

BEFORE THE PUBLIC UTILITY COMMISSION  
OF OREGON

UM 1716

In the Matter of

OREGON PUBLIC UTILITY COMMISSION

Investigation to Determine the Resource Value of  
Solar

Comments of Oregonians for  
Renewable Energy Progress

Oregonians for Renewable Energy Progress thanks the Commission for the opportunity to submit comments on the scope of the Investigation to Determine the Resource Value of Solar energy in Oregon. Our comments generally fall under five categories that are summarized below, with specific details and references following for each category as appropriate.

1. **OREP believes that the order in which the investigations are to be completed as currently proposed in the Timeline (Appendix: Table 1) is inconsistent with the goals of the studies.** OREP's understanding is that the purpose of Investigation #1 is to establish the value of electricity from solar photovoltaic panels to various stakeholder groups including ratepayers and citizens of Oregon. Investigation #2 *Fixed Cost Recovery*, is to look at utility cost recovery and possible cost shifting between solar participants and general ratepayers. Accurately determining to what extent, if any, cost shifting or fixed cost recovery is an issue in Oregon is entirely dependent on understanding what the full value of solar energy is to the electricity system. Therefore Investigation #2 cannot be completed until the results of the *Resource Value of Solar* investigation are available.

We are relatively happy with the consensus building approach used during the workshops and throughout the investigation so far. However, OREP is concerned with the definitions of some elements to be included in the RVOS as outlined in the Staff Recommendations to the Commission that were made public to stakeholders last week. With only three business days since the release of the report before stakeholder comments are due, we feel that it is critical to allow sufficient time for input and consensus on these definitions. OREP suggest that this topic be included in the RVOS investigation, Workshop 3: RFP Review or devote an additional comment opportunity to this issue. The consultant hired should also be allowed to use their knowledge of established best practices to further refine these definitions as needed, in consultation with the OPUC.

2. **Several elements considered are program-specific and appear to assume a net-metered solar value rather than a solar resource value independent of any program design, and should not be included in the RVOS.** The resource value of solar electricity from a PV panel with a given

location and orientation is quantifiable and independent of any program that encouraged the customer to install it. The value of the electricity coming off the panel is the same whether it was installed with ETO rebates and State tax credits, under the Solar Pilot Program, or paid for in its entirety by the owner.

The following elements **should be excluded** from the RVOS study on the basis of program dependence:

- #8 Utility: Administration Impacts;
- #9 Utility: Interconnection Impacts;
- #15 Rate Impacts: Net Metering Credits;
- #20 Behind-the-Meter Production During Billing Month;
- #22 Rate Impacts: Lost Utility Revenue;
- #23 Tax Credits; and
- #24 DSM Alternative Impact.

### 3. **Societal Benefits Should be Included in a Robust RVOS.**

**OREP believes that the Commission will make a serious error if it fails to consider externalized environmental costs in this docket.** The distinction drawn between “electricity ratepayers” and society is a contrived dichotomy. Electricity ratepayers are all members of society and nearly every member of society is an electricity ratepayer. The real distinction is between the shareholders of investor-owned utilities and society, which is composed primarily of ratepayers. This process should not ignore costs imposed on society by the owners of utility shares.

This docket’s purpose is to inform policy makers who have a broader policy-making lens than does the Commission. If one were to suggest to members of the Legislature that, in setting policy for society, they should specifically ignore economic development, health, water, or costs imposed on future taxpayers due to emissions from a given polluter, they would question the credibility of the suggestion. The traditional restrictive lens of the Commission is not appropriate for this docket.

These elements **should be included** in the RVOS study:

Avoided Environmental Externalities (all fall under #26):

- Societal Impacts of Carbon;
- Ocean Warming & Acidification;
- Societal Impacts of NOx/SOx/Particulates;
- Avoided water usage for thermal power production and for natural gas hydraulic fracturing; and
- Thermal pollution of fresh water.

