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BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE APPLICATION)	
OF IDAHO POWER COMPANY FOR)	CASE NO. IPC-E-17-13
AUTHORITY TO ESTABLISH NEW)	
SCHEDULES FOR RESIDENTIAL AND)	STAFF'S TECHNICAL BRIEF IN
SMALL GENERAL SERVICE CUSTOMERS)	RESPONSE TO COMMISSION
WITH ON-SITE GENERATION)	ORDER NO. 34098
)	

BACKGROUND

In Order No. 34098 the Commission, in response to Vote Solar's Petition for Reconsideration and related filings, ordered Vote Solar, Idaho Power, Commission Staff, and any other party with the desire to do so, to file briefs related to whether a customer's ability to export energy should determine if the customer should be included in new Schedules 6 and 8. The Commission also stated that it is interested in obtaining "information about export limiting devices, effects of battery storage, additional information and repercussions of 'in parallel' connections, and the masking of usage created by hourly analysis customer and Company energy exchanges." Order No. 34098 at 2-3. Staff's analysis follows.

SPECIFIC STAFF ANALYSIS AND RECOMMENDATIONS

Staff first reiterates the stance it took in its response to Vote Solar's Petition for Reconsideration, maintaining that those customers who are wholly incapable of exporting energy

STAFF'S TECHNICAL BRIEF
IN RESPONSE TO COMMISSION ORDER NO. 34098

to the grid should be exempt from inclusion in Schedules 6 and 8. Schedules 6 and 8 should only apply to customers with on-site generation who export. Currently virtually all of the Company's on-site generation customers have exported energy to the system. However, while the operative word in Staff's conclusion is *incapable*, Staff foresees that a certain subset of customers may desire to maintain a connection to the Company's grid, but utilize a grid tie limiter, grid inverter with export control, or a similar device to eliminate their ability to export power to the Company's grid.

Therefore, Staff concludes that if a customer is incapable of exporting she should be able to remain in Schedules 1 and 7 for purposes of scheduling and rates. Instead of simply removing customers who choose to limit their export capability from current Schedules 6 and 8 as proposed by Vote Solar, Staff would instead propose that a voluntary, applied-for, "non-export" categorization be incorporated into Schedules 1 and 7, after reasonable analysis, as one prong of the pending generic on-site generation case required by Order No. 34046.

The end goal would be to allow a customer with on-site generation to properly apply for and certify a non-exporting on-site generation system, sized and designed such that the generator's output is used for the generator's own load, and designed to prevent the transfer of electrical energy without compensation.¹ Staff further maintains that addressing the connected, but non-exporting, customer in the forthcoming generic docket may allow more time for reasonable standards to be analyzed and put in place to allow formal certification of non-export devices in order to alleviate Idaho Power's concerns related to improper customer-sided reconfiguration allowing for export. As well, a consistent statewide standard should apply in utility on-site generation interconnection and, therefore, the multi-utility generic docket would allow all utilities to explore this arena without inconsistent application or customer treatment.

Bi-directionality

First, generally, in line with the Commission's adopted reasoning in Order No. 34046, Staff maintains that Company customers who have a physical device that prevents them from exporting energy to the Company's grid should remain on Schedules 1 and 7 because these customers are not bi-directional, meaning they cannot export a meaningful amount of energy

¹ At least two states, California and Hawaii, have begun to implement non-export and storage program options for defined portions of their net metering customers. See e.g., <http://www.cpuc.ca.gov/Rule21/California> (California's Rule 21 Generating Facility Interconnections) and <https://puc.hawaii.gov/wp-content/uploads/2017/10/Hawaii-PUC-Rooftop-Solar-and-Storage-Press-Release-10-20-17-FINAL.pdf> (Hawaii Public Utilities Commission Press Release related to expanded options for the installation of rooftop solar and energy storage).

back to the grid, and do not “net” their consumption. Secondly, any rate structure predicated on a bi-directional relationship with the grid will allocate costs to Schedule 6 and 8 customers that are unique to that bi-directional relationship with the grid, hence, it would be unfair to require customers who cannot export energy to the grid to bear these additional costs.

