BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UM 1716

In the Matter of PUBLIC UTILITY COMMISSION OF OREGON, Investigation to Determine the Resource Value of Solar.	THE INTERSTATE RENEWABLE ENERGY COUNCIL, INC. COMMENTS ON STAFF MEMORANDUM TO PARTIES

The Interstate Renewable Energy Council, Inc. (IREC) respectfully submits these comments to the Public Utility Commission of Oregon (Commission) in response to the Staff Recommendations of July 15, 2015 (Staff Comments) in this docket.

I. INTRODUCTION AND BACKGROUND

IREC appreciates that the Commission has spent significant time considering the resource value of solar (RVOS), and has engaged stakeholders to establish RVOS calculations that are specific to Oregon while remaining consistent with best practices found throughout the United States. In these comments, IREC highlights the importance of studying the complete range of benefits and costs derived from distributed solar under all of the significant types of analyses and why certain elements are important in the development of an Oregon-specific valuation of solar methodology.

IREC is a 501(c)(3) non-partisan, non-profit organization working nationally to expand and simplify consumer access to reliable and affordable distributed clean energy by: (1) developing and advancing regulatory policy innovations; (2) generating and promoting national model rules, standards, and best practices; and (3) providing workforce training, education, and credentialing. IREC works independently from renewable energy industries, trade associations, technologies, and advocacy organizations; and, though we promote the creation of robust, competitive clean energy markets, IREC does not have a financial stake in those markets. Grounded in the latest research and objective analysis, IREC's work helps inform and guide fact-based regulatory decision-making and workforce development efforts. Through collaborative partnerships with diverse stakeholders, IREC seeks to build consensus and achieve workable solutions to create a sustainable and economically strong clean energy future.

IREC has recently been or is currently involved in solar valuation proceedings in California, Colorado, Nevada, Minnesota, Mississippi and Ohio. IREC has also published *A Regulator's Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation*, which captures lessons learned from prior utility-specific distributed solar generation (DSG) studies and offers a standardized valuation methodology for commissions to consider while conducting future studies.[1]

II. VARIATIONS AND CONSIDERATIONS OF VALUE OF SOLAR STUDIES

IREC commends the Commission and Staff for its diligence in researching state valuation studies and gathering the perspectives of Oregon stakeholders. IREC believes it is important to gather as much information as possible early in the process so that decision makers may consider the complete range of solar benefits and costs.

As the Commission noted in its July 2014 Solar Report, solar valuation studies from around the country "use different assumptions, different calculation methods, and quantify different combinations of value elements."[2] Specifically, Staff reviewed state studies from Hawaii, Minnesota, Maine, Nevada, Arizona, Louisiana, Mississippi, South Carolina, and Vermont. IREC agrees that there is wide variation in the approaches taken in these states. States such as South Carolina and Louisiana took a much more limited approach, failing to account for many of the numerable benefits that solar generation provides.[3] Other states, such as Maine[4] and Vermont[5] have studied a wide range of benefits and costs that convey to non-participating ratepayers and residents. Furthermore, some states have conducted studies to evaluate the value of solar, while others have solely aimed to determine if a state's net metering program is cost-effective. Because this research will likely influence a policy framework in Oregon for years to come, IREC believes it is important to follow the more comprehensive study course.

Maine and Vermont provide clear examples of studies that have taken a comprehensive but balanced approach in determining the value that solar provides to the state. Maine's study showed both first-year and 25-year levelized values for avoided market costs (including Energy Supply, Transmission Delivery, and Distribution Delivery) and societal and environmental benefits.[6] Significantly, the study recognized that it is important to include societal benefits that can help inform policy decisions, when it noted:

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1 Available at www.irecusa.org/publications.

2 See the "Investigation into the Effectiveness of Solar Programs in Oregon" (Solar Report) at iii.

3 See, e.g. PR Newswire article "Louisiana Solar Industry Responds to Unorthodox Solar Net Metering Study" for a discussion of the solar industry's view of the Louisiana study, available at http://www.prnewswire.com/news-releases/louisiana-solar-industry-responds-to-unorthodox-solar-net-metering-study-300048471.html.

