2015 RATE DESIGN APPLICATION (RDA)
RDA WORKSHOP 11B

- LARGE GENERAL SERVICE (LGS) RATE STRUCTURES
- GENERAL SERVICE (GS) OPTIONAL RATES
- OTHER ISSUES

BC hydro
FOR GENERATIONS

June 26, 2015

WORKSHOP 11B AGENDA – JUNE 26

1. **LGS**
   - Stakeholder Feedback and BC Hydro Consideration - **No preferred BC Hydro alternative for either Energy or Demand Rate Structure at this time**
   - Four LGS Energy Rate Structure Alternatives
   - Three LGS Demand Rate Structure Alternatives

2. **GS Optional Rates, to be addressed as part of 2015 RDA Module 2**
   - Voluntary Time of Use (TOU) rate
   - Interruptible rates
   - Efficiency Rate Credit concept
   - Optional demand charges

3. **Other Issues**
   - Minimum Charges (Demand Ratchet) (proposed to be addressed as part of Module 1)
   - Transformer ownership discount (TOD) (proposed to be addressed as part of Module 2)

WORKSHOP 11B PURPOSE

LGS

- To solicit additional feedback on four LGS energy rate structure alternatives
- To solicit additional feedback on three LGS demand rate structure alternatives

GS Rate Options

- To confirm BC Hydro's position that GS rate options are the subject of 2015 RDA Module 2, after receipt of BCUC Module 1 decision concerning default GS rates
- To solicit feedback on GS options explored to date

Other Issues

- Solicit feedback, including timing, on: demand ratchet and TOD

WORKSHOP 11B

LGS

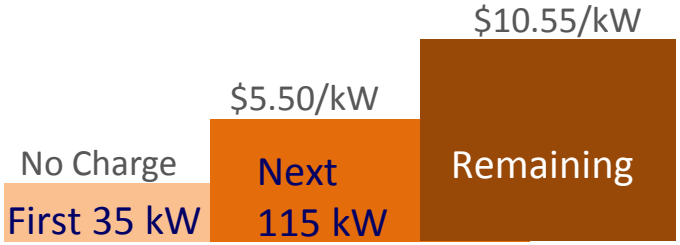
1. Summary of LGS Rate Structures
2. Stakeholder Feedback To Date and Summary of LGS Alternatives
3. Four LGS Energy Rate Structure Alternatives
4. Three Demand Rate Structure Alternatives

SUMMARY OF LGS RATE STRUCTURES – F2016 RATES

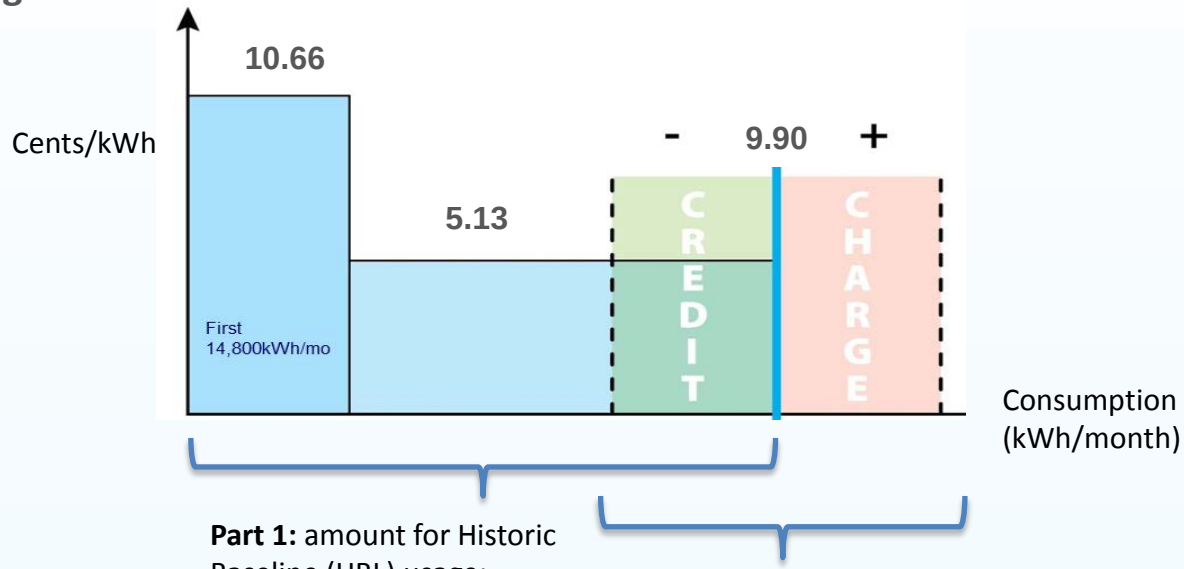
Basic Charge:

22.57 cents/day

Demand Charge:



Energy Charge:



Part 1: amount for Historic Baseline (HBL) usage; average of past 3 years

Part 2 (for ~80% of bills): Credits and charges at energy Long-Run Marginal Cost (LRMC)

BC hydro
FOR GENERATIONS

STAKEHOLDER FEEDBACK AND BC HYDRO CONSIDERATION
ENERGY RATE STRUCTURE

- General view that price signal and/or customer understanding of price signal could be improved – no consensus on preferred alternative:
  - Simplify energy rate structure (retain baseline) – consider modifying:
    - Determination of baselines (monthly versus annual versus rolling average, etc.)
    - Price limit bands (PLBs) to address concerns that rates are ‘punitive to growing customers’, and/or to encourage further conservation
    - Growth rules to make less restrictive
    - New account rules
  - Remove baseline structure (flat energy rate)

STAKEHOLDER FEEDBACK AND BC HYDRO CONSIDERATION
ENERGY RATE STRUCTURE, CONT'D

- Create a TSR-like rate with individually administered baselines for segment of very large LGS customers (e.g., demand exceeds 2,000 kilowatts (kW))

- Jurisdictional assessment: Atypical design in North America

- **No identified preferred LGS energy rate structure** – seeking further feedback

STAKEHOLDER FEEDBACK AND BC HYDRO CONSIDERATION
DEMAND CHARGE STRUCTURE AND COST RECOVERY

Rate Structure

- Feedback:
  - General agreement that inclining block demand rate structure does not align with cost causation
  - Concern that changes to the demand rate structure may result in large bill impacts

- Jurisdictional assessment: Atypical design in Canada

- **No identified preferred LGS demand rate structure** – seeking further feedback

Cost Recovery

- LGS demand charges recovery ~50% of assigned fixed costs
- **BC Hydro does not plan to bring forward alternatives which either increase or decrease LGS demand charge cost recovery**

SUMMARY OF LGS RATE ALTERNATIVES

BC Hydro has not identified a preferred LGS Energy Rate or Demand Rate Structure at this time

Energy Rate Alternatives:

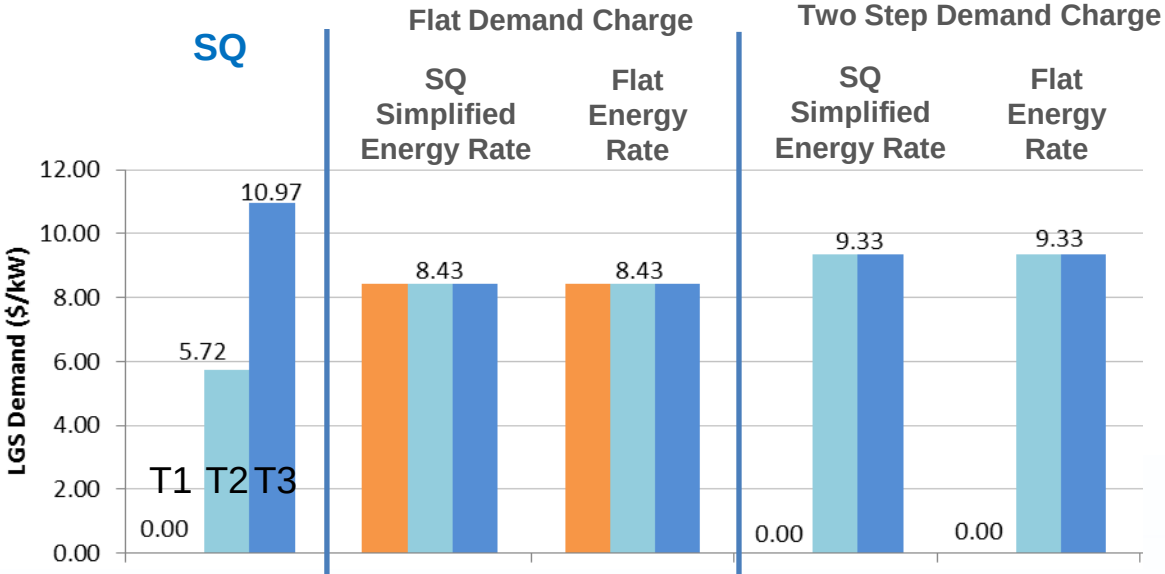
1. Status Quo (SQ) LGS Energy Rate (Retain Baseline)
2. SQ LGS Simplified Energy Rate (Retain Baseline)
3. LGS Flat Energy Rate (No Baseline)
4. LGS TSR-like Rate

Demand Charge Alternatives:

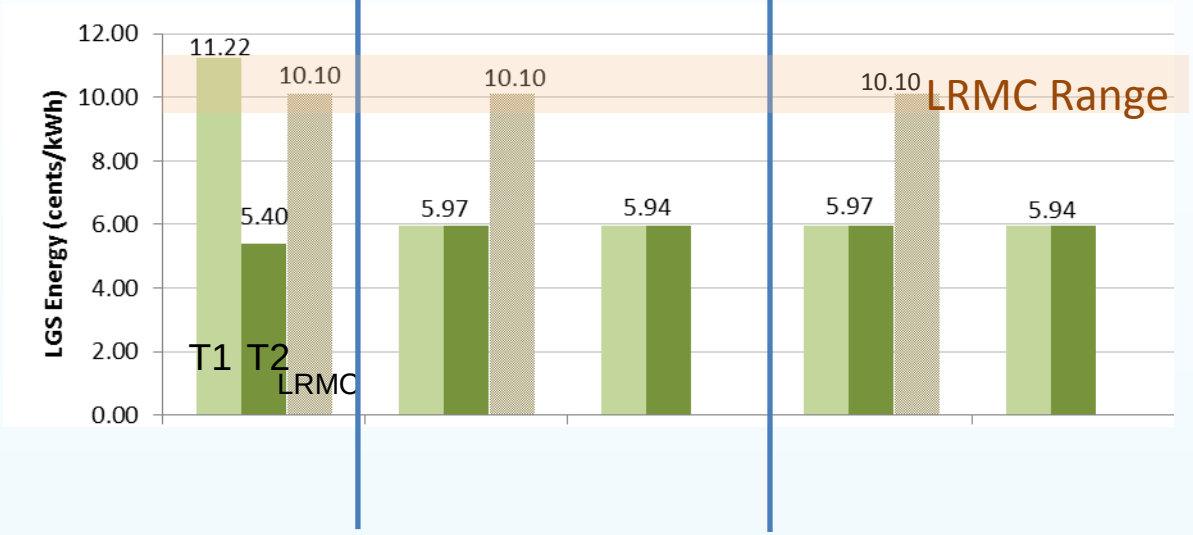
1. SQ Inclining 3 Step Demand Charge
2. Flat Demand Charge
3. Two Step Demand Charge

LGS RATE STRUCTURE ALTERNATIVES F2017 - OVERVIEW

SQ Demand Charge
T1 (First 35 kW)
T2 (35 to 150 kW)
T3 (>150 kW)



SQ Energy Charge
T1 (Pt 1 first 14800 kilowatt hour (kWh) per month (/mo)
T2 (Pt 1 >14800 kWh/mo)
Pt 2 LRMC (Credit/Charge)



BC hydro
FOR GENERATIONS

LGS ENERGY ALTERNATIVE 1: SQ ENERGY RATE

Energy Rate Alternatives:

1. **SQ LGS Energy Rate**
2. SQ LGS Simplified Energy Rate
3. LGS Flat Energy Rate (No Baseline)
4. LGS TSR-like Rate

Demand Charge Alternatives:

1. SQ Inclining 3 Step Demand Charge
2. Flat Demand Charge
3. Two Step Demand Charge

LGS ENERGY ALTERNATIVE 1: SQ ENERGY RATE

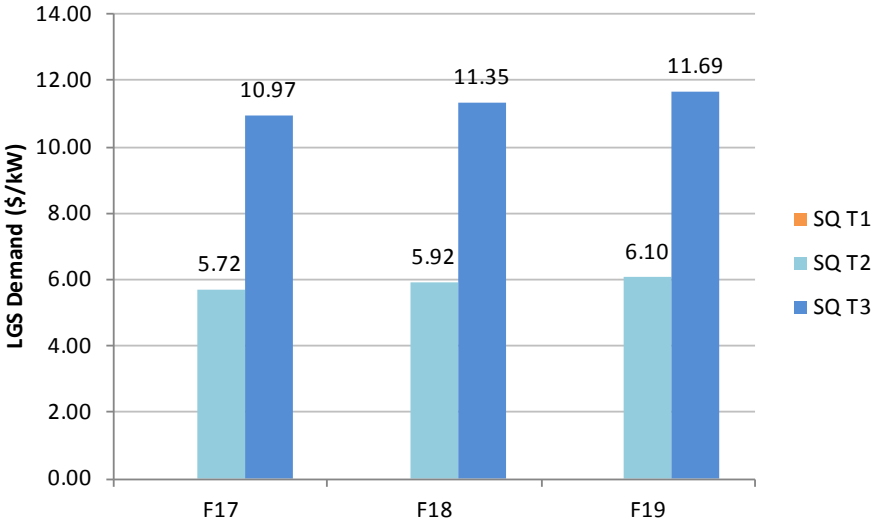
SQ Energy Rate not performing as expected:

1. **Complexity**
   - Customers have difficulty understanding the rate structures
   - Complex rate structures make budgeting/estimating savings difficult for customers
   - Perceived as inhibiting growth

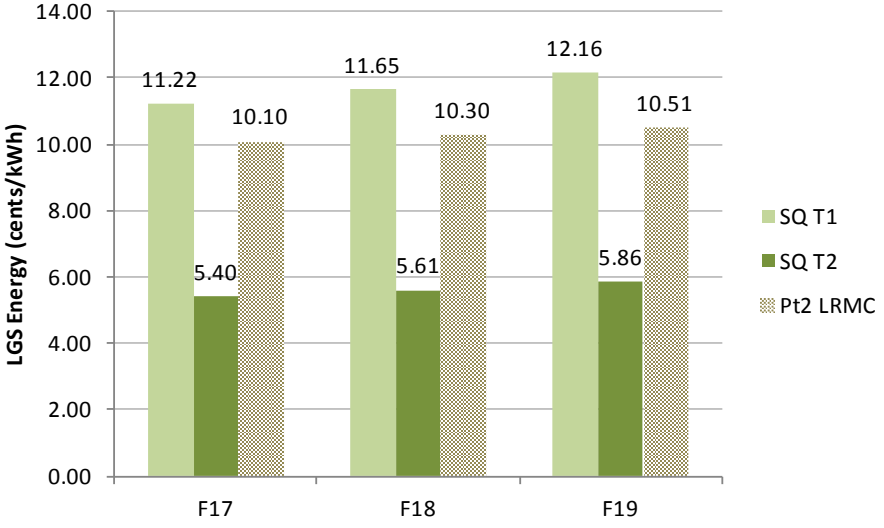
2. **Limited Conservation**
   - Result of two evaluation reports
   - Evaluation Report #2 found LGS evaluated savings in F2014 were 77 GWh/year at 85% confidence level, versus forecast of about 800 GWh/year

   - **BC Hydro forecasting zero conservation for LGS rate for planning purposes**

LGS ENERGY RATE ALTERNATIVE 1: SQ ENERGY RATE



Demand Charges



Energy Rates

Illustrative Customer Bill (F2017)

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
Consume at baseline	$12,501	$50,525	$86	$63,112
+ 5% from baseline	$12,501	$54,284	$86	$66,870
- 5% from baseline	$12,501	$46,767	$86	$59,354

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

Observations:

- Demand charges increase by Revenue Requirement Application (RRA)
- Energy charges increase slightly above RRA, due to recovery of net Part 2 LRMC credits to maintain class revenue neutrality
- Energy T1 exceeds Part 2 LRMC

BC hydro
FOR GENERATIONS

LGS ALTERNATIVE 2: SQ SIMPLIFIED ENERGY RATE

Energy Rate Alternatives:

1. SQ LGS Energy Rate
2. **SQ LGS Simplified Energy Rate**
3. LGS Flat Energy Rate (No Baseline)
4. LGS TSR-like Rate

Demand Charge Alternatives:

1. SQ Inclining 3 Step Demand Charge
2. Flat Demand Charge
3. Two Step Demand Charge

SQ LGS SIMPLIFIED ENERGY RATE

Can the SQ LGS rate be simplified to improve price signal and/or customer understanding and acceptance of price signal to encourage conservation?

A. Flatten Part 1 Energy Rate

B. Baseline Rate Provisions

- Baseline Determination
  - Annual baseline vs. monthly baseline
  - 3-year rolling average
- PLB
- Growth Mitigation
  - Formulaic growth rule (FGR)
  - Anomaly rule
  - Prospective growth rule (Tariff Supplement (TS) 82)
- New Accounts (85/15)

There is some overlap amongst these rules

A. FLAT PART 1 ENERGY RATE

- Flat Part 1 energy rate would be a nominal simplification only as Part 1 consumption threshold of 14,800 kWh/month is not material to most LGS customers

- Reviewed at RDA Workshop 8B:
  - Wide spread in bill impacts
  - Typical customers are mostly below RRA increases
  - More customers better off than worse off; higher consuming customers have more adverse bill impacts

Flat Part 1 Energy Rate – SQ Demand – F15/F16 illustrative bill impact (Workshop 8b)

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%	-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

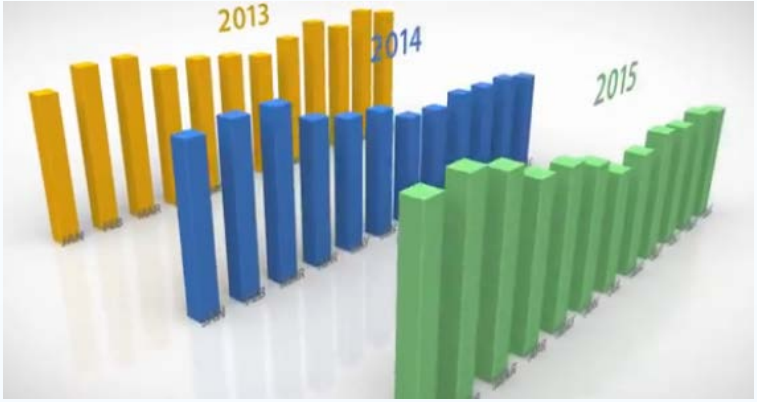
B. BASELINE DETERMINATION

Annual baseline vs. monthly baseline

- Some customers suggested that annual baseline can simplify energy rate and provide higher energy cost predictability
- BC Hydro concern: annual baseline could create annual cash flow burden for many customers at year end

