



## MEMORANDUM

To: Ryan Finesilver and Tom Pardee – Avista Corporation  
From: Eli Morris, Andy Hudson, Ken Walter, Fuong Nguyen - AEG  
Date: December 16, 2022  
Re: Avista Washington and Oregon Natural Gas Transportation Customer Conservation Potential Assessment

### Background

Avista Corporation (Avista) engaged Applied Energy Group (AEG) to assess the conservation potential at Washington and Oregon natural gas transportation customer<sup>1</sup> facilities to inform the extent to which energy efficiency savings at these facilities could help Avista comply with new regulations. In Washington and Oregon, Avista's transportation customers are currently exempt from funding energy efficiency programs and thus are not eligible to participate in natural gas energy efficiency programs administered by Avista and the Energy Trust of Oregon in Washington and Oregon, respectively.

In Washington, the Washington Utilities and Transportation Commission continues to consider whether pursuing all cost-effective conservation, as required by Initiative 937, requires utilities to fund energy efficiency programs for natural gas transportation customers. In Oregon, Executive Order 20-04, passed in March 2020, limits statewide greenhouse gas emissions from large stationary sources, transportation fuel, and other liquid and gaseous fuels by new goals established by the Oregon Department of Environmental Quality (DEQ). The Climate Protection Program (CPP) formalizes emission reduction requirements for Oregon's natural gas utilities, including the responsibility for on-site emissions of natural gas transportation customers.

The remainder of this memo presents high-level study results, followed by an overview of AEG's methodology, identification of key data sources, potential results, and considerations and recommendations as Avista considers new program options to reach these customers.

### Results Summary

Table 1 and Table 2 summarize the energy efficiency potential at transportation customer sites in Washington and Oregon, respectively. AEG notes the following considerations in reviewing these results:

- The potential represents expected levels of savings using average assumptions across customers and equipment. However, a small number of customers represent a majority of transportation customer consumption (the top 21% of the largest Washington transportation customers make up roughly 76% of Avista Washington transportation load). Therefore, actual energy efficiency impacts may vary widely depending on whether these large customers choose to participate in potential programs and customer-specific characteristics. As such, these results should be viewed as planning assumptions that are likely to differ in practice.
- The study relied on the best available data from Avista and secondary sources, which did not include on-site assessments of transportation customer equipment efficiency or practices. Therefore, current conditions and

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<sup>1</sup> Transportation customers are non-residential natural gas consumers, typically large industrial users, who purchase natural gas from an alternate supplier but use Avista's distribution system to deliver the fuel to their sites.



remaining opportunities were estimated using information about typical characteristics by market segment (i.e., business or industry type).

- Achievable economic potential was estimated from the Total Resource Cost (TRC) perspective, consistent with standard cost-effectiveness practices for energy efficiency in Washington and Oregon.
- In Washington, programs are anticipated to roll out halfway through 2024; therefore, there is zero achievable technical and achievable economic potential savings potential in 2023. In Oregon, programs are anticipated to roll out halfway through 2023.

Table 1 – Summary Potential Results – Reference Case, Washington

	2023	2024	2025	2035	2045
<b>Baseline Projection (Dth)</b>	7,948,528	7,926,395	7,906,170	7,784,947	7,734,852
<b>Cumulative Savings (Dth)</b>					
Achievable Economic Potential	0	35,247	97,553	821,836	1,234,253
Achievable Technical Potential	0	42,283	115,124	970,876	1,437,154
Technical Potential	37,603	121,842	239,931	1,417,264	2,031,971
<b>Cumulative Savings (% of Baseline)</b>					
Achievable Economic Potential	0.0%	0.4%	1.2%	10.6%	16.0%
Achievable Technical Potential	0.0%	0.5%	1.5%	12.5%	18.6%
Technical Potential	0.5%	1.5%	3.0%	18.2%	26.3%

