BEFORE THE WASHINGTON

UTILITIES & TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Complainant

v.

AVISTA CORPORATION

Respondent

DOCKETS UE-200900 and UG-200901

RESPONSE TESTIMONY OF SHAY BAUMAN ON BEHALF OF THE WASHINGTON STATE OFFICE OF THE ATTORNEY GENERAL PUBLIC COUNSEL UNIT

EXHIBIT SB-1T

April 21, 2021

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I. INTRODUCTION AND PREVIEW

Q. Please state your name and business address

A. My name is Shay Bauman, and my business address is 800 5th Avenue Suite 2000, Seattle, WA 98104.

Q. By whom are you employed and in what capacity?

A. I am a Regulatory Analyst for the Public Counsel Unit of the Washington State Office of the Attorney General ("Public Counsel"). Public Counsel is a statutory party to proceedings before the Washington Utilities and Transportation Commission ("Commission") under RCW 80.01.100, RCW 80.04.510, and RCW 81.04.500.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of the Public Counsel Unit of the Washington State Attorney General's Office.

Q. Please describe your professional qualifications.

A. I earned a B.S. in Economics from Southern Utah University in 2018. During this time, I served as a legislative research assistant to the Chair of the Public Utilities, Energy, and Technology Standing Committee in the Utah State Legislature. In 2020, I earned a Master of Public Administration degree from the Daniel J. Evans School of Public Policy and Governance at the University of Washington in Seattle. My degree features a specialization in public financial management. While completing my graduate studies, I served as an Internal Auditor at the Department of Workforce Services at the State of Utah, where I audited community action agencies and the administration of federal programs, such as

Weatherization Assistance and Low Income Home Energy Assistance. My final year of graduate school, I worked as a student consultant on developing a financial strategy for the Commission. Additionally, I completed the Michigan State University Institute of Public Utilities Utility Rate School in September 2020.

My current employment with Public Counsel began in August of 2020. Since joining the Attorney General's Office, I have worked on a variety of energy and transportation matters. I have also regularly participated in the low-income rate assistance, conservation, and integrated resource planning advisory groups for multiple Washington utilities including Avista and Puget Sound Energy. My participation includes attending quarterly meetings in-person or by teleconference, in addition to regularly weighing in on issues with stakeholders.

Q. Have you previously testified before the Commission?

A. No. This is my first time testifying.

Q. What is the purpose of your testimony in this proceeding?

A. I am testifying to address Avista's deployment of advanced metering infrastructure ("AMI" or "smart meters").

Q. Please summarize your testimony.

A. I recommend the Commission approve Avista's request for recovery of capital spent to implement its AMI system, but ***reject the Company's request for return on new meters until it can fulfill promised benefits***. Public Counsel witness Andrea Crane explains that the disallowance results in an electric revenue

requirement reduction of $7.02 million and gas revenue requirement reduction of $2.72 million. I base this recommendation on the following arguments:

- Avista understates customer costs in its cost-benefit analysis;
- Avista's benefit estimates are likely overstated, particularly for residential customers and depend upon specific action by the Company;
- There are other actions Avista should take to ensure the maximization of AMI benefits.

Finally, I recommend that the Commission order the pilot of a peak time rebate program designed to mimic and test universal enrollment and annual performance reporting on claims made in the cost-benefit analysis until they can quantify and capture system benefits accurately in a future rate case.

Q. How is your testimony organized?

A. I will begin my testimony by outlining how Avista understates costs by excluding true costs to customers and how that artificially reduces the benefits Avista must deliver to secure a favorable cost-benefit analysis for customers. Next, I discuss Public Counsel's concerns with Avista's benefit estimates, specifically how they are overstated, premature, and unreliable. I will then explain the reality of AMI benefits, and their reliance on specific utility actions, which Avista has not yet taken. Finally, I will propose and discuss Public Counsel's recommendation that the Commission deny Avista return on new meter investments until the Company can fulfill its promised benefits.

II. AVISTA UNDERSTATES COSTS TO CUSTOMERS

Q. Please briefly describe Avista's AMI business case.

A. The AMI business case explains why Avista chose to deploy AMI, estimates both the costs and the benefits of the AMI deployment, and describes the AMI implementation plan and progress.

Q. Please describe the costs the Company has identified in its AMI business case.

A. Avista identifies a total capital cost of about $117 million and an operating cost of about $44.7 million for a total present value cost of $158.7 million. Avista's business case separates the cost components into the following categories:[1]

- Meter data management
- Head end systems
- Collector infrastructure
- Data analytics
- Meter deployment
- Energy efficiency
- Regulatory Process

Q. Do these categories and their associated values account for the true costs customers will pay for Avista's decision to adopt AMI?

A. No, they do not. Avista understates costs by only accounting for Company costs and excluding customer costs while comparing Company costs to customer benefits in the business case. Avista does not include the carrying charges

[1] Joshua D. DiLuciano, Exh. JDD-2r, at 7–8.

customers must pay on AMI investments in its business case. Carrying charges, such as Company profits, federal income taxes on Company profits, Company interest expense, and Washington's Utility Tax, are all included in the Company's revenue requirement, yet excluded from the Company's cost-benefit analysis. Another type of cost Avista excludes from its cost-benefit analysis are the revenues Avista will collect on meters removed before the end of their useful lives to make way for AMI. The remaining costs for the meters removed before the end of their useful lives are costs directly tied to the company's choice to install AMI meters. These costs are only stranded costs because of Avista's decision to switch to AMI meters and will be paid for by customers. These costs should therefore be included in the cost-benefit analysis to capture all costs and benefits affecting customers.

In discovery, Public Counsel asked Avista to estimate the revenue requirements customers would actually pay assuming the Commission approves all of Avista's various cost-recovery requests for AMI-related spending. Exhibit SB-2 shows Avista's response that, net of "rate-related" benefits, such as O&M spending reductions and improved revenue collection, customers would pay $112.6 million over 16 years. In present value terms, that amounts to $95.3 million (discounted at 7.43 percent, Avista's weighted average cost of capital as requested in this case). I then compared this present value of AMI-related revenue requirements to the present value of both remaining types of customer benefits Avista did not include in its revenue requirement estimates. These remaining types of customer benefits, including improved Outage Management and Energy

Efficiency, discounted by the same 7.43 percent, amounted to just $104.3 million.[2] Exhibit SB-3 details these calculations.

Q. Does this assessment concern you?

A. Yes. The AMI benefits customers can expect to receive are barely larger than the amounts customers will be expected to pay for AMI. While Avista's business case claims that benefits will exceed costs by a margin of 1.35 to 1.0,[3] once carrying charges and stranded costs are included, the benefit to cost ratio is less than 1.1 to 1.0.[4] This means that if Avista misses its Outage Management and Energy Efficiency benefit projections by as little as 10 percent, the AMI cost-benefit analysis becomes negative. Given the fact that Avista's own sensitivity analyses indicate that it could miss its Outage Management benefit projection by as much as 13.8 percent, and its Energy Efficiency benefit projection by as much as 11.0 percent,[5] my concern is reasonable.