4 "Maine Distributed Solar Valuation Study," (Maine Study) prepared by Clean Power Research, April 14, 2015, available at http://www.maine.gov/mpuc/electricity/elect_generation/documents/MainePUCVOS-ExecutiveSummary.pdf.

5 "Evaluation of Net Metering in Vermont Conducted Pursuant to Act 125 of 2012" (Vermont Study), Vermont Public Service Department, January 15, 2013, available at http://publicservice.vermont.gov/sites/psd/files/Topics/Renewable_Energy/Net_Metering/Act%20125%20Study%2020130115%20Final.pdf.

6 The Maine Legislature enacted the "Act to Support Energy Development in Maine. P.L. 562" (codified at 35-A M.R.S. §§ 3471-3473 (Act). Section 2 of the Act required the Public Utilities Commission to determine the value of distributed solar energy generation in the State, including, "...the societal value of the reduced environmental impacts of the energy." evaluate implementation options, and to deliver a report to the Legislature. April 24, 2014. Available at: http://www.mainelegislature.org/legis/bills/bills_126th/chapters/PUBLIC562.asp

The societal benefits, such as the net Social Cost of SO2, are external to what present market mechanics monetize; as such they do not monetarily accrue to any market participants (distribution utility, transmission provider, third party generators, etc.). It is left as a policy decision to determine whether these values are relevant and whether to include them in tariff design, incentives, and other structures.[7]

The following graphic provides a snapshot of elements included in the 25-year levelized calculation.[8]

Figure ES- 2. CMP Distributed Value – 25 Year Levelized ($ per kWh)

25 Year Levelized		Gross Value A ($/kWh)	×	Load Match Factor B (%)	×	Loss Savings Factor (1+C) (%)	=	Distr. PV Value D ($/kWh)	
Energy Supply	Avoided Energy Cost	$0.076				6.2%		$0.081	Avoided Market Costs $0.138
	Avoided Gen. Capacity Cost	$0.068		54.4%		9.3%		$0.040	
	Avoided Res. Gen. Capacity Cost	$0.009		54.4%		9.3%		$0.005	
	Avoided NG Pipeline Cost								
	Solar Integration Cost	($0.005)				6.2%		($0.005)	
Transmission Delivery Service	Avoided Trans. Capacity Cost	$0.063		23.9%		9.3%		$0.016	
Distribution Delivery Service	Avoided Dist. Capacity Cost								
	Voltage Regulation								
Environmental	Net Social Cost of Carbon	$0.020				6.2%		$0.021	Societal Benefits $0.199
	Net Social Cost of SO_2	$0.058				6.2%		$0.062	
	Net Social Cost of NO_x	$0.012				6.2%		$0.013	
Other	Market Price Response	$0.062				6.2%		$0.066	
	Avoided Fuel Price Uncertainty	$0.035				6.2%		$0.037	
								$0.337	

