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BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE APPLICATION)	CASE NO. AVU-E-21-01
OF AVISTA CORPORATION FOR THE)	
AUTHORITY TO INCREASE ITS RATES)	
AND CHARGES FOR ELECTRIC AND)	DIRECT TESTIMONY
NATURAL GAS SERVICE TO ELECTRIC)	OF
AND NATURAL GAS CUSTOMERS IN THE)	SCOTT J. KINNEY
STATE OF IDAHO)	
)	

FOR AVISTA CORPORATION

(ELECTRIC ONLY)

1 **I. INTRODUCTION**

2 **Q. Please state your name, employer and business address.**

3 A. My name is Scott J. Kinney. I am employed as the Director of Power Supply at
4 Avista Corporation, located at 1411 East Mission Avenue, Spokane, Washington.

5 **Q. Would you briefly describe your educational and professional background?**

6 A. Yes. I graduated from Gonzaga University in 1991 with a Bachelor of Science in
7 Electrical Engineering and I am a licensed Professional Engineer in the State of Washington. I
8 joined the Company in 1999 after spending the first eight years of my career with the Bonneville
9 Power Administration. I have held several different positions at Avista beginning as a Senior
10 Transmission Planning Engineer. In 2002, I moved to the System Operations Department as a
11 Supervisor and Operations Support Engineer. In 2004, I was appointed as the Chief Engineer,
12 System Operations and as the Director of Transmission Operations in June 2008. I became the
13 Director of Power Supply in January 2013, where my primary responsibilities involve management
14 and oversight of short- and long-term resource planning, acquisition of power resources, and power
15 trading.

16 **Q. What is the scope of your testimony in this proceeding?**

17 A. My testimony provides an overview of Avista's evaluation and decision to join the
18 Western Energy Imbalance Market (EIM) operated by the California Independent System Operator
19 (CAISO). I will provide an overview of the current cost estimates associated with joining the EIM,
20 including a brief description of operation and maintenance costs (O&M) and a detailed description
21 of capital costs. As approved in Case No. AVU-E-20-01, Order No. 34606, the Company is
22 currently deferring the incremental O&M expenses associated with joining the EIM. Through this
23 deferral, the Company will be able to more appropriately align both the benefits and expenses of

1 the EIM and minimize the potential impacts to rates when benefits can be realized. At the time of
2 go-live, anticipated to be March 2, 2022, the Company will no longer defer these expenses, and
3 will provide additional information to justify the expenditures. Company witness Ms. Andrews
4 incorporates the capital additions, associated with the Company's EIM investment, included in the
5 Company's request for rate relief over the Two-Year Rate Plan effective September 1, 2021 and
6 ending August 31, 2023.

7 A table of contents for my testimony is as follows:

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15
16 **Q. Are you sponsoring an exhibit in this proceeding?**

17 A. Yes, I am sponsoring Exhibit No. 8, Schedules 1 - 12 as listed below:

- 18 • Schedule 1 includes Avista's signed EIM Implementation Agreement with the
19 CAISO.
20 • Schedule 2 includes the CAISO FERC filing of Avista's Implementation
21 Agreement.
22 • Schedule 3 includes the FERC acceptance of Avista's Implementation Agreement.
23 • Schedule 4 includes Utilicast Technology Assessment.
24 • Schedule 5 includes Utilicast Metering and Controls Assessment.
25 • Schedule 6 includes Avista's original EIM Project Charter.
26 • Schedule 7 includes the updated EIM Scope document.

- 1 • Confidential Schedule 8C includes the updated cost estimate associated with the
2 Human Resource Plan.
- 3 • Schedule 9 includes Avista's EIM Human Resource Plan.
- 4 • Confidential Schedule 10C includes the original cost estimate associated with the
5 Human Resource Plan.
- 6 • Schedule 11 includes the Energy and Environmental Economics (E3) EIM benefit
7 analysis report.
- 8 • Schedule 12 includes the EIM capital business case.
- 9

10 **II. EIM BACKGROUND – DECISION TO JOIN**

11 **Q. Please describe the circumstances which led to Avista's decision to join the**
12 **EIM.**

13 A. Avista has actively monitored the operation and expansion of the EIM since its
14 inception in the fall of 2014. The Company regularly participates in regional meetings and
15 dialogue associated with EIM operations and enhancements including the potential expansion of
16 the EIM to a day ahead market. Avista continuously evaluates the operational benefits associated
17 with EIM participation, and the associated risks of not participating in the market. One of the
18 largest operational benefits for current EIM participants is the ability to balance and regulate load
19 and renewable resources by leveraging available market resources, instead of relying only on
20 internal resources to provide regulation and flexible ramping.

21 Avista has also closely monitored the impacts to the bi-lateral trading market as more
22 entities join the EIM. The integration of northwest utilities such as Portland General Electric
23 ("PGE"), Puget Sound Energy ("PSE"), Idaho Power ("IPC") and Seattle City Light into the EIM
24 has had an impact on short term hourly market liquidity. The commitment of NorthWestern
25 Energy and the Bonneville Power Administration (BPA) to join the market in the next few years,

1 will put even more stress on near-term hourly market liquidity. EIM participants are less likely to
2 conduct bi-lateral transactions close to the operating hour due to the need to pass EIM sufficiency
3 and flexible ramping tests and meet other market transaction deadlines that occur well before the
4 operating hour. This leads to significant risk and inefficiencies for non-market participants to
5 reliably and responsibly meet load service obligations and balance variable resources.

6 With over 80 percent of the load in the western interconnection committed to joining the
7 EIM by April 2022, non-participating utilities will face growing market liquidity risk. To mitigate
8 that risk, they will need to hold back more reserves to minimize exposure to in-hour fluctuations
9 or extended non-planned generation outages. Holding additional reserves will lead to higher
10 overall power supply costs, as excess available resources can't be fully utilized, or additional
11 resources may need to be built or purchased.

