



## Office of the President

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November 7, 2013

From: Dr. Chris Maples, President  
Oregon Institute of Technology

To: The Oregon Public Utilities Commission

Dear Commissioners:

Climate change continues to be a significant focal point and priority in Governor Kitzhaber's Administration and for all of higher education. Presidents, faculty, students, and administrators are all dedicated to coordinating efforts and committing their institutions to environmental stewardship. Each of Oregon's seven public universities are signatories to the American College and University President's Climate Commitment, whereby each Institution has pledged to become carbon neutral.

The Oregon University System (OUS) developed, in conjunction with several of the universities, five pilot projects for renewable energy development on university property, which include; Wave, Biofuel, Wind, Solar, and Geothermal. The Oregon Institute of Technology (Oregon Tech) is leading the development of the Solar and Geothermal pilot projects. The intent of all of these pilot projects, is to help meet both university and state sustainability goals while also creating facilities where theory and practical application can intersect. The projects allow student and faculty researchers to develop and test new technologies, thereby increasing the competitiveness of the university system's renewable energy curriculum as well as increasing the value of the research, prior to commercialization. The program also improves the Oregon economy by creating both short- and long-term job opportunities in emerging renewable energy industries.

### **Statement of the Need**

For a state that has among the lowest power rates in the nation to be able to move to clean energy resources, which are often more expensive than prevailing rates in Oregon, shows a deep commitment to carbon neutrality and sustainable management of resources. If Oregon can achieve this type of movement, any state should be able to do so.

Currently, Oregon Tech is constructing two renewable energy generation projects; a 2 Megawatt (MW) net metered solar array, and a 1.75 MW geothermal power plant, operating as a qualified facility that could offset 100% of the campuses use of energy derived from fossil fuels. The campus has a fully executed Interconnection Agreement for each of the renewable generation projects, whose locations are contiguous to the Oregon Tech Campus premises. Oregon Tech would like to utilize all of the power generated on campus, however, several issues have come to light after the projects were well under construction.

*Hands-on education for real-world achievement.*

The campus has two university owned electrical distribution systems, (See Exhibit 1) served by the same PacifiCorp primary feeder. PacifiCorp has determined that an accounting aggregation of both meters is not possible at this time.

In the 2013 Oregon legislative session, Oregon Tech testified in favor of a bill (HB2435) that included a proposed solution to remedy the meter aggregation issue, whereby, geothermal power was to be added as a generation source permitted under the net metering statutes (ORS 757.300) with an increase in the system generation capacity to 5 MW. The legislature did in fact add geothermal to the definition of a net metering facility, but at the recommendation of PacifiCorp and several other utility companies, requested that Oregon Tech seek a remedy to the cap increase at the Oregon Public Utility Commission.

In performing our due diligence, Oregon Tech requested that PacifiCorp conduct an extensive legal, regulatory and technical analysis to determine viable options to allow the university to utilize all of its renewable generation to offset its electrical load. In a letter dated October 15, 2013, the utility has provided six options for Oregon Tech to consider in order to ensure that both campus and utility system safety and reliability goals are attained. (See Exhibit 2)

After review of the PacifiCorp analysis with PacifiCorp and independent engineers, all of the proposed options except for one will have substantial and long term financial impact on Oregon Tech. Oregon Tech makes the below request to the Commission because without action by the Commission, university has determined it will be forced to sell a majority of its renewable generation to PacifiCorp at an annual increase in cost of \$230,000, or be required to spend approximately \$1.3 million to rewire the campus to physically interconnect the two campus owned distribution systems.

### **Statement of the Proposed Solution**

Oregon Tech has reviewed each of the options as presented by PacifiCorp and has determined that their approach #2 provides the least regulatory and technical barriers, while also meeting both state and university sustainability goals. Approach #2 is to seek a narrow waiver of the 2MW generation cap for Oregon Tech so that it's two meters can be aggregated by an accounting method.