3-year rolling average, monthly baselines

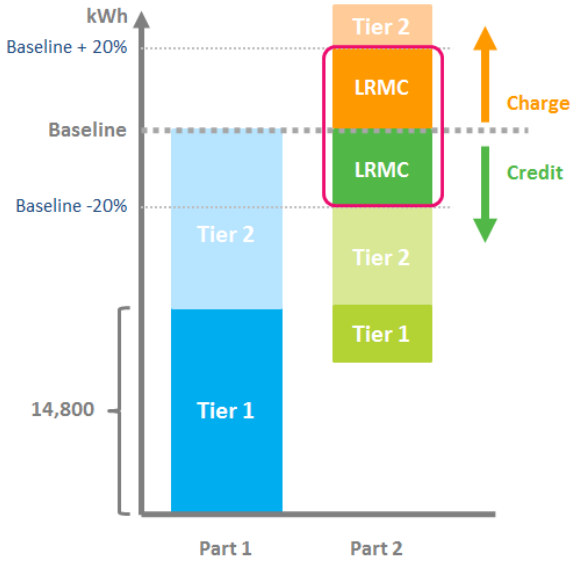
- 5-year rolling average baselines
  - Customers can receive credits or charges for longer
  - Increases complexity of baseline calculation and energy cost predictability
- 1-year baselines (based on previous year)
  - Simplifies baseline calculation
  - Causes bill instability as unusual consumption months cannot be levelled in baselines



BC Hydro recommends no change to current three-year rolling average monthly baseline calculations, and is seeking further feedback

B. PRICE LIMIT BAND

- PLB – Limit customer's exposure to Part 2 LRMC energy rate within a range of 80% of historic baseline (HBL) to 120% of HBL (+20%/-20%)
  - Only a maximum of 20% of HBL subject to Part 2 LRMC energy rate
  - Reviewed as part of the December 2013 Three Year Report
    - No direct evidence regarding impact of PLBs on conservation; changes not warranted
- 17 percent of LGS customer bills exceeded PLB, while 49 percent of LGS customer accounts had at least one bill exceeding PLB (F2014)
- BC Hydro sees these levels as generally low and reasonable
  - Appears to balance exposing customers to an efficient price signal without undue harm or benefit to customers with large changes in consumption



B. PRICE LIMIT BAND, CONT'D

- **Decreasing PLB (e.g., +10%/-10%):**
  - Could mitigate customer concerns that energy rate is a barrier to growing customers, but could diminish conservation signal (this may not be a material concern with a rate that is delivering very little conservation)

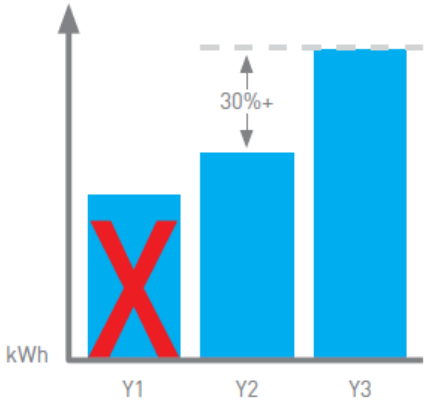
- **Increasing PLB (e.g., +30%/-30%):**
  - Due to relatively low frequency of exceedance of PLB, increasing PLB (or removing it altogether while keeping the Part 2 energy rate) would not be expected to materially impact conservation but could further exacerbate customer concerns that energy rate is a barrier to business expansion

BC Hydro continues to conclude that there are no changes to PLBs that would improve performance of SQ LGS Energy Rate in respect of conservation or customer understanding and acceptance, and is seeking further feedback

B. GROWTH MITIGATION

FGR

- HBLs based on two most recent years of consumption history in year (Y2) following a year (Y1) in which energy consumption exceeded previous year's (Y0) energy consumption by at least: (i) 30% or (ii) 4,000,000 kWh
- Resulted from 2009 LGS Application Negotiated Settlement Agreement (NSA)
- 98 LGS customers qualified in F2015, 127 LGS customers qualified in F2016 (13 qualified for both)
- Bill analysis on 98 F2015 FGR customers showed that FGR has mixed bill impacts:



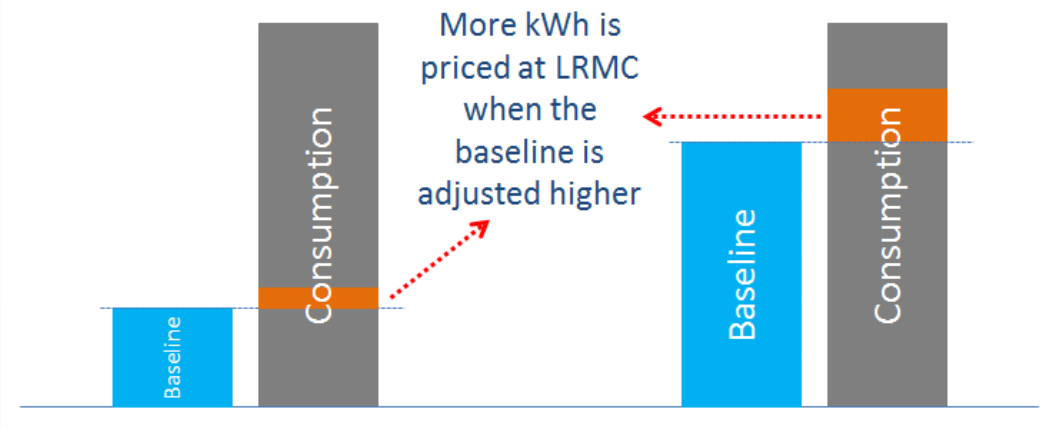
	# of Accounts	% of Accounts	# of Bills	% of Bills
Benefit from FGR	71	72%	591	51%
Pay More with FGR	23	24%	379	33%
No Difference	4	4%	184	16%

- **Note**: Most negatively impacted customer: $27,000 bill increase; most negatively impacted bill: $8,000 bill increase

B. GROWTH MITIGATION – FGR, CONT'D

- LGS rate design assumed customers will benefit from having higher baselines. In reality:
  - Some customers ended up with lower baselines with FGR (higher Y1 consumption was removed)
  - Higher baselines result in growing customers being exposed to a bigger 20% PLB

- Future bills are unpredictable due to multiple variables involved in billing – past, current and future consumption

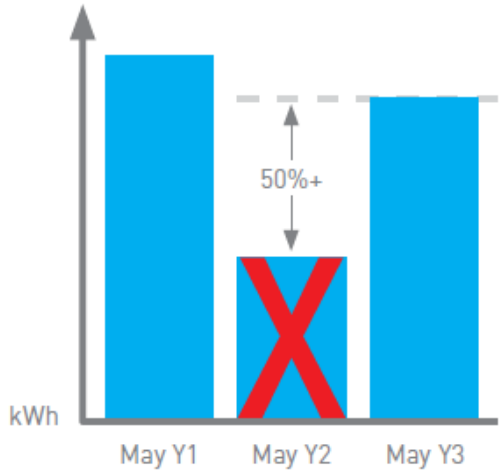


BC Hydro is seeking feedback on whether to remove or modify this provision

B. GROWTH MITIGATION

Anomaly Rule

- In calculating HBLs, anomalously low consumption months from previous years excluded:
  - In calculating HBL for a particular month, consumption in a historical month that is less than half the consumption in next lowest month of all months otherwise used for calculation would be excluded
  - Up to four HBLs can be adjusted in accordance with the Anomaly Rule
- Resulted from 2009 LGS Application NSA
- In practice, Anomaly Rule usually applies when a new account is first set up



B. GROWTH MITIGATION – ANOMALY RULE, CONT'D

- Customers will always end up with higher baselines; however, higher baselines sometimes create higher bills
- The table below summarizes Anomaly Rule application in F2015:

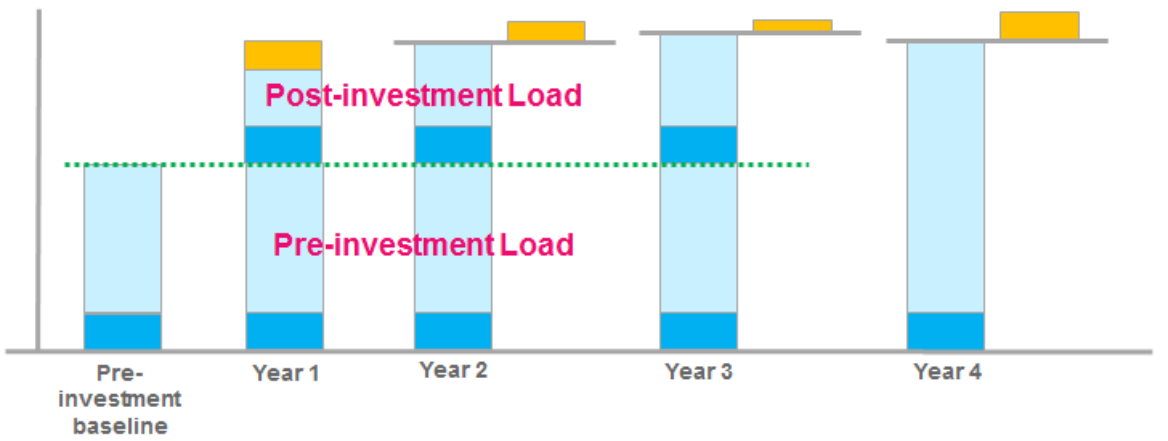
	# of Accounts	# of Occurrences
LGS	610	1,538
MGS	1,532	3,826
Total	**2,142**	**5,364**

BC Hydro is seeking feedback on whether to remove or modify this provision

B. GROWTH MITIGATION

Prospective Growth Rule (TS 82)

- Customers who anticipate 'significant', 'permanent' increases in energy consumption may apply to British Columbia Utilities Commission (BCUC) to seek an increases in their HBLs on a prospective basis
  - 'Significant' means increases in energy consumption totaling at least 30% or 4,000,000 kWh
  - 'Permanent' means arising from a significant capital investment in plant
- Resulted from 2009 LGS Application NSA



B. GROWTH MITIGATION

Prospective Growth Rule (TS 82)

