

Orange and Rockland Utilities, Inc.**VOLUNTARY RESIDENTIAL THREE-PART RATE PROPOSAL**

The following document outlines the Company's proposal for a three-part voluntary residential rate that would include fixed, usage, and demand charges ("Three Part Rate"). Such rate will be made available on a voluntary basis to: (1) residential customers with geothermal heat pump ("GEO HP") technologies that meet the requirements applicable to the New York State Energy Research Development Authority Geothermal Rebate Program until a final rate design decision is set forth by the New York Public Service Commission in the Value of Distributed Energy Resources ("VDER") Rate Design Working Group for all residential customers; and (2) other residential customers limited to a cumulative total of 500 customers by the end of the three year rate plan.¹

I. Proposed Rate Design

The Company proposes to implement a Three Part Rate that would be open to eligible Service Classification ("SC") No. 1 customers. The Three Part Rate is based, in part, on the "TOU Demand Rate" rate design proposed by the New York Joint Utilities in the VDER proceeding.² The Three Part Rate recovers delivery costs through demand (kW) charges and a monthly customer charge (a fixed amount each billing period), and supply costs through volumetric (kWh) time-of-use charges.³ The billing determinants and proposed rates have been included as Appendix 1.

- Customer Charge

¹ The rate plan covers the three-year period of January 1, 2019 through December 31, 2021.

² Case 15-E-0751 – In the Matter of Value of Distributed Energy Resources & Matter 17-01277 – In the Matter of the Value of Distributed Energy Resources Working Group Regarding Rate Design, Proposals of the Joint Utilities on Rate Design Successor to Net Energy Metering For Mass Market Customers (May 29, 2018).

³ Surcharges such as the Energy Cost Adjustment and System Benefits Charge will be collected from Three Part Rate customers on a volumetric basis.

The monthly customer charge for the Three Part Rate has been set based on the SC No. 1 embedded cost of service (“ECOS”) study customer-related costs.

- Demand Charges

The demand charges have been set to recover the portion of the SC No. 1 delivery revenue requirement that will not be recovered through the monthly customer charge, resulting in a delivery rate structure that is designed to be revenue-neutral to the current level of revenue. Further, demand charges were determined in a manner that accounts for differences in the cost drivers for local facilities which are located in close proximity to customers’ homes or businesses versus upstream facilities which are located (electrically) further from the customer. The determination of upstream delivery costs and local distribution costs is based on the ECOS study.

The Three Part Rate proposal includes two measures of demand in each billing period of the year: (1) a customer’s maximum demand during the peak period, and (2) a customer’s maximum demand during the off-peak period. The peak demand time period will be set from 12:00 PM through 8:00 PM, Monday through Friday, excluding holidays.⁴ The off-peak demand time period will be all other hours and days. The peak demand charges are designed to recover a portion of the rate class local distribution costs and upstream delivery costs. The peak demand charge varies by season. The off-peak demand charges are designed to recover a portion of the local distribution costs. Local distribution costs include: (a) secondary distribution costs, and (b) a portion of primary distribution costs. Upstream delivery costs include: (a) the portion of primary distribution costs that are not local distribution costs, and (b) transmission costs. The

⁴ Holidays include New Year’s Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.

billing determinants used to calculate the peak and off-peak demand charges, by season, are the sums of customers' seasonal peak period and off-peak period billing demands, respectively. A customer's peak and off-peak billing demands will be calculated as the average of the customer's three highest daily peak demands and the average of the three highest daily off-peak period demands, respectively, occurring during a billing period.

The demand rates of the Three Part Rate proposal may be described as consisting of a "base" demand rate layer that is included in both the peak and off-peak demand charges for all seasons, and an "incremental" demand rate layer on top of the base rate during peak periods of each season. The base demand rate layer is designed to recover local distribution costs and the incremental rate layer is designed to recover upstream delivery costs. The off-peak period demand charge is the same as the base demand rate layer and the peak period demand charge is the sum of the incremental demand rate layer and the base demand rate layer.

- Supply Charges

Supply costs under the Three Part Rate proposal will be recovered through volumetric peak and off-peak (kWh) charges that vary on a monthly basis. The peak period supply rates will recover peak energy costs and capacity costs. The off-peak period supply rates will recover off-peak energy costs.

Presented in Appendix 1 is the summary of the rate design proposal which contains the following sections:

- Summary of Rate Design with Delivery Rates (page 1)

This is summary of the rate design results showing the Company's proposed customer charge, on-peak and off-peak demand charges, and on-peak and off-peak time period designations.

- Rate Design Details (page 2)

This page shows the Company's proposed Three Part Rate design in greater detail. Billing determinant and revenue requirement assumptions are detailed in the notes section.

- Rates and Surcharges for Bill Impact Analysis (page 3)

This page lists the Company's current delivery rates and various surcharges used in the bill impact analysis.

- Supply Rates (page 4)

This page lists the supply charges used in calculating bills in the bill impact analysis.

II. Bill Impacts

O&R first estimated customer bill impacts for the 15 representative customer hourly load profiles used in the rate designs proposed by the Company in the VDER proceeding. The hourly customer load profiles analyzed represent customers at three levels of load factor within each of five annual usage strata from the Company's load research sample for the SC No. 1 residential service class.

Since customers who adopt GEO HP technology will consume a higher volume of energy than they did previously, the Company estimated bill impacts for the associated technology by adding hourly GEO HP heating usage to each of the 15 base case customer load profiles as described below.

Sizing of GEO HP technology can vary greatly by customer installation. Rather than adding a specific GEO HP unit's usage across customers with a wide array of annual usages (as can be seen in the Data Repository included in Appendix 2), the Company calculated

incremental annual GEO HP heating usage for each customer by applying a uniform percentage increase to each customer's annual kWh usage. The Company then layered this incremental annual heating usage onto each customer's respective hourly base load profile based on an hourly heating load shape for GEO HP technology.

The bill impacts were calculated monthly for an annual period using the following rate scenarios: (a) current SC No. 1 delivery rates effective as of July 1, 2019 ("Rate Year 1 rates"); and (b) the proposed Three Part Rate delivery rates for the same year. These bill impact estimates may represent a lower bound on savings as they do not account for changes in consumption behavior that may occur in response to the rate. Instead, the total bill savings for the GEO HP technology scenario is driven mainly by the effects of moving to the Three Part Rate from the current volumetric delivery rate. In addition the heat pump savings estimates assume heating loads only and do not include the effects of increased cooling efficiency heat pumps may provide over the customer's existing cooling system.

Please note that Stratum 1 and Stratum 5 customers represent, respectively, the smallest and largest monthly usage residential customers in O&R's service territory. Stratum 1 customers represent very low usage customers, including apartments, and Stratum 5 customers represent the very highest usage customers, including religious customers eligible for residential rates. As such, the Strata 2, 3 and 4 customers would represent customers who would likely install GEO HP technology, and should be the focus of this analysis. Presented in Appendix 2 is the bill impact analysis which contains the following sections:

- Summary of Impacts (page 1)

This is a simple summary of bill impact results showing the annual percentage changes and dollar impacts of the Three Part Rate design under two scenarios: customers with no GEO HP technology and customers with GEO HP technology.

