BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

UM 1673

In the Matter of OREGON PUBLIC UTILITY COMMISSION Comments on "Draft Report to the Legislative Assembly: Investigation into the Effectiveness of Solar Programs in Oregon"	Comments of Oregonians for Renewable Energy Progress

Oregonians for Renewable Energy Progress (OREP) thanks the Commission for the opportunity to submit comments on the May 8, 2014 Draft Report to the Legislature.

Please note that OREP also participated heavily in writing comments with the Joint Intervenors who, together with OREP, participated in the Working Group that lead to passage of HB 2893 and subsequently to this Report to the Legislature. These individual comments will speak to sections of the Draft Report from OREP's unique perspective while seeking not to be repetitive of the joint comments.

We also acknowledge and appreciate the comments of Chris Robertson that were filed in time for our review before this submission; his comments reflect a depth and breadth of information and perspective that the Commission would do well to incorporate into the final report.

We also attach, as an appendix to these comments, comments from our partner, the Clean Coalition.

Our individual OREP comments will specifically address:

1) General Success of Solar Programs to Date
2) The Value of Solar
3) Economic Benefits of Renewables for Oregon
4) The Oregon Solar Pilot Program
    a. Not an Advanced Feed-in Tariff
    b. Methodological Errors in Calculations in Draft Report
5) Other Approaches for Promoting Solar
    a. Feed-in Tariffs
    b. Thinking outside the box
6) Page-by-page reaction to some specifics in report

1) General Success of Solar Programs to Date

The rapid development of solar photovoltaic technology over the last decade and the precipitous drop in its cost is a story of stunning success that we in the renewable energy community are familiar with but which should be shared with legislators. Oregon has been a leader in incentive programs to promote solar technologies. That investment, along with even greater investments in the international community has come to fruition in the low cost of today's hardware. We are now very close to the point we have been working toward, where solar is competitive on its own merit. That is already true in many places for all system sizes (cloudy Germany's residential FIT rate is now below retail) and true in places in Oregon for utility scale projects. Legislators should be made aware of this success and understand the importance of supporting our well-developed industry of small scale installers just a little longer until solar is cost effective at all scales.

As a practical matter, we suggest trumpeting the cost reduction successes by bringing the cost data on solar PV toward the front of the report to be a companion to the installation data on pages 5 and 6.

2) The Value of Solar

That solar energy generated close to load has a value in excess of the same amount of energy generated at a central station fossil fuel plant is a concept that is likely new to the audience of this report and hence warrants a little more introduction and explanation than is in the draft report. OREP recommends that a brief description be given of each component and provides examples of possible language here.

The division of solar benefits in the Draft Report into hard and soft benefits is confusing and inconsistently defined. The report has functionally divided the benefits into those to be included and excluded as determined by the Commission's preliminary order in UM 1559; this is a temporary and local division. Furthermore, the terms "hard" and "soft" are unhelpful and confusing since these terms are already (and traditionally) used to describe the hardware and process costs of solar installation. We recommend instead using the terminology "Benefits to Ratepayers" and "Benefits to Society" as below.

Benefits to Ratepayers

Energy: "PV systems produce electricity. The basic energy production value occurs because the amount of electricity that needs to be generated at other plants is reduced by the amount of PV production, thus decreasing the amount of fuel that is consumed and the O&M costs associated with the electricity-generation equipment."[1]

Reduced transformer and line losses: "PV systems produce energy at the point of consumption. There are reduced losses in the T&D system because the energy produced by PV systems does not have to pass through the transmission and distribution systems to reach the point of use." [2] Line losses increase with increases in temperature. Since solar is produced during the day and to a greater extent in summer there are good arguments for calculating the benefit using marginal line losses instead of average line losses.[3]

Fuel Price Hedge Value: "PV systems produce electricity at a stable price. PV cost is almost entirely capital related, with nearly negligible O&M costs and no fuel costs. PV energy prices are therefore fixed and known over the life of the system. In contrast, electricity prices from fossil-based generation are subject to potentially large fuel price fluctuations. Just as insurance or certain financial products provide "hedge" value against undesirable outcomes under uncertain future conditions, PV provides a hedge against natural gas price uncertainty. This is the value of the reduction in fuel price uncertainty." [4]

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1 Hoff, Tom. "The Value of Distributed Photovoltaics to Austin Energy and the City of Austin ." Clean Power Research, 17 Mar. 2006. Web. 23 May 2014. <http://www.ilsr.org/wp-content/uploads/2013/03/Value-of-PV-to-Austin-Energy.pdf>.

2 Ibid.

3 Rabago, Karl, et al. "Designing Austin Enery's Solar Tariff Using a Distributed PV Value Calculator." < http://www.cleanpower.com/wp-content/uploads/090_DesigningAustinEnergysSolarTariff.pdf>

4 Hoff, Tom. "The Value of Distributed Photovoltaics to Austin Energy and the City of Austin ." Clean Power Research, 17 Mar. 2006. Web. 23 May 2014. <http://www.ilsr.org/wp-content/uploads/2013/03/Value-of-PV-to-Austin-Energy.pdf>.

Generation Capacity: "Distributed PV effectively provides generation capacity by reducing demand-side consumption. Generation capacity value is the product of an economic value of an ideal resource (as represented by a natural gas turbine) and a technical adjustment to reflect PV's actual peak load reduction value". [5]

Transmission and Distribution Capacity: "Targeted deployment of PV relieves loads on the utility's transmission, sub-transmission, and distribution systems, effectively increasing available T&D capacity. This relief allows utility T&D planners to defer capital investments in the T&D system. The economic value of these deferrals includes both the time value of money and the reduction in T&D system O&M costs." [6]

*Other Grid Support Service*s: Advanced inverter technologies can provide reactive power control, voltage and frequency ride-through, utility interoperability, and improved grid stability. "Advanced inverter functionalities may lend significant improvement to the stability, reliability, and efficiency of the electric power distribution system."[7]

Grid Resiliency: Solar provides a reliable source of energy that is independent of interruptions in the supply chain for natural gas. With the recent shift in electricity production from coal (which can be stockpiled on site at power plants) toward natural gas (which depends on just-in-time delivery and is simultaneously used for space and water heating), there is increasing concern about the resiliency of the delivery system. A recent study out of MIT reports, ""Natural gas is a just-in-time fuel, exacerbating the challenges between it and the electricity sector. But there are steps that can be taken to add in resiliency and reduce the risks that power won't be available when it's needed most." To provide more predictable and reliable power at natural gas plants, the report suggests incentivizing dual-fuel capabilities at new power plants, using fuels with separate supply chains."[8] A technology such as solar that has a predictable and reliable fuel source that provides duel fuel capability to the grid.

