

# 2015 RATE DESIGN APPLICATION (RDA) WORKSHOP NO. 8B

LARGE GENERAL SERVICE (LGS) & MEDIUM GENERAL SERVICE (MGS)  
**SESSION 2: ALTERNATIVE RATE STRUCTURES**



FOR GENERATIONS

February 11, 2015

# WORKSHOP OUTLINE

## 1. Topic #1: Introduction

- Recap of Session 1
- Objective of Session 2 - General Agreement on which alternatives to bring forward for analysis for Workshop 2 purposes
- Recap of current LGS and MGS rate structures

## 2. Topic #2: Screened-in Alternatives

- Alternatives development
- Rate structure objectives (Bonbright criteria)
- Overview of alternatives
- Summary of alternatives' benefits and drawbacks

## 3. Topic #3: Bill Impact Modeling Assumptions

## 4. Topic #4: Bill impacts and Assessment of Screened-in Alternatives

- Bill impact modeling results
- Result summary and need for transition strategy

## 5. Topic #5: Screened-out Alternatives

TOPIC #1

INTRODUCTION

## GENERAL SERVICE (GS) WORKSHOP STRUCTURE AND PURPOSE

- **GS Workshop 1 broken into 2 sessions:**
  - Session 1: Purpose is to review regulatory history and existing (Status Quo (SQ) ) rate structures
  - Session 2: Purpose is to review alternatives to the existing LGS/MGS rate structures
  
- **GS Workshop 2 (May 2015) will provide further alternatives analysis and discuss transition strategies**

## RECAP OF SESSION 1

1. Reviewed regulatory history of GS rate structures
2. Reviewed current GS rate structures
3. Demonstrated the heterogeneity of LGS/MGS customers
  - Heterogeneity increases the difficulty of finding a rate structure that is appropriate for all customers
4. Presented results of customer surveys and quantitative conservation analyses
  - Studies show that the complexity of the SQ LGS/MGS rate structures is impeding customer understanding and conservation
5. Presented three alternative rate structure categories
6. Discussed SGS rate structure and voluntary Time of Use rates

## OBJECTIVES OF SESSION 2

### 1. Present rate structure alternatives - 2 categories:

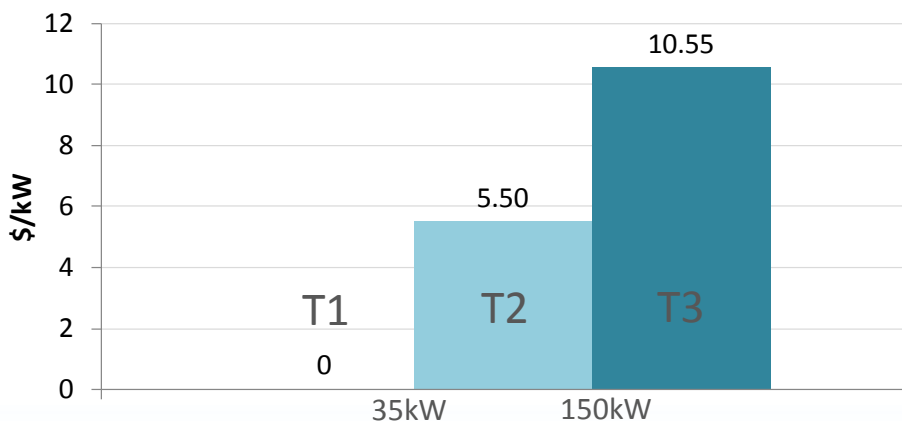
- 1) Screened-in (focus of Workshop) and
- 2) Screened-out (summary review)

### 2. Demonstrate the relative benefits and drawbacks of each alternative

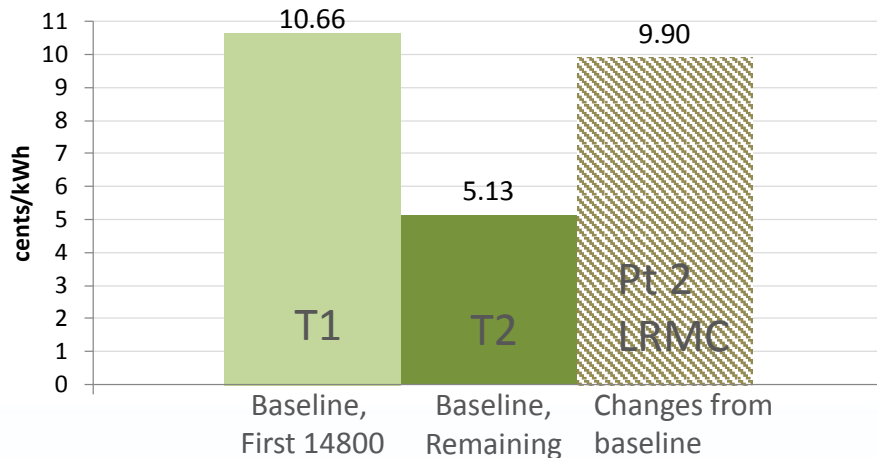
### 3. Present preliminary bill impact analyses of screened-in alternatives

- Indicates relative importance of transition strategies, which will be discussed in Workshop 2

# LGS SQ (F2016)



**Demand Charges**



**Energy Charges**

## Illustrative Customer Bill

Load Factor of 46%, Baseline Consumption = 744,240 kWh per year, Billed kW = 185 kW each month

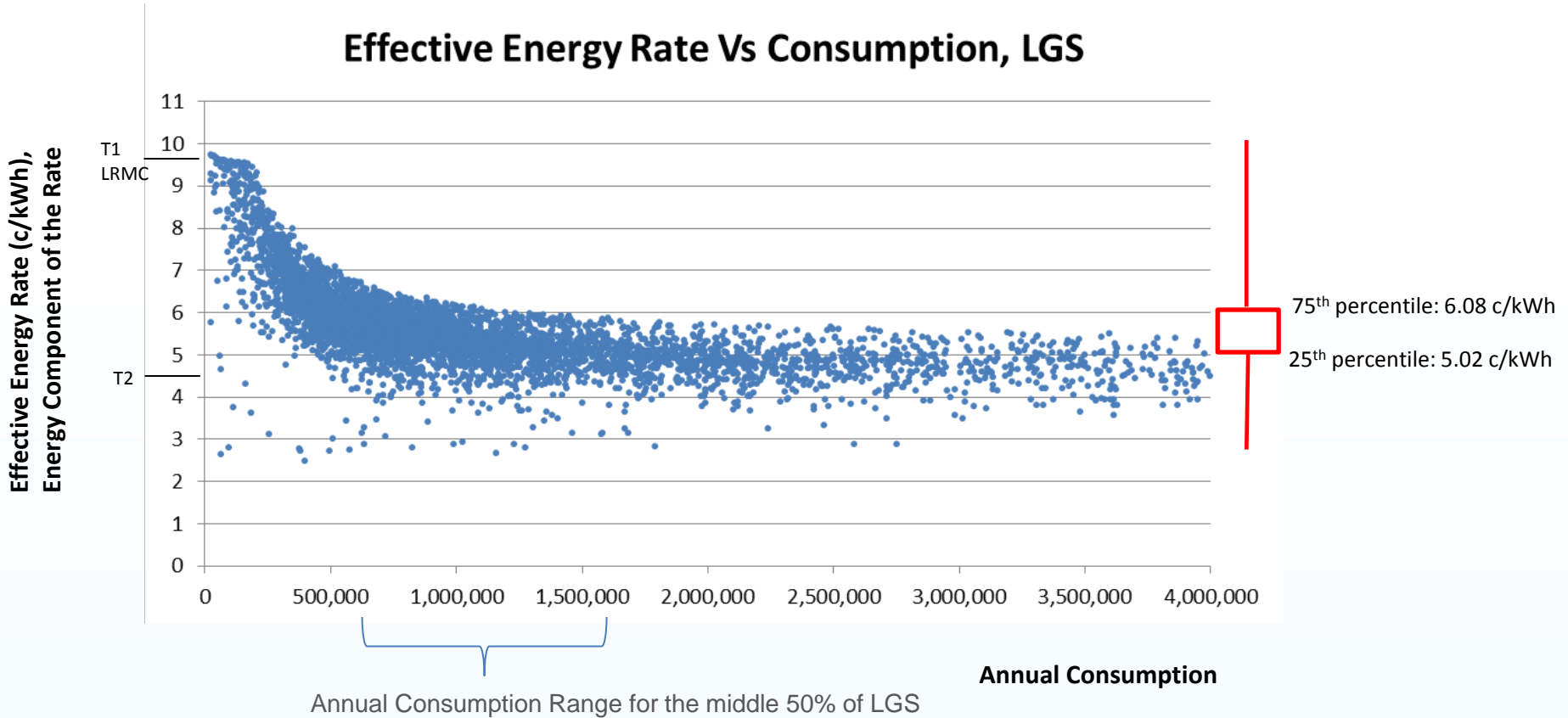
Customer Scenario	Demand Charge	Energy Charge	Basic Charge	Total Bill SQ
Consume at baseline	\$12,021	\$48,001	\$82	\$60,104
+ 5% from baseline	\$12,021	\$51,685	\$82	\$63,788
- 5% from baseline	\$12,021	\$44,317	\$82	\$56,420

## Observation:

- Issues presented at session 1 (Jan 21, 2015)

# LGS: BILLING DISTRIBUTION, ENERGY COMPONENT OF THE RATE (F2014)

## Effective Energy Rate Vs Consumption, LGS



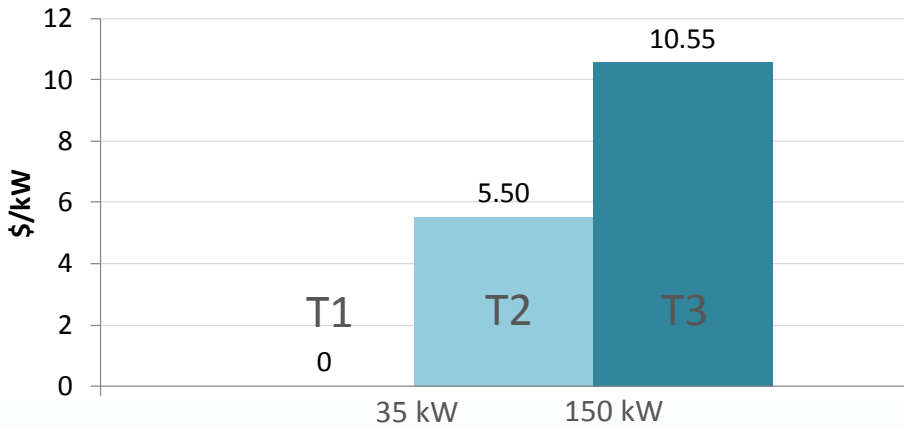
**Effective rate = Energy component of bill/kWh consumed**

Depends on:

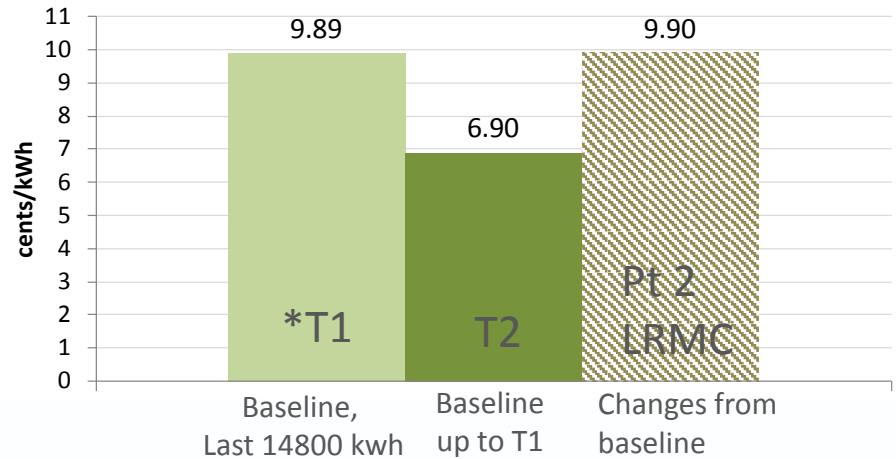
- Consumption at Part-1 T1 and T2 energy rates
- Consumption at Part-2 Long Run Marginal Cost (LRMC) rate (credit/charge)
- Minimum Energy Charge



# MGS SQ (F2016)



**Demand Charges**



**Energy Charges**

\*Note: Energy T1 and T2 are presented in the same sequence as the LGS rate for ease of illustration

## Illustrative Customer Bill

Load Factor of 36%, Baseline Consumption = 153,240 kWh per year, Billed kW = 49 kW each month

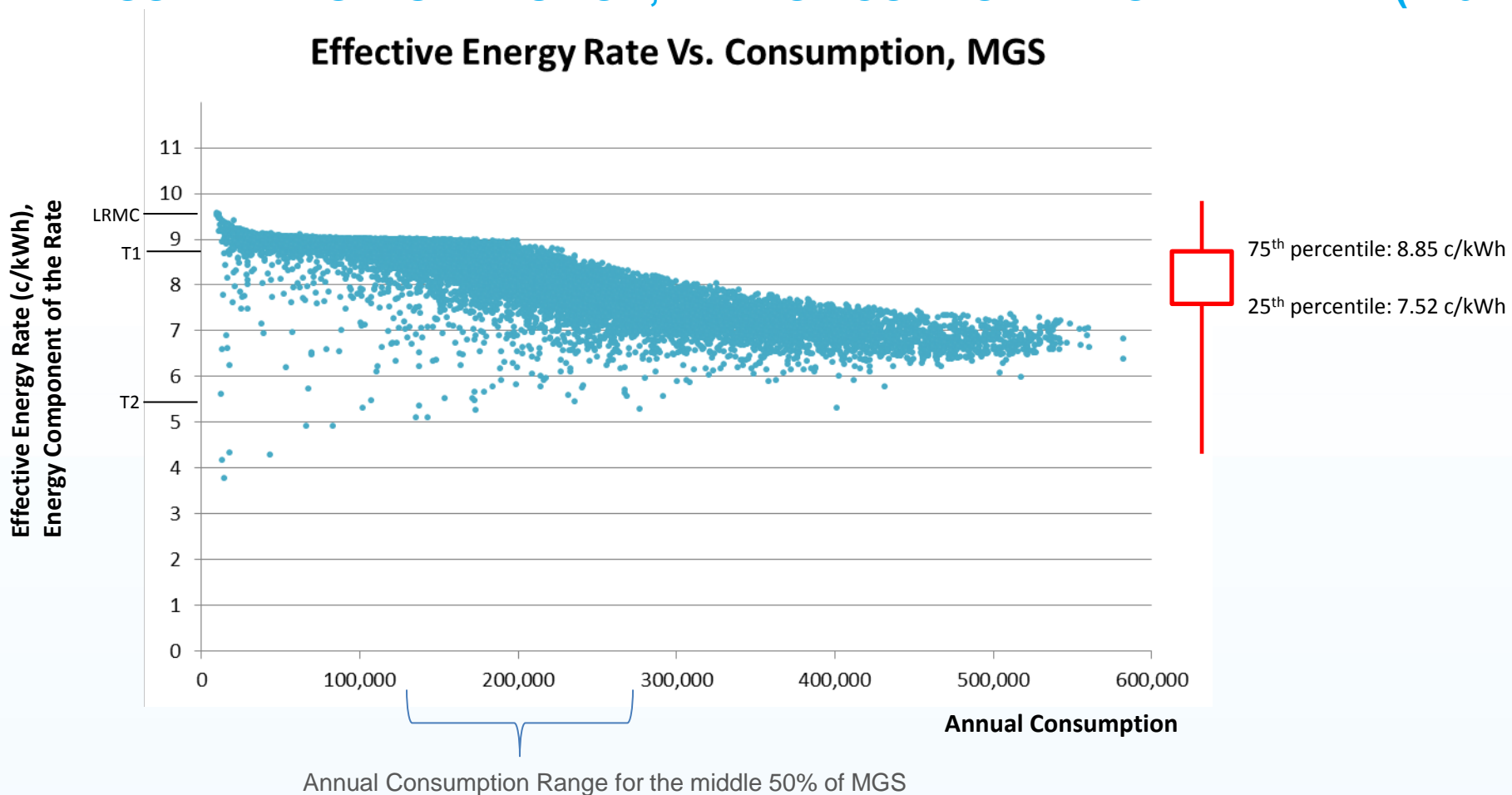
Customer Scenario	Demand Charge	Energy Charge	Basic Charge	Total Bill SQ
Consume at baseline	\$924	\$15,155	\$82	\$16,162
+ 5% from baseline	\$924	\$15,914	\$82	\$16,920
- 5% from baseline	\$924	\$14,397	\$82	\$15,403

### Observation:

- Issues presented at session 1 (Jan 21, 2015)

# MGS: BILLING DISTRIBUTION, ENERGY COMPONENT OF THE RATE (F2014)

## Effective Energy Rate Vs. Consumption, MGS



## BONBRIGHT ASSESSMENT OF THE SQ LGS AND MGS RATE STRUCTURES

Criteria (1961 Text)	Assessment
<p><b>Economic Efficiency</b></p> <p>Price signals that encourage efficient use and discourage inefficient use (1)</p>	<ul style="list-style-type: none"> <li>The SQ 2-part baseline rates are theoretically economically efficient rates intended to deliver rate structure energy conservation via an energy Long Run Marginal Cost (LRMC) price signal</li> <li>The LGS/MGS 2 part rates are not delivering substantial rate structure conservation</li> </ul>
<p><b>Fairness</b></p> <p>Fair apportionment of costs among customers (2); Avoid undue discrimination (3)</p>	<ul style="list-style-type: none"> <li>No cost of service basis for the inclining demand charges</li> </ul>
<p><b>Practicality</b></p> <p>Customer understanding and acceptance, practical and cost effective to implement (4); Freedom from controversies as to proper interpretation (5)</p>	<ul style="list-style-type: none"> <li>Complex rates                             <ul style="list-style-type: none"> <li>difficult for customers to understand and to administer (e.g. budgeting)</li> <li>difficult for BC Hydro to administer</li> </ul> </li> <li>Energy and demand charges are atypical (jurisdictional assessment)</li> </ul>
<p><b>Stability</b></p> <p>Recovery of the revenue requirement (6); revenue stability (7); rate stability (8)</p>	<ul style="list-style-type: none"> <li>Rate stability:                             <ul style="list-style-type: none"> <li>LGS transitioned on 1 Jan 2011</li> <li>MGS transitioned in 2 groups. All transitioned by 1 April 2013</li> </ul> </li> <li>The rates are effective in collecting the revenue requirement</li> </ul>

TOPIC # 2

# SCREENED-IN ALTERNATIVES

# OUTLINE

1. Alternatives development
2. Key rate structure objectives (Bonbright criteria)
  - Fairness
  - Economic efficiency
  - Customer acceptance
  - Practicality
3. Overview of screened-in alternatives, for both MGS and LGS classes
4. Screened-in alternative - objectives performance analysis

# ALTERNATIVES DEVELOPMENT

- Developed 35 possible alternatives via input from the following sources:
  - 2007 RDA submissions and decision
  - 2009 LGS Application submissions and 2010 Negotiated Settlement Agreement
  - Two evaluation reports (2011-2012, and F2014)
  - Customer issues
  - Jurisdictional review
  - Stakeholder input from session 1
- Rate structure objectives assessment used to “screen” alternatives
  - Screened-in alternatives discussed as topics 2, 3, and 4
  - Screened-out alternatives discussed as topic 5

# KEY RATE STRUCTURE ALTERNATIVE OBJECTIVES

Rate structure objectives can be used to evaluate and compare alternatives

## Key rate structure objectives:

Fairness

- How well the rate components reflect cost-causation

Economic efficiency

- How close the marginal energy rate is to LRMC

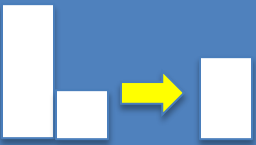


Customer understanding and acceptance

- Customer bill impacts
- Customer administrative effort and bill predictability
- Regulatory precedence

Practicality (of administration)

- Rate implementation and management costs

## SCREENED-IN ALTERNATIVES FOR LGS AND MGS

Alternative	Flatten Part-1 Energy 	Flatten Demand All Tiers 	Remove Baseline 
1. SQ	F2016 SQ rates		
Illustrate Energy effect	X		
Illustrate Demand effect		X	
<b>2. Flat Part-1 Energy and Flat Demand</b>	X	X	
<b>3. Flat Part-1 Energy and Flat Demand + No baseline</b>	X	X	X