12 **Q. Are there other circumstances that led to the Company's decision?**

13 A. Yes. As Avista seeks to transition its resource portfolio to meet stated Company
14 clean energy goals, there are multiple factors that influence Avista's renewable resource mix,
15 including the price of renewable resources, our customer's increasing interest in purchasing
16 cleaner energy, and the implementation of new carbon emission policies in the West. Based on
17 competitive pricing and customer interest, Avista recently signed two Power Purchase Agreements
18 (PPA) for renewable resources – 20 MW of solar starting in December of 2018 (Adams-Neilson)¹
19 and 145 MW of wind starting in December 2020 (Rattlesnake Flat).

20 Avista has seen an increased interest from developers looking to integrate qualifying
21 resources that meet the requirements under the Public Utility Regulatory Policies Act (PURPA),

¹ As described by Company witness Mr. Kalich, all output of Adams-Neilson solar is assigned to our Solar Select Program.

1 which may lead to additional PURPA renewable resources integrating into the Avista Balancing
2 Authority Area (BAA). The Company is also in the process of conducting a renewable request for
3 proposal for up to 300MW of clean non-emitting resources to further its transition to a cleaner
4 resource portfolio. As additional variable resources are integrated into the Avista BAA, it becomes
5 more efficient and cost-effective for Avista to rely on the EIM to help meet the in-hour variability
6 of these resources, instead of holding back reserves and dispatching Avista-owned resources to
7 meet flexible ramping requirements.

8 Based on the short-term market liquidity risks associated with being a non-EIM participant
9 and Avista's changing resource portfolio, which includes additional variable resources, Avista
10 made the decision in the spring of 2019 to join the Western EIM to reduce risk and provide benefits
11 to its customers.

12 **Q. What is the general timeline associated with joining CAISO?**

13 A. The signed CAISO implementation plan, and the associated approval from FERC,
14 called for an April 1, 2022 implementation date. However, in order to align with the decisions
15 made by both the Bonneville Power Administration and Tacoma Power, and capture efficiency
16 and operational gains associated with multiple entities joining simultaneously, the implementation
17 date has been accelerated to March 2, 2022. The following list provides a general timeline
18 associated with Avista joining the EIM:

April 25, 2019	Avista signed EIM Implementation Agreement with CAISO
December 11, 2019	CAISO filed Implementation Plan with FERC
February 19, 2020	FERC accepted the CAISO/Avista Implementation Agreement
March 2, 2022	Accelerated Go-Live date

19

1 A copy of the CAISO EIM Implementation Agreement, the CAISO FERC filing letter,
2 and the FERC acceptance letter are included in Exhibit No. 8, Schedules 1-3, respectively.

3

4 **III. EIM INTEGRATION AND ON-GOING COSTS**

5 **Q. Please provide an overview of the initial cost estimates associated with joining**
6 **the EIM.**

7 A. The original total cost estimates (system) associated with joining the EIM, as
8 compiled in the EIM Program Charter, are summarized in Table No. 1 below:

9 **Table No. 1 – EIM Program Charter Estimates**

EIM Program Charter Estimates (as of 05/2019)	Implementation	Contingency	Totals	Annual O&M Expenses
Capital	\$ 18,129,000	\$ 4,532,250	\$ 22,661,250	\$ -
Expense	\$ 2,380,000	\$ 595,000	\$ 2,975,000	\$ 3,534,000
Pre-Paid Expense	\$ 840,000	\$ 210,000	\$ 1,050,000	\$ -
Total Costs	\$ 21,349,000	\$ 5,337,250	\$ 26,686,250	\$ 3,534,000

10 The Company originally estimated spending approximately \$22.7 million in capital costs,
11 \$3.0 million in O&M expense, and \$1.0 million in pre-paid application expense for a total
12 implementation expenditure of \$26.7 million. The total expenditure included 25% contingency
13 funds for unknown costs and is consistent with the Company's engineering estimating
14 methodology. These estimates were primarily based on information obtained from both internal
15 subject matter experts as well as input from our third-party consultant Utilicast². Utilicast assisted
16 in the development of a technology assessment, as well as a metering and controls assessment

² Utilicast is a provider of consulting services to the energy and utilities industry, providing expertise and experience in the areas of regional electricity market solutions, power systems operations, project implementation, analytics, energy services, customer care and related IT infrastructure.

1 associated with EIM participation requirements. Utilicast also updated the market costs
2 assessment that it had previously conducted for the Company in 2015. These costs were primarily
3 related to metering upgrades, generation control modifications, communication/network
4 infrastructure additions and improvements, the purchase and integration of multiple market-based
5 software applications, the hiring of a System Integrator consultant, CAISO implementation fees
6 and Avista labor, including both existing Avista labor, as well as estimated new employees. The
7 technology assessment and metering and control assessments conducted by Utilicast as well as the
8 EIM Program Charter, are provided in Exhibit No. 8, Schedules 4-6 respectively.

9 The anticipated on-going costs of \$3.5 million included maintenance costs for software
10 licenses and communication networks, the addition of 11-13 new employees to facilitate market
11 operations and settlements (including a new five-person 24x7 hour EIM operating desk) and
12 CAISO grid management charges.

13 **Q. Has the Company made updates to the estimates provided in the EIM
14 Program Charter?**

15 A. Yes. The current estimate of total expected costs is summarized in Table No. 2
16 below and explained in the EIM Program Scope document³.

