

PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: December 19, 2013

REGULAR X CONSENT _____ EFFECTIVE DATE December 20, 2013

DATE: December 12, 2013

TO: Public Utility Commission

FROM: Adam Bless *AB by aa*

THROUGH: Jason Eisdorfer, Maury Galbraith, and Aster Adams *JE MB by aa AA*

SUBJECT: OREGON PUBLIC UTILITY COMMISSION STAFF: (Docket No. UM 1631) Request by Oregon Institute of Technology (OIT) for waiver of the 2 megawatt (MW) limit on net metering installations pursuant to OAR 860-039-0010.

STAFF RECOMMENDATION:

Staff recommends that the Commission deny the request by Oregon Institute of Technology to waive the 2 MW limit on the capacity of net metering facilities set forth at OAR 860-039-0010(2).

DISCUSSION:

Pursuant to OAR 860-039-0005(2), OIT seeks a waiver of Commission rule OAR 860-039-0010, which states:

Net Metering Kilowatt Limit

- (1) For residential customer-generators of a public utility, these rules apply to net metering facilities that have a generating capacity of 25 kilowatts or less.
- (2) For non-residential customer-generators of a public utility, these rules apply to net metering facilities that have a generating capacity of two megawatts or less.¹
- (3) Nothing in these rules is intended to limit the number of net metering facilities per customer-generator so long as the net metering facilities in aggregate on the

¹ "Customer-generator" is defined in rule as "... the person who is the user of a net metering facility and who has applied for and been accepted to receive electricity service at a premises from the serving public utility." See OAR 860-039-0005(3)(e).

customer-generator's contiguous property do not exceed the applicable kilowatt or megawatt limit.

Background

OIT has established a goal of becoming the nation's first net-zero university campus in terms of carbon emissions. The university hopes to achieve this goal by offsetting all of its electrical consumption with on-site renewable generation.

OIT owns and operates a 0.28 MW geothermal plant at its campus in Klamath Falls, Oregon. OIT is currently constructing a new 1.75 MW geothermal plant and a 2 MW solar photovoltaic (SPV) facility. The projects are sized so that the energy from these facilities can offset 100 percent of the university's electrical and heating loads.

The campus loads are divided among three separate university-owned distribution systems, each behind a separate meter. All three systems are served by a single primary feeder. The maximum load served by Meter 1 is 3 MW, and the maximum load served by Meter 2 is 1 MW. Actual loads are much less and vary with time and season. The load behind Meter 3 is small and does not factor in the remainder of this analysis.

The solar facility will be located behind Meter 1. Third party developer Solar City will own the solar facility, and OIT will purchase the output. Based on 2012 billing data and generation projections from Solar City, the solar facility will offset about 33 percent of the meter 1 load through net metering over the course of a year. OIT would purchase the remaining 67 percent, or approximately 5.1 megawatt hours (MWh), from PacifiCorp.

The existing geothermal facility is located at Meter 2. It offsets load and is contracted to sell any excess power to PacifiCorp as a Qualifying Facility (QF) under the federal Public Utility Regulatory Policy Act (PURPA). The new 1.75 MW geothermal facility will also be located at Meter 2. The combined 2.03 MW geothermal capacity will consistently exceed the load at Meter 2, and the excess power would flow to the grid, again under a QF contract with PacifiCorp. Using 2012 billing data and generation estimates from OIT, staff estimates that the geothermal output will exceed Meter 2 loads by approximately 5,892 MWh over the course of a year. The campus loads and renewable generation are summarized below:

Table 1: Annual Load and Generation at Meter 1 and Meter 2

Meter	Annual Usage (MWh)	Renewable Generation (MWh)	Generation minus Usage (MWh)
1	7,657	2,550	(5,106)
2	1,370	7,263	5,892
Total	9,027	9,814	787

Meter 1 = solar generation; Meter 2 = geothermal generation

As Table 1 shows, OIT's total renewable generation closely matches the campus electrical usage, but because of its physical configuration, nearly 80 percent of geothermal generation will be sold under a QF contract instead of offsetting campus load, and OIT will need to purchase nearly 57 percent of its campus load from PacifiCorp at a retail rate.

This is costly to OIT because the retail rate is higher than the QF rate.² Rather than sell geothermal power as a QF, OIT would like to net its excess geothermal generation against loads behind Meter 1, by aggregating Meter 1 with Meter 2 as described in OAR 860-039-0065. However, OIT already has a solar net metering facility with capacity of 2 MW. Net metering the geothermal generation is precluded by the 2 MW capacity limit at OAR 860-039-0010. A waiver of this limit would allow OIT to net meter all of its renewable generation, meet its goal of "net zero" carbon emissions, and realize savings in purchased power. This is the basis for OIT's waiver request.