Incremental changes from SQ

Major change from SQ



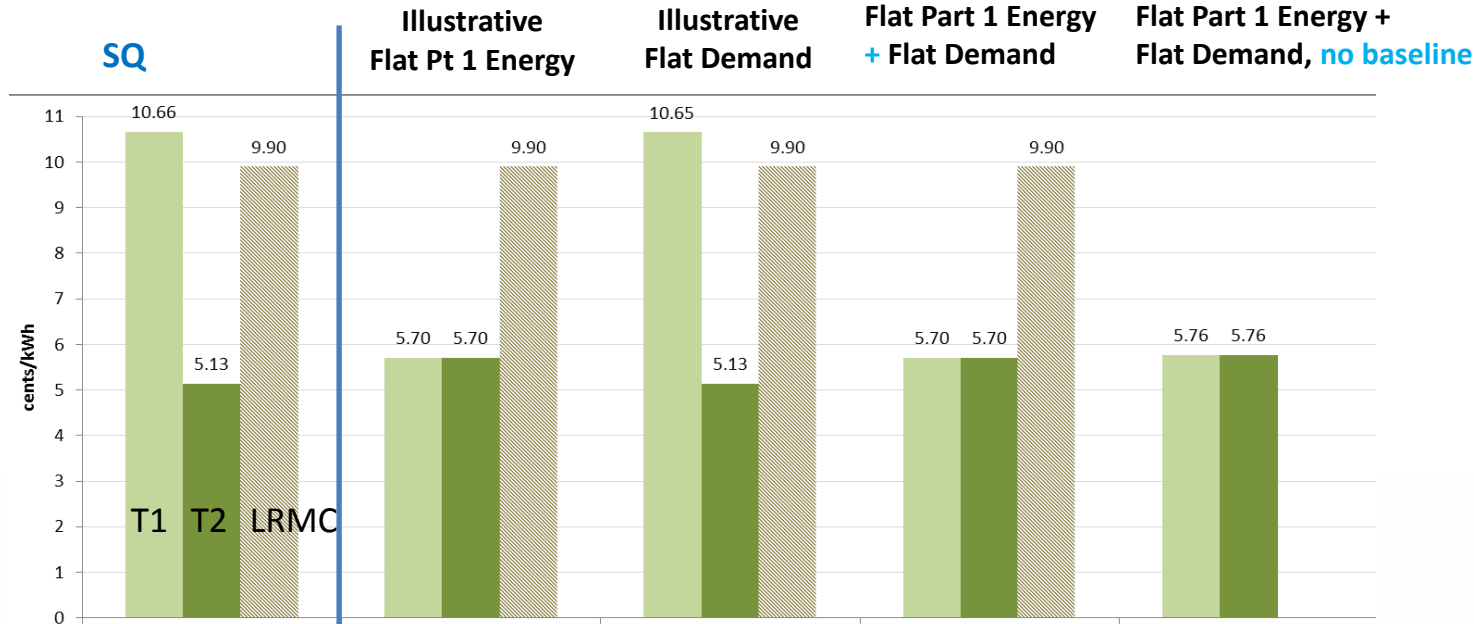
# LGS RATE SCREENED-IN ALTERNATIVES – OVERVIEW

## Energy Charge

T1 (Pt 1 first 14800 kWh/mo)

T2 (Pt 1 >14800 kWh/mo)

Pt 2 LRMC (Credit/Charge)

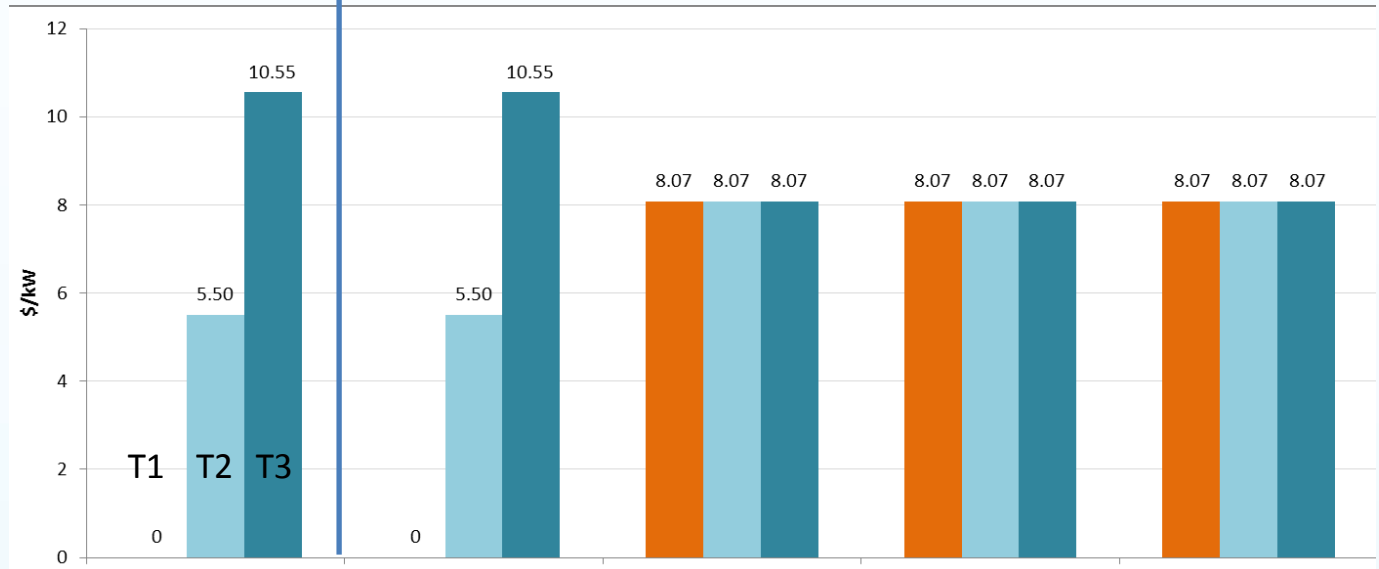


## Demand Charge

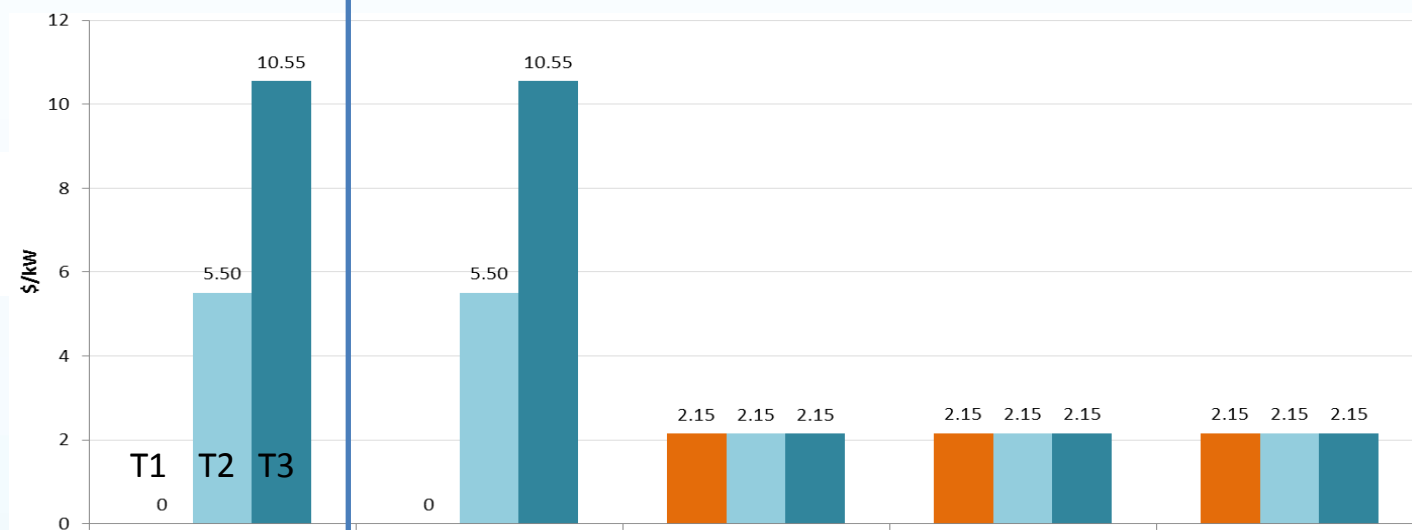
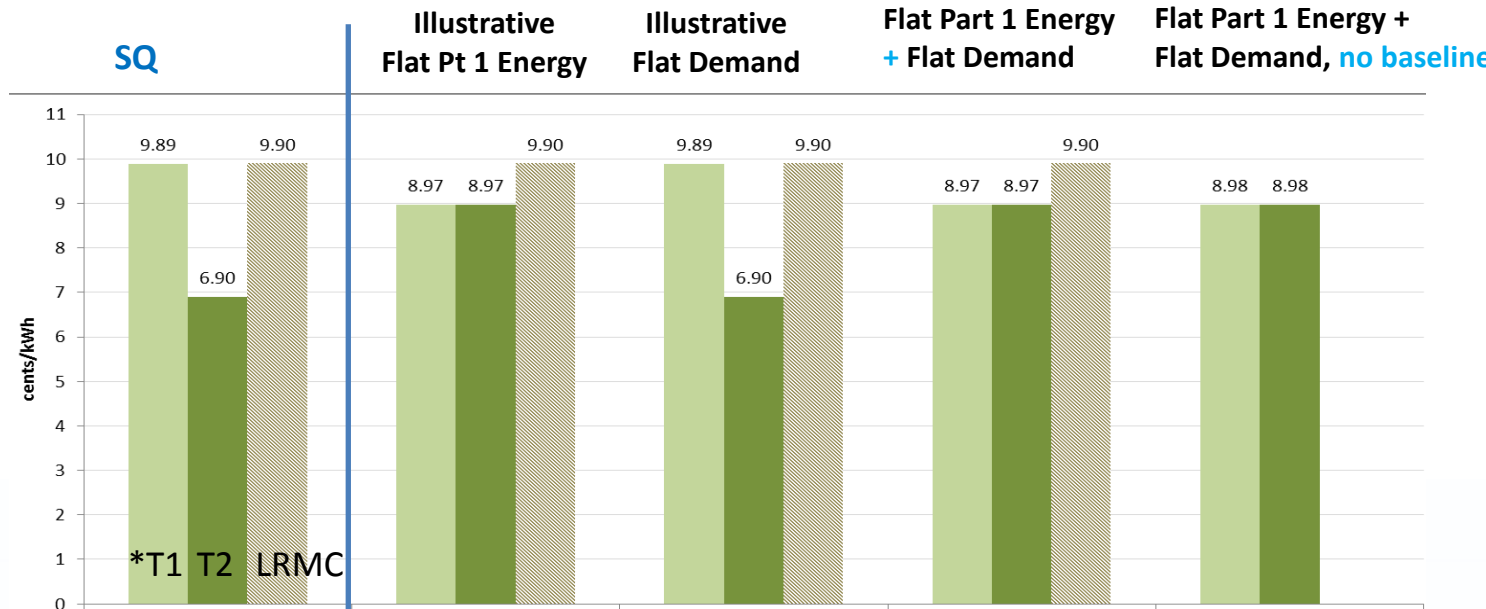
T1 (First 35 kW)

T2 (35 to 150 kW)

T3 (>150 kW)



# MGS RATE SCREENED-IN ALTERNATIVES – OVERVIEW



## Energy Charge

T1 (Pt 1 last 14800 kWh/mo)  
 T2 (Pt 1 remaining baseline kWh/mo)  
 Pt 2 LRMC (Credit/Charge)

## Demand Charge

T1 (First 35kW)  
 T2 (35 to 150kW)  
 T3 (>150kW)



\*Note: Energy T1 and T2 are presented in the same sequence as the LGS rate for ease of illustration, although the conceptual billing sequence on **reduction of consumption** beyond the price limit band (substantively apply only to a small % of bills) is inverted.

## LGS RATE SCREENED-IN RATE ALTERNATIVES OVERVIEW

	SQ	Illustrative Flat Part 1 Energy	Illustrative Flat Demand	Flat Part 1 Energy + Flat Demand	Flat Part 1 Energy + Flat Demand, <b>no baseline</b>	
<b>LGS Demand</b>	T1 \$/kW (First 35 kW)	0	0	8.07	8.07	
	T2 \$/kW (35 to 150 kW)	5.50	5.50			
	T3 \$/kW (>150 kW)	10.55	10.55			
<b>LGS Energy</b>	T1 c/kWh (Baseline; first 14800 kWh/mo)	10.66	5.70	10.65	5.70	
	T2 c/kWh (Baseline, Remainder)	5.13		5.13		
	Part 2 LRM c/kWh	9.90	9.90	9.90	9.90	N/A
	Basic Charge \$/day	0.2257				

Note: Flat Demand T1 energy variance with SQ (0.01c/kWh) is due to small increase to discounts when T1 demand becomes billable and T2 demand has increased.

## MGS RATE SCREENED-IN RATE ALTERNATIVES OVERVIEW

	SQ	Illustrative Flat Part 1 Energy	Illustrative Flat Demand	Flat Part 1 Energy + Flat Demand	Flat Part 1 Energy + Flat Demand, <b>no baseline</b>	
<b>MGS Demand</b>	T1 \$/kW (First 35 kW)	0	0	2.15	2.15	
	T2 \$/kW (35 to 150 kW)	5.50	5.50			
	T3 \$/kW (>150 kW)	10.55	10.55			
<b>MGS Energy</b>	T1 c/kWh (Baseline; first 14800 kWh/mo)	9.89	8.97	9.89	8.97	
	T2 c/kWh (Baseline, Remainder)	6.90		6.90		
	Part 2 LRM c/kWh	9.90	9.90	9.90	9.90	N/A
	Basic Charge \$/day	0.2257				

# FLATTENING PART-1 ENERGY AND DEMAND: BENEFITS AND DRAWBACKS (LGS AND MGS)

## Benefits (relative to SQ):

### Customer Understanding and Acceptance

- Easier for customers to understand rate structure as there are no more rate tiers for energy and demand

### Fairness

- Better reflection of demand costs and more equitable distribution of fixed costs among customers of different sizes

## Drawbacks (relative to SQ):

### Customer Understanding and Acceptance

- Some customers will experience large bill impacts

### Practicality

- One-time administrative cost to change billing procedure

## REMOVE BASELINE (PART-2) AND FLATTENING PART-1 ENERGY AND DEMAND: BENEFITS AND DRAWBACKS

### Benefits in addition to previous slide (relative to SQ):

#### Customer Understanding and Acceptance

- Removes substantive issues associated with baseline rate:
  - Complexity associated with baseline (including forecasting)
  - Growth issues with LRMC component of the rate
- Bill impact due to removal of baseline is minor

#### Practicality

- Significant reduction in time to manage bill adjustments and information technology time

#### Economic Efficiency

- MGS resulting marginal energy rate is within LRMC range

### Drawbacks (relative to SQ):

#### Economic Efficiency

- LGS: 0 to 77 GWh reduction in conservation
- LGS: Resulting marginal energy rate is below the lower end of the LRMC range

## TOPIC # 3

# BILL IMPACT MODELING ASSUMPTIONS

## MODELING ASSUMPTIONS

- F2016 rates are used for the workshop
- All rate alternatives are revenue neutral, designed to collect the F2016 target revenue in the most recent Revenue Requirements Application (RRA)
- Demand component of revenue kept constant in screened-in alternative cases (i.e., no transfer of revenue between demand and energy components of the rates)
- Billing determinants and assumptions
  - The billing data used for rate modeling are from F2013
  - Baseline assumptions for each account are taken from assumptions used for determining the F2016 rates, which is the F2015 actual (Apr to Sept) and forecasted (Oct to Mar) baselines without adjustments
  - Same load and revenue forecasts used for the RRA

## “TYPICAL CUSTOMER” DEFINITION FOR ILLUSTRATIVE BILLS ANALYSES

Illustrative customers are assumed to have approximately median consumption, median load factor, Max kW billed on all months, and uniform consumption throughout the year

### LGS:

- Load Factor = 46%
- Baseline Consumption = 744,240 kWh per year
- Max kW = 185 kW
- Special Notes: Demand includes T1, T2, and T3; about 33% of consumption at Energy Part 1 T1

### MGS:

- Load Factor = 36%
- Baseline Consumption = 153,240 kWh per year
- Max kW = 49 kW
- Special Notes: Demand only includes T1 and T2; All consumption at Energy Part 1 T1

### Simplifying Assumptions for bill calculations:

- Constant monthly consumption (no seasonal changes)
- Constant monthly max kW
- Annual bill computed
- No discounts, no anomalies, special provisions, etc.

### Customer Scenarios:

- Simulate No change from baseline
- Simulate Typical Growth in use, +5% from baseline
- Simulate Typical Reduction in use, -5% from baseline



## MODELING ASSUMPTIONS: BILL IMPACTS AND COMPARATIVE ANALYSIS WITH SQ

**Customer billing impacts are mainly influenced by:**

1. Energy Consumption (kWh)
2. Demand (kW)
3. Load factor = Annual kWh / (Max Annual kW x 365 days/yr x 24 hrs/day )

### **Bill impact analysis (analysis consistent with 2009 LGS application)**

If the consumption is the same between F15 and F16, what will be the % difference in the total annual bill from one year to the next, assuming no growth or decline from baseline?

This analysis assumes baseline = consumption (so no energy in part-2) to show the impact without the influence of part-2 to simplify the discussion.

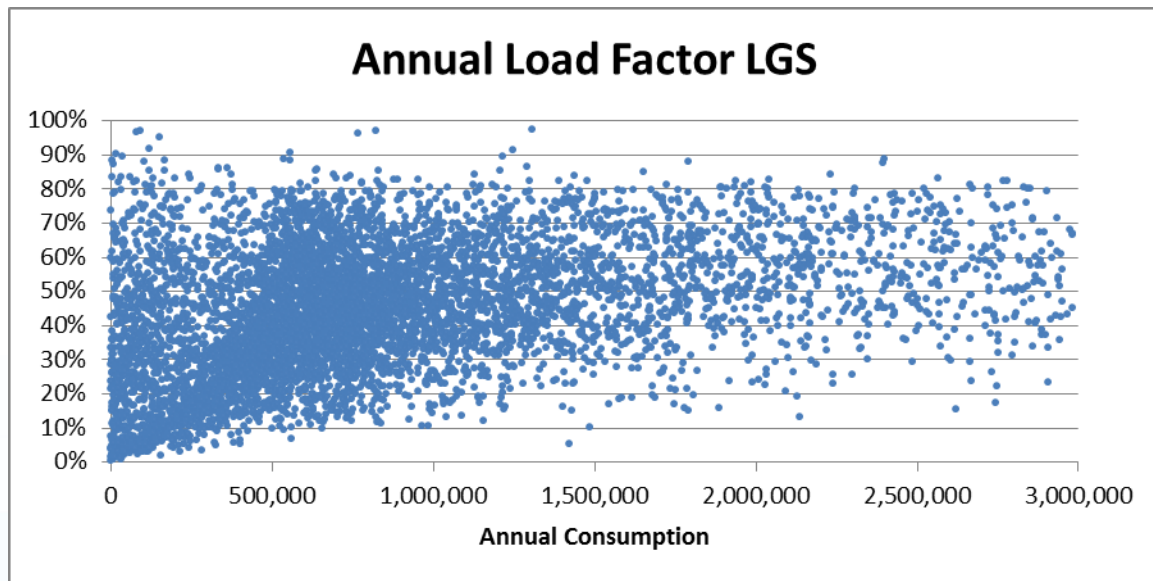
- Impact distribution by kWh by load factor
- Impact distribution by max annual kW by load factor
- Bill impacts by illustrative industry types

### **Comparative analysis**

For each account, same consumption, same baseline, same demand

What is the % difference in the annual bill between SQ and the alternative for each year?

# LGS ANNUAL LOAD FACTOR 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%

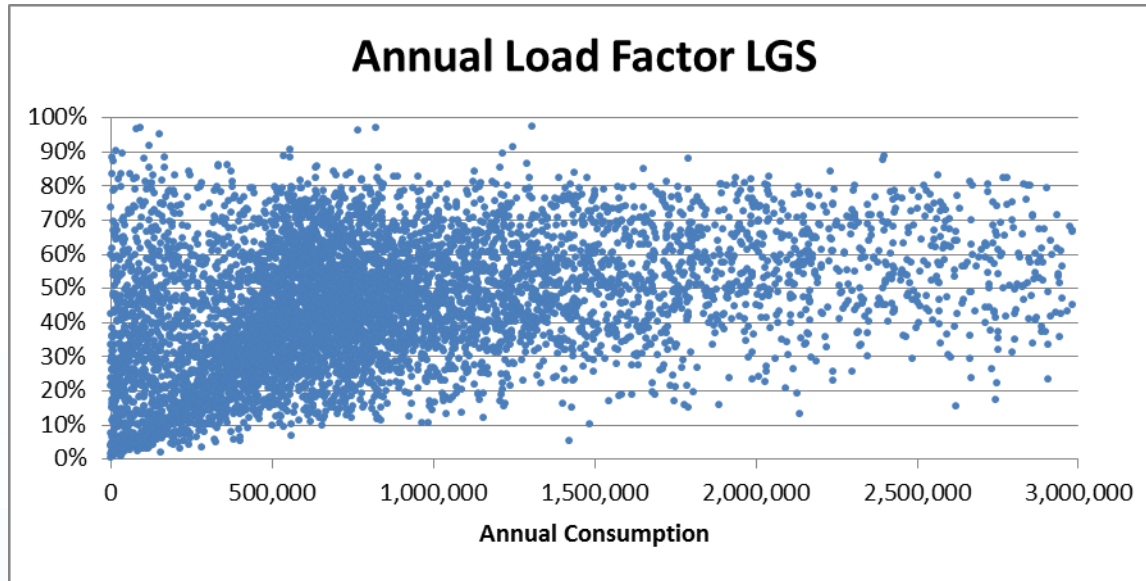
Annual Consumption (1000 kWh)

	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%	0.0%	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.