Further, in the next section of this testimony, I will provide several reasons why Avista could miss even the low-end of these and other benefit projections. Finally, my calculation of Avista's cost-benefit analysis assumes, as Avista's calculation does, that benefits will not vary by class. As I will also discuss in the next section of this testimony, because only two to four percent of Outage

[2] DiLuciano, Exh. JDD-2r, at 51, Table 4-2 on "Outage Management" and "Energy Efficiency" benefits from 2021-2036, discounted by 7.43 percent (Avista's weighted average cost of capital in this rate case).
[3] DiLuciano, Exh. JDD-2r, at 6, Table 1-1, Column "Net Present Value" ($215 million in benefits divided by $158.7 million in costs).
[4] $104.3 million in present value benefits divided by $95.3 million in present value revenue requirements.
[5] Per DiLuciano, Exh. JDD-2r, at 49, Table 4-1, and at 50, Figure 4-1, Outage Management benefits will be $53.7 million with a potential low of $46.3 million (13.8 percent lower), while Energy Efficiency benefits will be $33.7 million with a potential low of $30.0 million (11.0 percent lower). All figures expressed in present value terms.

Management benefits will fall to the residential customer class, even if Avista achieves all its benefit projections, the cost-benefit analysis as it stands is negative for residential customers, providing more reason the Commission must ensure achievement of benefits before allowing the Company to earn return on this massive investment.

Q. Why should Avista include abandoned legacy meter costs and carrying charges in its AMI cost-benefit analysis?

A. Public Counsel finds many reasons. Avista has already received Commission approval to account for stranded cost recovery, with profits (importantly, however, without a determination as to prudence).[6] If the Commission approves this deferred cost recovery, customers will be paying for assets that have been removed, for which potential operational value will be rescinded, and which are no longer used and useful. This cost cannot and should not be ignored in a cost-benefit analysis.

Avista could have reduced the size of the stranded cost by replacing meters by region, starting with the regions of oldest meters first, and extending the AMI deployment over a longer period. Avista's "all at once" deployment, absent any necessity to do so, exacerbated the significant stranded cost issue.

The Company is authorized to earn a rate of rate of return on investment in large part to compensate Avista for the risk that some costs will be stranded. Allowing Avista to recover stranded costs eliminates this risk with respect to

[6] *In the Matter of the Petition of Avista Corp. For an Accounting Order Authroizing Deferred Accounting Treatment related to the Undepreciated Net Book Value of the Company's Existing Elec. Meters*, Docket UE-160100, Order 01 (Mar. 15, 2016).

AMI. The least the Commission should demand are benefits sufficient to cover the stranded cost risk already compensated by customers in Avista's authorized rate of return. This means including stranded cost recovery in an AMI cost-benefit analysis.

It is important to note that Avista's decision to replace its existing meters was entirely discretionary, not mandatory. The nationwide surge in AMI deployment occurred in large part because of the significant grants that totaled $4 billion pursuant to the American Reinvestment and Recovery Act (ARRA) in 2009, in which the US Treasury reimbursed utilities for up to 50 percent of the cost for AMI deployment.[7] Avista did not receive ARRA grants. A few states mandated AMI deployment by statutory directive, but Washington specifically rejected a mandate for smart meters in its Interpretive and Policy Statement Regarding Energy Policy Act of 2005.[8] Public Counsel recognizes, nonetheless, the national trend of AMI deployment. This does not mean, however, that the cost of meters prematurely removed is not a real cost to customers. These costs must be included in the cost-benefit analysis.

Understating costs in a cost-benefit analysis by the amount of stranded costs customers must pay artificially reduces the amount of benefit Avista must deliver if customers are to secure AMI benefits in excess of AMI costs. I believe

[7] Smart Grid, *Recovery Act: Smart Grid Investment Grant Program.* U.S. DEP'T OF ENERGY, available at https://www.smartgrid.gov/recovery_act/overview/smart_grid_investment_grant_program.html (Last Visited Apr. 19, 2021).
[8] *In the Matter of the Comm'n's Investigation of Pub. Util. Regul. Policies Act Stadards Pertaining to Smart Metering and Time of Use Rates*, Docket UE-060649, Interpretive and Policy Statement, ¶¶ 30–35 (Aug. 23, 2007).

the Commission should strive to encourage Avista to deliver a level of AMI benefits such that all costs customers incur, including opportunity costs, are covered via benefits. Indeed, at least one state utility regulator has rejected AMI deployment proposals in large part due to a concern regarding the size of stranded meter costs[9] (and benefit projections).

Finally, cost-benefit analyses help determine whether the benefits of an investment to customers exceed the cost to customers. As we will outline below, Avista includes in its analysis customer benefits. The business case itself outlines costs as "project costs" while outlining benefits as "customer benefits."[10] Thus, in addition to the reasons above, to ensure an "apples-to-apples" comparison of customer benefits to customer costs, carrying charges and abandoned legacy meter costs must be included.

Q. Should meters removed from service prematurely be considered a sunk cost, and therefore excluded from cost-benefit analyses?

A. Absolutely not. "Sunk cost" is a concept that applies to for-profit, unregulated businesses. Consider a hypothetical example in which Amazon paid hundreds of millions to acquire a technology it later determined to be outdated, and that other businesses in the same market have since come out with better technology. In such an instance, Amazon would need to reduce or eliminate the value of the asset on its books, writing off the value against earnings. Amazon would have to

[9] *Petition of Nat'l Grid for Approval by the Dep't of Pub. Utils.of its Grid Modernization Plan; Petition of Unitil for Approval by the Dep't of Pub. Utils. of its Grid Modernization Plan; Petition of Eversource Energy for Approval by the Dep't of Pub. Utils. of their Grid Modernization Plan*, Dockets DPU 15-120, 15-121, and 15-122/123, Order, at 121-122 (Mass. Dep't of Pub. Utils. May 10, 2018).
[10] DiLuciano, Exh. JDD-2r, at 6.

explain its mistake to shareholders, who would have to "eat" the cost of an investment that turned out poorly. In this Petition, Avista is asking customers, not shareholders, to pay for the costs created by its all-at-once approach to AMI deployment, and to pay the Company a return on these costs to boot. The Commission should require Avista to ensure the costs that will be borne by ratepayers are offset by ensuring the maximization of benefits delivered by AMI. It is conceivable that disqualifying the recovery of these stranded costs entirely would be an appropriate course of action. While Public Counsel is not recommending the removal of these stranded costs, including them in a cost-benefit analysis to encourage greater benefit delivery is, in my opinion, a very reasonable expectation.

Q. Why does including stranded meter cost matter if Public Counsel is not objecting to its recovery?

A. In the following sections, we outline the benefits Avista claims in its business case. I will provide multiple reasons why Avista's achievement of 100 percent of projected AMI benefits is highly unlikely. Many of these benefits are unreliable and/or uncertain. Speculative benefits result in speculative cost-benefit ratios. Costs not included in cost-benefit analyses exacerbate the situation for customers, as we have proven, and further show why it is critical that Avista fulfill its promises to the customers. There are real costs the customers pay for this investment, and therefore there *must* be real, quantifiable benefits.

