BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

In the Matter of the Petition of	)	DOCKET NO. UE-17_____
	)	
Avista Corporation, dba Avista Utilities	)	PETITION OF AVISTA
Requesting Authorization for Electric	)	CORPORATION
Research and Development (R&D)	)	
Funding Pilot Through Tariff Schedule 88	)	

I. INTRODUCTION

1 Avista Corporation, doing business as Avista Utilities ("Avista or "Company"), requests an order from the Commission authorizing a three-year pilot program that would support electric power system research and development (R&D). The pilot program, would be implemented through Washington's four-year Universities, the Pacific Northwest National Laboratory (PNNL), private industry and Avista and funded through a new electric tariff. The main objective of the proposed R&D tariff is to provide a consistent base of funding that would allow regional research partners to design and sustain quality research programs that can be applied to benefit Avista's electric customers. Applied R&D refers to projects intended to yield benefits to customers within one to four years of project launch.

2 This petition is consistent with Washington Governor Jay Inslee's Executive Order 14-04 "Washington Carbon Pollution Reduction and Clean Energy Action" in which a new state program has been proposed to assist research institutions, utilities and businesses that would develop, demonstrate, and deploy new renewable energy and energy efficiency technologies.[1]

[1] http://www.governor.wa.gov/sites/default/files/exe_order/eo_14-04.pdf

3 The Company is proposing an annual funding level of $1.2 million (0.2% of base electric retail revenue) which would be collected from Washington electric customers through a new electric tariff Schedule 88, "Research and Development Funding – Washington." As proposed, the tariff would allow Avista to recover R&D costs through Schedule 88 pursuant to the terms included in this Petition. Avista proposes to initiate an applied R&D pilot program with universities in the state of Washington and PNNL to evaluate value added product and services for Avista customers. Due to the proliferation of Distributed Energy Resources (DER) in adjacent utility service areas, utility business and regulatory models are evolving in an effort to provide more customer energy choices. In response to customer expectation, Avista has initiated several internal initiatives to identify a strategic road-map towards the future utility business model. GridEdge3 is the most recent internal initiative which consisted of a three-week dedicated education of the utility business model, as well as comprised of a cross disciplined team.

4 In this initiative, the Avista GridEdge3 team researched and evaluated how DER's may influence the existing utility business and regulatory model. During this process, the GridEdge3 team held multiple interviews with national and regional experts to obtain insight on the technical and economic impact of DER's. The GridEdge3 goal was to develop a roadmap which identified existing and new initiatives which would develop a strategy to integrate DER's on the grid, as well as provide a suite of new product and services for our customers. The GrideEdge3 roadmap identified three iconic mileposts which would help Avista to navigate this uncertain landscape. The iconic mileposts were developed with a focus on the customer expectations and are called: 1) Customer Choice; 2) Local Choice; and 3) Peer to Peer Choice. Each of these mileposts represent a natural progression to provide a more participatory utility business model for our customers.

5 As a part of this strategy and through this filing, Avista would leverage the intellectual talents of the Washington Universities and National Labs to assist in the development of tools,

experimentation and valuations necessary to fill in the economic and technological gaps existing along this strategic roadmap. The proposed R&D pilot tariff will focus on how DER's and energy conservation can derive customer value. Also, the proposed R&D tariff will foster projects which align with the five key influences to the future utility business model 1) Regulatory Actions; 2) Resource Flexibility; 3) Technology Advancement; 4) DER Markets; and 5) Cost Effectiveness.

6 This Petition consists of:

- A description of the need for this program;
- How applied research translates into customer value;
- The funding of the program; and
- Program governance and reporting.

II. PETITIONER

7 In accordance with WAC 480-07-395, the name and address of Petitioner is Avista Corporation, doing business as Avista Utilities (hereinafter "Avista" or "Company"), at 1411 East Mission Avenue, Spokane, Washington. Please direct all correspondence related to this Petition as follows:

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III. BACKGROUND

8 The electric transmission and distribution systems in the United States are at a historic crossroad not likely experienced since the 1920's. The nation's utilities are once again defining a path forward following the expected restructuring of the 1990's and the power market crises of the new century. Today, there is a tremendous need for new capital investment to replace aging infrastructure and to respond to challenges and opportunities resulting from technology advancements, increased distributed generation, and changing customer energy use and service expectations.