Approach #2 retains the current approved utility interconnection design, for which Oregon Tech has paid PacifiCorp \$610,858 to make improvements to the utility's distribution system. The approach also allows an accounting aggregation of the total generation and load at both meters, provided we obtain a waiver of the net meter kilowatt limit rule from the Oregon Public Utility Commission (OPUC).

Per Oregon Administrative Rule (OAR) 860-039-0005(2), the OPUC may waive any of the Division 39 rules for good cause shown. An OPUC ruling that waives the net metering kilowatt limit (OAR 860-039-0010) for the Oregon Tech campus would allow all of the renewable energy demonstration projects to proceed as intended.

Although the Oregon Public Utility Commission intends to bring this very issue of the net metering cap next year, Oregon Tech would like to offer a solution as a demonstration to lead future discussion, exploring the pros and cons of such actions on a smaller scale.

Other states, including New Jersey, Ohio, and Colorado, have implemented net metering rules without a specified capacity limit, however, the systems must be sized to offset up to 125% of the customer's electricity requirements. On October 7, 2013, California passed legislation that would remove caps and limits in terms of both capacity installed and the numbers of renewable systems connected to the grid.

With a narrow exception to the net metering rules, Oregon Tech is seeking to accomplish something great for the State of Oregon, the university, and its students. To be considered the first of 674 universities across the nation to approach carbon neutrality, Oregon Tech proposes a waiver of OAR 860-039-0010 with the following caveats to allow the continued demonstration, research, and development of renewable generation technologies in the State of Oregon:

For the Oregon Institute of Technology, a net metering capacity limit of 2 megawatts per each renewable generation source, so long as the net metering facilities in aggregate on the customer-generator's contiguous property do not exceed 125% of the customer-generator's annual electricity consumption.

### **“Good Cause” Considerations**

This waiver request is only applicable to Oregon Tech to allow the university to continue its vital research, education, and economic development mission. A waiver of the 2 MW cap for net metering (OAR 860-039-0010) also allows Oregon Tech's to comply with several policies and statutes requiring the university to reduce and eliminate its carbon emissions. ORS 468A.205 establishes a policy that requires all of state government to meet a 75% reduction from 1990 levels of greenhouse gas emissions by 2050.

Being the first to demonstrate this level of environmental stewardship has not been an easy undertaking. Your support of this waiver request is vital to the financial health of Oregon's only public institute of technology in the Pacific Northwest. Oregon Tech was founded on the principles of excellence through hands-on knowledge. We believe in giving students a rigorous, practical education while applying cutting-edge concepts for real-world solutions.

The use of renewable energy to provide 100% of a university's power, heating, and cooling needs is a real-world solution to environmental issues that many communities from across the nation and world will look to the State of Oregon and Oregon Tech for leadership. Our efforts can be shown as a model for other states as we embark on creating a carbon neutral campus at Oregon Tech—the first of its kind anywhere.

Without a waiver of the net metering cap, Oregon Tech and the State of Oregon will be burdened with the following options, all of which will result in failure. A failure with both financial and environmental implications:

1. Oregon Tech will be forced to enter into an unfavorable 20-year power purchase agreement by February 3, 2014 that will not realize all of the savings required to offset the debt service on the state bonds used to construct the geothermal project. This loss will divert an estimated \$230,000 per year of state funds and student tuition dollars away from already severely underfunded academic programs, or;
2. Design and construct additional electrical infrastructure to physically connect both campus distribution systems. As noted in PacifiCorp's letter, this will also subject the university to additional regulatory and interconnection requirements, estimated a \$1.3 million. This funding will need to come from the Oregon Legislature and will delay the utilization of the generation for approximately 1 year, with an additional operating cost of \$230,000 as described above.