- Data Repository (pages 2 – 3)

This is a collection of data regarding each customer in the bill impact analysis under each of the scenarios described above. The data repository is the source for impact summaries and charts.

- Charts Comparing Rate Design on a Total Bill Basis (pages 4 – 5)

These charts show bill impacts of the Three Part Rate against current rates on a total bill basis. There is a comparison of bill impacts for customers both with and without GEO HP technology, on a percentage basis.

- Charts Comparing Rate Design on a Delivery-Only Basis (pages 6 – 7)

These charts show bill impacts of the Three Part Rate against current rates on a delivery-only basis. There is a comparison of bill impacts for customers both with and without GEO HP technology, on a percentage basis.

The Company also assessed the potential impact of the Three Part Rate on non-participating customers. The impact on non-participating customers during the duration of the rate plan would be a possible change in the Revenue Decoupling Mechanism (“RDM”) Adjustment applicable to the SC No. 1 class.

Since delivery service bills for customers adopting GEO HP technology will likely increase, customers adopting GEO HP technology and taking service under the Three Part Rate will result in increased delivery service revenues and a decrease in the RDM Adjustment. Conversely, if the limited number of customers without qualifying GEO HP technology consists only of customers with usage characteristics that would cause them to benefit from the Three

Part Rate, delivery service revenue associated with such customers would decrease, resulting in an increase in the RDM Adjustment.

To establish a “worst case” scenario for the impact of the Three Part Rate on non-participating customers, the Company considered only the limited number of customers without qualifying GEO HP technology that would adopt the Three Part Rate. Therefore, the Company assumed the maximum 500 customers without qualifying GEO HP technologies adopt the Three Part Rate, and assumed the largest Strata 4 (delivery only) bill decrease for all 500 customers. The resulting additional amount the Company would need to recover through the RDM Adjustment would be approximately \$183,000 per year, or \$0.00012 per kWh. The impact of such an increase on customers of various usages can be found in Appendix 3 which shows, for a typical SC No. 1 customer using 600 kWh per month, such increase would be \$0.07, or 0.1%.

Orange and Rockland Utilities, Inc.
Summary of Rate Design

Voluntary 3 Part Rate (Ave 3 Demand)		
	Summer	Non-Summer
Customer Charge	\$24.18	\$24.18
On Peak kW (\$/kW)	18.44	14.19
Off Peak kW (\$/kW)	3.96	3.96
Peak Period	Noon - 8:00 pm weekdays excluding holidays	
Off-peak Period	All other hours	

Summer Months - June through September

Orange and Rockland Utilities, Inc.**Voluntary 3 Part Rate (Ave 3 Demand) Rate Design
Residential**Delivery Revenue Recovery by Cost Category (1)

	Delivery Revenue (2)	Percent Distribution by Charge			Revenue Distribution by Charge			
		Customer	All kW Charges	Peak kW Charges	Customer (3)	All kW Charges	Peak kW Charges	Total
Customer	\$55,931,054	100.0%	0.0%		\$55,931,054	\$0		\$55,931,054
Secondary	30,842,169		100.0%	0.0%		30,842,169	0	\$30,842,169
Primary	70,496,404		33.3%	66.7%		23,498,801	46,997,602	\$70,496,404
Transmission	31,488,376		0.0%	100.0%		0	31,488,376	\$31,488,376
Total	\$188,758,003				\$55,931,054	\$54,340,970	\$78,485,979	\$188,758,003

Rate CalculationsSummer

	Billing Units	Rates (5)	Revenue
Customer Charge	770,988	24.18	18,643,685
On Peak kW (4)	2,802,396	18.44	51,681,776
Off Peak kW	2,931,578	3.96	11,609,825
			81,935,285

Summer Peak to Offpeak Ratio	4.66
Winter Peak to Offpeak Ratio	3.58
Summer to Winter Peak Ratio	1.30
Summer Revenue Recovery	43.4%

Winter

	Billing Units	Rates	Revenue	Total Revenue
	1,541,976	24.18	37,287,369	55,931,054
	3,706,518	14.19	52,581,229	104,263,005
	4,281,056	3.96	16,954,119	28,563,944
			106,822,717	188,758,003

- (1) Excludes merchant function which is recovered separately through the MFC
- (2) Based on Case 18-E-0067 Rate Year 1 rates
- (3) Assumes customer charge at full customer costs
- | | |
|-------------------------|------------|
| Customer Charge | 24.18 |
| No. of Customers | 192,747 |
| Customer Charge Revenue | 55,931,054 |
- (4) Peak period is Noon to 8:00 pm weekdays

(5) Calculation of Winter Peak kW rate:

$$x = \text{Winter Peak rate}$$

$$1.3x = \text{Summer Peak rate}$$

$$\text{Peak kW Rev} = \text{Total Rev} - \text{Customer Charge Rev} - \text{Offpeak kW Rev}$$

$$J26 * x + D26 * 1.3x = M17 - (G25 + L25 + G27 + L27)$$

$$x * (J26 + D26 * F34) = M17 - (G25 + L25 + G27 + L27)$$

$$x = (M17 - (G25 + L25 + G27 + L27)) / (J26 + D26 * F34)$$

Orange and Rockland Utilities, Inc**Rates for Bill Impacts**Current Delivery RatesNotes

Customer Charge	(\$/mo)	\$19.50	Rate as of July 1, 2019
BPP	(\$/mo)	\$1.30	Rate as of July 1, 2019
Winter - First 250 kWh	(\$/kWh)	\$0.07972	Rate as of July 1, 2019
Winter - Over 250 kWh	(\$/kWh)	\$0.07972	Rate as of July 1, 2019
Summer - First 250 kWh	(\$/kWh)	\$0.07972	Rate as of July 1, 2019
Summer - Over 250 kWh	(\$/kWh)	\$0.09603	Rate as of July 1, 2019

Current Non-Delivery Rates

Energy Cost Adjustment (ECA)	(\$/kWh)	-\$0.00049	Rate as of July 1, 2019
Dynamic Load Management (DLM) Surcharge	(\$/kWh)	\$0.00018	Rate as of July 1, 2019
System Benefits Charge (SBC)	(\$/kWh)	\$0.00562	Rate as of July 1, 2019
Merchant Function Charge (MFC)	(\$/kWh)	\$0.00408	Rate as of July 1, 2019
Delivery Revenue Surcharge (SDR)	(\$/kWh)	\$0.00000	Zero
Transition Adjustment for Competitive Services (TACS)	(\$/kWh)	\$0.00000	Zero
Revenue Decoupling Mechanism (RDM)	(\$/kWh)	\$0.00000	Zero
Value of Distributed Energy Resources (VDER)	(\$/kWh)	\$0.00000	Zero
Clean Energy Standard Surcharge (CES/CESD)	(\$/kWh)	\$0.00000	Zero
Delivery MTA Tax	Divisor	0.99870	Rate as of July 1, 2019
Delivery GRT Tax	Divisor	0.98000	Rate as of July 1, 2019
Market Supply Charge (MSC)	(\$/kWh)	Varies	See Market Supply Charges She
Commodity MTA Tax	Divisor	0.99870	Rate as of July 1, 2019
Commodity GRT Tax	Divisor	1.00000	Rate as of July 1, 2019
Sales Tax	Percentage	0.000%	Zero