Regulatory Analysis

Before requesting the waiver, OIT consulted with PacifiCorp to identify its options for meeting its net-zero emissions goal. In a letter to OIT dated October 15, 2013, attached to the waiver request, PacifiCorp described six available options.³ Staff discusses these options below, and their regulatory consequences. The options are presented in the same order as they appear in PacifiCorp's October 15, 2013 letter.

Option 1 is for OIT to continue with its current configuration. OIT would net meter its solar generation and sell excess geothermal power to PacifiCorp as a QF. This approach does not require electrical modifications to the campus, and does not require a waiver from the Commission. Staff considers Option 1 to be the base case for this analysis because no action is required to implement this option.

² Current on-peak retail rate is \$.08/kilowatt-hour (kWh) and the on-peak QF rate is \$.029/kWh

³ PacifiCorp letter October 15, 2013, Scott Bolton to Mary Zemke, Exhibit 2 to OIT's waiver request.

Option 2 is OIT's preferred option of aggregating Meter 1 with Meter 2 to allow netting excess geothermal power against the loads behind Meter 1. This approach requires no electrical modifications. It would maximize the renewable output used to offset load, and minimize the amount of power OIT purchases from PacifiCorp. As explained above, this approach requires a waiver of OAR 860-039-0010(2).

Option 3 involves rewiring the campus to transfer load from Meter 1 to Meter 2. This would balance load with renewable generation and use more of the geothermal power to offset load. PacifiCorp and OIT state that this approach does not present any legal or regulatory barriers. Staff concurs. The solar facility would be a net metering facility, but the geothermal plant is currently a QF and would remain one. No waiver of Commission rules is required. OIT estimates the cost of this modification at roughly \$1.3 million. This expenditure would require prior legislative approval. OIT states that the rewiring would take up to four years to complete, disrupt campus operations, and likely reduce the reliability of the campus electrical system.

Options 4, 5 and 6 involve physically interconnecting the distribution systems behind Meter 1 and Meter 2, creating one interconnection point with PacifiCorp. This would enable OIT to maximize its use of geothermal power to offset campus load. Even with this interconnection, the geothermal plant would still produce excess power, which would be sold under a QF contract. This approach does not require a waiver.

Options 4, 5 and 6 differ in the way OIT treats any excess solar generation. All of these three interconnection options require submetering to determine how much of the excess generation is coming from the solar and geothermal facilities. However, the amount of excess solar generation is small, and does not greatly affect the analysis.

Interconnecting the campus distribution loops and creating a single interconnection point with PacifiCorp will trigger a requirement to install Supervisory Control and Data Acquisition (SCADA) equipment. Pursuant to reliability requirements of the North American Electric Reliability Council (NERC), PacifiCorp interconnection standards include a requirement to install SCADA for interconnections larger than 3 MW. The cost to install SCADA would be in addition to the cost of interconnecting the campus electrical system.

OIT's engineering consultant estimates the "all in" cost of interconnecting the campus loops and installing SCADA at between \$5 million and \$6 million.⁴ The modifications

⁴ November 21, 2013 email from Bob Simonton, OIT, to Adam Bless: "Cost estimates of PacifiCorp options." In its November 7, 2013 waiver request, OIT represented that the physical modifications would take one year to complete. OIT later revised that to four years.

would require legislative approval and take up to four years to complete. For that reason, OIT did not present these options as reasonable alternatives to the waiver.

Financial Analysis

Using billing data from PacifiCorp and renewable generation projections from OIT’s solar and geothermal vendors, Staff analyzed the annual power cost to OIT and revenue impact on PacifiCorp under Option 1 (status quo), Option 2 (net metering and aggregation under the requested waiver), and Option 3 (rewiring the campus). The complete analysis, including assumptions regarding OIT’s renewable kWh generation, kWh consumption, sales to PacifiCorp, and applicable retail and QF rates, is shown at Attachment 1 for Option 1, Attachment 2 for Option 2 and Attachment 3 for Option 3. Staff summarizes the results of this analysis and compares the net cost of power to OIT under each option on the table below:

TABLE 2: Summary of Financial Analysis for Options 1, 2 and 3

OPTION	OIT Electric Bill Payments to PacifiCorp	OIT Revenue from QF Sales	Net OIT Cost of Power	OIT Savings Compared to Option 1	OIT Initial Expenditure	Percent of Campus Load Served by OIT Generation
1 (base case)	\$357,425	\$171,445	\$185,980	-----	-----	43%
2 (waiver)	\$0	\$0	\$0	\$185,980	-----	100%
3 (Campus Modification)	\$0	\$22,894	(\$22,894)	\$208,874	\$1.3 to \$6 million	100%

If OIT receives the waiver and proceeds with Option 2 (net metering with meter aggregation), its total onsite generation will exceed total campus load by approximately 787,000 kWh over the course of a year. Pursuant to OAR 860-039-0060, this excess generation would be donated to PacifiCorp’s low-income assistance program, and PacifiCorp would value the unused kWh credit at its average annual avoided cost rate.

Good Cause Consideration

In determining if there is good cause for the waiver, Staff considered the arguments for “good cause” in OIT’s application, the financial impact of the Commission’s decision on OIT and the utility and its ratepayers, and the underlying policy basis for the choice of 2 MW as the limit.

OIT's stated reasons for a finding of good cause are:

- (1) Its goal of becoming a "net zero carbon emissions" university, and
- (2) Financial impact on the university and its educational programs.

OIT's goal of becoming a "net zero emissions" campus is laudable, but it provides no benefit to ratepayers and by itself does not establish good cause to waive the cap. Nor does the fact that OIT has already invested in the renewable facilities establish good cause to grant the waiver.⁵ Staff's analysis of good cause is whether OIT's application presents circumstances that either achieve the same result obtained by the cap or warrant the overriding of the policies underlying the 2 MW cap – to protect other customers from cost shifts.

Financial Impact on OIT, PacifiCorp, and ratepayers

The actual power used and power generated will be the same regardless of the Commission's decision on the waiver. PacifiCorp's overall costs to meet its loads and maintain its grid will not change as a result of the decision on this waiver. If the Commission approves the waiver, OIT will realize savings, but PacifiCorp will see a corresponding loss of revenue, which will ultimately be recovered from other ratepayers.

If the Commission denies the waiver, OIT is free to choose from among its remaining options:

- (1) OIT can choose to do nothing (status quo) and continue to make a net payment to PacifiCorp estimated at \$185,980 a year. See Attachment 1. In this case, OIT will not be able to meet its "net zero emissions" goal. This option does not allow OIT to meet its "net zero emissions" goal but it presents a greater financial burden to taxpayers in the long run. However, it will result in no additional financial burdens to ratepayers of PacifiCorp.
- (2) OIT can choose to rewire its campus as described in option 3 above. In this case, PacifiCorp, and ultimately ratepayers, will still lose roughly \$208,000 per year in revenue, and taxpayers will ultimately fund the physical modifications estimated at \$1.3 to \$6.0 million. See Attachment 3. This option will allow OIT to meet its "net zero emissions" goal but at a substantial financial burden to ratepayers and taxpayers. Staff is reluctant to see \$1.3 to \$6.0 million spent on otherwise unnecessary campus

⁵ . The solar and geothermal installations are nearly complete, and the funds have already been invested. The total cost of the geothermal installation was approximately \$14.7 million. Approximately 42 percent of this cost was funded by the university. The remaining 58 percent was funded through a combination of federal grants, state grants, and funding from the Energy Trust of Oregon.

modifications, and considers that potential cost to be part of good cause. Staff also considered the disruption in campus operations as the electrical system is modified.

If the Commission grants the waiver, OIT would aggregate its meters and be able to net meter its solar and geothermal projects against its total load. Because OIT's total annual generation will exceed its total annual load, the excess generation will be donated to PacifiCorp's low-income assistance program per OAR 860-039-0060. The waiver will result in a loss of revenues for PacifiCorp estimated at \$185,980 which the company may choose to recover or not recover from the remaining ratepayers. Compared to the status quo, this option allows OIT to meet its "net zero emissions" goal and offers additional benefits to PacifiCorp's low-income customers.

If the waiver is denied, Staff does not know which of OIT's remaining options are realistic. Option 2, the waiver, results in greater ratepayer costs, but less cost to the taxpayer compared to Option 1. Option 2 also results in less taxpayer costs and less ratepayer costs compared to Option 3. Option 2 would serve somewhat as a hedge against the effect of OIT choosing Option 3.

However, OIT did not provide Staff with enough information to determine if Option 3 is a viable alternative. Without the showing that Option 3 is viable, the value of the waiver as a hedge against additional costs to the ratepayers is greatly diminished.