And Societal Economic Benefits (under #16)

- Financial benefit of keeping Oregon energy dollars recirculating locally instead of sent out of state for purchase of fossil energy
- Financial benefit to state from solar energy job creation

4. OREP has indicated agreement in past comments, that the following elements should be included. We suggest that any elements that are clearly greater than zero, but are difficult to establish this

time, be left in as placeholders for subsequent investigations. OREP has no further input on the following elements:

- #1 Avoided Energy Impacts
- #2 Avoided Capacity Additions
- #4 Avoided Transmission and Distribution
- #5 Compliance Value
- #10 Financial: Market Price Response
- #11 Ancillary Services and Grid Support
- #12 Financial: Fuel Price Hedge
- #13 Operational Impacts
- #14 Avoided Natural Gas Pipeline Impacts
- #17 Health and Other Societal Impacts
- #25 Environment: Compliance Impacts

5. Other Comments with further clarification by OREP in this document:

- #3 Line Losses
- #6 Security: Reliability, Resiliency and Disaster Recovery
- #7 Utility: Integration Impacts
- #16 Societal: Economic Development
- #18 Capital Risk
- #21 Resource Need

OREP recommends the following changes to the RVOS study, based on what other jurisdictions have included in their Value of Solar or net-metering evaluation studies. These studies were conducted in Maine, Minnesota, Mississippi, Missouri, Nevada, and Vermont, and most recently for Portland General Electric (See Appendix 1 for a list of these resources).

## 2. Program Dependent Elements Should be Excluded

### A. #8 Utility: Administration Impacts

**OREP Recommends Exclusion:** Utility administration costs are heavily dependent on the type of program developed and its requirements. This is important to consider when designing a program to encourage solar deployment but would introduce a program preference into this investigation, which is irrelevant to the value of solar electricity. Currently Portland General Electric participants in the Solar Pilot Program pay an additional \$10/month for administrative costs. As solar penetration increases, utilities can improve the sophistication of their administrative approach, automating systems to improve efficiency, decrease cost and reduce utility and shareholder impact. Several studies, including those in Missouri, Mississippi and Nevada, acknowledged how difficult this was to quantify due to the lack of precedence in other studies but did include administrative costs in their evaluation. They were all based on net-metered program requirements though, which illustrates how program-dependent this element is. Value of Solar studies in Maine and Minnesota did not include administrative costs.

### B. #9 Utility Interconnection Impacts

**OREP Recommends Exclusion:** Utility interconnection impacts will vary depending on the program requirements and contracts. No other studies that we've investigated have included interconnection costs, although Maine did recommend improving their 2010 interconnection standards.

C. #14 Rate Impacts: Net Metering Credits

**OREP Recommends Exclusion:** This element is program dependent, assuming that solar PV will be installed under a net metering program and belongs in Investigation #2. We first need to understand the value of solar electricity before we can adequately determine if there is any rate impact on customers.

D. #20 Behind-the-Meter Production During Billing Month

**OREP Recommends Exclusion:** Behind-the-meter production during the billing month is inherently program dependent. If all the energy were fed directly into the grid, there would be no behind-the-meter production at any point.

E. #22 Rate Impacts: Lost Utility Revenue

**OREP Recommends Exclusion:** This element is program dependent and should be included in Investigation #2 – Fixed Cost Recovery. For example, the utility *may* experience lost revenue under a net-metering program but they would not under a well-designed feed-in tariff where all customers continue to buy all their electricity from the utility, regardless of whether they've installed solar or not. Mississippi, Missouri and Vermont each acknowledged that lost utility revenue does occur, but again, all assumptions were based on a net-metering program. The true value of the energy generated from a solar PV panel is independent of programmatic impacts.

F. #23 Tax credits (State and Federal)

**OREP Recommends Exclusion:** This element is highly program dependent and changes over time both at the State and Federal level. A tax credit is applied to and reduces the installation cost of a PV array. It also assumes that the person or business installing the system has sufficient tax appetite to utilize the credit, although anyone can install a PV system with sufficient solar resource available, including NGOs, schools, houses of worship and government agencies that don't pay taxes. Tax credits have no bearing on the performance of the system and the energy that it produces, and therefore are irrelevant to the value of electricity produced by a solar array.