Parallel Connection

As noted above, Staff would recommend that the Company’s definition of “parallel”² be updated, after a full analysis under the prong of the generic docket related to non-export classification, to include the eventuality of a customer preventing the exportation of energy to the Company’s system. In other words, Staff would recommend that one outcome of the generic docket be to incorporate a definition of parallel which recognizes a non-export customer option.

Allowing customers the benefit of both a connection to the Company’s grid and on-site generation without export or compensation, would better synchronize with the Commission’s holding in Order No. 34046 related to the key element of new net metering classifications being based on the bi-directional relationship between customer and Company. Removing overt bi-directionality through a certified non-export classification removes the need for classification in new Schedules 6 and 8.

Export Limiting Devices

Export limiting devices limit the ability of on-site generators to export electricity to an electrical grid. Because electrical current flows from higher voltage to lower voltage, most grid limiting or non-export devices work by regulating voltage on a customer’s side of the limiter. In normal operation, the customer’s voltage is slightly less than the Company’s, leaving a small amount of electricity flowing from the Company to the customer, even when the customer’s generating system is operating, but it is occasionally possible for a very small quantity of energy to flow back to the grid. The quantity that may flow back is negligible.

Although relatively uncommon in the United States, though gaining in prevalence, export control devices are very common in other parts of the world, where, for example, regulators and electric providers use limiting devices to discourage self-generating customers from using the electrical grid as a battery. Under that scenario, meters are configured to charge customers for all power that passes through the meter, regardless of the direction that it flows. This treatment

² “Parallel” is defined in Schedules 6 and 8 as “generating electricity from an on-site generation system that is connected to and receives voltage from Idaho Power’s system.” See I.P.U.C No. 29, Tariff No. 101, Sheet 6-2; and Idaho Power Company’s Answer to Vote Solar’s Petition for Reconsideration at 3.

obviously provides an export disincentive to customers, motivating them to purchase grid limiting, non-export devices so as not to be charged the same rate for both power imported and power exported.

Staff recommends that export limiting devices be allowed and installed under Idaho utility on-site generation regimes. Staff would further recommend that non-export customers be allowed a small threshold for inadvertent or de minimis export amounts of electricity, with no compensation structure attached to any export. The Company's concerns about its customers bypassing the export limiting device would thus be greatly alleviated, since no benefit would accrue from a customer exporting.

Idaho Power has also expressed concern that customers utilizing export limiting devices would be able to reconfigure "at any time" to allow customer energy export. Idaho Power's Answer to Vote Solar's Petition for Reconsideration at 4. In order to combat this outcome Staff would propose, again, that any limiting device be certified, either by the manufacturer, or, in the future, using generally recognized standards, or something akin to the UL 1741 Non-Export Certification Requirement Document ("CRD") depending on applicability and availability. Staff holds that there are reasonable and safe methods of maintaining a connection to the Company's system while limiting export.

At base, Staff believes that certain customers may wish to have the option of a relatively affordable and simple³ method of offsetting consumption without exporting to the Company's grid. While Idaho Power argues that it would be difficult to monitor and verify that customers are not exporting power to the grid, the Company has not stated that it is impossible or overly burdensome, especially in light of the Company's advanced metering infrastructure ("AMI"). While Staff acknowledges that operational costs may increase slightly, Staff does not believe that the Company would be overly burdened by customers choosing to remain in Schedules 1 and 7 by utilizing an agreed upon grid limiting or non-export device. Simply put, Staff foresees that some customers may wish to remain in Schedules 1 and 7, connected to the Company's system, but choose to offset their own consumption without exporting or ever receiving any credit for exporting to the grid. Again, Staff believes this potentiality would be best addressed outside of

³ Staff has found that export limiting devices can cost as little as \$85.00, but typically are in the \$200-\$500 range. Further, grid limiting options are also a standard feature on many commonly used inverters.

the record available under this Petition for Reconsideration in a prong of the generic case required under Order No. 34046.