9 Avista's future investment in new infrastructure should consider how the utility will manage distributed generation and changes in customer energy usage to ensure that investment today meets the operational requirements of tomorrow. Applied research projects focused on these areas would strive to improve utility grid reliability, utilization, and efficiency.

10 In recent years Avista's electric R&D funding has consisted of payments to three primary organizations: the Electric Power Research Institute (EPRI), E-Source, and the Northwest Energy Efficiency Alliance (NEEA). Avista's current annual funding for R&D for these three organizations is $406,107, or $1.68 per customer, per year for our Washington electric jurisdiction, or 0.07% of retail revenues (less than one-tenth of one percent). [2]

11 As part of the Company's Schedule 91, "Energy Efficiency Rider Adjustment" tariff in Idaho, $300,000 of customer revenue is allocated each year to R&D focused on electric energy efficiency. This program's energy efficiency projects are proposed and implemented by the state of Idaho's four-year universities.

[2] $406,107 divided by 241,207 Washington electric customers.

12 Avista's Research and Development (R&D) program with the Idaho Public Utilities Commission was initiated during the 2014 and 2015 academic calendar. The R&D program reviewed proposals from the state of Idaho's leading research institutions in the area of energy efficiency, power systems and distributed energy resources. The proposals submitted by the Universities are evaluated across a cross disciplined team of engineers and program managers against a scoring matrix. Each successful proposal is assigned to a technical lead engineer to sponsor and mentor the research initiative. At the completion of the research effort, the research team presents their findings to a steering committee to obtain shared learning, research vectors and product solutions.

13 To date, fifteen R&D projects have been awarded to either University of Idaho or Boise State University. Boise State University research proposals include advance energy efficiency studies. Boise State proposals have included advance energy efficiency simulations as well as development of distribution equipment to support conservation voltage reduction. The University of Idaho's proposals awarded have focused on the utilization of simulation methods to emulate operational micro-grids, high penetration of Distributed Energy Resources and hosting capacity distribution planning.

14 While the Company's proposal for Washington is distinct (from Idaho) in its funding and focus, the R&D findings from each jurisdiction may be shared to better inform and develop Avista's engineering and technical staff.

15 In June 2015, the Oregon Public Utility Commission approved Portland General Electric's (PGE) request to fund its R&D proposal up to $2 million annually. This funding level indicates a two-fold increase in PGE's recorded R&D investment for 2011. Their main emphasis is related to renewable energy, energy efficiency, electric vehicle transportation infrastructure and smart grid applications. PGE's increased focus on R&D is indicative of regional utilities', and other

stakeholders', commitment to providing customer value through investing in more reliable and sustainable electric power systems.[3]

16 Avista acknowledges that national electric utility organizations, such as EPRI, that promote R&D for electric power systems can be impactful, but we believe there are limitations to what may be accomplished through participation in broad applications alone. Solutions developed at a national level may not be directly applicable to Avista's future electric power system needs. Further, these solutions are often not 'off-the-shelf applicable' because they cannot be fully developed or tailored to the system configuration and operating schemes of a local utility.

17 Local and regional R&D programs can provide for the identification and attainment of highly focused research and evaluation that maximize benefits for utilities' unique attributes, and additionally provide the opportunity to enhance university programs in the region related to the energy field. Combining appropriate industry wide R&D efforts with more focused, local research can prepare Avista for the future grid while enhancing educational and training opportunities for employees and university student development.

18 Over the past five years Washington State University, PNNL and Avista have successfully collaborated on a variety of projects. The first was funded through the American Reinvestment and Recovery Act (ARRA), which, as a part of the Pullman, Washington Smart Grid Demonstration Project, integrated Smart Grid technologies, demand response controls, customer experience programs, and regional value signals. The same team partnered on a Washington Department of Commerce Grant to install a UniEnergy Technologies (UET) one megawatt Vanadium Flow Battery on an Avista distribution circuit. UET is a Vanadium Flow Battery

[3] Portland General Electric: Docket No. UE-262
https://www.portlandgeneral.com/our_company/corporate_info/regulatory_documents/filings/docketed_filings/UE-262/docs/UE_262_Exhibit_1000.pdf

manufacturing company located in Kirkland, Washington and markets a product derived through PNNL research. Through continued partnerships with Washington's Universities, PNNL, and private industry, Avista would be better prepared to respond proactively to the dynamic changes of the grid. Future projects would be guided by Avista's GridEdge3 road map to align technology solutions with business objectives to better serve customers.