III. AVISTA'S BENEFIT ESTIMATES ARE LIKELY OVERSTATED, PARTICULARLY FOR RESIDENTIAL CUSTOMERS

Q. Please describe the benefits the Company has identified in its AMI business case.

A. Avista claims benefits under seven major categories:[11]

Table 1: Avista's Claimed Benefits

Meter reading and meter salvage	$69,547,463
Remote service connectivity	$22,010,615
Outage management	$53,723,041
Energy efficiency	$33,686,230
Energy theft and unbilled usage	$22,990,366
Billing accuracy	$10,978,456
Utility studies	$2,050,632
Total	**$214,986,802**

Q. Does Public Counsel agree with the Company's identified benefits?

A. No.

Q. Please explain why Public Counsel does not agree with the AMI business case benefits.

A. Public Counsel believes Avista's benefit estimates are overstated. I will discuss Avista's inflated estimates of the value of AMI-related reliability improvements. I will also the impact that rate case timing has on the recognition of several types of

[11] DiLuciano, Exh. JDD-2r, at 9–10.

AMI benefits in customer rates. Combined, the impacted benefit categories represent almost 60 percent of Avista's projected benefits, and indicate that overall shortfalls from the benefits Avista projected in its AMI cost-benefit analysis are likely.

Q. Please explain Public Counsel's concern with Avista's reliability benefits.

A. Avista claims reliability improvements which will be extremely challenging to secure, are associated with exaggerated economic value, and accrue disproportionately to commercial and industrial ("C&I") customers.

Avista claims system-wide SAIDI reductions of 10 percent will result from AMI implementation. I believe this estimate to be extremely overstated. First, Avista provides no research that indicates that a 10 percent SAIDI reduction can be secured from AMI deployment.[12] Based on research into completed AMI deployments, it appears that AMI offers a reliability improvement potential of 4.5 percent *at best*.[13] Avista doubled its SAIDI improvement estimate from five percent in its 2016 AMI Business Case,[14] from "outage restoration efficiency," to 10 percent in its most recent version.[15] Avista attributes the improvement to the addition of earlier outage notification, which it did not consider in the 2016 business case.

[12] Shay Bauman, Exh. SB-4, Avista Response to Public Counsel Data Request No. 202.
[13] Paul Alvarez, *Smart Grid Hype & Reality: A Systems Approach to Maximizing Customer Return on Utility Investment.* 2d ed., at 141–143, ISBN 978-0615887951 (2018).
[14] Heather L. Rosentrater, Exh. HLR-3, Appendix B, at 12, "Avista Utilities Advanced Metering Project — Business Case", *WUTC v. Avista Corp.*, (Feb. 2016)(Dockets UE-160228 & UG-160229).
[15] DiLuciano, Exh. JDD-2r, at 61–66.

Public Counsel met with Avista to review outage management capabilities and processes under AMI, as requested in Public Counsel Data Request No. 260.[16] Avista demonstrated the process of an actual event that occurred the weekend of March 27, 2021. The demonstration indicated how AMI could improve restoration time in some cases through both earlier notification and more efficient outage restoration. Public Counsel's concern is that the conditions in which AMI can deliver earlier outage notification and more efficient outage restoration only exist for some types of outages, and generally only for smaller outages. Thus, an assumption that AMI will improve system-wide SAIDI by 10 percent is aggressive, to say the least.

Q. What are these conditions in which AMI will be unable to deliver earlier outage notification and more efficient outage restoration?

A. The example Avista demonstrated to Public Counsel was a distribution-level outage impacting just a single lateral. Laterals generally serve just 30–50 customers each, as was true in the example. AMI provides more efficient outage restoration by helping direct Avista repair crews directly to the problematic distribution device, in this case a fuse. However, other outages are attributable to substation devices, not distribution devices. These outages have the potential to affect far more customers.[17] In such cases, at least for substations managed through Avista's SCADA system, which is most of Avista's substations, and certainly those serving the greatest number of customers, the SCADA system

[16] Bauman, Exh. SB-5, Avista Response to Public Counsel Data Request No. 260.
[17] Response Testimony of Paul Alvarez and Dennis Stephens ("Alvarez-Stephens"), Exh. PADS-1T, at 44.

immediately notifies Avista of the outage, enabling crews to be directed immediately to the problematic device.[18] Thus, for most outages involving substation-level outages, AMI provides no incremental benefit. Further, Public Counsel notes that substation-level outages impact an average of a thousand customers or more, not just the 30–50 customers which could be impacted by a distribution device problem (or, just the three to five customers impacted by a distribution transformer failure). As a result, substation-level outages disproportionately impact SAIDI, for which AMI generally provides little incremental benefit.

Q. Are there other such examples?

A. Yes. Consider a storm situation in which there are many outages. In instances of many outages impacting many customers simultaneously, outage notifications may not the limiting factor in a utility response given the likely number of customers notifying them to an outage. In such instances, the fact that the number of outages exceeds the capacity of available repair crews may be the limiting factor. In these situations, earlier outage notifications are unlikely to have much of an impact on improving restoration time at all. In this example, I note again that as the number of customers impacted by outages grows, the reliability-related AMI benefits fall, which again implies a disproportionately small impact on

[18] Gary Scheer. *Roles of Annunciators in Modern Electrical Substations,* SCHWEITZER ENGINEERING LABORATORIES, INC., at 3 (Presented at the 13th Annual Western Power Delivery Automation Conference, Spokane, WA. March 29-31, 2011), available at https://cms-cdn.selinc.com/assets/Literature/Publications/Technical%20Papers/6480_RolesAnnunciators_GS_20110201_Web.pdf?v=20150812-151847.

system-wide SAIDI from AMI. Avista uses system-wide SAIDI improvement estimates to estimate the economic value of AMI-related reliability improvements to customers.

Other research has included both earlier notification and outage restoration efficiency in his primary research on completed AMI deployments, which resulted in the claim above that AMI-related reliability improvements could be as high as 4.5 percent at best.[19] However, it is important to note that the size of projected SAIDI improvements is just one of my concerns regarding Avista's reliability benefit estimates.

I believe the economic value Avista places on reliability improvements is inflated as well. Before describing these concerns, I noted in my research on AMI benefit projections that *many utilities attribute no economic value at all to reliability improvement benefits potentially available from AMI*. This speaks to the fact that reliability improvements from AMI are difficult to secure, and even harder to value. However, I have examined the development of the online tool Avista used to place an economic value on its projected 10 percent SAIDI improvement—the Interruption Cost Estimator (ICE)—and the research on which

[19] Alvarez et al., MetaVu, *SmartGridCity™ Demonstration Project Summary*, XCEL ENERGY (Oct. 21, 2011), filed in Docket 11A-1001E, Direct Testimony of Michael Lamb, Exh. MGL-1 (Colo. Pub. Utils. Comm'n Dec. 14, 2011), available at http://nebula.wsimg.com/964db667494457ab2d7e28f15232b7a2?AccessKeyId=8AF7098D30C5BF55909C&disposition=0&alloworigin=1. Also, Alvarez et al., MetaVu, *Duke Energy Ohio Smart Grid Audit and Assessment*, Docket 10-2343-GE-RDR (Ohio Pub. Utils. Comm'n June 30, 2011), available at http://nebula.wsimg.com/5cbd3a404d5a8245caef27c6af9b9cf2?AccessKeyId=8AF7098D30C5BF55909C&disposition=0&alloworigin=1.

it is based. I am very concerned that this tool exaggerates the economic value of reliability improvements in the Avista service area.