Orange and Rockland Utilities, Inc.**Proposed Rates for Bill Impacts (Cont.)****Market Supply Charges**

	<u>Jan-15</u>	<u>Feb-15</u>	<u>Mar-15</u>	<u>Apr-15</u>	<u>May-15</u>	<u>Jun-15</u>	<u>Jul-15</u>	<u>Aug-15</u>	<u>Sep-15</u>	<u>Oct-15</u>	<u>Nov-15</u>	<u>Dec-15</u>
<u>2015 MSC Rates by Month (1)</u>												
All kWh (\$/kWh)	0.11988	0.07700	0.04872	0.13417	0.08751	0.09065	0.09217	0.07678	0.06162	0.07573	0.08821	0.08302
<u>Voluntary 3 Part Rate (Ave 3 Demand) (2)</u>												
Peak (\$/kWh)	0.21822	0.16499	0.13635	0.21587	0.17372	0.17914	0.18071	0.16438	0.14885	0.16218	0.17065	0.16313
Offpeak (\$/kWh)	0.08881	0.04911	0.02136	0.10852	0.05362	0.05480	0.05601	0.04168	0.02717	0.04170	0.06232	0.05770

- (1) Based on actual MSC rates by month for calendar year 2015 with capacity component recalculated using kWh consistent with alternative rate designs.
- (2) Based on peak and off-peak energy price forecasts and NTAC/Ancillary Services forecasts, load weighted by time period. Capacity cost components determined by dividing the capacity costs for each capability period by peak period kWh deliveries. Includes applicable MSC adjustment for each month.

ORANGE AND ROCKLAND UTILITIES, INC.
BILL IMPACT SUMMARY - SC 1 RESIDENTIAL

No Geothermal Heat Pump Scenarios			Voluntary 3 Part Rate - Ave 3 Demand		
Stratum	Load Factor	Average of Monthly LF's	Total Annual Bill at Current Rates	% Change	Total Annual Impact - \$
1	Low	20.07%	\$723.34	14.8%	\$107.10
1	Medium	27.08%	614.70	6.5%	39.93
1	High	34.53%	801.68	1.5%	11.95
2	Low	22.70%	1,492.12	5.2%	78.15
2	Medium	27.56%	1,646.64	3.3%	54.32
2	High	31.31%	1,954.99	1.4%	26.80
3	Low	27.19%	2,405.49	8.4%	202.27
3	Medium	33.41%	2,584.82	-2.9%	-75.16
3	High	37.47%	2,210.08	-5.4%	-120.34
4	Low	33.23%	3,004.68	0.7%	19.78
4	Medium	35.78%	2,943.99	-4.0%	-118.78
4	High	39.63%	3,180.87	-12.4%	-395.87
5	Low	35.59%	8,843.81	-9.4%	-828.93
5	Medium	37.78%	9,030.17	-14.1%	-1,273.62
5	High	41.84%	10,595.20	-16.4%	-1,736.93

Geothermal Heat Pump Scenarios			Voluntary 3 Part Rate - Ave 3 Demand			Current Rates	
Stratum*	Load Factor	Average of Monthly LF's (w/HP)	Total Annual Bill at Current Rates (No HP)	% Change	Total Annual Impact - \$	% Change	Total Annual Impact - \$
1	Low	27.78%	\$723.34	35.2%	\$254.35	32.1%	\$232.00
1	Medium	35.89%	614.70	26.1%	160.22	29.3%	180.09
1	High	39.74%	801.68	24.2%	194.25	33.9%	271.39
2	Low	29.05%	1,492.12	30.1%	448.68	40.0%	597.36
2	Medium	35.07%	1,646.64	29.2%	480.17	41.1%	676.27
2	High	38.97%	1,954.99	29.2%	569.97	42.3%	826.84
3	Low	35.57%	2,405.49	36.3%	872.76	43.3%	1,040.56
3	Medium	40.28%	2,584.82	25.7%	665.00	43.7%	1,128.89
3	High	37.11%	2,210.08	24.5%	541.60	42.6%	941.77
4	Low	40.94%	3,004.68	29.9%	898.98	43.9%	1,320.29
4	Medium	40.38%	2,943.99	26.3%	774.09	43.9%	1,292.21
4	High	46.05%	3,180.87	17.1%	542.60	44.4%	1,411.05
5	Low	43.96%	8,843.81	20.8%	1,840.71	46.8%	4,135.98
5	Medium	43.94%	9,030.17	16.8%	1,519.06	46.7%	4,217.54
5	High	50.09%	10,595.20	14.4%	1,528.72	47.0%	4,977.97

* Stratum 1 and Stratum 5 customers represent, respectively, the smallest and largest monthly usage residential customers in O&R's service territory.
 As such, Strata 2, 3 and 4 customers would represent customers who would likely install Geothermal Heat Pump technology.

