

2015 RATE DESIGN APPLICATION (RDA) RDA WORKSHOPS 11A AND 11B

APPENDIX

1. Jurisdictional Review
2. MGS and LGS Customer Characteristics
3. Modelling Assumptions
4. MGS and LGS Rates F2017-F2019
5. Reference for Interpreting Sensitivity Analysis Outcomes



FOR GENERATIONS

June 25-26, 2015

1. JURISDICTIONAL REVIEW: DEFAULT GENERAL SERVICE CHARGES JUNE 2015 – CANADA

Canadian Utility	General Service Rate Class	Definition of Class + Energy Charge	Demand Charge	Minimum Bill
SaskPower	Small Commercial	Commercial and municipal loads ≤ 75 kilovolt amperes (kVA) Energy Charge = Declining 2 Step	Inclining 2 Step First 50 kVA/month = \$0 (Urban (U) & Rural (R)) Balance \$/kVA = 13.10 (U) Balance \$/kVA = 13.41 (R)	Basic Monthly Charge (~\$27(U), ~\$37 (R)) <i>plus</i> \$4.24/kVA of the maximum recorded demand over 50 kVA over the past 11 months
	Standard	Non-residential & non-farm loads > 75 kVA Energy Charge = Declining 2 Step	Inclining 2 Step First 50 kVA/month = \$0 (U & R) Balance \$/kVA = 13.40 (U & R)	Basic Monthly Charge (~\$50 (U), ~\$58 (R)) <i>plus</i> \$4.24/kVA of the maximum recorded demand over 50 kVA over the past 11 months)
Manitoba Hydro	Small	Non-residential loads ≤ 200 kVA Energy Charge = Declining 3 Step	Inclining 2 Step First 50 kVA/month = \$0 Balance \$/kVA = \$9.09	Minimum monthly bill is the Basic Charge (~\$28, 3 phase) + Demand Charge
	Medium	Non-residential loads > 200 kVA Energy Charge = Declining 3Step	Inclining 2 Step First 50 kVA/month = \$0 Balance \$/kVA = \$9.09	Minimum monthly bill is the Basic Charge (~\$29) + Demand Charge Demand Charge is applied to the Monthly Billing Demand defined as the greater of the following expressed in kVA: <ul style="list-style-type: none"> • measured demand • 25% of contract demand • 25% of the highest measured demand in any of the previous 12 months
Hydro Quebec	Rate G: Small Power	Minimum demand < 65 kW Energy Charge = Declining 2 Step	Inclining 2 Step First 50 kW/month = \$0 Balance \$/kW = \$17.19	Minimum billing demand for any given consumption period is equal to 65% of the maximum power demand during a consumption period that falls wholly in the winter period included in the 12 consecutive monthly periods ending at the end of the given consumption period
	Rate M: Medium Power	Maximum demand > 50 kW at least once in last 12 billing periods Energy Charge = Declining 2 Step	Flat \$14.37/kW	

1. JURISDICTIONAL REVIEW: DEFAULT GENERAL SERVICE CHARGES JUNE 2015 – CANADA

Canadian Utility	General Service Rate Class	Definition of Class + Energy Charge	Demand Charge	Minimum Bill
Nova Scotia Power	Small Commercial	Annual consumption < 32,000 kWh Energy Charge = Declining 2 Step	No Demand Charge	
	Commercial	Annual consumption >= 32,000 kWh & regular billing demand is less than 2,000 kVA or 1,800 kW Energy Charge = Declining 2 Step	Flat \$10.497/month/kW maximum demand	The maximum charge per kWh will be that for a billing load factor of 10% except that the minimum monthly bill shall not be less than \$12.65
	Large Commercial	Consumption for any use except industrial, where the regular billing demand is 2,000 kVA or 1,800 kW and over Energy Charge = Flat	Flat \$13.345/month/kVA of maximum demand of the current month	Demand charge applied to maximum actual demand of the previous December, January or February occurring in the previous eleven (11) months
Newfoundland Power	General Service	< 100 kW (110 kVA) Energy Charge = Declining 2 Step	Seasonal (higher rates in 4 winter mo.) \$8.68 per kW of billing demand in the months of December, January, February and March and \$6.18 per kW in all other months.	~22/month (single phase) (Basic) ~36/month (three phase)
		110 kVA (100 kW) – 1000 kVA Energy Charge = Declining 2 Step	Seasonal (higher rates in 4 winter mo.) \$7.54 per kVA of billing demand in the months of December, January, February and March and \$5.04 per kVA in all other months.	~50/month (Basic)
		> 1000 kVA Energy Charge = Declining 2 Step	Seasonal (higher rates in 4 winter mo.) \$7.12 per kVA of billing demand in the months of December, January, February and March and \$4.62 per kVA in all other months.	~85/month (Basic)

1. JURISDICTIONAL REVIEW: DEFAULT GENERAL SERVICE CHARGES JUNE 2015 – CANADA

Canadian Utility	General Service Rate Class	Definition of Class + Energy Charge	Demand Charge	Minimum Bill
New Brunswick Power	Standard	Electricity use other than residential, small and large industrial, street lighting or unmetered categories Energy Charge = Declining 2 Step	Inclining 2 Step First 20 kW/month = \$0 Balance \$/kW = \$10.05	Basic Charge: \$21.78 per Billing Period
ATCO Electric Yukon	General Service	Multiple Energy Structures 1. Hydro – Gov. Municipal 2. Hydro – Gov. Federal 3. Hydro – Non-Government	Flat 1. \$7.39/kW/month 2. \$12.31/kW/month 3. \$7.39/kW/month	1. \$36.95 / month (5 kW) 2. \$61.55 / month (5 kW) 3. \$36.95 / month (5 kW)
FortisBC	Small Commercial	Demand generally < 40 kW Energy Charge = Flat	Not applicable	Customer Charge \$34.87 (60 day billing period)
	Commercial	Demand > 40 kW, < 500 kW Energy Charge = Declining 2 Step	Inclining 2 Step First 40 kW/month = \$0 Balance \$/kW = \$7.73	The greatest of: <ul style="list-style-type: none"> • 25% of Contract Demand • maximum Demand in kW (kVA Large Commercial) • 75% of the maximum Demand in kW (kVA Large Commercial) registered during the months previous eleven month period
	Large Commercial	Demand >= 500 kW Energy Charge = Flat	Flat \$8.25 / kVA	
BC Hydro	Small	Demand < 35kW Energy Charge = Flat	Not applicable	Basic Charge = 22.57 cents per day
	Medium	Demand >= 35 kW, <150 kW, or energy consumption in any 12 month period equal to or less than 550,000 kWh Energy Charge = Baseline Rate	Inclining 3 Step <ul style="list-style-type: none"> • First 35 kW = \$0 • Next 115 kW = \$5.50/kW/mo • All additional kW = \$10.55/kW/mo 	50% of the highest maximum Demand Charge billed in any Billing Period wholly within an on-peak period during the immediately preceding eleven Billing Periods
	Large	Demand >= 150 kW, or energy consumption in any 12 month period greater than 550,000 kWh Energy Charge = Baseline Rate	Inclining 3 Step <ul style="list-style-type: none"> • First 35 kW = \$0 • Next 115 kW = \$5.50/kW/mo • All additional kW = \$10.55/kW/mo 	50% of the highest maximum Demand Charge billed in any Billing Period wholly within an on-peak period during the immediately preceding eleven Billing Periods