Fuel Price Depression: As witnessed in European and other markets[9], high levels of renewable energy penetration reduces the demand for fossil fuel resources and creates a corresponding decrease in the cost of those resources to conventional power plants.

Environmental Compliance Savings: The impact of carbon dioxide emissions on global ecological systems is a well-established fact that is eliciting political responses at the national, state, and city levels. Further regulations on carbon emissions and/or carbon pricing mechanisms are certain to be instituted during the 40-year lifespan of solar panels being installed today. Just as solar provides a hedge against fuel price escalation and volatility, solar provides insurance to ratepayers against future rate shocks associated with carbon compliance costs.

Disaster Recovery: Solar PV, in conjunction with advanced inverters, storage, or microgrids, can provide a stable source of electricity for communications and other essential services during weather, earthquake, volcanic, or terrorist emergencies. Such systems are already being put in place in Oregon, such as the recent installation at the June Key Delta Community Center in North Portland.[10]

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5 Hoff, Tom. "The Value of Distributed Photovoltaics to Austin Energy and the City of Austin ." Clean Power Research, 17 Mar. 2006. Web. 23 May 2014. <http://www.ilsr.org/wp-content/uploads/2013/03/Value-of-PV-to-Austin-Energy.pdf>.

6 Ibid

7 Advanced Inverter Technologies Report, Grid Planning and Reliability, Public Utilities Commission, State of California (January 18, 2013), available at <http://www.cpuc.ca.gov/NR/rdonlyres/6B8A077D-ABA8-449B-8DD4-CA5E3428D459/0/CPUCAdvancedInverterReport2013FINAL.pdf>.

8 Ekstrom, Vikki. "Grid Reliability and the Role of natural Gas." MIT News, 8, May 2014. Web. 23 May 2014. <http://newsoffice.mit.edu/2014/grid-reliability-and-role-natural-gas>.

9 Shahan, Zachary. "Link Between Electricity Prices & Renewable Energy Completely Warped In Forbes Article." CleanTechnica, May 1, 2014. Accessed May 22, 2014 at http://cleantechnica.com/2014/05/01/electricity-prices-renewable-energy-forbes/

10 Oregon Solar Energy Industries Association. Press Release, Nov 12, 2013

Benefits to Society

Economic Benefits: Installation of distributed solar creates local installation jobs and supports manufacturing of solar panels and other associated hardware in Oregon. These might be called direct economic benefits. Indirect economic benefits are accrued by the economic activity created by buying home-grown energy and keeping Oregon's energy dollars circulating here in Oregon. Currently $12 billion goes permanently out of state each year to buy fossil energy. The extent of these dual benefits is not yet quantitatively known. The legislature would do well to earmark funding for a study of these benefits.

Avoided Human Health Impacts: The lifecycle health costs of coal-fired electricity in particular is well documented. A study by the Harvard School of Public Health estimates that the externalized health cost of coal fired electricity is 13 cents/kWh.[11] While these health effects are for the most part not borne by Oregonians, they are borne by our neighbors to the east whose coal in 2011 provided 67.4% of the electricity in the Pacific Power energy mix and 30.3% of PGE's electricity.

Avoided Environmental Harms: There is a tendency in the discussions of the value of solar to confuse environmental compliance benefits to ratepayers with the actual value of avoided harms to the environment. It is now well-established that anthropogenic emissions of carbon dioxide are having profound effects on the climate, sea level, and ocean chemistry.[12] The current and future costs of these emissions have historically been "externalized" from the processes generating them. Now that cause and effect is better understood and it is clear that Oregonians are already paying the price in such areas as increased forest fire fighting costs and loss of shellfish nurseries, it is appropriate to think in terms of the least cost of generating "responsible energy", whether that be through renewables or fossil fuels with capture and permanent sequestration of carbon.

3) Economic Benefits of Renewables for Oregon

In its brief discussion of jobs, the Draft Report notes that there are 1,239 solar jobs in Oregon and that smaller installations support an ongoing stream of installation jobs.

According to the Solar Foundation (www.solarfoundation.org/research/national-solar-jobs-census-2013), Oregon had 2,700 solar jobs in 2013 and was one of only four states to lose solar jobs in the past year, when it showed decline of 200 jobs. This may be a reflection of the declining solar incentives offered in Oregon. This job impact would doubtless be of interest to legislators.

Furthermore, inasmuch as Oregon produces no fossil fuels, increased in-state generation of energy from renewable sources would increase employment and tax revenues and decrease the flow of dollars sent out of state for fossil fuels. Recommendations for future programs should make legislators aware of this benefit to Oregon's economy.

4) The Oregon Solar Pilot Program

a. Not an Advanced Feed-in Tariff

Due to program size limitations, chosen solutions to issues of compliance with federal laws and policies, a desire to measure total interest in the program, and other considerations, the ultimate design of the Solar Pilot Program differs in many important ways from that of advanced feed-in tariff policies. The similarities and differences are summarized in Table 1.

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11 Harvard Medical School. "Mining Coal, Mounting Costs:The Lifecycle consequences of Coal". <http://www.oregonrenewables.com/Publications/Reports/Mining_Coal_Mounting_Costs.pdf>

12 2014 National Climate Assessment. U.S. Global Change Research Program. May 2014. Accessed May 7, 2014 at http://nca2014.globalchange.gov.