Table 2 – Summary Potential Results – Reference Case, Oregon

	2023	2024	2025	2035	2045
<b>Baseline Projection (Dth)</b>	4,681,846	4,677,171	4,672,870	4,646,028	4,633,981
<b>Cumulative Savings (Dth)</b>					
Achievable Economic Potential	18,128	51,503	86,078	459,802	665,887
Achievable Technical Potential	19,119	53,850	89,939	475,228	684,470
Technical Potential	31,066	79,749	129,326	615,631	874,975
<b>Cumulative Savings (% of Baseline)</b>					
Achievable Economic Potential	0.4%	1.1%	1.8%	9.9%	14.4%
Achievable Technical Potential	0.4%	1.2%	1.9%	10.2%	14.8%
Technical Potential	0.7%	1.7%	2.8%	13.3%	18.9%

## Methodology

AEG used a bottom-up approach to perform the potential analysis, following the steps listed:

1. Perform a customer segmentation analysis to estimate the number of Avista Washington and Oregon transportation customers in each market segment and the energy consumption of each segment.
2. Perform a market characterization to describe sector-level natural gas use for transportation customers for the base year, 2021. The characterization included extensive use of Avista data and other secondary data sources from the US Energy Information Administration (EIA).
3. Develop a baseline projection of energy consumption by segment, end use, and technology for 2023 through 2045.
4. Define and characterize energy efficiency measures to be applied to all segments and end uses.
5. Estimate technical, achievable technical, and achievable economic potential for 2023 through 2045.



## Key Data Sources

AEG used Avista’s 2022 Washington Natural Gas Conservation Potential Assessment (CPA) as the foundation for this assessment. The Washington CPA assessed natural gas energy efficiency potential for Avista’s residential, commercial, and industrial sales customers, but excluded transportation customers. Key updates AEG made to Washington CPA assumptions to reflect Washington and Oregon transportation customers, loads, and potential included:

- Input and market characterization data for this analysis were specific to Avista’s Washington and Oregon transportation customers, including baseline sales, forecasts, and industry designations. The Washington CPA generally formed the basis for the measure cost assumptions and savings percentage estimates.
- AEG benchmarked the distribution of end use loads with data from the EIA’s Commercial Building and Manufacturing Energy Consumption Surveys and discussed notable differences with Avista to ensure that they accurately reflected known aspects of those customers. For example, if a particular manufacturing sector showed a greater proportion of space heating load than expected compared to MECS data, Avista could confirm that their Oregon transportation customers was dominated by a facility with significant conditioned space and whose product line did not require as much natural gas use.
- The assessment leveraged the Washington CPA measure list.

Where data gaps existed in Avista data, AEG relied on national and regional data sources for assumptions in the potential model. Table 3 summarizes key data sources used for the analysis and how each informed the study.

Table 3 – Key Data Source Summary

Data Source	Used for
Avista Utility Data	Load segmentation by industry/building type, presence of equipment, end use load distribution, comparison baseline forecast, economics inputs, scenario development
Northwest Power and Conservation Council’s 2021 Power Plan	Technical Achievable ramp rate library and study methodology
NEEA’s 2019 and 2014 Commercial Building Stock Assessment (CBSA)	Benchmark equipment saturations, normalized end use and equipment intensity (therms per sq.ft)
EIA 2014 Manufacturing Energy Consumption Survey (MECS) and 2012 Commercial Building Energy Consumption Survey (CBECS)	Estimated equipment use per unit, end use distribution of natural gas use by business/industry type, benchmarking equipment presence (saturation)
EIA’s 2022 Annual Energy Outlook	Reference baseline purchase assumptions, equipment lifetimes and costs

## Potential Results

AEG developed achievable economic potential based on assumptions regarding the rate at which potential could be acquired. The achievable economic potential started with standard ramp rate assumptions from the Northwest Power and Conservation Council’s (Council’s) 2021 Power Plan, mapped to natural gas measures,<sup>2</sup> and accounting for the assumed timing of Avista’s program offerings. In Washington, programs are anticipated to roll out halfway through 2024; therefore, there is zero potential savings in 2023 and fewer savings potential in 2024 before ramping up in future years. In Oregon, programs are anticipated to roll out halfway through 2023; therefore, reduced savings potential is identified in the first year before ramping up in future years.

Figure 1 presents the annual potential savings relative to the baseline projection. Based on the ramp rates used, a majority of the identified potential is assumed to be acquired over the first 10 years of the study period.