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



- Typical customers consume between 600 MWh and 1,700 MWh per year, with a load factor between 30% and 60%

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%	2.9%	0.8%	0.4%	0.1%	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%	1.4%	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%
<b>Total</b>	<b>6.5%</b>	<b>10.3%</b>	<b>12.4%</b>	<b>17.6%</b>	<b>12.5%</b>	<b>7.8%</b>	<b>5.7%</b>	<b>4.4%</b>	<b>3.0%</b>	<b>2.6%</b>	<b>2.1%</b>	<b>1.7%</b>	<b>1.4%</b>	<b>1.2%</b>	<b>1.2%</b>	<b>0.7%</b>	<b>0.7%</b>	<b>90.9%</b>

Offices

Ind. Manu

Food retail

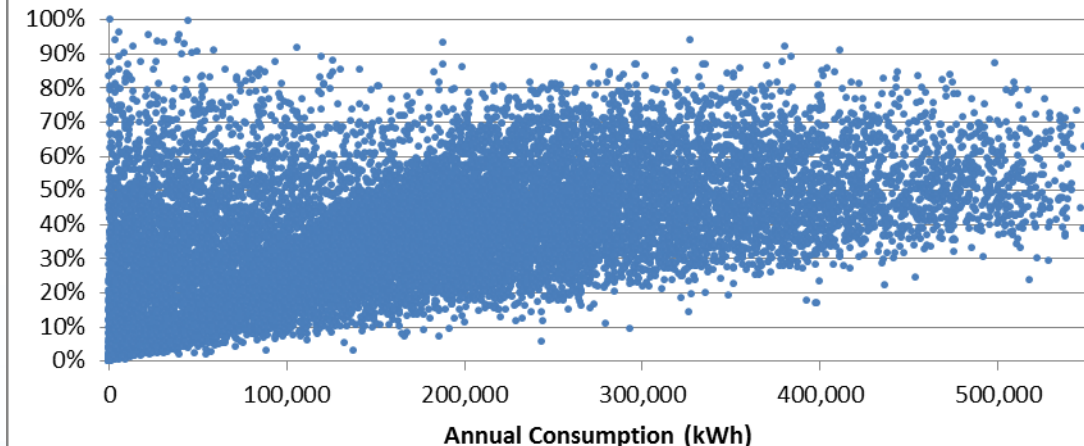
Non Food Retail

Note: 9% accounts higher than 3200 MWh

Red font indicates peak of distribution for each kWh series.

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

## Annual Load Factor MGS



- Load factor generally increases as consumption increases

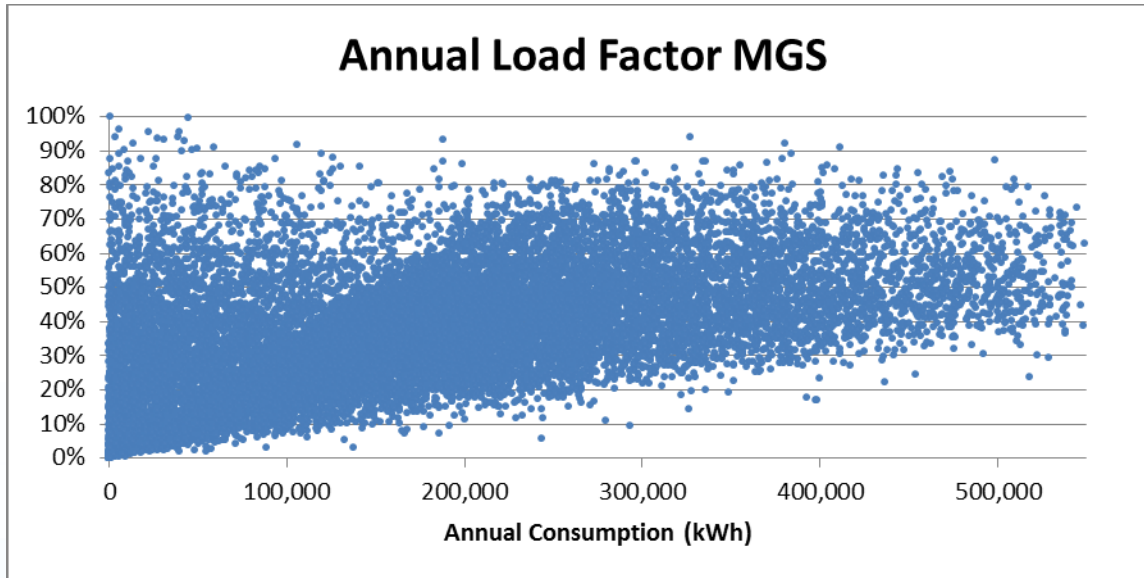
### Annual Consumption (1000s of kWh)

	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.

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



- Typical customers consume between 90 MWh and 210 MWh per year, with a load factor between 20% and 60%

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%	1.5%	2.1%	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%	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%	2.8%	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%	0.8%	0.8%	0.2%	0.6%	0.9%	0.8%	0.7%	0.7%	0.4%	0.5%	0.3%	0.2%	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.

# 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

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

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

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

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

- 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 CONVERSION TABLE: KWH AND KW VS. LOAD FACTOR

## LGS Annual Consumption kWh

Highest kW

Load Factor	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
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

Load Factor	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
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 Load Factor fall within the blue oval area

# ILLUSTRATIVE ANNUAL BILLS UNDER SQ STRUCTURE, KWH VS LOAD FACTOR

**LGS Annual Consumption kWh**  
\$ amount in \$1000's

Highest kW  
Highest 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
<b>10%</b>	\$ 40	\$ 81	\$ 122	\$ 163	\$ 204	\$ 245	\$ 286	\$ 327	\$ 369	\$ 410	\$ 451	\$ 492	\$ 533	\$ 574	\$ 615	\$ 656	\$ 698
<b>20%</b>	\$ 27	\$ 50	\$ 76	\$ 102	\$ 128	\$ 154	\$ 180	\$ 206	\$ 232	\$ 258	\$ 284	\$ 310	\$ 336	\$ 362	\$ 388	\$ 414	\$ 440
<b>30%</b>	\$ 24	\$ 40	\$ 61	\$ 82	\$ 103	\$ 124	\$ 145	\$ 166	\$ 186	\$ 207	\$ 228	\$ 249	\$ 270	\$ 291	\$ 312	\$ 333	\$ 354
<b>40%</b>	\$ 23	\$ 37	\$ 54	\$ 72	\$ 90	\$ 109	\$ 127	\$ 145	\$ 164	\$ 182	\$ 200	\$ 219	\$ 237	\$ 255	\$ 274	\$ 292	\$ 311
<b>50%</b>	\$ 22	\$ 36	\$ 50	\$ 66	\$ 83	\$ 99	\$ 116	\$ 133	\$ 150	\$ 167	\$ 184	\$ 201	\$ 217	\$ 234	\$ 251	\$ 268	\$ 285
<b>60%</b>	\$ 21	\$ 35	\$ 48	\$ 62	\$ 78	\$ 93	\$ 109	\$ 125	\$ 141	\$ 157	\$ 173	\$ 188	\$ 204	\$ 220	\$ 236	\$ 252	\$ 268
<b>70%</b>	\$ 21	\$ 34	\$ 47	\$ 60	\$ 74	\$ 89	\$ 104	\$ 119	\$ 134	\$ 150	\$ 165	\$ 180	\$ 195	\$ 210	\$ 225	\$ 240	\$ 255
<b>80%</b>	\$ 21	\$ 33	\$ 46	\$ 59	\$ 72	\$ 86	\$ 100	\$ 115	\$ 130	\$ 144	\$ 159	\$ 173	\$ 188	\$ 202	\$ 217	\$ 231	\$ 246
<b>90%</b>	\$ 21	\$ 33	\$ 46	\$ 58	\$ 71	\$ 83	\$ 97	\$ 112	\$ 126	\$ 140	\$ 154	\$ 168	\$ 182	\$ 196	\$ 211	\$ 225	\$ 239

Lowest kW  
Lowest kWh

**MGS Annual Consumption kWh**  
\$ amount in \$1000's

Highest kW  
Highest 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
<b>10%</b>	\$ 1	\$ 3	\$ 9	\$ 14	\$ 20	\$ 26	\$ 34	\$ 41	\$ 47	\$ 54	\$ 61	\$ 68	\$ 74	\$ 81	\$ 88	\$ 95	\$ 101
<b>20%</b>	\$ 1	\$ 3	\$ 6	\$ 11	\$ 15	\$ 19	\$ 23	\$ 27	\$ 30	\$ 34	\$ 38	\$ 43	\$ 47	\$ 52	\$ 56	\$ 60	\$ 65
<b>30%</b>	\$ 1	\$ 3	\$ 6	\$ 9	\$ 13	\$ 17	\$ 21	\$ 24	\$ 27	\$ 30	\$ 33	\$ 36	\$ 39	\$ 42	\$ 45	\$ 49	\$ 53
<b>40%</b>	\$ 1	\$ 3	\$ 6	\$ 9	\$ 13	\$ 16	\$ 20	\$ 23	\$ 25	\$ 28	\$ 31	\$ 34	\$ 36	\$ 39	\$ 42	\$ 45	\$ 48
<b>50%</b>	\$ 1	\$ 3	\$ 6	\$ 9	\$ 13	\$ 16	\$ 19	\$ 22	\$ 24	\$ 27	\$ 30	\$ 32	\$ 35	\$ 38	\$ 40	\$ 43	\$ 46
<b>60%</b>	\$ 1	\$ 3	\$ 6	\$ 9	\$ 13	\$ 16	\$ 19	\$ 21	\$ 24	\$ 26	\$ 29	\$ 31	\$ 34	\$ 37	\$ 39	\$ 42	\$ 44
<b>70%</b>	\$ 1	\$ 3	\$ 6	\$ 9	\$ 13	\$ 16	\$ 19	\$ 21	\$ 23	\$ 26	\$ 28	\$ 31	\$ 33	\$ 36	\$ 38	\$ 41	\$ 43
<b>80%</b>	\$ 1	\$ 3	\$ 6	\$ 9	\$ 13	\$ 16	\$ 19	\$ 21	\$ 23	\$ 25	\$ 28	\$ 30	\$ 33	\$ 35	\$ 38	\$ 40	\$ 43
<b>90%</b>	\$ 1	\$ 3	\$ 6	\$ 9	\$ 13	\$ 16	\$ 19	\$ 21	\$ 23	\$ 25	\$ 28	\$ 30	\$ 32	\$ 35	\$ 37	\$ 40	\$ 42

Lowest kW  
Lowest kWh

“Typical” customers fall within the blue oval area

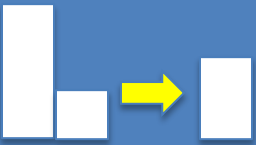







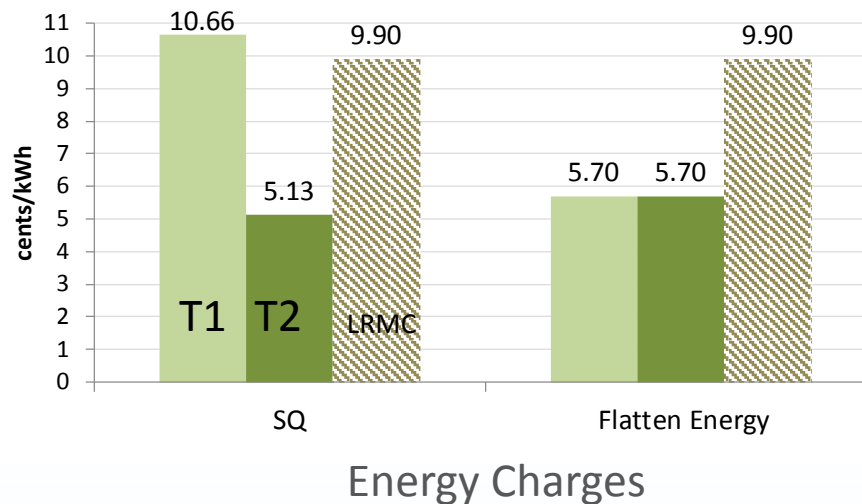
## TOPIC # 4

# BILL IMPACTS AND ASSESSMENT OF SCREENED-IN ALTERNATIVES

## FLATTENING OF LGS AND MGS PART-1 ENERGY RATES

Alternative	Flatten Part 1 Energy 	Flatten Demand All Tiers 	Remove Baseline 
1. SQ	F2016 SQ rates		
 Illustrate Energy effect	X		
Illustrate Demand effect		X	
2. Flat Part-1 Energy and Flat Demand	X	X	
3. Flat Part-1 Energy and Flat Demand + No baseline	X	X	X

# LGS FLATTENING OF PART-1 ENERGY RATES



## Illustrative Customer Bill

Load Factor of 46%, Baseline Consumption = 744,240 kWh per year, Billed kW = 185 kW each month

Customer Scenario	Demand Charge	Energy Charge	Basic Charge	Total Bill	SQ Bill	Variance
Consume at baseline	\$12,021	\$42,422	\$82	\$54,525	\$60,104	-\$5,579 (-9%)
+ 5% from baseline	\$12,021	\$46,106	\$82	\$58,209	\$63,788	-\$5,579 (-9%)
- 5% from baseline	\$12,021	\$38,738	\$82	\$50,841	\$56,420	-\$5,579 (-10%)

Note: Illustrative bill computation excludes rate rider, discounts, ratchets, and other provisions

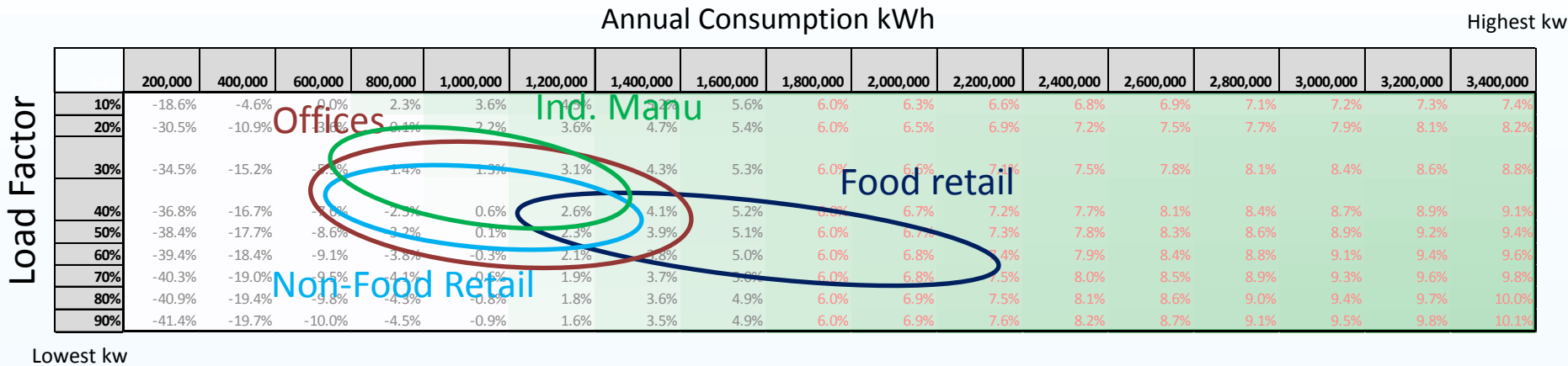
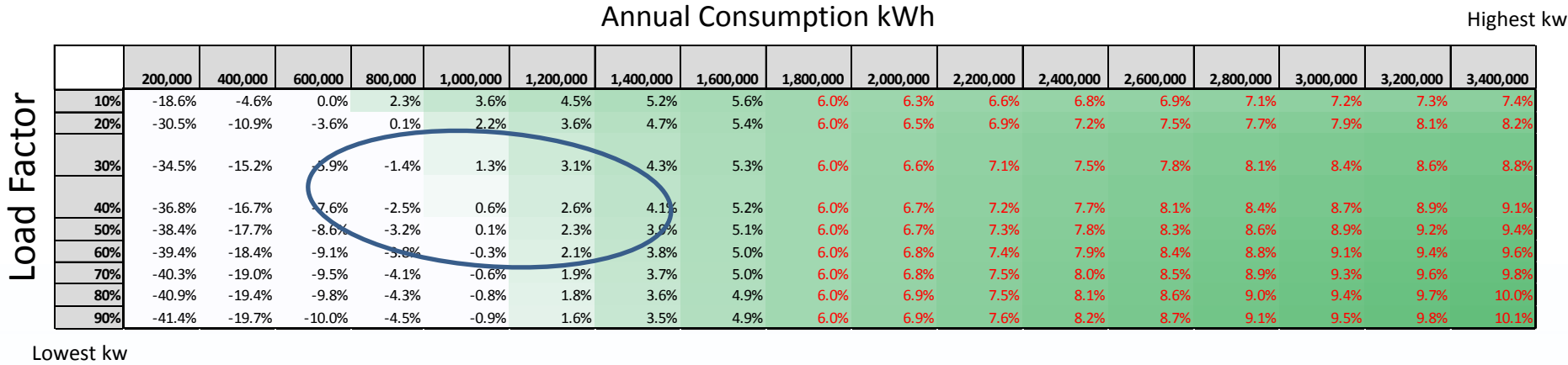
## Observations:

- T1 Energy Rates substantially decreased
- T2 Energy Rates increased by about 10% to maintain revenue neutrality

# LGS FLATTENING OF PART 1 ENERGY RATES

## ILLUSTRATIVE SENSITIVITY ANALYSIS

### F15/F16 illustrative bill impact

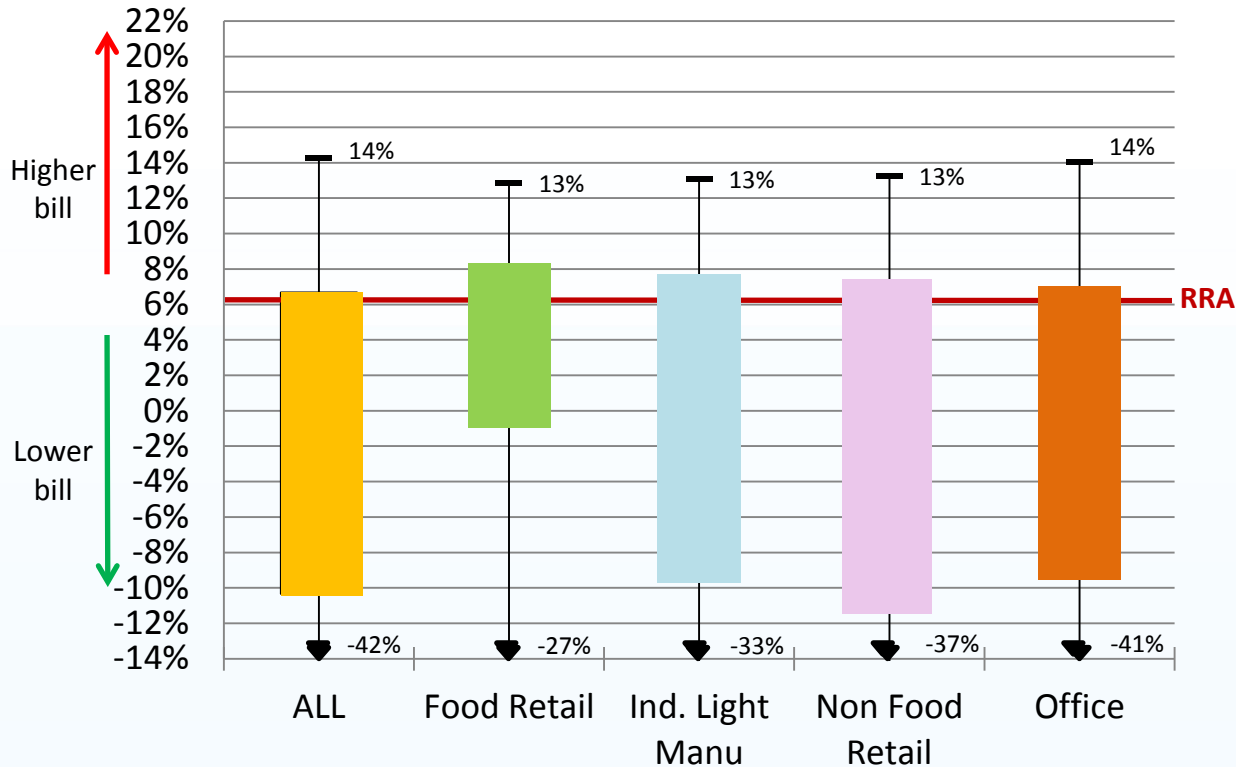


Red means higher than CARC of 6%; More intense green indicates higher bill impact  
 Most "typical" customers as defined by kWh and load factor fall within the blue oval area.  
 Major assumption: customers have the annual max kW for all months.