1. JURISDICTIONAL REVIEW: GENERAL SERVICE / COMMERCIAL CUSTOMER RATE OPTIONS – JUNE 2015 – CANADA

Canadian Utility	Option	General Service Availability
SaskPower	Not available	Not available
Manitoba Hydro	Limited Use of Billing Demand – Lower Demand Charges & Higher Energy Charges <ul style="list-style-type: none"> Customers with relatively low load factors (approximately 18% or less) will benefit Demand charge structure is the same as for default , but demand charges are lower A comparatively higher and flat energy charge (structure is no longer 3-tier declining block) 	All General Service demand customers
	Surplus Energy Program <ul style="list-style-type: none"> Energy Charge varies week to week according to spot market conditions Possible lengthy interruptions; working alternate back-up system required in most cases 	Connected load > 200 kW + other eligibility requirements
Hydro Quebec	Limited Use of Billing Demand <ul style="list-style-type: none"> Demand charges are lower Comparatively higher and flat energy charge (structure is no longer 2-tier declining block) 	Medium Power - not applicable to demand that never exceeds 65 kW
	Additional Electricity Option <ul style="list-style-type: none"> Consume a small amount of electricity in excess of normal consumption during off-peak hours to meet short-term or exceptional need Designed for customers who are able to adjust their production and to manage their electricity consumption under lower rates while working around the associated constraints 	Medium Power - Maximum power demand has been at least 1,000 kW during a consumption period included in the 12 consecutive monthly periods preceding the date of the sign-up request
	Economic Development Rate (ends 2024) <ul style="list-style-type: none"> Initial 20% rate deduction, to be reduced by 5 % points a year over the final 3 years, in order to ensure a gradual transition to applicable rates Eligibility : <ul style="list-style-type: none"> Build / commission a new facility with a power demand of at least 1,000 kW or to add at least 1,000 kW of demand to an existing facility For an existing facility, the expected maximum power demand of the new equipment must not be less than 20% of the highest billing demand during the 12 consumption periods preceding its commissioning Facility’s electricity costs must account for at least 10% of operating expenses The facility must have significant potential for the net addition of new loads within Québec. Each project evaluated also on the project’s value added and its economic benefits to Quebec 	
	Running-in of New Equipment Option <ul style="list-style-type: none"> Temporary exemption from conditions that apply contract power is exceeded. Allows testing of new equipment without having to pay for the resulting increase in power demand during the running-in period 	Medium Power
Interruptible Electricity Option <ul style="list-style-type: none"> Credits in exchange for curtailing your electricity consumption on request 	Medium Power	

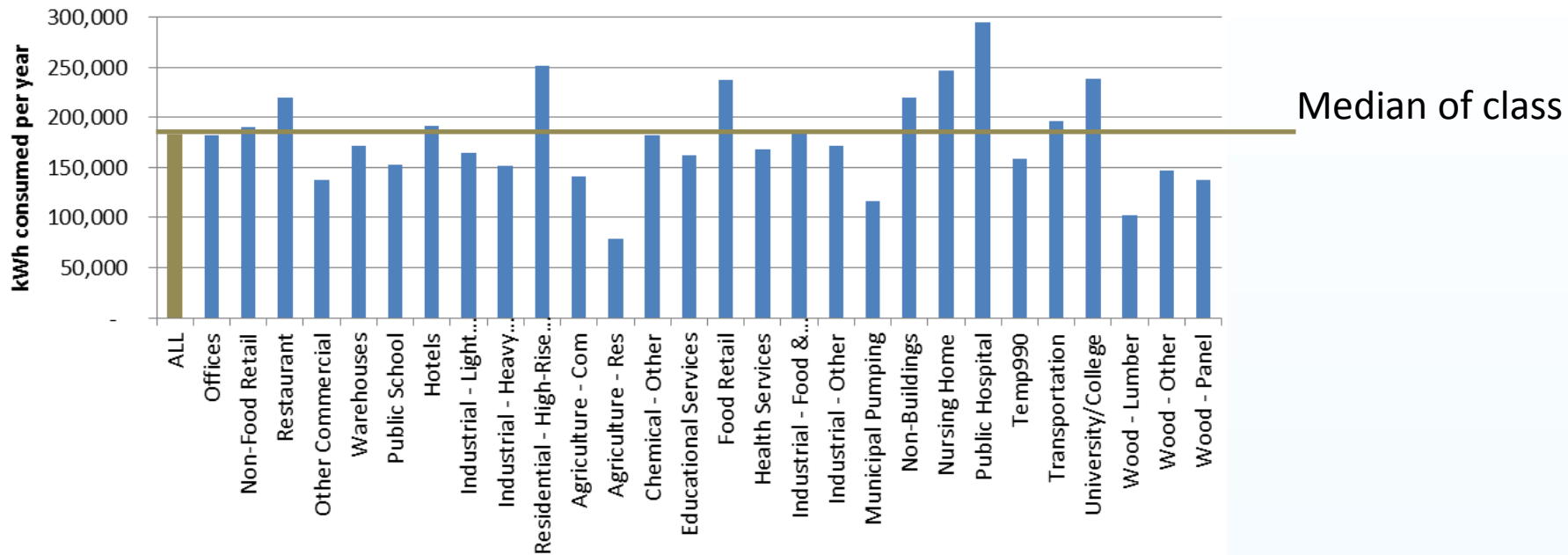
1. JURISDICTIONAL REVIEW: GENERAL SERVICE / COMMERCIAL CUSTOMER RATE OPTIONS – JUNE 2015 – CANADA

Canadian Utility	Option	General Service Availability
Nova Scotia Power	Not available	Not available
Newfoundland Power	<p>Curtailed Service Option</p> <ul style="list-style-type: none"> • Curtailment credit available and determined based on whether: <ol style="list-style-type: none"> 1. Customer contracts to reduce demand by a specific amount during curtailment periods ; or 2. Customer contract to reduce demand to a Firm Demand level which cannot exceed maximum demand during a Curtailment period <p>Curtailment periods will:</p> <ol style="list-style-type: none"> 1. Not exceed 6 hours duration for any one occurrence 2. Not be requested to start within 2 hours of the expiration of a prior Curtailment period 3. Not exceed 100 hours duration in total during a winter period 	For customers or 110-100 kVA or >1000 kVA that can reduce their demand by between 300 kW (330 kVA) and 5000 kW (5500 kVA) upon request by the Company during the Winter Peak Period.
New Brunswick Power	Not available	Not available
ATCO Electric Yukon	Not available	Not available
FortisBC	<p>Time of Use Options</p> <ul style="list-style-type: none"> • Primary and Secondary voltage customers. • Customers required satisfactory load factors, as determined by the Company • Available for a minimum of 12 consecutive months and will continue, at the election of the Customer, to be available for a minimum of 36 consecutive months after commencement of service 	Commercial and Large Commercial
BC Hydro	Not available	Not available