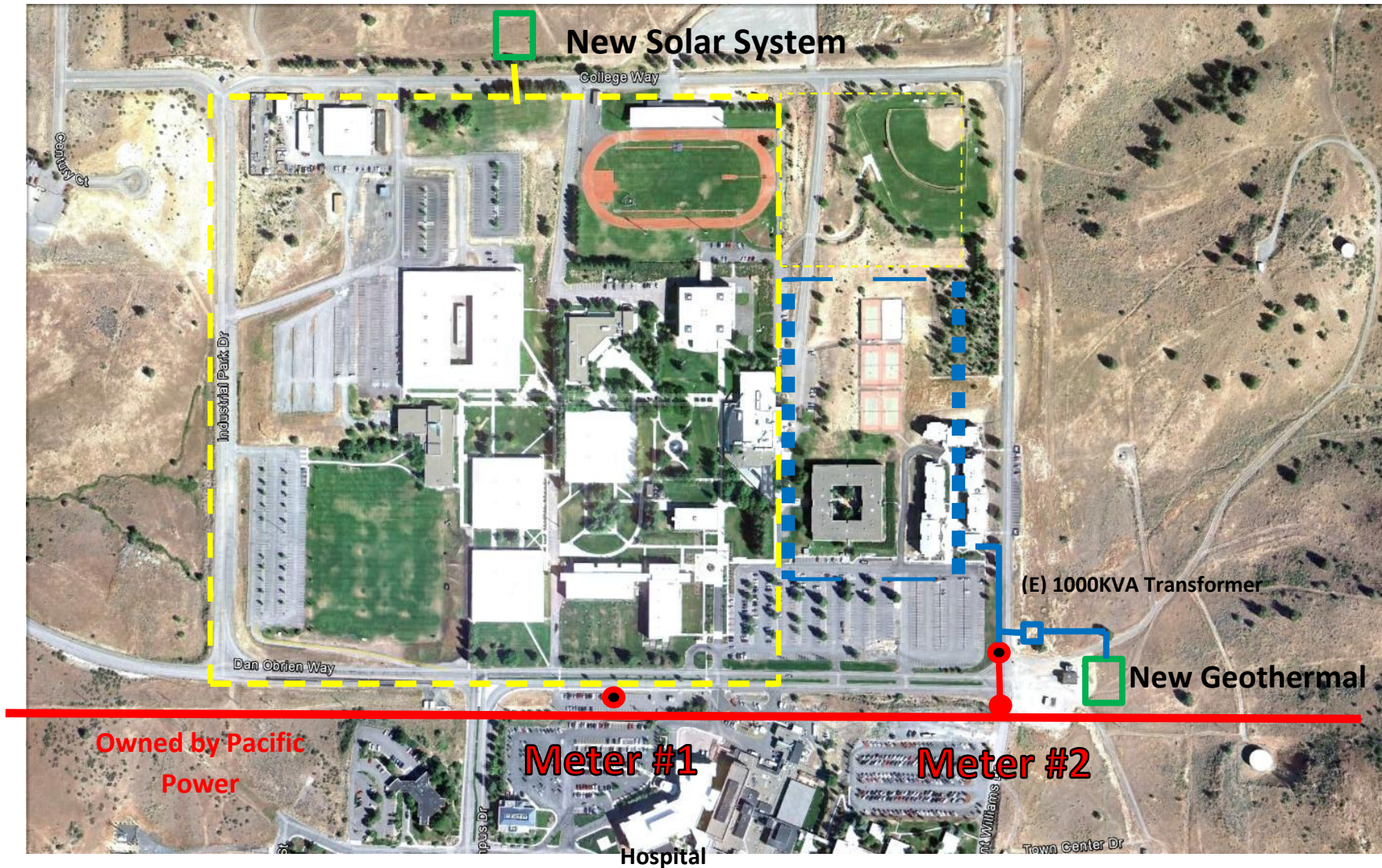
We look forward to discussing this important issue with the Commission as we work together to explore ways to diminish the gaps between current policy limits and ideal solutions.

Sincerely,

A handwritten signature in black ink, appearing to read 'C. G. Maples', with a stylized flourish at the end.