# LGS FLATTENING OF PART 1 ENERGY RATES

## ILLUSTRATIVE BILL IMPACT (F15 TO F16)

- Note: This analysis assumes baseline = consumption (so no energy in part-2) to show the impact without the influence of part-2 to simplify the discussion.



Bill impact of customer segment

Color Bars: Middle 60%; 20<sup>th</sup> to 80<sup>th</sup> percentile of impacts

### Observations:

- Typical customers are mostly below RRA increases
- There are outlier customers, especially those with high load factor and low consumption
- Wide spread in bill impacts






### Bounding customers:

**Highest:** 78% load factor; 50,000 MWh/yr  
Industrial

**Lowest:** 37% load factor; 149 MWh/yr  
Public School

## ILLUSTRATIVE COMPARATIVE ANALYSIS VS. SQ

- Note: This analysis differs from the bill impact analysis as it uses F2014 actual baseline and consumption to compute the difference between status quo and the rate alternative.

Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	 74%	\$52,191	-\$3,784
Food Retail	 42%	\$119,028	\$185
Ind. Manufacturing	 74%	\$75,755	-\$5,121
Non Food Retail	 75%	\$55,100	-\$5,165
Office	 74%	\$61,868	-\$4,350

\* “Better off” = at least 1% lower than SQ bill; \*\* “Median” customer has about median kWh and Load Factor of the class

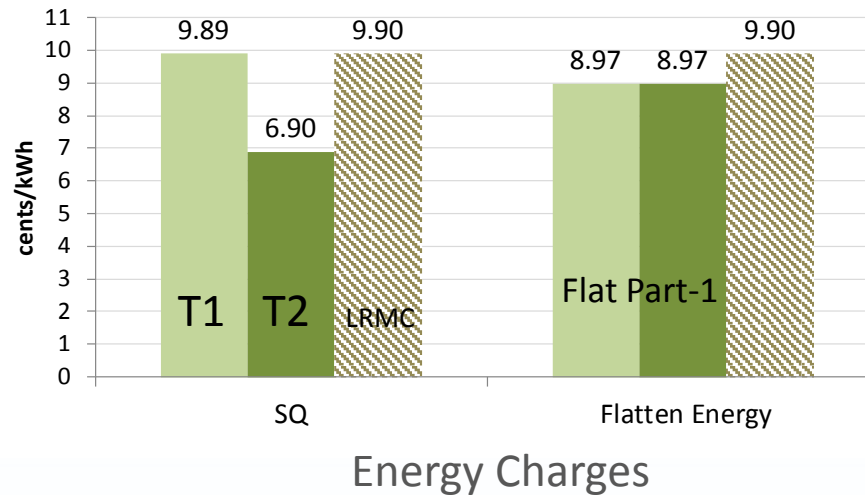
### Observations:

- More LGS customers better off than worse off
- Food Retail stands out due to tendency to have higher consumption and load factor than the “norm”

### Notes:

- Better off/worse off are influenced by each customer’s
  - monthly baseline and consumption variance
  - monthly load factor and consumption (bill impact pattern)
  - provisions such as the minimum energy charge

# MGS FLATTENING OF PART 1 ENERGY RATES



## Illustrative Customer Bill

Load Factor of 36%, Baseline Consumption = 153,240kWh per year, Billed kW = 49kW each month

Customer Scenario	Demand Charge	Energy Charge	Basic Charge	Total Bill	SQ Bill	Variance
Consume at baseline	\$924	\$13,746	\$82	\$14,752	\$16,162	-\$1,410 (-9%)
+ 5% from baseline	\$924	\$14,504	\$82	\$15,511	\$16,920	-\$1,410 (-8%)
- 5% from baseline	\$924	\$12,987	\$82	\$13,993	\$15,403	-\$1,410 (-9%)

Note: Illustrative bill computation excludes rate rider, discounts, ratchets, and other provisions

## Observations:

- T1 Energy rate decreased
- T2 Energy rate increased by about 10% to maintain revenue neutrality
- Flat Energy rate close to T1 energy rate, as most customers have high proportion of use in T1
- Flat Part-1 energy rate is within LRMC range

# MGS FLATTENING PART 1 ENERGY RATES

## ILLUSTRATIVE SENSITIVITY ANALYSIS

### F15/F16 illustrative bill impact

Annual Consumption kWh

Load Factor	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
10%	-3.2%	-3.7%	-1.2%	-0.6%	-0.3%	0.1%	0.8%	3.3%	5.2%	6.5%	7.6%	8.5%	9.2%	9.8%	10.3%	10.7%	11.1%
20%	-3.2%	-3.7%	-3.8%	-2.8%	-2.4%	-2.1%	-1.6%	1.9%	4.7%	6.9%	8.6%	9.9%	11.0%	11.9%	12.7%	13.3%	13.9%
30%	-3.2%	-3.7%	-3.8%	-3.9%	-3.3%	-3.0%	-2.5%	1.4%	4.5%	7.0%	9.0%	10.7%	12.1%	13.3%	14.2%	15.0%	15.7%
40%	-3.2%	-3.7%	-3.8%	-3.9%	-3.9%	-3.6%	-3.0%	1.2%	4.4%	7.0%	9.2%	11.0%	12.5%	13.8%	14.9%	15.9%	16.8%
50%	-3.2%	-3.7%	-3.8%	-3.9%	-3.9%	-3.9%	-3.3%	1.0%	4.4%	7.1%	9.3%	11.2%	12.7%	14.1%	15.3%	16.3%	17.2%
60%	-3.2%	-3.7%	-3.8%	-3.9%	-3.9%	-3.9%	-3.5%	0.9%	4.3%	7.1%	9.4%	11.3%	12.9%	14.3%	15.5%	16.6%	17.6%
70%	-3.2%	-3.7%	-3.8%	-3.9%	-3.9%	-3.9%	-3.5%	0.8%	4.3%	7.1%	9.5%	11.4%	13.1%	14.5%	15.7%	16.8%	17.8%
80%	-3.2%	-3.7%	-3.8%	-3.9%	-3.9%	-3.9%	-3.5%	0.8%	4.3%	7.1%	9.5%	11.5%	13.2%	14.6%	15.9%	17.0%	18.0%
90%	-3.2%	-3.7%	-3.8%	-3.9%	-3.9%	-3.9%	-3.5%	0.8%	4.3%	7.1%	9.5%	11.6%	13.3%	14.7%	16.0%	17.1%	18.1%

Annual Consumption kWh

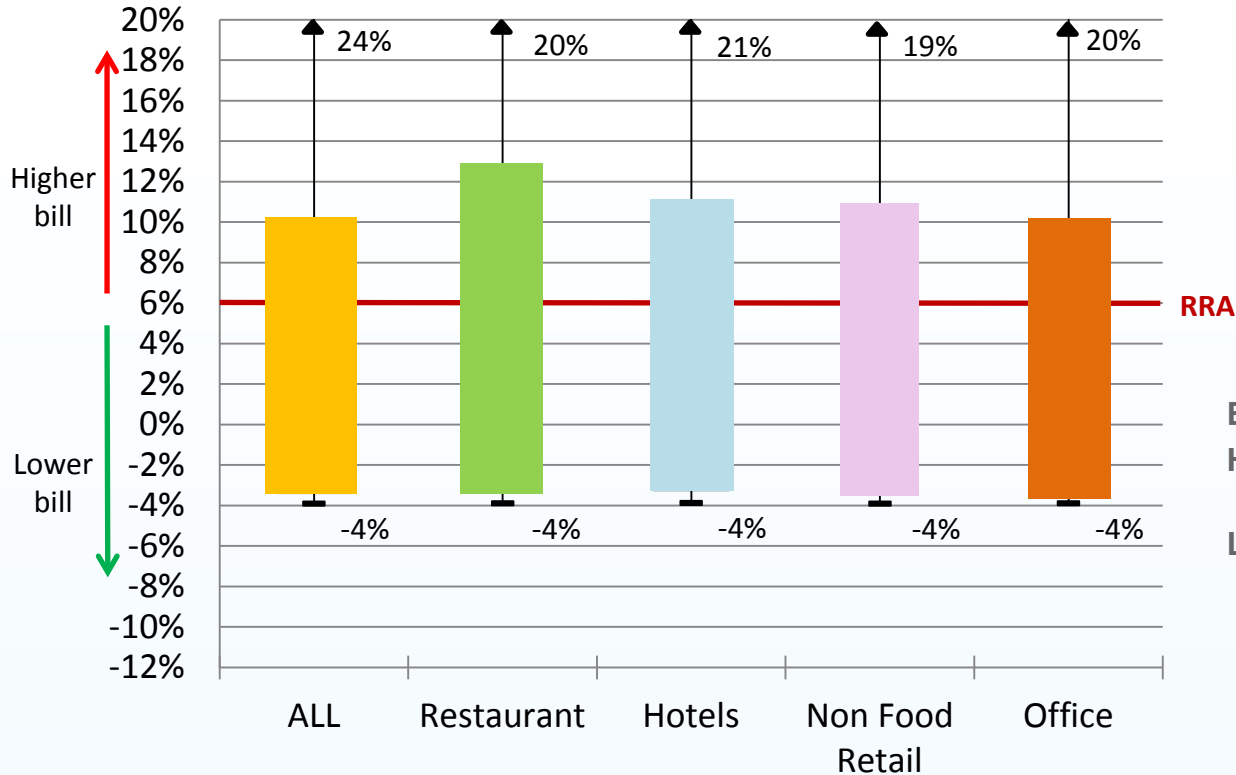
Load Factor	Annual Consumption kWh																
	10,000	30,000	60,000	90,000	120,000	150,000	180,000	210,000	240,000	270,000	300,000	330,000	360,000	390,000	420,000	450,000	480,000
10%	-3.2%	-3.7%	-1.2%	-0.6%	-0.3%	0.1%	0.8%	3.3%	5.2%	6.5%	7.6%	8.5%	9.2%	9.8%	10.3%	10.7%	11.1%
20%	-3.2%	-3.7%	-3.8%	-2.8%	-2.4%	-2.1%	-1.6%	1.9%	4.7%	6.9%	8.6%	9.9%	11.0%	11.9%	12.7%	13.3%	13.9%
30%	-3.2%	-3.7%	-3.8%	-3.9%	-3.3%	-3.0%	-2.5%	1.4%	4.5%	7.0%	9.0%	10.7%	12.1%	13.3%	14.2%	15.0%	15.7%
40%	-3.2%	-3.7%	-3.8%	-3.9%	-3.9%	-3.6%	-3.0%	1.2%	4.4%	7.0%	9.2%	11.0%	12.5%	13.8%	14.9%	15.9%	16.8%
50%	-3.2%	-3.7%	-3.8%	-3.9%	-3.9%	-3.9%	-3.3%	1.0%	4.4%	7.1%	9.3%	11.2%	12.7%	14.1%	15.3%	16.3%	17.2%
60%	-3.2%	-3.7%	-3.8%	-3.9%	-3.9%	-3.9%	-3.5%	0.9%	4.3%	7.1%	9.4%	11.3%	12.9%	14.3%	15.5%	16.6%	17.6%
70%	-3.2%	-3.7%	-3.8%	-3.9%	-3.9%	-3.9%	-3.5%	0.8%	4.3%	7.1%	9.5%	11.4%	13.1%	14.5%	15.7%	16.8%	17.8%
80%	-3.2%	-3.7%	-3.8%	-3.9%	-3.9%	-3.9%	-3.5%	0.8%	4.3%	7.1%	9.5%	11.5%	13.2%	14.6%	15.9%	17.0%	18.0%
90%	-3.2%	-3.7%	-3.8%	-3.9%	-3.9%	-3.9%	-3.5%	0.8%	4.3%	7.1%	9.5%	11.6%	13.3%	14.7%	16.0%	17.1%	18.1%

Red means higher than CARC of 6%; More intense green indicates higher bill impact  
 Most "typical" customers as defined by kWh and Load Factor fall within the blue oval area.  
 Major assumption: customers have the annual max kW for all months.



# MGS FLATTENING PART 1 ENERGY RATES

## ILLUSTRATIVE BILL IMPACT (F15 TO F16)



### Observations:

- Bill impacts for typical customers are on both sides of the RRA increase
- Outlier customers impacted

### Bounding customers:






**Highest:** 46% load factor; 532 MWh/yr Industrial

**Lowest:** 53% load factor; 163 MWh/yr non-food retail

Bill Impact of customer segment  
Color Bars: Middle 60%; 20<sup>th</sup> to 80<sup>th</sup> percentile of impacts

# MGS FLATTENING PART 1 ENERGY RATES

## ILLUSTRATIVE COMPARATIVE ANALYSIS VS. SQ

Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	 64%	\$18,884	-\$1,248
Restaurant	 53%	\$21,971	-\$684
Hotels	 61%	\$18,330	-\$245
Non Food Retail	 63%	\$18,990	-\$1,300
Office	 64%	\$18,185	-\$744

\* “Better off” = at least 1% lower than SQ bill; \*\* “Median” customer has about median kWh and Load Factor of the class




### Observations:

- More MGS customers are better off than are worse off
- The degree of better off / worse off is not as high as LGS

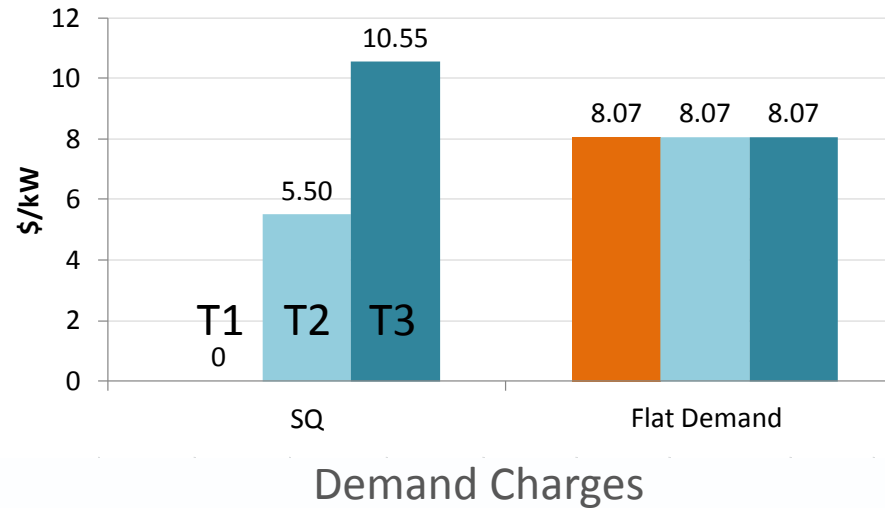
### Notes:

- Better off/worse off are influenced by each customer’s
  - monthly baseline and consumption variance
  - monthly load factor and consumption (bill impact pattern)
  - provisions such as the minimum energy charge

## FLATTENING OF LGS AND MGS DEMAND CHARGES

Alternative	Flatten Part 1 Energy 	Flatten Demand All Tiers 	Remove Baseline 
1. SQ	F2016 SQ rates used as comparison point in the illustrative analysis		
Illustrate Energy effect	High Consumption, high load factor = higher bills		
Illustrate Demand effect		X	
2. Flat Part-1 Energy and Flat Demand	X	X	
3. Flat Part-1 Energy and Flat Demand + No baseline	X	X	X

# LGS FLATTENING OF DEMAND CHARGES



## Illustrative Customer Bill

Load Factor of 46%, Baseline Consumption = 744,240 kWh per year, Billed kW = 185 kW each month

Customer Scenario	Demand Charge	Energy Charge	Basic Charge	Total Bill	SQ Bill	Variance
Consume at baseline	\$17,915	\$47,983	\$82	\$65,981	\$60,104	\$5,877 (10%)
+ 5% from baseline	\$17,915	\$51,667	\$82	\$69,665	\$63,788	\$5,877 (9%)
- 5% from baseline	\$17,915	\$44,299	\$82	\$62,297	\$56,420	\$5,877 (10%)

Note: Illustrative bill computation excludes rate rider, discounts, ratchets, and other provisions

## Observations:

- T1 and T2 Demand substantially increased, as most LGS customers have demand billed in T1 and T2, as well as T3
- T3 Demand reduced to maintain revenue neutrality

# LGS FLATTENING OF DEMAND CHARGES

## ILLUSTRATIVE SENSITIVITY ANALYSIS

### F15/F16 illustrative bill impact

Annual Consumption kWh

Load Factor

* Load Factor	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%	2.8%	-2.4%	-4.9%	-6.4%	-7.4%	-8.2%	-8.7%	-9.1%	-9.5%	-9.7%	-10.0%	-10.2%	-10.3%	-10.5%	-10.6%	-10.7%
20%	29.8%	15.8%	7.5%	3.4%	0.9%	-0.7%	-1.8%	-2.7%	-3.4%	-3.9%	-4.4%	-4.7%	-5.0%	-5.3%	-5.5%	-5.7%	-5.9%
30%	27.0%	24.5%	14.0%	8.9%	5.8%	3.8%	2.3%	1.2%	0.4%	-0.3%	-0.8%	-1.3%	-1.7%	-2.0%	-2.3%	-2.5%	-2.8%
40%	25.4%	22.8%	18.7%	12.8%	9.2%	6.9%	5.3%	4.0%	3.1%	2.3%	1.7%	1.2%	0.7%	0.3%	0.0%	-0.3%	-0.5%
50%	24.3%	21.4%	20.1%	15.7%	11.8%	9.3%	7.5%	6.1%	5.1%	4.2%	3.5%	3.0%	2.5%	2.1%	1.7%	1.4%	1.1%
60%	23.5%	20.4%	19.0%	17.9%	13.8%	11.1%	9.2%	7.7%	6.6%	5.7%	5.0%	4.4%	3.9%	3.4%	3.0%	2.7%	2.4%
70%	22.9%	19.6%	18.1%	17.2%	15.4%	12.5%	10.5%	9.0%	7.8%	6.9%	6.1%	5.5%	5.0%	4.5%	4.1%	3.7%	3.4%
80%	22.5%	19.0%	17.4%	16.5%	15.9%	13.7%	11.6%	10.1%	8.8%	7.9%	7.1%	6.4%	5.8%	5.4%	5.0%	4.6%	4.3%
90%	22.1%	18.5%	16.9%	15.9%	15.3%	14.7%	12.5%	10.9%	9.7%	8.7%	7.8%	7.2%	6.6%	6.1%	5.7%	5.3%	5.0%

\*Note: Very high sensitivity on low load factor, lower consumption customers.