Attribute	Advanced FIT	Solar Pilot Program
Production Payment - Utility pays a fixed, contracted price to the producer for each kWh produced for the length of the contract	Yes	Yes
Buy All - Utility is required to buy all the energy produced from the renewable energy system	Yes	No
Cost-Based Price - The price paid is set in order to cover the cost of the system and a return on investment	Yes	No – set by automatic rate adjustment mechanisms and bid
Published Degression -The price paid is subject a degression that is published in advance and that is further subject to review and adjustment in the case of rapidly dropping costs	Yes	No
The price paid is differentiated by technology and geographic resource intensity	Yes	Yes
Offers TLC – transparency, longevity, and certainty	Yes	No
Transparency	Yes	Somewhat - good public process at the PUC for those involved but confusion for the public due to multiple names of program
Longevity	Yes	No – limited to five years
Certainty	Yes	No – lottery and bid system both leave application success uncertain

We will briefly discuss each of the areas in which the Oregon Solar Program (SPP) differ from an advance FIT and the ramifications thereof.

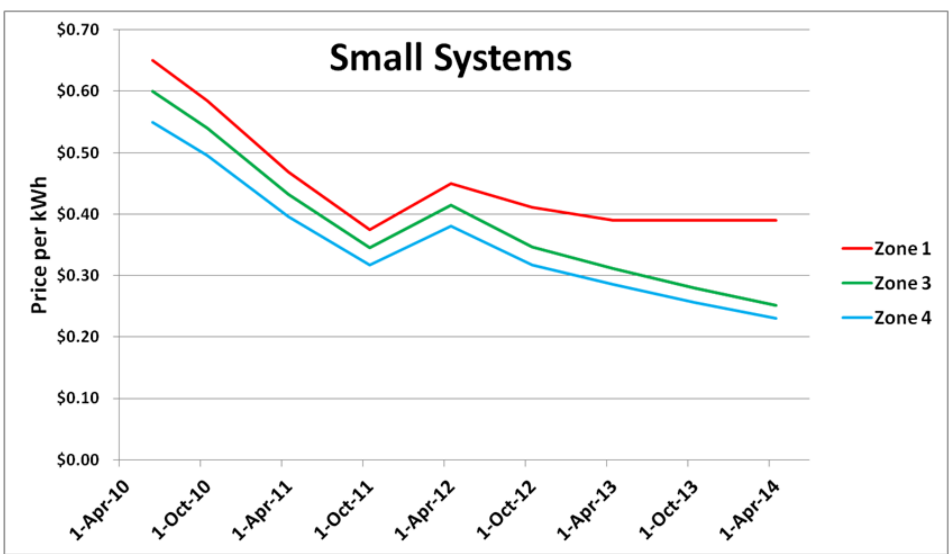
Buy All. Most of the systems installed under the SPP were limited in size to production of 90% of load of the associated facility. This means that roof space may not be maximized, leaving efficiencies of scale on the table, hence requiring a higher VIR to pencil out than would otherwise be necessary.

Cost-Based Price. The SPP program began with a cost-based price for small and medium systems and a bid system for large systems but quickly reverted to a form of market-set mechanism for all sizes.

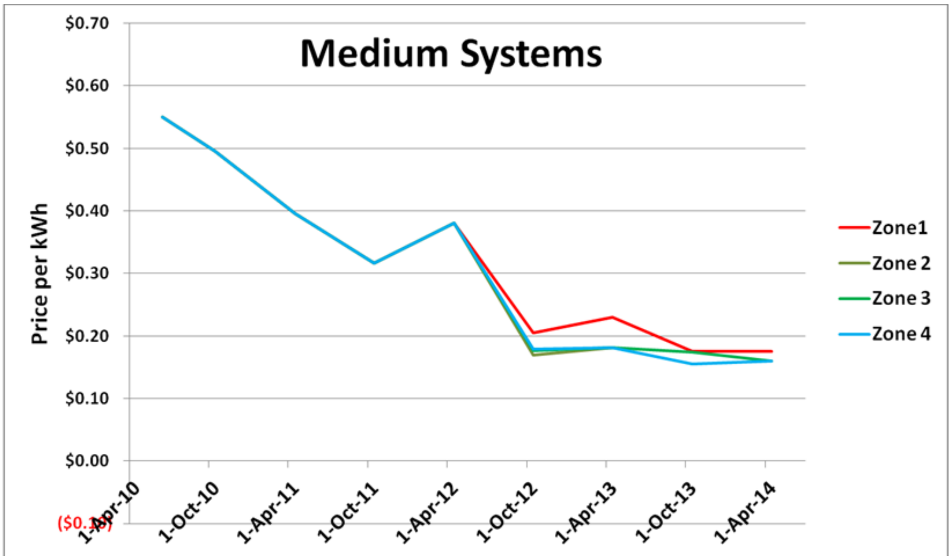
The bid system seems to have been effective at installing systems at a good price. This method of price setting has the potential to suffer from inability to actually build at the winning bid price. During the course of the SPP, successful installation of the bid systems was likely aided by the rapidly falling cost of hardware, leading to a very successful outcome.

For small systems, after the initial price was set on a cost-based method, the VIRs were set by arbitrary adjustments for the next allocations until the lottery system was instituted. Henceforth, the price for each period was set by an automatic rate adjustment mechanism (ARAM) based on uptake in the previous period. This mechanism worked to some extent but the lottery added a great deal of uncertainty into the marketplace, reportedly increasing the soft costs of customer acquisition and discouraging installers from using the SPP as they were unable to guarantee a successful enrollment to their customers.[13] This uncertainty around winning an allotment may have been less important to vendors using third-party-leasing models who would be able to offer their customers a financial deal that was independent of the incentive program used.

The lottery structure and the ARAM eventually may have been used strategically by installers, who would be incented to limit their applications into this program in order to not depress the price. This possibility is suggested by the fact that while 69% of the systems in the 2013 SPP in PGE territory were installed by a single company, that same company installed many more systems during the same time under the ETO/Tax Credit program. It is possible that lack of certainty leading to lack of competition in the SPP market place worked against the ARAM to prevent a decrease in VIR in Zone 1. The cause of the curiously and consistently high prices in Zone 1 is worth understanding given their departure from the decreasing prices in other regions and system sizes over the last several enrollment periods.