Q. What is the ICE tool, and how does it exaggerate the economic value of reliability improvements?

A. The ICE tool is an online application sponsored by the U.S. Department of Energy.[20] In response to a limited number of inputs (customer counts by class, estimated percentage improvements in SAIDI and SAIFI, estimated useful life of equipment, etc.), the tool delivers an estimate of the economic value the specified reliability improvements will deliver over the life of a reliability-related investment. Unfortunately, the data used in this tool was not collected in an appropriate manner, nor was the data collected with the intention of using it to estimate the economic impact of outages over a defined geography. Instead, the DOE found some customer outage cost data a few utilities had collected by survey—in some cases more than 30 years ago—and applied it to the ICE tool.[21] This data is inappropriate for use in making grid investment decisions of hundreds of millions of dollars. It inflates estimates because the cost of an outage to an individual customer is not the same as the cost of an outage to a defined geography (such as a utility's service territory).

The surveys completed to create the data used in the ICE tool were clearly intended to calculate costs to individual customers, but the tool has expanded that

[20] The ICE tool can be accessed at https://www.icecalculator.com/home.
[21] Michael Sullivan et al. *Updated Value of Service Reliability Estimates for Electricity Utility Customers in the United States*, Lawrence Berkeley National Labs Report LBNL-6941E, at 16–17 and 48–49 (Jan. 2015), available at https://certs.lbl.gov/sites/all/files/lbnl-6941e.pdf.

to represent a cost to a community or a service area. It is inappropriate to simply aggregate the outage costs estimated by individual customers to approximate the economic impact of outages across a service area.

Consider a residential customer, faced with no electricity for cooking and air conditioning, who decides to go out to dinner, or to a shopping mall; such an outage would benefit some businesses and the local economy. While one business lost revenue, another business gained revenue, resulting in no net economic loss to the community as a whole. The ICE tool does not account for this economic offset whatsoever.

There are also significant problems with the survey administration, which introduced several types of bias, especially prevalent in the commercial and industrial (C&I) surveys:[22]

- The surveys were limited in number, conducted decades ago, and collected data only from C&I customers in manufacturing and retail businesses (now a minority among non-residential customer classes);
- The identities of the survey takers—utilities—were known to the C&I customers, which likely biased responses from respondents hoping for financial remuneration;
- The 15 survey projects were completed in just five U.S. geographies, and it is not known if any of these were conducted in the northwestern U.S.; and

[22] *Id*.

- There is no consistency in how survey respondents took back-up generation and uninterruptible power supplies into account when completing surveys.

Q. Does Public Counsel have additional concerns regarding Avista's reliability benefit estimates?

A. Yes. Unfortunately, there are still other problems with Avista's reliability benefit estimates. According to the tool, 96 percent to 98 percent of the economic value of reliability improvements accrue to C&I customers, with just two to four percent of such economic value accruing to residential customers.[23] As the economic value of reliability improvements are one of the greatest sources of value in Avista's AMI cost-benefit analysis—second only to meter reading expense reductions—this is a significant observation. The observation that most reliability-related benefits will not apply to residential customers indicates that for Avista's AMI deployment as planned, the costs outweigh the benefits for residential customers, even if one assumes all Avista benefit projections are accurate. This is another reason why we must take action to ensure that Avista follows through in providing customer benefits. Given the uncertainty of the reliability benefits and other benefits that I will soon explain, the business case is not strong enough to justify a return on investment at this time.

[23] *Id*.

Q. You mentioned that rate case timing could reduce further reduce the recognition of operating benefits by customers. Please elaborate on this.

A. O&M reductions are behind schedule.[24] While the delayed meter rollout explains part of this, it does not capture the full story nor instill confidence that Avista can hit the O&M savings targets in its cost-benefit analysis. A bigger issue is the difference in timing between the point in time when Avista secures an operational benefit, and the point in time when such operational benefits are recognized as rate reductions for customers. Benefits Avista includes in its cost-benefit analysis which are subject to the rate case timing issue include both O&M savings benefits and revenue assurance benefits (such as reductions in unbilled usage/theft, as well as improvements in meter accuracy). O&M savings benefits are not recognized as customer rate reductions until reflected in a rate case test year; revenue assurance benefits are not recognized as customer rate reductions until reflected in the sales forecasts used to calculate rates in a rate case. It may take not one rate case, but perhaps two rate cases, for all such benefits to finally be reflected in rates. Shareholders, not customers, secure such benefits in the interim.

Avista's cost-benefit analysis assumes operational savings benefits will grow rapidly as the AMI deployment is completed, and then more slowly over time due to inflation.[25] However, while AMI-related operational savings grow year-by-year for Avista, they only grow for customers periodically, when a rate case is filed. Rate cases are the only opportunity for falling operational costs and

[24] DiLuciano, Exh. JDD-2r, at 51.
[25] Bauman, Exh.SB-6, Avista Response to Public Counsel Data Request No. 196 and Bauman, Exh. SB-7, Avista Response to Public Counsel Data Request No. 197.

higher sales volumes to be reflected in test year books and records, and therefore as rate reductions. If Avista gets these benefits from AMI before the next rate case, those benefits will not be reflected in customer rates. If these AMI benefits grow between the next rate case and the rate case which follows it, that growth will be lost to customers until that following rate case. To summarize, differences in timing between utility recognition of O&M and revenue benefits and customer recognition of O&M and revenue benefits always result in customer benefits which are less than those a utility projects in its cost-benefit analysis. We must be sure, then, that benefits exceed costs.

To summarize, because the benefits of reliability improvements accrue disproportionately to larger customer classes, and because O&M savings and reliability benefits may be overstated, and because it will take time for operational benefits to be reflected to customers, it is vital that the Company maximize the benefits of AMI for residential and small business customers. The next section of my testimony outlines key potential benefits of AMI that either Avista has excluded entirely or that will require a lot of work on their behalf to be effective. These are all programs that would directly benefit and empower residential and small business customers. Absent Commission action, there is no way to ensure Avista follows through in delivering maximum value to customers.

IV. AVISTA CLAIMS BENEFITS FOR PROGRAMS NOT YET OPERATIONAL

Q. Does Public Counsel have other concerns with Avista's benefits?

A. Yes. Another concern of Public Counsel's is that Avista purports benefits for programs not yet implemented or complete. One of these is behavioral energy feedback. Avista claims a benefit of $8.9 million in behavioral energy efficiency. Behavioral feedback programs provide customers with personalized insights based on their interval data to help motivate them to take actions in reducing energy consumption. These programs have the potential to provide benefits to customers. However, Avista does not expect to launch its first AMI-enabled behavioral feedback program until late 2021, and currently proposes only one program.[26]

In the report published by the American Council for an Energy Efficient Economy (ACEEE) titled *Leveraging Advanced Metering Infrastructure to Save Energy,* Gold et al. note:

> While energy use data alone can influence customer behavior, simply providing such data is insufficient to affect most customers' energy consumption. Experience shows that providing customers with personalized insights based on interval data (as a number of vendors do in their home energy reports or other communications) is much more effective at motivating customers and getting them to take actions to change their energy use. Such reports are a common application of behavioral feedback.[27]

Because Avista has no behavioral programs currently operating, it is likely that the energy feedback benefits to customers are not currently maximized.