IV. CUSTOMER VALUE

19 The following research categories are provided to illustrate opportunities to enhance customer value as Avista transforms its role to further accommodate distributed generation, and other products and services to assist customers in managing their energy usage and future energy-related expectations. Avista recognizes a delicate balance exists between providing an economical, reliable and efficient electric grid with the delivery of new energy product and services to meet customer demands. However, Avista is experiencing rapidly changing customer expectations due to the influence of social media, online shopping and sharing economy. In light of these expectations, consumers want to have more influence in how they select and participate in their energy choices. Today, Avista is observing entrepreneur's startup companies which are actively disintermediating utility customers by offering energy choice options.

20 The utility regulatory model is specifically designed to provide transparency, fairness and cost control for their regulated utility customer. Historically, the regulatory cost allocation model has been achieved by the development of rate schedules which distribute the fixed and variable costs across customer classes like commercial, industrial and residential. Today, this rate model does not align with the expectation customers have to choose their energy mix or to self-supply there load. Avista is pursuing a deliberate but judicious path to meet customer expectation by doing the hard work to design and evaluate a variety of energy alternative products and services for our

customers. By working with the research institutions in Washington, we can ensure appropriate level of experimentation can be performed to protect the fair allocation of cost, the economic valuation, and efficient and reliable grid for Avista customers. The type of projects currently identified which would benefit by R&D investment are summarized below.

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Distributed Energy Resources - Avista is positioned to advance the adoption of distributed generation assets (e.g., solar and wind) located at the customer's premise. By recognizing the customer's interest in distributed generation assets, Avista can develop projects that serve that interest as well as ensure the integrity of its distribution system. By partnering with universities, National Labs, and private industry Avista can assemble projects which would combine demand response, storage, and distributed generation into a customer-focused platform. These projects can identify the technology and regulatory gaps that may impede programs that benefit Avista and our customers.

Real Time Control and Monitoring - The deployment of smart devices and the expansion of sensor technology provide an unprecedented opportunity to integrate system visibility with operational awareness. As sensor data becomes more prevalent, the translation of data to actionable information would enable Avista to respond to events more effectively and improve system reliability. For example, smart transformers can combine real time loading data with manufacturers' specifications to determine the useful life of the transformer and proactive replacement programs and synchrophasors can help operators operate the grid more reliably and efficiently by providing instantaneous voltage, current, and frequency measurements at specific system locations. R&D projects targeted at bridging the gap between "big data" and operational control centers, provide opportunities to optimize system performance, and improve system reliability for customers.

Data Mining and Analytics - Data mining and statistically driven techniques can uncover useful trends and correlations. Model-based approaches have the potential to uncover useful customer characteristics through analytical methods. Analytics allow overlays of dissimilar data to uncover consumption and behavior insights. For example, voltage may sag and provide a low voltage alarm back to Avista's operational center. By combining customer data with operational characteristics Avista could verify that, for example, city sewer pumping lift stations are impacting system voltage. By knowing the low voltage alarm is due to city lift stations, then a program can be developed to analyze a lift station's operating schedule. Analytics, if designed correctly, can improve the efficiency of responding to power quality problems that may adversely affect customers.

Planning and Operational Tools - One of the main challenges associated with forecasting the operational characteristics of tomorrow's electric grid is the product immaturity of planning and operational tools. Traditional planning and operational models forecast load growth based on historical data and market trends. These same planning models provide little historical trend data to forecast distributed generation penetration rates. Therefore, research opportunities are

available to enhance the planning and design toolsets to model distributed energy assets on the grid. Improved planning tools would allow Avista to better account for power quality and capacity requirements that are becoming critically important to customers that rely on distributed electric generation systems.

Demonstrated Value – Avista leveraged ARRA funded projects to deliver over 42,000 MWh of distribution energy efficiency via integrated volt/var control (IVVC) and conservation voltage reduction (CVR), as well as nearly 1 million customer avoided outage minutes using fault detection isolation and restoration (FDIR) annually. The success of those projects has led to new standards and modes of operation as Avista modernizes its grid. In the absence of this R&D funding, the pace of accomplishment would be much slower. With R&D funding, not only is the pace of innovation and accomplishment much quicker, the foundational capabilities enable grid and customer opportunities to be realized.