Christopher G. Maples, Ph.D.  
President

### Oregon Tech Power Distribution Systems Map - Klamath Falls Campus



Owned by Pacific Power

- Yellow** = Loads served by Meter #1, ~80%
- Blue** = Loads served by Meter #2, ~20%
- Green** = New Renewable Generation
- Red** = Equipment owned by Pacific Power

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October 15, 2013

Mary Ann Zemke  
Vice President Finance and Administration  
Oregon Institute of Technology  
3201 Campus Drive  
Klamath Falls, OR 97601

Dear Ms. Zemke:

Thank you for your letter dated September 25, 2013 regarding Oregon Institute of Technology's (OIT) proposal to design and install a new main meter. Pacific Power has initiated extensive legal, regulatory and technical analysis of OIT's proposal. The company also analyzed a number of other approaches that may be viable for your projects to move forward. I have included this analysis as an attachment to this letter.

Pacific Power appreciates our partnership with OIT to ensure your campus is able to reach its goals, while ensuring that our system is operated safely and reliably. We believe the options we analyzed are the best possibilities for your campus; if there are other approaches that we have not considered, we would be happy to review and identify any legal, regulatory or technical considerations that would be associated.

I would like to extend the offer to sit down with your team to discuss this analysis. I can be reached at 503-813-7202 or [Scott.Bolton@PacifiCorp.com](mailto:Scott.Bolton@PacifiCorp.com).

Sincerely,

A handwritten signature in black ink that reads "Scott D. Bolton". The signature is written in a cursive, flowing style.

Scott D. Bolton

cc: Christina Kruger  
Lita Colligan  
Tashiana Wangler

att: Attachment A -Pacific Power Analysis of Options for OIT



## ATTACHMENT A: Pacific Power Analysis of Options for OIT

### Background

Oregon Institute of Technology (OIT) in Klamath Falls, Oregon owns and operates a 0.28-megawatt geothermal plant that became operational in 2010. OIT is constructing two additional projects: a 2-megawatt solar and a 1.75-megawatt geothermal facility. OIT has a goal that all of the power generated on campus will be used to offset all of its electrical and heating loads to demonstrate being the first geothermal and solar powered campus in the nation. The campus has a total of three meters. The solar facility is located on one meter (for purposes of this discussion, we'll call it meter #1). Meter #1 load is approximately 75 percent of the total campus load. The geothermal facilities are located on another meter (for purposes of this discussion, we'll call it meter #2). Meter #2 load is approximately 20 percent of the total campus load.

### Load analysis

The solar project is estimated to offset 37 percent of the load at meter #1. However, during low load usage in the daylight hours, it is estimated that the solar generation will exceed the load behind the meter and, therefore, the excess will flow back onto the grid. We anticipate this will occur approximately 10 to 20% of the year with an excess of 264 megawatt-hours. Under the proposed net-metering scenario, the excess generation in those hours would be rolled forward to offset a percentage of future usage but will not completely offset load at meter #1.

Meter #2 currently has the existing 0.28 MW geothermal project offsetting load and delivering any excess to Pacific through a qualifying facility (QF) contract. The generation from the new geothermal project is also being installed behind meter #2 and will be combined with the existing geothermal plant. The new geothermal plant will operate at a high capacity factor and will exceed the load behind meter #2 on a consistent basis. With both geothermal plants operating, it is expected that 100% of the meter #2 load will be offset and the geothermal plan will deliver approximately 1,000 kWh per hour or 8,000,000 kWh (or 8,000 MWh) on an annual basis to PacifiCorp as excess generation.

OIT is not interested in establishing a buy-all/sell-all QF agreement with the company for its geothermal projects. Instead, OIT would like to utilize its excess geothermal generation behind meter #2 to offset the load behind meter #1 that is not offset by the net-metered solar project. OIT has proposed to physically connect meter #1 and meter #2 to establish one interconnection point with Pacific Power's system. Offsetting the combined load on the meters with the geothermal generation will allow OIT to offset its retail rates (rates cover utility costs associated with generation, transmission, distribution, maintenance, operation and administrative costs) which are higher than the generation rate that OIT would be paid by PacifiCorp for the output of its geothermal facility on a buy-all/sell-all QF contract.