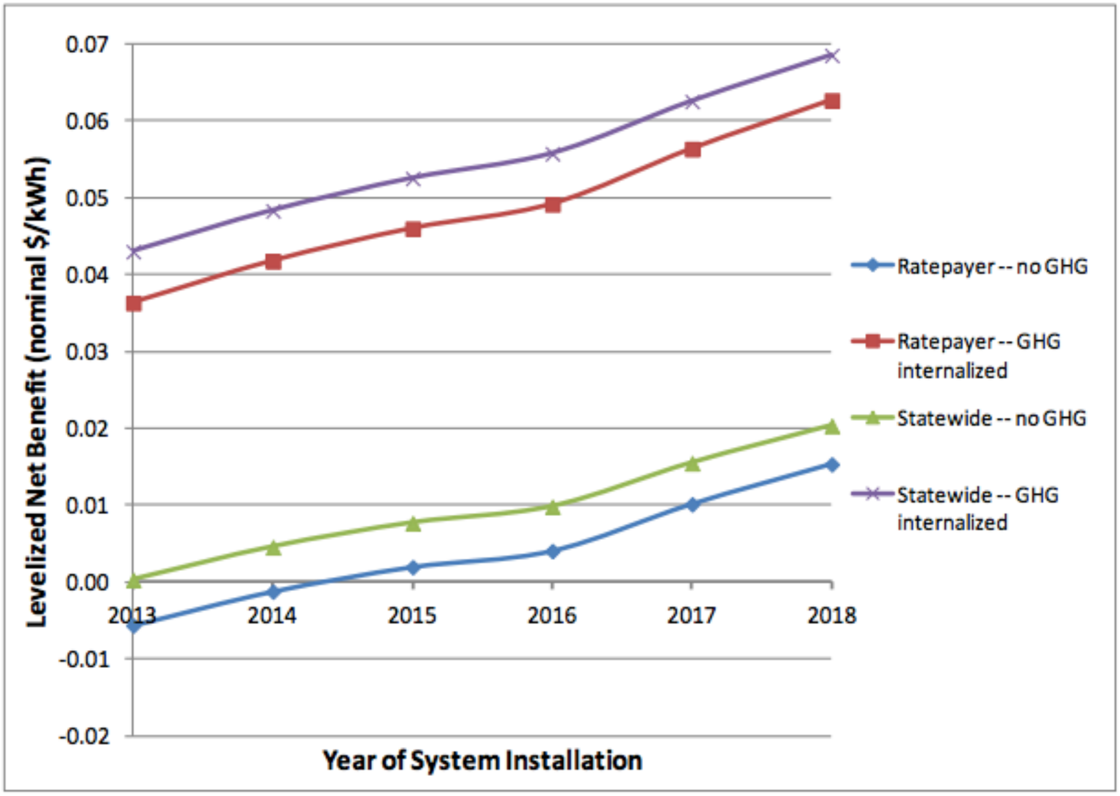
The study also included placeholders for Avoided Natural Gas Pipeline Cost, Avoided Distribution Capacity Cost, and Voltage Regulation for future evaluations.

Vermont's study also noted the importance of calculating environmental and societal benefits for the purposes of informing policy decisions. The study notes:

> The Department's analysis calculates the costs and benefits of net metering to the state's nonparticipating ratepayers both with and without the estimated externalized cost of greenhouse gas emissions. It should be noted that these benefits from a marginal net metering installation in Vermont do not flow to Vermonter ratepayers in direct monetary terms. Instead, they reflect both a societal cost that is avoided and the size of potential risk that Vermont ratepayers avoid by reducing greenhouse gas emissions.[9]

[7] Maine Study at 6.
[8] *Id.*
[9] Vermont Study at 21.

Vermont's study found that a net benefit flowed to the state's residents and ratepayers from net metering systems. The following graph shows the net benefit provided by a 4-kilowatt (kW) system installed in years 2013-2018, based on four scenarios:[10]



Based on this evaluation the Vermont Public Service department concluded that net metering is a cost-effective way to meet the state's energy goals and that there was no need for changes to the policy.

In addition to considering the full range of costs and benefits in this type of analysis, it is also important to understand these costs and benefits from the perspective of all participants by applying the range of utility costs tests to the study. These include the total resource cost test (TRC), the ratepayer impact measure test (RIM), the utility cost test (UCT), participant cost test (PCT) and societal cost test (SCT). Any individual test on its own would be insufficient to fully characterize the value of distributed resources but, when considered together, these tests can be useful in helping to portray a more complete picture of how costs and benefits are distributed among various groups or individuals. It will then require a balancing act by the Commission to weigh the results of these tests and set state policy going forward.

Some have argued that societal benefits are beyond the scope of utility rates. For example, in comments submitted by Portland General Electric (PGE) on April 30, 2015, the utility states that,

[10] Vermont Study at 29.

