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IDAHO PUBLIC
UTILITIES COMMISSION

August 24, 2018

VIA HAND DELIVERY

Diane Hanian, Secretary
Idaho Public Utilities Commission
472 West Washington Street
Boise, Idaho 83702

Re: Case No. IPC-E-17-13
New Schedules for Residential and Small General Service Customers with
On-Site Generation – Idaho Power Company's Closing Brief on
Reconsideration

Dear Ms. Hanian:

Enclosed for filing in the above matter please find an original and seven (7) copies
of Idaho Power Company's Closing Brief on Reconsideration.

Very truly yours,



Lisa D. Nordstrom

LDN:csb
Enclosures

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IDAHO PUBLIC
UTILITIES COMMISSION

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	)	IDAHO POWER COMPANY'S
SMALL GENERAL SERVICE CUSTOMERS	)	CLOSING BRIEF ON
WITH ON-SITE GENERATION	)	RECONSIDERATION
	)	

The standard rate design in place since net metering's inception in 1983 does not properly recover the costs to serve customers with on-site generation. The Idaho Public Utilities Commission ("Commission"), its Staff ("Staff"), and Idaho Power Company ("Idaho Power" or "Company") shared the belief in 2001 that the resulting cost shift was tolerable up to a 2.9 megawatt ("MW") capacity limit but that it would need to be addressed in the future.¹ Nearly 2,500 participants² and 17 years later, this rate design issue remains

¹ *In the Matter of the Application of Idaho Power Company for Approval of a New Schedule 84—Net Metering Tariff*, Case No. IPC-E-01-39, Order No. 28951 at 12 (February 13, 2002) ("The Commission recognizes that in the program we approve today for Schedules 1 and 7 customers, the full cost of the program may not be born[e] by participants. Raising the cap, we realize, increases the level of subsidization.")

² As of July 31, 2018, Idaho Power has 2,407 active customers with on-site generation taking service under Schedules 1 and 7 with 16.738 MW of generation capacity. An additional 325 applications with 2.437 MW of generating capacity were pending completion.

unresolved. Many utilities and regulatory commissions in other jurisdictions have taken steps to resolve this issue;³ it is time that Idaho does as well.

The tariffs approved by Commission Order No. 34046⁴ appropriately established an “in parallel connection” as the criteria to include all customers with on-site generation in Schedules 6 and 8.⁵ This criterion recognizes the mechanical coupling of devices to the electrical grid that enables all self-generators to take energy and grid services—and allows the Commission to determine a non-preferential rate design for them.

To more fully respond to the issues raised in the parties’ opening briefs, Idaho Power submits this Closing Brief on Reconsideration (“Closing Brief”) pursuant to *Idaho Code* § 61-626(2),⁶ Procedural Rule 332,⁷ and Commission Order No. 34098.⁸ Recommendations⁹ to exclude customers who limit self-generation exports from Schedules 6 and 8 would perpetuate cost shifting from partial service customers who self-

³ Tr. at 737, l. 2. – 741, l. 13.

⁴ *In the Matter of the Application of Idaho Power Company for Authority to Establish New Schedules for Residential and Small General Service Customers with On-Site Generation*, Case No. IPC-E-17-13, Order No. 34046 (May 9, 2018).

⁵ Idaho Power Tariff Schedule 6, Sheet No. 6-1.; Idaho Power Tariff Schedule 8, Sheet No. 8-1.

⁶ When reconsideration is granted, “the matter must be reheard, or written briefs, comments or interrogatories must be filed, within thirteen (13) weeks after the date for filing petitions for reconsideration.”

⁷ Rule of Procedure 332 states in part, “When the order for reconsideration finds that the grounds upon which the petition is granted present on issues of law and not of fact or issues of fact not requiring hearings, the Commission may direct that the grounds be considered on reconsideration by submission of briefs, memoranda, written interrogatories or written statements and not by further submission of evidence at hearing.” IDAPA 31.01.01.332.

⁸ *In the Matter of the Application of Idaho Power Company for Authority to Establish New Schedules for Residential and Small General Service Customers with On-Site Generation*, Case No. IPC-E-17-13, Order No. 34098 (June 28, 2018).

⁹ Staff’s Technical Brief in Response to Commission Order No. 34098, filed August 10, 2018; Vote Solar’s Brief on Reconsideration, filed August 10, 2018; City of Boise City’s Brief in Response to Order Granting Reconsideration, filed August 10, 2018; Idaho Conservation League (“ICL”), the Idaho Chapter of the Sierra Club (“Sierra Club”), Idaho Chapter Idaho Clean Energy Association (“ICEA”), Northwest Energy Coalition (“NEC”) Reconsideration Brief, filed August 10, 2018.

generate to standard service customers without on-site generation. The three analyses presented in Idaho Power Company's Opening Brief on Reconsideration ("Opening Brief")—along with information provided in Rocky Mountain Power's Comments in Opposition of Vote Solar's Petition for Reconsideration and the Idaho Irrigation Pumpers Association, Inc.'s Brief in Opposition—demonstrate that customers who limit their exports with devices, batteries, or other technologies have much more in common with other partial requirements customers than full requirements customers. Neither Vote Solar's nor Staff's proposal promotes safety, enforceability, or the proper assignment of costs for services received.

Consequently, the Commission should deny requests by Vote Solar and others to carve out non-exporting self-generators from Schedules 6 and 8 for continued preferential treatment for the reasons described in greater detail below.

I.

**PARALLEL CONNECTION IS THE
APPROPRIATE CRITERIA, NOT BI-DIRECTIONALITY**

As correctly stated by Rocky Mountain Power, "An 'in parallel' connection facilitates the *ability* or capability to export."¹⁰ The only way to ensure that no electricity is exported back to the utility and that no other services are provided to residential and small general service ("R&SGS") generators is if the customer's generation system is not connected in parallel to the utility. That is, if the customer's generation system is not connected in parallel, then it is not connected to the utility and there is no electrical path for the customer-generated energy to flow onto the utility's distribution system nor is there

¹⁰ Rocky Mountain Power's Comments in Opposition of Vote Solar's Petition for Reconsideration, filed August 10, 2018, at 2 (emphasis in original).

an electrical path for Idaho Power to serve the customer's generation system.¹¹ Therefore, the parallel connection of an on-site generation system is the appropriate criteria to determine whether customers should be included in the new customer classes.