### Legal issues and analysis

Net-metering. Under current net metering law, net meter capacity for a customer at a particular site and also under net-meter aggregation is capped at 2 megawatts direct current. Both solar and geothermal qualify as net-metering technologies under Oregon law. OIT's generation of 4 megawatts from its geothermal and solar

facilities will exceed the 2-megawatt cap. The Public Utility Commission has the authority to waive the cap for customers, although the Commission has not historically granted waivers of the net metering cap and has indicated it may not grant the waiver for OIT.

Single meter. OIT is proposing to physically interconnect its generation behind one meter and establish one point of interconnection with PacifiCorp. National Electric Reliability Corporation has established a regulatory requirement for transmission owners (such as PacifiCorp) to establish standards to avoid adverse impacts on reliability.<sup>1</sup> As such, the transmission owners (i.e., PacifiCorp) must establish facility connection and performance requirements. Per this standard, PacifiCorp requires any generation that exceeds 3 MW to invest in SCADA.<sup>2</sup> SCADA stands for “supervisory control and data acquisition” and play a vital role in utility systems by providing utilities with valuable knowledge and capabilities that are key to a primary business function - delivering power in a reliable and safe manner. A quality SCADA solution is central to effective operation of a utility's most critical and costly distribution, transmission, and generation assets. Per this requirement, OIT would be required to initiate a new interconnection request with the company and the interconnection analysis would likely lead to significant additional equipment investments by OIT. A new analysis is necessary to determine the overlap between the current interconnection analysis and the new interconnection, which will inform the level of investments necessary by OIT to meet the SCADA requirements.

With the assumption that on an annual basis the solar generation will be less than the total campus load, OIT is also proposing that any power generated in excess of total campus load be considered as generated from the geothermal projects. Based on the load and generation analysis, however, it is expected that even under a net-metering structure the solar generation will exceed total campus load on an hourly basis in multiple hours (see load analysis above). Therefore, in actual operation, a portion of the energy that flows back to the grid will be from the solar generation and a portion will be from the geothermal generation.

There are no legal barriers associated with the Company purchasing the energy associated with the geothermal generation under a QF arrangement.

There are, however, potential legal barriers associated with the excess energy associated with the solar generation due to the ownership of the facility. OIT does not own the solar facility. The solar facility is owned by Solar City, and OIT purchases the output through a power purchase agreement. This ownership structure prevents OIT from certifying the solar facility as a QF (although Solar city could establish a QF contract with PacifiCorp, an approach which is analyzed below).

The Company analyzed the following arrangements with OIT that would be possible if OIT were to physically connect its meters and establish one interconnection point with the company:

- *Solar is net metered – excess donated to low income:* Under Oregon law, third-party net metering is allowed (third-party net metering is net metering generation associated with a facility on a customer’s premises that is not owned by the customer). If the solar facility is net metered, the excess energy that flows onto the grid would be subject to OAR 860-039-0060, which directs that “any unused kilowatt-hour credit accumulated by a customer-generator of a public utility at the conclusion of the annual

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<sup>1</sup> <http://www.nerc.com/files/FAC-001-0.pdf>.

<sup>2</sup> [http://www.pacificorp.com/content/dam/pacificorp/doc/Transmission/Transmission\\_Services/Generation\\_Interconnection/Facility\\_Interconnection\\_Requirements\\_for\\_Distribution.pdf](http://www.pacificorp.com/content/dam/pacificorp/doc/Transmission/Transmission_Services/Generation_Interconnection/Facility_Interconnection_Requirements_for_Distribution.pdf).



billing cycle will be transferred, in a manner approved by the Commission, to customers enrolled in the public utility's low-income assistance programs. The public utility will value any unused kilowatt-hour credit at the applicable average annual avoided cost tariff rate."