> "While we can discuss social benefits of solar that accrue generally, these benefits should not be paid for by utility customers on their electricity bills. In particular, we are concerned that parties may argue that environmental benefits beyond those resulting from environmental compliance with the Oregon Renewable Portfolio Standard and the Environmental Protection Agency's recent carbon standards should be considered system benefits. These marginal environmental benefits are societal because there is no required regulation for the utility to meet."

Utilities often argue that these environmental and societal benefits are contrary to setting just and reasonable rates, as required by the Federal Power Act. However, societal benefits fall into the realm of policy setting, which is the purview of the Oregon legislature.

The legislature has specifically acknowledged the importance of evaluating environmental and public policy benefits associated with distributed generation.[11] In the State's net metering statute, the legislature requires the Commission to evaluate societal benefits before placing limits on net metering. The statute reads:

> When limiting net metering obligations under this subsection, the commission or the governing body shall *consider the environmental and other public policy benefits of net metering systems*. The commission may limit net metering obligations under this subsection only following notice and opportunity for public comment. The governing body of a municipal electric utility, electric cooperative or peoples utility district may limit net metering obligations under this subsection only following notice and opportunity for comment from the customers of the utility, cooperative or district (emphasis added).

To provide the legislature with information it needs to set policies going forward, it is necessary to understand, to the extent possible, the impact that solar has on environmental and societal indicators.

Furthermore, when studying the costs that can be attributed to net metering, it is important to only study solar exports to the grid. Under the Public Utilities Regulatory Act (PURPA), customers have the right to avoid purchasing any and all electricity from a utility by offsetting his or her own consumption with onsite generation.[12] As a result, many studies that have been conducted around the country only consider net-metering exports to the grid when evaluating costs and benefits. In other words, considering lost utility revenue from a net metering customer's offset consumption, would be akin to evaluating a the costs related to investments customers make in energy-saving appliances. As such, IREC recommends only studying the costs related to a distributed solar customer's exports to the grid when analyzing net metering.

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[11] ORS 757.300(6)

[12] 16 U.S.C. § 824a-3; see generally 16 U.S.C. § 2601 et seq

III. COST AND BENEFIT CONSIDERATIONS REGARDING RESOURCE VALUE OF SOLAR CALCULATIONS

As stated above, IREC recognizes the investment in time and resources the Commission, Staff and Parties have provided to date in determining the benefits and costs of distributed solar in Oregon. Below, we organize our comments in the order provided in Table 2, as with Staff's July 15, 2015 Comments, in order to make it easier for all participants to place our comments in context.

1. Avoided Energy Impacts

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: A distributed solar facility allows a utility to reduce operations of marginal generating plants, reduce maintenance needs of those plants and reduce the fuel needed to produce the next unit of energy at these plants. As all parties agree, this benefit should be considered in the RVOS calculations. IREC further supports Staff's recommendation to specify the marginal generator and calculate the corresponding cost of generation.[13] Typically, the least efficient generator is turned off first, meaning that the marginal generator at any given time uses more fuel per kilowatt-hour (kWh) than the average generator, so average fuel use is not the appropriate measure. As noted above, this element should only evaluate the avoided energy impact resulting from energy that is exported from net metered solar facilities.

2. Avoided Capacity Additions

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: Distributed solar interconnected to the grid can reduce the requirement for utility investment in new generation capacity resources, resulting in a decrease in capital expenditures for generation capacity as once previously required. A utility's historically high financial burdens associated with construction of new generation plants is therefore deferred or avoided, and should be included in the RVOS calculations. This is typically done through an Effective Load Carrying Capacity approach, which looks at the amount of capacity that can be counted on with a very high degree of confidence during periods of utility peak load.

3. Line Losses

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: Similar to other parties, IREC recommends including avoided line losses into the RVOS calculation. Line losses are a function of system load, and distributed solar facilities generate during daytime hours, when loads are higher than average. The ability of solar customers to serve on-site load without taxing the distribution system reduces transformer

[13] Staff Comments, July 15, 2015, at 5.

overheating, a major driver of transformer wear and tear, and in turn allows customers to receive power from utility generators at lower marginal loss rates.