Annual Consumption kWh

Highest kw

Load Factor

Load Factor	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%	2.8%	2.1%	-4.9%	-6.4%	-7.4%	-8.2%	-8.7%	-9.1%	-9.5%	-9.7%	-10.0%	-10.2%	-10.3%	-10.5%	-10.6%	-10.7%
20%	29.8%	15.8%	7.5%	3.4%	0.9%	-0.7%	-1.8%	-2.7%	-3.4%	-3.9%	-4.4%	-4.7%	-5.0%	-5.3%	-5.5%	-5.7%	-5.9%
30%	27.0%	24.5%	14.0%	8.9%	5.8%	3.8%	2.3%	1.2%	0.4%	-0.3%	-0.8%	-1.3%	-1.7%	-2.0%	-2.3%	-2.5%	-2.8%
40%	25.4%	22.8%	18.7%	12.8%	9.2%	6.9%	5.3%	4.0%	3.1%	2.3%	1.7%	1.2%	0.7%	0.3%	0.0%	-0.3%	-0.5%
50%	24.3%	21.4%	20.1%	15.7%	11.8%	9.3%	7.5%	6.1%	5.1%	4.2%	3.5%	3.0%	2.5%	2.1%	1.7%	1.4%	1.1%
60%	23.5%	20.4%	19.0%	17.9%	13.8%	11.1%	9.2%	7.7%	6.6%	5.7%	5.0%	4.4%	3.9%	3.4%	3.0%	2.7%	2.4%
70%	22.9%	19.6%	18.1%	17.2%	15.4%	12.5%	10.5%	9.0%	7.8%	6.9%	6.1%	5.5%	5.0%	4.5%	4.1%	3.7%	3.4%
80%	22.5%	19.0%	17.4%	16.5%	15.9%	13.7%	11.6%	10.1%	8.8%	7.9%	7.1%	6.4%	5.8%	5.4%	5.0%	4.6%	4.3%
90%	22.1%	18.5%	16.9%	15.9%	15.3%	14.7%	12.5%	10.9%	9.7%	8.7%	7.8%	7.2%	6.6%	6.1%	5.7%	5.3%	5.0%

Annotations on the table above:

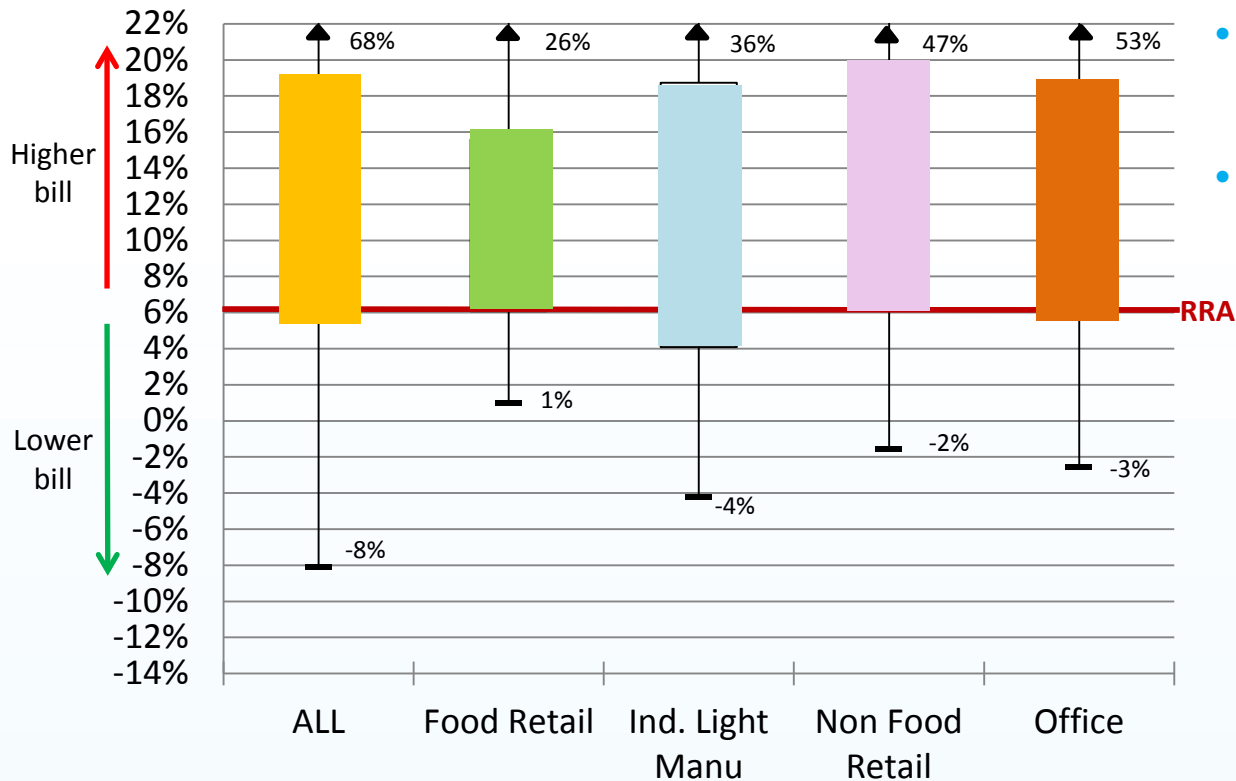
- Offices** (Red oval): 600,000 kWh, 30% Load Factor
- Ind. Manu** (Green oval): 800,000 kWh, 30% Load Factor
- Food retail** (Blue oval): 1,400,000 kWh, 30% Load Factor
- Non-Food Retail** (Blue oval): 1,000,000 kWh, 40% Load Factor

Lowest kw

Red means higher than CARC of 6%; More intense green indicates higher bill impact  
 Most "typical" customers as defined by kWh and Load Factor fall within the blue oval area  
 Major assumption: customers have the annual max kW for all months

# LGS FLATTENING OF DEMAND CHARGES

## ILLUSTRATIVE BILL IMPACT (F15 TO F16)



Bill Impact of customer segment  
 Color Bars: Middle 60%; 20<sup>th</sup> to 80<sup>th</sup> percentile of impacts

### Observations:

- Most typical customers have higher impact than RRA increase
- Typical customers subsidize large customers with low load factor

### Bounding customers:






Highest: 5% load factor, 47 MWh  
 Industrial  
 Lowest: 15% load factor; 9,000 MWh  
 Municipal Pumping

This illustrates the high sensitivity at extremely low load factors:

	30,000	40,000	50,000	100,000
4%	84.8%	70.2%	62.5%	14.5%
5%	90.8%	72.9%	63.7%	23.0%
6%	96.4%	75.4%	64.8%	31.7%
10%	115.4%	83.3%	68.2%	44.2%

# LGS FLATTENING OF DEMAND CHARGES

## ILLUSTRATIVE COMPARATIVE ANALYSIS VS. SQ

Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	 19%	\$62,139	\$6,164
Food Retail	 11%	\$122,510	\$3,668
Ind. Manufacturing	 24%	\$84,406	\$3,530
Non Food Retail	 15%	\$66,422	\$6,158
Office	 18%	\$71,882	\$5,664

\* “Better off” = at least 1% lower than SQ bill; \*\* “Median” customer has about median kWh and Load Factor of the class

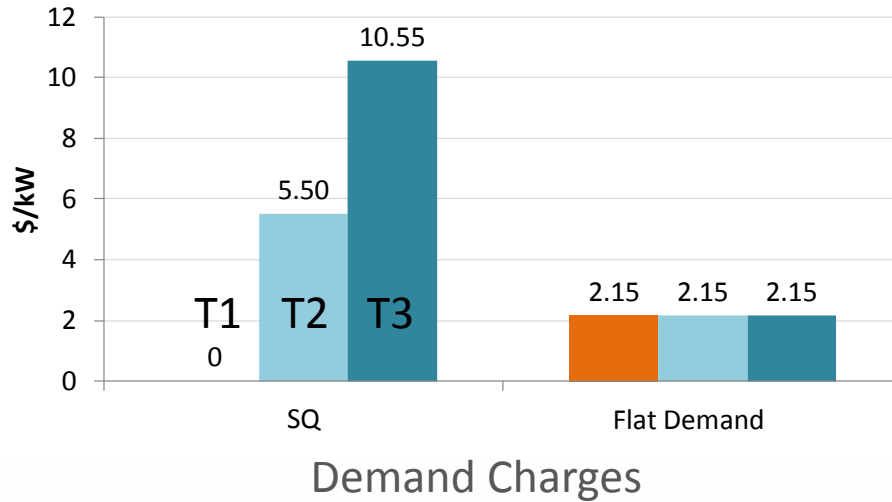
### Observations

- More LGS customers are worse off than better off

### Notes:

- Better off/worse off are influenced by each customer’s
  - monthly baseline and consumption variance
  - monthly load factor and consumption (bill impact pattern)
  - provisions such as the minimum energy charge

# MGS FLATTENING OF DEMAND CHARGES



## Illustrative Customer Bill

Load Factor of 36%, Baseline Consumption = 153,240 kWh per year, Billed kW = 49 kW each month

Customer Scenario	Demand Charge	Energy Charge	Basic Charge	Total Bill	SQ Bill	Variance
Consume at baseline	\$1,264	\$15,155	\$82	\$16,502	\$16,162	\$340 (2%)
+ 5% from baseline	\$1,264	\$15,914	\$82	\$17,261	\$16,920	\$340 (2%)
- 5% from baseline	\$1,264	\$14,397	\$82	\$15,743	\$15,403	\$340 (2%)

Note: Illustrative bill computation excludes rate rider, discounts, ratchets, and other provisions

## Observations:

- T1 and T2 Demand charges are relatively low, because a high proportion of customers have most demand usage at T1, which had no charge, and consumption at T3 is seldom as the customer would migrate to LGS



# MGS FLATTENING OF DEMAND CHARGES

## ILLUSTRATIVE SENSITIVITY ANALYSIS

### F15/F16 illustrative bill impact

Annual Consumption kWh

Load Factor	*	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%		35.0%	36.6%	0.2%	-8.4%	-12.2%	-18.7%	-24.5%	-28.9%	-32.0%	-34.4%	-36.2%	-37.7%	-38.9%	-39.9%	-40.8%	-41.5%
20%		20.5%	21.2%	21.4%	8.5%	2.6%	-0.7%	-2.7%	-4.5%	-5.9%	-7.7%	-11.1%	-13.8%	-16.0%	-17.9%	-19.4%	-20.7%	-21.8%
30%		15.6%	16.1%	16.3%	16.3%	9.9%	6.0%	3.6%	1.7%	0.3%	-0.8%	-1.8%	-2.6%	-3.2%	-3.8%	-5.6%	-7.3%	-8.8%
40%		13.2%	13.6%	13.7%	13.7%	13.7%	9.9%	7.3%	5.4%	4.0%	2.8%	1.9%	1.1%	0.4%	-0.2%	-0.7%	-1.1%	-1.5%
50%		11.7%	12.0%	12.1%	12.1%	12.2%	12.2%	9.7%	7.9%	6.4%	5.2%	4.3%	3.5%	2.8%	2.2%	1.7%	1.2%	0.8%
60%		10.7%	11.0%	11.1%	11.1%	11.1%	11.1%	11.1%	9.6%	8.1%	7.0%	6.0%	5.2%	4.5%	3.9%	3.4%	2.9%	2.5%
70%		10.1%	10.3%	10.3%	10.4%	10.4%	10.4%	10.4%	10.6%	9.4%	8.2%	7.3%	6.5%	5.8%	5.2%	4.7%	4.2%	3.8%
80%		9.5%	9.7%	9.8%	9.8%	9.8%	9.8%	9.8%	10.0%	10.2%	9.2%	8.3%	7.5%	6.8%	6.2%	5.6%	5.2%	4.8%
90%		9.1%	9.3%	9.3%	9.4%	9.4%	9.4%	9.4%	9.6%	9.7%	9.8%	9.1%	8.3%	7.6%	7.0%	6.4%	6.0%	5.6%

\* Extremely high sensitivity for load factors under 10%

Annual Consumption kWh

Load Factor		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%		35.0%	36.6%	0.2%	-8.4%	-12.2%	-18.7%	-24.5%	-28.9%	-32.0%	-34.4%	-36.2%	-37.7%	-38.9%	-39.9%	-40.8%	-41.5%
20%		20.5%	21.2%	21.4%	8.5%	2.6%	-0.7%	-2.7%	-4.5%	-5.9%	-7.7%	-11.1%	-13.8%	-16.0%	-17.9%	-19.4%	-20.7%	-21.8%
30%		15.6%	16.1%	16.3%	16.3%	9.9%	6.0%	3.6%	1.7%	0.3%	-0.8%	-1.8%	-2.6%	-3.2%	-3.8%	-5.6%	-7.3%	-8.8%
40%		13.2%	13.6%	13.7%	13.7%	13.7%	9.9%	7.3%	5.4%	4.0%	2.8%	1.9%	1.1%	0.4%	-0.2%	-0.7%	-1.1%	-1.5%
50%		11.7%	12.0%	12.1%	12.1%	12.2%	12.2%	9.7%	7.9%	6.4%	5.2%	4.3%	3.5%	2.8%	2.2%	1.7%	1.2%	0.8%
60%		10.7%	11.0%	11.1%	11.1%	11.1%	11.1%	11.1%	9.6%	8.1%	7.0%	6.0%	5.2%	4.5%	3.9%	3.4%	2.9%	2.5%
70%		10.1%	10.3%	10.3%	10.4%	10.4%	10.4%	10.4%	10.6%	9.4%	8.2%	7.3%	6.5%	5.8%	5.2%	4.7%	4.2%	3.8%
80%		9.5%	9.7%	9.8%	9.8%	9.8%	9.8%	9.8%	10.0%	10.2%	9.2%	8.3%	7.5%	6.8%	6.2%	5.6%	5.2%	4.8%
90%		9.1%	9.3%	9.3%	9.4%	9.4%	9.4%	9.4%	9.6%	9.7%	9.8%	9.1%	8.3%	7.6%	7.0%	6.4%	6.0%	5.6%

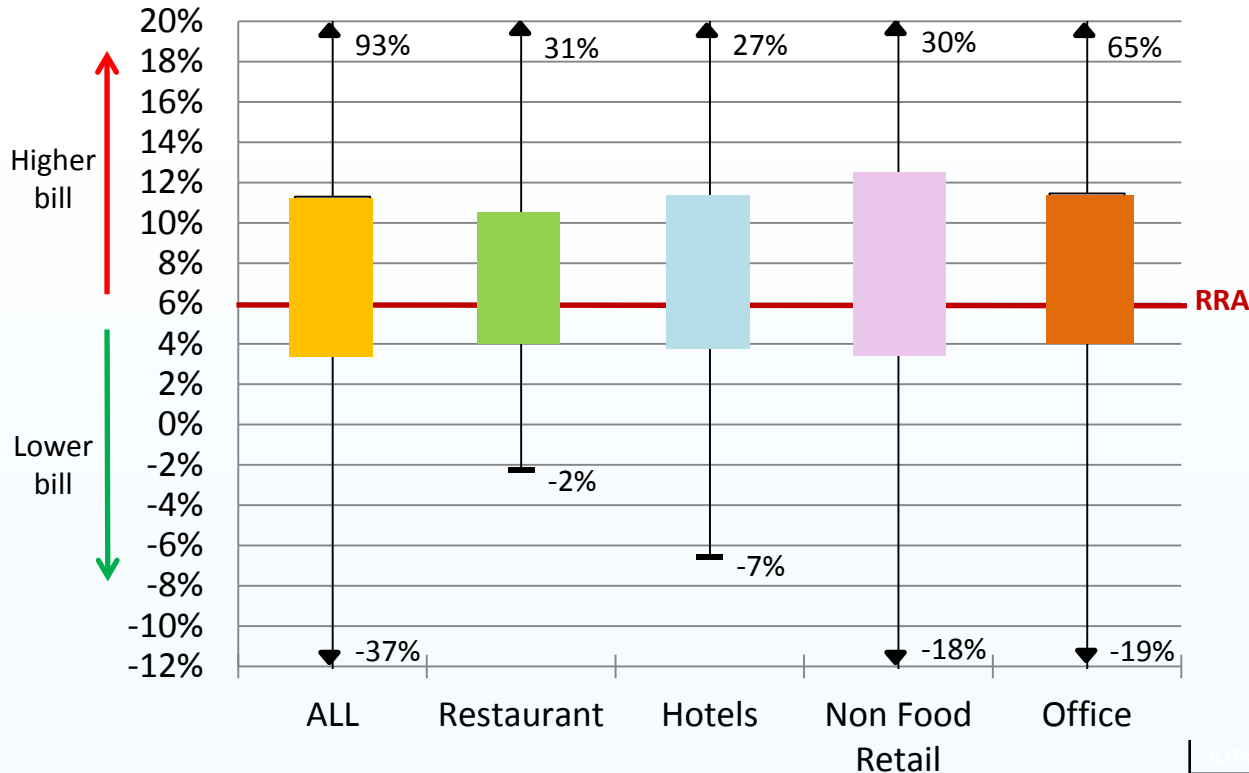
Red means higher than CARC of 6%; More intense green indicates higher bill impact

Most "typical" customers as defined by kWh and Load Factor fall within the blue oval area

Major assumption: customers have the annual max kW for all months

# MGS FLATTENING OF DEMAND CHARGES

## ILLUSTRATIVE BILL IMPACT (F15 TO F16)



Bill Impact of customer segment  
Color Bars: Middle 60%; 20<sup>th</sup> to 80<sup>th</sup> percentile of impacts

### Observations:

- Typical customers are having bill impacts above RRA increase, as well as below
- Very large spread in bill impact, depending on consumption and load factor
- High sensitivity (see below)

### Bounding customers:

Highest: 1% load factor, 4 MWh  
Wood

Lowest: 2% load factor; 55 MWh  
Municipal Pumping

This illustrates the high sensitivity at extremely low load factors:

	8,000	10,000	12,000	14,000	16,000	18,000
2%	37.8%	6.6%	-7.6%	-15.6%	-20.8%	-24.5%
2.5%	97.4%	34.2%	10.3%	-2.2%	-10.0%	-15.2%
3%	101.1%	70.8%	31.4%	12.6%	1.6%	-5.6%

# MGS FLATTENING OF DEMAND CHARGES

## ILLUSTRATIVE COMPARATIVE ANALYSIS VS. SQ

Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	34%	\$20,103	-\$29
Restaurant	33%	\$22,809	\$154
Hotels	32%	\$18,944	\$370
Non Food Retail	33%	\$20,393	\$104
Office	30%	\$19,125	\$195

\* “Better off” = at least 1% lower than SQ bill; \*\* “Median” customer has about median kWh and Load Factor of the class




### Observations:

- More MGS customers are worse off than better off, but not substantially (the \$ variance for the median customers are not that different than SQ)

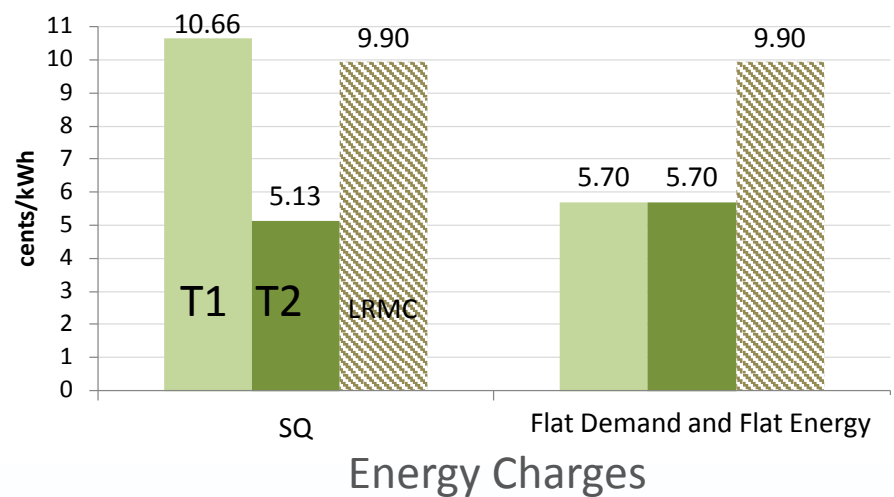
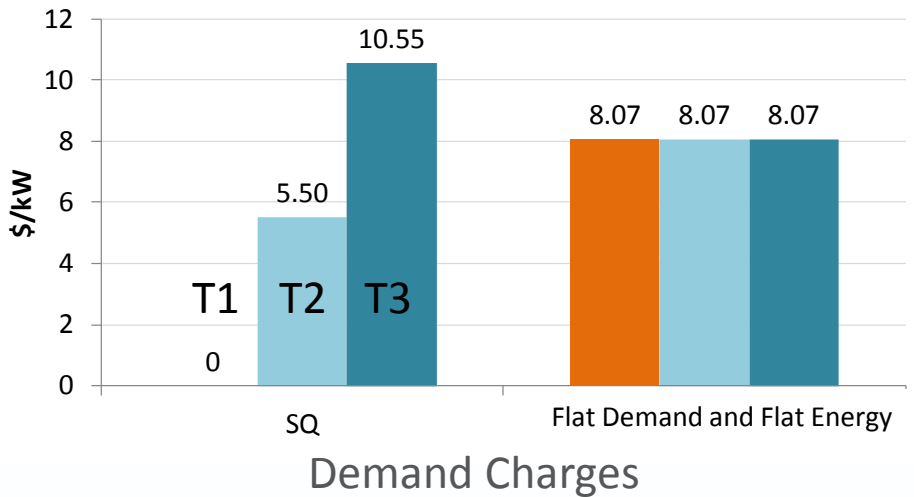
### Notes:

- Better off/worse off are influenced by each customer’s
  - monthly baseline and consumption variance
  - monthly load factor and consumption (bill impact pattern)
  - provisions such as the minimum energy charge

## FLATTENING OF LGS AND MGS PART 1 ENERGY RATE AND FLATTENING OF DEMAND CHARGES

Alternative	Flatten Part 1 Energy 	Flatten Demand All Tiers 	Remove Baseline 
1. SQ	F2016 SQ rates		
Illustrate Energy effect	High Consumption, high load factor = higher bills		
Illustrate Demand effect		High Consumption, low load factor = Lower bills	
<span style="color: blue; font-size: 2em;">➔</span> 2. Flat Part-1 Energy and Flat Demand	X	X	
3. Flat Part-1 Energy and Flat Demand + No baseline	X	X	X

# LGS FLATTENING OF PT 1 ENERGY RATE AND FLATTENING OF DEMAND CHARGES



## Illustrative Customer Bill

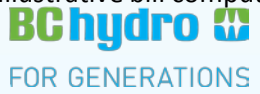
Load Factor of 46%, Baseline Consumption = 744,240 kWh per year, Billed kW = 185 kW each month

Customer Scenario	Demand Charge	Energy Charge	Basic Charge	Total Bill	SQ Bill	Variance
Consume at baseline	\$17,915	\$42,422	\$82	\$60,419	\$60,104	\$315 (1%)
+ 5% from baseline	\$17,915	\$46,106	\$82	\$64,103	\$63,788	\$315 (0%)
- 5% from baseline	\$17,915	\$38,738	\$82	\$56,735	\$56,420	\$315 (1%)

## Observations:

- Offset effect:
  - Bill increase due to Demand flattening
  - Reduction in bills due to Energy flattening

Note: Illustrative bill computation excludes rate rider, discounts, ratchets, and other provisions



# LGS FLATTENING OF PT 1 ENERGY RATE AND FLATTENING OF DEMAND CHARGES

## ILLUSTRATIVE SENSITIVITY ANALYSIS

### F15/F16 illustrative bill impact

Annual Consumption kWh

Load Factor	*	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%		-5.7%	-7.6%	-8.2%	-8.5%	-8.7%	-8.8%	-8.9%	-8.9%	-9.0%	-9.0%	-9.1%	-9.1%	-9.1%	-9.1%	-9.1%	-9.2%
20%		-6.2%	-0.8%	-1.8%	-2.3%	-2.6%	-2.8%	-3.0%	-3.1%	-3.2%	-3.2%	-3.3%	-3.3%	-3.4%	-3.4%	-3.4%	-3.5%	-3.5%
30%		-13.0%	3.8%	2.4%	1.8%	1.4%	1.1%	0.9%	0.8%	0.7%	0.6%	0.5%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%
40%		-16.9%	0.5%	5.4%	4.7%	4.2%	3.9%	3.7%	3.5%	3.4%	3.3%	3.2%	3.1%	3.1%	3.0%	3.0%	2.9%	2.9%
50%		-19.5%	-1.9%	5.0%	6.8%	6.3%	6.0%	5.7%	5.5%	5.4%	5.3%	5.2%	5.1%	5.1%	5.0%	4.9%	4.9%	4.9%
60%		-21.4%	-3.6%	4.3%	8.5%	7.9%	7.6%	7.3%	7.1%	7.0%	6.8%	6.7%	6.7%	6.6%	6.5%	6.5%	6.4%	6.4%
70%		-22.8%	-4.9%	3.1%	7.6%	9.2%	8.9%	8.6%	8.4%	8.2%	8.1%	8.0%	7.9%	7.9%	7.7%	7.7%	7.6%	7.6%
80%		-23.8%	-5.9%	2.1%	6.7%	9.6%	9.9%	9.6%	9.4%	9.2%	9.1%	9.0%	8.9%	8.8%	8.7%	8.7%	8.6%	8.6%
90%		-24.7%	-6.7%	1.3%	5.9%	8.9%	10.8%	10.5%	10.2%	10.1%	9.9%	9.8%	9.7%	9.6%	9.6%	9.5%	9.5%	9.4%

\*Note: Very high sensitivity on low load factor, lower consumption customers.