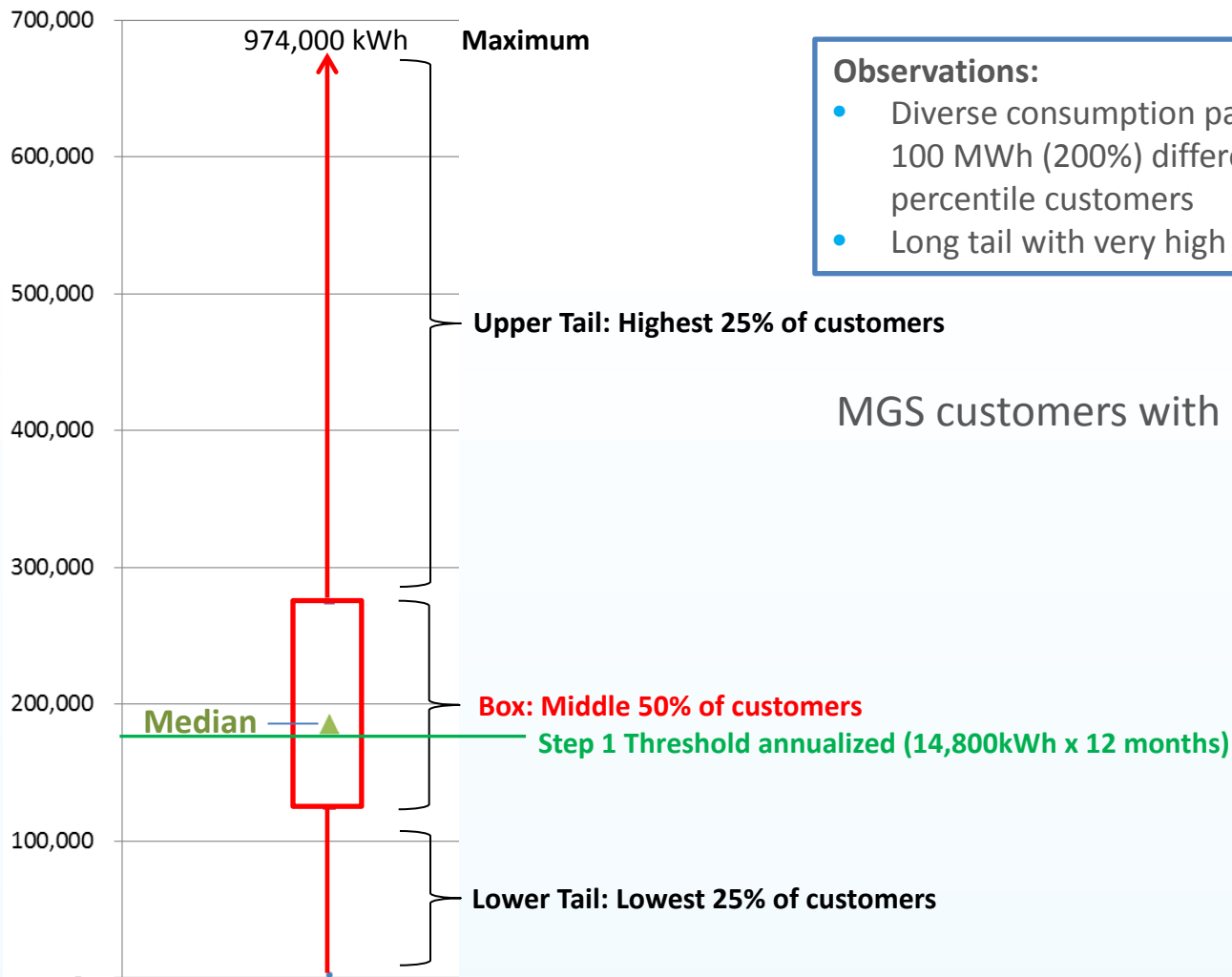
MGS CUSTOMERS – SIMILAR DIVERSITY AS LGS

- Consumption driven by site type (type of business)
- Consumption levels vary widely by site type

Median Annual Consumption by Site Type



MGS: ANNUAL CONSUMPTION DISTRIBUTION F2014, BOX PLOT

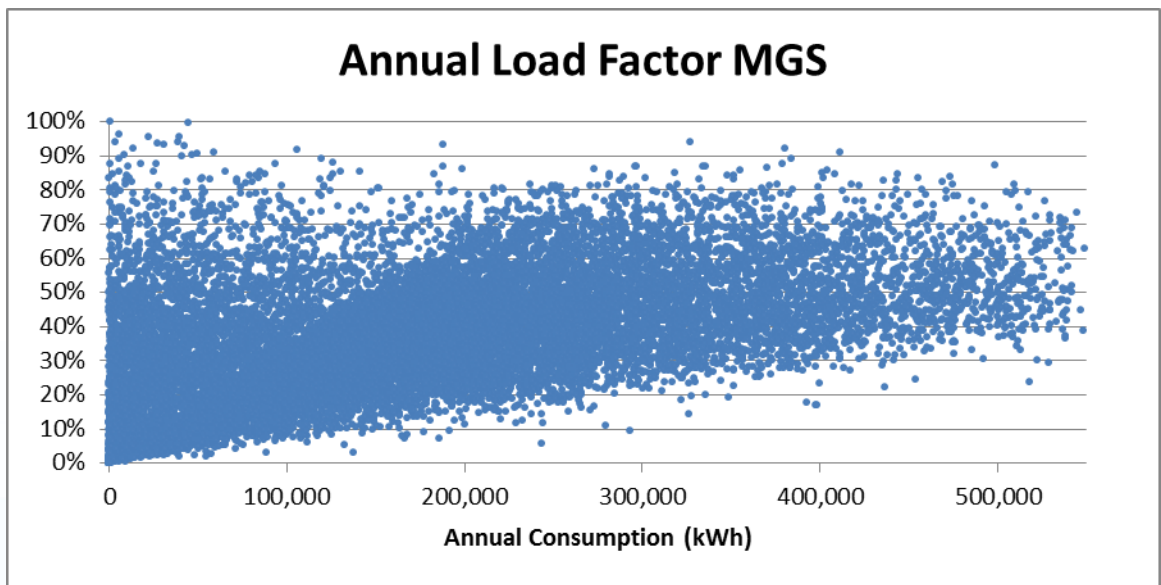


Observations:

- Diverse consumption patterns within the group; 100 MWh (200%) difference between 75th and 25th percentile customers
- Long tail with very high consumption

MGS customers with 12 monthly bills in F2014

MGS ANNUAL LOAD FACTOR ACCOUNT DISTRIBUTION BY CONSUMPTION (ABOUT 16,500 ACCOUNTS IN F2014)



- Load factor generally increase as consumption increases

Annual Consumption (1000s of kWh)