G. #24 DSM Alternative Impact

**OREP Recommends Exclusion:** This element too, is program dependent and has no bearing on the actual value of solar energy produced. Under a Feed-In Tariff or PURPA installation there is no loss of revenue to the public purpose charge. This element may be included in Investigation #2.

### **3. Societal Benefits Should be Included in a Robust RVOS.**

#### **Environmental Externality Elements Should be Included**

**Independent expertise is needed to consider external environmental costs in this docket.** Staff's comments are replete with assertions that external costs are not within the Commission's usual purview. Economic development is "outside the normal scope of the OPUC's activities" (p. 8); health and other societal impacts "are outside the scope of the PUC" (p. 8). Further, that "these environmental externalities are outside the scope of the PUC" (p. 10). Staff notes at page 11 that societal benefits "are not within the scope of utility ratemaking."

The parties are well aware that the Commission has not yet considered these external costs. However, rather than being merely "social benefits such as improved environmental quality" (p. 2), mitigation of climate change impacts imposes real cost on members of society and taxpayers which, while caused in significant part by fossil fuel generators, are not paid by them and are imposed on everybody else.

Because the Commission's normal scope has not included this work, an expert consultant's is needed.

#### **The commission is not precluded from considering external environmental costs.**

In an Oregon Department of Justice Memorandum dated April 16, 1992 the Department concluded that the Commission has authority to consider external environmental costs in a utility's least-cost plan.

"For example, a utility's consideration of external environmental costs in its least-cost plan may cause it to choose a resource that has higher costs when measured without inclusion of the external costs. A coal-fired electrical generation plan may be a lower cost resource, without consideration of environmental costs, than a solar-powered generation plan. Nevertheless, the Commission may allow cost recovery for the higher cost-solar powered plant by taking into consideration its lower impact on the environment." (p. 4).

These decisions cannot be made wisely without quantifying what the external environmental costs are.

In recommending that these costs not be considered, Staff is essentially making a policy decision from a traditional perspective that is narrower and more restrictive than the broader policy concerns of the Legislature.

#### **Inclusion of societal benefits in other value of solar studies.**

The study conducted for PGE by Clean Power Research notes that inclusion of societal benefits are policy choices that have been included in other value of solar studies. "Clean Power Research does not recommend to PGE whether any of the societal benefits should be included or excluded from a benefit and cost study. They represent policy choices that must be evaluated by the affected parties."<sup>1</sup> (emphasis added)

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<sup>1</sup> Norris, Benjamin. Clean Power Research. (July 13, 2015). *PGE Distributed Solar Valuation Methodology*. (P 36). Email attachment from Mihir Desu to the PGE OPUC Filings list, forwarded by Mark Pengilly, July 20, 2015.

“The Avoided Social Cost of Carbon (SCC) is a measure of the externality benefit based on the federal social cost of avoided CO2 emissions. This cost is included here for completeness as it has been used as the basis of other value of solar studies.” (page 36)(emphasis added)

To exclude external environmental costs from this docket would be to give Oregon’s Legislature less information than has been presented in other value of solar studies. This docket should endeavor to meet the standard of value of solar studies elsewhere, rather than giving our Legislature less than a full deck.

The Commission has the legal authority to consider societal impacts.

A. #26 Carbon-Societal Impacts of Carbon

**OREP Recommends Inclusion:** The harms due to carbon dioxide emissions are real and immediate and are impacting our economy now. The US EPA and other federal agencies use the Social Cost of Carbon (SC-CO2) in their rulemaking procedures and use verifiable data that is included on their website<sup>2</sup>. The likelihood of quantifiable carbon pricing in the near future for other forms of electricity generation is high and therefore it should be included when determining the value of solar electricity that will continue to produce clean energy for years to come. See the PGE Distributed Solar Valuation Methodology, July 13, 2015 report from Clean Power Research for a thorough description of how to apply the SC-CO2 to a solar valuation study (Pg 36)<sup>3</sup>.