Considering losses on a marginal basis is more accurate and should be standard practice as it reflects the likely correlation of solar PV to heavy loading periods where congestion and transformer thermal conditions tend to exacerbate losses. In its Austin Energy study, Clean Power Research (CPR) evaluated marginal transmission and distribution losses at times of seasonable peak demand using load flow analysis. CPR decided to average the marginal energy losses on the distribution system, for purposes of the study, and added marginal transmission losses in order to report hourly marginal loss savings due to solar generation.[14] In other words, without on- or near-peak distributed solar systems, all customers would face higher marginal loss rates. Thus, the value attributed to avoided line losses is a benefit to all those on the system and should be included in the RVOS calculation.

Regarding line losses, IREC has suggested that they be addressed within the analyses of energy and capacity benefits, but it is also fine to break out line losses as a separate benefit. If treating line losses separately, it is still important to consider the benefits with regard to both energy and capacity.

4. Avoided Transmission & Distribution

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: Real value can be attributed to distributed solar for avoided transmission and distribution system upgrades. Reductions in distribution system load are most likely already freeing up capacity on utility transmission systems, which is providing a benefit to utility ratepayers. Moreover, incremental additions of distributed solar can help defer or avoid further transmission system upgrades.

5. Compliance Value: reduced RPS procurement due to reduced utility sales

IREC Recommendation: Inclusion in the RVOS calculations

IREC Perspective: Utilities in states with RPS policies are able to reduce their compliance costs with increased distributed solar penetration. Utility compliance with RPS requirements is based on a set percentage of the utility's load. As the utility's overall load decreases with the addition of net metered solar, the utility's costs of RPS compliance also decrease. This avoided cost of compliance should be included in the RVOS calculations.

6. Security: Reliability, Resiliency, and Disaster

IREC Recommendation: Inclusion in the RVOS calculation

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[14] "A Regulator's Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation" Interstate Renewable Energy Council, October 2013 at 23. Available at: http://www.irecusa.org/a-regulators-guidebook-calculating-the-benefits-and-costs-of-distributed-solar-generation/

IREC Perspective: Value can be attributed to increased reliability and resiliency due to distributed solar, at both the grid and the individual customer levels.[15] To the extent that utilities have an obligation to increase reliability to vulnerable customers, distributed solar can help avoid those utility costs. On a larger scale, if distributed solar is able to improve reliability beyond what the utility would otherwise provide, it should be included in RVOS calculations.

7. Utility: Integration Impacts

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: In certain "high-penetration" cases, utilities may face integration costs that reduce some of the benefits of distributed generation. Oregon's current and predicted near-term levels of penetration do not warrant much concern for integration costs at this time; however, IREC supports the inclusion of integration impacts as a potential utility cost in the future.

8. Utility: Interconnection Impacts

IREC Recommendation: Exclusion in the RVOS calculation

IREC Perspective: IREC agrees that interconnection costs not carried by the customer-generator should be captured in RVOS calculations. However, we recognize that most often customers are responsible for interconnection costs and upgrades, and that this is not a common cost borne by the utility. After review of Oregon's interconnection procedures, IREC recommends that the Commission not spend money unnecessarily on having a consultant try to discern whether there are any related utility costs that are not borne by the interconnecting customer.

Oregon PUC Order 09-196 set a cap of $100 for interconnection applications for systems up to 25 kW, $500 for non-exporting systems under 10 MW, and $1000 for all other systems. In all cases, if interconnection requires utility upgrades, the customer has to pay for those upgrades, though capped at utility costs of $100 per hour (in 2009, with inflation adjustment from there).

Oregon's application fees are higher than many states, with studies often showing lower costs for application processing. As well, the provisions for cost responsibility in Oregon's rules seem to leave little likelihood for utility costs. IREC suggests that if there is any interconnection cost outside of what the customer bears under the existing interconnection procedures, those costs would not be significant enough to change the cost valuation results by even a tenth of cent per kilowatt-hour, and therefore unnecessary to consider.