V. FUNDING

In the 1990s, with the prospect of electric deregulation and direct retail access, utilities reduced or eliminated capital budgets to become more competitive with third-party marketers for sales of power to end-use customers. R&D funding was negatively impacted by utilities' focus on capital cost reductions. This contributed to the utility industry having the lowest level of R&D investment, as a percentage of revenue, among all U.S. industries. Today, the utility industry's R&D funding as a percentage of revenue is 0.1% as compared with the overall U.S. industry average of 3.5%.[4] Another measure of utilities' R&D investment levels is the R&D and demonstration project expenditures reported by U.S. investor-owned, local distribution companies. A summary report compiled by the U.S. Energy Information Administration shows more than 100 U.S. local distribution utilities reported R&D and demonstration project spending in 2013 that totaled just over $389 million. On a per-customer basis this was equal to annual funding of $5.51 per customer.[5]

[4] National Science Foundation. Appendix Table 4-14 "Company and other (nonfederal) R&D fund share of net sales in R&D-performing companies, by industry and company size: 2003-2007" This is the most recent available data.
[5] U.S. investor owned utilities 2013 R&D expenditures of $389,714,577 divided by 70,685,518 customers equals $5.51 per customer.

23 Avista's proposal to dedicate up to $1.2 million per year to fund applied R&D represents 0.2% of Avista's current annual Washington electric retail revenue of approximately $500 million. Avista's proposed annual electric R&D funding of $1.2 million would equal $4.97 per customer.[6] The reference "up to" means the full amount may not be spent every year. Only those R&D projects that are screened and approved would be funded. Any unspent funds would be accounted for as referenced in the "Reporting" section below.

24 Avista proposes funding from all Washington electric customer rate classes through tariff Schedule 88. Avista proposes that collection of funds through the tariff begin on January 15, 2018. The request for project proposals would be submitted in the summer of 2018. Collection of funds in 2018 will allow projects to commence with the start of academic year in August and September. A breakdown of the proposed funding from each customer class is provided in the table below, and additional details are provided in the accompanying work papers.

Proposed R&D funding by electric customer rate class:

Retail Revenue	Residential Schedule 1	General Service Schedules 11 & 12	Large General Service Schedules 21 & 22	Extra Large General Service Schedule 25	Pumping Schedules 30, 31 & 32	Street and Area Lighting Schedules 41-49	Total
Percentage of Revenue	43.70%	14.16%	26.04%	12.56%	2.14%	1.40%	100%
Proposed R&D Funding	$524,355	$169,892	$312,531	$150,692	$25,733	$16,798	$1,200,000

[6] Based on a $1,200,000 annual R&D funding level divided by 241,207 Washington electric customers.

VI. GOVERNANCE

25 Avista recognizes that a well-directed R&D program would be required to successfully achieve the program's objectives. The Company proposes to appoint a program manager who will be responsible for program oversight, including research goals and objectives, financial budgeting and program reporting. The program manager will organize a R&D Working Group made up of cross-disciplined engineers and subject matter experts from Avista's Electric Generation, Electric Transmission and Distribution Planning, Electric Operations, Customer Solutions, and Rates departments. This Working Group would be responsible for the development of technology and program road maps, and assessing the appropriate application of R&D outcomes. This program approach is currently being utilized by Bonneville Power Administration and is a process that is documented in "Research and Technology Management in the Electricity Industry"[7] The R&D Working Group will also develop a schedule that details all program milestones and deliverables.

26 The Working Group plus at least two additional third-party research advisors would be responsible for research proposal evaluations and selections. The third-party research advisors shall be unaffiliated with any project submitting institution or Avista Corporation and its subsidiaries.

27 The program manager will report to a steering committee of Avista leaders who serve at a Director or Executive level. The Steering Committee would provide oversight and will be responsible for approving research and financial recommendations made by the program manager and R&D Working Group.

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[7] "One key to BPA's success is making a firm connection with the business and technology challenges facing the utility industry. Technology roadmaps capture the logic and business framework for research and development..." http://www.bpa.gov/Doing%20Business/TechnologyInnovation/Pages/default.aspx

28 The Avista R&D program would combine the intellectual talents of Washington's state universities, PNNL, private industry and Avista's engineering resources. Avista's R&D program will direct resources in the following research categories: 1) Applied Research, 2) Demonstration Programs, and 3) Utility Research Development & Demonstration Initiatives.