[26] DiLuciano, Exh. JDD-2r, at 56.
[27] Gold, Waters, and York, *Leveraging Advanced Metering Infrastructure to Save Energy*, AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., Report U2001, at 14 (Jan. 2020), available at https://www.aceee.org/sites/default/files/publications/researchreports/u2001.pdf.

Behavioral programs enhance customers' conceptualization of the data. Because these programs are not yet operational, and therefore work must be done to ensure customer energy efficiency is maximized, it is essential the Commission ensure the Company follow through in delivering the benefits they claim.

This is also true for Avista's grid-interactive efficient buildings program. Avista "currently has the objective of minimizing the aggregate energy used by multiple buildings in a development, flattening the capacity demand being placed on the distribution system, and shifting capacity peaks."[28] An objective is neither a verified result nor evidence of future success. Avista currently claims a benefit in their cost-benefit analysis of $2.6 million; however, the build-out of its eco-district will take another four years. This project has the potential for customer savings through energy efficiency, but again, the benefit depends on specific action and is not operational at this time.

Public Counsel is also concerned with Avista's implementation of conservation voltage reduction (CVR) to date and the amount of work necessary for Avista to maximize the program.

Q. What is Conservation Voltage Reduction?

A. Several types of customer loads, called inductive loads, use less energy at lower voltage levels. Examples of inductive loads lighting and the heating elements of various appliances (dishwashers, electric clothes dryers, electric water and space heaters, etc.). The concept of CVR involved the reduction of voltage levels all along a circuit, so that the inductive loads all along the circuit can use less energy

[28] DiLuciano, Exh. JDD-2r, at 77.

(the "conservation" in CVR). The challenge is that voltage falls as it travels from the source (a substation, for example) to the customer on the end of the circuit. Since electrical appliances and equipment intended for use in North American homes are designed to operate at no less than 110 volts, utilities must ensure all customers, including those at the end of the circuit, receive electricity at no less than 110 volts. The goal of CVR is to reduce voltage all along the circuit without violating the minimum 110-volt limit at the end of the circuit.

Q. Does Avista practice CVR?

A. Yes, the company is actively implementing the program using data from AMI.

Q. Why is Public Counsel concerned with Avista's CVR implementation and future?

A. The problems Avista encountered during implementation led to a decrease in the life cycle present value estimate of over 66 percent.[29] The decreases in the estimated value of this program occurred due to the following:

- The potential to reduce feeder voltages in the Spokane operations area was minimal, contrary to pilot suggestions, due to secondary service lines;
- The voltage on many of the company's rural feeders cannot be reduced to achieve CVR savings and Avista serves many customers in rural areas;
- Customers served on the feeder beyond the midline regulator are already typically at the minimum voltage level; and
- The COVID-19 pandemic delayed the adoption of CVR on 36 feeders slated for completion this year.

[29] DiLuciano, Exh. JDD-2r, at 72.

CVR benefits often vary widely and require a lot of effort to achieve and maximize. According to a study by the National Rural Electric Cooperative Association (NRECA), the ratios between voltage reduction and energy load consumption for a particular part of the system vary widely from substation to substation, feeder to feeder, and especially load to load. Achievement can change from customers' load mix, transformer and conductor characteristics, and voltage control schemes as moderated by voltage regulators, line drop compensators, and switched capacitor banks.[30] Generally speaking, a well-planned CVR system can achieve significant voltage reductions and benefits in excess of costs for customers. However, as with most "grid modernization" endeavors, results vary by utility. CVR requires dedicated management time and attention to maximize. The continued monitoring of AMI sourced voltage data will remain an important part of the CVR deployment.[31] Utilities vary in the amount of attention applied to CVR programs and in the percentage of voltage reduction deemed satisfactory. The optimum locations for voltage regulators and capacitors change. The software used to reduce voltage can also be used to increase voltage (and therefore sales volumes) just as easily. There is also the chance for simple human error: CVR disabled for circuit maintenance or construction work can simply be forgotten to be re-established after the work is completed. Avista has a unique service

[30] Nat'l Rural Elec. Coop. Ass'n, *Costs and Benefits of Conservation Voltage Reduction* (May 31, 2014), available at https://www.energy.gov/sites/prod/files/2016/10/f34/NRECA_DOE_Costs_Benefits_of_CVR_May_2014.pdf.

[31] Ahmad Faruqui et al., *The Impact of AMI-Enabled Conservation Voltage Reduction on Energy Consumption and Peak Demand*, THE ELEC. J., Vol. 30, Issue 2, 60–65 (2017), available at https://www.sciencedirect.com/science/article/pii/S1040619016302536.

territory, with a combination of rural and metropolitan areas. This has made CVR even more difficult to operate for the Company.

Without performance measurement, CVR benefits could easily be zero. At a minimum, CVR benefits are likely to be less than stated, and unlikely to increase over time, without performance measurement and continued effort.

Q. Have we seen any other volatility in Avista's AMI benefit projections?

A. Yes. Avista only recently completed implementation of its AMI system and has yet to prove, as shown above, that the customer benefits estimated in multiple areas are accurate. Avista's estimates have been volatile throughout the course of this rate case and its AMI implementation. Table 2, below, outlines the volatility in assumed benefits since Avista's 2016 business case, and even since this rate case was filed. Each time Avista "takes another look" at benefits, they continue to fall.

Table 2: Benefit Volatility

Area of Benefit	*2016 Business Case*	*2020 Business Case*	*2016-2020 Increase (Decrease)*	*New Estimate from Rate Case Revisions*
Meter Reading/Meters	$75.90	$73.70	(3%)	$69.5
Outage Management	$40.30	$53.70	33%	n/a
Remote Service Connectivity	$24.30	$22.00	(9%)	n/a
Energy Efficiency	$59.40	$33.70	(43%)	n/a
Energy Theft and Unbilled Usage	$28.90	$23.40	(19%)	$22.99
Billing Accuracy	$10.60	$11.40	8%	$10.98
Utility Studies	$2.20	$2.10	(5%)	n/a

Outage Management, one of only two increases, only increased because Avista added new benefits titled "more rapid restoration," which includes earlier outage notification, to the category. Public Counsel challenged these benefit claims earlier in this testimony. During this rate case, Avista revised Billing Accuracy benefits, originally estimated in this rate case at an 8 percent increase over 2016 estimates, to only a 3.6 percent increase over 2016 estimates.

Public Counsel acknowledges that, of course, benefit estimates will change during system implementation. The point of this analysis is to show the dramatic volatility of Avista's estimates so far. This volatility and the uncertainty in the potential benefits, discussed above, underscores the need to hold off on a final prudency determination and to condition the recovery of the return on capital investment until benefits from the AMI system are reliable and proven.

AMI investments are specifically different from almost any other investment a utility can make. When a utility constructs a generating station, builds a substation, or installs a pole, the assets are either available for use on behalf of customers, and therefore used and useful, or they are not. There are no shades of gray. Smart meters, on the other hand, are not *required* to deliver safe and reliable service. Smart meters are only worth their incremental—and significant—cost if the smart features are used to deliver more benefits to customers than their counterparts. The manner in which the "smarts" of AMI meters are utilized varies widely from utility to utility, which in turn affects the level of benefits delivered.