<sup>2</sup> The Council’s 2021 Power Plan only covers electric measures. To adapt these ramp rates for this natural gas assessment, AEG mapped gas measures to the same or similar electric measure, consistent with the methodology from the Washington Natural Gas CPA.



Figure 1 – Reference Case Cumulative Potential, Washington

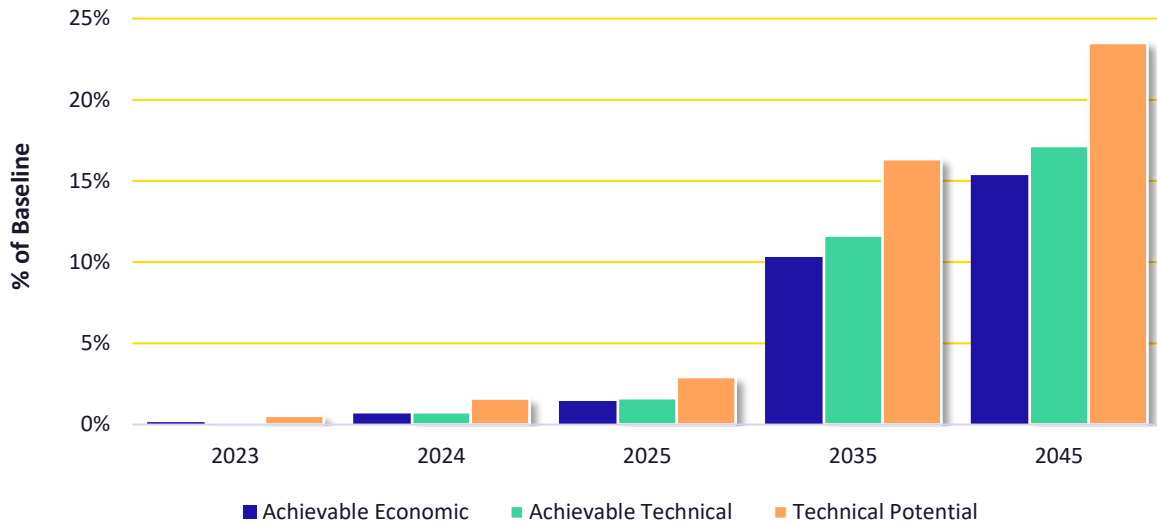
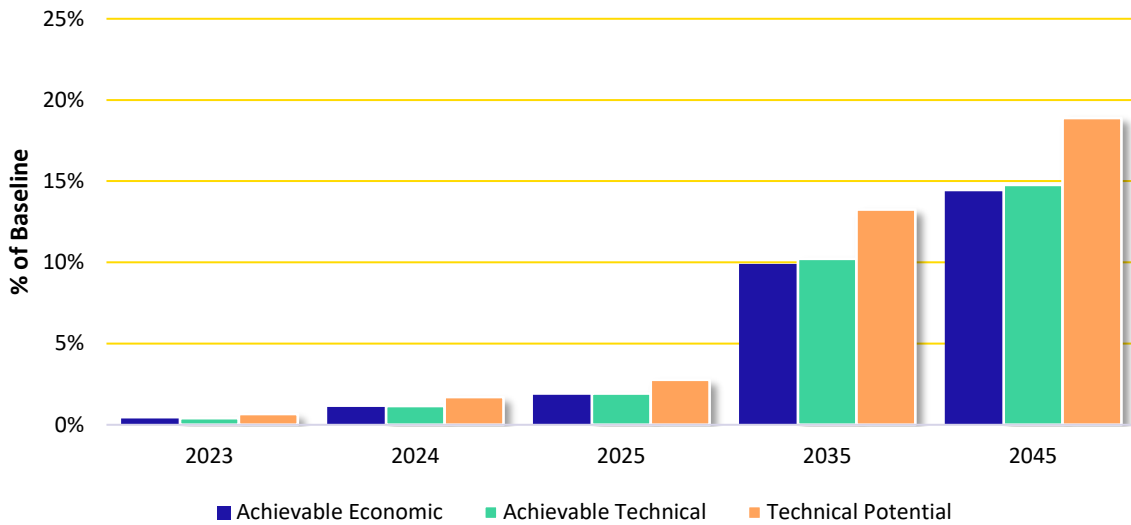


Figure 2 – Reference Case Cumulative Potential, Oregon



### Commercial Potential Results

Figure 3 and Figure 4 present the percentage of achievable economic potential 2045 by market segment and end use, respectively. The majority of Avista’s commercial transportation customers are college (52% in Oregon and 61% in Washington). Space heating accounts for the largest share of end use potential in both states, representing 60% and 76% of cumulative commercial achievable economic potential in Oregon and Washington, respectively.