9. Financial: Market Price Response

IREC Recommendation: Inclusion in the RVOS calculation

[15] For grid benefits, this value in particular is difficult to quantify; it depends on the assumed risk of extended blackouts, the assumed cost to strengthen the grid to avoid that risk, and the assumed ability of distributed to strengthen the grid.

IREC Perspective: By reducing a utility's energy and capacity needs, market purchases are reduced. From a microeconomic perspective, the demand curve for energy and capacity are pulled back, reducing the price of each. That means that the price paid by the utility on the open market for the energy and capacity that they do need is lower, benefiting all customers. In this way, distributed solar reduces the cost of wholesale energy and capacity to all ratepayers and should be included in RVOS calculations.

10. Utility: Administration Impacts

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: IREC agrees with Staff Comments that costs associated with utility administration required to manage solar resources should be considered in RVOS calculations *if* they exceed the comparable metering and billing costs for regular utility customers.[16] However, assumptions about administrative costs should reflect an industry-wide move toward automation. With higher penetration, costs per solar customer tend to decline, so administrative costs should reflect this trend. The impact of administrative expenses is typically quite low, and should not be a focus area for a consultant looking at the impacts.

11. Operational Impacts: Enhanced Forecasting, scheduling, resulting from availability of solar

IREC Recommendation: Exclusion from the RVOS calculation

IREC Perspective: Distributed solar arrays are dispersed throughout a utility's service territory and are predictable generation sources. At Oregon's current and near-term level of penetration, it is not clear whether the presence of solar energy will enhance forecasting and scheduling of utility resources, or add complexity. More likely, we anticipate that at low penetrations, there will not be any significant change in a utility's costs related to enhanced forecasting and scheduling.

12. Ancillary Services and Grid Support

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: Inverters capable of providing grid support are being mass-produced and are numerous studies have included this benefit. As a result of a smarter grid, ancillary services will almost certainly be available in the near future, including voltage support and reactive power. Modeling the costs and benefits of ancillary services can inform policy decisions like those related to interconnection technology requirements and provide a hedging benefit. This is rarely a large benefit, but it is frequently included in studies and has an obvious positive impact.

13. Financial: Fuel Price Hedge

[16] Staff Comments, July 15, 2015 at 6.

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: Distributed solar provides a fuel cost price hedge benefit by reducing reliance on fuel sources that are susceptible to shortages and market price volatility. In addition, distributed solar provides a hedge against the uncertain future regulation of greenhouse gas and other emissions, which also impact fuel prices. Distributed solar exports help hedge against these price increases by reducing the volatility risk associated with base fuel prices— effectively blending price stability into the total utility portfolio.

14. Rate Impacts: Net Metering Credits

IREC Recommendation: Exclusion from the RVOS calculation

IREC Perspective: IREC did not initially comment on net metering credits as an element of the RVOS calculation, as the difference between this element and *#22 Rate Impacts: Lost Utility Revenue* is not clearly defined. A net metering credit is by function "lost utility revenue" associated with the import of electricity to the grid. IREC respectfully cautions the Commission against the potential for the same element to be counted twice in the RVOS calculation under both *Rate Impacts: Net Metering Credits* and *Rate Impacts: Lost Utility Revenue*.

15. Societal: Economic Impact

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: Installation and construction associated with onsite generation facilities is inherently local in nature, as contractors or installers must be within reasonably close geographic proximity to economically install a system and be present for building inspections. Accordingly, the solar industry creates local jobs and generates revenue locally. Economic activity associated with a growing rooftop solar industry in Oregon creates additional tax revenue at the state and local levels as installers purchase supplies, goods and other related services subject to state and local sales tax, and pay payroll taxes. Locally spent dollars also displace those frequently sent out of state for fuel and other supplies. Because Oregon statute requires the consideration of public policy goals, the economic development and tax-base benefits of distributed solar installation and operation should be considered in the RVOS calculations.[17]

16. Avoided Natural Gas Pipeline

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: Similar in nature to how distributed solar generation displaces the need for continuing high levels of utility transmission and distribution investment, it displaces current levels of investments in natural gas pipelines. As with element *#4 Transmission and Distribution,* the decreased investment in further natural gas pipelines provides a direct benefit that should be included in RVOS calculations.