[13] Anecdotal evidence based on installer comments.



Critical to a good FIT design are the attributes of TLC, standing for transparency, longevity, and certainty. All of these attributes combine to drive the costs of installation and the prices needed down as quickly as possible. As noted in table 1 and in the conversation above, the SPP is lacking in all areas.

Transparency. The process at the PUC was transparent for those who actively engaged in the process. Promotion and public education around the program was hampered by the three different names used by the three utilities. There is no centralized place on the internet for interested consumers to find consistent information about the SPP.

Longevity. The program was initially set to use its allotted capacity in four years. This expiry date coupled with the small size of the program discouraged financial institutions, which are notoriously slow to change, from developing new financing products around the program. We understand that several banks have begun to loan under the program, but overall, participants in the program have been challenged to find financing. This challenge has required higher VIRs to make systems pencil out.

Certainty. The SPP has been lacking in certainty for all participants, both in knowing whether or not an allocation will be won (true for both bid and lottery) and in knowing what the price will be going forward. Lack of certainty translates into lack of efficiency, participation, and higher VIRs. This certainty for solar financing "is a combination of a long-term contract, a guaranteed grid connection, and a contract price sufficient for a modest return on investment. The contract provides secure financing for solar projects, reducing borrowing costs and the total cost of solar electricity."[14]

Given the multiple ways in which the Solar Pilot Program differs from an advanced feed-in tariff we suggest that it be referred to as the Solar Pilot Program in the report and that its outcomes, for the reasons outlined above, can be expected to have fallen significantly short of what might be achieved with an actual FIT. As will be discussed later, advanced FITs should be added to the list of other possible programs to pursue.

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[14] Farrell, John. "How to Phase Out Incentives and Grow Solar Energy" Grist, May 5, 2014. Accessed May 15, 2014 at http://grist.org/article/how-to-phase-out-incentives-and-grow-solar-energy/.

b. Methodological Errors in Calculations in Draft Report

The Draft Report appears to suffer from methodological errors in calculating the costs of incentives for the Solar Pilot Program. On page 1 of Appendix 2, the Draft Report states the assumption that for years 16 through 20 the *incentive* payments for the VIR program will be 15 cents/kWh. Given that statute requires that payments to participants at the end of the program be based on the solar resource value of the energy produced, and that producers will continue to purchase their energy back at retail rate, there is zero *incentive* after the contracts come to an end.

OREP inquired as to the source of this error and was told by Staff that the cash payments *plus* bill credits (ie the full VIR) was counted as incentive for the purpose of the LCOI analysis. This is a conceptual and accounting error. The consumer-producer owns the system and the energy that it produces. The producer-consumer sells the energy to the utility for the VIR rate and buys it back at the retail rate. Because of our net-metering-plus approach to accounting for the program, the sale and purchase of the energy at retail rate shows up as a net zero billing for energy on the bill and the utility pays the consumer-producer the (VIR minus retail rate) in the form of a cash "incentive." (In many jurisdictions this additional payment is thought of as payment for the additional attributes that solar provides.)

Alternatively, the consumer could receive the entire VIR as a cash payment and buy their energy back at retail rate like other customers. In any case, the retail rate portion of the VIR paid (or credited) to the consumer is payment for the energy produced, not an incentive.

OREP used Staff's master spreadsheet and subtracted the retail value of the electricity (assumed 10 cents/kWh) from the program costs that were identified by staff as cash payment plus bill credit. Since the retail rate is expected to rise over time, the value of the incentive (VIR minus retail) is expected to decrease over time. OREP looked at retail rate escalation rates of 0%, 3% and 5% and arrive at LCOIs ranging from 15.7 to 18.7 cents/kWh for PGE and 20.1% to 23.1cents/kWh for PAC. Compared to the results for the 3% escalation in retail rates, Staff's calculations for the LCOI for the VIR program are *70% and 60% overstated* for the two utilities. The correct results are, in fact, very much in line with the LCOIs for the combination of ETO and State incentives reported in Appendix 1.

This fundamental error in thinking makes all the numeric results for the VIR program and the comparative conclusions in the report invalid. OREP is happy to work with staff as needed to sort out this important issue.

5) Other Approaches for Promoting Solar

a. Advanced Feed-in Tariffs

Any discussion of successful policies for promoting solar must include a discussion of feed-in tariffs (FITs) which by the end of 2012 were responsible for more than 70% of capacity installed worldwide.[15] In this country, FITs are often known as Clean Contracts, where CLEAN is an acronym form Clean Local Energy Accessible Now. The Clean Coalition tracks FIT/Clean Contract legislation in the US and recently published a recap of 2013 legislative efforts.[16] Key characteristics of FIT policies were discussed in section 4a.

15 Morris, Craig. Feed-in tariffs – do they discourage efficiency? Energy Transition: The German Energievende, Feb 20, 2014. Accessed May 23, 2014 at http://energytransition.de/2014/02/do-fits-discourage-efficiency/

16 Community Update | March 20, 201, the Clean Coalition

<http://hosted.verticalresponse.com/620882/86bc3ca80a/282619947/b07d4e3551/#CLEAN>

b. Thinking outside the box

As noted by other comments, the Draft Report would be strengthened and would provide more useful guidance to legislators by consulting with the State Department of Energy to identify barriers within the programs and setting forth more detailed recommendations for establishing new programs. Some of these might include:

- Requiring solar installations on new construction
- Requiring advanced meters and solar-ready wiring on new construction
- Orientation of new housing development for solar access
- Allowing utilities to treat above-market payments to generators as capital expenses
- Establishing State low-interest loan programs
- Virtual net metering programs
- Expanded purchases of local solar energy by voluntary green power program subscribers
- Installation of solar arrays in transmission rights of way close to substations
- Mapping of areas for high, medium and low value of solar projects
- Establishment of renewable energy avoided costs for different technologies and system sizes
- Incentive utility participation in carbon reduction and distributed generation
- Utility participation in customer acquisition and marketing
- Including utility bills and PV generation revenue streams in mortgage calculations

Business-as-usual approaches will neither reduce carbon emissions nor decrease cost rapidly enough.