V. STRATEGIES FOR AVISTA TO MAXIMIZE AMI BENEFITS

Q. In addition to ensuring the delivery of benefits Avista claims above, does Public Counsel have other recommendations to maximize AMI benefits?

A. Yes, Avista should work with stakeholders to develop a universal Peak Time Rebate (PTR) pilot, which is a type of time varying rate structure, to investigate potential customer benefits from such rate design programs. Public Counsel also recommends that Avista be required to submit annual performance reporting on benefits claimed in the business case, as we will discuss.

Q. What are time varying rates?

A. "Time varying rates" is an umbrella term used to describe multiple dynamic rate structures. Rates under these structures are adjusted in real-time based on system conditions, such as the time of day or the season. Encouraging customers to shift usage away from coincident system peak periods is one of the largest potential benefits from AMI. Adopting these structures could avoid spending in generation, transmission, and distribution capacity.

Q. Why are time varying rates important?

A. In my opinion, when done right, the shift of usage from peak periods provided by time varying rates is one of the largest potential benefits from AMI, second only to meter reading cost savings. Utilities have been implementing various types of these structures for decades, and multiple pilots have been considered in Washington. Time varying rate structures provide potentially large benefits from AMI with high levels of customer participation, but only when implemented correctly. This is why a pilot with a third-party evaluator is important in this case.

Q. Please describe the different rate structures that qualify as time varying.

A. Outlined below are the major time varying rate structures:

- Time of use rates ("TOU") — TOU rates vary on a fixed schedule to recover higher revenue during times when utility demands (and costs) are higher and lower revenue at other times. The intention of a TOU rate is to send customers price signals to reduce usage during peak hours at times when utility costs are highest.[32]
- Critical peak pricing (CPP) — under CPP, a higher energy rate is the result of higher wholesale electricity prices and allocations of costs for capacity needed and peak load. The announced events are often limited to a certain number of days or hours per year.[33]
- Peak time rebate (PTR) — The PTR rate structure rewards customers with a financial rebate for energy saved during announced peak events. Generally, a utility will notify customers in advance of the opportunity to reduce usage for a bill credit of a specified amount.[34]
- Variable peak pricing (VPP) — VPP is a pricing structure that charges customers a higher rate for a predefined peak period. The rate's on-peak price component can change day by day and customers are often alerted

[32] Brandon Baatz, *Rate Design Matters: The Intersection of Residential Rate Design and Energy Efficiency*, AM. COUNCIL FOR AN ENERGY EFFICIENT ECON., Report U1703, at 9 (Mar. 2017), available at https://www.aceee.org/sites/default/files/publications/researchreports/u1703.pdf.
[33] *Id*.
[34] *Id.*, at 10.

about it by a specific time during the previous day.[35] A related variant is real-time pricing.

Q. How do these structures differ from one another conceptually?

A. Besides basic pricing and rebate strategies to shift loads, these structures vary from each other on a conceptual and critical level. This can be described using the "carrot and stick" idiom, so named in reference to a cart driver either dangling a carrot in front of a mule or holding a stick behind it. The carrot is a reward for behavior; the stick is a punishment to encourage or discourage behavior. Most of the above structures are sticks that punish customers with increased rates for failing to shift individual load to off-peak hours. In fact, the only structure that is a carrot is PTR, which rewards customers in the form of a rebate for shifting load during peak periods without any potential for punishment. Research indicates the impact of carrot approaches can be just as large as the impact of stick approaches.[36] Public Counsel believes Avista should pilot a PTR program designed to mimic and test universal enrollment in a wider program.

Q. How should Avista develop the pilot?

A. Avista should engage external stakeholders in program development, as it does with integrated resource planning, low-income assistance, and energy efficiency. This includes stakeholder participation throughout the development of the program and rate design and selection of a third-party evaluator.

[35] *Id.*
[36] Ahmad Faruqui and Sanem Sergici, *Dynamic pricing of Electricity in the mid-Atlantic region: Econometric results from the Baltimore Gas and Electricity experiment,* J. OF REGUL. ECON., Vol. 40, at 98 (2011).

Q. What are the advantages of peak-time rebate programs?

A. There are several. First, because PTR programs do not have the potential to punish customers, the programs can be offered universally, meaning there would be no need to proactively enroll. One-hundred percent of customers could have an opportunity to earn a rebate immediately upon smart meter installation. This leads to quicker benefit realization for customers, and greater conservation during critical peak events, which are key drivers of system peak reduction and AMI benefit capture. It also leads to comparatively lower marketing costs, which can be significant for time varying rates, which require customers to take action to switch rates. Second, and quite importantly, there are no penalties for failing to conserve during peak periods, as there are with "stick" type rate designs, such as TOU. This feature is important for customers who lack the ability to respond to a critical peak event or daily peak times. Lower-income customers often have a flatter load profile and use less electricity on average than other customers. Because of this, they may be disproportionately affected by demand charges. Research shows that while low-income customers are able to respond to changes in volumetric energy prices, it is at a lower level than other customers are.[37] PTR prevents disproportional negative effects and can provide a reason for customers to look forward to smart meters, rather than oppose them.

It is especially important right now to pilot programs that will not negatively impact customers given the economic realities of the country as a

[37] Brandon Baatz, *Rate Design Matters: The Intersection of Residential Rate Design and Energy Efficiency*, AM. COUNCIL FOR AN ENERGY EFFICIENT ECON., Report U1703, at viii (Mar. 2017), available at https://www.aceee.org/sites/default/files/publications/researchreports/u1703.pdf.

whole and Avista's service territory. The ongoing COVID-19 public health crisis has devastated the nation's economy. Social distancing, self-isolation, and travel restrictions have led to a reduced workforce across all economic sectors and caused many jobs to be lost.[38] It will take time to recover economically, and Public Counsel cautions against programs that have the potential to punish customers at such a catastrophic moment in history. Additionally, Avista's service territory experiences higher than average energy burdens.[39] Punitive, "stick" programs could potentially harm Avista's customers in particular.

Q. How could Avista's potential Energy Imbalance Market (EIM) participation affect the value of a universal PTR program?

A. As indicated, universal PTR offers opportunities to reduce growth in coincident system peak loads. As Avista's recent Integrated Resource Plan calls for costly increases in new electric generation capacity,[40] universal PTR offers the potential to reduce the need for such increases. It makes sense to implement universal PTR for this reason alone. However, EIM participation could increase universal PTR program value beyond the deferral or avoidance of costly increases in new electric generation capacity.

Like most utilities, Avista employs plant capacity to generate electricity for sale to other utilities when such capacity is not needed to meet Avista's own

[38] Maria Nicola et al., *The socio-economic implications of the coronavirus pandemic (COVID-19): A review*, INT'L J. OF SURGERY (London, U.K.), Vol. 78, 185–193 (June 2020), available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7162753/.
[39] Ookie Ma et al., *2019.Low-Income Energy Affordability Data (LEAD) Tool Methodology*, NAT'L RENEWABLE ENERGY LAB'Y, U.S. DEP'T OF ENERGY, available at https://www.energy.gov/eere/slsc/maps/lead-tool (Last Visited Apr. 20, 2021).
[40] Avista 2021 Electric IRP, Table 12.30: 2022-2045 Portfolio Selection Summary, at 12-51, available at https://www.myavista.com/about-us/integrated-resource-planning.

system peaks. These transactions are governed by bi-lateral contracts with other utilities on a case-by-case basis. EIM likely offers more frequent opportunities for these off-system sales, with less transaction friction, at market prices which could potentially be higher overall. As a result, while a universal PTR program offers value without EIM participation, the potential value of a universal PTR program probably increases with Avista's participation in EIM.