- *Solar is net metered – excess purchased by the company:* If the solar facility is not a QF, OIT can only sell the output of the solar facility to the company pursuant to market based rate (MBR) authority from the Federal Energy Regulatory Commission (FERC). This is because sales of electricity to a utility fall within FERC's exclusive jurisdiction over wholesale sales of electricity, and FERC has noted that if the facilities are not certified as QFs, the output in excess of net metering must be sold pursuant to MBR authority. This option requires OIT to seek MBR authority from FERC and to comply with all on-going MBR-related compliance obligations.
- *Solar is certified as a QF by Solar City – excess purchased by the company:* CFR 292.207 sets forth the process for self-certification as a QF or, alternatively, application to FERC for certification. In both instances, the regulation states that the "owner or operator of the facility or its representative" is the party that can seek certification – which would require Solar City to be the entity seeking certification and initiating a QF contract with the company. It is unclear whether this approach would be acceptable for Solar City or OIT.

### **Summary of options**

- Status quo - the meters are left as is, OIT sells its excess generation from its geothermal facility as a qualified facility and its solar generation is net metered with the excess donated to low-income programs per Oregon rules.
- Current meter setup - OIT proposes a waiver to the PUC rules for net metering and meter aggregation.
- Single meter - Solar is net metered and excess is donated to low-income programs. SCADA requirements apply.
- Single meter - Solar is net metered and excess is purchased by the company. OIT seeks MBR authority from FERC. SCADA requirements apply.
- Single meter - Solar is certified as a QF by Solar City. The company and Solar City initiate a QF agreement. SCADA requirements apply.
- Current meter setup - OIT rewires its campus to align its load and generation, avoiding investment in connection of its meters and investment in SCADA equipment.

Approach	Regulatory/Legal considerations	Technical considerations	Notes
1. Status quo; OIT net meters its solar and sells excess geothermal as a QF.	<ul style="list-style-type: none"> <li>• There are no state or federal legal or regulatory barriers.</li> </ul>	Meter at point of interconnect with company’s facilities. Then, meter at each generation facility.	Would alleviate the need for OIT to make additional investments in infrastructure.
2. Meter construction as is; OIT proposes a waiver to the PUC rules for net meter aggregation.	<ul style="list-style-type: none"> <li>• <i>OAR 860-039-0005</i>: (2) Upon request or its own motion, the Commission may waive any of the Division 039 rule for good cause shown. A request for waiver must be made in writing, unless otherwise allowed by the Commission.</li> </ul>	Meter at point of interconnect with company’s facilities. Then, meter at each generation facility.	Commission staff has indicated PUC commissioners may not waive the current rules.
3. Rewire campus to move load from solar meter to geothermal meter to balance load with generation.	<ul style="list-style-type: none"> <li>• There are no state or federal legal or regulatory barriers.</li> </ul>	Rewire campus to move load from solar meter to geothermal meter to balance load with generation.	This approach would avoid investment by OIT in physical interconnection of the two meters and would avoid the investment to meet SCADA requirements. However, the rewiring approach may be costly and it is unclear whether it would be more or less than the avoided investments.
4. Physical connection by OIT of meter #1 and meter #2 to create one interconnection point with the company; solar is net metered and excess output that is not used to offset load is donated to low-income programs; geothermal is subject to a QF contract to purchase excess output that is not used to offset load.	<ul style="list-style-type: none"> <li>• <i>OAR 860-039-0060</i> (Excess Energy from Net Metering Facilities) directs that : Any unused kilowatt-hour credit accumulated by a customer-generator of a public utility at the conclusion of the annual billing cycle will be transferred, in a manner approved by the Commission, to customers enrolled in the public utility’s low-income assistance programs. The public utility will value any unused kilowatt-hour credit at the applicable average annual avoided cost tariff rate.</li> </ul>	<p>National Electric Reliability Corporation has established a regulatory requirement for transmission owners (such as PacifiCorp) to establish standards to avoid adverse impacts on reliability.<sup>3</sup> As such, the transmission owners must establish facility connection and performance requirements. Per this standard, PacifiCorp requires any generation that exceeds 3 MW to invest in SCADA.<sup>4</sup></p> <p>Current engineering already has fiber between solar and geothermal to tie relays together. However, in order to meet the SCADA telemetry requirement, a communications link would need to be run from the OIT facilities to the company’s substation to provide real-time data. New interconnection request would be necessary to determine how the system needs to be modified with likely very significant expense (very minimum is \$50k for radio, protection and control, metering \$30k, distribution changes would also add additional cost – but it is unclear what the costs would be until further analysis is conducted).</p> <p>Meter at point of interconnect with company’s facilities.</p>	<p>While this approach is legally and regulatory possible, it would require significant new investment by OIT to meet SCADA requirements.</p> <p>OIT’s proposal requests that all excess output that reaches PacifiCorp’s grid would be treated as associated with the geothermal facility; however, load analysis shows that the solar facility will produce generation in excess of load at periods of light load (weekends and holidays). Therefore, it is necessary to determine how to treat the solar excess generation. Under this proposal, the excess would be donated to low-income programs per state requirements. Submetering is required to determine when excess output is attributable to solar and when it is attributable to geothermal.</p>