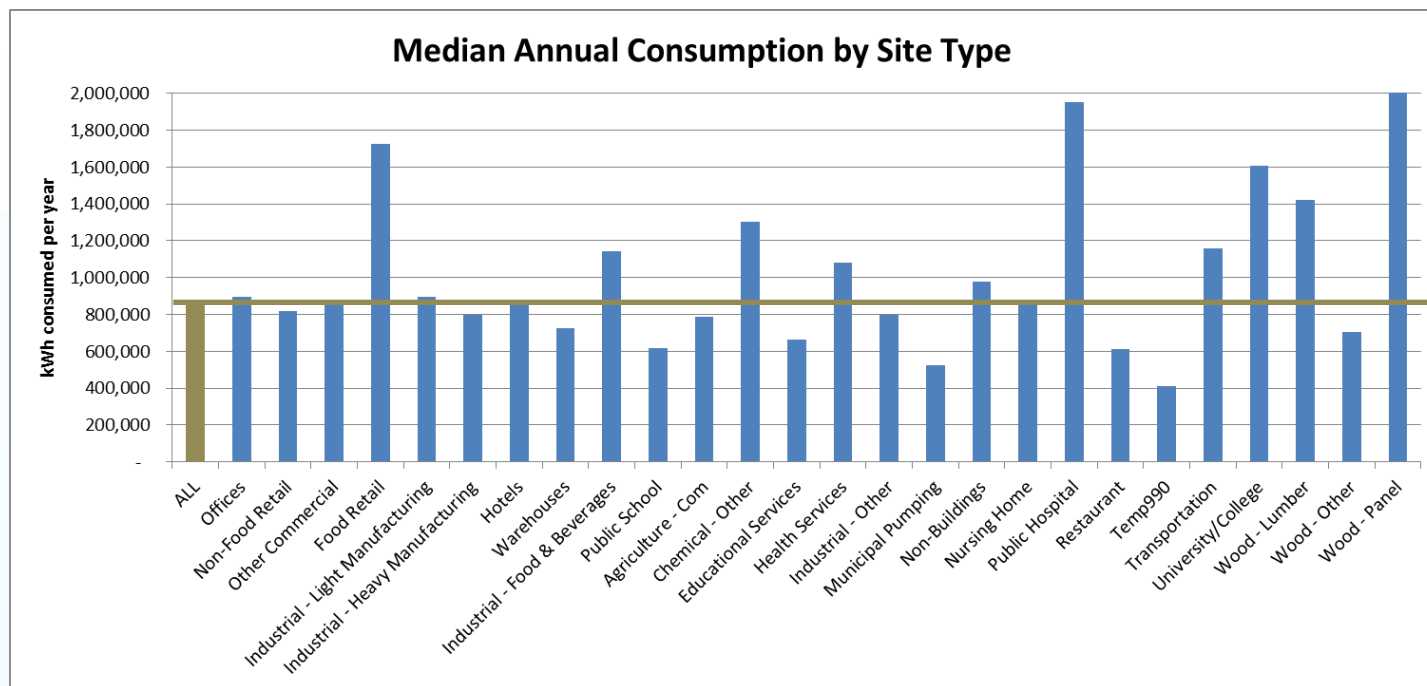
	0	30	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480	Total
0%	0.0%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
10%	1.6%	2.1%	2.2%	1.0%	0.5%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.8%
20%	1.1%	1.3%	2.5%	4.0%	2.6%	1.4%	1.0%	0.8%	0.5%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.5%
30%	0.8%	1.3%	1.2%	3.0%	4.7%	3.8%	2.6%	1.6%	1.4%	1.0%	0.7%	0.6%	0.3%	0.2%	0.1%	0.1%	0.0%	23.3%
40%	0.6%	1.0%	1.0%	0.8%	2.3%	3.4%	2.9%	2.1%	1.9%	1.3%	1.0%	0.9%	0.7%	0.6%	0.5%	0.4%	0.2%	21.4%
50%	0.5%	0.7%	0.5%	0.5%	0.4%	1.1%	1.7%	1.8%	1.3%	1.3%	0.9%	0.7%	0.7%	0.7%	0.6%	0.4%	0.4%	14.1%
60%	0.2%	0.5%	0.4%	0.3%	0.2%	0.2%	0.6%	0.9%	0.8%	0.7%	0.7%	0.5%	0.7%	0.5%	0.3%	0.2%	0.3%	7.9%
70%	0.1%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.3%	0.5%	0.5%	0.4%	0.3%	0.3%	0.3%	0.2%	0.2%	0.1%	4.2%
80%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%	1.4%
90%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
100%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	5.0%	7.8%	8.1%	9.9%	10.8%	10.3%	9.0%	7.5%	6.5%	5.0%	3.9%	3.1%	2.8%	2.4%	1.8%	1.3%	1.1%	96.4%

Note: 3.6% accounts higher than 480 MWh

Red font indicates peak of distribution for each kWh series.

