BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

Docket No. UM 2032

In the matter of

PUBLIC UTILITY COMMISSION OF OREGON,

Investigation into the Treatment of Network Upgrade Costs for Qualifying Facilities

RESPONSE TESTIMONY OF BRIAN S. RAHMAN

October 30, 2020

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Brian S. Rahman. I am the Executive Director of Engineering at ZGlobal Inc. My business address is 604 Sutter Street, Suite 250, Folsom, California 95630.

Q. Please describe your background and experience.

A. I am an electric power professional with a 30-year career which has focused on extensively on interconnection and transmission, including planning, design, power flow analysis, transmission system capacity analysis, power scheduling and trading, and extensive related policy, market, regulatory, and technical matters. I have held a wide variety of roles during that time, as a utility professional, employee of California Independent System Operator, and as an employee of one of the leading engineering and technical firms in California, ZGlobal, where my work has ranged from technical engineering studies to development support, to managing and working with a group of leading engineers and policy experts related to interconnection and transmission, many of which are former CAISO and/or utility interconnection and transmission professionals, working for a broad range of clients on projects of all sizes, in numerous states and utility service areas and transmission and distribution systems. I have also worked as an expert witness on multiple occasions (see below), including on behalf of the CAISO in a legal dispute. My full resume is attached as NewSun/101. I have a Bachelor of Science Degree in Electrical Engineering from Washington State University and am a Registered Professional Engineer in the State of California, PE License number 14914. I have been with ZGlobal since October 2006. Prior to this was employed by the California Independent System Operator for 9 years where I held various staff and management positions including Manager of Market Operations and Director of the Project Management Office. I began my career at Pacific Gas and Electric in 1991 where I worked as a staff level engineer in the bulk transmission operations group, hydro-electric generation, and distribution planning.

Over the past 15 years with ZGlobal I have worked on hundreds of large and small generator interconnections across the Western United States including projects in Oregon, Washington, Montana, Nevada, Arizona, California, Utah, and New Mexico. These projects have ranged in size from 2 MW to 3,200 MW and include an array of technologies and system impacts. Additionally, I have worked on many transmission service requests (TSRs), both Network and Energy Resources, including those within Imperial Irrigation District, Nevada Energy, LA Department of Water and Power, Bonneville Power Administration, Public Service Company of New Mexico.

Q. On whose behalf are you appearing in this proceeding?

A. I am testifying on behalf of NewSun Energy LLC.

Q. Have you previously provided testimony in any state or federal regulatory dockets or court cases?

A. During the past 4 years I have participated as an expert witness in the following proceedings: (1)*Tesoro Refining and Marketing Company LLS v. Pacific Gas & Electric Company* (Case No. 14 CIV 00930 (JCS)) in the United States District Court, Northern District of California; (2) *Imperial Irrigation District v. California Independent System Operator Corporation* (Case No. 3:15-cv-01576-AJB-AGS) in the United States District Court, Southern District of California;(3) *McKinley Hove Foundation v. West Hills* (No: KC069072) in the Superior Court of California, County of Los Angeles, Pomona

Courthouse South; and, (4) *California Solar Ranch v. Area Energy* (JAMS ref. No 1100088728), an arbitration proceeding. Prior to the past 4 years, I represented the CAISO as an expert on matters related to system voltages and reliability issues in a case presided over by an Administrative Law Judge[1].

Additionally, during my time at the CAISO, I provided written testimony to the Federal Energy Regulatory Commission (FERC) related to market rules and functionality. I provided written testimony to FERC on 3 occasions which included comments related to the re-design of the CAISO markets under the Market Re-Design and Technology Upgrade (MRTU) project[2], development of Business Practice Manuals for MRTU[3], and Long-Term transmission rights in organized markets[4].

Q. Please summarize your testimony.

A. My testimony responds to the Joint Utilities' Direct Testimony and addresses the two issues raised in this docket:

(1) Who should be required to pay for Network Upgrades necessary to interconnect the QF to the host utility?

[1] "Arbitration Findings and Award in Cities of Anaheim et al. v. the ISO & Southern California Edison regarding "Allocation of Transmission Cost", Rahman, B., Testimony, Docket No. EL03-54-000, August 27, 2003.

[2] "California Independent System Operator Corporation Electric Tariff Filing to Reflect Market Redesign and Technology Upgrade", Docket No. ER06, declaration and testimony of Brian Rahman, Program Director of CAISO Market Re-design and Technology Upgrade (MRTU), Submitted to FERC on February 9, 2006.