Figure 3 – Commercial Achievable Economic Potential by Market Segment, 2045

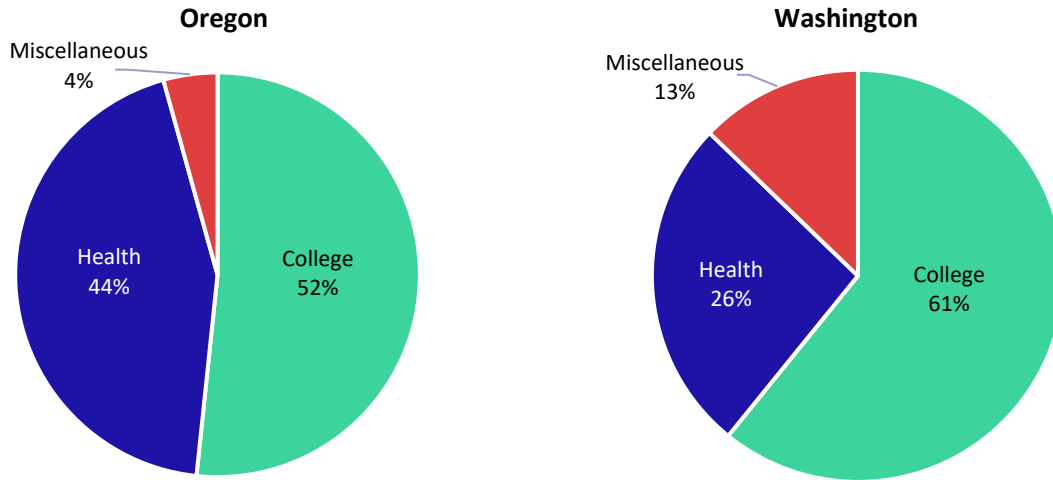
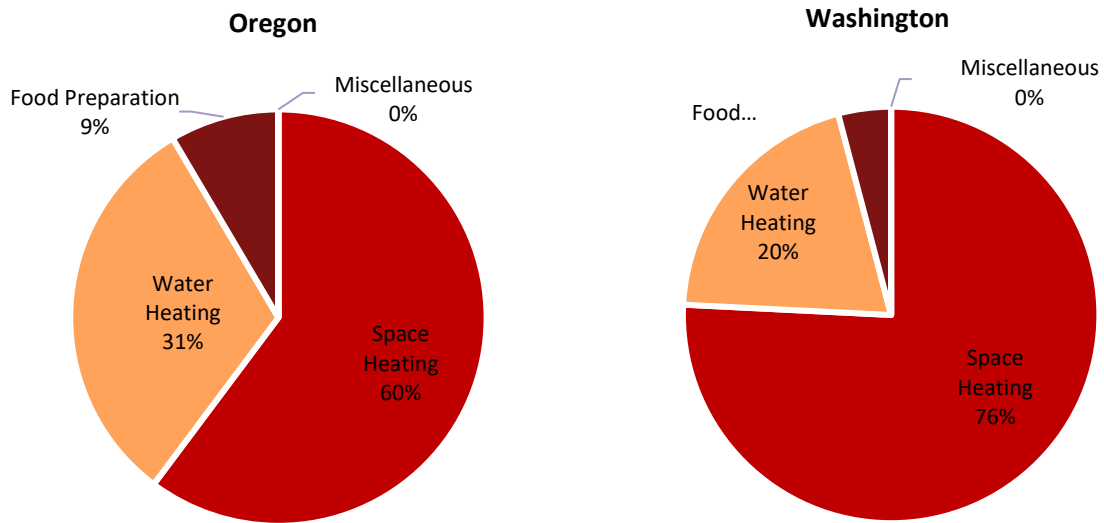


Figure 4 – Commercial Achievable Economic Potential by End Use, 2045



Cumulative commercial achievable economic potential is provided in Figure 5 for Oregon and Figure 6 for Washington.