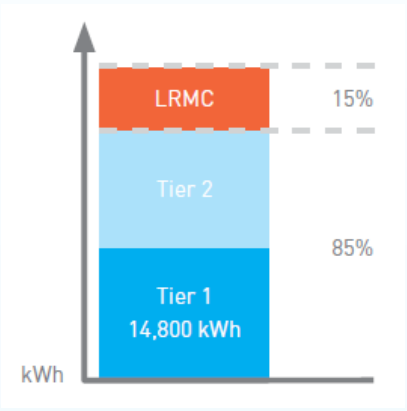
- Very few customers have applied due to high thresholds
- 17 customers have been on TS 82 since it was first introduced in March 2012; 4 customers did not meet threshold after 12 months and were removed from TS 82
- Customer with lower consumption might meet the 30% threshold but won't benefit from the special pricing structure
- High administrative cost to BC Hydro (manual billing process)

BC Hydro is seeking feedback on whether to remove or modify this provision

B. NEW ACCOUNTS (85/15)

Situations that trigger 85/15	Situations that don't trigger 85/15
• A new connection • A customer moves in to an existing metered location • An existing account with new ownership and informed BC Hydro • An existing account being transferred to a different party for accounting purposes (parent company vs. subsidiary) • Asset sale	• Legal name change • Accounts transferred from property management firms to strata corporations • An existing account changes use of premise • Meter amalgamation or separation initiated by BC Hydro

- 85/15 applies when a new account is set up in BC Hydro's billing system, regardless of whether there were changes in customers' operation
  - Last 15% of energy consumed in a monthly billing period charged Part 2 LRMC rate rather than Part 1 energy rates
- Established to prevent customers from 'gaming' by opening new accounts to reset baselines



B. NEW ACCOUNTS (85/15), CONT'D

- BC Hydro found no evidence of gaming in December 2013 Three Year Report
- Customers raised concerns that 85/15 rate unfairly penalizes customers who have no change in operations during account ownership transfers
- Alternatives considered: apply 85/15 rate based on energy usage (regardless of occupancy) or occupancy (regardless of energy usage)
  - Anything other than energy usage will lead to judgment calls, while energy usage can lead to results not acceptable to LGS customers
  - It is operationally infeasible for BC Hydro to apply 85/15 based on "new operations" instead of "new accounts"

BC Hydro recommends applying 100% Part 1 rates for new accounts, and is seeking further feedback

LGS ENERGY ALTERNATIVE 3: LGS FLAT ENERGY RATE

Energy Rate Alternatives:

1. SQ LGS Energy Rate
2. SQ LGS Simplified Energy Rate
3. **LGS Flat Energy Rate (No Baseline)**
4. LGS TSR-like Rate

Demand Charge Alternatives:

1. SQ Inclining 3 Step Demand Charge
2. Flat Demand Charge
3. Two Step Demand Charge

LGS ENERGY ALTERNATIVE 3: LGS FLAT ENERGY RATE

Pros

- Eliminates all complexity resulting from baseline component of SQ LGS Energy Rate
- Easier and more accurate customer forecasting
- Improved customer understanding
- Aligns with other Canadian jurisdictions

Cons

- Energy rate is well below lower end of energy LRMC

Observations on Bill Impacts and Conservation

- Little to no bill impacts resulting solely from removal of baseline (given no changes in consumption over time), as demonstrated in Workshop 8b
- There are bill impacts from flattening Part 1 Energy rates; typical customers better off
- No change in conservation – zero forecast for planning purposes

LGS ENERGY ALTERNATIVE 3: LGS FLAT ENERGY RATE

- **What is flat demand charge for F2017 if energy rate is set at lower end of LRMC for LGS (9.55c/kWh)?**

	Demand Charge	Energy Charge
Flat Rate, revenue neutral to rate component	$8.43 / kW	5.94 c/kWh
Set Flat Energy rate at lower end of LRMC	-$6.14 / kW	9.55 c/kWh

- BC Hydro would need to credit customers $6.14/kW to maintain revenue neutrality

LGS ENERGY ALTERNATIVE 4: TSR-LIKE ENERGY RATE

Energy Rate Alternatives:

1. SQ LGS Energy Rate
2. SQ LGS Simplified Energy Rate
3. LGS Flat Energy Rate (No Baseline)
4. **LGS TSR-like Rate**

Demand Charge Alternatives:

1. SQ Inclining 3 Step Demand Charge
2. Flat Demand Charge
3. Two Step Demand Charge

LGS TSR-LIKE ENERGY RATE

Viterra and Association of Major Power Consumers of British Columbia (AMPC) suggest a TSR-like Rate for a segment of high consumption LGS customers

- Rate may have following elements based on BC Hydro's existing Transmission Service Stepped Rate (Rate Schedule (RS) 1823):
  - Available to large LGS accounts – assumption used for workshop is top 100 accounts by annual energy consumption representing 2,020 GWh (F2014 data) (AMPC suggests LGS accounts with 2,000 kW of demand which would apply to about 170 accounts)
  - Energy Rate (F2017) – illustrative based on RS 1823 90/10 split and rate neutral to LGS Flat Energy Rate:
    - 5.48 ¢/kWh applied to all kWh up to and including 90% of Customer Baseline Load (CBL) in each Billing Year
    - 10.10 ¢/kWh applied to all kWh above 90% of Customer's CBL in each Billing Year
  - Initial annual CBL determined by historic baseline year(s)
  - Allowable adjustments for Demand Side Management (DSM), plant capacity increase and force majeure
  - Annual CBL approved each year by the BCUC

LGS TSR-LIKE ENERGY RATE

Potential Energy Savings?

Assume all accounts consume at 90% of Customer CBL to avoid Tier 2 rate:

- 2,020 GWh x 10% = 202 GWh potential annual energy saving

Pros of TSR-like Rate

1. Rate structure based on RS 1823 is now well understood and provides a clear LRMC price signal
2. Annual Energy CBL – one fixed number versus 12 HBL numbers that change each year
3. Conservation savings mainly based on reported DSM savings (hardwire savings)
4. Significant changes in consumption trigger dead-band (+/-10%) so that CBL is automatically reset

LGS TSR-LIKE ENERGY RATE

Cons of TSR-Like Rate:

1. May affect cash-flow of some customers since they will pay Tier 2 rate for all consumption in last few months of billing year
2. Customers that face year to year load variability due to economic conditions may have bill volatility
3. Increased administrative work for both customer and BC Hydro:
   - Requires CBL determination by BC Hydro and agreement by customer
   - Unlike TSR customers, not all large LGS accounts have a Key Account Manager to assist with rate on-going implementation
   - BC Hydro needs to file annual CBLs with BCUC for approval
   - BCUC needs to approve annual CBLs and adjudicate CBL disputes

LGS DEMAND CHARGE ALTERNATIVE 1: SQ INCLINING 3-STEP

Energy Rate Alternatives:

1. SQ LGS Energy Rate
2. SQ LGS Simplified Energy Rate
3. LGS Flat Energy Rate (No Baseline)
4. LGS TSR-like Rate

Demand Charge Alternatives:

1. **SQ Inclining 3 Step Demand Charge**
2. Flat Demand Charge
3. Two Step Demand Charge

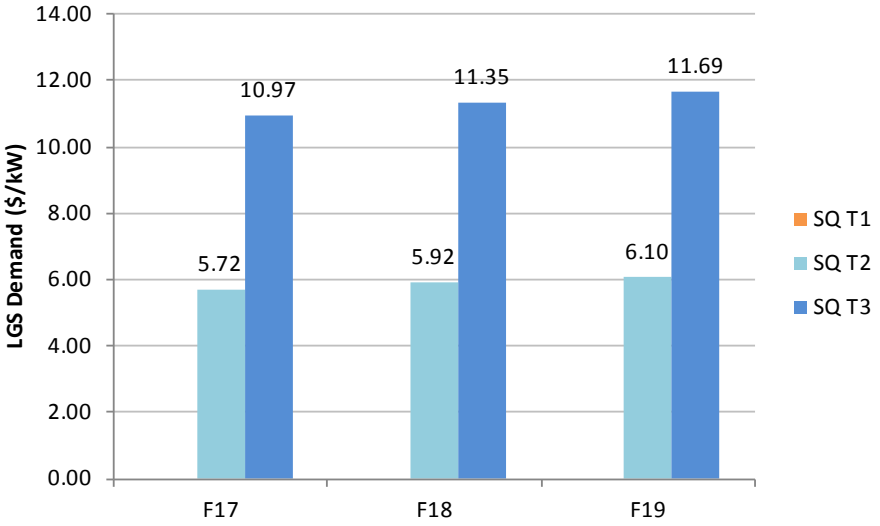
LGS DEMAND CHARGE ALTERNATIVE 1: SQ INCLINING 3-STEP

- BC Hydro has had an inclining block demand charge since at least 1974
  - 1974 rate was five step charge, simplified to four step rate in 1976 and modified further to the existing three step structure in 1980
  - Ratio of charges for demand greater than 150 kW and demand between 35 kW and 150 kW has remained 1.91 since 1980

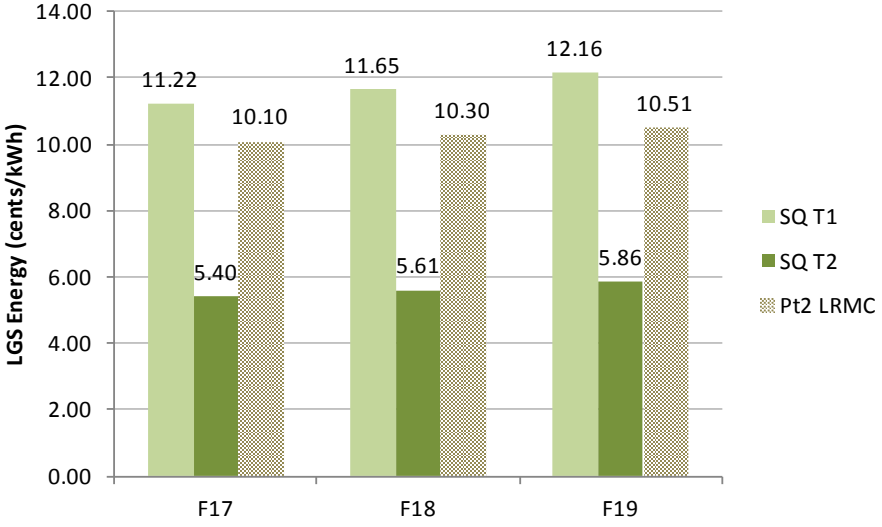
- Identified issue
  - Current structure is likely not justifiable from a COS basis - Analysis to date suggests that BC Hydro's cost to serve demand of LGS class on a $/kW basis is generally flat and does not vary by customer size and amount of demand served