6) Page-by-page reaction to some specifics in report

Parties have been allowed a very short window of time to respond to this very long report. Here are some brief reactions, corrections, and suggestions.

p. 5 – since 68% of 2013 VIR participants used third party financing models it is worth a full discussion of how these models work and who they benefit.

p.4- 5 – it would be good to see the graphs of how prices have come down in conjunction with installs going up.

p. 6 – take out incentive in top line as not all these programs are incentive programs

p.10 pp.3 – change “the prevailing” to “a fixed”

p. 11 – Federal Investment Tax Credit – it is worth noting here or in a section dedicated to third party leasing models that the third party leasing companies are able to give customers a better deal because of them being able to take advantage of the accelerated depreciation allowed under federal law. This accelerated depreciation is of no direct value to most straight forward owners of a system

p.13 – the reported cost of 24.9 cents/kWh (over what time frame?) as reported by ETO is a red flag regarding the VIR set for small systems in the Willamette Valley. The difference between the ETO value in the valley (24.9 cents/kWh) versus southern and central Oregon (18.2 cents/kWh) is 6.5cents per kWh, a reasonable reflection of the 30%-40% difference in insolation levels. The difference in VIR for small systems is 14 to 16 cents/kWh (39kWh versus 25 and 23cents/kWh). Why?
Assumptions are not given in the first reported numbers about insolation levels.Also, see Chris Robertson’s comments for costs.

p. 15 – As per Chris Robertson's comments, it would be very helpful to show costs and especially soft costs elsewhere (Germany, Australia) to show legislators what is possible

p. 16 and 17 graphs – these graphs are not well cited or explained. What is the time frame assumed for cost of generation? Discount rate? Assumed natural gas prices? These data are only as meaningful as their assumptions are good. Assumptions should be expressly given.
How would these graphs look after achieving SunShot goals?

p. 24 – For clarity, we suggest revising Table 5.4 on page 24 to use kWh rather than MWh. KWh are the denomination used throughout the report, including Tables. 5.1, 5.2, 5.3 and 6.1. To the casual reader who may not know what MWh means relative to kWh, it may make the information in Table 5.4 easier to compare to other figures in the report if the denominations are consistent. MWh is used in only one other place in the draft report, in Figure 8 at page 17, but its use there is unlikely to cause confusion as it simply reflects comparative generation costs of different technologies in the same figure.

p. 25 – 20 years is a short time horizon for a zero-cost resource that keeps on generating with very little O and M. This point should be acknowledged at minimum. What discount rate is used? If 7% then this is too high. What matters to ratepayers is the rate of inflation not the return that utilities make on their investments.

p. 28 pp. 2 – one of the many instances where the reports states as fact the unsupported supposition that net metering shifts costs to non-participating customers

p. 33 – the Solar Pilot Program is scheduled to end in 2016 but the majority of the capacity has already been allocated. A small allocation in April 2015 will apportion out the capacity left over from systems not built in 2014.

THESE COMMENTS AND THE ATTACHED APPENDIX ARE RESPECTFULLY SUBMITTED

DATED this 23rd day of May, 2014.

Kathleen Newman,

Oregonians for Renewable Energy Progress
Kathleen@OregonRenewables.com
503-648-5218 (h) 503-724-4135 (c)
http://www.oregonrenewables.com

Advancing the transition to locally-owned, locally-generated, clean and renewable energy.

UM 1673–CERTIFICATE OF SERVICE

I hereby certify that I have this day caused Comments of Interveners on "Draft Report to the Legislative Assembly: Investigation into the Effectiveness of Solar Programs in Oregon" to be served by electronic mail to those parties whose email addresses appear on the attached service list, and by First Class Mail, postage prepaid and properly addressed, to those parties on the service list who have not waived paper service from OPUC Docket No. UM 1673.

DATED this 23rd day of May, 2014.

Kathleen Newman,

Oregonians for Renewable Energy Progress
Kathleen@OregonRenewables.com
503-648-5218 (h) 503-724-4135 (c)
http://www.oregonrenewables.com

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	ROBERT DELMAR ENERGY ANALYST	625 MARION STREET NE SALEM OR 97301-3737 robert.delmar@state.or.us
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	RENEE M FRANCE SENIOR ASSISTANT ATTORNEY GENERAL	NATURAL RESOURCES SECTION 1162 COURT ST NE SALEM OR 97301-4096 renee.m.france@doj.state.or.us
W	**CABLE HUSTON BENEDICT HAAGENSEN & LLOYD LLP**	
	RICHARD LORENZ	1001 SW FIFTH AVE - STE 2000 PORTLAND OR 97204-1136 rlorenz@cablehuston.com
	CHAD M STOKES	1001 SW 5TH - STE 2000 PORTLAND OR 97204-1136 cstokes@cablehuston.com
W	**CHRIS ROBERTSON & ASSOCIATES, LLC**	
	CHRIS ROBERTSON	3707 NE 16TH AVE PORTLAND OR 97212 cnrobertson@comcast.net
W	**CITIZENS' UTILITY BOARD OF OREGON**	
	OPUC DOCKETS	610 SW BROADWAY, STE 400 PORTLAND OR 97205 dockets@oregoncub.org
	ROBERT JENKS	610 SW BROADWAY, STE 400 PORTLAND OR 97205 bob@oregoncub.org
	G. CATRIONA MCCRACKEN	610 SW BROADWAY, STE 400 PORTLAND OR 97205 catriona@oregoncub.org

