendix B**) in Q3 2025.

Efficient Rooftop Units

The Efficient Rooftop Units program advanced to Market Development[3] in late 2022. The program's goal is to accelerate the adoption of efficient gas rooftop units in the like-for-like replacement market while working to influence the adoption of improved test procedures and more stringent federal standards.

In 2024, the program updated its measure specification to emphasize a fuel-neutral approach that focuses on the rooftop unit cabinet design and shell measures - cabinet insulation, low-leakage dampers, and heating/energy recovery. This new specification aligns with how builders select rooftop units where the heating type provided is an option after choosing product line and feature sets. The program made the change to enhance NEEA and partner influence to increase adoption of the most efficient options.

The program also worked to encourage manufacturers to develop and promote efficient rooftop units for the light commercial market. In 2024, one light commercial manufacturer designed and worked to bring an energy recovery ventilator product to market for use in their light commercial rooftop units. The manufacturer started production on initial products. NEEA continues to vet and support development of additional product lines to expand qualified choices to customers and drive down costs of efficient options.

Finally, the program completed a performance monitoring study for two efficient rooftop units installed in Portland in 2023. The study found that the efficient rooftop unit features contributed to the expected efficiency / energy savings, though it highlighted cost and compatibility barriers that need to be addressed to reach the like-for-like replacement market.

To measure savings, NEEA collects sales data annually from HVAC distributors and manufacturers in addition to data from the annual local utility program survey. NEEA is working to recruit additional distributors and manufacturer reps to gain a better view into efficient unit sales and expects improvement in market insight over time.

[3] The purpose of this phase is to create lasting market change through direct market interventions designed to remove barriers, leverage market opportunities and tap influencers and existing channels for diffusion. Interventions are strategic, planned and adaptively managed as market dynamics change and more information is gained. During annual planning, NEEA staff look for the most impactful market levers and activities that could bolster or accelerate the achievement of alliance MT goals.

Advanced Commercial Water Heating

NEEA's Advanced Commercial Water Heating program centers on utilizing gas heat pumps as the primary heat source in commercial central water heating systems. A gas heat pump functions by transferring heat from one area to another while intensifying the heat during this process. NEEA anticipates the technology will enable water heating applications to achieve efficiencies of greater than 1.0 Thermal Efficiency and hold the technical potential to save the Northwest region more than 22 million Therms over a 20-year projection.

NEEA completed market research in 2024 indicating that most decision makers see gas heat pumps as an exciting new option and are impressed with their features, such as good return on investment and low operating costs.[4] Findings from the research will inform NEEA's market transformation program planning and help identify key target markets for possible inclusion in future program efforts.

During 2025, NEEA is launching a North American Commercial Gas Hater Heating Market characterization funded by the North American Gas Heat Pump Collaborative and led by NEEA and is in the screening and selection process for 2 sites for field demonstrations of the technology.

Gas High-Efficiency Dedicated Outdoor Air Systems

NEEA's goal is to build a portfolio of the most impactful market transformation opportunities for HVAC systems across gas and electric technologies/practices. In 2024, NEEA started a plan to add a gas option to its Very High Efficiency Dedicated Outdoor Air System specification and program. The addition will allow NEEA to more swiftly transform the commercial market through broader market engagement and demand creation. NEEA expects to publish the first Market Progress and Evaluation report for the program in 2025.

Residential Dual-Fuel HVAC

This program is currently in the Concept Assessment phase of the Initiative Lifecycle (Appendix B). The solution would pair a heat pump with a gas furnace to deliver an efficient combined HVAC system. To date, NEEA has partnered on multiple dual-fuel modeling, lab and field-testing projects in addition to convening regional stakeholders to share information about the pilot projects underway. NEEA is expecting to build off these findings to bring forward a proposal to advance to the Program Development Phase in 2025.

[4] Lieberman Research. 2025. Market Research on Existing Water Heater in Select Commercial Buildings.

Efficient Residential Gas Water Heaters

In 2024, NEEA responded to policy directives in Washington by evolving the Natural Gas Market Transformation Portfolio to prioritize dual-fuel, fuel neutral, and commercial opportunities relevant to all funders. Because of this, as well as market headwinds that these products have been experiencing, NEEA is winding down activities in Efficient Residential Gas Water Heating. NEEA will continue engagement with North American Gas Heat Pump Collaborative, other utilities, and industry groups as a part of scanning to track the commercialization and market response to this product and its viability for inclusion in future building codes or product standards.

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Appendix A: Methodology to Forecast Savings

Allocation Methodology

NEEA allocates code savings for gas measures using a state/service territory approach (Table 3). The approach uses EIA residential consumer sales for Residential Codes and nonresidential volume for Commercial Codes.

Table 3: State Code Savings Allocation Share

Sector	WA	OR	ID
Residential	12.65%	0.00%	0.00%
Commercial	15.82%	0.00%	0.00%

NEEA used service territory allocations for the Efficient Rooftop Units savings because the program is new to the market and is tracking installations by service territory.

Baseline, Local Programs and Technical Assumptions

This report follows NEEA's method of measuring gas energy savings from market transformation efforts. The baseline is an estimate of market adoption without intervention by NEEA, Energy Trust of Oregon and utilities. Prior to reporting the savings above the baseline, NEEA removes the savings counted through the local programs. This effort helps funders avoid double counting energy savings.

The technical assumptions come from third-party research including NEEA contracted research and the Regional Technical Forum. Details are available within the spreadsheet accompanying this memo.

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Appendix B: Initiative Life Cycle

NEEA has a robust stage-gate process for managing its programs called the “initiative lifecycle”. The ILC provides a set of core business processes & tools that ensure standardized management of investment, risk and best practices. Figure 1 shows how initiatives move through the cycle (from left to right) as NEEA learns more about their promise and potential for the region, the barriers preventing that promise from being achieved, and ways to leverage the power of the region to remove those barriers.The end of each phase is marked by a formal management review called a milestone. NEEA formally solicits approval from Natural Gas Advisory Committees at key program milestones.

Figure 1: Initiative Lifecycle

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APPENDIX I – EIA (I-937) CONSERVATION REPORT 2024-2025

Compliance Year	**2025**
Utility	**Avista Corp.**
Report Date	**6/1/25**
Contact Name/Dept	**Kim Boynton/Energy Efficiency**
Phone	**509-495-4744**
Email	**kim.boynton@avistacorp.com**

Summary of Achievement and Targets (MWh)			
2024-2025 Biennial		**2026-2027 Biennial**	
Conservation Potential 2024-2033	316,870	Conservation Potential 2026-2035	
Equal Pro Rata Biennial Target	63,374	Equal Pro Rata Biennial Target	–
Established Biennial Target 2024-2025	63,374	Biennial Target 2026-2027	
Actual Achievement 2024-2025	51,492		
Excess Conservation from Prior Periods	–		
Total Biennial Conservation Savings	**51,492**		
Deficit/Excess	**(11,882)**		

Biennial Achievement				
Biennial Period 2024-2025				
	2024 Achievement Year		2025 Achievement Year	
Value	**MWh**	**Utility Expenditures**	**MWh**	**Utility Expenditures**
Residential	6,510	$ 9,046,387		
Commercial	38,508	$ 19,365,354		
Industrial				
Agriculture				
Distribution Efficiency				
Production Efficiency				
NEEA	6,474	$ 1,585,015		
Misc Category 1*		$ 1,828,856		
Misc Category 2*				
Total	**51,492**	**$ 31,825,612**		

* Conservation expenditures NOT included in sector expenditures.

Spokane County, Washington