ORANGE AND ROCKLAND UTILITIES, INC.
BILL IMPACT DATA REPOSITORY - SC 1 RESIDENTIAL

No Geothermal Heat Pump Scenarios				Bills at Current Rates											
				Billing Units			Bill Calculations								
Stratum	Annual kWh	Load Factor	Average of Monthly LF's	Summer kWh	Winter kWh	Annual kWh	Summer Delivery	Summer Supply	Total Summer	Winter Delivery	Winter Supply	Total Winter	Total Delivery	Total Supply	Total Annual Bill
1	2,625	Low	20.07%	1,501.81	1,123.38	2,625.19	\$230.11	\$121.05	\$351.15	\$272.30	\$99.89	\$372.18	\$502.40	\$220.94	\$723.34
1	2,039	Medium	27.08%	1,300.22	739.18	2,039.39	209.51	101.91	311.42	237.32	65.96	303.27	446.83	167.87	614.70
1	3,071	High	34.53%	1,548.36	1,522.58	3,070.95	235.12	126.54	361.66	308.64	131.38	440.02	543.76	257.91	801.68
2	6,759	Low	22.70%	2,592.00	4,167.45	6,759.44	347.53	207.39	554.92	549.45	387.75	937.20	896.98	595.13	1,492.12
2	7,652	Medium	27.56%	2,935.23	4,717.21	7,652.44	384.50	238.39	622.89	599.50	424.25	1,023.75	984.01	662.63	1,646.64
2	9,356	High	31.31%	4,165.85	5,190.37	9,356.22	517.05	331.78	848.83	642.58	463.57	1,106.16	1,159.64	795.35	1,954.99
3	11,775	Low	27.19%	5,394.67	6,379.85	11,774.52	649.41	438.21	1,087.62	750.88	566.98	1,317.87	1,400.29	1,005.20	2,405.49
3	12,774	Medium	33.41%	6,090.66	6,683.38	12,774.04	724.38	492.35	1,216.73	778.52	589.58	1,368.10	1,502.90	1,081.93	2,584.82
3	10,657	High	37.47%	7,758.23	2,898.43	10,656.67	903.99	618.17	1,522.17	433.91	254.00	687.91	1,337.91	872.18	2,210.08
4	14,940	Low	33.23%	8,092.45	6,847.43	14,939.88	939.99	657.88	1,597.88	793.45	613.35	1,406.81	1,733.45	1,271.23	3,004.68
4	14,622	Medium	35.78%	7,475.61	7,146.49	14,622.10	873.55	612.62	1,486.17	820.68	637.13	1,457.82	1,694.24	1,249.75	2,943.99
4	15,967	High	39.63%	7,630.46	8,336.39	15,966.85	890.23	617.25	1,507.48	929.02	744.37	1,673.39	1,819.25	1,361.62	3,180.87
5	46,801	Low	35.59%	19,446.04	27,355.06	46,801.10	2,162.91	1,595.14	3,758.05	2,660.61	2,425.15	5,085.76	4,823.52	4,020.29	8,843.81
5	47,724	Medium	37.78%	27,511.17	20,212.85	47,724.02	3,031.61	2,237.51	5,269.12	2,010.33	1,750.72	3,761.05	5,041.95	3,988.23	9,030.17
5	56,329	High	41.84%	29,645.06	26,683.68	56,328.74	3,261.46	2,387.13	5,648.59	2,599.48	2,347.13	4,946.61	5,860.94	4,734.26	10,595.20

Geothermal Heat Pump Scenarios				Bills at Current Rates											
				Billing Units			Bill Calculations								
Stratum*	Annual kWh (No HP)	Load Factor	Average of Monthly LF's (w/HP)	Summer kWh	Winter kWh	Annual kWh	Summer Delivery	Summer Supply	Total Summer	Winter Delivery	Winter Supply	Total Winter	Total Delivery	Total Supply	Total Annual Bill
1	2,625	Low	27.78%	1,522.92	2,380.06	3,902.98	\$232.38	\$122.66	\$355.04	\$386.71	\$213.58	\$600.29	\$619.09	\$336.24	\$955.34
1	2,039	Medium	35.89%	1,316.62	1,715.43	3,032.05	211.14	103.17	314.30	326.20	154.28	480.48	537.34	257.45	794.79
1	3,071	High	39.74%	1,573.06	2,992.64	4,565.71	237.78	128.42	366.20	442.49	264.38	706.87	680.27	392.80	1,073.07
2	6,759	Low	29.05%	2,646.37	7,403.19	10,049.56	353.39	211.54	564.93	844.05	680.49	1,524.54	1,197.44	892.03	2,089.47
2	7,652	Medium	35.07%	2,996.79	8,380.43	11,377.22	391.13	243.09	634.22	933.03	755.66	1,688.69	1,324.16	998.75	2,322.91
2	9,356	High	38.97%	4,241.11	9,669.19	13,910.31	525.16	337.53	862.69	1,050.37	868.78	1,919.15	1,575.53	1,206.31	2,781.83
3	11,775	Low	35.57%	5,489.38	12,016.31	17,505.69	659.61	445.45	1,105.06	1,264.06	1,076.92	2,340.99	1,923.68	1,522.37	3,446.05
3	12,774	Medium	40.28%	6,193.41	12,798.31	18,991.72	735.44	500.20	1,235.64	1,335.26	1,142.81	2,478.07	2,070.71	1,643.00	3,713.71
3	10,657	High	37.11%	7,843.95	7,999.78	15,843.73	913.23	624.72	1,537.95	898.37	715.53	1,613.90	1,811.60	1,340.25	3,151.85
4	14,940	Low	40.94%	8,212.62	13,999.14	22,211.77	952.94	667.06	1,620.00	1,444.60	1,260.38	2,704.97	2,397.53	1,927.44	4,324.97
4	14,622	Medium	40.38%	7,593.22	14,146.09	21,739.32	886.22	621.60	1,507.82	1,457.98	1,270.40	2,728.37	2,344.20	1,892.00	4,236.20
4	15,967	High	46.05%	7,758.89	15,979.72	23,738.61	904.07	627.06	1,531.13	1,624.92	1,435.87	3,060.79	2,528.99	2,062.93	4,591.92
5	46,801	Low	43.96%	19,822.49	49,758.74	69,581.23	2,203.45	1,623.89	3,827.35	4,700.40	4,452.05	9,152.45	6,903.85	6,075.94	12,979.79
5	47,724	Medium	43.94%	27,895.05	43,058.33	70,953.37	3,072.96	2,266.83	5,339.79	4,090.35	3,817.58	7,907.93	7,163.31	6,084.41	13,247.72
5	56,329	High	50.09%	30,098.14	53,648.23	83,746.38	3,310.26	2,421.74	5,732.00	5,054.52	4,786.65	9,841.18	8,364.78	7,208.39	15,573.17