- BC Hydro is only Canadian utility with 3 tier inclining block demand charge
  - Most common is a flat or 2 step demand charge; 2 step have no charge for an initial small block of demand

LGS DEMAND CHARGE ALTERNATIVE 1: SQ INCLINING 3-STEP



Demand Charges



Energy Rates

Illustrative Customer Bill (F2017)

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
Consume at baseline	$12,501	$50,525	$86	$63,112
+ 5% from baseline	$12,501	$54,284	$86	$66,870
- 5% from baseline	$12,501	$46,767	$86	$59,354

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

Observations:

- Demand charges increase by RRA
- Energy charges increase slightly above RRA, due to recovery of net Part 2 LRMC credits to maintain class revenue neutrality
- Energy T1 exceeds Part 2 LRMC

LGS DEMAND CHARGE ALTERNATIVE 2: FLAT DEMAND CHARGE
MODELLED WITH TWO ENERGY RATE ALTERNATIVES

Energy Rate Alternatives:

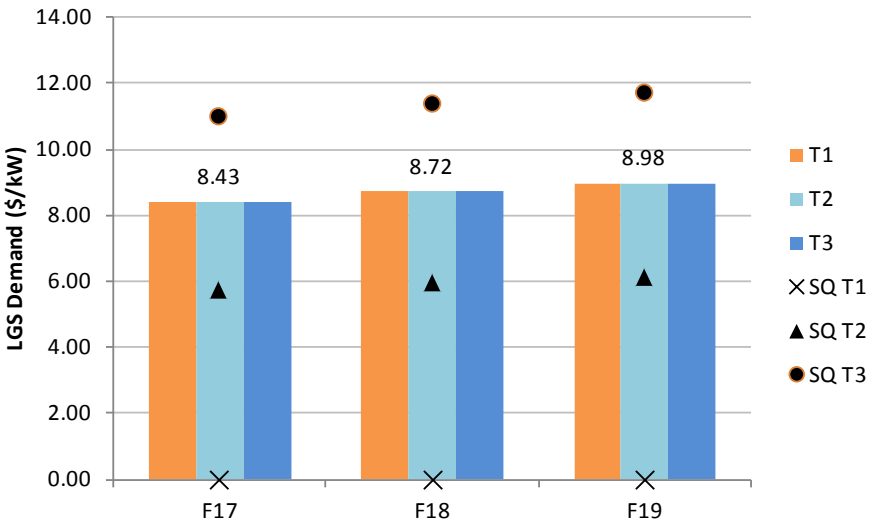
1. SQ LGS Energy Rate
2. **SQ LGS Simplified Energy Rate**
3. **LGS Flat Energy Rate (No Baseline)**
4. LGS TSR-like Rate

+

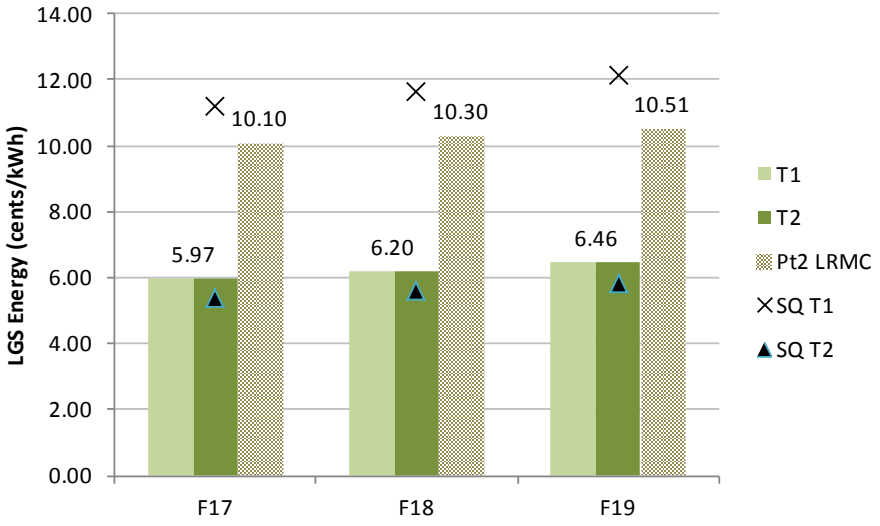
Demand Charge Alternatives:

1. SQ Inclining 3 Step Demand Charge
2. **Flat Demand Charge**
3. Two Step Demand Charge

LGS DEMAND CHARGE ALTERNATIVE 2: FLAT DEMAND CHARGE + SQ LGS SIMPLIFIED ENERGY RATE



Demand Charges



Energy Charges

Illustrative Customer Bill (F2017)

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

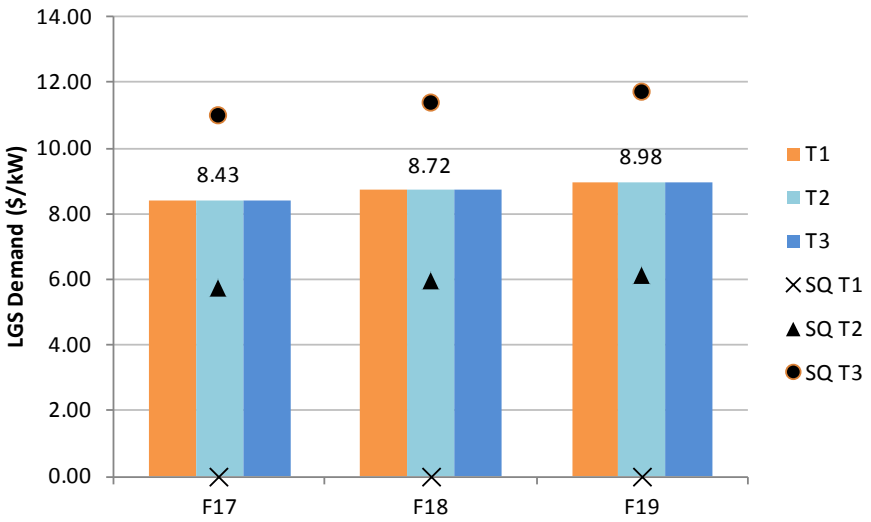
Customer Scenario	Demand Charge	Energy Charge	Basic Charge	Total Bill	SQ Bill	Variance
Consume at baseline	$18,715	$44,431	$86	$63,231	$63,112	$119 (0%)
+ 5% from baseline	$18,715	$48,190	$86	$66,990	$66,870	$119 (0%)
- 5% from baseline	$18,715	$40,673	$86	$59,473	$59,354	$119 (0%)

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

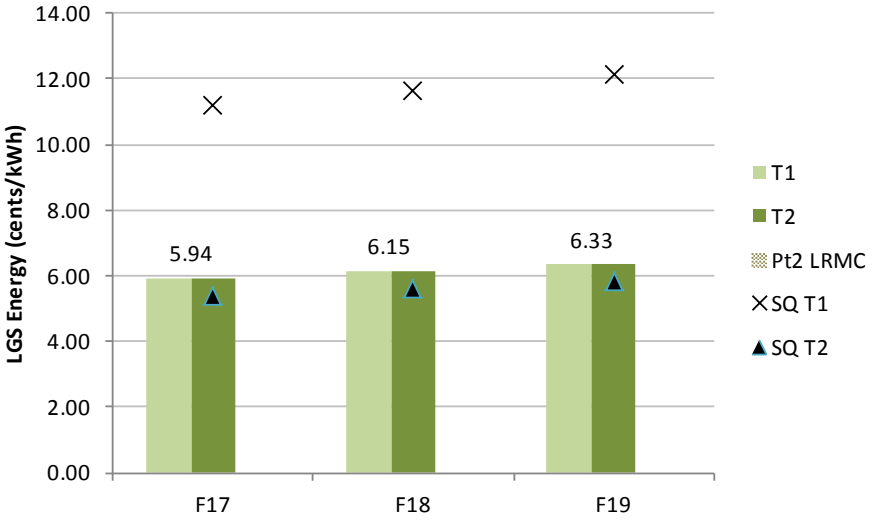
Observations:

- Offsetting effects of flattening demand and energy together is evident on median customer
- Demand charges increase by RRA
- Energy charges increases slightly above RRA

LGS DEMAND CHARGE ALTERNATIVE 2: FLAT DEMAND CHARGE + FLAT ENERGY RATE



Demand Charges



Energy Charges

Illustrative Customer Bill (F2017)

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	$18,715	$44,208	$86	$63,008	$63,112	-$104 (0%)
+ 5% from baseline	$18,715	$46,418	$86	$65,219	$66,870	-$1,652 (-2%)
- 5% from baseline	$18,715	$41,997	$86	$60,798	$59,354	$1,444 (2%)

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

Observations:

- Most variance comes from removal of baseline, due to absence of credits and charges

SUMMARY OF TRADEOFFS DUE TO FLAT DEMAND CHARGE, COMPARED TO SQ

Fairness	Customer Understanding and Acceptance	
Cost Causation	**Customer Understanding**	**Bill Impacts**
• Better reflection of demand costs • More equitable distribution of fixed costs among customers of different kW sizes	• Potentially better understanding • Jurisdictional precedent for flat demand charge • No jurisdictional precedent for 3 step inclining block	• Generally, bill impacts from flattening of demand rates and energy rates offset • Customers with high load factor, high consumption, and low load factor, low consumption experience highest adverse bill impacts