Figure 5 - Cumulative Achievable Economic Commercial Potential by End Use, Oregon

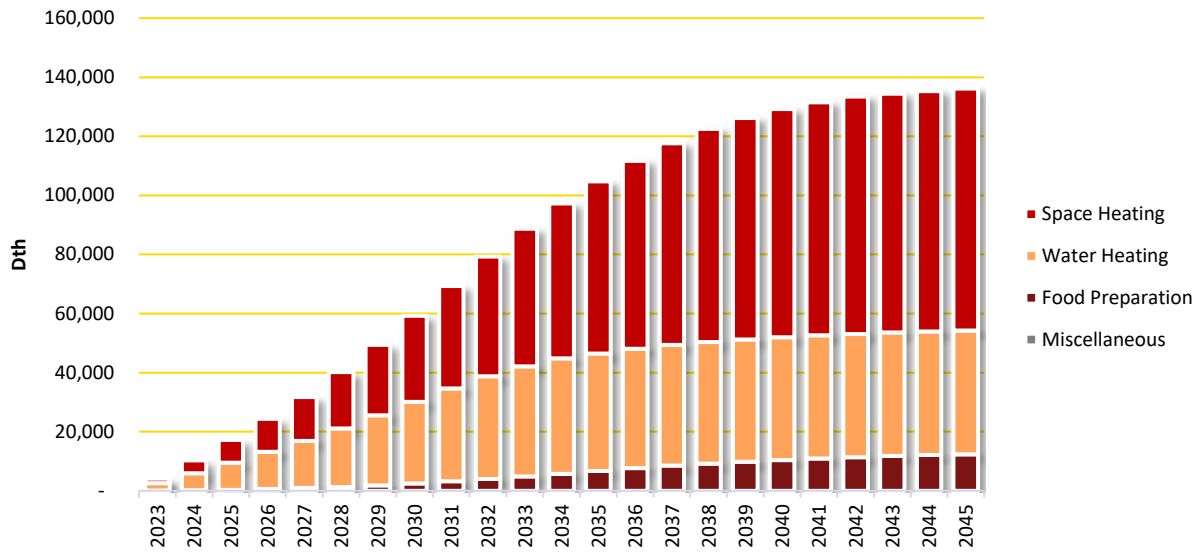
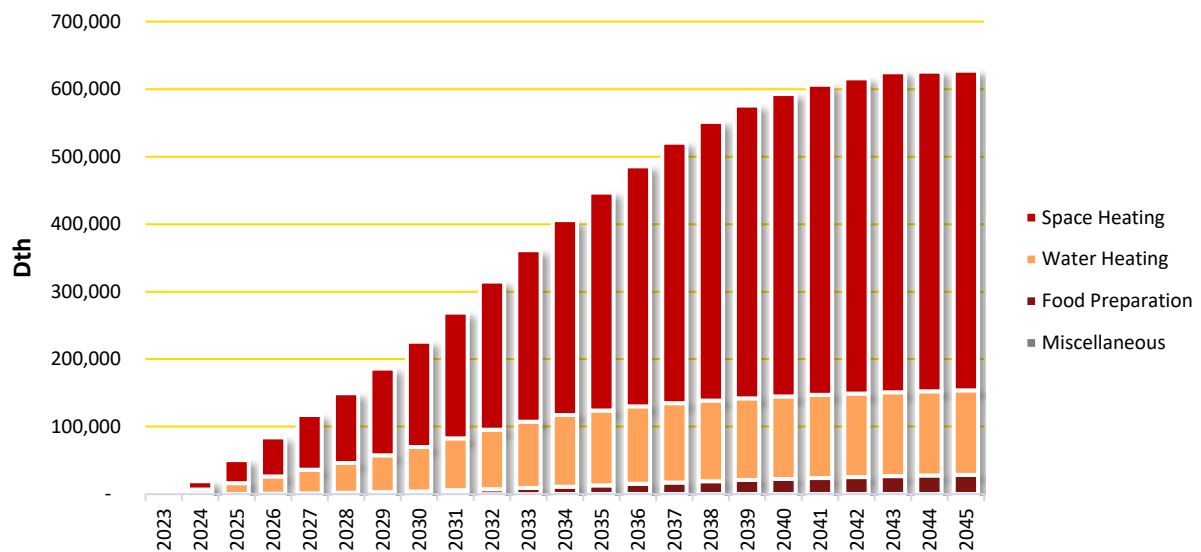