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[17] ORS 757.300(6)

17. Health and Other Societal Impacts

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: Electric generation of distributed solar reduces the necessity for continued higher levels of fossil fuel generation, especially from less efficient peaker plants and potentially from thermal plants that emit higher levels of pollution during startup operations. The Maine Study, for example, included the "Net Social Cost of Carbon, SO2 and NOx" by using Environmental Protection Agency estimates of social costs, reduced by compliance costs embedded in wholesale electricity prices.[18] Valuing emissions of carbon and other matter based on green energy pricing programs or RPS compliance costs, as described earlier, is an effective way to capture this benefit. Even outside of states with such programs, the value of reduced emissions is not zero; the value ascribed by nearby states with programs could serve as a proxy. Because Oregon statute requires the consideration of public policy goals, this value should be included in the RVOS calculation.[19] As with other categories, it is important to ensure that these benefits are not being double counted in another category.

18. Capital Risk: Decreased risk of capital and cost due to system impacts of solar

IREC Recommendation: Undecided about inclusion in the RVOS calculation

IREC Perspective: There is not currently a sound indication that capital markets are experiencing lower interest rates, and therefore portrayed as "safer," based on increased solar penetration. As there is not currently readily available data as to whether installing solar increases or decreases risk, IREC defers opinion on this element.

19. Utility: Production Impacts (IRP Process) – Levelized cost of production over the lifetime of the project based on an assumed annual capacity factor ($/MWh)

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: We recommend use of a levelized approach to estimating benefits and costs over the fully assumed distributed solar generator's life of 30 years. Levelization involves calculating the stream of benefits and costs over an extended period and discounting to a single present value. Such levelized estimates are routinely used by utilities in evaluating alternative and competing resource options. As such, levelization of the entire stream of benefits and costs is appropriate.

20. Behind-the-Meter Production During Billing Month

IREC Recommendation: Exclusion from the RVOS calculation

IREC Perspective: The value derived from behind-the-meter production is found in the customer-generator's ability to offset some or all of their on-site load requirements. IREC agrees

[18] Maine Study at 4.
[19] *Id*.

with Staff Comments[20] that this element is properly captured in both *#1 Avoided Energy Impacts* and *#2 Avoided Capacity Addition*, and respectfully cautions the Commission against the potential for the same element to be counted twice. However, IREC also notes that customers may reduce their consumption behind the meter through conservation, energy efficiency measures, or distributed solar, and in none of these cases should the customer be penalized for reduced consumption. As noted previously, IREC urges the Commission to only consider that portion of the generation from a net metered system that actually gets exported to the electric grid.

21. Resource Need

IREC Recommendation: Exclusion in the RVOS calculation

IREC Perspective: It is unclear how the resource need would be incorporated into a study process. It seems that this relates to the capacity benefits already considered.

22. Rate Impacts: Lost Utility Revenue

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: In the Ratepayer Impact Measure, lost utility revenue is the principal cost of net metering. However, as noted above, the utility has no inherent right to recover "lost" revenues when a customer reduces consumption; it is up to the utility to accurately forecast demand, including customer efforts to reduce energy usage through conservation, energy efficiency, and on-site solar. Net metering as a policy allows a customer a kWh credit for every kWh exported to the grid, so the "lost revenue" when analyzing net metering is the value of that kWh credit –which is the retail rate times total kWh exported.

23. Tax Credits

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: Tax credits provide a direct benefit to the participant and would be factored in to the Total Resource Cost test, the Societal test and the Participant Cost test. IREC recommends the Commission examine all perspectives, which would include tax credits in these two contexts.