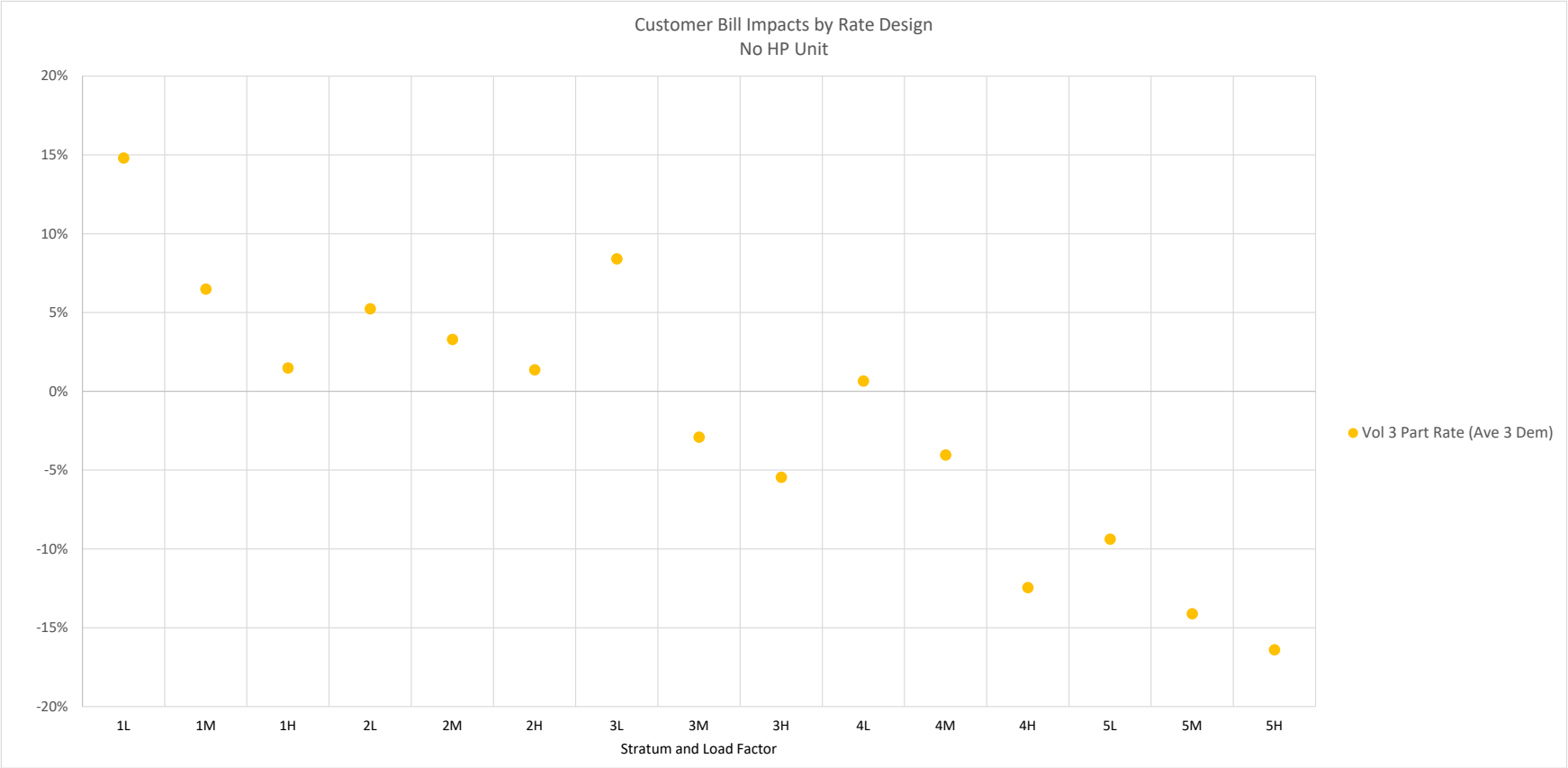
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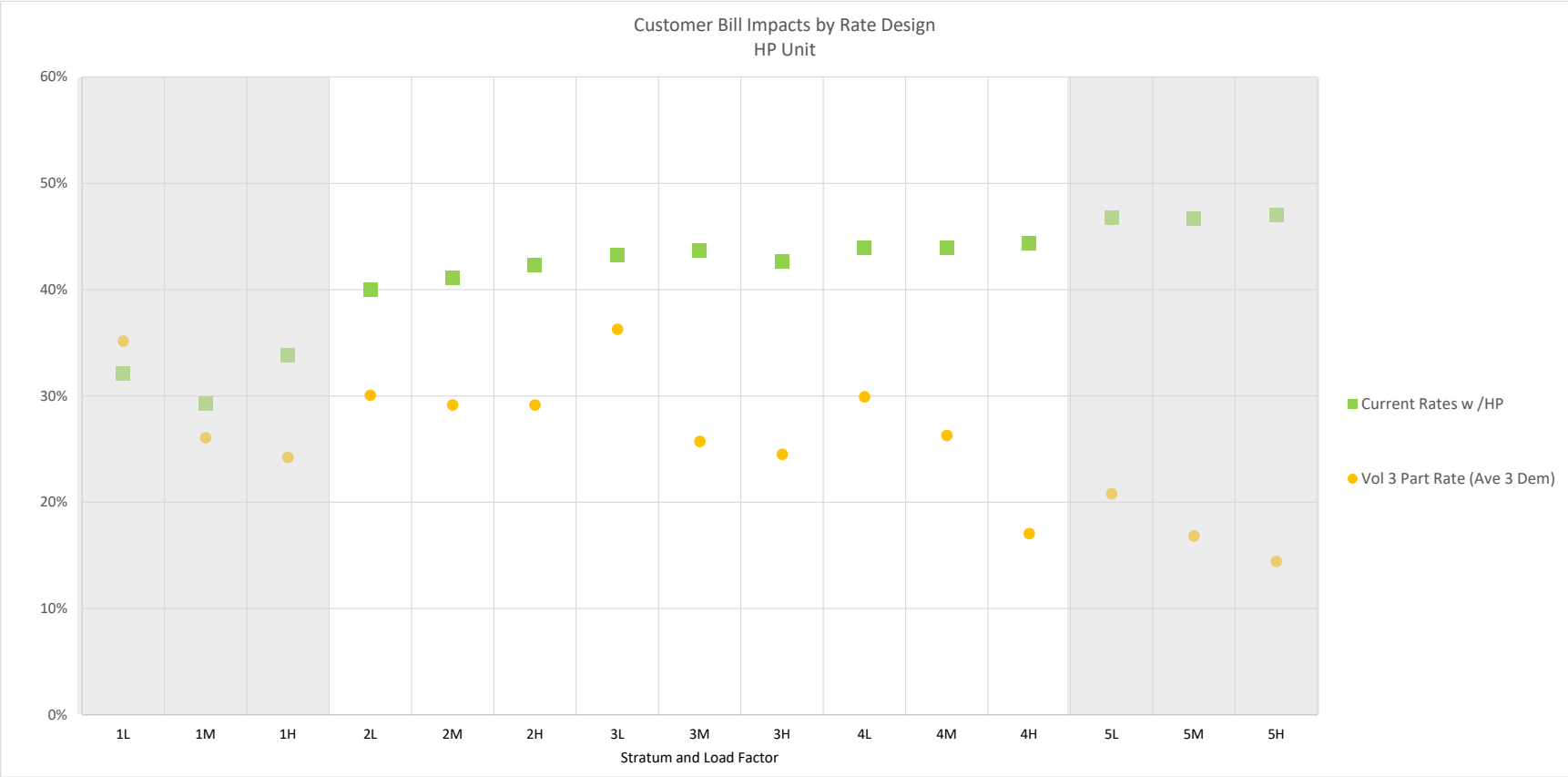
ORANGE AND ROCKLAND UTILITIES, INC.
BILL IMPACT DATA REPOSITORY - SC 1 RESIDENTIAL