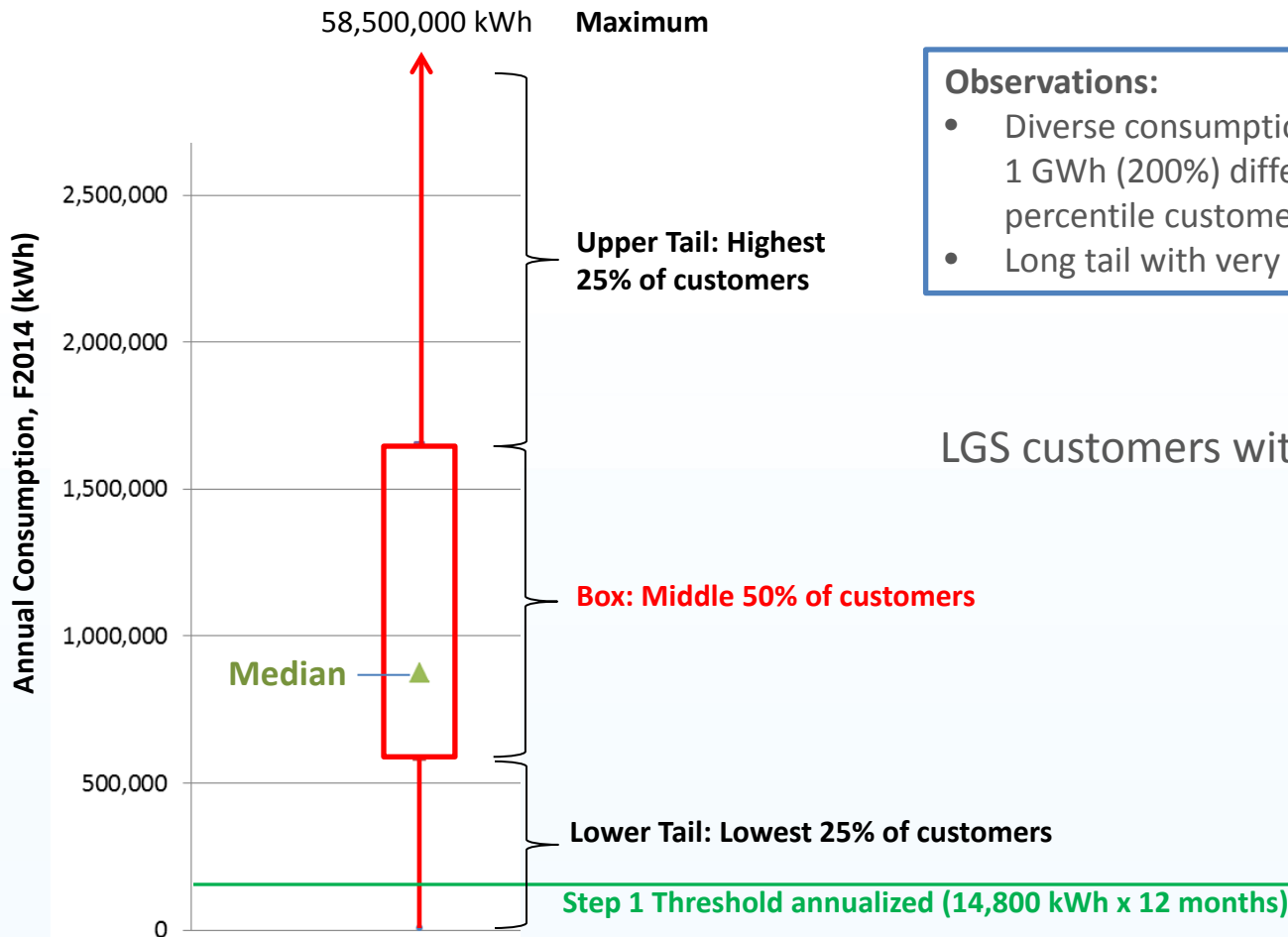
LGS CUSTOMERS

- Consumption driven by site type (type of business)
- Consumption levels vary widely by site type



Median of class

LGS: ANNUAL CONSUMPTION DISTRIBUTION F2014, BOX PLOT

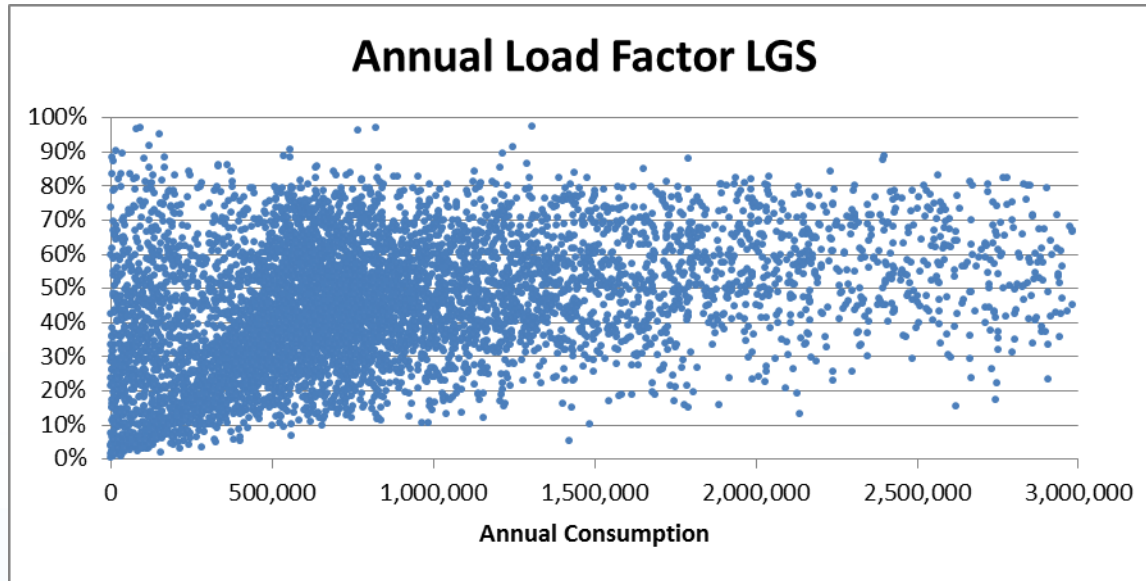


Observations:

- Diverse consumption patterns within the group; 1 GWh (200%) difference between 75th and 25th percentile customers
- Long tail with very high consumption

LGS customers with 12 monthly bills in F2014

LGS ANNUAL LOAD FACTOR ACCOUNT DISTRIBUTION BY CONSUMPTION (ABOUT 7000 ACCOUNTS IN F2014)



- Typical customers consume between 600 Megawatt Hours (MWh) and 1,700 MWh per year, with a load factor between 30% and 60%
- Load factor increases somewhat as consumption increases

Annual Consumption (1000 kWh)

	0	200	400	600	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	Total
0%	1.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%
10%	1.1%	2.6%	0.8%	0.3%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.1%
20%	1.0%	2.3%	2.6%	1.2%	0.8%	0.4%	0.2%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.2%
30%	1.1%	1.4%	3.8%	3.1%	1.8%	1.0%	0.6%	0.4%	0.3%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	14.2%
40%	0.7%	1.0%	2.0%	4.1%	2.8%	1.8%	1.3%	0.9%	0.6%	0.4%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	17.0%
50%	0.6%	1.0%	1.4%	3.7%	3.3%	1.9%	1.4%	1.1%	0.8%	0.6%	0.6%	0.3%	0.4%	0.2%	0.2%	0.2%	0.1%	17.8%
60%	0.4%	0.9%	0.9%	2.8%	1.9%	1.6%	1.0%	1.0%	0.5%	0.5%	0.4%	0.5%	0.3%	0.3%	0.3%	0.2%	0.2%	13.7%
70%	0.3%	0.4%	0.5%	1.6%	1.2%	0.8%	0.8%	0.5%	0.6%	0.5%	0.5%	0.4%	0.3%	0.2%	0.2%	0.1%	0.1%	9.2%
80%	0.2%	0.3%	0.2%	0.6%	0.4%	0.2%	0.3%	0.3%	0.1%	0.2%	0.3%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	3.6%
90%	0.1%	0.1%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
100%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Total	6.5%	10.3%	12.4%	17.6%	12.5%	7.8%	5.7%	4.4%	3.0%	2.6%	2.1%	1.7%	1.4%	1.2%	1.2%	0.7%	0.7%	90.9%

Note: 9% accounts higher than 3200 MWh

Red font indicates peak of distribution for each kWh series.