W	**CITY OF PORTLAND**	
	FRANCO LUCCHIN	1221 SW 4TH AVE ROOM 430 PORTLAND OR 97204 franco.lucchin@portlandoregon.gov
	JAIMES VALDEZ	1900 SW 4TH AVE ROOM 7100 PORTLAND OR 97201 jaimes.valdez@portlandoregon.gov
W	**ENERGY TRUST OF OREGON**	
	DEBBIE GOLDBERG MENASHE	421 SW OAK ST, STE. 300 PORTLAND OR 97204 debbie.goldbergmenashe@energytrust.org
	THAD ROTH	421 SW OAK STE 300 PORTLAND OR 97204 thad.roth@energytrust.org
W	**ENVIRONMENT OREGON**	
	CHARLIE FISHER	1536 SE 11TH AVE STE B PORTLAND OR 97214 charlie@environmentoregon.org
	SARAH HIGGINBOTHAM	1536 SE 11TH AVE STE B PORTLAND OR 97214 sarah@environmentoregon.org
W	**IDAHO POWER COMPANY**	
	REGULATORY DOCKETS	PO BOX 70 BOISE ID 83707-0070 dockets@idahopower.com
	JULIA HILTON	PO BOX 70 BOISE ID 83707-0070 jhilton@idahopower.com
W	**MCDOWELL RACKNER & GIBSON PC**	
	LISA F RACKNER	419 SW 11TH AVE., SUITE 400 PORTLAND OR 97205 dockets@mcd-law.com
W	**NW & INTERMOUTAIN POWER PRODUCERS COALITION**	
	ROBERT D KAHN	PO BOX 504 MERCER ISLAND WA 98040 rkahn@nippc.org
W	**NW ENERGY COALITION**	

	WENDY GERLITZ	1205 SE FLAVEL PORTLAND OR 97202 wendy@nwenergy.org
W	**OBSIDIAN RENEWABLES**	
	LAURIE HUTCHINSON	5 CENTERPOINTE DR STE 590 LAKE OSWEGO OR 97035 lhutchinson@obsidianrenewables.com
W	**OBSIDIAN RENEWABLES, LLC**	
	DAVID BROWN	5 CENTERPOINT DR, STE 590 LAKE OSWEGO OR 97035 dbrown@obsidianfinance.com
W	**OREGONIANS FOR RENEWABLE ENERGY POLICY**	
	KATHLEEN NEWMAN	1553 NE GREENSWORD DR HILLSBORO OR 97214 k.a.newman@frontier.com
	MARK PETE PENGILLY	PO BOX 10221 PORTLAND OR 97296 mpengilly@gmail.com
W	**PACIFIC POWER**	
	GARY TAWWATER	825 NE MULTNOMAH STE 2000 PORTLAND OR 97232 gary.tawwater@pacificorp.com
W	**PACIFICORP**	
	ETTA LOCKEY	825 NE MULTNOMAH ST., STE 1800 PORTLAND OR 97232 etta.lockey@pacificorp.com
W	**PACIFICORP, DBA PACIFIC POWER**	
	OREGON DOCKETS	825 NE MULTNOMAH ST, STE 2000 PORTLAND OR 97232 oregondockets@pacificorp.com
W	**PORTLAND GENERAL ELECTRIC**	
	JAY TINKER	121 SW SALMON ST 1WTC-0702 PORTLAND OR 97204 pge.opuc.filings@pgn.com
W	**PORTLAND GENERAL ELECTRIC COMPANY**	
	J RICHARD GEORGE	121 SW SALMON ST 1WTC1301

		PORTLAND OR 97204 richard.george@pgn.com
W	**PUBLIC UTILITY COMMISSION OF OREGON**	
	ADAM BLESS	PO BOX 1088 SALEM OR 97308-1088 adam.bless@state.or.us
W	**RENEWABLE NORTHWEST**	
	RENEWABLE NW DOCKETS	421 SW 6TH AVE., STE. 1125 PORTLAND OR 97204 dockets@renewablenw.org
	MEGAN DECKER	421 SW 6TH AVE #1125 PORTLAND OR 97204-1629 megan@renewablenw.org
W	**RENEWABLE NORTHWEST PROJECT**	
	MICHAEL O'BRIEN	421 SW 6TH AVENUE #1125 PORTLAND OR 97204 michael@rnp.org
W	**RICHARDSON ADAMS, PLLC**	
	GREGORY M. ADAMS	PO BOX 7218 BOISE ID 83702 greg@richardsonadams.com
	PETER J RICHARDSON	PO BOX 7218 BOISE ID 83707 peter@richardsonadams.com
W	**SIERRA CLUB**	
	RHETT LAWRENCE	1821 SE ANKENY ST PORTLAND OR 97214 rhett.lawrence@sierraclub.org
	BRIAN PASKO	1821 SE ANKENY ST PORTLAND OR 97214 brian.pasko@sierraclub.org
W	**THE ALLIANCE FOR SOLAR CHOICE**	
	ANNE SMART	18595 MARKET ST 29TH FL SAN FRANCISCO CA 94105 anne@allianceforsolarchoice.com

Clean Coalition
Making Clean Local Energy Accessible Now

May 23, 2014

Adam Bless
Public Utility Commission of Oregon
3930 Fairview Industrial Dr. SE
Salem, Oregon 97302-1166

RE: Comments on May 2014 Draft Report, Investigation into the Effectiveness of Solar Programs in Oregon

The Clean Coalition respectfully submits the following comments on the Commission's Draft Report into the Investigation into the Effectiveness of Solar Programs in Oregon (the "Draft Report"). The Clean Coalition's comments focus on quantifying the value of distributed solar power to the ratepayers and the energy system.