A. Definition of "Parallel."

In Staff's Technical Brief in Response to Commission Order No. 34098 ("Staff's Technical Brief"), Staff recommends that "the Company's definition of 'parallel' be updated, after a full analysis under the prong of the generic docket related to the non-export classification, to include the eventuality of a customer preventing the exportation of energy to the Company's system."¹² The Commission should reject this recommendation.

First, Staff's suggestion that the Company or the Commission could simply choose to "update"¹³ the definition of "parallel" fails to recognize that the definition of a parallel connection is based on the physical electrical configuration of the customer generation. Writing a definition that excludes certain parallel configurations (such as one that does not export) does not change the physical configuration, but confuses the term "parallel connection" as it is commonly used in the industry. The exchange of power in any direction is not part of the definition of parallel nor is it a requirement to run in parallel; rather, as depicted in Figures 7¹⁴ and 9¹⁵ in Idaho Power's Opening Brief, parallel connection means there is an electrical coupling between a generation system and the

¹¹ Tr. at 670, ll. 1-19.

¹² Staff's Technical Brief at 3.

¹³ *Id.*

¹⁴ Idaho Power's Opening Brief on Reconsideration at 19.

¹⁵ *Id.* at 22.

grid. A generation system in parallel could be operating in any one of the following modes: (1) injecting power to the grid; (2) supplying the customer load; or (3) operating in a stand-by mode without any exchange of power.

Second, the distinction of a “parallel” connection is also a commonly recognized term within the Company’s tariff as well as other utilities’ tariffs. Idaho Power’s tariff Schedule 45, Standby Service, which is available to Schedule 9 and 19 Primary and Transmission Customers with on-site generation, provides that “parallel operations will only be authorized by the Company under the terms of a Standby Service Agreement with the Customer.”¹⁶ A Schedule 45 arrangement provides for interconnection of a customer’s on-site generation in the third “mode” described above—the utility is operating in a stand-by mode without any exchange of power. Schedule 72, Interconnections to Non-Utility Generation, also uses the term “parallel” to describe the interconnection between a seller and the Company; this arrangement operates in the first mode described above—generation injecting power to the grid.¹⁷ Further, both Rocky Mountain Power¹⁸ and Avista Corporation¹⁹ currently use the term “parallel” to define the type of customer to which their respective net metering tariffs apply. To maintain consistency within Idaho Power’s tariff and between the tariffs of Idaho’s utilities, it is most appropriate to continue

¹⁶ I.P.U.C. No. 29, Tariff No. 101, Schedule 45, Sheet No. 45-2.

¹⁷ I.P.U.C. No. 29, Tariff No. 101, Schedule 72, Sheet No. 72-19.

¹⁸ Rocky Mountain Power, I.P.U.C. No. 1, Electric Service Schedule No. 135, Net Metering Service. (“Application: On a first-come, first served basis to any customer that owns and operates an Eligible Generating Plant that is located on the Customer’s premises, on the Customer’s side of the Point of Delivery, is interconnected and operates in parallel with the Company’s existing transmission and distribution facilities and is intended primarily to offset part of all of the Customer’s own electrical requirements.”)

¹⁹ Avista Utilities, I.P.U.C. No. 28, Tariff Schedule 63, Net Metering Option, Section (1) Customer Eligibility, “(D) Operates in parallel with the electric utility’s transmission and distribution facilities.”

to use the parallel criteria to determine applicability of the newly established schedules available for R&SGS customers with on-site generation.

Finally, changing the definition of “parallel” to apply only non-exporting customers fails to recognize that it is the same “parallel” connection through which essential grid services and standby service are provided to all non-exporting customers.²⁰ Non-exporting customers with self-generators who operate in parallel take the same grid services as other customers with self-generators who export in Schedules 6 and 8.

B. Bi-Directional Flow of Energy.

Both Vote Solar and Staff argue that Idaho Power’s case to establish separate customer classes for R&SGS customers with on-site generation was based on the bi-directional flow of energy. This is an overly selective view of Idaho Power’s case.

Vote Solar suggests that Idaho Power’s case “relied on customer exports.”²¹ Citing a 2016 Public Utilities Fortnightly article attached as Exhibit No. 5 to Mr. Tatum’s direct testimony, Vote Solar argues that “The [Company’s] ‘subsidy’ claim relied on industry literature that looks to the level of credit customers receive on their bill for exported electricity.”²² Further, Vote Solar implied that “defining the ‘subsidy’ as the ‘credit on [net metering customers’] bill when their rooftop panels generate excess power and sell it back to the utility’ . . . purporting to ‘quantify[] the subsidy’ based on the value of exports compared to the credit provided.”²³ This mischaracterizes the Company’s position. Mr. Tatum referenced Exhibit No. 5 of his direct testimony for the proposition that “Others in

²⁰ Idaho Power’s Opening Brief on Reconsideration at 20.

²¹ Vote Solar’s Brief on Reconsideration at 2-3.

²² *Id.* at 3.

²³ *Id.* at 3.

the industry have concluded that the net metering policy is also regressive in nature.”²⁴ His reference to the article was not an effort to quantify the subsidy. On the contrary, the Company’s testimony about the net metering subsidy, or “cost shift” as Mr. Tatum refers to it,²⁵ was centered around the current rate structure for R&SGS customers. Mr. Tatum explained that:

Currently, the Company’s R&SGS customers are billed two types of charges: (1) a flat monthly service charge of \$5.00 and (2) per kilowatt-hour (“kWh”) energy charges that vary by season and total monthly consumption. Due to the limited billing components associated with these rates classes, most of the Company’s revenue requirement is collected through the volumetric energy rates. This includes costs associated with all components of the electrical system, from investment in generation resources to the meters installed on customers’ premises. Consequently, energy rates for R&SGS customers reflect not only the energy-related components of the revenue requirement, but fixed costs associated with generation, transmission, and distribution as well.