KEY MODELLING ASSUMPTIONS AND COMMENTS

Element	Assumptions and Comments
Fiscal Year Modeled	F2017, F2018, F2019
Revenue Neutrality	Rates from new models are revenue neutral to SQ target revenue on forecasted load for all years
Effective Years	New Rates Effective F2017, No Phase-in unless otherwise stated. F2018 and F2019 Rates escalated by same proportion for all tiers to maintain revenue neutral to SQ.
Billing Data Used	F2014 Customer Billing Data (latest available)
Baseline forecast Assumptions	Baselines for F2017, F2018, and F2019 are forecasted from 1. baselines used for the F15/F16 compliance filing 2. the average class load for the years that make up the F15 baselines (F12, F13, and F14) 3. the average class load forecasts for the years that will be used to compute baselines
“Part-1 adjustment”	<ul style="list-style-type: none"> The above yields between 1-3% of total load as LRMC credits T1 and T2 prices are adjusted to compensate for the credits to maintain class revenue neutrality This results in a lift of T1 and T2 energy rates by up to ~1% after RRA. This is somewhat consistent with historical trends.
Part-2 LRMC-based energy rate	Based on F2006 Call for Power Price, includes Line Losses (9.42c/kWh in F2013\$) per 2009 LGS Application. Current rate computed by escalating above price by inflation.
Current LRMC, upper bound Excludes Capacity and Includes Distribution (D) Loss (6%)	11.23 c/kWh \$F2017 (Lower bound = 9.55 c/kWh) 11.45 c/kWh \$F2018 11.68 c/kWh \$F2019 Equivalent to 10c/kWh + D loss in \$F2013 $= 10\text{c/kWh} \times (1+\text{D Loss}) \times (1+\text{F14 Inf.}) \times (1+\text{F15 fcst}) \times (1+\text{F16 fcst}) \times (1+\text{F17 fcst}) \times (1+\text{F18 fcst}) \times (1+\text{F19 fcst})$ $= 10\text{c/kWh} \times (1+6\%) \times (1+0.2\%) \times (1+1.6\%) \times (1+2.0\%) \times (1+2.0\%) \times (1+2.0\%) \times (1+2.0\%)$

MGS ALTERNATIVES, F2017 TO F2019

MGS	Status Quo				Flat Energy Rate					
	F16	F17	F18	F19	Flat Demand (3)			Two Step Demand Charge (4a)		
	F17	F18	F19		F17	F18	F19	F17	F18	F19
Basic \$/day	0.2257	0.2347	0.2429	0.2502	0.2347	0.2429	0.2502	0.2347	0.2429	0.2502
Demand \$/kW										
T1		0	0	0	2.22	2.29	2.36	-	-	-
T2	5.50	5.72	5.92	6.10	2.22	2.29	2.36	5.73	5.94	6.11
T3	10.55	10.97	11.35	11.69	2.22	2.29	2.36	5.73	5.94	6.11
Energy c/kwh										
T1	9.89	10.33	10.72	11.08	9.33	9.65	9.94	9.33	9.65	9.94
T2	6.90	7.21	7.48	7.73	9.33	9.65	9.94	9.33	9.65	9.94
Part 2	9.90	10.10	10.30	10.51						
Minimum	3.30	3.43	3.55	3.66	3.43	3.55	3.66	3.43	3.55	3.66

**Flat Energy Rate, Flat Demand Charge.
35% Cost Recovery on demand**

Phase-in to Flat Energy Rate, Flat Demand Charge.

MGS	35% Cost Recovery on demand			Over 3 years			10% BI Cap	
	F17	F18	F19	F17	F18	F19	F17	
Basic \$/day	0.2347	0.2429	0.2502	0.2347	0.2429	0.2502	0.2347	
Demand \$/kW								
T1	4.92	5.10	5.25	0.79	1.57	2.36	0.16	Estimated to take over 15 yrs to fully phase in to flat under a 10% BI Cap
T2	4.92	5.10	5.25	4.49	3.44	2.36	5.48	
T3	4.92	5.10	5.25	4.49	3.44	2.36	5.48	
Energy c/kwh								
T1	8.48	8.78	9.04	9.96	9.97	9.94	10.26	
T2	8.48	8.78	9.04	7.95	8.97	9.94	7.30	
Part 2								
Minimum	3.43	3.55	3.66	3.43	3.55	3.66	3.43	

LGS ALTERNATIVES, F2017 TO F2019

Flat Demand Charge

SQ Simplified Energy Rate (2)

Flat Energy Rate (3)

LGS	F16	F17	F18	F19	F17	F18	F19	F17	F18	F19
Basic \$/day	0.2257	0.2347	0.2429	0.2502	0.2347	0.2429	0.2502	0.2347	0.2429	0.2502
Demand \$/kW										
T1		0	0	0	8.43	8.72	8.98	8.43	8.72	8.98
T2	5.50	5.72	5.92	6.10	8.43	8.72	8.98	8.43	8.72	8.98
T3	10.55	10.97	11.35	11.69	8.43	8.72	8.98	8.43	8.72	8.98
Energy c/kwh										
T1	10.66	11.22	11.65	12.16	5.97	6.20	6.46	5.94	6.15	6.33
T2	5.13	5.40	5.61	5.86	5.97	6.20	6.46	5.94	6.15	6.33
Part 2	9.90	10.10	10.30	10.51	10.10	10.30	10.51			
Minimum	3.30	3.43	3.55	3.66	3.43	3.55	3.66	3.43	3.55	3.66

Two Step Demand Charge

Flat Energy Rate (4a)

SQ Simplified Energy Rate (4b)

LGS	F17	F18	F19	F17	F18	F19
Basic \$/day	0.2347	0.2429	0.2502	0.2347	0.2429	0.2502
Demand \$/kW						
T1	-	-	-	-	-	-
T2	9.33	9.66	9.95	9.33	9.66	9.95
T3	9.33	9.66	9.95	9.33	9.66	9.95
Energy c/kwh						
T1	5.94	6.15	6.34	5.97	6.20	6.46
T2	5.94	6.15	6.34	5.97	6.20	6.46
Part 2				10.10	10.30	10.51
Minimum	3.43	3.55	3.66	3.43	3.55	3.66

5. REFERENCE FOR INTERPRETING SENSITIVITY ANALYSIS OUTCOMES

- F15/F16 illustrative bill impact shown.
- Computed by assuming consumption and demand is identical for all months (i.e. the same load factor).

Annual Consumption kWh – Range that encompass most customers in the class

Highest kW

	200,000	400,000	600,000	800,000	1,000,000	1,200,000	1,400,000	1,600,000	1,800,000	2,000,000	2,200,000	2,400,000	2,600,000	2,800,000	3,000,000	3,200,000	3,400,000
10%	-18.6%	-4.6%	0.0%	2.3%	3.6%	4.5%	5.2%	5.6%	6.0%	6.3%	6.6%	6.8%	6.9%	7.1%	7.2%	7.3%	7.4%
20%	-30.5%	-10.9%	-3.6%	0.1%	2.2%	3.6%	4.7%	5.4%	6.0%	6.5%	6.9%	7.2%	7.5%	7.7%	7.9%	8.1%	8.2%
30%	-34.5%	-15.2%	-5.9%	-1.4%	1.3%	3.1%	4.3%	5.3%	6.0%	6.6%	7.1%	7.5%	7.8%	8.1%	8.4%	8.6%	8.8%
40%	-36.8%	-16.7%	-7.6%	-2.5%	0.6%	2.6%	4.1%	5.2%	6.0%	6.7%	7.2%	7.7%	8.1%	8.4%	8.7%	8.9%	9.1%
50%	-38.4%	-17.7%	-8.6%	-3.2%	0.1%	2.3%	3.9%	5.1%	6.0%	6.7%	7.3%	7.8%	8.3%	8.6%	8.9%	9.2%	9.4%
60%	-39.4%	-18.4%	-9.1%	-3.8%	-0.3%	2.1%	3.8%	5.0%	6.0%	6.8%	7.4%	7.9%	8.4%	8.8%	9.1%	9.4%	9.6%
70%	-40.3%	-19.0%	-9.5%	-4.1%	-0.6%	1.9%	3.7%	5.0%	6.0%	6.8%	7.5%	8.0%	8.5%	8.9%	9.3%	9.6%	9.8%
80%	-40.9%	-19.4%	-9.8%	-4.3%	-0.8%	1.8%	3.6%	4.9%	6.0%	6.9%	7.5%	8.1%	8.6%	9.0%	9.4%	9.7%	10.0%
90%	-41.4%	-19.7%	-10.0%	-4.5%	-0.9%	1.6%	3.5%	4.9%	6.0%	6.9%	7.6%	8.2%	8.7%	9.1%	9.5%	9.8%	10.1%