The Clean Coalition is a California-based nonprofit organization whose mission is to accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise. The Clean Coalition drives policy innovation to remove barriers to procurement, interconnection, and realizing the full potential of integrated distributed energy resources, such as distributed generation, advanced inverters, and energy storage. The Clean Coalition's Resource Hub includes many resources that reveal the value of distributed generation[1] and provide guidance and developing local renewables programs, including the Local CLEAN Program Guide, a seven-volume guide to evaluating, enacting and implementing utility programs for procuring and interconnecting local renewables.[2] This comprehensive guide includes step-by-step guidance and national and global best practices for estimating the net value of local renewables, estimating economic benefits, and designing policies and procedures for local renewables programs. The Clean Coalition participates in proceedings before state and federal agencies throughout the United States. The Clean Coalition has also produced

Throughout the country, state regulators and utilities generally include in distributed solar value calculations all quantifiable, direct benefits to ratepayers. The following quantifiable, direct benefits to ratepayers should be considered "hard" benefits to Oregon ratepayers.[3] We also recommend that Oregon

[1] See http://www.clean-coalition.org/resource/the-resource-hub/state-level-resources/value-of-distributed-generation/
[2] The Clean Coalition's Local CLEAN Program Guide is available at http://www.clean-coalition.org/resource/the-resource-hub/single-utility-resources/
[3] See the Clean Coalition's Local CLEAN Program Guide, Module 3: Evaluating Avoided Costs for more details on determining the full value of distributed renewable generation

policymakers consider additional societal benefits, such as those included in our catalogue of benefits of distributed generation,[4] or as calculated by the Clean Coalition for the Hunters Point substation of San Francisco, California.[5]

I. Renewable energy compliance value

The report lists Oregon's avoided energy cost as 3.7 cents per kWh. Oregon has a Renewable Portfolio Standard, and therefore the cost of any distributed solar program that meets RPS requirements should be compared with the cost of renewable energy that could meet the RPS.[6]

II. Environmental compliance value

To the extent that distributed solar generation can save ratepayer dollars by cost-effectively meeting federal, state or local environmental legal requirements, these savings should be included in benefits calculations. For example, on June 2, the Environmental Protection Agency is expected to propose sweeping new Clean Air Act regulations designed to cut emissions of carbon dioxide from power plants. After the regulations are announced, states will have a year to develop a plan to comply with the rules. Experts expect that the regulations will allow states to comply by promoting increased renewable energy generation.[7]

III. Peak demand value

The report notes that avoided investments in generating capacity refers to the amount of generating resources needed to meet peak load. However, this is different from peak demand value, which refers to the higher value of energy during periods of high demand and low supply. Accordingly, the market price of electricity is higher during times of the day and times of the year when customers have greater demand for electricity. When assessing the value of replacement generation, it is important to account for how generation profiles align with demand for electricity.[8]

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[4] The Clean Coalition's Catalogue of Benefits of Distributed Generation is available at http://www.clean-coalition.org/site/wp-content/uploads/2014/02/DG-Catalog-of-Benefits-07-tk-9-Aug-2013.pdf

[5] The Clean Coalition's Hunters Point Project Benefits Analysis is available at http://www.clean-coalition.org/site/wp-content/uploads/2012/10/HPP-Benefits-Analysis-Summary-22_zf-9-April-2014.pdf

[6] For an example from Colorado, see Clean Coalition's Local CLEAN Program Guide, Module 3: Evaluating Avoided Costs, at 8-9

[7] See Susan F. Tierney, "Greenhouse Gas Emissions Reductions from Existing Power Plants: Options to Ensure Electric System Reliability", available at http://www.analysisgroup.com/article.aspx?id=14915

[8] Clean Coalition's Local CLEAN Program Guide, Module 3: Evaluating Avoided Costs, at 6-7

Utilities generally must pay extra for electricity during peak demand periods in accordance with time-of-delivery (TOD) price schedules. In addition to or as an alternative to these TOD schedules, suppliers may impose "demand charges" to offset their cost of maintaining sufficient generating and delivery capacity to meet peak demand. These charges are often substantial and are sometimes even higher than the procurement cost of the energy itself. It is possible that values for avoided TOD adders and demand charges have already been calculated for local demand response or other programs. Hence, current data is often readily available in published rate tables through the utility, the transmission operator, and/or the energy supplier.

IV. Hedge or price certainty value

As the report noted, many states have acknowledge the value of renewable energy contracts as a hedge against fuel volatility. In addition to the studies noted in the report, it is worth noting that many states regularly forecast expected fuel volatility for planning purposes. The California Energy Commission, for example, recently updated its projections of future fuel and solar costs.[9]

V. Locational value

Distributed generation has significant quantifiable locational value to ratepayers beyond line losses, including avoided transmission costs and transmission and distribution upgrade costs.[10] As the Clean Coalition has testified before the California Public Utilities Commission, such value especially applies to any portion of the generation that is deemed "deliverable" and does not exceed 100% of the coincident load at the substation, as all such generation avoids use of transmission system and associated access charges.[11] Further, as described below, Oregon can proactively guide distributed solar to the most cost-effective locations on the grid to maximize locational value of its distributed solar programs.

Utilities across the country have quantified how local solar capacity may avoid, reduce, or defer the need for additional new transmission capacity. For example,

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[9] California Energy Commission Draft report on Estimated Cost of New Renewable and Fossil Generation in California available at http://www.energy.ca.gov/2014publications/CEC-200-2014-003/CEC-200-2014-003-SD.pdf

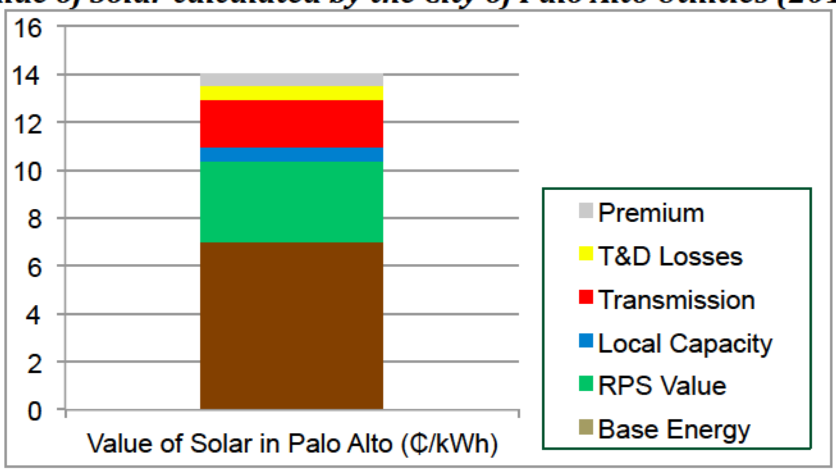
[10] See Clean Coalition's Locational Benefits brief, available at http://www.clean-coalition.org/site/wp-content/uploads/2013/11/Locational-Benefits-Brief-08_tk-6-Nov-2013.pdf