For this type of rate design, recovery of fixed costs from an individual customer declines with any reduction in net energy usage. This creates a potential inequity between net metering customers and standard service customers as net metering customers, who still rely heavily upon the grid to both purchase power and transfer excess generation, are provided the opportunity to unduly reduce collection of class revenue requirement by reducing a portion or even all of their net kWh usage while other residential customers are left to compensate for the fixed costs that transfer to them through this revenue shortfall.²⁶

Like Vote Solar, Commission Staff submits that the rate structure for customers in Schedules 6 and 8 would be “predicated on a bi-directional relationship with the grid.”²⁷

²⁴ Tr. at 190, ll. 17-18.

²⁵ Tr. at 188, l. 23.

²⁶ Tr. at. 189, ll. 1-25.

²⁷ Staff’s Technical Brief at 3.

Idaho Power disagrees. The bi-directional flow of energy is only one consideration among many when implementing the proper rate structure for customers with on-site generation. Utility rates and rate design are established by (1) determining what costs are appropriately allocated to each segment of customers and (2) deciding the most effective and fair way to collect those costs from each segment of customers. Cost allocation is determined by examining when, what, and how much each customer class uses of the utility's services. A rate design is then established by determining how to best collect those costs from each segment of customers depending on how they use energy.

Based only on the energy that the self-generators consumed from the utility, Idaho Power provided evidence in its Opening Brief that the load service requirements and the usage characteristics of R&SGS customers who install on-site generation justify a separate and unique rate structure.²⁸ The evidence of reduced load factor and different load service requirements for these partial requirements customers remains unchanged—regardless if the customer prevents the export of excess energy. The average usage characteristics of customers with on-site generation are not based on volumes of energy but rather on capacity, as evidenced by the Company's load factor analysis.²⁹

II.

SUFFICIENT EVIDENCE EXISTS TO INCLUDE ALL R&SGS ON-SITE GENERATION IN SCHEDULES 6 AND 8

The evidence presented in the Company's case-in-chief was developed using the interval data for all Idaho residential customers with on-site generation. This data

²⁸ Idaho Power's Opening Brief on Reconsideration at 3-11, Attachments 2 and 3.

²⁹ *Id.* at 6.

included customers who did not generate excess energy for extended periods of time. In response to Commission Order No. 34098's request for information, Idaho Power's Opening Brief presented additional evidence that demonstrates customers with on-site generation, who either prevent the export of excess energy via an export limiting device or battery storage, would be expected to have load service requirements more similar to those with on-site generation who export energy to the grid than those of standard service customers without on-site generation.

A. Non-Exporting Customers were Included in Idaho Power's Case-in-Chief.

In its Petition for Reconsideration, Vote Solar argues that "All of the Company's evidence related to different load shapes—or time, nature, and pattern of use—was limited to net metering customers" and excluded evidence of customers who self-generate but do not export any electricity to the Company's distribution system.³⁰ Idaho Power disagrees; customers with significant non-exporting periods were indeed included in the Company's evidence.

The evidence presented in the Company's case-in-chief³¹ was developed using the interval data for all Idaho residential customers with on-site generation—including customers who did not export excess energy for extended periods of time. In any given month, there are residential customers who do not export excess energy. Staff witness Donohue alluded to this fact in her direct testimony stating, "most of the energy produced [by net metering customers] is consumed on-site rather than pushed back onto the grid."³²

³⁰ Vote Solar's Petition for Reconsideration at 2.

³¹ Tr. at 598, I. 6 – Tr., p. 618, I. 2.

³² Tr. at 1482, II. 7-9.

Idaho Power quantified the amount of excess energy that flowed onto the grid and showed that, in January and December, “the average residential customer with on-site generation consumes most of their generation and has very little excess generation”³³ Table 2 of Mr. Angell’s rebuttal testimony quantified the average monthly excess generation per residential customer.³⁴ Hence, in its case-in-chief, Idaho Power did include customers with no energy exports and demonstrated R&SGS customers who install on-site generation are different than R&SGS standard service customers.

B. Vote Solar’s Visualization of the Removal of Exports is Not a Proxy.

In its Brief on Reconsideration, Vote Solar suggests Dr. Faruqui provided a “theoretical proxy” for evidence during Mr. Bender’s cross-examination that compares the loads of bi-directional customer-generators when their exports are removed from their load shapes.³⁵ This is misleading because no data was presented by Dr. Faruqui during cross-examination regarding the removal of export flows.

It is a reach for Vote Solar to conclude that Dr. Faruqui’s response to a series of questions about the impacts of removing energy exports represents a proxy for actual evidence comparing bi-directional customer-generators’ load shapes with and without their respective exports. During Mr. Bender’s cross-examination of Dr. Faruqui, Dr. Faruqui used phrases such as “by and large, you would expect that to be the case”³⁶ and “it may not be exactly the same”³⁷ when describing his envisioning of the theoretical

³³ Tr. at 634, ll. 17-20.

³⁴ Tr. at 635, l. 1.

³⁵ Vote Solar’s Brief on Reconsideration at 4.

³⁶ Tr. at 770, ll. 15-16.

³⁷ Tr. at 771, l. 6.

removal of exports from the load shapes. Vote Solar goes as far as suggesting that “data” was presented and inaccurately concludes, “Therefore, even to the extent the Commission were to look to evidence of bi-directional customer-generators after their export flows have been stripped from load data, those data actually show no distinguishing load and usage characteristics that could justify a new class to include non-exporting customers.”³⁸ Vote Solar’s visualization of the removal of energy exports does not constitute “data” and does not provide a proxy for evidence as to the load and usage characteristics of non-exporting customers.

C. The Evidence Provided on Reconsideration Continues to Show that On-Site Generators Have Different Load Service Requirements Regardless of Exports.

In response to Commission Order No. 34098’s direction to file “briefing related to whether a customer’s ability to export energy should determine if the customer should be included in new Schedules 6 and 8,”³⁹ Idaho Power provided evidence that demonstrates customers with on-site generation, who either prevent the export of excess energy via an export limiting device or battery storage, continue to have different load service requirements than standard service customers.⁴⁰

Idaho Power conducted three separate analyses to study the effects of preventing the export of excess energy. The three separate analyses consisted of two simulations, the Limited Export Simulation⁴¹ and The Effect of Storage on Customer Load Shapes

³⁸ Vote Solar’s Brief on Reconsideration at 4.