B. #26 Carbon-Ocean Warming and Acidification

**OREP Recommends Inclusion:** Affects include the loss of income and taxes paid as a result of degradation of the ocean environment due to acidification from CO2 emissions and atmospheric warming from Greenhouse Gas emissions. Very real harm to ocean life, and people and industries that depend on healthy oceans are already manifesting in Oregon and around the world.

C. #26 NOx/SOx/Particulates-Societal Impacts

**OREP Recommends Inclusion:** These combustion products produce harms that must be accounted for in a fully loaded cost of generation by fossil fuels.

D. #26 Avoided water usage-for thermal power production

**OREP Recommends Inclusion:** With the exception of endangered species regulations, utilities have generally been exempt from water restrictions implemented during droughts. As of June 12, 2015, nineteen Oregon counties are currently under emergency drought conditions illustrating the value placed on water resources in the state<sup>4</sup>. Solar PV delays the need for such

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<sup>2</sup> US Environmental Protection Agency. (July 2015). Social Cost of Carbon. Retrieved from <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html>

<sup>3</sup> Ibid

<sup>4</sup> Associated Press. (June 12, 2015). Drought emergencies declared in 19 Oregon counties. *Oregon Live: The Oregonian*. Retrieved from [http://www.oregonlive.com/pacific-northwest-news/index.ssf/2015/06/drought\\_emergencies\\_declared\\_i.html](http://www.oregonlive.com/pacific-northwest-news/index.ssf/2015/06/drought_emergencies_declared_i.html)

restrictions that directly affect the Oregon economy, electricity prices, and if severe enough could affect the direct operations of power plants.

E. #26 Avoided water usage-for Oil and Natural Gas Hydraulic Fracturing

**OREP Recommends Inclusion:** A large amount of water is required for the process of hydraulic fracturing demonstrating competing needs for water. Hydraulic fracturing in several other states has been exempt from drought or other water restrictions. Solar electricity negates some of the need to acquire natural gas and therefore saves a quantifiable amount of water for other uses, in the process.

F. #26 Thermal Pollution of Fresh Water

**OREP Recommends Inclusion:** Thermal pollution refers to the negative implications on plants and wildlife of warm water discharge from power plants. This discharge directly affects the health of fish and other aquatic organism's possibly leading to death. According to a recent report from Oregon Public Broadcasting, "Unusually warm waters in the Columbia River Basin have prompted federal officials to invoke measures to help migrating fish survive the hostile conditions."<sup>5</sup> As our climate continues to warm, this will be an increasingly important consideration for all forms of electricity generation and should be included now in the Value of Solar calculations.

### **Social Economic Benefit Elements Should be Included**

A. #16 Societal: Economic Development

According to the *PGE Solar Valuation Methodology* (July 13, 2015), methodologies are available for economic development and market price response as summarized in the 2013 RMI meta-study<sup>6</sup>. Other states, such as Rhode Island, had previously made such assessments.<sup>7</sup>

### **5. Other Comments**

A. #3 Line Losses

Accurate evaluation of the value of solar electricity applies line losses as a final correction to the value of the other elements. This is something that the consultant should do properly and it is important to bear in mind as our investigation progresses.

B. #6 Security: Reliability, Resiliency, and Disaster Recovery

**OREP Recommends Inclusion:** This is a valuable component of producing electricity from decentralized solar energy. Optimally valued and planned for disaster-resilience, solar electricity

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<sup>5</sup> Oregon Public Broadcasting. (July 14, 2015). High Temperatures Prompt Cool-Water Releases To Aid Columbia Basin's Migrating Fish. Retrieved from <http://www.opb.org/news/article/high-temps-prompt-cool-water-releases-to-aid-columbia-fish/>

<sup>6</sup> Ibid.