17 **Table No. 2 – EIM Program Scope Estimates***

EIM Program Scope Estimates (as of 08/2020)	Implementation	Contingency	Totals	Annual O&M Expenses
Capital	\$ 24,091,964	\$ 2,600,000	\$ 26,691,964	\$ -
Expense	\$ 5,011,026	\$ 400,000	\$ 5,411,026	\$ 3,907,100
Total Costs	\$ 29,102,990	\$ 3,000,000	\$ 32,102,990	\$ 3,907,100

21 *Pre-paid expense estimates were reclassified to capital.

³ The cost estimates included in Table No. 2 represent the total costs of the EIM implementation and are not meant to represent incremental. In this context, incremental represents only those costs which are new (not currently in ongoing operation costs) and are required in order to join the EIM.

1 After completing more than a year of EIM integration work, and continued conversations
2 with Utilicast and other current EIM-entities, Avista obtained a better understanding of the total
3 market integration and operational support needs for both labor and non-labor. Based on this new
4 information and experience the Company updated estimates for overall EIM implementation and
5 on-going market operations. These new estimates are explained in the EIM Program Scope
6 document, provided in Exhibit No. 8, Schedules 7 and 8C, which incorporates updated metering
7 and network project designs and schedules; updated labor estimates as determined in the EIM
8 Human Resource Plan, provided in Exhibit No. 8, Schedule 9 and 10C; and overall project cost
9 estimates based on actual project spend through August of 2020 and remaining integration work.
10 The EIM Human Resource Plan provides the details related to labor requirements, including
11 number of full-time equivalents (FTE), hire dates, and salary estimates to support both integration
12 work and on-going market operations. Contingency funds were also included to address costs
13 unknown, but at a much lower rate than assumed in the EIM Project Charter.

14 **Q. Please describe the revised costs in the preferred Human Resource Plan and**
15 **Scope document specific to labor costs.**

16 A. The Human Resource Plan includes updates for how many new employees would
17 be needed for operational support after joining the market and the preferred hire date for all new
18 resources. As Avista continued to evaluate resource needs, the Company sought input from other
19 EIM participating utilities including what roles and responsibilities were needed to successfully
20 operate in the market post go-live. Avista met with these utilities, including Portland General
21 Electric, Idaho Power Company, Arizona Public Service and PacifiCorp, to discuss the roles and
22 responsibilities required to successfully operate in the market post go-live. These utilities indicated
23 a separate EIM operating desk was required to interact with the CAISO and ensure reliable market

1 operations. They also shared that they hired new employees to support settlement activities, data
2 collection and review, network model maintenance, system operations support, resource bidding
3 strategies, and new application technology support. Further, these EIM participating utilities
4 indicated that too lean of a workforce at the time of entry had contributed to operational
5 inefficiencies and recommended some additional personnel. After collecting this information,
6 Avista consulted with Utilicast regarding the new job responsibilities and functions, and gathered
7 input based on their knowledge with CAISO EIM requirements and experience integrating other
8 EIM participating utilities.

9 As a result of the information gathered through the review process, Avista determined that
10 an additional 17 full time employees (five more than the 12 originally estimated in the EIM
11 Program Charter) would be necessary to ensure successful implementation and on-going
12 operational support. In addition to revisions made based on external feedback, the Company also
13 performed several internal reviews to finalize labor cost estimates based on anticipated hire dates.
14 Additional changes were made in August 2020 to the original Human Resource Plan cost forecast
15 to reflect 2020 hiring delays and the postponement of two positions – the EIM BA Relief Operator
16 and one of the Settlement Analysts. Both roles were delayed a year from their original proposed
17 hire date. Table No. 3 provides a comparison of the original new employee estimate and hire dates
18 as provide in the EIM Charter, the Human Resource Plan and the revised estimate included in the
19 EIM Scope document.

1 **Table No. 3 – EIM New Employee Plan Comparison**

EIM FTE Estimates		Charter Estimates (as of 05/2019)		Scope Estimates (as of 08/2020)		
		Quantity	Hire Date	Quantity	Org. Hire Date (as of 06/2020)	Rev. Hire Date (as of 08/2020)
Implementation Resources						
EIM Program Manager	1		Jan-19	1	Jan-19	
Org. Change Management Specialist	1			1	Sep-20	
Substation Engineer				1	Jan-20	
Total	2			3		
Incremental EIM FTEs						
Power Supply Analyst	1	Oct-20		1	Jul-21	Sep-21
Network Model Tech	1	Oct-20		1	Jun-20	
SCADA Tech	1	Oct-20		0		
EIM BA Desk	1	Jul-21		1	Feb-20	
EIM BA Desk	1	Jul-21		1	Sep-20	Oct-20
EIM BA Desk	1	Jul-21		1	Sep-20	Oct-20
EIM BA Desk	1	Jul-21		1	Jan-21	
EIM BA Desk	1	Jul-21		1	Jan-21	
EIM BA Desk	0			1	Mar-21	Mar-22
Training Admin	0			1	Mar-22	
EIM BA Analyst	0			1	Jul-21	Sep-21
Settlements Manager	0			1	Sep-20	Oct-20
Data Management Operator	1	Oct-20		1	Apr-21	
Settlement Analyst	1	Apr-21		1	Apr-21	
Settlement Analyst	0			1	Jul-21	Jun-21
Settlement Analyst	0			1	Jul-21	Aug-22
Compliance	0 or 1	Apr-21		0		
IT Analyst	1 or 2	Oct-20		1	Jun-20	Oct-20
IT Analyst	0			1	Jun-20	Jan-21
Total	11 to 13			17		

15 The Human Resources Plan includes a thorough description and justification for each new
 16 position. Avista believes the 17 employees represents a mature workforce needed to fully support
 17 implementation and on-going EIM operations. Once Avista has experience operating in the EIM
 18 market, additional EIM labor and roles requirements will be reassessed at that time.

19 Table No. 4 provides a labor cost comparison associated with adding the five additional
 20 employees from the original EIM Program Charter estimate.