³⁹ Order No. 34098 at 2.

⁴⁰ Idaho Power’s Opening Brief on Reconsideration at 3-17.

⁴¹ The Company produced a Limited Export Simulation to simulate a residential customer before and after the installation of on-site generation without the capability to export excess energy. The methodology used by the Company to create the Limited Export Simulation is described in Attachment 1 to Idaho Power’s Opening Brief on Reconsideration.

when Coupled with Distributed Generation⁴² Simulation, and one analysis using actual data – Pilot Customer Load Shapes with No Energy Exports.⁴³ Table 1 summarizes the additional analyses performed by the Company.

Table 1. Results of Analyses Comparing the Effects of Limiting Self-Generator Exports

Load Service Requirements	The load factors of partial requirements customers are lower than those of full-requirements customers—even without the capability to export excess energy. The usage characteristics are not based on volumes of energy but rather on capacity. ⁴⁴
Load Profile	The load profile changes significantly after the installation of on-site generation—even without the ability to export excess energy. The rate of change in usage is larger than customers without on-site generation. ⁴⁵
System-Coincident Demand	The system-coincident demand is lower in nine out of 12 months after the installation of on-site generation—even without the capability to export excess energy. ⁴⁶
Non-Coincident Demand	A customer's monthly peak is not necessarily reduced by the installation of on-site generation—even without the capability to export excess energy. ⁴⁷

The results of the three additional analyses demonstrate that the load service requirements and the usage characteristics of R&SGS customers who install on-site generation are distinctly different for a residential customer before and after the installation of on-site generation—even without the capability to export excess energy.

⁴² The Brattle Group performed a simulation of the net load shapes of customers who install battery storage as a means to eliminate the export of excess energy. The Brattle Group's resulting analysis, "The Effect of Storage on Customer Load Shapes when Coupled with Distributed Generation," dated August 9, 2018, can be found in Attachment 3 to Idaho Power's Opening Brief on Reconsideration.

⁴³ To verify and validate the results of the Company's Limited Export Simulation, the Company performed a supplementary analysis on the effects of preventing the export of excess energy. For the supplementary analysis, the Company obtained actual data from a segment of 18 residential solar customers in Idaho Power's Oregon service area who participate in a Solar Photovoltaic Pilot Program. The Company's resulting analysis, "Pilot Customer Load Shapes With No Energy Exports," can be found in Attachment 2 to Idaho Power's Opening Brief on Reconsideration.

⁴⁴ Idaho Power's Opening Brief on Reconsideration at 5-6.

⁴⁵ *Id.* at 6-8.

⁴⁶ *Id.*, Figure 5.

⁴⁷ *Id.*, Figure 6.

Partial requirements customers who limit their ability to export excess generation have more in common with partial requirements customers who export than standard customers without on-site generation. These differences justify including all customers with parallel-connected on-site generation—regardless of energy exports—in Schedules 6 and 8. This will provide the Company, other interested stakeholders, and the Commission an opportunity to evaluate options for a rate structure that will allow a reasonable opportunity to appropriately assign and collect costs without cost shifting to standard service, full requirements customers.

III.

STAFF'S PROPOSAL WILL NOT SOLVE THE PROBLEM WITH THE CURRENT RATE STRUCTURE

Staff argues 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” and that “a voluntary, applied-for, ‘non-export’ categorization be incorporated into Schedules 1 and 7.”⁴⁸

A. Staff's Proposal Will Perpetuate Cost Shift.

Staff's proposal will not solve the rate design issue in this case. Staff's proposal to create a voluntary, non-export category within standard service Schedules 1 and 7 will only continue the opportunity to shift costs from those customers who choose to install on-site generation to reduce the volume of energy they consume from the grid to customers in those classes who cannot afford to or choose not to install on-site generation.

An export limiting device only limits energy sent to the utility; these devices do not limit the customer's ability to receive energy or other grid services. Consequently,

⁴⁸ Staff's Technical Brief at 2.

customers who self-generate in parallel but limit the export of energy to the utility take the same services as other customers who self-generate in Schedules 6 and 8 who do export.

In its Opening Brief, Idaho Power provided evidence that demonstrates how the load service requirements and usage characteristics differ for a customer before and after the installation of on-site generation without the capability to export excess energy.⁴⁹ The Company found that “even in the absence of energy exports, the customer with on-site generation still has the ability to offset their usage on an hourly basis; this reduction in energy consumption, coupled with a rate design that collects fixed costs through a volumetric rate, creates the opportunity for shifting costs from customers with on-site generation to standard service customers.”⁵⁰

In Order No. 34046, the Commission expressed its desire “for the Company to address fixed-cost apportionment across its system.”⁵¹ In response to Staff’s initial proposal to alleviate the cost shifting by changing the compensation for excess energy exported to the grid,⁵² the Commission stated, “We appreciate Staff’s attempt to quantify potential cost shifting and then alleviate it But we disagree this solution . . . completely fixes the rate design issue.”⁵³ Staff’s proposal to create a non-export categorization in Schedules 1 and 7 has the same inherent flaw as its initial proposal—it fails to completely fix the rate design issue. The Commission rejected Staff’s initial proposal and should reject Staff’s latest proposal for the same reason.

⁴⁹ Idaho Power’s Opening Brief on Reconsideration at 4.

⁵⁰ *Id.*

⁵¹ Order No. 34046 at 17.

⁵² Tr. at 1489, I. 23 – p. 1492, I. 7.; Tr. at 1450, II. 8-21.

⁵³ Order No. 34046 at 17.

B. Export Limiting Devices.

In its Answer to Vote Solar's Petition for Reconsideration, Idaho Power expressed concern that "It is not adequate to depend on a customer configurable device, such as a dynamically controlled inverter, a grid tie limiter, or a grid inverter with export control, because the device could be reconfigured at any time to allow the customer to export energy."⁵⁴ Staff's and Vote Solar's arguments overlook or unduly minimize the administrative challenges of allowing a select non-exporting group of self-generators to remain in Schedules 1 and 7.