<sup>7</sup> Distributed Generation Standard Contracts and Renewable Energy Fund Jobs, Economic and Environmental Impact Study available at <http://www.energy.ri.gov/documents/DG/RI%20Brattle%20DG-REF%20Study.pdf>

can provide critical, reliable services during disaster recovery scenarios. According to a recent New Yorker article, "...we now know that the odds of the big Cascadia earthquake happening in the next fifty years are roughly one in three. The odds of the very big one are roughly one in ten. Even those numbers do not fully reflect the danger—or, more to the point, how unprepared the Pacific Northwest is to face it."<sup>8</sup> Solar electricity will not help us withstand the actual earthquake when it happens, but it can play a significant role in helping us to prepare for life afterwards, or any one of a number of significant disruptions to the electric grid from forest fires to rainstorms to mudslides. The energy security value of solar electricity is worthy of our attention and should be included in the RVOS calculations. According to the recent PGE Solar Valuation Methodology, methodologies are also available for reliability and resilience as summarized in a 2013 meta-study from Rocky Mountain Institute (RMI)<sup>9</sup>.

C. #7 Utility: Integration Impacts

Integration impacts for the utility can be either a cost or benefit. Staff's Recommendations define the impact only as a cost, and this value requires a more neutral assumption. While integration of solar may incur some costs to the utility, it may also provide greater grid stability and resiliency. Both values need to be properly weighted and accounted for in the RVOS investigation.

D. #18 Capital Risk

**OREP Recommends Inclusion:** Capital risk addresses the costs of borrowing money in relation to time. Solar PV's incremental, small capital acquisition does not carry the same time/risk related costs as acquiring a significant loan for a major power plant project. Over time solar electricity is more cost effective from a loan servicing perspective than central-station energy production, and therefore should be included in the RVOS.

E. #21 Resource Need

**OREP Recommends Exclusion:** Resource Need, unless more clearly defined, doesn't appear to be any different than solar capacity value. Without further clarification and consensus between stakeholders, this element should be excluded from the RVOS investigation.

OREP thanks the Commission for consideration of our comments on this critical docket.

Sincerely,

Ray Neff

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<sup>8</sup> Kathryn Schultz. (July 20, 2015 Issue). The Really Big One. *The New Yorker*. Retrieved from <http://www.newyorker.com/magazine/2015/07/20/the-really-big-one>

<sup>9</sup> A Review of Solar PV Benefit and Cost Studies. Electricity Innovation Lab, Rocky Mountain Institute. (2013) Available at [http://www.rmi.org/cms/Download.aspx?id=10793&file=eLab\\_DERBenefitCostDeck\\_2nd\\_Edition&title=A+Review+of+Solar+PV+Benefit+and+Cost+Studies.pdf](http://www.rmi.org/cms/Download.aspx?id=10793&file=eLab_DERBenefitCostDeck_2nd_Edition&title=A+Review+of+Solar+PV+Benefit+and+Cost+Studies.pdf)