[3] "Post-Technical Conference Response of the California Independent System Operator Corporation on Business Practice Manual Issues", Brian Rahman, Program Director of CAISO Market Re-design and Technology Upgrade (MRTU), submitted to FERC in March 2007, Docket # ER06-615-012 and ER 07-1257-000

[4] "Long-Term Firm Transmission Rights in Organized Electricity Markets" proposal by Brian Rahman, Program Director of CAISO Market Re-design and Technology Upgrade (MRTU), Submitted to FERC Docket Nos. RM06-8-000 and AD05-7-000, March 13, 2007

(2) Should on-system QFs be required to interconnect to the host utility with Network Resource Interconnection (NRIS) or should QFs have the option to interconnect with Energy Resource Interconnection Service (ERIS) or an interconnection service similar to ERIS?

Based on my experience and prior work throughout the WECC area on many generator interconnections with various host utilities, I contend that:

1. Host utilities should ultimately pay for the network upgrades necessary to interconnect the QF. That is, QFs should be treated the same as any other generator type, with refunds of any network upgrade costs they might pay up-front. For which this is the overwhelmingly prevailing, if not universal, practice outside of Oregon QFs.

2. The interconnection process of the host utility should provide the QF with the cost for both NRIS and ERIS and allow the QF the option to select the service that best meets the QF business objectives.

My testimony does not respond to the parts of the Joint Utilities' Direct Testimony where they characterize Oregon Public Utility Commission (PUC) and Federal Energy Regulatory Commission (FERC) laws and policies.

II. ISSUE 1: COST RESPONSIBILITY FOR NETWORK UPGRADES

Q. This docket is about Network Upgrades. Can you please explain what Network Upgrades are and how they are identified?

A. When a prospective generator proposes to be interconnected to the grid, there is an interconnection study process which the applicable transmission owner goes through in order to evaluate the ability of the grid to interconnect the facility to the grid, including the capacity of the system to support the generator, impacts the generators would have, and what new system features, safety and reliability measures, generator metering and communication requirements, as well as downstream upgrades might be necessary, to meet minimum applicable reliability and other standards for the grid should the generator be built. These studies generally happen through a sequence of three primary studies: a feasibility study (sometimes optional), a system impact study ("SIS"), and a facilities study ("FAS"), which sequentially look in greater detail at the impacts of the facility to the system.

- Network Upgrades are one of the two primary types of upgrades identified to mitigate, where applicable, certain impacts, and achieve the required standards associated with the interconnection of a new proposed generation facility. The upgrades (and costs) to successfully, and in compliance with applicable regulatory standards are generally allocated into two groups as follows:

  1) "***Interconnection Facilities***" are those facilities (and costs) strictly associated with interconnecting the project-specific generator itself reliably *to* the existing host transmission system. The associated facilities (and costs) are also called "Direct Assign" facilities (and costs), meaning that they are only needed due to the physical interconnection of the generator and the generator is the sole reason these facilities are needed. Direct Assignment facilities (and costs) for interconnection, for example, include items such as the interconnection substation elements needed to terminate the generator's tieline and looping in and out of the existing utility transmission line, or to connect the generation facility's customer-owned substation to the utility-owned grid. Direct Assigned Interconnection Facilities may also commonly include the addition of protection devices (i.e. protective relays) at substation remote from the point of interconnection that are solely needed for coordinating line protection with the new interconnection substation. Direct Assignment facilities cost are entirely the responsibility of the generator developer as they do not provide benefits to others. Direct Assign interconnection facilities *do not include* "downstream" impacts to the system which must be upgraded to support the generator, but which also benefit the grid more broadly than the specific project, which are generally called network upgrades, as described further below.

2) *"Network Upgrades"* are facilities necessary to interconnect a generator associated with system upgrades *beyond the point of interconnection* (i.e. beyond the interconnection substation) both locally and regionally, required to address reliability impacts as well as deliverability of the generation to system demand.

Q. Are there different types of Network Upgrades? If so, please explain further about the types and purpose of these?

A. In my experience with the various utility interconnection processes there are two types of upgrades that may be required associated with the interconnection study beyond the project-specific, direct assignment Interconnection Facilities needed for the basic interconnection to the electric grid. These are either Reliability Upgrades (RU) or Network Upgrades (NU).