Figure 6 - Cumulative Achievable Economic Commercial Potential by End Use, Washington

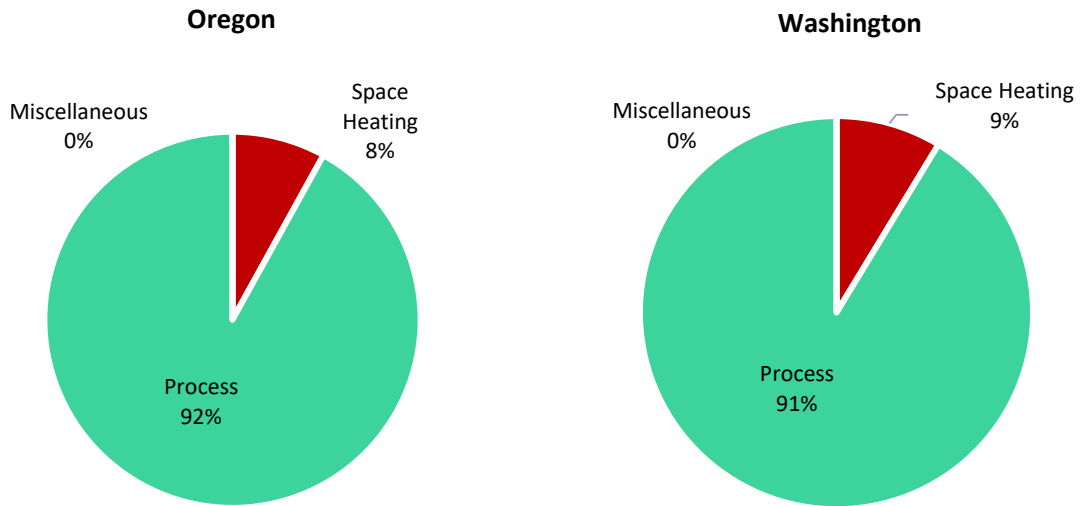


### Industrial Potential Results

Figure 7 presents the cumulative industrial potential in 2045 by end use. Industrial process end use accounts for 92% of Oregon's identified industrial achievable economic potential process and 91% of Washington's identified industrial achievable economic potential.



Figure 7 – Industrial Achievable Economic Potential by End Use, 2045



Cumulative industrial achievable economic potential is provided in Figure 8 for Oregon and Figure 9 for Washington.

Figure 8 – Cumulative Achievable Economic Industrial Potential by End Use, Oregon