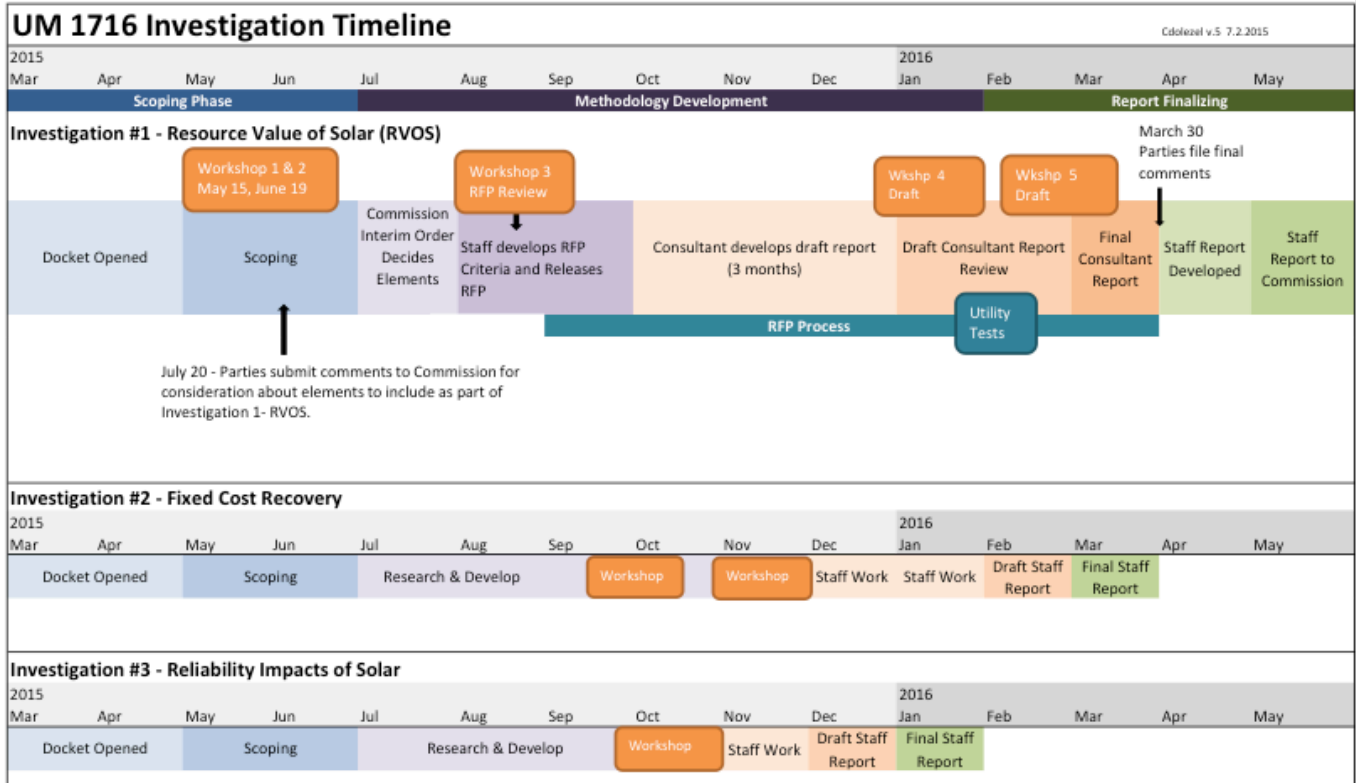


## RESOURCES

- 1) Maine Distributed Solar Valuation Study, Clean Power Research, March 1, 2015. Available online: <https://mpuc-cms.maine.gov/CQM.Public.WebUI/Common/CaseMaster.aspx?CaseNumber=2014-00171>
- 2) Minnesota Value of Solar Methodology, Clean Power Research, January 30, 2014. Available online: <https://www.cleanpower.com/wp-content/uploads/MN-VOS-Methodology-2014-01-30-FINAL.pdf>
- 3) Net Metering in Mississippi: Costs, Benefits and Policy Considerations, Synapse Energy Economics, Inc., September 2014. Available online: [http://www.psc.state.ms.us/InsiteConnect/InSiteView.aspx?model=INSITE\\_CONNECT&queue=CTS\\_ARCHIVEQ&docid=337867](http://www.psc.state.ms.us/InsiteConnect/InSiteView.aspx?model=INSITE_CONNECT&queue=CTS_ARCHIVEQ&docid=337867)
- 4) Net Metering in Missouri: The Benefits and The Costs, Missouri Energy Initiative, Winter 2015. Available online: <http://moenergy.org/images/Net%20Metering%20in%20Missouri%202015%201.pdf>
- 5) Nevada Net Energy Metering Impacts Evaluation, E3, July 2014. Available online: [http://puc.nv.gov/uploadedFiles/pucnv.gov/Content/About/Media\\_Outreach/Announcements/Announcements/E3%20PUCN%20NEM%20Report%202014.pdf?pdf=Net-Metering-Study](http://puc.nv.gov/uploadedFiles/pucnv.gov/Content/About/Media_Outreach/Announcements/Announcements/E3%20PUCN%20NEM%20Report%202014.pdf?pdf=Net-Metering-Study)
- 6) Norris, Benjamin. Clean Power Research. (July 13, 2015). *PGE Distributed Solar Valuation Methodology*. Email attachment from Mihir Desu to the PGE OPUC Filings list, forwarded by Mark Pengilly, July 20, 2015.
- 7) Evaluation of Net Metering in Vermont Conducted Pursuant to Act 125 of 2012, Public Service Department, January 2013. Available online: [http://publicservice.vermont.gov/sites/psd/files/Topics/Renewable\\_Energy/Net\\_Metering/Act%20125%20Study%2020130115%20Final.pdf](http://publicservice.vermont.gov/sites/psd/files/Topics/Renewable_Energy/Net_Metering/Act%20125%20Study%2020130115%20Final.pdf)