Reliability Upgrades are those upgrades needed to meet basic NERC/WECC reliability standards. They are most often associated with elements such as short circuit ratings of existing substation equipment such as breakers and switches, and typically very local to the interconnection site location. Other Reliability Upgrades may include expansion of substation buses and installation of special protection schemes. In general, RU are required to ensure the bulk electric grid is in compliance with North American Electric Reliability Corporation (NERC) reliability standards and WECC reliability criteria.

Network Upgrades are typically needed to support the delivery of energy from generation resources to some loads, i.e. loads that may be remote from the generator, or export points at the boundary with neighboring transmission owners. NU often include upgrades to limiting equipment within substations such as under rated equipment or conductors. At times, with large additions of generation, network upgrades may include the need for upgraded or new transmission lines and associated facilities. Network Upgrades can be further categorized into local and area (or regional) network upgrades.

Local Area Upgrades are those upgrades in close proximity to the Point of Interconnection. For example, consider a single transmission line that is bisected so that an Interconnection Facility can be added and during the system impact study, the host utility finds that during an outage of one of the line segments results in an emergency overload of the other while the generator is operating. Under this scenario, the host utility would identify a local network upgrade which could include a special protection scheme to remove the generator in the event of the line outage or a physical capacity increase. While this specific upgrade might appear to be solely associated with the interconnecting generator, it allows for an increased utilization of existing transmission system capacity, not only by the interconnecting generator but to the host utility as well as other “merchant” generation in the area. In other words, it provides a benefit to system capacity, especially within the local area for both merchant generation as well as the host utility.

Area, or regional, network upgrades are most often associated with upgrades to bulk transmission lines and facilities needed for "deliverability" of generation to the aggregate of load on the host utility system. These types of network "deliverability" upgrades provide a broad system wide benefit. For example, under typical study conditions, were the system planner considers the system impacts under stressed system conditions such as 1 in 10 year peak load and minimum load conditions both with all existing generation in operation ignoring economic dispatch, they are likely to find that additional system capacity is needed to avoid line overloads while serving native load. The mitigation of these types of overloads are often very expensive, large scale, upgrades of existing transmission lines or the addition of new transmission lines, both of which result in system wide benefit to not only generators but to the host utility.

Although network upgrades can be categorized as I have done above which is consistent with CAISO approach, many transmission owners within the WECC, simply group Reliability, Local and Area Upgrades all together under the single Network Upgrade category. In general, across the WECC, Network Upgrades are treated separately from Interconnection Facilities because Network Upgrades are refunded.

Q. The Joint Utilities describe two different types of upgrades as well. Can you explain whether RU and NU as you understand them are consistent with the two types of upgrades described by the Joint Utilities?

A. Sure. First, the Joint Utilities describe Network Upgrades identified in an Energy Resource Interconnection Service (ERIS) study that are primarily needed to safely and reliably physically interconnect the generating resource to the utility's transmission system.[5] Under an ERIS the Joint Utilities are describing Reliability Upgrades needed to meet basic reliability criteria as I describe above and do not include local or area deliverability network upgrades. This would be consistent with my understanding of an ERIS and the types of "network upgrades" that an ERIS interconnection study would identify. An ERIS, by definition, allows for the use of existing firm capacity, which would not include any local or area capacity increases.

Second, the Joint Utilities describe Network Upgrades beyond those identified in an ERIS that are needed to ensure the aggregate of generation in the area where the generator proposes to interconnect can be reliably delivered to the aggregate of load on the transmission provider's system during peak load conditions.[6] The utilities also describe these as "deliverability-driven Network Upgrades, or [Network Resource] Network Upgrades." The Joint Utilities are describing the Local and Area Network Upgrades I discuss above. This is consistent with my understanding. These types of Network Upgrades, local or area, are identified in the study process to enable deliverability of generation to the aggregate of system load, even if this system load is far removed from the generator and under most often under stressed system conditions.

Q. What is your understanding of how transmission providers generally evaluate and classify upgrades?

A. In my experience, working within the WECC on transmission level interconnections, the same or very similar rules and methodologies apply with respect to evaluation of the electric system and general classification of upgrades. In some situations, the local utility

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5 Joint Utilities/100, Vail-Bremer-Foster-Larson-Ellsworth/8.
6 Id.

may apply slightly different criteria in the classification of a specific upgrade as either Reliability or Network. For example, one utility may include a special protection scheme as a reliability upgrade because it addresses a specific reliability violation such as a contingency overload. But another, may view this same upgrade as being more akin to a network upgrade because it actually allows for a higher utilization of existing transmission capacity. However, with the exception of how QF's are treated within Oregon, the utility is always the ultimate beneficiary of the increased capacity associated with network or reliability upgrades and either funds these upgrades directly or, if initially funded in some cases by the interconnection customer, provides a refund to the generator who finances or secures the funding for upgrades after the energization of the associated facilities.