21 **Table No. 4 – Labor Cost Comparison**

EIM HR Plan Incremental Loaded Labor Costs	Charter Estimates (as of 05/2019)			Scope Estimates (as of 08/2020)		
	Capital	Implementation Expense	Ongoing Expense	Capital	Implementation Expense	Ongoing Expense
EIM HR Plan	\$ 550,000	\$ 185,000	\$ 2,500,000	\$ 2,255,219	\$ 1,033,570	\$ 3,177,467
Grand Totals	\$ 550,000	\$ 185,000	\$ 2,500,000	\$ 2,255,219	\$ 1,033,570	\$ 3,177,467

1 As it relates to integration, the new Resource Plan added \$1.7 million of capital and \$0.85
2 million of expense related integration labor to the project based on the five additional employees
3 and accelerating the hire dates to support software implementation, employee training, system
4 operator NERC certification, and parallel market testing. The original new employee estimate in
5 the EIM Program Charter included only four months of labor costs to support parallel testing and
6 employee training. The original project estimate in the Charter significantly underestimated the
7 required incremental integration labor. The updated estimated incremental labor cost to hire the
8 new employees to support integration effort is \$3.3 million, with \$2.25 million in capital related
9 work and \$1.03 million in expense.⁴

10 The original Charter estimate for on-going annual O&M labor was \$2.5 million attributed
11 to the original labor estimate of 11-13 incremental EIM employees. Labor has since been revised
12 to include the estimated 17 incremental employees resulting in an increased annual labor estimate
13 of \$3.2 million (system loaded).

14 **Q. Please now describe the revisions made in the EIM Scope document that are
15 not related to labor associated with the additional new hires.**

16 A. The significant factors contributing to the non-labor capital project estimate
17 changes in the Scope document are associated with required enhancements to the Avista Decision
18 Support System (ADSS) system optimization software and the inclusion of pre-paid software
19 expenses as capital costs. Prior to making the decision to join the EIM, cost estimates related to
20 enhancements to the current ADSS application were approximately \$1.0 million and were included
21 as part of Avista's productivity business case, not EIM. These enhancements were intended to
22 expand the ADSS software to create intra-hour optimization runs and automated resource bidding.

⁴ The cost includes labor and labor loadings (primarily related to medical and retirement benefits).

1 As these enhancements were intended to maximize resource optimization prior to the decision to
2 join the EIM, they were deemed productivity related and were therefore not included in the original
3 EIM Charter estimate. Only those costs related to Utilicast support for ADSS enhancements, in
4 the amount of \$0.4 million were included in the original cost estimates.

5 However, after selecting the full suite of new market applications and working with the
6 vendors on specific design requirements, it was determined that additional ADSS requirements
7 and enhancements were deemed required in order to support EIM market operations and facilitate
8 data interchange between the different applications. Due to this change in scope, all costs
9 associated with the ADSS enhancements were assigned to the EIM integration project, resulting
10 in an increase in system EIM capital cost estimates by \$3.0 million (original \$1.0 million plus
11 additional system enhancements for \$2.0 million), for a total revised estimate of \$3.4 million
12 including Utilicast support. After negotiating software costs with the EIM related software
13 vendors, the planned pre-paid software expenses were determined to be capital costs. Therefore
14 the \$1.0 million in pre-paid expense was included in capital spend.

15 Changes to the non-labor expense estimates include Utilicast support costs, updating
16 metering settings at locations that didn't require replacement, and annual maintenance costs for
17 new software applications. Utilicast expense costs are associated with collecting generation and
18 interchange data to complete required operational and maintenance data templates, system
19 modeling, supporting Avista process changes and providing market training. After completing
20 field assessments and preliminary designs it was determined that the meters at a few substation
21 interconnection sites could be reprogrammed instead of replaced. The costs associated with meter
22 reprogramming is considered expense not capital. The implementation of the EIM business
23 application systems and the associated annual support costs are driven by software vendors

1 changing how they license and deliver software solutions; an example includes moving from an
2 on-premise solution to a cloud-based solution hosted by the software vendor. In addition, software
3 vendors regularly increase the cost of on-going maintenance and support to accommodate the cost
4 of enhancing, fixing and supporting their products, and to align with market driven forces such as
5 annual consumer price index increases. To mitigate the risk of price escalation and attain cost
6 certainty, the Company engaged in aggressive negotiations with each vendor to reduce the non-
7 labor expense and secure pricing for five years after market go-live. Details about each software
8 solution can be found in the EIM Scope document.

9 **Q. Please provide a brief summary of the components contributing to the overall**
10 **O&M implementation and ongoing expense.**

11 A. The estimate for total implementation O&M expense is approximately \$5.4 million.
12 The primary components contributing to the O&M implementation expense are associated with
13 application procurement of approximately \$1.2 million, Utilicast EIM consultant integration
14 support costs associated with training, business process design and generation/interchange
15 modeling of approximately \$1.1 million, new and existing employee labor expense of
16 approximately \$1.8 million associated with business process development and change, NERC
17 operator certification, training, system modeling, and contract development, metering
18 reconfiguration at substations and generating plants of approximately \$0.4 million, CAISO
19 implementation fees of approximately \$0.3 million, and contingency funds of approximately \$0.4
20 million.

21 The primary components of O&M expense for on-going operations (post-implementation)
22 is related to labor (\$3.2 million) and software maintenance and support (\$0.7 million) with a total
23 estimated expense of \$3.9 million. Table No. 5 provides a summary of the total estimated

1 implementation and on-going expenses.