24. Demand Side Management Alternative Impacts

IREC Recommendation: Exclusion from the RVOS calculation

IREC Perspective: The scope of the current solar valuation is too broad to accurately address whether demand side management (DSM) alternative impacts will be positive or negative. IREC recommends that this element be excluded from the process of determining the RVOS until such time as the scope has tapered to accurately weight the cost and/or benefits of DSM impacts.

[20] *Id.* at 9.

25. Environmental Compliance Impacts

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: The cost of environmental compliance to regulatory or statutory requirements is an operational expense of a generation plant, and therefore should be considered in the avoided cost calculation.[21] Direct emissions reductions can be quantified and calculated against the market price for the relative compliance instrument. To the extent these values are fully reflected in the cost of the avoided energy, they should not be counted again in the RVOS calculation. It is important to account for only residual environmental compliance costs in estimating the benefit of distributed solar.

The markets for NOx, SOx, and CO_2 are increasingly available and quantified through public sources. Therefore, any RVOS calculation should include the benefit of avoided cost compliance reflected in air emissions, land use, and water consumption and discharges costs.

IREC recommends that Clean Air Act provisions for CO_2 regulation in the proposed rulemaking for section 111(d) be analyzed to evaluate the impact of these provisions on compliance costs resulting from increased customer-sited generation.

26. *Environment: Externalities*

IREC Recommendation: Inclusion in the RVOS calculation

IREC Perspective: IREC recognizes that the quantification of societal and environmental benefits to be challenging in determining the RVOS. Regarding environmental benefits, avoided utility compliance costs for pollution may capture, to some extent, what society has deemed an appropriate value of efforts and investments aimed at reducing or mitigating these external costs. However, this value does not capture the all of the environmental benefits derived from the avoidance of generating electricity from fossil fuels. Health and other societal benefits are already covered in #17, so "environmental externalities" should be exclusive of those benefits.

The emissions not released thanks to net metered facilities would have had some impact on the environment in Oregon, but the environmental compliance impacts in #25 only cover the avoided utility costs related to the what emissions the utility would have stopped. For instance, if net metered systems lead to a million MWh of reduced fossil-fired generation in a year, the utility avoids having to pay to limit NOx emissions related to those million MWhs (#25), but there's still the NOx emissions that would have gotten out to be considered. There's an associated value in not emitting the pollutants that would have been emitted but for net metering.

Objections to valuing societal benefits such as environmental externalities are commonly centered on the argument that doing so conflates customers with citizens and asserts that utility rates must be based on those costs that are directly impacting utilities. By this line of reasoning, job creation, health benefits and environmental externalities may be the basis of legislative

[21] This avoided cost is typically included in studies as a direct utility cost.

policies supportive of distributed solar but should not be considered when developing tariffs. However, a major reason for establishing distributed solar programs is primarily related to the same broad societal benefits that drive utility regulatory decision-making—economic efficiency, and rates and reliable services in the public interests. IREC suggests that it is more efficient to consider all benefits under one program rather than breaking out benefits to ratepayers and citizens separately, given the nearly complete overlap of ratepayers and citizens.

Again, IREC recommends a consideration of the SCT test in order to accurately assess the environmental externalities, as Oregon's net metering statute requires.[22]

IV. SCHEDULE

As stated in IREC's Comments on Staff's Scoping Memorandum (Scoping Comments), submitted April 30, 2015, IREC believes that it is currently impractical to delve into Phase 2, resource valuation, prior to the further development of Phase 1, scope development. IREC suggests that Phase 2 begin after Phase 1 has largely been settled. Phase 3, regarding fixed cost recovery, depends on study results, and therefore should follow Phase 2. Also as noted in the Scoping Comments, Phase 4, regarding assessment of reliability impacts, can begin immediately, although IREC believes reliability impacts are not likely be near term concerns.

V. CONCLUSION

IREC appreciates the opportunity to submit these comments and to participate in the Commission's effort to finalize interconnection and net metering rules for Oregon.

DATED this 20TH day of July, 2015

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[22] ORS 757.300(6).