Q. How does a universal PTR program differ from a mandatory TOU or CPP structure?

A. *PTR programs bear absolutely no financial risk to customers for failing to shift individual load*. Some customers simply do not have the discretionary load to shift energy usage as much as others and using behavioral tools to penalize them by implementing a "stick" program as opt-out or otherwise mandatory would potentially harm vulnerable customers and would not be in the public interest. For a program like peak-time rebates, in which there are no customer penalties for failing to conserve during peak periods, the pilot can randomly select customers and automatically enroll them, simultaneously testing participation under a "universal" structure, without any potential whatsoever to harm customers financially for failing to shift individual load. Public Counsel believes the program should be piloted using random selection such to test the effectiveness of a universal structure.

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Q. How should Avista evaluate the effectiveness of time variant rate pilots?

A. In order to reduce bias on the effectiveness of the pilots, Avista should engage its stakeholders, as suggested above, to select a third-party evaluator with experience in objectively analyzing the results of time variant pilots.

Q. Public Counsel seems to have given time variant rates extensive consideration. Are there overarching policy positions Public Counsel has adopted that the Commission should consider?

A. Yes. First and foremost, Public Counsel believes "stick" time variant rate options, as well as any particular demand reduction event requests, while not endorsed in this case, should be opt-in. Punitive rate options should not be mandatory or opt-out in order to prevent harming customers who may not have the flexibility to shift individual load, or the resources to know they can opt-out or how to do so. This policy is designed to reduce customer risk. Second, as research indicates time-of-use rate options have little impact on coincident peak,[41] Public Counsel will not endorse time-of-use rates without some kind of critical peak price feature designed to reduce coincident peaks. Third, Public Counsel opposes mandatory or opt-out programs for punitive or discriminatory rate options. Public Counsel considers mandatory or opt-out "stick" time variant rate approaches, such as TOU with critical peak prices, as punitive and discriminatory, because low-income customers may have fewer discretionary loads to shift away from critical peak periods.

[41] Ahmad Faruqui and Jenny Palmer, *The Discovery of Price Responsiveness — A Survey of Experiments Involving Dynamic Pricing of Electricity*, SSRN Elec. J. 4. 10.2139/ssrn.2020587 (2012).

Public Counsel recommends a PTR program as (1) 100% customer participation is possible because there is no customer harm, which would lead to good data collection; (2) the rebate serves as the critical peak pricing feature; and (3) low-income customers are not penalized or discriminated against for failing to participate. Fourth, and critically, Public Counsel endorses high levels of customer participation in coincident peak reduction programs, particularly given the need to maximize residential customer benefits from AMI, Avista's Integrated Resource Plan calling for new electric resources, and Avista's Energy Imbalance Market participation proposal. Public Counsel believes a PTR pilot designed to mimic and test universal enrollment in a wider program is ideally suited to maximizing customer participation.

Q. How do these policy positions relate to Public Counsel's AMI recommendations?

A. Public Counsel recommends that the Commission deny Avista a return on investment of new meters until Avista properly evaluates all potential benefits from AMI and completes its assessment of a universal PTR program pilot. Public Counsel also recommends the Commission require that the universal PTR pilot be designed and evaluated by a third party selected and managed by Staff or stakeholders.

Q. You've also mentioned the need for performance reporting. Please explain.

A. Avista has only just completed implementation of its AMI system.[42] Despite the system's newness, Avista stated in discovery that they see no advantage of

[42] DiLuciano, Exh. JDD-2r, at 2.

performance reporting. Specifically, "Avista does not believe that the burden of continuing commitment and reporting requirements will enhance the cost effectiveness of the AMI system for our customers."[43] Public Counsel disagrees with this statement because of the arguments we have made throughout this testimony.

Avista claims benefits for programs not yet operational or that require a lot of work to maximize or even utilize properly. Their benefit estimates have proven to be volatile throughout implementation. Public Counsel believes that Avista must be held accountable to its customers. Avista failed to include significant customer costs in its cost-benefit analysis. By including those costs, Public Counsel shows that it is critical for Avista to fulfill its promises in order for the AMI system to benefit customers, particularly residential customers. This cannot be done without performance reporting related to the benefits claimed in its business case. These programs require continuous and intentional effort, and performance reporting increases Avista's accountability to their customers and the Commission.

Q. Which performance variables should be included in the performance report?

A. The following table outlines Public Counsel's suggested components for the AMI performance report:

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[43] Bauman, Exh. SB-8, Avista Response to Public Counsel Data Request No. 136(b).

Table 3: Reporting Requirements

Program		**Measures**
Conservation Voltage Reduction		Average voltage at which energy is delivered through a circuit
O&M Savings		Year-end headcounts in 1) meter reading; 2; meter services
Unbilled Revenue, Theft		1) Count of meters identified with bad phase; 2) Average days from identification to meter replacement; 3) kWh billed on bad phases
Customer Energy Efficiency		1) Head count use of budget alerts; 2) download count of energy data, in both CSV and green button format
Time Varying Rates Pilots		1) Count of customer participating; 2) Load reductions during called events; 3) Counts of participating customer complaints
SAIFI		1) Failing transformers identified in advance; 2) SAIFI improvement from transformers replaced prospectively.
SAIDI		1) SAIDI improved by faster outage reporting; 2) SAIDI improved by faster outage diagnosis; 3) SAIDI improved through nested outage detection.

Q. How often should Avista report AMI performance?

A. Public Counsel considered both annual and quarterly reports. We determined annual reports were adequate.

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Q. Can AMI implementation across the country provide any insight to the achievement of benefits?

A. Yes. A report completed by the U.S. Department of Energy's Advanced Grid Research division, *AMI in Review: Informing the Conversation,* compiles information from an analysis of more than 100 AMI public findings and draws on conversations with nearly 125 individuals from almost 50 entities across the country including utilities, regulators, and consumer advocates.[44] According to the report, doubts persist about the cost and value of AMI to customers, and AMI's forward-looking benefits *depend on how it is deployed and implemented*.[45] Further, their analysis shows that quantified benefits were overwhelmingly dominated by operational benefits that, in many respects, are not directly visible to the customer, and that value is being left on the table.[46] The commissions interviewed emphasized the importance of achieving benefits for customers sooner, rather than later, and that a positive cost-benefit analysis is not necessarily enough.

Additionally, according to a comprehensive report by the American Council for an Energy Efficient Economy titled *Leveraging Advanced Metering Infrastructure to Save Energy,* "Many utilities are underexploiting AMI capabilities and attendant benefits, thus missing a key tool to deliver value to their

[44] Advanced Grid Rsch., Off. Of Elec., *AMI In Review: Informing the Conversation*, U.S. DEP'T OF ENERGY, at ii (July, 8, 2020), available at https://smartgrid.gov/files/documents/AMI_Report_7_8_20_final_compressed.pdf.
[45] *Id*. at 19.
[46] *Id*. at 14.

customers and systems."[47] This conclusion comes from a survey done by the organization of the top 52 electric utilities by sales that collected information of how they are leveraging AMI. Utilities across the country are experiencing a slowed pay-off of benefits, and stakeholders are increasingly taking steps to ensure benefit capture.