ILLUSTRATIVE SENSITIVITY ANALYSIS

F17 illustrative bill impact

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%	-6.8%	-8.7%	-9.3%	-9.6%	-9.8%	-9.9%	-10.0%	-10.1%	-10.1%	-10.2%	-10.2%	-10.2%	-10.3%	-10.3%	-10.3%	-10.3%	-10.3%
20%	-7.1%	-1.8%	-2.9%	-3.4%	-3.7%	-3.9%	-4.1%	-4.2%	-4.3%	-4.3%	-4.4%	-4.4%	-4.5%	-4.5%	-4.5%	-4.6%	-4.6%
30%	-13.8%	2.8%	1.4%	0.7%	0.3%	0.0%	-0.2%	-0.3%	-0.4%	-0.5%	-0.6%	-0.6%	-0.7%	-0.7%	-0.8%	-0.8%	-0.8%
40%	-17.7%	-0.4%	4.4%	3.6%	3.2%	2.9%	2.6%	2.5%	2.3%	2.2%	2.1%	2.1%	2.0%	2.0%	1.9%	1.9%	1.8%
50%	-20.2%	-2.7%	5.0%	5.8%	5.3%	5.0%	4.7%	4.5%	4.4%	4.3%	4.2%	4.1%	4.0%	4.0%	3.9%	3.9%	3.8%
60%	-22.0%	-4.4%	3.4%	7.5%	7.0%	6.6%	6.3%	6.1%	6.0%	5.8%	5.7%	5.6%	5.6%	5.5%	5.5%	5.4%	5.4%
70%	-24.0%	-5.7%	2.2%	6.6%	8.3%	7.9%	7.6%	7.4%	7.2%	7.1%	7.0%	6.9%	6.8%	6.7%	6.7%	6.6%	6.6%
80%	-26.0%	-6.7%	1.2%	5.7%	8.7%	8.9%	8.6%	8.4%	8.2%	8.1%	8.0%	7.9%	7.8%	7.8%	7.7%	7.6%	7.6%
90%	-27.6%	-7.5%	0.5%	5.0%	8.0%	9.8%	9.5%	9.3%	9.1%	9.0%	8.8%	8.7%	8.7%	8.6%	8.5%	8.5%	8.4%

Lowest kw

Red means higher than Class Average Rate Change (CARC) of 4% for F17

F17 illustrative % bill difference after RRA is excluded

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%	-10.8%	-12.7%	-13.3%	-13.6%	-13.8%	-13.9%	-14.0%	-14.1%	-14.1%	-14.2%	-14.2%	-14.2%	-14.3%	-14.3%	-14.3%	-14.3%	-14.3%
20%	-11.1%	-5.8%	-6.9%	-7.4%	-7.7%	-7.9%	-8.1%	-8.2%	-8.3%	-8.3%	-8.4%	-8.4%	-8.5%	-8.5%	-8.5%	-8.6%	-8.6%
30%	-17.8%	-1.2%	-2.6%	-3.3%	-3.7%	-4.0%	-4.2%	-4.3%	-4.4%	-4.5%	-4.6%	-4.6%	-4.7%	-4.7%	-4.8%	-4.8%	-4.8%
40%	-21.7%	-4.4%	0.4%	-0.4%	-0.8%	-1.1%	-1.4%	-1.5%	-1.7%	-1.8%	-1.9%	-1.9%	-2.0%	-2.0%	-2.1%	-2.1%	-2.2%
50%	-24.2%	-6.7%	1.0%	1.8%	1.3%	1.0%	0.7%	0.5%	0.4%	0.3%	0.2%	0.1%	0.0%	0.0%	-0.1%	-0.1%	-0.2%
60%	-26.0%	-8.4%	-0.6%	3.5%	3.0%	2.6%	2.3%	2.1%	2.0%	1.8%	1.7%	1.6%	1.6%	1.5%	1.5%	1.4%	1.4%
70%	-28.0%	-9.7%	-1.8%	2.6%	4.2%	3.9%	3.6%	3.4%	3.2%	3.1%	3.0%	2.9%	2.8%	2.7%	2.7%	2.6%	2.6%
80%	-30.0%	-10.7%	-2.8%	1.7%	4.7%	4.9%	4.6%	4.4%	4.2%	4.1%	4.0%	3.9%	3.8%	3.8%	3.7%	3.6%	3.6%
90%	-31.6%	-11.5%	-3.5%	1.0%	4.0%	5.8%	5.5%	5.3%	5.1%	5.0%	4.8%	4.7%	4.7%	4.6%	4.5%	4.5%	4.4%

Lowest kw

Red means higher than RRA

***Note: Very high sensitivity on low load factor, lower consumption customers due to T1 kW no longer free.**

More intense green indicates higher bill impact
Most "typical" customers as defined by kWh and Load Factor fall approximately within the blue oval area
Major assumption: customers have the annual max kW for all months

ILLUSTRATIVE SENSITIVITY ANALYSIS

F19 illustrative bill impact

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%	-0.1%	-2.2%	-2.9%	-3.2%	-3.4%	-3.5%	-3.6%	-3.7%	-3.8%	-3.8%	-3.8%	-3.9%	-3.9%	-3.9%	-3.9%	-3.9%	-4.0%
20%	-0.3%	5.4%	4.3%	3.7%	3.4%	3.2%	3.0%	2.9%	2.8%	2.7%	2.7%	2.6%	2.6%	2.5%	2.5%	2.5%	2.4%
30%	-7.3%	10.6%	9.1%	8.3%	7.9%	7.6%	7.4%	7.2%	7.1%	7.0%	6.9%	6.9%	6.8%	6.8%	6.7%	6.7%	6.7%
40%	-11.4%	7.3%	12.4%	11.6%	11.1%	10.7%	10.5%	10.3%	10.2%	10.1%	10.0%	9.9%	9.8%	9.8%	9.7%	9.7%	9.6%
50%	-14.1%	4.8%	13.1%	14.0%	13.5%	13.1%	12.8%	12.6%	12.4%	12.3%	12.2%	12.1%	12.1%	12.0%	12.0%	11.9%	11.9%
60%	-16.0%	3.0%	11.4%	15.9%	15.3%	14.9%	14.6%	14.4%	14.2%	14.1%	14.0%	13.9%	13.8%	13.7%	13.7%	13.6%	13.6%
70%	-18.0%	1.7%	10.2%	15.0%	16.8%	16.3%	16.0%	15.8%	15.6%	15.5%	15.4%	15.3%	15.2%	15.1%	15.1%	15.0%	15.0%
80%	-20.2%	0.6%	9.2%	14.1%	17.2%	17.5%	17.2%	17.0%	16.8%	16.6%	16.5%	16.4%	16.3%	16.2%	16.2%	16.1%	16.1%
90%	-21.9%	-0.2%	8.4%	13.3%	16.5%	18.5%	18.2%	17.9%	17.7%	17.6%	17.4%	17.3%	17.3%	17.2%	17.1%	17.1%	17.0%

Lowest kw

Red means higher than cumulative CARC of 10.9% from (Cumulative increase between F16 and F19)

F19 illustrative % bill difference after RRA is excluded

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%	-11.0%	-13.1%	-13.7%	-14.1%	-14.3%	-14.4%	-14.5%	-14.6%	-14.6%	-14.7%	-14.7%	-14.7%	-14.8%	-14.8%	-14.8%	-14.8%	-14.8%
20%	-11.2%	-5.4%	-6.6%	-7.1%	-7.5%	-7.7%	-7.9%	-8.0%	-8.1%	-8.1%	-8.2%	-8.3%	-8.3%	-8.3%	-8.4%	-8.4%	-8.4%
30%	-18.1%	-0.3%	-1.8%	-2.6%	-3.0%	-3.3%	-3.5%	-3.6%	-3.8%	-3.9%	-3.9%	-4.0%	-4.1%	-4.1%	-4.1%	-4.2%	-4.2%
40%	-22.2%	-3.6%	1.6%	0.7%	0.2%	-0.1%	-0.4%	-0.6%	-0.7%	-0.8%	-0.9%	-1.0%	-1.0%	-1.1%	-1.1%	-1.2%	-1.2%
50%	-24.9%	-6.1%	2.2%	3.2%	2.6%	2.2%	1.9%	1.7%	1.6%	1.5%	1.4%	1.3%	1.2%	1.1%	1.1%	1.0%	1.0%
60%	-26.8%	-7.9%	0.6%	5.0%	4.4%	4.0%	3.7%	3.5%	3.3%	3.2%	3.1%	3.0%	2.9%	2.9%	2.8%	2.8%	2.7%
70%	-28.9%	-9.2%	-0.7%	4.1%	5.9%	5.5%	5.2%	4.9%	4.8%	4.6%	4.5%	4.4%	4.3%	4.2%	4.2%	4.1%	4.1%
80%	-31.1%	-10.2%	-1.7%	3.2%	6.3%	6.7%	6.3%	6.1%	5.9%	5.8%	5.6%	5.5%	5.4%	5.4%	5.3%	5.3%	5.2%
90%	-32.8%	-11.1%	-2.4%	2.5%	5.6%	7.6%	7.3%	7.1%	6.9%	6.7%	6.6%	6.5%	6.4%	6.3%	6.2%	6.2%	6.1%