29 The Applied Research category will consist of requests for proposals from Washington State's universities to submit research projects that align with the program and technology roadmaps developed by the R&D Working Group. The proposals will be ranked and selected by the R&D Working Group with a recommendation made to the R&D Steering Committee. The applied research program will align with the academic calendar, and a report would be submitted to the R&D Working Group summarizing the research accomplishments.

30 The Demonstration Programs category would review various state and federal funding opportunities for demonstration projects which align with the R&D Working Group's program and technology roadmaps. The Demonstration Programs typically require partnering with Washington State's universities, PNNL and private industry to develop a competitive project on a regional or national scale. The Demonstration Programs provide a unique opportunity to pilot leading edge ideas within the context of an operational power system.

31 The Utility Research Development & Demonstration Initiatives category is derived from Avista's internal project requests. The R&D Working Group will coordinate with departments and teams across the Company to identify innovative projects which align with the group's program and technology roadmaps focused on enhancing customer value. The R&D Working group will create criteria that guide project qualification and approval and will receive regular summary reports on each of the program initiatives.

32 The R&D program manager will be responsible to administer the research categories under the governance of the R&D Working Group and R&D Steering Committee. In addition, the

program manager will be responsible to report outcomes to Avista's Executive leaders. In light of the external challenges with the modern grid, Avista's R&D program will combine applied research, demonstration programs and utility research development and demonstration initiatives to manage ambiguity, risk and to ensure solutions drive towards customer value.

33 Avista proposes to organize its R&D Working Group and program manager according to the integrated process of Road Mapping, Portfolio Management, and Project Management. The integrated process aligns research initiatives with business challenges and balances a portfolio of research projects by feasibility versus value. Also, the integrated process manages the evaluations of individual projects by stage gate methodology to determine the life-cycle of the project. Each research project's product or methodologies are continuously evaluated to determine if they meet the business criteria for commercialization. These projects would combine resources at Washington universities, PNNL, private industry, and Avista to identify, evaluate, and adopt projects intended to build a broader base of customer value. Any intellectual property developed from the R&D program will be retained in accordance to the contracts with the research institutions.

VII. REPORTING

34 Avista proposes to file with the Commission, on or before September 1 of each year, a report for the preceding calendar year. This report would include key events during the reporting period and the accounting for related revenues and expenditures. The key events would include, at a minimum:

- the process Avista followed for selection of projects (e.g., request for proposals) including the Avista staff (e.g., working group) involved;
- description of the selected project(s) for funding;
- agreement between Avista and its R&D program partners, including intellectual property, publication rights and associated issues (similar to Avista's existing research agreements with universities);

- project milestones and related stage-gates;
- summary of research in-progress and anticipated completion milestones (for other than first-year projects) pursuant to contractual agreements and project manager's administration; and
- other information, as appropriate, to ensure the Commission is apprised of relevant activity.

Reporting on accounting would include:

- funds authorized per R&D project;
- funds expended per R&D project;
- funds collected during the reporting period;
- balance in the fund to carry forward for application to project costs in the following year.

VIII. CUSTOMER NOTIFICATION

35 Notice to the public of the proposed tariff, pursuant to WAC 480-100-194 is provided as Attachment B and given simultaneously with the filing of this Application by posting a notice to the Company's website at www.avistautilities.com.

IX. REQUEST

36 Avista requests authorization from the Commission to fund R&D up to $1.2 million per year from revenue collected through tariff Schedule 88, "Research and Development Funding – Washington" effective on January 15, 2018.

DATED at Spokane, Washington, this 8th day of November 2017

AVISTA CORPORATION

By: _____
Patrick D. Ehrbar
Director, Avista Corp.

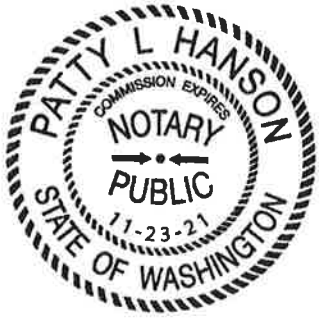
VERIFICATION

STATE OF WASHINGTON)
)
County of Spokane)

Patrick D. Ehrbar, being first duly sworn on oath, deposes and says: That he is a Director of Avista Corporation and makes this verification for and on behalf of said corporation, being thereto duly authorized;

That he has read the foregoing Petition, knows the contents thereof, and believes the same to be true.

SIGNED AND SWORN to before me on this 8 day of November 2017



NOTARY PUBLIC in and for the State of Washington, residing at Spokane.

Commission Expires: 11/23/2021