Q. Do these reports provide any recommendations to regulators on how to ensure the capture of benefits?

A. Yes. ACEEE recommends that regulators adjust shareholder compensation for AMI investment based on performance.[48] The variability in AMI benefits discussed throughout this testimony, combined with Avista's incomplete plans to maximize available AMI benefits, and the fact that Avista systems are immature, all indicate that performance and customer benefits cannot be reliability estimated at this time.

Q. Has this Commission approved something similar in the past?

A. Yes. In the Final Order of PSE's most recent general rate case (Dockets UE 190529 and UG-190530, *Consolidated*), the commission denied PSE's request for recovery of return on capital stating, "We will reserve a final determination of prudency on the project as a whole until the AMI installation is complete *and* all customer benefits can be presented for evaluation. *The final prudency*

[47] Rachel Gold, Corri Waters, and Dan York, *Leveraging Advanced Metering Infrastructure to Save Energy*, AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., Report U2001, at 32 (Jan. 2020), available at https://www.aceee.org/sites/default/files/publications/researchreports/u2001.pdf.
[48] *Id*. at 37.

determination thus rests on PSE's ability to live up to its promises of multiple customer benefits" (emphasis added).[49]

Q. What benefits did the commission mention in its final order in PSE's general rate case, docket UE-190529?

A. The Commission specifically cited the ability to live up to customer benefits classified by six use-cases in ACEEE's report. Customer benefits include feedback and pricing strategies that encourage or enable customers to lower their bills, improve satisfaction from better communication with their utility about billing, outages, and the sources of energy use in their home.

The six use-cases characterized by ACEEE are:

1. **Energy use feedback to customers:** AMI is an opportunity to provide customers' near-real-time feedback of energy use data shortly after use. This exact interval of use and feedback may vary depending on technologies but can be close to zero.
2. **Behavior based programs:** Behavioral feedback applies tools of behavioral science to enhance responsiveness to energy use feedback.
3. **TOU Rates:**[50] Time-of-use is a rate plan in which the price for energy varies depending on the time of day, the season, and the day type (weekend, holiday, etc.)[51] The intent is to encourage the most efficient use

[49] *WUTC v. Puget Sound* Energy, Dockets UE-190529 et al., Order 08: Final Order, ¶ 156 (July 8, 2020).
[50] For the purposes of the survey, ACEEE looked at time-of-use rates only; the rest of their report considers time-varying rates, which include but are not limited to time-of-use rates.
[51] Cal. Pub. Utils. Comm'n, *What are TOU Rates?*, available at https://www.cpuc.ca.gov/general.aspx?id=12194 (Last Visited Apr. 20, 2021).

of the system and reduce overall costs. While ACEEE's survey focuses only on TOU rates, they discuss the benefits of other time-varying pricing strategies as well, which we discussed in Section III of this testimony.

4. **Data disaggregation:** Extracting end-use-level and/or appliance-level data from an aggregate or whole building energy signal to engage consumers and to target relevant programs to specific customers. [52]

5. **Grid-interactive efficient buildings:** These buildings, also known as "smart buildings" help utilities adapt to rapid changes in the electric grid by promoting energy efficiency and grid flexibility.[53]

6. **Conservation reduction (CVR) or volt/VAR optimization (VVO):** CVR involves measuring and analyzing voltages on distribution feeders in order to find ways to reduce voltages while still maintaining service requirements.[54]

Q. Do you believe Avista is capturing benefits from the use cases above?

A. I believe Avista is capturing some benefits, but the plans to maximize customer benefits are inadequate and incomplete. Avista is using data disaggregation and providing customers with energy use feedback (which is likely not maximized due to the lack of behavioral feedback). That is 2 out of the 6 benefit categories.

[52] Rachel Gold, Corri Waters, and Dan York, *Leveraging Advanced Metering Infrastructure to Save* Energy, AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., Report U2001, at 53 (Jan. 2020), available at https://www.aceee.org/sites/default/files/publications/researchreports/u2001.pdf.
[53] Christopher Perry, *Grid-interactive Efficient Buildings are the Future, and Utils. Can Help Lead the Way*, AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON (Nov. 2019), available at https://www.aceee.org/blog/2019/11/grid-interactive-efficient-buildings.
[54] Rachel Gold, Corri Waters, and Dan York, *Leveraging Advanced Metering Infrastructure to Save Energy.* AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON, Report U2001, at 29 (Jan. 2020), available at https://www.aceee.org/sites/default/files/publications/researchreports/u2001.pdf.

As I outlined above, however, the first AMI-enabled behavioral energy efficiency program will not launch until late 2021, Avista has yet to pilot time variant rates, their grid-interactive buildings are not yet operational, and Avista has a lot of work to do to utilize CVR fully. Given the volatility of benefit estimates so far, it is fair to say we cannot estimate with any certainty how successfully these programs will be implemented. The Commission simply needs more time with mandatory performance reporting to evaluate the effectiveness of the AMI system before allowing a return on capital.

VI. RECOMMENDATION

Q. Please summarize Public Counsel's recommendation.

A. Public Counsel recommends the Commission approve Avista's request for recovery of capital spent to implement its AMI system, but ***reject the Company's request for return on new meters until Avista properly evaluates all potential benefits from AMI***. In order to ensure customers receive the benefits from the AMI system, Public Counsel recommends properly proving benefits, implementing a PTR pilot designed to mimic and test universal enrollment in a wider program, and reporting annual performance based on claims made in the cost-benefit analysis.

Our testimony has made the following points:

- Avista understates costs to customers by failing to include abandoned legacy meter costs and carrying charges in its cost benefit analysis;
- Avista claims SAIDI reductions of 10 percent, but our research shows that actual AMI enabled SAIDI reductions are 4.5 percent at best;

- The ICE tool used to estimate reliability benefits is inappropriate and exaggerates these benefits, particularly for residential customers, as 96 percent to 98 percent of the economic value of reliability improvements accrue to C&I customers; Avista claims benefits in its cost-benefit analysis for two programs, behavioral energy efficiency and grid-interactive efficient buildings, that are not yet operational;
- The achievement of maximized CVR benefits will require significant work on behalf of Avista to maximize;
- Throughout implementation, Avista's benefit estimates have been volatile and we cannot accurately predict programs premature or not yet implemented;
- Avista has yet to pilot time variant rates; and
- Avista has yet to commit to annual performance reporting to prove benefits and maintain system accountability.

All of these points show that Avista's AMI system is still in its early stages and we must take action to ensure the promised customer benefits. Without doing so, customers may not see the full value of AMI. Indeed, this Commission has previously made shareholder return contingent on fulfilling promised benefits. We have shown that nationally renowned organizations recommend this practice. The risk of slowed or unfulfilled benefits is almost entirely borne by the customers. This Commission has served as a leader in ensuring AMI customer benefit promises, and has the opportunity to continue doing so such that all customer classes can see the full value of an AMI system.

Q. Does this conclude your testimony?

A. Yes.