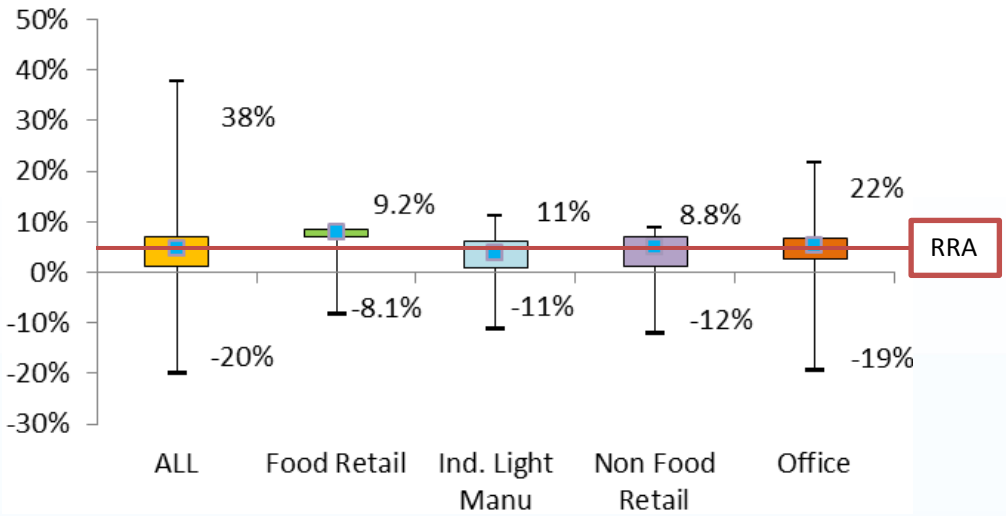
Lowest kw

Red means higher than RRA

***Note: Very high sensitivity on low load factor, lower consumption customers due to T1 kW no longer free.**

More intense green indicates higher bill impact
Most "typical" customers as defined by kWh and Load Factor fall approximately within the blue oval area
Major assumption: customers have the annual max kW for all months

F2017 ILLUSTRATIVE BILL IMPACT



Boxes represent middle 60% of accounts

Most adversely impacted customer:

- Low load factor, low consumption
- Mostly due to demand T1 no longer free
- 5% load factor, 47 megawatt hours per year (MWh/yr), Industrial

Most benefitted customer:

- Medium low load factor, consumption about 150,000 kWh
- Heavily weighted to demand T1 consumption, which reduced in price by 50%
- 37% load factor, 150 MWh/yr, School

F2017 PROPORTION BETTER OFF

SQ LGS Simplified Energy Rate

F17 Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	46%	$61,621	$2,241
Food Retail	9%	$128,568	$3,678
Ind. Manufacturing	57%	$82,804	-$1,803
Non Food Retail	39%	$64,186	$838
Office	36%	$70,873	$1,162

Most adversely impacted customer:

- Low load factor, low consumption
- Mostly due to T1 no longer free
- 5% load factor, 47 MWh/yr, Industrial

LGS Flat Energy Rate

F17 Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	44%	$68,876	$9,496
Food Retail	13%	$128,875	$3,986
Ind. Manufacturing	55%	$79,372	-$5,235
Non Food Retail	34%	$64,327	$979
Office	36%	$72,807	$3,096

Most benefitted customer:

- Medium low load factor, consumption about 150,000 kWh
- Heavily weighted to Part 1 Tier 1 energy consumption; Part 1 Tier 1 rate reduced in price by 50%
- 37% load factor, 150 MWh/yr, School

LGS DEMAND ALTERNATIVE 3: TWO-STEP DEMAND
MODELED WITH TWO ENERGY RATE ALTERNATIVES

Energy Rate Alternatives:

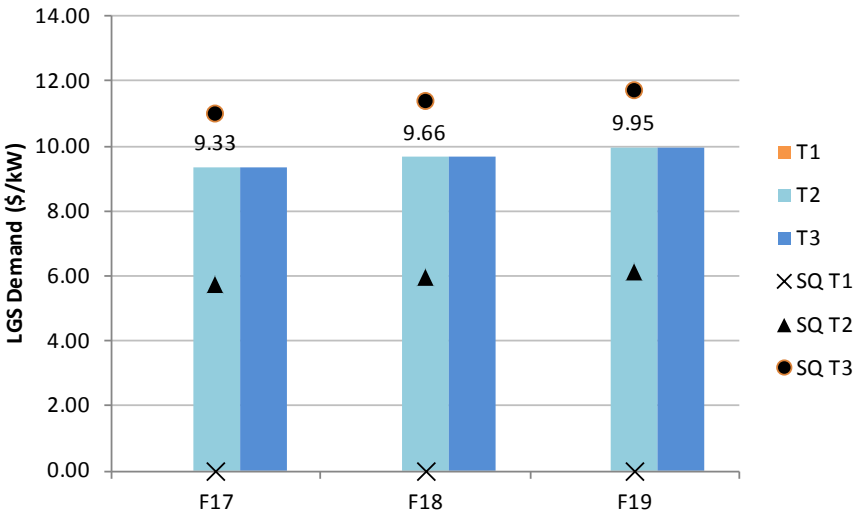
1. SQ LGS Energy Rate
2. **SQ LGS Simplified Energy Rate**
3. **LGS Flat Energy Rate (No Baseline)**
4. LGS TSR-like Rate

+

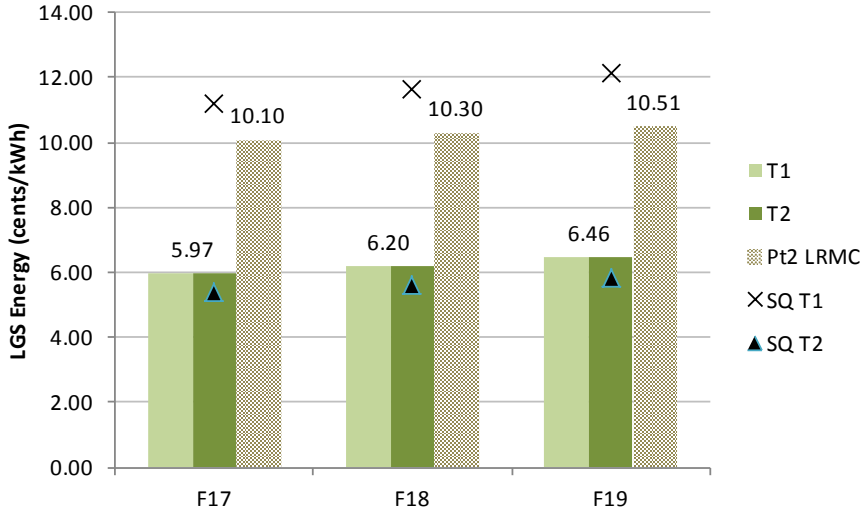
Demand Charge Alternatives:

1. SQ Inclining 3 Step Demand Charge
2. Flat Demand Charge
3. **Two Step Demand Charge**

LGS DEMAND CHARGE ALTERNATIVE 3: TWO STEP DEMAND CHARGE + SQ LGS SIMPLIFIED ENERGY RATE



Demand Charges



Energy Charges

Illustrative Customer Bill (F2017)

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	$16,794	$44,431	$86	$61,311	$63,112	-$1,801 (-3%)
+ 5% from baseline	$16,794	$48,190	$86	$65,069	$66,870	-$1,801 (-3%)
- 5% from baseline	$16,794	$40,673	$86	$57,552	$59,354	-$1,801 (-3%)

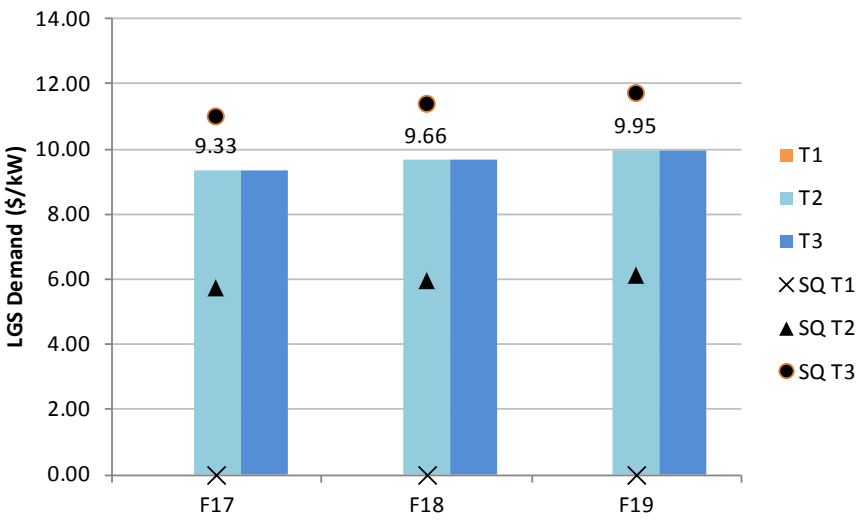
Note: Illustrative bill computation excludes rate rider, discounts, ratchets, and other provisions

Observations:

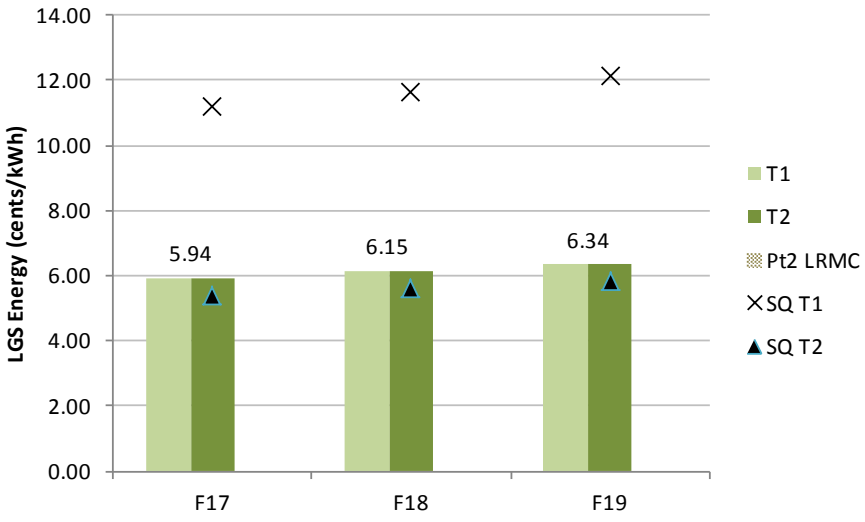
- Less offsetting of bill impacts when compared with LGS Demand Charge Alternative 2