No Geothermal Heat Pump Scenarios				Voluntary 3 Part Rate (Ave 3 Demand)																					
				Billing Units										Bill Calculations											
Stratum	Annual kWh	Load Factor	Average of Monthly LF's	Summer kWh Peak	Summer kWh Off-Peak	Summer kWh Total	Winter kWh Peak	Winter kWh Off-Peak	Winter kWh Total	Annual kWh Peak	Annual kWh Off-Peak	Annual kWh Total	Sum of Summer kW Peak	Sum of Summer kW Off-Peak	Sum of Winter kW Peak	Sum of Winter kW Off-Peak	Summer Delivery	Summer Supply	Total Summer	Winter Delivery	Winter Supply	Total Winter	Total Delivery	Total Supply	Total Annual Bill
1	2,625	Medium	20.07%	451.77	1,050.04	1,501.81	303.42	819.96	1,123.38	755.19	1,870.00	2,625.19	6.64	7.85	5.46	7.58	\$275.38	\$123.65	\$399.04	\$328.88	\$102.52	\$431.40	\$604.26	\$226.18	\$830.44
1	2,039		27.08%	310.58	989.64	1,300.22	169.70	569.48	739.18	480.28	1,559.12	2,039.39	4.48	5.39	2.97	3.70	222.91	94.26	317.16	273.32	64.14	337.46	496.23	158.39	654.62
1	3,071		34.53%	402.09	1,146.28	1,548.36	369.61	1,152.97	1,522.58	771.70	2,299.25	3,070.95	5.62	5.91	4.83	4.99	248.79	121.27	370.06	313.14	130.43	443.57	561.93	251.70	813.63
2	6,759	Medium	22.70%	608.02	1,983.98	2,592.00	923.25	3,244.20	4,167.45	1,531.27	5,228.17	6,759.44	8.99	10.22	20.84	28.59	339.78	190.65	530.43	666.02	373.81	1,039.83	1,005.80	564.47	1,570.27
2	7,652		27.56%	802.95	2,132.28	2,935.23	1,162.81	3,554.40	4,717.21	1,965.76	5,686.68	7,652.44	13.68	13.66	18.46	19.60	445.29	233.46	678.74	600.42	421.80	1,022.22	1,045.71	655.25	1,700.96
2	9,356		31.31%	1,403.54	2,762.32	4,165.85	1,262.22	3,928.15	5,190.37	2,665.76	6,690.47	9,356.22	19.99	20.41	15.96	18.13	603.27	357.42	960.70	562.72	458.37	1,021.09	1,165.99	815.80	1,981.79
3	11,775	Medium	27.19%	1,714.34	3,680.33	5,394.67	1,750.31	4,629.54	6,379.85	3,464.65	8,309.87	11,774.52	28.51	26.54	26.64	26.70	800.45	458.64	1,259.08	763.71	584.97	1,348.68	1,564.16	1,043.61	2,607.76
3	12,774		33.41%	2,001.58	4,089.08	6,090.66	1,772.66	4,910.72	6,683.38	3,774.24	8,999.80	12,774.04	21.62	23.33	23.85	25.52	664.28	523.75	1,188.04	721.42	600.20	1,321.62	1,385.71	1,123.96	2,509.66
3	10,657		37.47%	2,432.28	5,325.96	7,758.23	638.52	2,259.92	2,898.43	3,070.79	7,585.88	10,656.67	28.51	26.29	7.64	8.49	822.23	643.89	1,466.12	381.22	242.40	623.62	1,203.45	886.29	2,089.74
4	14,940	Medium	33.23%	3,087.53	5,004.92	8,092.45	1,773.91	5,073.51	6,847.43	4,861.44	10,078.44	14,939.88	35.04	29.97	21.86	24.43	963.35	752.55	1,715.90	689.62	618.95	1,308.56	1,652.97	1,371.49	3,024.46
4	14,622		35.78%	2,918.11	4,557.50	7,475.61	2,006.30	5,140.19	7,146.49	4,924.41	9,697.70	14,622.10	25.02	23.17	24.42	21.14	740.99	707.86	1,448.85	716.31	660.05	1,376.36	1,457.30	1,367.91	2,825.21
4	15,967		39.63%	2,030.88	5,599.58	7,630.46	1,988.71	6,347.68	8,336.39	4,019.59	11,947.26	15,966.85	20.25	20.59	27.62	30.29	642.21	597.53	1,239.74	811.17	734.09	1,545.26	1,453.38	1,331.62	2,785.00
5	46,801	Medium	35.59%	5,831.38	13,614.66	19,446.04	7,218.55	20,136.51	27,355.06	13,049.93	33,751.17	46,801.10	63.91	61.89	92.66	91.24	1,745.30	1,625.68	3,370.99	2,183.00	2,460.89	4,643.89	3,928.31	4,086.57	8,014.88
5	47,724		37.78%	8,617.41	18,893.77	27,511.17	5,184.57	15,028.28	20,212.85	13,801.98	33,922.05	47,724.02	67.95	73.85	70.56	75.74	1,947.27	2,326.72	4,273.99	1,731.39	1,751.16	3,482.56	3,678.66	4,077.88	7,756.55
5	56,329		41.84%	9,132.46	20,512.60	29,645.06	7,017.86	19,665.82	26,683.68	16,150.32	40,178.42	56,328.74	68.07	67.18	84.60	97.65	1,943.06	2,464.53	4,407.60	2,085.70	2,364.97	4,450.67	4,028.76	4,829.50	8,858.27