As an initial matter, the Company does not agree with Staff's characterization of how export limiting devices are configured and operate.⁵⁵ To avoid the outcome where customers utilizing export limiting devices could reconfigure them at any time to allow customer export, Staff suggested 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."⁵⁶ This is not a solution to prevent a customer from

⁵⁴ Idaho Power's Answer to Vote Solar's Petition for Reconsideration at 4.

⁵⁵ On page 4 of Staff's Technical Brief, Staff claimed that "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."

Idaho Power disagrees with Staff's description of electrical current flow and how an export limiting device works. The direction of real power (Watts) current flow is due to a difference in the alternating current ("AC") voltage phase relationship between the inverter and utility supplied voltage at the customer location. The direction of the reactive power (VARs) current flow is caused by a difference in voltage magnitude between the two. The most common method to limit power export is to control the photovoltaic ("PV") inverter power output. A customer would need to install a device that monitors the direction of the power flow at the utility customer meter (point of interconnection/common coupling). Once this monitor detects power flowing to the grid, the export limiter would cause the PV inverter to reduce the power converted from the PV panels to AC, thus reducing the invert voltage phase and cease the power flowing to the grid.

⁵⁶ Staff's Technical Brief at 4.

reconfiguring their device to allow exports. A certification only means that the customer owned and operated device is capable of certain functionality. If an inverter is certified to perform a function such as export limiting, the certification means the inverter is capable of export limiting. A certification does not guarantee that the device has been properly configured or that it is locked at that configuration. Likewise, a certification does not prevent the customer from changing the settings at will.

Vote Solar argues that a requirement to use export limiting devices may not be needed if “Customer-generators opting out of Schedules 6 and 8 will not receive credit for any exports—meaning that any electricity incidentally delivered to the grid provides no value to the customer-generator and constitutes a financial loss to the customer and a benefit to IPC.”⁵⁷ Vote Solar goes on to claim “That financial disincentive will ensure any actual exports from customers opting out of Schedules 6 and 8 are minimal.”⁵⁸ Idaho Power disagrees. A financial incentive will exist for those customers with on-site generation who could benefit from continued access to the cross-subsidy that exists in volumetric standard service rates.

C. Actual and Virtual Battery Storage.

Idaho Power disagrees with Staff’s belief 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.”⁵⁹ If customers’ on-site generation

⁵⁷ Vote Solar’s Brief on Reconsideration at 7.

⁵⁸ *Id.*

⁵⁹ Staff’s Technical Brief at 5.

systems are connected in parallel to the grid, they will likely choose to use the Company's grid as a virtual battery unless physically⁶⁰ or legally prohibited from doing so.

To better understand to what degree a customer who installs their own battery would use the grid as a battery, The Brattle Group further analyzed the effects of battery storage specifically to understand if or when a self-generator with a battery would use the grid as a battery. The Brattle Group's resulting analysis, "The Effect of Storage on Customer Load Shapes when Coupled with Distributed Generation SUPPLEMENTAL ANALYSIS" can be found in Attachment 1 to this Closing Brief.

For its analysis, The Brattle Group assumed the individual battery capacity of each net metering customer to be large enough to store all net exports on any individual day of the year.⁶¹ The supplemental analysis finds that low load during nighttime hours prevents the customer's battery from fully discharging overnight. This eventually leads to conditions where the battery is fully charged with no remaining capacity; consequently, the excess energy would either be exported to the grid or the customer would use an export limiting device to curtail their on-site generation.⁶²

Figure 1 below illustrates the net load of an individual residential customer with on-site generation with and without battery storage during a week in June 2016. The top portion of Figure 1 illustrates the net load shapes for an individual residential self-generating customer with and without battery storage and the bottom portion of Figure 1 illustrates the customer's battery state of charge over time. The light blue line represents

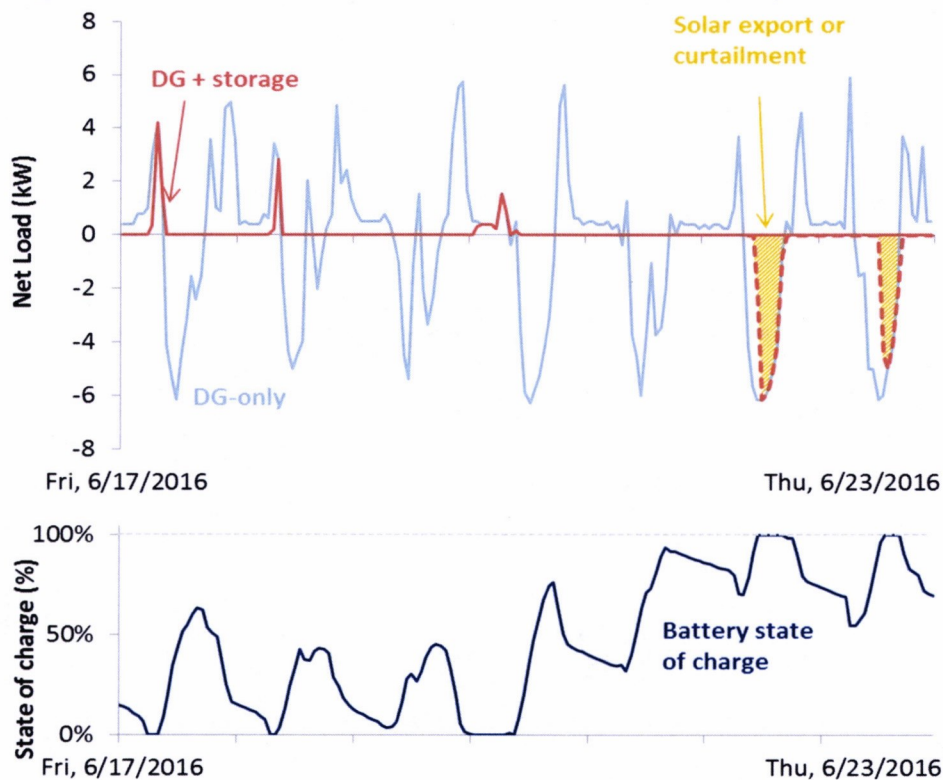
⁶⁰ "Physically" refers to an electrical separation from the grid that is administratively enforceable and not within the customer's ability to change.