Q. You say Oregon is the exception. Have you experienced any other interconnection processes that treat QFs differently?

A. Given how the balance of transmission owners within the WECC treat the cost responsibility for Network Upgrades, it is befuddling why Oregon would implement a separate tariff and treat state jurisdictional interconnections differently than others. Network Upgrades to the transmission system benefit all system users, not just the QF in question, and increase the value of the transmission system "asset". Putting this cost burden on a specific QF, with no ability to recover costs, puts the QF at a significant economic disadvantage and provides the utility with added system value at little or no cost.

Q. Who should be required to pay for Network Upgrades necessary to interconnect the QF to the host utility?

A. I believe, considering the treatment of Network Upgrades by all other transmission owners and planning entities I have worked with on interconnections, network upgrades should ultimately be payed for by the transmission owner. While there are variations in whether the interconnection customer might pay for certain upgrades up front versus these be initially paid for by the utility directly, and certain variations in the repayment schemes that repay interconnection customers who do directly fund certain upgrades, the transmission owner and their ability to reliably serve interconnected demand is really the beneficiary of the network upgrade. As discussed above, Network Upgrades, specifically those associated with increasing system capacities have system wide benefits by increasing overall system capacity and in general the robustness of the interconnected system. For example, a relatively small upgrade to a transmission line, even in remote section of the grid, will likely improve the voltage profile of the remote area which in turn will improve the voltage profile of less remote segments of the interconnected grid, improving overall performance, resulting in lower system losses, and increased transfer capability to serve customer demand. This is certainly a system wide benefit to the transmission owner. There are also benefits in terms of improved reliability management, including for outages, due to additional flexibility added to segment and disconnect parts of the system, as well, for example, larger line sizes, which can both be used to move more power as well as allow the system to operate farther from its peak capacity and mitigate associated stresses and failure points under peak system conditions or unplanned outages.

Q. Can you provide some examples of how other transmission providers and host utilities treat Network Upgrades?

A. There are many examples of host utilities and transmission owners that include provision in their interconnection processes that provide a refund to the generator developer for the cost of Network Upgrades. In some cases, this is a refund of up-front funds provided by the QF while in some cases, where no direct up-front funding is required from the interconnection customer, but rather solely a letter of credits ("LOC"), it is simply the termination of requirement to maintained the posted a Letter of Credit (which would have only been drawn on in the event some upgrade costs have been incurred but the project development has stopped). The following describes how a few of the other host utilities handle the cost/refundability of required network upgrades.

Interconnection Authority	Network Upgrade Security Methodology	Refund Methodology
California ISO	Generator posts Cash or LOC at conclusion of SIS (Phase 1) and FAS (Phase 2). Balance of funding included in LGIA Milestones.	Refunded over 5 year period from date upgrade reaches COD. Applies to Reliability and Local Area Network Upgrades Only
PG&E	Generator posts Cash or LOC at conclusion of SIS (Phase 1) and FAS (Phase 2). Balance of funding included in LGIA Milestones.	Refunded over 5 year period from date upgrade reaches COD. Applies to Reliability and Local Area Network Upgrades Only
SCE	Generator posts Cash or LOC at conclusion of SIS (Phase 1) and FAS (Phase 2). Balance of funding included in LGIA Milestones.	Refunded over 5 year period from date upgrade reaches COD. Applies to Reliability and Local Area Network Upgrades Only
SDG&E	Generator posts Cash or LOC at conclusion of SIS (Phase 1) and FAS (Phase 2). Balance of funding included in LGIA Milestones.	Refunded 100% upon upgrade reaching COD. Applies to Reliability and Local Area Network Upgrades Only
NVEnergy	Generator posts LOC as backstop in event project fails but work has been done on network upgrade.	LOC terminated once network upgrades complete
IID	Generator funds network upgrade	Generator receives dollar for dollar transmission service credits. If not able to utilize, they can sell to others in need

Q. Thank you. What is the risk of not refunding the costs of Network Upgrades and requiring the QF to bear that cost?

A. Regardless of the host utility, it is the host utility that pays for the upgrade and ultimately passes these costs to the customer via a transmission revenue requirement. Alternatively, the QF would need a higher cost for the energy produced to absorb the cost of the network upgrade. This in turn will ultimately be an incremental cost also passed to the customer. Comparing the Oregon approach to what others do, Oregon substantially disadvantages the QF and its approach appears to be discriminatory.