Basis for 2 MW as the cap

OAR 860-039-0010 was adopted in 2007 Docket No. AR 515.⁶ In AR 515, parties considered a range of limits. There was no fundamental reason for choosing 2 MW. At the time, a 2 MW limit was a significant increase over the limit then in effect. The Staff participating in that rulemaking proposed 2 MW after researching limits in other states and gathering comments from other parties.

In its Opening Comments in AR 515, staff stated:

"Staff's proposal for excess energy credits, described further below, encourages customer-generators to size net metering systems to meet, not exceed, annual energy usage. That mitigates the potential impact that a higher size limit and annualized netting may have on utility revenues to cover fixed transmission and distribution system costs, as well as any cost-shifting between net metering participants and non-participants".

⁶ The rule was amended in 2011 Docket No. AR 548 to clarify the definition of "customer-generator." That amendment does not affect this analysis.

OIT's renewable generation is sized to meet, not exceed, annual energy usage. Nonetheless, the waiver request still raises the above stated concern about cost shifting and recovery of fixed transmission and distribution system costs. However, in Order No. 07-319 adopting this rule, the Commission suggested that it was open to a higher cap in the future. The Commission's Order states that it could "... revisit the appropriateness of the size limits as necessary."⁷

If the PUC chooses to approve the waiver, it must be constructed narrowly so that it does not set a precedent with wide application. There are certain unique factors that can prevent this waiver from being applied broadly in the future. OIT is an institution of higher learning with a public service mission which already made substantial investments in renewable generation to reach its goal of achieving "net zero" emissions. In addition, OIT's need for this waiver is largely caused by the unique configuration of its current campus distribution system that prevents OIT from fully optimizing the use of its owned renewable resources. Finally, a waiver would act as a form of hedge for ratepayers against an option that OIT may choose.

Conclusion

The decision on the waiver request is a balance between the financial impact on OIT and taxpayers, the financial impact on PacifiCorp and ratepayers, the question of consistency with the underlying basis for the rule being waived, and the potential for a waiver to be precedent setting.

On balance, Staff believes the impact on ratepayers outweighs the financial benefit to the university. Staff's financial analysis shows that granting the requested waiver will result in an annual revenue impact on PacifiCorp and its ratepayers, at current rates, of about \$185,980. In forming its recommendation to deny this waiver request, Staff is also influenced by the concerns about recovery of fixed transmission and distribution costs described in the record of Docket No. AR 515. These concerns can only be addressed by ensuring that this waiver does not set precedent. The unusual circumstances described above do provide some assurance, but Staff does not know what future waiver requests may be presented, each with their own seemingly unique arguments. The goal of becoming a "net zero" university, while worthy, does not on balance outweigh the negative impact on ratepayers of granting the waiver request.

⁷ See Order No. 07-319 at p. 7.

Staff acknowledges that without the waiver, OIT may still have an option to reconfigure its campus, resulting in a similar or larger revenue impact to PacifiCorp and ratepayers at great expense to taxpayers and inconvenience to students and faculty. Staff considered recommending approval as a hedge against this option. However, Staff is not persuaded that reconfiguring the campus electrical system is viable enough to be the determining factor in this decision.

Staff recommends denial of the waiver.

PROPOSED COMMISSION MOTION:

The request by Oregon Institute of Technology to waive the 2 MW limit on the capacity of net metering facilities set forth at OAR 860-039-0010(2) be denied.

Attachments

Attachment 1: Financial Analysis of Option 1

Solar Net-Metering at Meter 1 and Geothermal QF at Meter 2

(Base Case - No waiver required)

	Meter 1	Meter 2	Total	Notes
	Solar PV	Geothermal		
System Configuration:				Geothermal and Solar Generation Projected by OIT
Annual Usage (kWh)	7,657,047	1,370,314	9,027,361	
Annual Generation (kWh)	2,550,979	7,263,290	9,814,269	
Generation minus Usage (kWh)	(5,106,068)	5,892,976	786,908	
Load Sources:				
Load Served by PacifiCorp (kWh)	5,106,068	-	5,106,068	57% of OIT Load Served by PacifiCorp
Load Served by OIT Generation (kWh)	2,550,979	1,370,314	3,921,293	43% of OIT Load Generated onsite
Total Load Served (kWh)	7,657,047	1,370,314	9,027,361	
Generation Sinks:				
Generation Used to Serve Load (kWh)	2,550,979	1,370,314	3,921,293	40% of OIT Generation Used to Serve Load
Generation Purchased by PacifiCorp (kWh)	-	5,892,976	5,892,976	60% of OIT Generation sold as QF
Generation Donated to Charity (kWh)	-	-	-	0% of OIT Generation donated
Total Generation (kWh)	2,550,979	7,263,290	9,814,269	
OIT Variable Costs/Revenues:				
OIT QF Revenue from PacifiCorp (\$)	\$ -	\$ 171,445	\$ 171,445	0.070 Retail Rate (\$/kWh)
OIT Electric Bill Payment to PacifiCorp (\$)	\$ 357,425	\$ -	\$ 357,425	0.029 QF Rate (\$/kWh)
Difference			\$ (185,980)	
PacifiCorp Power Cost/ Retail Revenue:				
Retail Revenue	\$ 357,425	\$ -	\$ 357,425	
QF Purchased Power Cost	\$ -	\$ 171,445	\$ 171,445	
Difference			\$ 185,980	