⁶¹ The Brattle Group, *The Effect of Storage on Customer Load Shapes when Coupled with Distributed Generation SUPPLEMENTAL ANALYSIS* at 3 (August 21, 2018).

⁶² *Id.*

the net load for the residential customer with on-site generation *absent* battery storage and the red line represents the net load for the residential customer with on-site generation *with* battery storage. The yellow area depicts the instances where the customer would either export excess energy to the grid or otherwise curtail their on-site generation system. Please note that (1) when the battery state of charge is depleted, this coincides with the time when the customer consumes energy from the utility and (2) as the customer's consumption from the utility goes to zero, the battery state of charge increases. Over the course of the week, the battery state of charge increases until eventually the battery is fully charged. One can see that with battery storage (the red line) the customer continues to consume energy from the utility at times and exports excess energy to the grid at other times—that is, the customer uses the grid as a virtual battery.

Figure 1. Individual Customer Net Load and Battery State of Charge



To maximize the output of their generation systems and their investments, customers will choose to generate more energy than their batteries can hold and “store” energy on the grid as a virtual battery. In other words, savvy customers will continue to depend on the utility for energy when their systems are not generating or when their batteries are depleted and they will export excess energy to the grid in exchange for credits against future consumption when their batteries are fully charged.

Staff concludes that “a non-export option may have the effect of incenting battery storage.”⁶³ Artificially limiting customer exports would be counter to the purpose of net metering when no reliability issues prevent the grid’s acceptance of excess energy exports. Second, even with a lot of storage capacity (e.g., sized to store maximum net energy exports on any given day of the year as in The Brattle Group’s analysis), customers have a financial incentive to export generation in excess of storage rather than curtailing their on-site generation. That is unless, of course, there is a greater financial incentive for those self-generators who could benefit from continued access to the cross-subsidy that exists in volumetric standard service rates.

D. Safety of Interconnections.

Idaho Power shares Staff’s concern that, “depending on rate structures, that certain customers may install panels clandestinely to avoid being moved to and from Schedules 6 and 8.”⁶⁴ The current inclusion of all R&SGS customers with on-site generation, regardless of energy exports, in Schedules 6 and 8 will address this concern.

However, Idaho Power is concerned that Staff’s proposed creation of a subcategory of non-exporting generating customers within Schedules 1 and 7 would

⁶³ Staff’s Technical Brief at 5.

⁶⁴ *Id.* at 6.

impair safe interconnection.⁶⁵ When a customer installs electric generating equipment that has the capability to energize Idaho Power's distribution lines (this includes export limiting devices within the customer's control), it is imperative that Idaho Power know about the installation and have the ability to protect its employees and system from injury or damage. Idaho Power will continue to insist that customer-owned disconnection and protection equipment be well designed and constructed with quality materials. Without notice of the installation and an opportunity to review it, Idaho Power's qualified personnel cannot verify that this equipment exists.

IV.

HAWAIIAN ELECTRIC'S RELIABILITY SOLUTION WILL NOT SOLVE IDAHO'S RATE DESIGN PROBLEM

In their Reconsideration Brief, ICL, Sierra Club, ICEA, and NEC state that "Hawaiian Electric has adopted a net metering policy that allows customers to elect a non-export option."⁶⁶ Hawaiian Electric Company does indeed allow its customers to elect a non-export option.⁶⁷ However, Hawaiian Electric implemented this policy to solve a reliability issue, not a rate design issue. On October 12, 2015, the Hawaii Public Utilities

⁶⁵ As the Commission noted in a previous case, "The Commission has a statutory responsibility to ensure safety for the public and employees of the Company. We believe that reasonable safeguards such as the one at question [interconnections be certified by a licensed electrician] are necessary to maintaining the integrity of Idaho Power's system." *In the Matter of the Application of Idaho Power Company for an Order Revising the Rates, Terms and Conditions under which Idaho Power Purchases Non-Firm Energy from Qualifying Facilities*, Case No. IPC-E-95-15, Order No. 26850 at 5 (March 27, 1997).

⁶⁶ ICL, Sierra Club, ICEA, and NEC's Reconsideration Brief at 2.

⁶⁷ Hawaiian Electric Company Tariff, Rule No. 22, Customer Self-Supply; Section D (Interconnection Process) governs the interconnection process and requirements for "Eligible Customer-Generator requests to interconnect and operate a Generating Facility in parallel with the Company's electric system" See also Hawaiian Electric Company Tariff, Rule No. 14, Service Connections and Facilities on Customer's Premises.

Commission closed Hawaiian Electric's Net Energy Metering program⁶⁸ and approved new rooftop PV programs to allow customers the ability to install rooftop PV and not further degrade service reliability.⁶⁹ At that time, roughly 12 percent of Hawaii's homes had rooftop solar systems.⁷⁰ In other words, Hawaiian Electric offered net metering for all customers until the distribution circuits reached a maximum penetration of distributed generation based on distribution circuit voltage deviation beyond the allowed⁷¹ +/- 5 percent. A non-export option was created to allow additional customers with on-site generation to interconnect and maintain distribution circuit voltage within the +/- 5 percent.

An important bit of information that ICL, Sierra Club, ICEA, and NEC did not include about Hawaiian Electric's non-export option for customers with on-site generation is that the new rooftop PV program developed for non-exporting solar PV installations, the Customer Self-Supply program, includes a minimum billing requirement.⁷² The minimum billing requirement allowed Hawaiian Electric to address a rate design deficiency for non-export partial requirements customers. While closing the net metering program solved the reliability issue, it was necessary to implement the minimum billing charge to address the existing rate design issue.

⁶⁸ Hawaiian Electric Company Tariff, Rule No. 18, Net Energy Metering (fully subscribed and closed as of October 12, 2015). One of the criteria to be considered an "Eligible Customer-Generator" is owning or operating a generating facility "operated in parallel with the Company's transmission and distribution facilities"

⁶⁹ *In the Matter of Public Utilities Commission Instituting a Proceeding to Investigate Distributed Energy Resource Policies*, Public Utilities Commission of the State of Hawaii Docket No. 2014-0192, Order No. 33258 (October 12, 2015).