[11] Clean Coalition, A.14-01-007 et. al., Opening Brief regarding Southern California Edison's Application to Establish Green Rate and Community Renewables Programs, available at http://www.clean-coalition.org/site/wp-content/uploads/2014/05/SB-43-SCE-Clean-Coalition-Opening-Brief-2-ddp-2-May-2014.pdf

the Long Island Power Authority (LIPA) recently offered a 7¢/kWh premium to 40 MW of appropriately sited solar DG facilities to encourage locational capacity sufficient to avoid $84,000,000 in new transmission costs that would otherwise be incurred, expecting a net savings of $60,000,000.[12]

As shown in the graphic below, the City of Palo Alto Utilities estimated in 2012 that avoided transmission costs had a value of 1.94 cents per kWh, about 14% of the total value of local solar energy.[13]

Value of Solar calculated by the City of Palo Alto Utilities (2012)

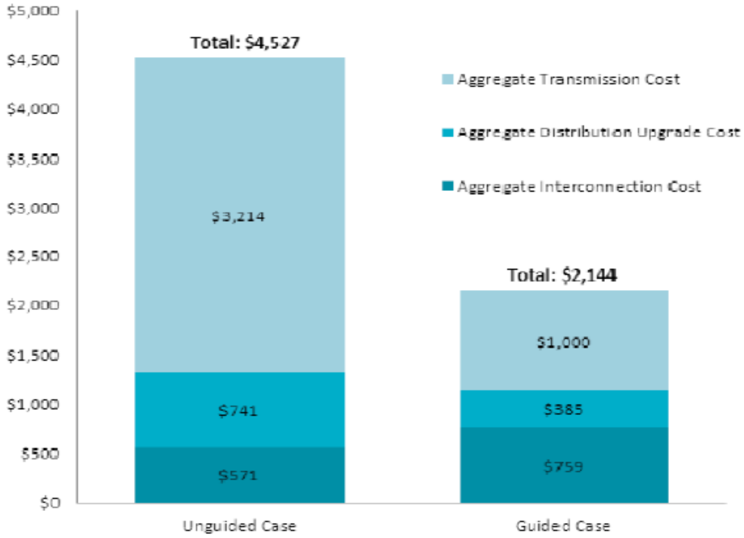


Similarly, a May 2012 study by Southern California Edison found that transmission upgrade costs for their share of the Governor's goal of 12,000 MW of distributed generation could be reduced by over $2 billion from the trajectory scenario. The lower costs were associated with the "guided case" where 70 percent of projects would be located in urban areas, and the higher costs were associated with the "unguided case" where 70 percent of projects would be located in rural areas.[14]

[12] Proposal Concerning Modifications to LIPA's Tariff for Electric Service, available at http://www.lipower.org/pdfs/company/tariff/proposals-FIT070113.pdf. LIPA's guidance states: "The rate will be a fixed price expressed in $/kWh to the nearest $0.0000 for 20 years applicable to all projects as determined by the bidding process defined below, plus a premium of $0.070 per kWh paid to projects connected to substations east of the Canal Substation on the South Fork of Long Island."

[13] Clean Coalition, A.14-01-007 et. al., Opening Brief regarding Southern California Edison's Application to Establish Green Rate and Community Renewables Programs

[14] The Impact of Localized Energy Resources on Southern California Edison's Transmission and Distribution System, SCE, May 2012



Southern California Edison Comparison of Costs of Primarily Local vs. Primarily Rural Distributed Generation[15]

The Clean Coalition recommends that Oregon policymakers proactively guide distributed solar projects to the most cost-effective locations on the grid, as required in California.[16] The California Public Utilities Code also recognizes locational value and requires utilities to submit plans to maximize locational benefits of distributed resources. AB 327 (2013) added Public Utilities Code Section 769, which requires utilities to submit Distribution Resource Plans by July 1, 2015 to identify optimal locations on the distribution grid through cost-benefit analyses,[17] and guide distributed resources towards optimal locations on the grid.

The Clean Coalition is currently working with California policymakers to leverage advanced grid modeling tools to help utilities develop interactive Distribution Resources Plans that guide distributed energy resources to the best locations on the grid and reduce the timeframes and uncertainty involved in grid interconnection.

The Clean Coalition is currently working on the Hunters Point Project, a Community Microgrid Initiative project in collaboration with Pacific Gas & Electric.[18] This

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15 Id.
16 See Clean Coalition, Planning Distributed Generation for Transmission Savings, available at http://www.clean-coalition.org/site/wp-content/uploads/2014/02/Planning-Distributed-Generation-for-Transmission-Savings-1-ssw-19-Mar-2014.pdf
17 Each Distribution Resource Plan must "Evaluate locational benefits and costs of distributed resources located on the distribution system. This evaluation shall be based on reductions or increases in local generation capacity needs, avoided or increased investments in distribution infrastructure, safety benefits, reliability benefits, and any other savings the distributed resources provides to the electric grid or costs to ratepayers of the electrical corporation." Public Utilities Code Section 769(b)(1).
18 For more info, see http://www.clean-coalition.org/our-work/community-microgrids/

project will serve 25% of total energy consumed at the Hunters Point substation in San Francisco with local renewables, balanced with intelligent grid solutions like advanced inverters, demand response, and energy storage. The Clean Coalition uses sophisticated powerflow modeling and cost-benefit analysis tools to reveal how – and precisely where – local renewable energy can be supported in the distribution grid by intelligent grid solutions. The Clean Coalition team works with utilities and modeling tools providers to improve tools for seeing, and planning enhancements for, the distribution grid. For the Hunters Point project, we are working with PG&E's modeling tool provider Cyme. Our team has experience with a broad range of powerflow modeling tools, but we've found that it's important to be able to show that utilities' favored tools can meet these new challenges once they have the right specifications to move forward. We are also developing standard specifications for modeling tools providers, so that our lessons learned from this experience can be applied to any other modeling tool.

Respectfully submitted,

Stephanie Wang
Policy Director, Clean Coalition
16 Palm Court,
steph@clean-coalition.org

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