Attachment 2: Financial Analysis of Option 2
Net-Metering with Meter Aggregation
(Waiver required)

	Meter 1	Meter 2	Total	Notes
	Solar PV	Geothermal		
System Configuration:				Geothermal and Solar Generation Projected by OIT
Annual Usage (kWh)	7,657,047	1,370,314	9,027,361	
Annual Generation (kWh)	2,550,979	7,263,290	9,814,269	
Generation minus Usage (kWh)	(5,106,068)	5,892,976	786,908	
Load Sources:				
Load Served by PacifiCorp (kWh)	-	-	-	0% of OIT Load Served by PacifiCorp
Load Served by OIT Generation (kWh)	7,657,047	1,370,314	9,027,361	100% of OIT Load Generated onsite
Total Load Served (kWh)	7,657,047	1,370,314	9,027,361	
Generation Sinks:				
Generation Used to Serve Load (kWh)	7,657,047	1,370,314	9,027,361	92% of OIT Generation Used to Serve Load
Generation Purchased by PacifiCorp (kWh)	-	-	-	0% of OIT Generation sold as QF
Generation Donated to Charity (kWh)	-	786,908	786,908	8% of OIT Generation donated
Total Generation (kWh)	7,657,047	2,157,222	9,814,269	
OIT Variable Costs/Revenues:				
OIT QF Revenue from PacifiCorp (\$)	\$ -	\$ -	\$ -	
OIT Electric Bill Payment to PacifiCorp (\$)	\$ -	\$ -	\$ -	
Difference			\$ -	
Change from Option 1			\$ 185,980	
PacifiCorp Power Cost/ Retail Revenue:				
Retail Revenue	\$ -	\$ -	\$ -	
QF Purchased Power Cost	\$ -	\$ -	\$ -	
Difference			\$ -	
Change from Option 1			\$ (185,980)	

Attachment 3: Financial Analysis of Option 3

**Solar Net-Metering and Geothermal QF with Reconfigured Load
(No waiver required)**

	Meter 1	Meter 2	Total	Notes
	Solar PV	Geothermal		
System Configuration:				Geothermal and Solar Generation Projected by OIT
Annual Usage (kWh)	2,550,979	6,476,382	9,027,361	
Annual Generation (kWh)	2,550,979	7,263,290	9,814,269	
Generation minus Usage (kWh)	-	786,908	786,908	
Load Sources:				
Load Served by PacifiCorp (kWh)	-	-	-	0% of OIT Load Served by PacifiCorp
Load Served by OIT Generation (kWh)	2,550,979	6,476,382	9,027,361	100% of OIT Load Generated onsite
Total Load Served (kWh)	2,550,979	6,476,382	9,027,361	
Generation Sinks:				
Generation Used to Serve Load (kWh)	2,550,979	6,476,382	9,027,361	92% of OIT Generation Used to Serve Load
Generation Purchased by PacifiCorp (kWh)	-	786,908	786,908	8% of OIT Generation sold as QF
Generation Donated to Charity (kWh)	-	-	-	
Total Generation (kWh)	2,550,979	7,263,290	9,814,269	
OIT Variable Costs/Revenues:				
OIT QF Revenue from PacifiCorp (\$)	\$ -	\$ 22,894	\$ 22,894	
OIT Electric Bill Payment to PacifiCorp (\$)	\$ -	\$ -	\$ -	
Difference			\$ 22,894	
Change from Option 1			\$ 208,874	
PacifiCorp Power Cost/ Retail Revenue:				Fixed Reconfiguration Costs
Retail Revenue	\$ -	\$ -	\$ -	\$1,300,000
QF Purchased Power Cost	\$ -	\$ 22,894	\$ 22,894	Payback in Years
Difference			\$ (22,894)	6.2
Change from Option 1			\$ (208,874)	