⁷⁰ New York Times, *Solar Power Battle Puts Hawaii at Forefront of Worldwide Changes*, April 18, 2015 (citing data from the Energy Information Administration).

⁷¹ Hawaiian Electric Company Tariff, Rule No. 2, Character of Service, Revised Sheet No. 7.

⁷² Hawaiian Electric Company Tariff, Rule No. 22, Customer Self-Supply, Sheet No. 43A.

Idaho Power disagrees with ICL, Sierra Club, ICEA, and NEC's recommendation to apply Hawaiian Electric's solution to Idaho Power customers. Idaho Power does not currently have, nor did it present, a distribution circuit problem. To apply a Hawaiian solution to Idaho Power's system is not a necessary or appropriate outcome; separate classes with separate rate structures for all R&SGS customers with on-site generation is the right solution for Idaho Power and its non-generating R&SGS customers.

V.

IDAHO POWER INSTALLS METERING INFRASTRUCTURE REQUIRED TO BILL RATE SCHEDULES IN THE MOST ECONOMICAL MANNER FOR CUSTOMERS

A. Net Consumption is Measured Through a Single Meter.

Idaho Power's net metering option was first offered in 1983 as part of Schedule 86, which governed non-firm energy purchases from Qualified Facilities.⁷³ The Commission has been aware that the potential existed to shift costs to non-participants, and approved a program that kept billing and metering costs low. In 1997, the Commission found that "a reasonable net metering option is one that . . . (a) allows the Company to use its existing billing system, (b) allows the customer to use a conventional single meter metering system" ⁷⁴ The Commission also agreed with Staff's recommendation to more clearly revise the net metering option to more clearly exempt participants from installing a second meter. In the Commission's words, "To do otherwise would defeat the very purpose of a net metering option."⁷⁵

⁷³ *In the Matter of the Application of Idaho Power Company for Approval of Revised Rates to be Paid for Power and Energy Sold to Idaho Power Pursuant to Section 210 of The Public Utility Regulatory Policies Act of 1978*, Case No. U-1006-200, Order No. 18358 (October 20, 1983).

⁷⁴ *In the Matter of the Application of Idaho Power Company for an Order Revising the Rates, Terms and Conditions Under Which Idaho Power Purchases Non-Firm Energy from Qualifying Facilities*, Case No. IPC-E-95-15, Order No. 26750 at 9 (January 22, 1997).

⁷⁵ *Id.* at 10.

When the Company became concerned in 2006 that the requirement to have a second meter separate from the retail load metering to measure customer generation created a financial barrier to commercial, industrial, and irrigation (“CI&I”) customers installing a small net metering systems, it proposed to allow CI&I customers to participate in net metering on the same basis as the Company’s R&SGS customers if their generation facilities had a total nameplate capacity rating of less than 2 percent of their Basic Load Capacity and the system was 25 kilowatts or smaller.⁷⁶ In Order No. 30227, the Commission again authorized a single meter option to CI&I qualifying net metering systems and concluded, “Financial impediments . . . are reduced in the Company’s proposal to extend the one-meter option to qualifying net metering systems. We commend the Company for making its program more affordable.”⁷⁷

In short, Idaho Power installs metering infrastructure required to bill rate schedules in the most economical manner for customers. This is in accordance with Rule D of Idaho Power’s tariff: “The Company will install and maintain the metering equipment required by the Company to measure power and energy supplied to the Customer.”⁷⁸

B. Granularity of Interval Data.

ICL, Sierra Club, ICEA, and NEC suggest that “the utility elects to use a certain level of granularity in the metering system for recording customer consumption.” ICL, Sierra Club, ICEA, and NEC argue that “If the utility elects to use a more granular time,

⁷⁶ *In the Matter of the Application of Idaho Power Company for Revision of Schedule 84–Net Metering*, Case No. IPC-E-06-17, Order No. 30227 at 5-6 (January 25, 2007).

⁷⁷ *Id.* at 8.

⁷⁸ I.P.U.C. No. 29, Tariff No. 101, Rule D, Metering.

like 15 minutes, then the customer is not ‘masking’ usage any more or less; the utility is just measuring consumption better.”⁷⁹

Idaho Power agrees that measuring consumption in smaller increments is a better measurement of consumption; however, when Idaho Power explained that “recording net consumption would not provide the granularity necessary”⁸⁰ it was not referring to the length of the interval but rather to the fact that the Company uses a single meter to measure the net consumption. Because Idaho Power currently measures net consumption, it does not capture energy exports separate from energy consumption.

Decreasing the measurement increment, as suggested by ICL, Sierra Club, ICEA, and NEC will not address the potential cost shifting and rate design issues at hand. Moreover, any additional infrastructure costs would increase the cost shift from customers with on-site generation if allowed to remain in Schedules 1 and 7. To implement the recommendation by ICL, Sierra Club, ICEA, and NEC for “Schedules 6 and 8 to exclude a customer who elects to be a non-exporting customer”⁸¹ would continue cost shifting from customers with on-site generation who choose to prevent energy exports to customers without on-site generation.

C. Intra-Hour Masking.

Intra-hour exports are not always detectable with Idaho Power’s current single net consumption meter configuration—and is not necessary to detect exports to solve the rate design problem at issue in this case.

⁷⁹ ICL, Sierra Club, ICEA, and NEC’s Reconsideration Brief at 3.

⁸⁰ Idaho Power’s Answer to Vote Solar’s Petition for Reconsideration at 4-6.

⁸¹ ICL, Sierra Club, ICEA, and NEC’s Reconsideration Brief at 4.

ICL, Sierra Club, ICEA, and NEC mistakenly assert that “even if a customer did [evade export limits], Idaho Power’s metering system would alert the company instantly.”⁸² This statement is incorrect. As currently configured, Idaho Power’s meters will not instantly alert the Company because when consumption and production are equal, and also in every hour when the amount of energy consumed from the utility is greater than the amount of excess energy they exported to the grid, the power flow in the opposite direction would be undetectable.

The Company utilizes the appropriate metering to gather the necessary billing components according to each rate schedule. If future rate design requires additional meter data, Idaho Power would consider implementing additional metering infrastructure necessary to capture the required data. However, any costs incurred to implement additional metering requirements for any given customer class should be assigned directly to that customer class.