<sup>3</sup><http://www.nerc.com/files/FAC-001-0.pdf>

<sup>4</sup>[http://www.pacificorp.com/content/dam/pacificorp/doc/Transmission/Transmission\\_Services/Generation\\_Interconnection/Facility\\_Interconnection\\_Requirements\\_for\\_Distribution.pdf](http://www.pacificorp.com/content/dam/pacificorp/doc/Transmission/Transmission_Services/Generation_Interconnection/Facility_Interconnection_Requirements_for_Distribution.pdf)

		Then, submeter at the point of generation facility, without load being mixed in (one for solar and one for geothermal). Last, submetering would be necessary to assign certain loads to specific generation units in order to understand where excess generation is coming from when exported to grid.	
5. Physical connection by OIT of meter #1 and meter #2; solar is net metered and excess is purchased by the company. OIT seeks market-based rate authority from FERC.	<ul style="list-style-type: none"> <li>•In MidAmerican Energy Company, 94 FERC P 61340 at 62263 (2001), FERC stated that “[w]hen there is a net sale to a utility, and the individual’s generation is a QF, that net sale must be at an avoided cost rate consistent with PURPA and [FERC] regulations implementing PURPA.”</li> <li>•Sale of excess from solar would be a sale-for-resale based on the contractual arrangements between OIT and the solar plant owner/operator.</li> </ul>	See SCADA and metering requirement above.	<p>While this approach is legally and regulatory possible, it would require significant new investment by OIT to meet SCADA requirements.</p> <p>OIT’s proposal requests that all excess output that reaches PacifiCorp’s grid would be treated as associated with the geothermal facility; however, load analysis shows that the solar facility will produce generation in excess of load at periods of light load (weekends and holidays). Therefore, it is necessary to determine how to treat the solar excess generation. Under this proposal, OIT would seek market-based rate (MBR) authority and the excess would be purchased by PacifiCorp at the MBR. Submetering is required to determine when excess output is attributable to solar and when it is attributable to geothermal.</p>
6. Physical connection by OIT of meter #1 and meter #2; solar is certified as a QF by Solar City. The company and Solar City initiate a QF agreement.	<ul style="list-style-type: none"> <li>•There are no state or federal legal or regulatory barriers.</li> </ul>	See SCADA and metering requirement above.	<p>While this approach is legally and regulatory possible, it would require significant new investment by OIT to meet SCADA requirements.</p> <p>It is unclear whether Solar City would be interested in initiating a QF agreement with PacifiCorp.</p>