Appendix 1: UM 1716 Timeline (from Staff Recommendations)

Attachment A - Timelines for UM 1716 Investigations



Appendix 2: UM 1716 Elements Matrix (from Staff Recommendations)

Attachment C - List of Elements and Parties Responses																
#	Elements	Utilities*				Non-Profits/Advocacy **								Totals		
		PUC	PGE	PAC	Idaho	CUB	IREC	GEI	TASC	OREP	Enviro OR	RNP	OSEIA	NWEC	Total ( Yes out of total responders)	% of Responders Said Yes
	Should these elements be included for exploration for a methodology to lead to a resource value of solar?															
1	Avoided Energy Impacts														13	100%
2	Avoided Capacity Additions														13	100%
3	Line Losses														13	100%
4	Avoided Transmission and Distribution														13	100%
5	Compliance Value: RPS														13	100%
6	Security: Reliability, Resiliency, and Disaster Recovery														13	100%
7	Utility: Integration Impacts														13	100%
8	Utility: Administration Impacts														13	100%
9	Utility: Interconnection Impacts														12	92%
10	Financial: Market Price Response					~									12	92%
11	Ancillary Services and Grid Support					~									12	92%
12	Financial: Fuel Price Hedge														12	92%
13	Operational Impacts					~	~				~	~	~		7	88%
14	Avoided Natural Gas Pipeline Impacts														9	69%
15	Rate Impacts: Net Metering Credits														9	69%
16	Societal: Economic Development														8	62%
17	Health and Other Societal Impacts												~		7	58%
18	Capital Risk					~	~				~	~	~		4	50%
19	Utility: Production Impacts (IRP Process)												~		6	50%
20	Behind-the-Meter Production During Billing Month			~		~									5	45%
21	Resource Need					~				~			~		4	40%
22	Rate Impacts: Lost Utility Revenue														3	23%
23	Tax Credits (State and Federal)										TBD	TBD	TBD		2	20%
24	DSM Alternative Impacts			~	~	~	~			~			~		1	14%
25	Environment: Compliance Impacts															
	Carbon—Current												~		11	92%
	Carbon—Future												~		9	82%
	NOx/SOx/Particulates—Current												~		11	92%
	NOx/SOx/Particulates—Future												~		8	73%
	Other—Current (e.g. Mercury Air Toxics)												~		11	92%
	Other—Future					TBD	~						~		7	70%

#	Elements	PUC	PGE	PAC	Idaho	CUB	IREC	GEI	TASC	OREP	Enviro OR	RNP	OSEIA	NWEC	Total ( Yes out of total responders)	% of Responders Said Yes
26	Environment: Externalities															
	Carbon—Societal Impacts of Carbon												~		8	67%
	Carbon—Ocean Warming and Acidification												~		7	58%
	NOx/SOx/Particulates—Societal Impacts												~		7	58%
	Avoided water usage—for Thermal Power Production												~		7	58%
	Avoided water usage—for Natural Gas Hydraulic Fracturing												~		7	58%
	Avoided pollution—Associated with Hydraulic Fracturing												~		7	58%

\* Portland General Electric (PGE), Pacific Power (PAC), Idaho Power (Idaho)  
 \*\* Citizens' Utility Board (CUB), Interstate Renewable Energy Council, Inc. (IREC), Green Energy Institute, Lewis & Clark Law School (GEI), The Alliance for Solar Choice (TASC), Oregonians for Renewable Energy Progress (OREP), Renewable Northwest (RNP), Oregon Solar Energy Industries Association (OSEIA), and Environment Oregon (Enviro OR), Northwest Energy Coalition (NWEC), Oregon Department of Energy (ODOE)

Legend:  
 = YES  
 = YES with a caveat  
 = No  
 ~ = No Answer, TBD

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