2 **Table No. 5 – Implementation and On-Going Expense Summary**

3 Implementation & On Going Expense (as of 08/2020)	Scope Estimates	
	4 <i>Implementation Expense</i>	5 <i>Ongoing Expense</i>
Labor	\$ 3,082,966	\$ 3,177,467
Non-Labor	\$ 2,328,060	\$ 729,633
Totals:	\$ 5,411,026	\$ 3,907,100

7 Incremental O&M Expense is currently being deferred in Idaho in accordance with AVU-
8 20-E-20-01, Order No. 34606. The Company currently estimates the incremental implementation
9 O&M costs to be approximately \$3.6 million (system). The difference between total estimated
10 O&M expense and incremental O&M expense is primarily related to labor costs associated with
11 existing employees and the software selection efforts. This deferral will end in March 2022 on the
12 EIM go-live date. The Company will seek recovery of these costs after the deferral ends. A
13 summary of the estimated incremental implementation and on-going expenses are provided in
14 Table No. 6.

15 **Table No. 6– Incremental Expense Summary**

16 EIM Program Incremental Implementation Expense (as of 08/2020)	
Labor	\$ 3,234,255
Non-Labor	\$ 374,625
Totals:	\$ 3,608,880

1

IV. EIM BENEFITS

2 **Q. Please describe the estimated benefits from joining the EIM.**

3 A. Avista contracted with Energy and Environmental Economics (E3)⁵ in the fall of
4 2017 to perform an EIM benefit analysis. E3 was chosen since they had previously conducted
5 multiple market benefit assessments for other EIM participants and had the best available system
6 model. This allowed Avista to compare results to the other utilities. The E3 assessment estimated
7 Avista could see a range of system annual benefits from \$2 million to \$12 million by participating
8 in the EIM. The E3 study is provided as Exhibit No. 8, Schedule 11.

9 There are four main study assumptions that drive the range of potential EIM benefits: (1)
10 the amount of flexible hydro Avista bids into the market, (2) the amount of transmission that is
11 made available for market transactions, (3) the amount of renewable generation that is integrated
12 into Avista's BAA, and (4) the data source of the estimated benefits of other EIM participants,
13 which was used for comparison purposes and a proxy for market price variations. E3 varied the
14 assumption of these critical drivers to create 24 different study scenarios. Avista analyzed the 24
15 different scenarios and anticipates EIM system annual benefits to be approximately \$5.8 million,
16 which is an average of four of the 24 benefit scenarios (scenarios 6, 12, 18, 24). These four
17 scenarios assume: Avista maximizes hydro bids into the market; has increased renewable
18 generation into the Avista resource mix, due to new carbon emission policies; uses an average of
19 low and high transmission made available to the market; and an average of EIM benefits based on
20 modeled and actual data to represent price variations.

⁵ Energy+Environmental Economics (or E3) is an energy consulting firm that helps utilities, regulators, policy makers, developers, and investors make strategic decisions as they implement new public policies, respond to technological advances, and address customers' shifting expectations.

1 There is a high likelihood that Avista could see benefits move closer to the upper end of
2 the study range (\$12 million system) based on the actual benefits that have been published for
3 existing EIM participants. Market price volatility experienced in 2018 significantly increased the
4 benefits of current EIM participants, compared to anticipated results from their E3 studies. Both
5 IPC and PGE achieved EIM benefits in 2018 as calculated by the CAISO that were over five times
6 their anticipated benefits determined by E3 studies. Avista's resource mix and transmission
7 connection to other EIM participants most closely matches IPC and PGE so Avista should
8 observed higher benefits during volatile market conditions. In 2019, CAISO also reported annual
9 benefits for IPC and PGE of \$28.2 million and \$42.9 million respectively, well above estimated
10 studied values.

11 There are other operational benefits associated with EIM participation that were not
12 quantified in the E3 study. Participation in the EIM will improve system visibility and reliability
13 through improved modeling and new real-time monitoring. EIM participants also experience
14 improved outage coordination, both internal and external. According to the 2020 CAISO second
15 quarter EIM benefit report, a utility's total flexible ramping requirement can be reduced by 47-
16 54% because of the load and generation diversity that exists across the larger EIM footprint.

17 That flexible ramping requirement reduction is shared among the EIM participants. The
18 CAISO also calculates a reduction in renewable curtailments and associated greenhouse gas
19 emission as a result of EIM participation. None of these additional benefits were given an
20 economic value in the E3 study. However, after entering the EIM, Avista's customers will see
21 some unquantified financial benefit from these operating efficiencies.

V. COST BENEFIT ANALYSIS

Q. Did Avista conduct an economic analysis to support joining the EIM?

3 A. Yes. Prior to deciding to join the EIM, Avista performed an initial economic
4 analysis to determine the system annual benefits required to breakeven over a ten-year operating
5 period based on initial estimated EIM implementation and on-going costs based on two scenarios.
6 The first scenario assumed integration costs of \$21.4 million and on-going costs of \$3.5 million
7 (original expected system project costs) and the second scenario assumed integration costs of \$26.7
8 million and on-going costs of \$4.0 million (expected system with contingency). In order to break
9 even in 10 years, assuming integration costs of \$21.4 million, Avista would need to achieve system
10 annual benefits of approximately \$5.0 million. Assuming integration costs of \$26.7 million, Avista
11 would need to achieve annual system benefits of approximately \$6.0 million. As previously
12 discussed, based on the E3 benefit analysis, Avista estimated conservative annual EIM benefits of
13 \$5.8 million (system). Therefore, Avista initially anticipated positive revenue from EIM
14 participation in less than 10 years and could achieve breakeven much sooner if observed market
15 benefits are closer to what IPC and PGE have experienced in 2018 and 2019.