Annual Consumption kWh

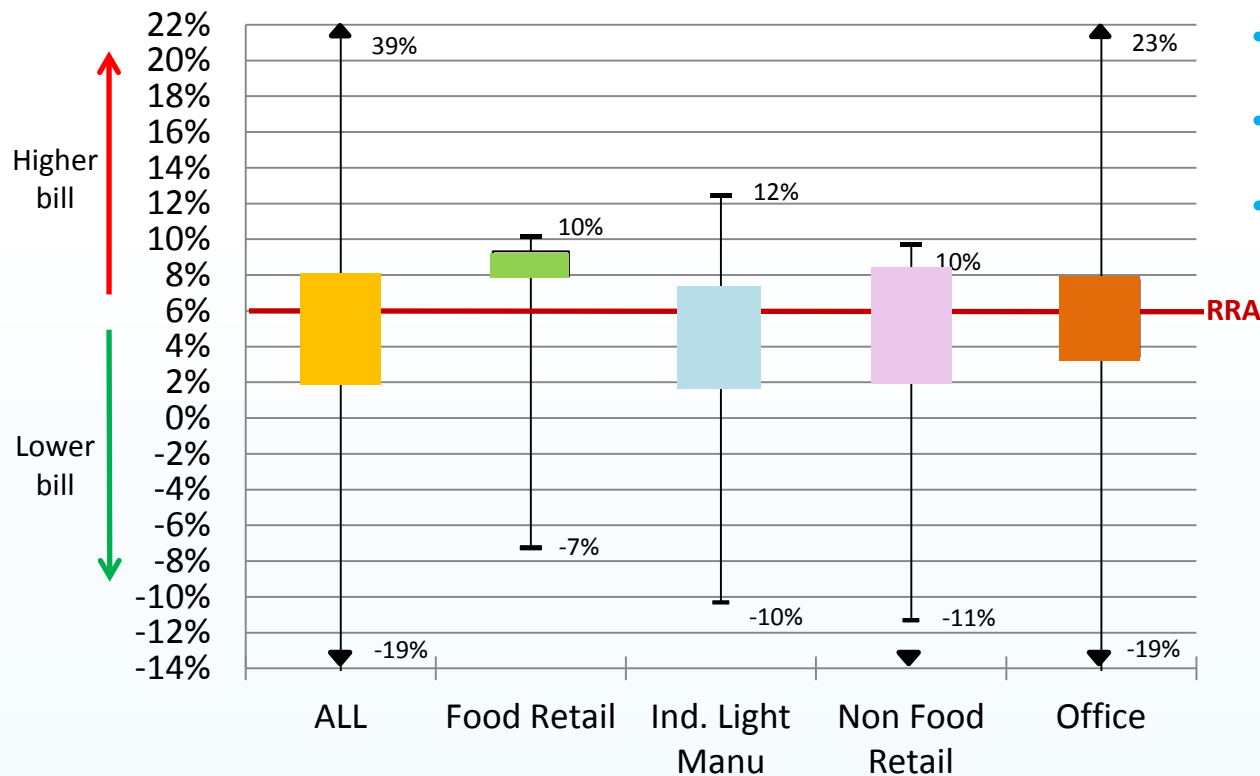
Highest kw

Load Factor		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%		-5.7%	-7.6%	-8.2%	-8.5%	-8.7%	-8.8%	-8.9%	-8.9%	-9.0%	-9.0%	-9.1%	-9.1%	-9.1%	-9.1%	-9.1%	-9.2%
20%		-6.2%	-0.8%	-1.8%	-2.3%	-2.6%	-2.8%	-3.0%	-3.1%	-3.2%	-3.2%	-3.3%	-3.3%	-3.4%	-3.4%	-3.4%	-3.5%	-3.5%
30%		-13.0%	3.8%	2.4%	1.8%	1.4%	1.1%	0.9%	0.8%	0.7%	0.6%	0.5%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%
40%		-16.9%	0.5%	5.4%	4.7%	4.2%	3.9%	3.7%	3.5%	3.4%	3.3%	3.2%	3.1%	3.1%	3.0%	3.0%	2.9%	2.9%
50%		-19.5%	-1.9%	5.0%	6.8%	6.3%	6.0%	5.7%	5.5%	5.4%	5.3%	5.2%	5.1%	5.1%	5.0%	4.9%	4.9%	4.9%
60%		-21.4%	-3.6%	4.3%	8.5%	7.9%	7.6%	7.3%	7.1%	7.0%	6.8%	6.7%	6.7%	6.6%	6.5%	6.5%	6.4%	6.4%
70%		-22.8%	-4.9%	3.1%	7.6%	9.2%	8.9%	8.6%	8.4%	8.2%	8.1%	8.0%	7.9%	7.9%	7.7%	7.7%	7.6%	7.6%
80%		-23.8%	-5.9%	2.1%	6.7%	9.6%	9.9%	9.6%	9.4%	9.2%	9.1%	9.0%	8.9%	8.8%	8.7%	8.7%	8.6%	8.6%
90%		-24.7%	-6.7%	1.3%	5.9%	8.9%	10.8%	10.5%	10.2%	10.1%	9.9%	9.8%	9.7%	9.6%	9.6%	9.5%	9.5%	9.4%

Lowest kw

Red means higher than CARC of 6%; More intense green indicates higher bill impact  
 Most "typical" customers as defined by kWh and LF fall within the blue oval area.

## ILLUSTRATIVE BILL IMPACT (F15 TO F16)



### Observations:

- Most of the typical customers have bill impact less than 6%
- Typical customers in food retail has bill impact higher than 6%
- Seems to mitigate impacts triggered by alternatives with only flat demand or flat energy

### Bounding customers:

Highest: 5% load factor, 47 MWh  
Industrial

Lowest: 37% load factor; 149 MWh  
Public School

This illustrates the high sensitivity at extremely low load factors:

Bill Impact of customer segment  
Color Bars: Middle 60%; 20<sup>th</sup> to 80<sup>th</sup> percentile of impacts

	30,000	40,000	50,000	100,000
4%	61.1%	48.3%	41.5%	-0.3%
5%	62.2%	47.0%	39.1%	4.5%
6%	63.3%	45.7%	36.9%	9.3%

## ILLUSTRATIVE COMPARATIVE ANALYSIS VS. SQ

Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	43%	\$58,373	\$2,397
Food Retail	8%	\$122,713	\$3,871
Ind. Manufacturing	55%	\$79,302	\$1,574
Non Food Retail	36%	\$61,275	\$1,011
Office	32%	\$67,550	\$1,331

\* “Better off” = at least 1% lower than SQ bill; \*\* “Median” customer has about median kWh and Load Factor of the class

### Observations

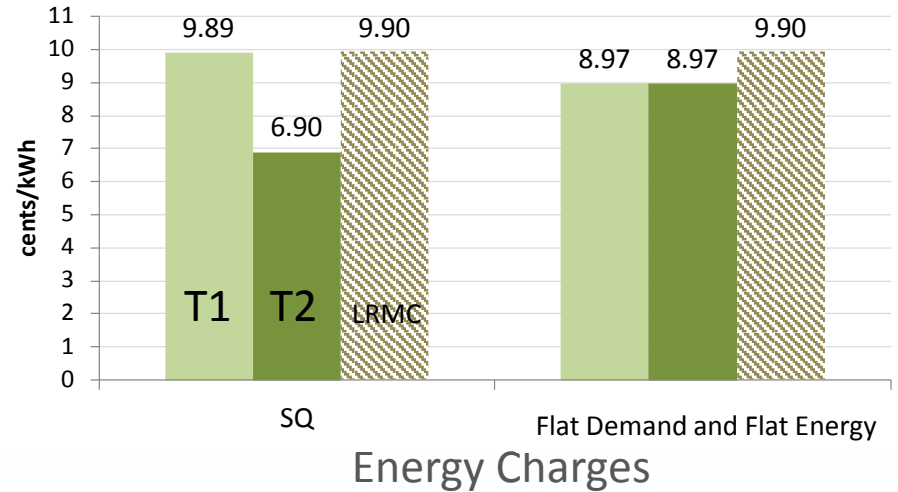
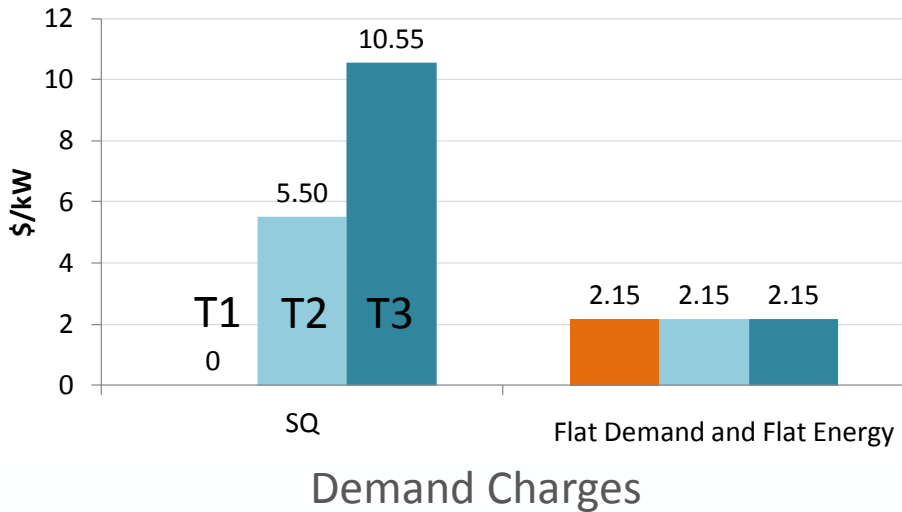
- Just under half of the customers are better off
- Offsetting effect

### Notes:

- Better off/worse off are influenced by each customer’s
  - monthly baseline and consumption variance
  - monthly load factor and consumption (bill impact pattern)
  - provisions such as the minimum energy charge



# MGS FLATTENING OF PT 1 ENERGY RATE AND FLATTENING OF DEMAND CHARGES



## Illustrative Customer Bill

Load Factor of 36%, Baseline Consumption = 153,240kWh per year, Billed kW = 49kW each month

Customer Scenario	Demand Charge	Energy Charge	Basic Charge	Total Bill	SQ Bill	Variance
Consume at baseline	\$1,264	\$13,746	\$82	\$15,092	\$16,162	-\$1,070 (-7%)
+ 5% from baseline	\$1,264	\$14,504	\$82	\$15,851	\$16,920	-\$1,070 (-6%)
- 5% from baseline	\$1,264	\$12,987	\$82	\$14,334	\$15,403	-\$1,070 (-7%)

Note: Illustrative bill computation excludes rate rider, discounts, ratchets, and other provisions

## Observations:

- T1 and T2 Demand charges are relatively low, because a high proportion of customers have most demand usage at T1, which had no charge, and consumption at T3 is seldom as the customer would have migrated to LGS
- Flat Energy rate close to T1 energy rate, as most customers have high proportion of use in T1
- Flat energy rate is within energy LRMC range

# MGS FLATTENING OF PT 1 ENERGY RATE AND FLATTENING OF DEMAND CHARGES

## ILLUSTRATIVE SENSITIVITY ANALYSIS

### F15/F16 illustrative bill impact

Annual Consumption kWh

Load Factor

	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%	25.9%	27.0%	-6.9%	-14.9%	-18.5%	-24.5%	-29.7%	-31.5%	-32.8%	-33.8%	-34.6%	-35.2%	-35.7%	-36.1%	-36.5%	-36.8%	-37.1%
20%	11.4%	11.6%	11.7%	-0.2%	-5.7%	-8.7%	-10.8%	-8.5%	-7.1%	-6.8%	-8.5%	-9.9%	-11.0%	-11.9%	-12.7%	-13.3%	-13.9%
30%	6.5%	6.5%	6.5%	6.3%	0.6%	-2.9%	-4.8%	-2.7%	1.1%	0.2%	1.3%	2.2%	2.9%	3.6%	2.7%	1.7%	0.9%
40%	4.1%	4.0%	4.0%	3.9%	3.9%	0.5%	-1.6%	0.7%	2.5%	3.9%	5.1%	6.1%	6.9%	7.6%	8.3%	8.8%	9.3%
50%	2.6%	2.4%	2.4%	2.4%	2.4%	2.4%	0.5%	2.9%	4.8%	6.1%	7.6%	8.7%	9.6%	10.3%	11.0%	11.6%	12.1%
60%	1.7%	1.4%	1.4%	1.3%	1.3%	1.3%	1.7%	4.5%	6.5%	8.1%	9.4%	10.5%	11.5%	12.3%	13.0%	13.6%	14.1%
70%	1.0%	0.7%	0.6%	0.6%	0.6%	0.6%	1.0%	5.5%	7.8%	9.4%	10.8%	11.9%	12.9%	13.7%	14.5%	15.1%	15.6%
80%	0.4%	0.1%	0.1%	0.0%	0.0%	0.0%	0.4%	4.9%	8.5%	10.5%	11.9%	13.0%	14.0%	14.9%	15.6%	16.3%	16.8%
90%	0.0%	-0.3%	-0.4%	-0.4%	-0.4%	-0.4%	0.0%	4.4%	8.0%	11.0%	12.7%	13.9%	14.9%	15.8%	16.5%	17.2%	17.8%

Annual Consumption kWh

Load Factor

	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%	25.9%	27.0%	-6.9%	-14.9%	-18.5%	-24.5%	-29.7%	-31.5%	-32.8%	-33.8%	-34.6%	-35.2%	-35.7%	-36.1%	-36.5%	-36.8%	-37.1%
20%	11.4%	11.6%	11.7%	-0.2%	-5.7%	-8.7%	-10.8%	-8.5%	-7.1%	-6.8%	-8.5%	-9.9%	-11.0%	-11.9%	-12.7%	-13.3%	-13.9%
30%	6.5%	6.5%	6.5%	6.3%	0.6%	-2.9%	-4.8%	-2.7%	1.1%	0.2%	1.3%	2.2%	2.9%	3.6%	2.7%	1.7%	0.9%
40%	4.1%	4.0%	4.0%	3.9%	3.9%	0.5%	-1.6%	0.7%	2.5%	3.9%	5.1%	6.1%	6.9%	7.6%	8.3%	8.8%	9.3%
50%	2.6%	2.4%	2.4%	2.4%	2.4%	2.4%	0.5%	2.9%	4.8%	6.4%	7.6%	8.7%	9.6%	10.3%	11.0%	11.6%	12.1%
60%	1.7%	1.4%	1.4%	1.3%	1.3%	1.3%	1.7%	4.5%	6.5%	8.1%	9.4%	10.5%	11.5%	12.3%	13.0%	13.6%	14.1%
70%	1.0%	0.7%	0.6%	0.6%	0.6%	0.6%	1.0%	5.5%	7.8%	9.4%	10.8%	11.9%	12.9%	13.7%	14.5%	15.1%	15.6%
80%	0.4%	0.1%	0.1%	0.0%	0.0%	0.0%	0.4%	4.9%	8.5%	10.5%	11.9%	13.0%	14.0%	14.9%	15.6%	16.3%	16.8%
90%	0.0%	-0.3%	-0.4%	-0.4%	-0.4%	-0.4%	0.0%	4.4%	8.0%	11.0%	12.7%	13.9%	14.9%	15.8%	16.5%	17.2%	17.8%

Hotels

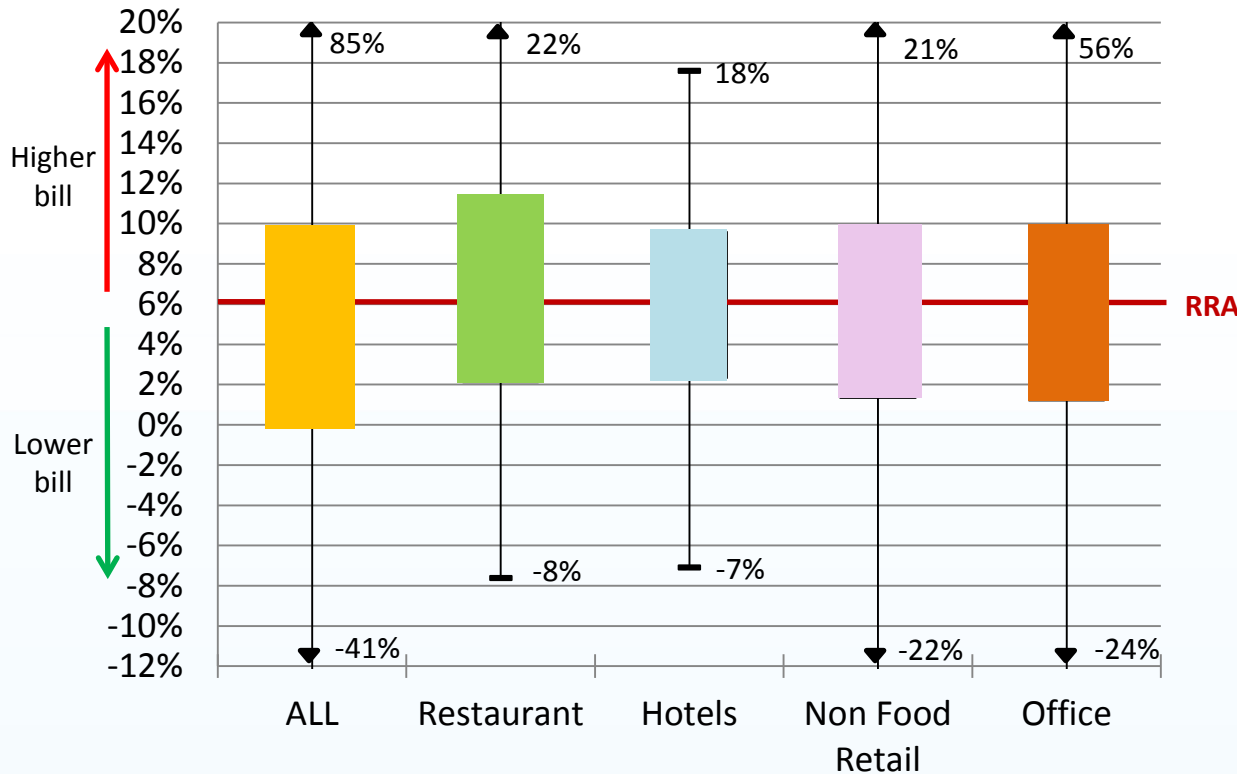
Non-Food Retail

offices

Restaurants

Red means higher than CARC of 6%; More intense green indicates higher bill impact  
 Most "typical" customers as defined by kWh and Load Factor fall within the blue oval area  
 Major assumption: customers have the annual max kW for all months

