Draft Utah Customer Generator Load Research and Analysis

Revised June 2018

Prepared by the Load Research Group
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Introduction

As part of the net-metering stipulation proposed on August 28, 2017 and approved on September 29, 2017, a new net-metering load-research study (LRS) is to be implemented in Utah to determine the appropriate export rate for post-net-metering customers. On April 17, 2018 the Public Service Commission (PSC) held a hearing regarding the adequacy of the Company's originally proposed LRS. On May 21, 2018, the PSC of Utah issued its order on the Company's proposed LRS under Docket No. 17-035-61 (the PSC order).[1]

The PSC order specified the following:

1. PacifiCorp shall select new samples for residential and commercial customers that either give each member of the class an equal chance of being selected, or each member of the separate strata an equal chance of being selected.

2. PacifiCorp shall increase the sample size to accommodate the separate study of residential and commercial customers.

3. PacifiCorp shall collect export, import, and production data from the existing LRS study's 36 Schedule 135 participants.

4. We approve the study period as proposed by PacifiCorp to run for 12 months beginning no later than January 1, 2019.

5. We decline to require PacifiCorp to make any modifications to its proposed LRS beyond the directives articulated in this order.

6. We conclude that this order does not constitute final agency action because the results of PacifiCorp's proposed LRS will be subject to a robust adjudicatory proceeding in Phase II of this docket.

As such, this paper describes the procedures to be used in development of the Utah Customer Generator LRS to meet the requirements of the PSC order. This study will provide load data that will be used to estimate the appropriate export rate for Utah customer generators. The remainder of this document discusses the purpose of this research, analytical needs of the research, participant recruitment and study timeline for the research.

Purpose

Exports are a function of private generation energy production, customer consumption and Company electricity deliveries. In an effort to determine the appropriate compensation rate for

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[1] Application of Rocky Mountain Power to Establish Export Credits for Customer Generated Electricity

exported power for customer generators, the Company intends to implement a two-part LRS; the first component focuses on measuring delivered energy and exported energy, while the second component focuses on measuring private generation energy production.

Export and Delivery Sample

From a billing perspective, transition customers offset their full requirements usage with energy produced during each 15-minute interval and are billed on their delivered load (15-minute full requirement less energy production). Any private generation in excess of full requirements in the 15-minutes creates a bill credit at the export rate (exports).

In order to bill and credit customers in 15-minute intervals, the Company installs a profile meter for each transition program customer. This will provide load research data for exports and delivery for the entire transition customer population. As such, it will not be necessary to design a sample of this population, since data for the whole population will be available. The LRS will collect 15-minute exported energy and delivered energy for every transition program customer over the January 1, 2019 to December 31, 2019 timeframe.

Private Generation Sample

Although the Company will have access to export and delivery data for all transition customers; to obtain an estimate of private generation energy production, the Company proposes to design two samples; a residential private generation sample and a non-residential private generation sample. At this time, customer specific private generation energy production data is not readily available for sample design purposes. However, based on the high positive correlation of nameplate capacity to private generation system output[2] the Company intends to design a private generation sample based on nameplate capacity for residential and non-residential customers.

When drawing sample customers from the population of private generation customers, it is necessary to employ a schema that will select customers from across the entire spectrum. The Company's standard practice is to utilize stratified sampling with systematic, random selection. Fundamentally, the sample is divided into several homogenous groups (strata), which in essence translates to low nameplate, medium nameplate and high nameplate groups. The recommended sample design for the private generation profile will incorporate the use of four strata per sample population.

Based on the most recent data available, the April 2018 population of residential private generation customers is 29,183, while non-residential private generation customers total 1,124 (including schedule 135 and schedule 136 customers). A sample size of 40 private generation profile meters are necessary to achieve a precision level of ±10% at the 95% confidence level for residential customers; whereas, 52 sites are necessary for the non-residential sample.[3] The Company proposes to bolster this minimum sample size by installing a total of 45 private generation profile meters for the residential sample and 60 profile meters for the non-residential

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[2] April 10, 2018, Rebuttal Testimony of Kenneth Lee Elder Jr. for Rocky Mountain Power, RMP Work Papers 1
[3] PURPA guidelines specify a precision of ±10% at the 90% confidence level. As a result of input from parties, the Company has agreed to increase the level of accuracy from ±10% at the 90% confidence level to ±10% at the 95% confidence level for this proceeding.

sample (see Tables 1 and 2) to enhance regional coverage and increase sample precision. Furthermore, as provided in Tables 3 and 4, the proposed sample design is consistent with the existing saturation of private generation customers throughout Utah.

Of note, although a total of 360 schedule 136 customers were included as part of the residential population, none were selected for the proposed sample as part of the random selection process.