16 As previously discussed, the integration and on-going estimates associated with EIM
17 operations were updated based on the preferred Human Resource Plan and the inclusion of all
18 costs associated with required EIM modifications to the ADSS program (previously budgeted in a
19 different capital business case). Avista performed an additional economic analysis with the new
20 costs estimates. Based on the new integration cost of \$32.1 million and on-going costs of \$3.9
21 million, an annual revenue of \$7.8 million is needed to breakeven after 10 years of market
22 operations. This is still well within the range of estimated benefits determined by E3 and quite a
23 bit less than CAISO reported benefits for IPC and PGE in 2018 and 2019. If Avista's actual EIM

1 system benefits are closer to the potential upper bound of \$12 million, as determined by E3 and
2 experienced by other similar situated EIM participating utilities, then Avista customers will see
3 positive revenue in a much shorter time period. The economic analysis did not consider other EIM
4 benefits such as reduced flexible ramping requirements, reliability and system visibility
5 enhancements, and reductions in greenhouse gases. The economic analyses conducted for both
6 the original and updated project cost estimates are provided in my workpapers accompanying this
7 filed case.

8

9 **VI. REQUESTED CAPITAL RATE RECOVERY**

10 **Q. Please provide a summary of the EIM capital projects included in this rate
11 filing?**

12 A. In order to prepare for EIM entry, Avista will need to implement a variety of EIM
13 software solutions, perform metering upgrades at a majority of its generation and substation
14 interconnection sites, install generation control systems and upgrade network communications.
15 When planning these capital investments, Avista partnered with Utilicast to leverage their market
16 knowledge and understand the implication of project scope decisions. The Company also sought
17 input from CAISO on market requirements. During the metering upgrade planning process,
18 multiple solutions were discussed for satisfying metering requirements with financial tradeoff
19 implications of reprogramming meters where possible, taking a metering correction factor or the
20 physical location of where a new meter should be installed within a substation, and the likelihood
21 that a generator will be bid into the EIM. During the EIM software procurement and planning
22 process, options for internal development, integrating multiple EIM software vendor solutions and
23 the option of choosing one main EIM software vendor to reduce integration risk was discussed and

1 evaluated prior to making a final selection.

2 After a year into the EIM integration effort and acquiring a better understanding of the
3 market requirements and how Avista planned to accommodate those requirements, Avista updated
4 its cost estimates in the October 2020 Program Scope document. The Scope Document reflected
5 \$24.1 million, with \$2.6 million planned in contingency, for a total estimated capital spend of
6 \$26.7 million. Of the \$24.1 million implementation capital, \$2.3 million was attributed to the
7 incremental EIM employees that will be hired to support implementation efforts and on-going
8 operations. The risk of not implementing the projects as planned in the Scope document, puts
9 Avista at risk for a delayed market entry and/or incurring unplanned market settlement charges
10 that may decrease Avista's EIM benefit or operational efficiency in the market. Avista
11 acknowledges the business operational shift the EIM has brought to participating utilities and made
12 project decisions based on the long-term involvement in the market and the best approach to
13 position Avista for operational success.

14 Table No. 7 below provides a summary of the EIM capital projects by business unit and
15 type of work with spend estimates by year. These estimates are representative of the Scope
16 document, with an estimated allocation of contingency across business units and the inclusion of
17 the estimated labor costs associated with the new EIM employees supporting EIM software testing
18 and completing parallel operations within the ET Hardware/Software project area. The costs
19 shown in 2019 and 2020 are actual spend and costs shown in 2021 and 2022 are estimates based
20 on the EIM Scope.

1 **Table No. 7 – EIM Capital Project Summary - Spend⁶**

EIM Project Area	Capital Budget Year				Totals
	2019	2020	2021	2022	
EIM Transmission Facilities Upgrade	\$ -	\$ 186,121	\$ 303,479		\$ 489,600
ET Network	\$ 322,855	\$ 1,181,526	\$ 736,619		\$ 2,241,000
ET Hardware/Software	\$ 348,589	\$ 3,685,971	\$ 6,726,093	\$ 5,601,847	\$ 16,362,500
EIM Low Side Metering Upgrades - Generation	\$ 43,949	\$ 907,084	\$ 64,767		\$ 1,015,800
EIM High Side Metering Upgrades - Generation	\$ 263,590	\$ 1,383,645	\$ 747,065		\$ 2,394,300
EIM Control Upgrades - Generation	\$ 437,178	\$ 789,440	\$ 688,882		\$ 1,915,500
Trans Substation Metering - EIM	\$ 16,462	\$ 590,144	\$ 462,094		\$ 1,068,700
Trans High Side Metering - EIM	\$ 77,636	\$ 641,263	\$ 496,501		\$ 1,215,400
System Ops SCADA Upgrades - EIM	\$ -	\$ -	\$ 274,500		\$ 274,500
EIM HR FTEs					\$ -
Contingency					\$ -
Other*	\$ -	\$ -	\$ -		\$ (285,336)
Totals	\$ 1,510,259	\$ 9,365,194	\$ 10,500,000	\$ 5,601,847	\$ 26,691,964

8 Additional detail of the EIM capital projects are included in the EIM Capital Business Case
9 provided as Exhibit No. 8, Schedule 12.

10 **Q. Please describe the EIM Transmission Facilities Upgrade project.**

11 A. To prepare for EIM operations, Transmission System Operations needed to install
12 a new EIM Operator workstation, along with the associated hardware, for the new 24x7 EIM
13 Operations desk at both the main control center and the backup control center. Based on the EIM
14 Scope estimate, including contingency, Avista planned for two workstation projects with a capital
15 estimate of \$0.5 million.

16 **Q. Please describe the ET Network projects.**

17 A. To ensure the reliable data transmission of 5-minute interval meter data for EIM
18 settlements, network improvement projects were needed at substation interconnection locations
19 and generation sites. Avista's pre-EIM network capabilities consisted of various network
20 protocols, including dial up communications and the use of SCADA and Plant Information (PI)

⁶ Amounts in Table No. 7 above are based on capital addition spend as described in the EIM Scope document, as of the filing of this case. See also Table No. 2 above. As noted below, the timing by year and total amounts vary from Table No. 8 below, as that table reflects transfer-to-plant data, as well as estimated transfer-to-plant amounts available at time of completion of the Company's revenue requirement in this case.