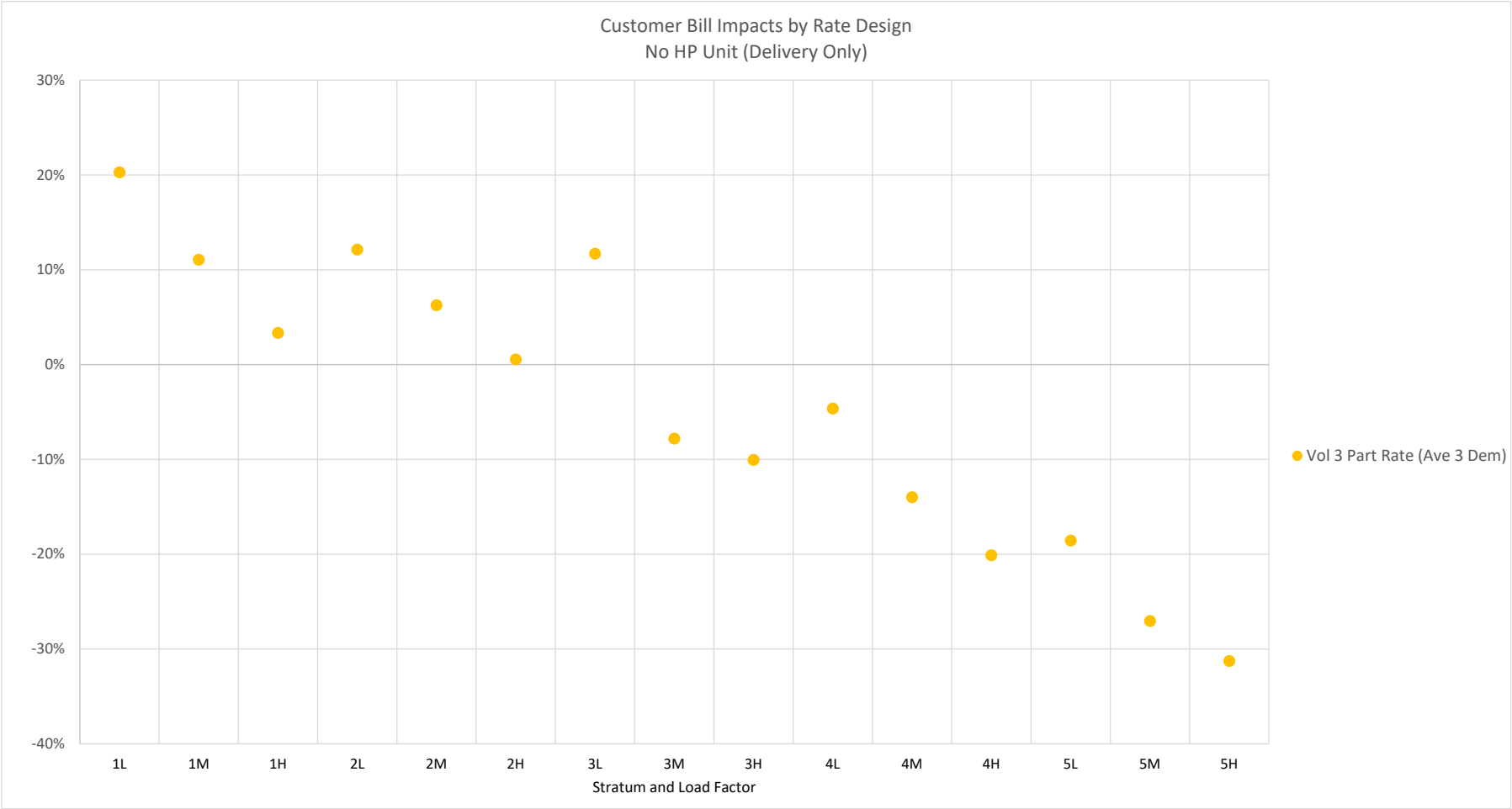
Geothermal Heat Pump Scenarios				Voluntary 3 Part Rate (Ave 3 Demand)																					
				Billing Units										Bill Calculations											
Stratum*	Annual kWh (No HP)	Load Factor	Average of Monthly LF's (w/HP)	Summer kWh Peak	Summer kWh Off-Peak	Summer kWh Total	Winter kWh Peak	Winter kWh Off-Peak	Winter kWh Total	Annual kWh Peak	Annual kWh Off-Peak	Annual kWh Total	Sum of Summer kW Peak	Sum of Summer kW Off-Peak	Sum of Winter kW Peak	Sum of Winter kW Off-Peak	Summer Delivery	Summer Supply	Total Summer	Winter Delivery	Winter Supply	Total Winter	Total Delivery	Total Supply	Total Annual Bill
1	2,625	Medium	27.78%	452.48	1,070.44	1,522.92	509.89	1,870.17	2,380.06	962.37	2,940.61	3,902.98	6.64	7.89	6.93	10.10	\$275.78	\$124.61	\$400.39	\$372.52	\$204.77	\$577.29	\$648.31	\$329.38	\$977.68
1	2,039		35.89%	311.13	1,005.49	1,316.62	330.10	1,385.34	1,715.43	641.23	2,390.82	3,032.05	4.48	5.42	4.50	5.74	223.17	95.00	318.17	313.17	143.57	456.74	536.34	238.57	774.91
1	3,071		39.74%	402.93	1,170.14	1,573.06	611.14	2,381.51	2,992.64	1,014.06	3,551.65	4,565.71	5.62	5.93	7.03	8.76	249.10	122.39	371.50	374.39	250.04	624.43	623.50	372.43	995.93
2	6,759	Medium	29.05%	609.87	2,036.50	2,646.37	1,454.87	5,948.32	7,403.19	2,064.74	7,984.81	10,049.56	8.99	10.29	24.90	32.08	340.58	193.12	533.70	770.01	637.08	1,407.09	1,110.59	830.20	1,940.79
2	7,652		35.07%	805.04	2,191.74	2,996.79	1,764.66	6,615.76	8,380.43	2,569.71	8,807.51	11,377.22	13.68	13.66	23.12	24.96	445.88	236.25	682.13	724.84	719.84	1,444.69	1,170.72	956.09	2,126.81
2	9,356		38.97%	1,406.10	2,835.01	4,241.11	1,998.08	7,671.12	9,669.19	3,404.18	10,506.13	13,910.31	19.99	20.41	22.72	26.45	603.99	360.84	964.83	737.35	822.78	1,560.13	1,341.35	1,183.61	2,524.96
3	11,775	Medium	35.57%	1,717.56	3,771.82	5,489.38	2,676.36	9,339.95	12,016.31	4,393.92	13,111.77	17,505.69	28.51	26.54	34.41	36.59	801.37	462.93	1,264.31	970.39	1,043.56	2,013.94	1,771.76	1,506.49	3,278.25
3	12,774		40.28%	2,005.08	4,188.33	6,193.41	2,777.32	10,020.99	12,798.31	4,782.40	14,209.32	18,991.72	21.62	23.33	33.01	36.78	665.28	528.42	1,193.69	958.41	1,097.72	2,056.13	1,623.68	1,626.14	3,249.82
3	10,657		37.11%	2,435.19	5,408.76	7,843.95	1,476.65	6,523.13	7,999.78	3,911.84	11,931.89	15,843.73	28.51	26.29	16.21	25.54	823.05	647.78	1,470.83	623.39	657.45	1,280.85	1,446.45	1,305.23	2,751.68
4	14,940	Medium	40.94%	3,091.61	5,121.01	8,212.62	2,948.92	11,050.22	13,999.14	6,040.54	16,171.23	22,211.77	35.04	30.17	32.96	39.36	965.29	758.00	1,723.29	979.55	1,200.82	2,180.37	1,944.84	1,958.82	3,903.66
4	14,622		40.38%	2,922.11	4,671.12	7,593.22	3,156.31	10,989.78	14,146.09	6,078.42	15,660.90	21,739.32	25.02	23.17	36.27	40.40	742.12	713.20	1,455.32	1,033.21	1,229.55	2,262.76	1,775.33	1,942.75	3,718.08
4	15,967		46.05%	2,035.25	5,723.64	7,758.89	3,244.49	12,735.23	15,979.72	5,279.74	18,458.87	23,738.61	20.25	20.68	39.34	46.61	643.83	603.35	1,247.19	1,120.32	1,355.96	2,476.28	1,764.16	1,959.32	3,723.47
5	46,801	Medium	43.96%	5,844.19	13,978.30	19,822.49	10,899.41	38,859.33	49,758.74	16,743.60	52,837.63	69,581.23	63.91	61.89	122.11	136.82	1,748.92	1,642.76	3,391.68	3,009.16	4,283.68	7,292.84	4,758.07	5,926.44	10,684.52
5	47,724		43.94%	8,630.47	19,264.58	27,895.05	8,938.02	34,120.31	43,058.33	17,568.48	53,384.89	70,953.37	68.13	74.02	102.36	132.25	1,954.98	2,344.14	4,299.11	2,640.21	3,609.91	6,250.12	4,595.19	5,954.04	10,549.23
5	56,329		50.09%	9,147.87	20,950.28	30,098.14	11,448.06	42,200.17	53,648.23	20,595.93	63,150.45	83,746.38	68.07	67.52	124.33	149.80	1,948.80	2,485.09	4,433.89	3,131.19	4,558.84	7,690.03	5,079.99	7,043.93	12,123.92