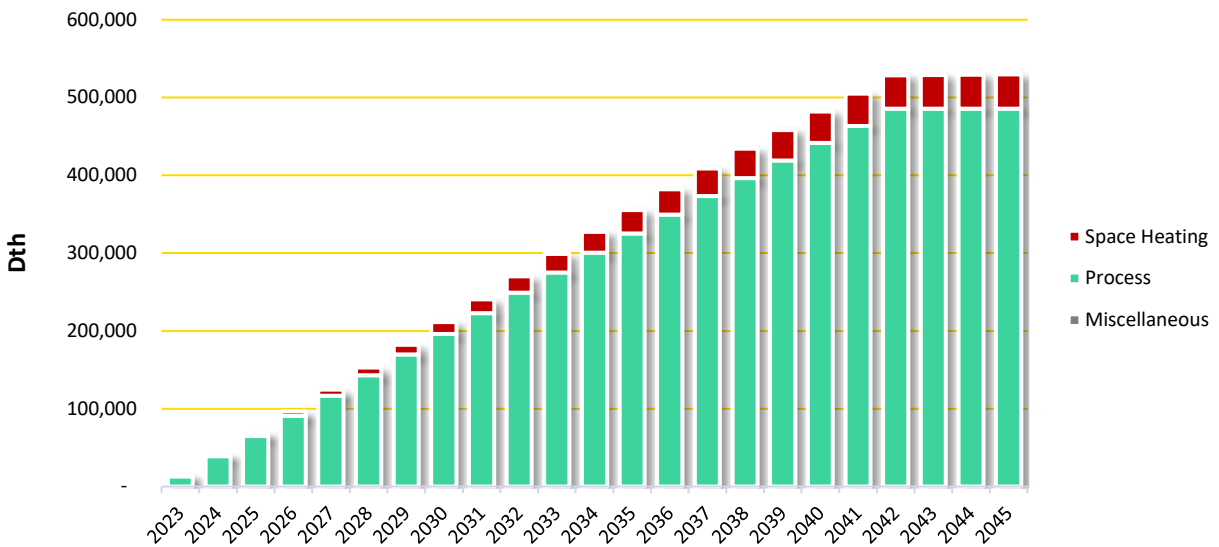
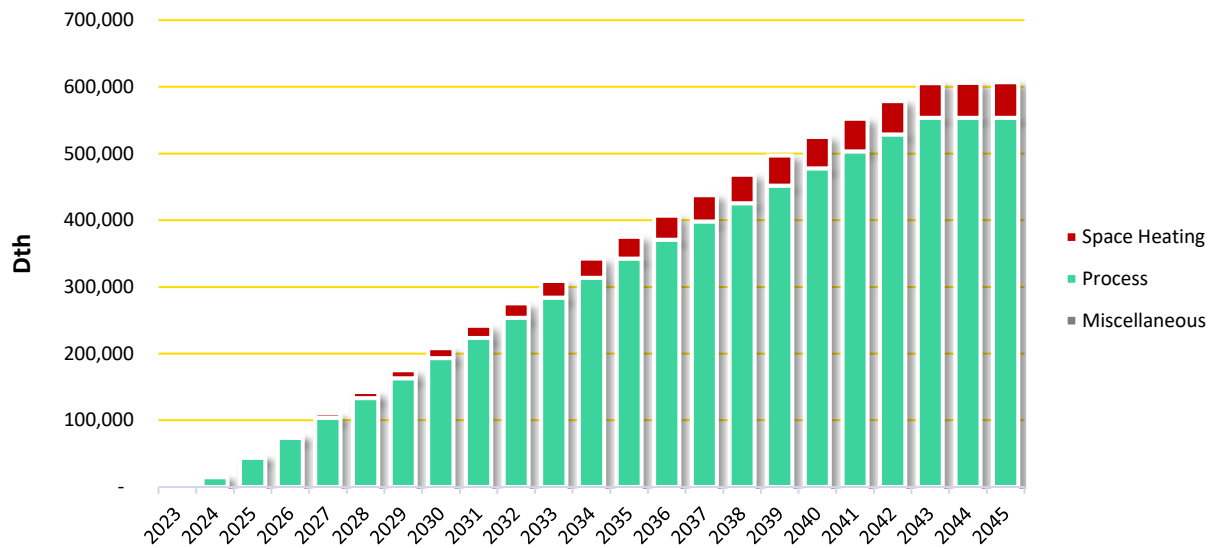




Figure 9 – Cumulative Achievable Economic Industrial Potential by End Use, Washington



## Considerations and Recommendations

This assessment was a first step in identifying and realizing natural gas energy efficiency (and associated greenhouse gas emissions reductions) within Avista’s transportation customer base. While program design is outside the scope of this assessment, AEG notes the following items for Avista as it determines the best way to achieve these savings:

- Many of the inputs into the analysis are averages across market segments based on the best available data sources and may not reflect the available potential at any individual site. **To address this, AEG recommends that Avista consider sponsoring audits of specific transportation customer sites to better understand current equipment and practices to refine estimates of available potential for these customers.**
- Because a small number of customers account for a large amount of transportation customer consumption, whether these customers choose to participate in future programs will significantly affect the amount of savings that Avista is able to achieve. This uncertainty could increase or decrease acquisition levels relative to the potential identified in this assessment. **As Avista considers new program designs for transportation customers, AEG recommends targeted outreach to the largest customers to understand their likelihood of participating in future programs, including to what extent and on what timeline.**