1 averages, along with manual processes, to collect data for hourly reconciliation. These processes
2 and the associated data were not scalable or reliable for accurate 5-minute interval EIM metering
3 and settlements. To address this, Avista planned the following type of network upgrades: install
4 Internet Provider (IP) communications through a Network Service Provider (NSP), install IP
5 communications through a wireless cellular option, or increase Avista network capacity at
6 locations where IP connectivity already existed. Based on the EIM Scope estimate, including
7 contingency, Avista planned for approximately 33 network improvement projects across
8 generation and substation interconnection sites with a capital estimate of \$2.2 million.

9 **Q. Please describe the ET Hardware/Software projects.**

10 A. In order to operate in the CAISO EIM, multiple software applications were needed
11 to process 5-minute operational data, comply with the market operating deadlines and satisfy the
12 market requirements needed for successful EIM operations. For Avista, this meant the
13 procurement and installation of nine major software systems, including:

- 14 • **Generation Outage Management System (GOMS)** – Performs functions to submit
15 planned and unplanned outages to CAISO for all generation units.
- 16 • **Transmission Outage Management System (TOMS)** – Performs functions to submit
17 planned and unplanned outages to CAISO for transmission lines.
- 18 • **Participating Resource Bidding & Scheduling System (PRSC)** – Performs functions
19 to allow Merchant department to submit bids and base schedules to CAISO for
20 participating resources.
- 21 • **EIM Entity Scheduling System (EESC)** – Performs functions to allow the EIM Entity
22 (Balancing Authority) to submit base schedules for both participating resources and
23 non-participating resources.
- 24 • **Energy Accounting System** – Performs meter verification, estimation and editing
25 (VEE) for generation and interchange meters to produce and share Settlement Quality
26 Meter Data (SQMD) with CAISO.

- **PRSC Settlement System** – Performs Merchant settlement functions for the participating resources and activities.
- **EESC Settlement System** – Performs EIM Entity settlement functions for non-participating resources and transmission purchases.
- **Performance & Analytics System** – Performs near real-time market analysis and monitoring functions to evaluate market performance.
- **Meter Head-End System** – Collects interval meter data from generation and substation interconnection meters for market submission and settlements.

In addition to these purchased software applications, Avista also planned to enhance the Avista Decision Support System (ADSS) – Avista’s in-house bidding and optimization application – for EIM operations. These enhancements were intended to expand the ADSS software to create intra-hour optimization runs and automated resource bidding, along with required integrations with the OMS, PRSC and EESC.

Based on the Scope estimates, contingency and new labor, Avista planned for the major projects listed above, as well as other software and hardware projects, with a capital estimate of \$16.4 million.

Q. Please describe the EIM Low Side Metering Upgrades for Generation.

A. To meet the CASIO requirement of revenue quality metering and the reliable collection of 5-minute interval meter data for EIM settlements, metering improvement projects were needed at some generation sites. Avista’s metering improvement decision was also influenced by the planned resource participation strategy employed at each generation site. Low-side meter (LSM) projects planned to install SEL-735 meters at the plant-side of the Generator Step Up (GSU) transformer in accordance with Avista’s most current *SEL-735 Combined (interchange and generation) Meter Setting Standard*. LSM meters validate market resource configurations and related metering components in alignment with the physical characteristics and

1 the EIM participation level at generating unit or station service. When an LSM is installed, revenue
2 class Current Transformers (CTs)/Potential Transformers (PTs) are added or existing non-revenue
3 class CTs/PTs are utilized with an appropriate compensation factor applied. LSM projects involve
4 SCADA and network communication improvements, as well as configuration in the head-end
5 meter collection system (MV-90). Based on the EIM Scope estimates, including contingency,
6 Avista planned for three LSM capital projects at an estimate of \$1.0 million.

7 **Q. Please describe the EIM High Side Metering Upgrades for Generation.**

8 A. To meet the CAISO requirement of revenue quality metering and the reliable
9 collection of 5-minute interval meter data for EIM settlements, metering improvement projects
10 were needed at some generation sites. Avista's metering improvement decision was also
11 influenced by the planned resource participation strategy employed at each generation site. High-
12 side meter (HSM) projects planned to install SEL-735 meters on the substation-side of the GSU in
13 accordance with Avista's most current *SEL-735 Combined Meter Setting Standard*. These meters
14 validate market resource configurations, and related metering components in alignment with the
15 physical characteristics and EIM participation level of all generation units feeding the metered
16 GSU and station service. When an HSM is installed at a participating resource, revenue class
17 CTs/PTs are often installed as part of the project since existing CTs/PTs do not have the required
18 accuracy to meet CAISO standards. HSM projects involve SCADA and network communication
19 improvements, as well as configuration in the head-end meter collection system (MV-90). Based
20 on the EIM Scope estimates, including contingency Avista planned for seven HSM projects with
21 a capital estimate of \$2.4 million.

22 **Q. Please describe the EIM Control Upgrades for Generation.**

23 A. To meet CAISO requirements for market dispatch, some generation sites required

1 Programmable Logic Control (PLC) additions and/or other plant control changes to participate in
2 the market and follow market dispatch signals. The decision to conduct PLC projects were
3 influenced by Avista's resource participation strategy and existing control equipment capability at
4 market participating resource sites. The EIM PLC projects planned to install a PLC system to act
5 as an interface point between Avista's Supervisory Control and Data Acquisition (SCADA)
6 system, plant high-side meters, low-side meters and plant unit controllers. The PLC receives plant
7 MW set points from SCADA, from Avista plant operators or the EIM, and delivers the unit MW
8 set point to the existing plant PLC. It also receives HSM, unit, and station service inputs, as well
9 as meter position switch inputs and other plant operating parameters. Based on the EIM Scope
10 estimates, including contingency, Avista planned for two PLC projects with a capital estimate of
11 \$1.9 million.