Battery Storage

Batteries and storage were not, per se, part of the net metering docket now before the Commission, therefore Staff has received limited data from the Company related to their presence on the Company's system. However, generally, Staff believes that customers who choose to generate and store energy on-site are less likely to want to use to the Company's grid as a battery, and, therefore, would likely attempt to limit export. Therefore, a non-export option may have the effect of incenting battery storage.

However, as it currently stands, batteries are very expensive. As one example, according to Tesla's website, a 7 kWh Powerwall costs approximately \$6,600 plus installation costs of \$1,000 to \$3,000. Summer night time consumption of an Idaho Power self-generating customer is about 26 kWh, so a typical customer would need four Powerwalls to meet her own needs without reversion to the Company's grid. There are also currently long wait times for battery storage systems, for example, depending on the region and availability of Tesla installers, wait times for Powerwall installation are currently more than a year, with some customers reporting (in June of 2018) that they have been waiting since 2016.

Intra-Hour Masking

In its Answer to Vote Solar's Petition for Reconsideration, Idaho Power stated that it captures net hourly consumption, and therefore, "if the net result at the end of every hour is greater than or equal to zero; the exported energy, which is less than the amount of energy consumed, is masked over the course of every hour." See Idaho Power's Answer to Vote Solar's Petition for Reconsideration at 5. Therefore, at base, intra-hour masking is the problem of exported energy being hidden by consumption.

While Staff recognizes the potentiality of this problem, it is concerned by the weight the Company apparently attached to it. The Company's system measures hourly data, so in order to effectively mask intra-hour consumption, a customer would have to make sure that she never has a net export in any given hour in the year. Generally speaking, the opportunity for masking is limited to only those hours in which consumption and production are nearly equal. In practice this would be the hours during the day when solar production is ramping up and down, or, more specifically, the hour when production first exceeds consumption and vice versa when


consumption first exceeds production. In other words, a customer would have to carefully configure her on-site generation site to consume more energy than it produced in each of a typical year's 8,760 hours. Therefore, Staff concludes the intra-hour masking is a limited occurrence and would be difficult for most customers to achieve.

While Staff maintains that intra-hour masking would be very difficult to achieve, and the Company's concerns appear to be disconnected from customer reality on the ground, Staff notes that intra-hour masking is *impossible* with a grid tie limiter because it and similar devices remove the ability for customers to export energy to the grid, which is the only way customers could mask usage. Further, without any financial or kWh credit, there is no incentive for customers to export energy.

Safety of Interconnections

As a corollary to Staff's analysis related to the Petition for Reconsideration, Staff also has an additional safety concern. There may soon be a time when the costs of solar panels are sufficiently low to make their use economically attractive on a large scale, even without excess power credit from Idaho Power. If and when that is the case, Staff is concerned, depending on rate structures, that certain customers may install panels clandestinely to avoid being moved to and from Schedules 6 and 8. This outcome could make it dangerous and/or impossible for the Company to fully de-energize power lines for repair. In order to properly analyze safety issues related to clandestine generation, Staff would also recommend that parties to the generic on-site generation docket address safety issues related to Company grid interconnection.

RESPECTFULLY submitted this 10th day of August, 2018.


Sean Costello

CERTIFICATE OF SERVICE

I HEREBY CERTIFY THAT I HAVE ON THIS 10th DAY OF AUGUST, 2018, SERVED THE FOREGOING **STAFF'S TECHNICAL BRIEF IN RESPONSE TO COMMISSION ORDER NO. 34098**, IN CASE NO. IPC-E-17-13, BY MAILING A COPY THEREOF, POSTAGE PREPAID, TO THE FOLLOWING:

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STAFF'S TECHNICAL BRIEF
IN RESPONSE TO COMMISSION ORDER NO. 34098

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