VI.

CONCLUSION

Vote Solar’s Petition for Reconsideration to carve out non-exporting, self-generators would perpetuate the cost shift caused when a rate structure designed for full requirements customers is applied to self-generating customers that require only partial services. Staff’s proposal would not solve this rate design problem; however, it would unnecessarily limit customer self-generation when no reliability issues exist, introduce an opportunity to game the differential between rate schedules, and perpetuate the cost shift from R&SGS costs with on-site generation to standard service customers. Neither Vote

⁸² ICL, Sierra Club, ICEA, and NEC’s Reconsideration Brief at 2-3.

Solar's nor Staff's proposal promotes safety, enforceability, or the proper assignment of costs for services received and should be denied.

As demonstrated by the three analyses presented in Idaho Power's Opening Brief, self-generating customers who limit their exports have much more in common with other partial requirements customers than full requirements customers. The tariffs approved by Commission Order No. 34046 appropriately established an "in parallel connection" as the criteria to include all customers with on-site generation in Schedules 6 and 8. As generation technology evolves, this criterion will support non-preferential rate design and interconnection of on-grid devices and batteries employed by customers with on-site generation.

Respectfully submitted this 24th day of August 2018.


LISA D. NORDSTROM
Attorney for Idaho Power Company

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on the 24th day of August 2018 I served a true and correct copy of IDAHO POWER COMPANY'S CLOSING BRIEF ON RECONSIDERATION upon the following named parties by the method indicated below, and addressed to the following:

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Christa Bearry, Legal Assistant

**BEFORE THE
IDAHO PUBLIC UTILITIES COMMISSION**

CASE NO. IPC-E-17-13

IDAHO POWER COMPANY

ATTACHMENT 1

The Effect of Storage on Customer Load Shapes when Coupled with Distributed Generation

SUPPLEMENTAL ANALYSIS

PRESENTED TO

Idaho Power Company

PRESENTED BY

Ryan Hledik
Walter Graf
Tony Lee

August 21, 2018

THE **Brattle** GROUP



Background

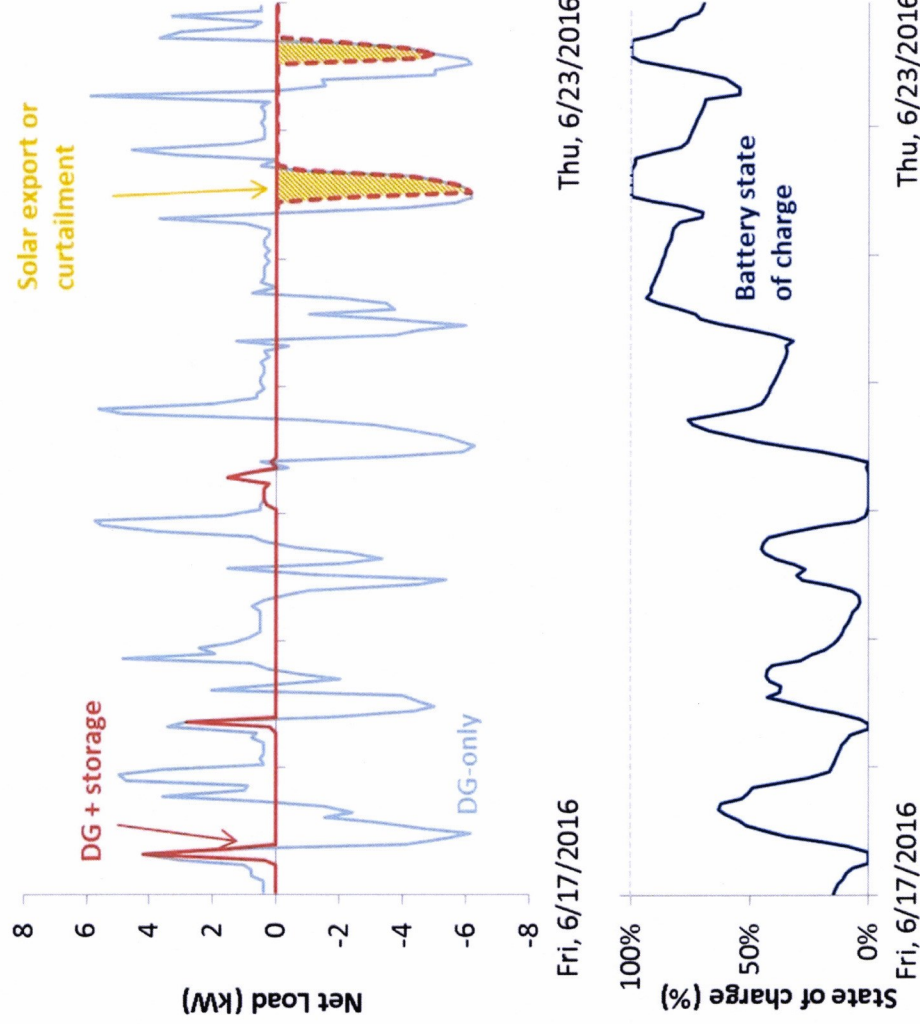
In support of Idaho Power Company's (IPC's) opening brief in Idaho PUC Case No. IPC-E-17-13, Brattle conducted analysis on the impact of behind-the-meter (BTM) storage on the load shapes of customers with distributed generation (DG)

Our analysis found that, while the installation of storage flattened load shapes on average, maximum monthly demand remained similar to pre-storage levels

This supplemental presentation illustrates the extent to which DG+storage customers would need to export energy or otherwise curtail DG output in spite of having installed a battery sized to store maximum net energy exports on any given day of the year

Findings

Individual Customer Net Load and Battery State of Charge



- Figure illustrates net load for an individual DG customer with and without storage
- Battery capacity is assumed to be large enough to store all energy that would otherwise be exported on any individual day of the year
- However, low load during nighttime hours prevents battery from fully discharging between days
- This eventually leads to conditions where the battery is charged fully to capacity, and excess DG output would need to be exported to the grid or otherwise curtailed to avoid exporting
- For further methodological detail, see Brattle's presentation that was filed on August 10, 2018 by IPC in Idaho PUC Case No. IPC-E-17-13