Lowest kW

“typical” customers as defined by kWh and LF fall within the blue oval area

More intense green indicates higher bill impact (only positive impacts are colored)

Red means Bill Impact higher than Class Average Rate Changes (CARC) (6%)

Important Notes

The distribution of customer by kWh and load factor may not follow the same trend as the **bill impact distributions** and **comparative distributions**

These are separate analyses with different and independent distributions, even though the metrics are related.

i.e.

- The median customer as defined by kWh and load factor is different than the median customer defined by bill impact of each rate design, dependent on which rate component is changed
- The “middle 60%” of customers in the kWh/load factor distribution above can be different than the ones in the bill impact of each rate design, also dependent on which rate component is changed

LGS/MGS CONVERSION TABLE: KWH AND KW VS. LOAD FACTOR

LGS Annual Consumption kWh

Highest kW

	200,000	400,000	600,000	800,000	1,000,000	1,200,000	1,400,000	1,600,000	1,800,000	2,000,000	2,200,000	2,400,000	2,600,000	2,800,000	3,000,000	3,200,000	3,400,000
10%	228	457	685	913	1,142	1,370	1,598	1,826	2,055	2,283	2,511	2,740	2,968	3,196	3,425	3,653	3,881
20%	114	228	342	457	571	685	799	913	1,027	1,142	1,256	1,370	1,484	1,598	1,712	1,826	1,941
30%	76	152	228	304	381	457	533	609	685	761	837	913	989	1,065	1,142	1,218	1,294
40%	57	114	171	228	285	342	400	457	514	571	628	685	742	799	856	913	970
50%	46	91	137	183	228	274	320	365	411	457	502	548	594	639	685	731	776
60%	38	76	114	152	190	228	266	304	342	381	419	457	495	533	571	609	647
70%	33	65	98	130	163	196	228	261	294	326	359	391	424	457	489	522	554
80%	29	57	86	114	143	171	200	228	257	285	314	342	371	400	428	457	485
90%	25	51	76	101	127	152	178	203	228	254	279	304	330	355	381	406	431

Lowest kW In T1

In T2

In T3

In Demand alternatives – note high sensitivity at T1/T2/T3 interfaces.

MGS Annual Consumption kWh

Highest kW

	10,000	30,000	60,000	90,000	120,000	150,000	180,000	210,000	240,000	270,000	300,000	330,000	360,000	390,000	420,000	450,000	480,000
10%	11	34	68	103	137	171	205	240	274	308	342	377	411	445	479	514	548
20%	6	17	34	51	68	86	103	120	137	154	171	188	205	223	240	257	274
30%	4	11	23	34	46	57	68	80	91	103	114	126	137	148	160	171	183
40%	3	9	17	26	34	43	51	60	68	77	86	94	103	111	120	128	137
50%	2	7	14	21	27	34	41	48	55	62	68	75	82	89	96	103	110
60%	2	6	11	17	23	29	34	40	46	51	57	63	68	74	80	86	91
70%	2	5	10	15	20	24	29	34	39	44	49	54	59	64	68	73	78
80%	1	4	9	13	17	21	26	30	34	39	43	47	51	56	60	64	68
90%	1	4	8	11	15	19	23	27	30	34	38	42	46	49	53	57	61

Lowest kW

In T1

In T2

In T3

In Demand alternatives – note high sensitivity at T1/T2/T3 interfaces.

“Typical” customers as defined by kWh and LF fall within the blue oval area



F2017 Illustrative Bills by Annual Consumption and Annual Load Factor – Status Quo

LGS Illustrative Annual Bills in \$1000's (Max kW assumed to be constant for all months)

		Annual consumption (kWh)																
		200,000	400,000	600,000	800,000	1,000,000	1,200,000	1,400,000	1,600,000	1,800,000	2,000,000	2,200,000	2,400,000	2,600,000	2,800,000	3,000,000	3,200,000	3,400,000
Annual Load Factor	10%	\$41 (228 kW)	\$84 (457 kW)	\$127 (685 kW)	\$170 (913 kW)	\$213 (1142 kW)	\$256 (1370 kW)	\$299 (1598 kW)	\$342 (1826 kW)	\$385 (2055 kW)	\$427 (2283 kW)	\$470 (2511 kW)	\$513 (2740 kW)	\$556 (2968 kW)	\$599 (3196 kW)	\$642 (3425 kW)	\$685 (3653 kW)	\$728 (3881 kW)
	20%	\$28 (114 kW)	\$53 (228 kW)	\$80 (342 kW)	\$107 (457 kW)	\$134 (571 kW)	\$161 (685 kW)	\$188 (799 kW)	\$215 (913 kW)	\$243 (1027 kW)	\$270 (1142 kW)	\$297 (1256 kW)	\$324 (1370 kW)	\$351 (1484 kW)	\$378 (1598 kW)	\$405 (1712 kW)	\$432 (1826 kW)	\$460 (1941 kW)
	30%	\$25 (76 kW)	\$42 (152 kW)	\$64 (228 kW)	\$86 (304 kW)	\$108 (381 kW)	\$130 (457 kW)	\$152 (533 kW)	\$173 (609 kW)	\$195 (685 kW)	\$217 (761 kW)	\$239 (837 kW)	\$261 (913 kW)	\$283 (989 kW)	\$305 (1065 kW)	\$326 (1142 kW)	\$348 (1218 kW)	\$370 (1294 kW)
	40%	\$24 (57 kW)	\$39 (114 kW)	\$56 (171 kW)	\$75 (228 kW)	\$95 (285 kW)	\$114 (342 kW)	\$133 (400 kW)	\$152 (457 kW)	\$172 (514 kW)	\$191 (571 kW)	\$210 (628 kW)	\$229 (685 kW)	\$248 (742 kW)	\$268 (799 kW)	\$287 (856 kW)	\$306 (913 kW)	\$325 (970 kW)
	50%	\$23 (46 kW)	\$38 (91 kW)	\$52 (137 kW)	\$69 (183 kW)	\$87 (228 kW)	\$104 (274 kW)	\$122 (320 kW)	\$140 (365 kW)	\$157 (411 kW)	\$175 (457 kW)	\$193 (502 kW)	\$210 (548 kW)	\$228 (594 kW)	\$246 (639 kW)	\$263 (685 kW)	\$281 (731 kW)	\$299 (776 kW)
	60%	\$23 (38 kW)	\$37 (76 kW)	\$51 (114 kW)	\$65 (152 kW)	\$81 (190 kW)	\$98 (228 kW)	\$115 (266 kW)	\$131 (304 kW)	\$148 (342 kW)	\$164 (381 kW)	\$181 (419 kW)	\$198 (457 kW)	\$214 (495 kW)	\$231 (533 kW)	\$247 (571 kW)	\$264 (609 kW)	\$281 (647 kW)
	70%	\$22 (33 kW)	\$36 (65 kW)	\$49 (98 kW)	\$63 (130 kW)	\$78 (163 kW)	\$94 (196 kW)	\$109 (228 kW)	\$125 (261 kW)	\$141 (294 kW)	\$157 (326 kW)	\$173 (359 kW)	\$189 (391 kW)	\$205 (424 kW)	\$220 (457 kW)	\$236 (489 kW)	\$252 (522 kW)	\$268 (554 kW)
	80%	\$22 (29 kW)	\$35 (57 kW)	\$49 (86 kW)	\$62 (114 kW)	\$75 (143 kW)	\$90 (171 kW)	\$105 (200 kW)	\$121 (228 kW)	\$136 (257 kW)	\$151 (285 kW)	\$167 (314 kW)	\$182 (342 kW)	\$197 (371 kW)	\$212 (400 kW)	\$228 (428 kW)	\$243 (457 kW)	\$258 (485 kW)
	90%	\$22 (25 kW)	\$35 (51 kW)	\$48 (76 kW)	\$61 (101 kW)	\$74 (127 kW)	\$88 (152 kW)	\$102 (178 kW)	\$117 (203 kW)	\$132 (228 kW)	\$147 (254 kW)	\$162 (279 kW)	\$177 (304 kW)	\$192 (330 kW)	\$206 (355 kW)	\$221 (381 kW)	\$236 (406 kW)	\$251 (431 kW)