ILLUSTRATIVE BILL IMPACT (F15 TO F16)



Observations:

- Very wide ranges
- Typical customers' bill impacts varies

Bounding customers:






Highest: 1% load factor, 4 MWh  
Wood  
Lowest: 2% load factor; 55 MWh  
Municipal Pumping

This illustrates the high sensitivity at extremely low load factors:

	4,000	6,000	10,000	40,000
1%	45.2%	-12.3%	-33.9%	-67.5%
2%	128.3%	135.7%	2.7%	-53.0%

Bill Impact of customer segment  
Color Bars: Middle 60%; 20<sup>th</sup> to 80<sup>th</sup> percentile of impacts

## ILLUSTRATIVE COMPARATIVE ANALYSIS VS. SQ

Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	 58%	\$18,857	-\$1,275
Restaurant	 47%	\$22,126	-\$530
Hotels	 53%	\$18,701	\$127
Non Food Retail	 55%	\$19,094	-\$1,195
Office	 57%	\$18,383	-\$547

\* “Better off” = at least 1% lower than SQ bill; \*\* “Median” customer has about median kWh and Load Factor of the class

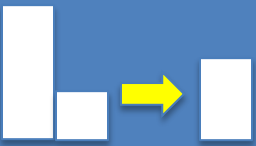


### Observations

- Slightly more than half of MGS customers are better off
- similar trend in each of the sectors

### Notes:

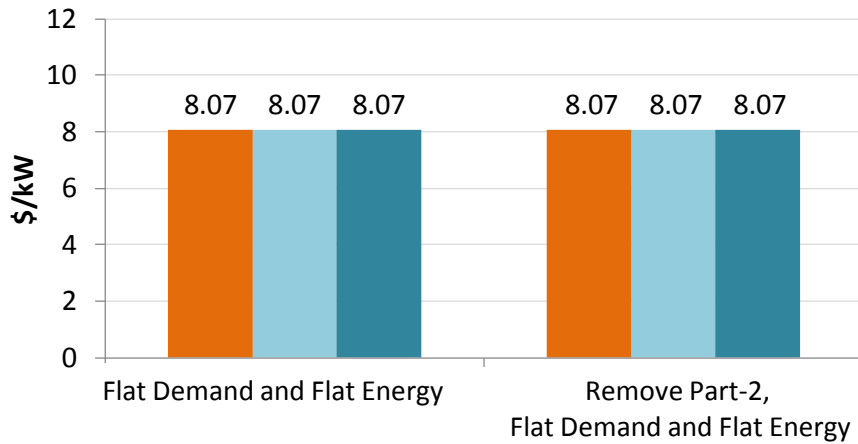
- Better off/worse off are influenced by each customer’s
  - monthly baseline and consumption variance
  - monthly load factor and consumption (bill impact pattern)
  - provisions such as the minimum energy charge

## LGS AND MGS REMOVE BASELINE RATE (PART-2), FLATTEN ENERGY RATE AND FLATTEN DEMAND CHARGES

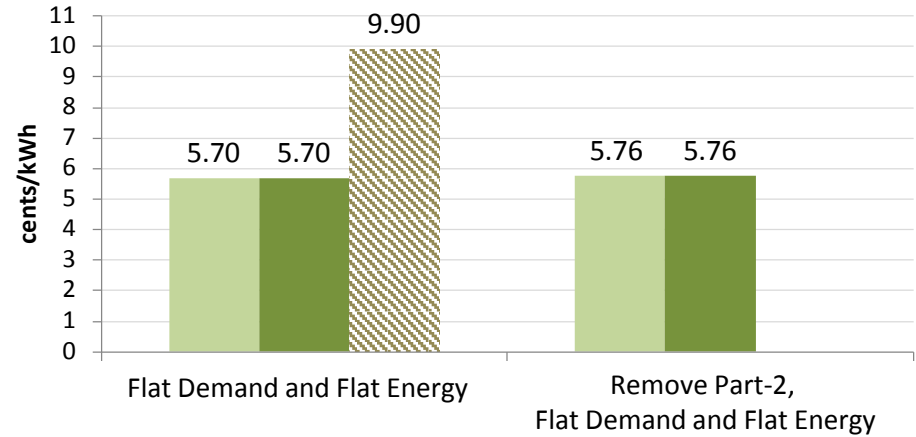
Alternative	Flatten Part 1 Energy 	Flatten Demand All Tiers 	Remove Baseline 
1. SQ	F2016 SQ rates		
Illustrate Energy effect	High Consumption, high load factor = higher bills		
Illustrate Demand effect		High Consumption, low load factor = Lower bills	
2. Flat Part-1 Energy and Flat Demand	Bill impacts generally offset		
3. Flat Part-1 Energy and Flat Demand + No baseline	X	X	X

# LGS: REMOVE BASELINE RATE (PART-2), FLATTEN ENERGY RATE AND FLATTEN DEMAND CHARGES

## Comparison with Flat Energy + Flat Demand Design including Part-2



Demand Charges



Energy Charges

## Illustrative Customer Bill

Load Factor of 46%, Baseline Consumption = 744,240 kWh per year, Billed kW = 185 kW each month

Customer Scenario	Demand Charge	Energy Charge	Basic Charge	Total Bill No 2-Part	Total Bill With 2- Part	Variance (Between with 2Pt and no 2Pt)
Consume at baseline	\$17,917	\$42,868	\$82	\$60,868	\$60,419	\$448 (1%)
+ 5% from baseline	\$17,917	\$45,012	\$82	\$63,011	\$64,103	-\$1,092 (-2%)
- 5% from baseline	\$17,917	\$40,725	\$82	\$58,724	\$56,735	\$1,989 (4%)

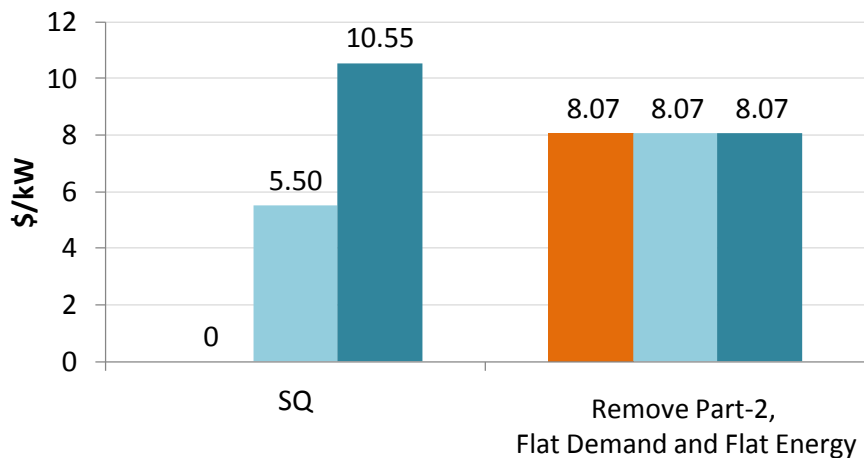
## Observations:

- Negligible change on Part-1 rates
- No substantive change in customer bills if consumption stays about the same from flat demand and flat energy charges
- Customer who grow are better off
- Customers who decrease are worse off

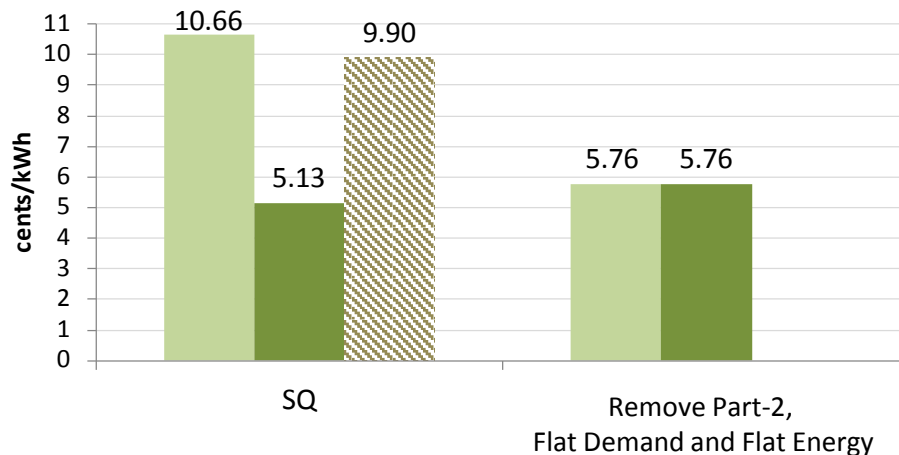
Note: Illustrative bill computation excludes rate rider, discounts, ratchets, and other provisions

# LGS: REMOVE BASELINE RATE (PART-2), FLATTEN ENERGY RATE AND FLATTEN DEMAND CHARGES

## Comparison with SQ



Demand Charges



Energy Charges

## Illustrative Customer Bill

Load Factor of 46%, Baseline Consumption = 744,240 kWh per year, Billed kW = 185 kW each month

Customer Scenario	Demand Charge	Energy Charge	Basic Charge	Total Bill	SQ Bill	Variance
Consume at baseline	\$17,917	\$42,868	\$82	\$60,868	\$60,104	\$764 (1%)
+ 5% from baseline	\$17,917	\$45,012	\$82	\$63,011	\$63,788	-\$777 (-1%)
- 5% from baseline	\$17,917	\$40,725	\$82	\$58,724	\$56,420	\$2,304 (4%)

Note: Illustrative bill computation excludes rate rider, discounts, ratchets, and other provisions

## Observations:

- Increase due to Demand flattening and reduction in bills due to Energy flattening “Nets out”
- Customer who grow are better off (no baseline related charges)
- Customers who decrease are worse off (no baseline related credits)

# LGS: REMOVE BASELINE RATE (PART-2), FLATTEN ENERGY RATE AND FLATTEN DEMAND CHARGES

## ILLUSTRATIVE SENSITIVITY ANALYSIS

### F15/F16 illustrative bill impact

Annual Consumption kWh

Load Factor	*	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%		-5.3%	-7.2%	-7.9%	-8.2%	-8.3%	-8.5%	-8.5%	-8.6%	-8.7%	-8.7%	-8.7%	-8.8%	-8.8%	-8.8%	-8.8%	-8.8%
20%		-5.7%	-0.2%	-1.3%	-1.8%	-2.1%	-2.3%	-2.5%	-2.6%	-2.6%	-2.7%	-2.8%	-2.8%	-2.9%	-2.9%	-2.9%	-2.9%	-3.0%
30%		-12.4%	4.4%	3.1%	2.4%	2.0%	1.7%	1.6%	1.4%	1.3%	1.2%	1.1%	1.1%	1.0%	1.0%	1.0%	0.9%	0.9%
40%		-16.4%	1.3%	6.2%	5.4%	4.9%	4.6%	4.4%	4.2%	4.1%	4.0%	3.9%	3.9%	3.8%	3.7%	3.7%	3.7%	3.6%
50%		-18.9%	-1.1%	6.7%	7.6%	7.1%	6.8%	6.5%	6.3%	6.2%	6.1%	6.0%	5.9%	5.8%	5.8%	5.7%	5.7%	5.7%
60%		-20.8%	-2.8%	5.1%	9.4%	8.8%	8.4%	8.2%	8.0%	7.8%	7.7%	7.6%	7.5%	7.4%	7.4%	7.3%	7.3%	7.2%
70%		-22.1%	-4.1%	3.9%	8.5%	10.1%	9.7%	9.5%	9.3%	9.1%	9.0%	8.9%	8.8%	8.7%	8.6%	8.6%	8.5%	8.5%
80%		-23.2%	-5.1%	3.0%	7.6%	10.5%	10.8%	10.5%	10.3%	10.1%	10.0%	9.9%	9.8%	9.7%	9.7%	9.6%	9.6%	9.5%
90%		-24.0%	-5.9%	2.2%	6.8%	9.8%	11.7%	11.4%	11.2%	11.0%	10.9%	10.8%	10.7%	10.6%	10.5%	10.5%	10.4%	10.4%

\*Note: Very high sensitivity on low load factor, lower consumption customers.

Annual Consumption kWh

Highest kw

Load Factor		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%		-5.3%	-7.2%	-7.9%	-8.2%	-8.3%	-8.5%	-8.5%	-8.6%	-8.7%	-8.7%	-8.7%	-8.8%	-8.8%	-8.8%	-8.8%	-8.8%
20%		-5.7%	-0.2%	-1.3%	-1.8%	-2.1%	-2.3%	-2.5%	-2.6%	-2.6%	-2.7%	-2.8%	-2.8%	-2.9%	-2.9%	-2.9%	-2.9%	-3.0%
30%		-12.4%	4.4%	3.1%	2.4%	2.0%	1.7%	1.6%	1.4%	1.3%	1.2%	1.1%	1.1%	1.0%	1.0%	1.0%	0.9%	0.9%
40%		-16.4%	1.3%	6.2%	5.4%	4.9%	4.6%	4.4%	4.2%	4.1%	4.0%	3.9%	3.9%	3.8%	3.7%	3.7%	3.7%	3.6%
50%		-18.9%	-1.1%	6.7%	7.6%	7.1%	6.8%	6.5%	6.3%	6.2%	6.1%	6.0%	5.9%	5.8%	5.8%	5.7%	5.7%	5.7%
60%		-20.8%	-2.8%	5.1%	9.4%	8.8%	8.4%	8.2%	8.0%	7.8%	7.7%	7.6%	7.5%	7.4%	7.4%	7.3%	7.3%	7.2%
70%		-22.1%	-4.1%	3.9%	8.5%	10.1%	9.7%	9.5%	9.3%	9.1%	9.0%	8.9%	8.8%	8.7%	8.6%	8.6%	8.5%	8.5%
80%		-23.2%	-5.1%	3.0%	7.6%	10.5%	10.8%	10.5%	10.3%	10.1%	10.0%	9.9%	9.8%	9.7%	9.7%	9.6%	9.6%	9.5%
90%		-24.0%	-5.9%	2.2%	6.8%	9.8%	11.7%	11.4%	11.2%	11.0%	10.9%	10.8%	10.7%	10.6%	10.5%	10.5%	10.4%	10.4%

Lowest kw

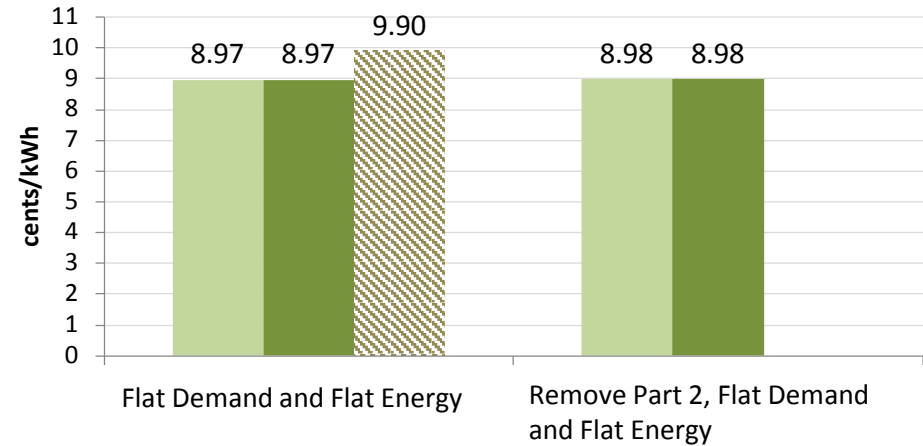
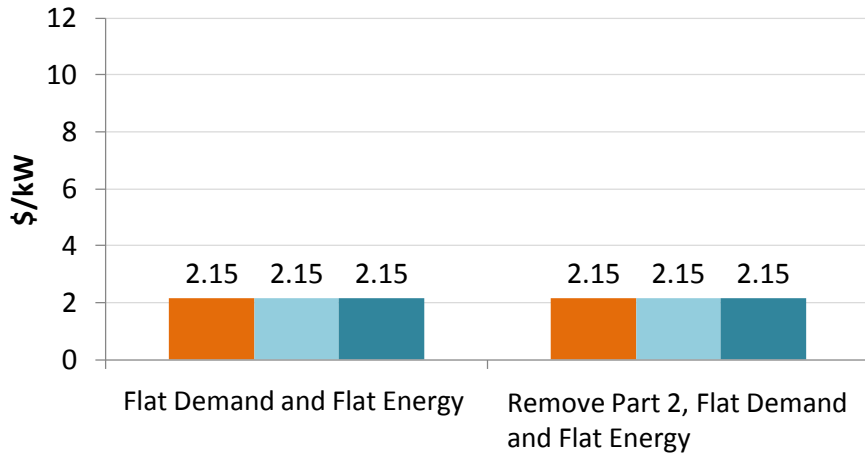
Red means higher than CARC of 6%; More intense green indicates higher bill impact  
 Most "typical" customers as defined by kWh and LF fall within the blue oval area

Bill impact patterns effectively the same as with-baseline



# MGS: REMOVE BASELINE RATE (PART-2), FLATTEN ENERGY RATE AND FLATTEN DEMAND CHARGES

## Comparison with Flat Energy + Flat Demand Design including Part-2



## Illustrative Customer Bill

Load Factor of 36%, Baseline Consumption = 153,240kWh per year, Billed kW = 49kW each month

Customer Scenario	Demand Charge	Energy Charge	Basic Charge	Total Bill No 2-Part	Total Bill With 2- Part	Variance (Between with 2Pt and no 2Pt)
Consume at baseline	\$1,264	\$13,761	\$82	\$15,108	\$15,092	\$15 (0%)
+ 5% from baseline	\$1,264	\$14,449	\$82	\$15,796	\$15,851	-\$55 (0%)
- 5% from baseline	\$1,264	\$13,073	\$82	\$14,419	\$14,334	\$86 (1%)

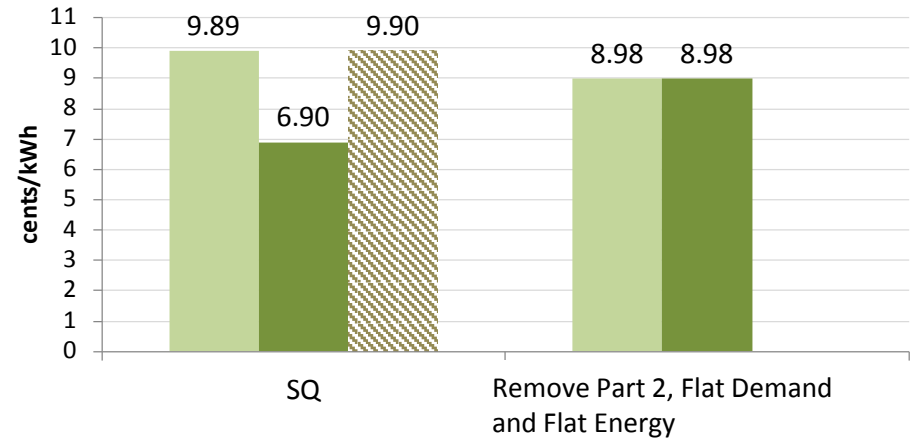
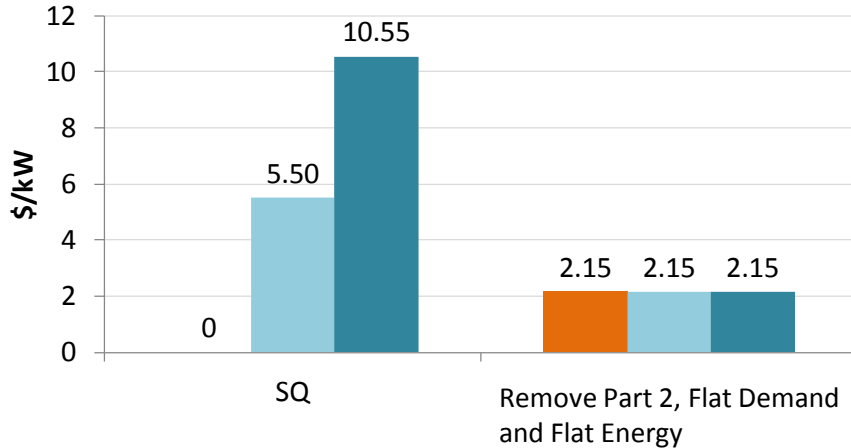
## Observations:

- Negligible change on Part-1 Rates
- Negligible bill impact
- No substantive change in customer bills if consumption stays about the same from flat demand and flat energy
- Customers who grow are better off
- Customers who decrease are worse off