III. ISSUE 2: INTERCRONNECTION SERVICE AVAILABLE TO QFS

Q. Please define ERIS and NRIS.

A. Energy Resource Interconnection Service (ERIS) is defined as "an Interconnection Service that allows the Interconnection Customer to connect its Generating Facility to the Transmission Providers Transmission System to be eligible to deliver the Generating Facility's electric output using the existing firm or nonfarm capacity on the Transmission Providers Transmission System on an as available basis".

Network Resource Interconnection Service (NRIS) is defined as "an Interconnection Service that allows the Interconnection Customer to integrate its Large Generating Facility with the Transmission Provider's Transmission System (1) in a manner comparable to that in which the transmission Provider integrates its generating facilities to serve native load customers".

Q. When is each interconnection service type typically used?

A. ERIS is used by generators that can operate and deliver energy utilizing the existing system capacity on an as-available basis. The decision to go with ERIS as opposed to NRIS is generally a decision left to the generator based on many factors including: cost of the network upgrade, risk of curtailment, power purchase agreement provision, and ability for the generator in general to remain economically viable. In the case of renewable generation such as solar, ERIS is often found to be acceptable when economic dispatch is considered. Under a least cost economic dispatch, constrained by system capacities, solar will most often be the least cost during sunlight hours and be the primary user of system capacity. Gas plants and non-renewable resources will most often be needed in the early morning and evening hours when solar is not available. Consequently, from a practical perspective, considering economic dispatch, ERIS can be an acceptable arrangement for solar generation and avoid costly and possibly unnecessary network upgrades.

NRIS is used by generators that require dedicated firm system capacity to satisfy a power purchase agreement or otherwise require or desire firm capacity to avoid curtailments and financial deficiencies. In most cases the need to be "deliverable" via firm system capacity also comes with added benefit in terms of energy value. Without a corresponding increase in energy value corresponding with the "firm" capacity associated with a costly network upgrade, the generator may become un-economic and will certainly be disadvantaged in terms of energy price needed to remain an economically viable project. From my experience, working with generation interconnections across the WECC, NRIS is most often used by generation that may be exporting form the area they are interconnected with to a neighboring area and selling a firm or "deliverable" energy product, or they have a contract obligation imposed by the buyer that requires firm transmission service for deliveries within the host utility area. It is decidedly less common, unless perhaps a study that looks at ERIS *and* NRIS, as is sometimes requested by interconnection customers, shows no additional cost for the NRIS due to not requiring upgrades to achieve NRIS.

With either approach, it is most often the generator that must make the decision on what type of service best meets their business needs and objectives. From my experience, it is unusual for the host utility to force the choice upon the generator developer.

Q. What is your understanding of the host utility's responsibility?

A. The host utility is typically also the load serving entity with the ultimate responsibility of serving the end use customer, retail or others not operating at a wholesale level. With this responsibility, also comes the ability for the host utility to incorporate the costs of system upgrades, reliability or deliverability, into their Transmission Revenue Requirement, which is a common approach across the WECC, with the apparent exception of Oregon's QF treatment.

Q. What is the impact of shifting network upgrade costs to the generator?

A. First, shifting the network upgrade cost to the generator, puts an unnecessary financial burden on the generator, and will result in higher overall project costs for energy produced by the specific generator burdened with the additional cost, with commensurate implications for project economics and project viability. These costs are further amplified by the fact that interconnection costs—whether direct assign or network upgrades—are not eligible for tax credits, meaning their impact is effectively a multiple of the costs. So additional costs, especially if not needed for the delivery of the power to the utility, burden and might kill the project's viability. This is true in the case that such costs are small, proportionally, but even more in the case that unnecessary large costs are added. There is also an issue from the perspective of the developer being required to post such costs, especially when large, before a PPA is secured, in terms of the risk profile (or even impossibility) of posting them before a viable off-take agreement is secured. Oregon's approach is thus unnecessarily burdensome on the generator developer and ultimately would be harmful to a QF and discriminatory to a QF generator as compared to substantially identical generator (i.e. same size and technology) that would interconnect, and be allowed to sell power, as is common, as an ERIS.