12 **Q. Please describe the Transmission Substation and Transmission High Side**
13 **Metering projects for EIM.**

14 A. To meet the CASIO requirement of revenue quality metering and the reliable
15 collection of 5-minute interval meter data for EIM settlements, metering improvement projects
16 were needed at some substation interconnection sites and third-party generation sites. The Scope
17 document estimates represented this work in terms of meter reprogramming (expense costs) and
18 meter replacement (capital costs). Through the planning process, it was determined if a meter
19 replacement should occur on the distribution voltage side or the transmission voltage side of the
20 substation transformer. Transmission Substation Metering projects planned to install SEL-735
21 meters on the distribution voltage side of the substation transformer, while Transmission High
22 Side Metering projects planned to install SEL-735 meters on the transmission voltage side of the

1 substation transformer – both in accordance with Avista’s most current *SEL-735 Combined Meter*
2 *Setting Standard.*

3 These new meters integrate with the MV-90 billing recorders and provide EIM
4 information to the SCADA and Generation Distributed Network Protocol Maps. In some cases,
5 accompanying integration equipment was also required, such as a Remote Terminal Unit, GPS
6 clock, security appliances, and/or an Ethernet switch. Based on the EIM Scope estimates,
7 including contingency, Avista planned for nine Substation Metering projects at an estimated cost
8 of \$1.1 million and 13 Transmission High Side Metering projects at an estimated cost of \$1.2
9 million.

10 **Q. Please describe the System Ops SCADA Upgrades for EIM.**

11 A. In order to receive market dispatch signals from CAISO’s Automated Dispatch
12 System (ADS), Avista needed to procure an add-on dispatch module from General Electric (GE)
13 – its current SCADA software provider. The CAISO ADS provides the market Dispatch Operating
14 Targets (DOTs) which the EIM entity uses to control its generation plants. Resources registered
15 as participating market resources and awarded a market dispatch will be sent operating targets
16 from ADS through this add-on dispatch module, and plant control systems will follow the dispatch
17 targets to achieve the targeted energy output. Based on the EIM Scope estimates, including
18 contingency, Avista planned for one SCADA dispatch project with a capital estimate of \$0.3
19 million.

20 The final row in Table No. 7 above labeled “Other” reflects a reduction in overall project
21 scope changes of \$285,000 that occurred after the completion of the pro forma adjustments
22 included in the Company’s revenue requirement in this case. This scope change, as well as the net

1 plant included in the Company's case will be updated during the pendency of the case, along with
2 actual information that becomes available.

3 **Q. What EIM capital investment is the Company seeking recovery for in this rate
4 filing?**

5 A. Table No. 8 below provides by project the system pro formed plant additions
6 transferred to plant during 2020 and 2022 included in the Company's filing.

7 **Table No. 8 – Pro Forma Capital Investment – System⁷**

EIM Project Area	Budget Year				Totals
	2020	2021	2022		
EIM Transmission Facilities Upgrade	\$ 199,700	\$ 289,900	\$ -	\$ 489,600	
ET Network	\$ 819,400	\$ 1,421,600	\$ -	\$ 2,241,000	
ET Hardware/Software	\$ 449,200	\$ 4,146,300	\$ 11,767,000	\$ 16,362,500	
EIM Low Side Metering Upgrades - Generation	\$ 392,800	\$ 623,000	\$ -	\$ 1,015,800	
EIM High Side Metering Upgrades - Generation	\$ 1,197,400	\$ 1,196,900	\$ -	\$ 2,394,300	
EIM Control Upgrades - Generation	\$ -	\$ 1,915,500	\$ -	\$ 1,915,500	
Trans Substation Metering -EIM	\$ 422,500	\$ 646,200	\$ -	\$ 1,068,700	
Trans High Side Metering -EIM	\$ 152,600	\$ 1,062,800	\$ -	\$ 1,215,400	
System Ops SCADA Upgrades - EIM	\$ -	\$ 274,500	\$ -	\$ 274,500	
Total	\$ 3,633,600	\$ 11,576,700	\$ 11,767,000	\$ 26,977,300	

14 As shown in the workpapers supported by Company witness Ms. Schultz, the Company
15 has pro formed gross plant additions of approximately of \$8.4 million (Idaho-share) in this case
16 for the period between January 2020 through March 2022 (project completion) on an average-
17 monthly-average basis, through the end of the rate-effective period ending August 31, 2023.

18 As discussed by Ms. Andrews, the net plant investment included over the Company's Two-
19 Year Rate Plan, totals approximately \$6.4 million (Idaho-share)⁸, or \$5.6 million Rate Year 1, and

⁷ As noted above, the total amount in Table No. 8 varies from Table No.7 and Table No. 2 above. As noted in Table No. 7, there was a \$285,000 overall reduction in the updated EIM Scope estimate for capital additions after completion of the Company's revenue requirement. Scope document updates were approved by the EIM Executive Steering Committee post-filing. Updates for this current information, as well as actual transfer to plant data as available, will be updated during the pendency of the case.

⁸ Net plant investment is net of accumulated depreciation and accumulated deferred federal income tax, on an AMA basis through the rate effective period ending August 31, 2023. See Ms. Schultz workpapers.

1 \$0.8 million Rate Year 2. Depreciation expense associated with this pro forma investment has
2 also been included, resulting in an overall revenue requirement requested in this case of
3 approximately \$1.8 million, or \$1.3 million in Rate Year 1 and \$0.5 million in Rate Year 2.

4 **Q. Does this conclude your direct testimony?**

5 A. Yes.