All consumption assumed to equal baseline (no part-2 charges or credits)

MGS Illustrative Annual Bills in \$1000's (Max kW assumed to be constant for all months)

		Annual consumption (kWh)																
		10,000	30,000	60,000	90,000	120,000	150,000	180,000	210,000	240,000	270,000	300,000	330,000	360,000	390,000	420,000	450,000	480,000
Annual Load Factor	10%	\$1 (11 kW)	\$3 (34 kW)	\$9 (68 kW)	\$15 (103 kW)	\$20 (137 kW)	\$28 (171 kW)	\$35 (205 kW)	\$42 (240 kW)	\$50 (274 kW)	\$57 (308 kW)	\$64 (342 kW)	\$71 (377 kW)	\$78 (411 kW)	\$85 (445 kW)	\$92 (479 kW)	\$99 (514 kW)	\$106 (548 kW)
	20%	\$1 (6 kW)	\$3 (17 kW)	\$7 (34 kW)	\$11 (51 kW)	\$16 (68 kW)	\$20 (86 kW)	\$24 (103 kW)	\$28 (120 kW)	\$31 (137 kW)	\$35 (154 kW)	\$40 (171 kW)	\$44 (188 kW)	\$49 (205 kW)	\$54 (223 kW)	\$58 (240 kW)	\$63 (257 kW)	\$68 (274 kW)
	30%	\$1 (4 kW)	\$3 (11 kW)	\$7 (23 kW)	\$10 (34 kW)	\$14 (46 kW)	\$18 (57 kW)	\$22 (68 kW)	\$25 (80 kW)	\$28 (91 kW)	\$31 (103 kW)	\$34 (114 kW)	\$37 (126 kW)	\$41 (137 kW)	\$44 (148 kW)	\$47 (160 kW)	\$51 (171 kW)	\$55 (183 kW)
	40%	\$1 (3 kW)	\$3 (9 kW)	\$7 (17 kW)	\$10 (26 kW)	\$13 (34 kW)	\$17 (43 kW)	\$21 (51 kW)	\$24 (60 kW)	\$26 (68 kW)	\$29 (77 kW)	\$32 (86 kW)	\$35 (94 kW)	\$38 (103 kW)	\$41 (111 kW)	\$44 (120 kW)	\$47 (128 kW)	\$50 (137 kW)
	50%	\$1 (2 kW)	\$3 (7 kW)	\$7 (14 kW)	\$10 (21 kW)	\$13 (27 kW)	\$16 (34 kW)	\$20 (41 kW)	\$23 (48 kW)	\$26 (55 kW)	\$28 (62 kW)	\$31 (68 kW)	\$34 (75 kW)	\$37 (82 kW)	\$39 (89 kW)	\$42 (96 kW)	\$45 (103 kW)	\$48 (110 kW)
	60%	\$1 (2 kW)	\$3 (6 kW)	\$7 (11 kW)	\$10 (17 kW)	\$13 (23 kW)	\$16 (29 kW)	\$20 (34 kW)	\$22 (40 kW)	\$25 (46 kW)	\$28 (51 kW)	\$30 (57 kW)	\$33 (63 kW)	\$36 (68 kW)	\$38 (74 kW)	\$41 (80 kW)	\$44 (86 kW)	\$46 (91 kW)
	70%	\$1 (2 kW)	\$3 (5 kW)	\$7 (10 kW)	\$10 (15 kW)	\$13 (20 kW)	\$16 (24 kW)	\$20 (29 kW)	\$22 (34 kW)	\$24 (39 kW)	\$27 (44 kW)	\$29 (49 kW)	\$32 (54 kW)	\$35 (59 kW)	\$37 (64 kW)	\$40 (68 kW)	\$43 (73 kW)	\$45 (78 kW)
	80%	\$1 (1 kW)	\$3 (4 kW)	\$7 (9 kW)	\$10 (13 kW)	\$13 (17 kW)	\$16 (21 kW)	\$20 (26 kW)	\$22 (30 kW)	\$24 (34 kW)	\$27 (39 kW)	\$29 (43 kW)	\$32 (47 kW)	\$34 (51 kW)	\$37 (56 kW)	\$40 (60 kW)	\$42 (64 kW)	\$45 (68 kW)
	90%	\$1 (1 kW)	\$3 (4 kW)	\$7 (8 kW)	\$10 (11 kW)	\$13 (15 kW)	\$16 (19 kW)	\$20 (23 kW)	\$22 (27 kW)	\$24 (30 kW)	\$26 (34 kW)	\$29 (38 kW)	\$31 (42 kW)	\$34 (46 kW)	\$36 (49 kW)	\$39 (53 kW)	\$42 (57 kW)	\$44 (61 kW)

All consumption assumed to equal baseline (no part-2 charges or credits)