Note: Illustrative bill computation excludes rate rider, discounts, ratchets, and other provisions

# MGS: REMOVE BASELINE RATE (PART-2), FLATTEN ENERGY RATE AND FLATTEN DEMAND CHARGES

## Comparison with SQ



## Illustrative Customer Bill

Load Factor of 36%, Baseline Consumption = 153,240kWh per year, Billed kW = 49kW each month

Customer Scenario	Demand Charge	Energy Charge	Basic Charge	Total Bill No 2-Part	Total Bill With 2- Part	Variance (Between with 2Pt and no 2Pt)
Consume at baseline	\$1,264	\$13,761	\$82	\$15,108	\$16,162	-\$1,054 (-7%)
+ 5% from baseline	\$1,264	\$14,449	\$82	\$15,796	\$16,920	-\$1,125 (-7%)
- 5% from baseline	\$1,264	\$13,073	\$82	\$14,419	\$15,403	-\$984 (-6%)

## Observations:

- T1 and T2 Demand charges are relatively low, because a high proportion of customers have most demand usage at T1, which was free, and consumption at T3 is seldom as the customer would have migrated to LGS
- Flat Energy rate close to T1 energy rate, as most customers have high proportion of use in T1
- Flat energy rate is within energy LRM range

Note: Illustrative bill computation excludes rate rider, discounts, ratchets, and other provisions

# MGS: REMOVE BASELINE RATE (PART-2), FLATTEN ENERGY RATE AND FLATTEN DEMAND CHARGES

## ILLUSTRATIVE SENSITIVITY ANALYSIS

### F15/F16 illustrative bill impact

Annual Consumption kWh

Load Factor

	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%	26.0%	27.1%	-6.8%	-14.9%	-18.4%	-24.4%	-29.6%	-31.5%	-32.8%	-33.8%	-34.6%	-35.2%	-35.7%	-36.1%	-36.5%	-36.8%	-37.1%
20%	11.5%	11.8%	11.8%	-0.1%	-5.6%	-8.6%	-10.2%	-8.4%	-7.1%	-6.7%	-8.5%	-9.8%	-10.9%	-11.9%	-12.6%	-13.3%	-13.9%
30%	6.6%	6.6%	6.6%	6.1%	0.7%	-2.8%	-4.7%	-2.7%	1.0%	0.3%	1.3%	2.2%	3.0%	3.6%	2.7%	1.8%	1.0%
40%	4.2%	4.1%	4.1%	4.0%	4.0%	0.6%	-1.5%	0.8%	2.5%	4.0%	5.2%	6.1%	7.0%	7.7%	8.3%	8.9%	9.3%
50%	2.7%	2.5%	2.5%	2.5%	2.5%	2.5%	0.6%	3.0%	4.9%	6.4%	7.7%	8.7%	9.6%	10.4%	11.1%	11.6%	12.2%
60%	1.8%	1.5%	1.5%	1.4%	1.4%	1.4%	1.8%	4.6%	6.6%	8.2%	9.5%	10.6%	11.5%	12.3%	13.0%	13.6%	14.2%
70%	1.1%	0.8%	0.7%	0.7%	0.7%	0.7%	1.1%	5.6%	7.9%	9.5%	10.9%	12.0%	13.0%	13.8%	14.5%	15.1%	15.7%
80%	0.5%	0.2%	0.2%	0.1%	0.1%	0.1%	0.5%	5.0%	8.6%	10.5%	11.9%	13.1%	14.1%	14.9%	15.7%	16.3%	16.9%
90%	0.1%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	0.1%	4.5%	8.1%	11.1%	12.8%	13.9%	15.0%	15.8%	16.6%	17.2%	17.8%

Annual Consumption kWh

Load Factor

	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%	26.0%	27.1%	-6.8%	-14.9%	-18.4%	-24.4%	-29.6%	-31.5%	-32.8%	-33.8%	-34.6%	-35.2%	-35.7%	-36.1%	-36.5%	-36.8%	-37.1%
20%	11.5%	11.8%	11.8%	-0.1%	-5.6%	-8.6%	-10.2%	-8.4%	-7.1%	-6.7%	-8.5%	-9.8%	-10.9%	-11.9%	-12.6%	-13.3%	-13.9%
30%	6.6%	6.6%	6.6%	6.1%	0.7%	-2.8%	-4.7%	-2.7%	1.0%	0.3%	1.3%	2.2%	3.0%	3.6%	2.7%	1.8%	1.0%
40%	4.2%	4.1%	4.1%	4.0%	4.0%	0.6%	-1.5%	0.8%	2.5%	4.0%	5.2%	6.1%	7.0%	7.7%	8.3%	8.9%	9.3%
50%	2.7%	2.5%	2.5%	2.5%	2.5%	2.5%	0.6%	3.0%	4.9%	6.4%	7.7%	8.7%	9.6%	10.4%	11.1%	11.6%	12.2%
60%	1.8%	1.5%	1.5%	1.4%	1.4%	1.4%	1.8%	4.6%	6.6%	8.2%	9.5%	10.6%	11.5%	12.3%	13.0%	13.6%	14.2%
70%	1.1%	0.8%	0.7%	0.7%	0.7%	0.7%	1.1%	5.6%	7.9%	9.5%	10.9%	12.0%	13.0%	13.8%	14.5%	15.1%	15.7%
80%	0.5%	0.2%	0.2%	0.1%	0.1%	0.1%	0.5%	5.0%	8.6%	10.5%	11.9%	13.1%	14.1%	14.9%	15.7%	16.3%	16.9%
90%	0.1%	-0.2%	-0.3%	-0.3%	-0.3%	-0.3%	0.1%	4.5%	8.1%	11.1%	12.8%	13.9%	15.0%	15.8%	16.6%	17.2%	17.8%

Hotels

Non-Food Retail

offices

Restaurants

Red means higher than CARC of 6%; More intense green indicates higher bill impact  
 Most "typical" customers as defined by kWh and LF fall within the blue oval area.  
 Major assumption: customers have the annual max kW for all months.

Bill impact patterns effectively the same as with-baseline

## LGS AND MGS BILL IMPACTS: SUMMARY BY CUSTOMER TYPE

	LGS Bill Impacts		MGS Bill Impacts	
	Generally Higher	Generally Lower	Generally Higher	Generally Lower
Flat Part-1 Energy + Flat Demand	<ul style="list-style-type: none"> <li>• High consumption + high load factor</li> <li>• Very Low consumption + very low load factor</li> </ul>	<ul style="list-style-type: none"> <li>• Low consumption + low load factor</li> </ul>	<ul style="list-style-type: none"> <li>• High consumption + high load factor</li> <li>• Low consumption + low load factor</li> </ul>	<ul style="list-style-type: none"> <li>• Typical customers with consumption and load factor at around median are better off</li> </ul>
	<ul style="list-style-type: none"> <li>• <b>Generally, bill impacts from flattening of demand rates and energy rates offset</b></li> <li>• Typical customers with consumption and load factor at around median have minimal impact</li> <li>• Effect of higher demand prices at T1 and T2 and lower demand prices at T3 are balanced by lower energy prices in Energy T1 and higher energy prices in Energy T2</li> </ul>		<ul style="list-style-type: none"> <li>• <b>Generally, bill impacts from flattening of demand rates and energy rates offset</b></li> </ul>	
Flat Part-1 Energy + Flat Demand, no Baseline	As above	As above	As above	As above
	As above		As above	

# LGS ALTERNATIVES: SUMMARY OF TRADEOFFS COMPARED TO SQ

	Fairness	Economic Efficiency	Customer Service and Acceptance		Practicality
Rate Structure Alternative	Cost Causation	LRMC Signal	Customer Understanding	Bill Impacts	Implementation and Admin Costs
<b>Flat Part-1 Energy + Flat Demand</b>	<ul style="list-style-type: none"> <li>Better reflection of demand costs</li> <li>More equitable distribution of fixed costs among customers of different kW sizes</li> <li>Minor improvement on Part-1 (no longer declining)</li> </ul>	<ul style="list-style-type: none"> <li>No change</li> <li>(no change in rate structure conservation)</li> </ul>	<ul style="list-style-type: none"> <li>Better understanding (flat demand and flat part-1 energy)</li> </ul> <p><b>Challenges with baseline still remain</b></p>	<ul style="list-style-type: none"> <li>Generally, bill impacts from flattening of demand rates and energy rates offset</li> </ul>	<p>Implementation:</p> <ul style="list-style-type: none"> <li>One-time minor system change</li> <li>Customer communication will be required</li> </ul> <p>Operational practicality once implemented:</p> <ul style="list-style-type: none"> <li>Simpler calculations</li> </ul> <p><b>Challenges with baseline still remain</b></p>
<b>Flat Part-1 Energy + Flat Demand, no Baseline</b>		<ul style="list-style-type: none"> <li>Resulting rate falls below the lower end of the LRMC range</li> <li>Given the evaluation results, minimal effect on rate structure conservation</li> <li>LGS: 0 to 77 GWh reduction in conservation due to removal of conservation rate</li> </ul>	<ul style="list-style-type: none"> <li>As above</li> <li>Eliminates all complexity resulting from the baseline component of the rate</li> <li>Easier and more accurate forecasting</li> <li>Removal of baseline Part-2 rate does not substantively impact energy charges - thus no substantive changes to bill impact patterns</li> </ul>	<ul style="list-style-type: none"> <li>Removal of baseline Part-2 rate in isolation does not substantively impact energy charges, and thus no substantive changes to bill impact patterns vs. "with baseline"</li> </ul>	<ul style="list-style-type: none"> <li>As above.</li> <li>Significant reduction in time to manage bill adjustments and Information Technology time</li> </ul>

Much better than SQ

Somewhat Better than SQ

Neutral relative to SQ

Somewhat worse than SQ

Much worse than SQ

# MGS ALTERNATIVES: SUMMARY OF TRADEOFFS COMPARED TO SQ

	Fairness	Economic Efficiency	Customer Service and Acceptance		Practicality
Rate Structure Alternative	Cost Causation	LRMC Signal	Customer Understanding	Bill Impacts	Implementation and Admin Costs
<b>Flat Part-1 Energy + Flat Demand</b>	<ul style="list-style-type: none"> <li>Better reflection of demand costs</li> <li>More equitable distribution of fixed costs among customers of different kW sizes</li> <li>Minor improvement on Part-1 (no longer declining)</li> </ul>	<ul style="list-style-type: none"> <li>No change</li> <li>(no change in rate structure conservation)</li> </ul>	<ul style="list-style-type: none"> <li>Better understanding (flat demand and flat part-1 energy)</li> <li><u>No more Part-1 inversion of rates</u></li> </ul> <p><b>Challenges with baseline still remain</b></p>	<ul style="list-style-type: none"> <li>Generally, bill impacts from flattening of demand rates and energy rates offset</li> </ul>	<p>Implementation:</p> <ul style="list-style-type: none"> <li>One-time minor system change</li> <li>Customer communication will be required</li> </ul> <p>Operational practicality once implemented:</p> <ul style="list-style-type: none"> <li>Simpler calculations</li> </ul> <p><b>Challenges with baseline still remain</b></p>
<b>Flat Part-1 Energy + Flat Demand, no Baseline</b>		<ul style="list-style-type: none"> <li><u>Resulting energy rate is within LRMC range</u></li> <li><u>Given the evaluation results, no effect on rate structure conservation</u></li> <li><u>no change from SQ (0 GWh for all years evaluated)</u></li> </ul>	<ul style="list-style-type: none"> <li>As above</li> <li>Eliminates all complexity resulting from the baseline component of the rate</li> <li>Easier and more accurate forecasting</li> <li>Removal of baseline Part-2 rate does not substantively impact energy charges - thus no substantive changes to bill impact patterns</li> </ul>	<ul style="list-style-type: none"> <li>Removal of baseline Part-2 rate in isolation does not substantively impact energy charges, and thus no substantive changes to bill impact patterns vs. "with baseline"</li> </ul>	<ul style="list-style-type: none"> <li>As above.</li> <li>Significant reduction in time to manage bill adjustments and Information Technology time</li> </ul>

Much better than SQ	Somewhat Better than SQ	Neutral relative to SQ	Somewhat worse than SQ	Much worse than SQ
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TOPIC # 5

# SCREENED-OUT ALTERNATIVES

# SCREENED-OUT ALTERNATIVES

Alternatives were screened-out if:

**1. Unsuitable to a large heterogeneous group of customers**

- Example 1 to follow: Fixed Threshold Inclining Block Rate, like Residential Inclining Block (no baseline)

**2. Incurred high levels of bill impact**

- Example 2 to follow: Retain baseline – 100% demand charge cost recovery

**3. Performed prohibitively poorly on rate design objectives**

- Example 3 to follow: Retain baseline - Part 2 Energy Adjustments (Credit only)

**Other screened-out alternatives differed in only minor ways from others examined**

- Examples:
  - Flattening demand – T2/T3 only vs. T1/T2/T3 on MGS
  - Increasing cost recovery on Demand >75%



## EXAMPLE 1: FIXED THRESHOLD INCLINING BLOCK RATE (NO BASELINE)

1. Unsuitable to large heterogeneous group of customers (see next slide)

2. Performs prohibitively poorly on all 4 of the 4 objectives:

### Fairness

- Penalizes large customers and rewards small customers without a cost-causation basis

### Economic Efficiency

- Small customers (with usage below threshold) not exposed to LRMC

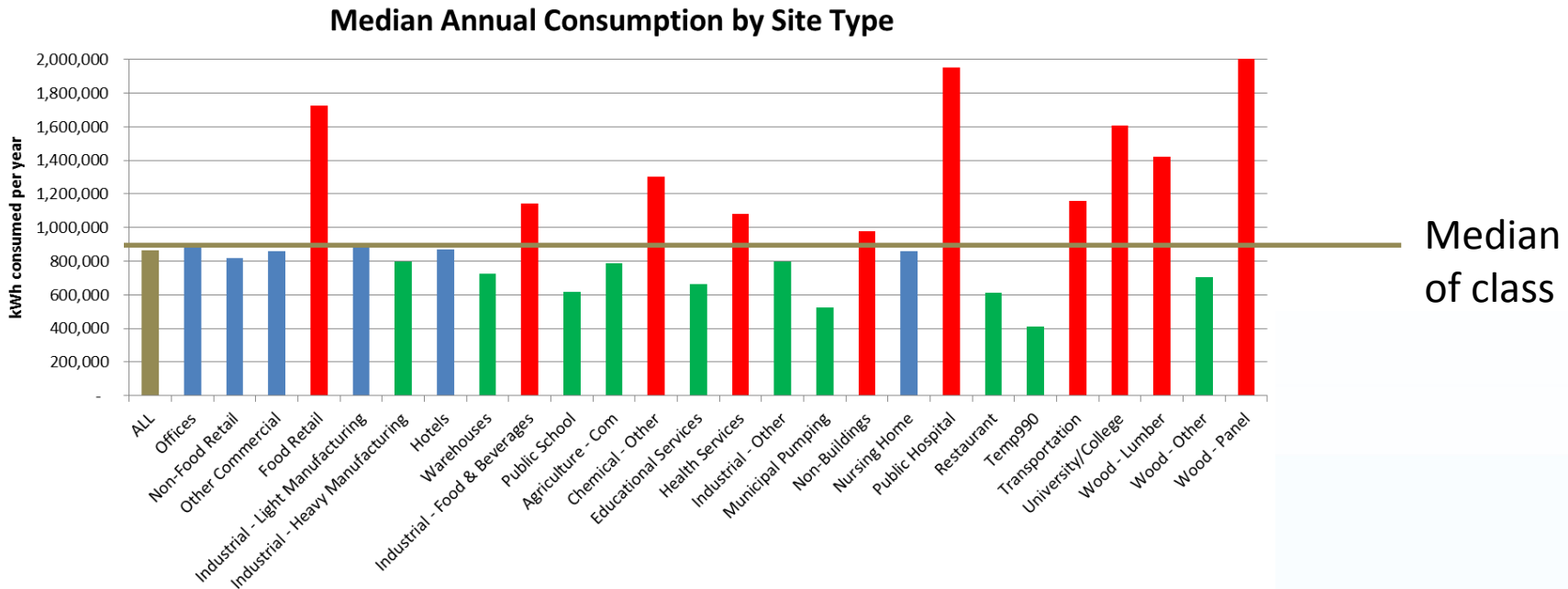
### Customer Acceptance

- Would result in large bill impacts for large customers
- Inclining block energy charges for GS customers are uncommon – even the block charges under the Ontario Regulated Price Plan are being phased out

### Practicality

- No criteria or means to develop a one-size fits all threshold between a Step 1 and Step 2 rate

## EXAMPLE: A THRESHOLD AT LGS MEDIAN CLASS CONSUMPTION



- A substantial portion of customers in these sectors likely see higher block most of the time; bill impact issues (10 sectors)
- 6 sectors with median consumption close to median class consumption
- A substantially higher proportion of customers likely see lower bills priced at the lower block; ineffective signal (10 sectors)

It is difficult, if not impossible, to choose an appropriate threshold that is fair and effective

- The class is very diverse, and consumption is driven by business type
- At the median, it might only be appropriate for 6 industry types

If the price differential is set at an effective level to incent conservation, it will unfairly reward smaller customer and penalize larger customers

## EXAMPLE 2: RETAIN BASELINE - 100% DEMAND COST RECOVERY

### Modeling Criteria

- Demand revenue is raised to recover 100% for the class
- Energy revenue is lowered to maintain class revenue neutrality for the class

### LGS

- Maintain the ratio of Demand T3 to T2 prices at 1.92
- **The current demand cost recovery is 56%**
- Demand Revenue needs to go up by a factor of 2 (100%/56%)

### MGS

- Maintain the ratio of Demand T3 to T2 prices at 1.92
- **The current demand cost recovery is 15%**
- Demand Revenue needs to go up by a factor of 7 (100%/15%)

## EXAMPLE 2: RETAIN BASELINE - 100% DEMAND COST RECOVERY

### Analysis Outcomes

- Extremely sensitive bill impacts, dependent on consumption size and load factor
- Large consuming customers at typical Load Factors are most impacted
- MGS experiences extreme impacts due to high escalation factor on energy charge

### Examples

- LGS:
  - At 3,200,000 kWh/year at a Load Factor of 30% (1,218 kW), the F15/F16 bill impact is about 33%
  - At 600,000 kWh/year at a Load Factor of 46% (159 kW), the F15/F16 bill impact is -11.8%
- MGS:
  - At 480,000kWh/year at a Load Factor of 30% (183 kW), the F15/F16 bill impact is over 100%
  - At 150,000kWh/year at a Load Factor of 30% (57 kW), the F15/F16 bill impact is -19%

## EXAMPLE 3: RETAIN BASELINE - PART 2 ENERGY ADJUSTMENTS (CREDIT ONLY)

Explore Part 2 pricing alternatives to mitigate customer concerns (for example, growth)

### Analysis

Credit only: Remove charges, keep credits component of Part 2 LRMC, all else equal

### Outcomes

1. Efficiency:

- SQ shows low conservation for LGS and no conservation for MGS
- This alternative will not remedy SQ efficiency issues

2. Customer Understanding and Acceptance:

- Customers still face baseline-related complexity problems

3. Customer Bill Impacts and Growth:

- The credits given out result in Part-1 energy rates increasing for all customers to maintain class revenue neutrality
- Only some growth customers may substantively benefit if their growth is above a certain amount that neutralizes the initial bill escalation
- Free riders – reduction in consumption is rewarded whether or not it's due to conservation efforts

## WORKSHOP 2 CONSIDERATIONS

### Bill Impacts and Transition Strategy

- There are various transition strategies that can mitigate bill impacts
- Transition strategies will be discussed in Workshop 2

### Additional Alternatives

- BC Hydro seeks feedback on whether there are other alternatives
- BC Hydro also seeks feedback on retaining the baseline and refining SQ issues, such as:
  - definition of the baseline
  - price limit band
  - growth rules
  - treatment of new accounts

## NEXT STEPS

1. Written comment period will begin at the posting of the Session 2 workshop notes
2. BC Hydro consideration memo – April 2015
3. LGS/MGS/SGS Workshop 2 is planned for May 26, 2015

# THANK YOU

## SEND COMMENTS TO:

[bchydroregulatorygroup@bchydro.com](mailto:bchydroregulatorygroup@bchydro.com)

Mail: BC Hydro, BC Hydro Regulatory Group – “Attention 2015 RDA”, 16th Floor,  
333 Dunsmuir St., Vancouver, B.C. V6B-5R3

FAX: 604-623-4407, “ATTENTION 2015 RDA”

For further information,  
please contact:

BC Hydro Regulatory Group: [bchydroregulatorygroup@bchydro.com](mailto:bchydroregulatorygroup@bchydro.com)

Tel: (604) 623-4046

Web: [www.bchydro.com/about/planning\\_regulatory/2015-rate-design.html](http://www.bchydro.com/about/planning_regulatory/2015-rate-design.html)



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