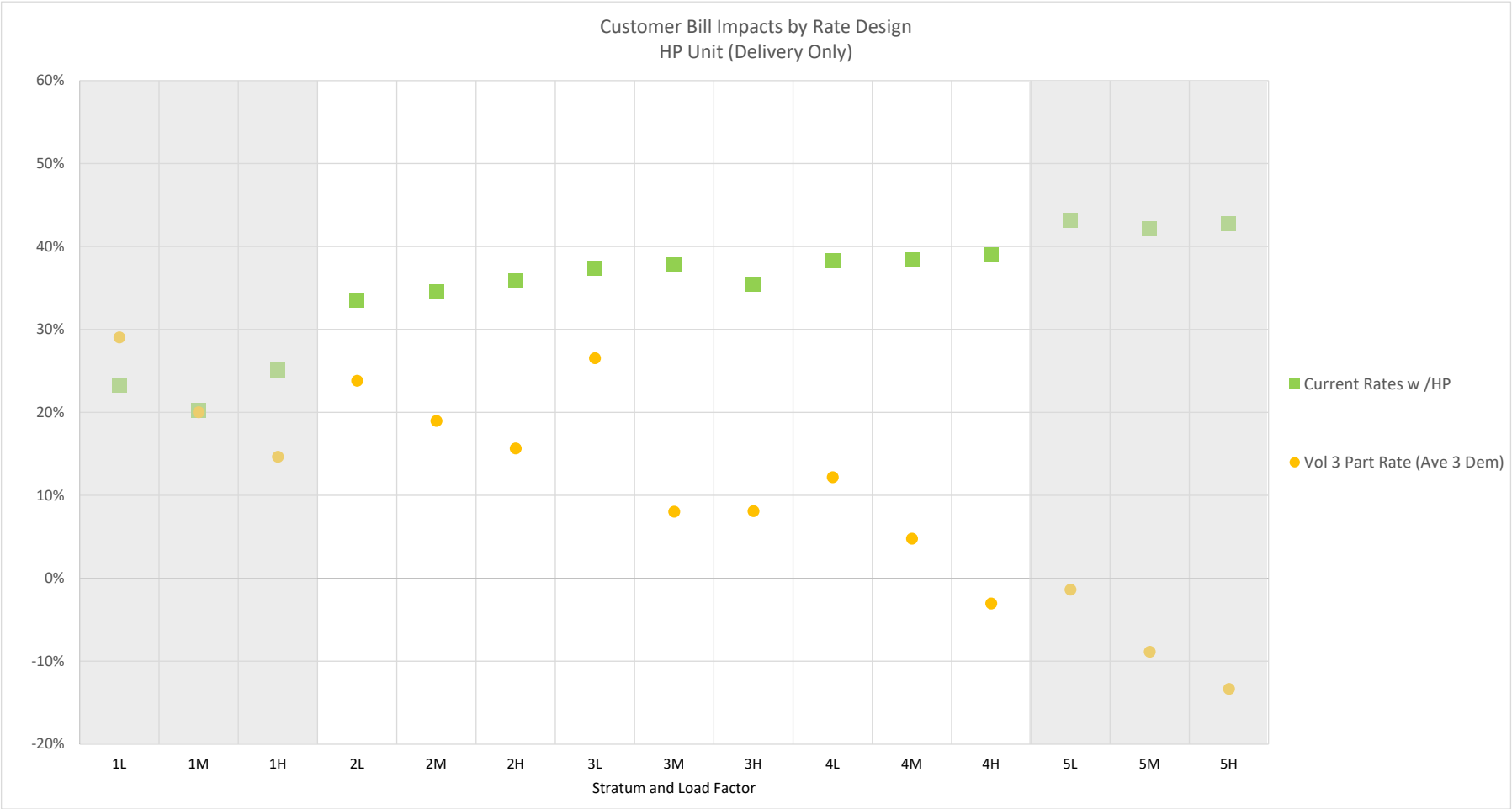
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* Stratum 1 and Stratum 5 customers represent, respectively, the smallest and largest monthly usage residential customers in O&R's service territory. As such, Strata 2, 3 and 4 customers would represent customers who would likely install Geothermal Heat Pump technology.





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As such, Strata 2, 3 and 4 customers would represent customers who would likely install Geothermal Heat Pump technology.

Orange and Rockland Utilities, Inc.
Voluntary 3 Part Rate - Impact on RDM Adjustment

Impact on RDM Adjustment - No GEO HP				
Stratum	Load Factor	Total Delivery Charges Current Rates	Total Delivery Charges Vol 3 Part Rate (Ave 3 Dem)	Variance
4	High	\$1,819.25	\$1,453.38	\$365.87

Participants	500
Total RDM Impact	<u>\$182,936.48</u>
Forecasted kWh SC 1 - CY 2020	1,497,457,000
RDM Adj	\$0.00012

Orange and Rockland Utilities, Inc.

Voluntary 3 Part Rate - Impact on RDM Adjustment

Monthly Billing Comparison
Reflecting Change in RDM (500 Participants)

SC1 Residential

Monthly Usage (kWh)	Bill at Present Rates	Bill at Proposed Rates	<u>Change</u> <u>Amount</u>	<u>%</u>
<u>Summer</u>				
0	\$21.26	\$21.26	\$0.00	0.0
50	29.46	29.47	0.01	0.0
100	37.67	37.68	0.01	0.0
200	54.07	54.10	0.03	0.1
250	62.29	62.32	0.03	0.0
300	71.33	71.37	0.04	0.1
400	89.40	89.45	0.05	0.1
600	125.61	125.68	0.07	0.1
750	152.72	152.81	0.09	0.1
1,000	197.91	198.03	0.12	0.1
1,500	288.34	288.52	0.18	0.1
2,000	378.73	378.98	0.25	0.1
<u>Winter</u>				
0	\$21.26	\$21.26	\$0.00	0.0
50	29.46	29.47	0.01	0.0
100	37.67	37.68	0.01	0.0
200	54.07	54.10	0.03	0.1
250	62.29	62.32	0.03	0.0
300	70.50	70.54	0.04	0.1
400	86.90	86.95	0.05	0.1
600	119.77	119.84	0.07	0.1
750	144.38	144.47	0.09	0.1
1,000	185.42	185.54	0.12	0.1
1,500	275.85	276.03	0.18	0.1
2,000	366.24	366.49	0.25	0.1