As directed, the Company will continue to collect export, delivered, and production data from the 36 Schedule 135 participants, which had production and load profile meters installed as part of the net metering proceeding (Docket No. 14-035-114).[4]

Load Research Participation
As described in Special Condition 14 of Schedule 136 and in Special Condition 10 of Schedule 135, all randomly selected customers under these rate schedules must participate in any LRS including the installation of production meters at a mutually convenient location.

Timing of Load Research
The Company will target full enrollment of customers for the private generation sample by December 2018. The study will be based on export and delivery data collected as a census from schedule 136 customers and private generation energy production from a sample of schedule 135 and schedule 136 customers compiled over the January 1, 2019 to December 31, 2019 timeframe. Once the study begins, the Company is willing to report to the Division and other interested parties on a monthly basis to provide the on-going results of the LRS under this proceeding.

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[4] Docket No. 14-035-114 - In the Matter of the Investigation of the Costs and Benefits of PacifiCorp's Net Metering Program

Appendix

Table 1   Utah Residential Private Generation Load Research Study Design

Strata	Nameplate (kW)	Count	Mean Nameplate (kW)	Squared Nameplate (kW)	Standard Deviation	Required Sample	Supplemented Sample
1	0-4	6,364	2.76	54,637	1.00	10	10
2	4-7	13,528	5.45	409,732	0.78	10	14
3	7-10	6,678	8.30	464,288	0.80	10	10
4	10-25	2,613	13.05	473,679	3.30	10	11
Total		29,183	6.19			40	45

Table 2   Utah Non-Residential Private Generation Load Research Study Design

Strata	Nameplate (kW)	Count	Mean Nameplate (kW)	Squared Nameplate (kW)	Standard Deviation	Required Sample	Supplemented Sample
1	0-27	677	13.86	171,167	7.79	12	14
2	27-100	376	40.18	700,154	15.75	13	15
3	100-560	51	240.69	3,612,950	114.76	13	15
4	560-1,885	20	938.13	19,577,469	322.48	14	16
Total		1,124	49.41			52	60

Table 3   Geographic Location of Private Generation Residential Sample Meters

County	Current Population		Supplemented Sample					Required Sample
	Number	% of Total	Strata 1	Strata 2	Strata 3	Strata 4	Total	
SALT LAKE	12,510	42.9%	4	5	3	5	17	15
UTAH	4,747	16.3%		2	3	2	7	7
DAVIS	3,697	12.7%		2	3		5	5
WEBER	2,991	10.3%	1	1	1	1	4	3
TOOELE	833	2.9%				1	1	0
CACHE	821	2.8%		1			1	0
WASHINGTON	790	2.7%	2			1	3	3
SUMMIT	714	2.4%	2				2	2
IRON	585	2.0%	1				1	1
BOX ELDER	463	1.6%		3			3	3
GRAND	198	0.7%					0	0
SEVIER	190	0.7%					0	0
UINTAH	130	0.4%					0	0
MORGAN	118	0.4%				1	1	1
SANPETE	80	0.3%					0	0
JUAB	64	0.2%					0	0
MILLARD	59	0.2%					0	0
CARBON	48	0.2%					0	0
EMERY	35	0.1%					0	0
SAN JUAN	31	0.1%					0	0
WASATCH	25	0.1%					0	0
BEAVER	24	0.1%					0	0
RICH	15	0.1%					0	0
GARFIELD	10	0.0%					0	0
PIUTE	5	0.0%					0	0
Total	29,183	100.0%	10	14	10	11	45	40

Table 4   Geographic Location of Private Generation Non-Residential Sample Meters

County	Current Population		Supplemented Sample					Required Sample
	Number	% of Total	Strata 1	Strata 2	Strata 3	Strata 4	Total	
SALT LAKE	577	51.3%	4	5	5	13	27	24
WEBER	93	8.3%	2	2			4	3
UTAH	86	7.7%	1	2	1		4	1
DAVIS	74	6.6%	1	2	1		4	4
IRON	56	5.0%	1	2	1		4	4
SUMMIT	54	4.8%	1		2		3	3
GRAND	30	2.7%	1				1	0
CACHE	28	2.5%			2	2	4	4
WASHINGTON	27	2.4%	1				1	1
TOOELE	24	2.1%		1			1	1
BOX ELDER	20	1.8%		1	1		2	2
SEVIER	12	1.1%	2		1	1	4	4
BEAVER	7	0.6%					0	0
UINTAH	7	0.6%					0	0
EMERY	6	0.5%					0	0
MILLARD	6	0.5%					0	0
SAN JUAN	5	0.4%					0	0
SANPETE	4	0.4%					0	0
CARBON	3	0.3%					0	0
MORGAN	2	0.2%					0	0
JUAB	1	0.1%			1		1	1
PIUTE	1	0.1%					0	0
RICH	1	0.1%					0	0
GARFIELD	0	0.0%					0	0
WASATCH	0	0.0%					0	0
Total	1,124	100.0%	14	15	15	16	60	52