Appendix C:

Summarization of Cost-Effectiveness Methodology

Cost-Effectiveness Methodology

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

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

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

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

3. A participating customer's view of cost-effectiveness is focused upon their reduced energy cost (at their retail rate). Avista also includes the value of any non-energy benefits that they may receive. Incentives received by the customer offset the incremental cost associated with the efficiency measure. This is the participant cost test (PCT). Since participation within utility programs is voluntary it could be asserted that well-informed participating customers are performing their own cost-effectiveness test based upon their own circumstances and voluntarily participate only to the extent that it is beneficial for them to do so. Avista has included a 10% conservation credit to the PCT calculation adding a benefit to overall cost effectiveness.

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

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

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

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

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

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

Avoided cost of utility energy: The avoided cost of electricity and natural gas is based upon the results of the most recent Integrated Resource Plan (IRP) to include the valuation of several avoided costs that are somewhat unique to energy-efficiency (e.g., distribution losses, the monetary cost of carbon etc.). The cost of electric transmission and distribution (T&D) capacity benefits was adjusted to align with the upcoming 7th Power Plan and a $34.41 per kW-yr for 20 year levelized cost was used to bring electricity into the Avista Balancing Area from the Mid-C Market.

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

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

The commodity and capacity benefits are summed for each year and the combined avoided costs are increased to account for avoided line loss rates (6.04%).

The avoided cost of the natural gas IRP produces an annual and winter avoided therm value which an avoided delivery charge is added (represented by the demand portion of Schedule 150) to each as well as an estimated carbon tax starting in 2020 with a cost of $10/ton and escalating at 3% per year.

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

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

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

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

Customer incremental cost: This represents the additional cost of an efficient measure or behavior above the baseline alternative. To the maximum extent possible the determination

of customer incremental cost is based upon alternatives that are identical in all aspects other than efficiency. When a clear comparison isn't possible an individualized adjustment is made to the extent possible.

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

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

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

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

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

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

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

Measure: Measures are stand-alone energy efficiency options. Consequently measures are generally expected to pass cost-effectiveness requirements barring justifiable

exceptions. Exceptions include, but are not necessarily limited to, measures with market transformation value not incorporated into the assessment of the individual measure, significant non-energy benefits that cannot be quantified with reasonable rigor and cooperative participation in larger regional programs.

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

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

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

Fuel portfolio: Aggregating electric or natural gas DSM programs.

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

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

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

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

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

Methodology for Allocation of DSM Costs

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

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

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

It should be noted that costs <u>not</u> associated with the delivery of local DSM within the planned year are excluded from the cost-effectiveness calculations. These are termed "supplemental costs" and consist of NEEA funding, funding low income educational outreach programs, Idaho research funding and similar expenses unrelated to the planned 2018 local portfolio.

Unit Energy Savings

The quantification of energy savings applicable towards achieving Washington EIA acquisition targets has been an ongoing topic of discussion since the effective date of this requirement became effective. The company plan will create an annual locked UES associated with the TRM that will be updated on an annual basis. The savings will primarily be derived from the RTF or previous impact evaluations. The next annual update will be utilize the upcoming Nexant evaluation for the 2016-2017 Biennium.

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

Analytical Methodology Applicable to the Low Income Programs

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

Except for the low income program, Avista does not typically fully fund the customer incremental cost and even less frequently the full installed cost of an end-use. For low income programs delivered with Avista funding in partnership with Community Action Program (CAP) agencies the

participating customer may receive full funding of the end-use. There is a need to appropriately represent this expenditure within the overall DSM expenditure budget, but at the same time it is necessary to recognize that only a portion of this expenditure is dedicated toward energy efficiency. The Company does so by recognizing the full expenditure as a cost but also recognizing that there is a non-energy benefit associated with the provision of base case end-use services. The full cost less this non-energy benefit is equal to the amount invested in energy efficiency. Thus the assessment of the cost-effectiveness of the energy efficiency investment is appropriately based upon the value of the energy savings of the efficient measure in comparison to this incremental cost. In situations where a measure might be found cost-effective under one fuel it will be reimbursed at the full cost for both fuels.

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

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

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