Q. What is the risk of forcing QFs to interconnect with NRIS?

A. By forcing the QF into the Network Resource Interconnection Service (NRIS) bucket the host utility imposes an economic burden on the QF not imposed on other generation in a similar situation. This is especially true for intermittent renewable generation that is unlikely to fully utilize the upgrade. Moreover, with increased system capacity, the incentive for the utility to find the most economic dispatch is removed. For example, If QF generation is more efficient (less expensive) than an existing utility generation asset, then under a constrained transmission system the less expensive generation should be dispatched. However, if transmission capacity has been increased on the back of the QF, then there is reduced incentive for the host utility to perform economic dispatch and possibly curtail the more expensive utility asset.

NRIS, by definition, provides for the generator to be integrated within the transmission system similar to how the utility would integrate its own generation to serve native load. However, imposing NRIS on QF generation, may result in unnecessary system upgrades. For example, a solar resource may be acceptable of ERIS given their specific business plan and delivery requirements. However, if NRIS is imposed, the host utility may find a need, under conservative study assumptions, that at times there may be insufficient demand in the local area and consequently the need for upgraded or entirely new capacity. Unless the situation results in a violation of NERC/WECC reliability standards that require a RU, the generator should be offered the option of ERIS or NRIS.

Q. Can you provide any examples of how ERIS and NRIS is typically studied outside of the Oregon state process?

A. A good example of study process that allows for a selection of ERIS or NRIS by the generator is the California ISO. While it is important to note that California and Oregon are fundamentally different in terms of power supply, i.e. CAISO operates an energy market while Oregon functions under the more traditional utility approach of utility owned generation and power purchases from third parties, the fundamental system planning and study function are largely the same. With the CAISO process, which includes all three of the large Load Serving Entities (PG&E, SCE, and SDG&E), the generator is presented with the costs associated with energy only (i.e. ERIS) vs. full deliverability (i.e. NRIS) interconnection upgrades. The decision to accept the costs for NRIS is left to the generator or in the case of utility owned generation, the utility, based on their own specific objectives

California is obviously unique in that it has experienced a massive influx of solar generation over the past 10 years which has largely consumed available system capacity. Consequently, the costs for full deliverable status (i.e. NRIS) has significantly increased to the point *that nearly all generators select to go with ERIS type interconnection*. In fact, the CAISO has implemented a step in their process where generators specify if they are willing to fund NRIS type upgrades or go with ERIS. This process step has been going on for roughly the past 5 years, and to date it is my understanding that NRIS has never been selected by a generator due to the treatment of the associated network upgrades.

Q. So, should QFs have the option to select ERIS?

A. Generator developers should be provided with the option to select ERIS or NRIS based on their business objectives, power purchase agreement provisions, and economic assessment of the total project costs to interconnect. This is the most common and prevailing practice across the WECC. In fact, most transmission owners consider the interconnection and transmission service arrangements separately and the decision is left entirely to the developer.

It seems that an obligation to only be able to select NRIS, which is significantly more likely to have the effect of creating unviable economics that would fundamentally have the effect of denying the QF its ability to sell power under the PURPA mandatory purchase obligation is unjust and unfair, particularly given the much higher likelihood to have higher, or even impossible costs, that might not be necessary to get the power to the off-taking utility or load. This seems particularly evident in the case of PacifiCorp, per the CREA study, where projects received $300 MM, 10-year construction timeline type upgrades for similar sized projects under NRIS than under ERIS. ERIS projects on the same lines in the same load pocket had much, much smaller ERIS-only upgrades of just a few million dollars.

IV. CONCLUSION

Q. Do you have any concluding remarks?

A. Oregon's approach of forcing QF generation into the NRIS path is largely inconsistent with other entities I have work on generator interconnections with through the WECC area. Not all generation requires firm transmission service to meet their business objectives and by imposing NRIS and associated costs places generation at a disadvantage economically and can even have the effect of unnecessarily killing a project, as well as effectively subverting the ability of the QF to sell under its mandatory purchase obligation under PURPA. The utility has the ultimate responsibility to serve load, and should be responsible for delivering whatever power it is required to buy to where it would deliver such power; but this is not the obligation of the power facility delivering power to the utility's system. Consequently, I believe the utility should ultimately pay for network upgrades, either directly (in lieu of the generator posting money) or, as is very common, reimburse the generator for these costs. Also, the generator that is funding the system impact study should be offered the option, based on business needs, to select the interconnection service, whether that be ERIS or NRIS based on the host utility study results which should include impacts for both.

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

A. Yes.