BC hydro
FOR GENERATIONS

LGS DEMAND CHARGE ALTERNATIVE 3: TWO STEP DEMAND CHARGE + LGS FLAT ENERGY RATE



Demand Charges



Energy Charges

Illustrative Customer Bill (F2017)

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	$16,794	$44,208	$86	$61,088	$63,112	-$2,024 (-3%)
+ 5% from baseline	$16,794	$46,418	$86	$63,298	$66,870	-$3,572 (-5%)
- 5% from baseline	$16,794	$41,997	$86	$58,877	$59,354	-$476 (-1%)

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

Observations:

- Most variance comes from removal of baseline, due to absence of credits and charges
- Additional bill savings from lower T3 demand charges

BC hydro
FOR GENERATIONS

SUMMARY OF TRADEOFFS DUE TO TWO STEP DEMAND CHARGE, COMPARED TO SQ

Fairness	Customer Understanding and Acceptance	
Cost Causation	**Customer Understanding**	**Bill Impacts**
• Better reflection of demand costs but Step 1 remains free • Minor improvement on Part-1 (no longer declining)	• Potentially better understanding but flattening T2/T3 demand only could still cause confusion • Jurisdictional precedent for two step inclining block • No jurisdictional precedent for 3 step inclining block	• Generally, bill impacts from flattening of demand rates and energy rates offset. However, offsetting effect is less than for LGS Demand Charge Alternative 2 • Higher bill impacts for high consuming customers with high load factor

ILLUSTRATIVE SENSITIVITY ANALYSIS

F17 illustrative bill impact

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%	-10.8%	-7.5%	-6.5%	-5.9%	-5.6%	-5.4%	-5.3%	-5.2%	-5.1%	-5.0%	-5.0%	-4.9%	-4.9%	-4.8%	-4.8%	-4.8%	-4.8%
20%	-18.0%	-5.1%	-3.4%	-2.6%	-2.1%	-1.8%	-1.6%	-1.4%	-1.3%	-1.2%	-1.1%	-1.0%	-0.9%	-0.9%	-0.8%	-0.8%	-0.8%
30%	-27.6%	-3.5%	-1.4%	-0.4%	0.2%	0.6%	0.9%	1.1%	1.2%	1.4%	1.5%	1.6%	1.6%	1.7%	1.8%	1.8%	1.9%
40%	-33.2%	-8.2%	0.0%	1.2%	1.8%	2.3%	2.6%	2.8%	3.0%	3.2%	3.3%	3.4%	3.5%	3.6%	3.6%	3.7%	3.7%
50%	-36.9%	-11.7%	-0.6%	2.3%	3.1%	3.6%	3.9%	4.2%	4.4%	4.5%	4.6%	4.8%	4.8%	4.9%	5.0%	5.1%	5.1%
60%	-39.6%	-14.2%	-2.9%	3.3%	4.0%	4.5%	4.9%	5.2%	5.4%	5.6%	5.7%	5.8%	5.9%	6.0%	6.1%	6.1%	6.2%
70%	-40.7%	-16.0%	-4.6%	1.8%	4.8%	5.3%	5.7%	6.0%	6.2%	6.4%	6.5%	6.6%	6.7%	6.8%	6.9%	7.0%	7.0%
80%	-40.7%	-17.5%	-6.0%	0.5%	4.7%	6.0%	6.4%	6.7%	6.9%	7.1%	7.2%	7.3%	7.4%	7.5%	7.6%	7.7%	7.7%
90%	-40.7%	-18.6%	-7.1%	-0.5%	3.7%	6.5%	6.9%	7.2%	7.4%	7.6%	7.8%	7.9%	8.0%	8.1%	8.2%	8.2%	8.3%

Lowest kw

Red means higher than CARC of 4% for F17

F17 illustrative % bill difference after RRA is excluded

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%	-14.8%	-11.5%	-10.5%	-9.9%	-9.6%	-9.4%	-9.3%	-9.2%	-9.1%	-9.0%	-9.0%	-8.9%	-8.9%	-8.8%	-8.8%	-8.8%	-8.8%
20%	-22.0%	-9.1%	-7.4%	-6.6%	-6.1%	-5.8%	-5.6%	-5.4%	-5.3%	-5.2%	-5.1%	-5.0%	-4.9%	-4.9%	-4.8%	-4.8%	-4.8%
30%	-31.6%	-7.5%	-5.4%	-4.4%	-3.8%	-3.4%	-3.1%	-2.9%	-2.8%	-2.6%	-2.5%	-2.4%	-2.4%	-2.3%	-2.2%	-2.2%	-2.1%
40%	-37.2%	-12.2%	-4.0%	-2.8%	-2.2%	-1.7%	-1.4%	-1.2%	-1.0%	-0.8%	-0.7%	-0.6%	-0.5%	-0.4%	-0.4%	-0.3%	-0.3%
50%	-40.9%	-15.7%	-4.6%	-1.7%	-0.9%	-0.4%	-0.1%	0.2%	0.4%	0.5%	0.6%	0.8%	0.8%	0.9%	1.0%	1.1%	1.1%
60%	-43.6%	-18.2%	-6.9%	-0.7%	0.0%	0.5%	0.9%	1.2%	1.4%	1.6%	1.7%	1.8%	1.9%	2.0%	2.1%	2.1%	2.2%
70%	-44.7%	-20.0%	-8.6%	-2.2%	0.8%	1.3%	1.7%	2.0%	2.2%	2.4%	2.5%	2.6%	2.7%	2.8%	2.9%	3.0%	3.0%
80%	-44.7%	-21.5%	-10.0%	-3.5%	0.7%	2.0%	2.4%	2.7%	2.9%	3.1%	3.2%	3.3%	3.4%	3.5%	3.6%	3.7%	3.7%
90%	-44.7%	-22.6%	-11.1%	-4.5%	-0.3%	2.5%	2.9%	3.2%	3.4%	3.6%	3.8%	3.9%	4.0%	4.1%	4.2%	4.2%	4.3%

Red means higher than RRA

***Note: Very high sensitivity on low load factor, lower consumption customers due to T2 kW much higher than SQ, even though T1 is free**

ILLUSTRATIVE SENSITIVITY ANALYSIS

F19 illustrative bill impact

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%	-4.8%	-1.4%	-0.2%	0.3%	0.7%	0.9%	1.0%	1.2%	1.3%	1.3%	1.4%	1.4%	1.5%	1.5%	1.5%	1.6%	1.6%
20%	-12.5%	1.3%	3.0%	3.9%	4.4%	4.8%	5.0%	5.2%	5.3%	5.5%	5.5%	5.6%	5.7%	5.7%	5.8%	5.8%	5.9%
30%	-22.7%	3.0%	5.2%	6.3%	6.9%	7.3%	7.6%	7.9%	8.0%	8.2%	8.3%	8.4%	8.5%	8.5%	8.6%	8.6%	8.7%
40%	-28.7%	-2.1%	6.7%	8.0%	8.7%	9.1%	9.5%	9.7%	9.9%	10.1%	10.2%	10.3%	10.4%	10.5%	10.6%	10.6%	10.7%
50%	-32.7%	-5.8%	6.1%	9.2%	10.0%	10.5%	10.8%	11.1%	11.4%	11.5%	11.7%	11.8%	11.9%	12.0%	12.0%	12.1%	12.2%
60%	-35.5%	-8.4%	3.6%	10.2%	11.0%	11.6%	11.9%	12.2%	12.5%	12.6%	12.8%	12.9%	13.0%	13.1%	13.2%	13.2%	13.3%
70%	-36.7%	-10.4%	1.8%	8.7%	11.8%	12.4%	12.8%	13.1%	13.3%	13.5%	13.7%	13.8%	13.9%	14.0%	14.1%	14.2%	14.2%
80%	-36.7%	-11.9%	0.3%	7.3%	11.8%	13.1%	13.5%	13.8%	14.1%	14.2%	14.4%	14.5%	14.6%	14.7%	14.8%	14.9%	15.0%
90%	-36.7%	-13.1%	-0.8%	6.2%	10.7%	13.7%	14.1%	14.4%	14.7%	14.8%	15.0%	15.1%	15.3%	15.4%	15.4%	15.5%	15.6%

Lowest kw

Red means higher than CARC of 10.9% for F16 to F19

F19 illustrative % bill difference after RRA is excluded

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%	-15.7%	-12.2%	-11.1%	-10.5%	-10.2%	-10.0%	-9.8%	-9.7%	-9.6%	-9.5%	-9.5%	-9.4%	-9.4%	-9.4%	-9.3%	-9.3%	-9.3%
20%	-23.3%	-9.6%	-7.8%	-7.0%	-6.4%	-6.1%	-5.9%	-5.7%	-5.5%	-5.4%	-5.3%	-5.2%	-5.2%	-5.1%	-5.1%	-5.0%	-5.0%
30%	-33.6%	-7.9%	-5.7%	-4.6%	-4.0%	-3.5%	-3.2%	-3.0%	-2.8%	-2.7%	-2.6%	-2.5%	-2.4%	-2.3%	-2.3%	-2.2%	-2.2%
40%	-39.6%	-13.0%	-4.1%	-2.9%	-2.2%	-1.7%	-1.4%	-1.1%	-0.9%	-0.8%	-0.6%	-0.5%	-0.5%	-0.4%	-0.3%	-0.2%	-0.2%
50%	-43.6%	-16.6%	-4.8%	-1.7%	-0.9%	-0.4%	0.0%	0.3%	0.5%	0.7%	0.8%	0.9%	1.0%	1.1%	1.2%	1.2%	1.3%
60%	-46.4%	-19.3%	-7.2%	-0.7%	0.1%	0.7%	1.1%	1.4%	1.6%	1.8%	1.9%	2.0%	2.1%	2.2%	2.3%	2.4%	2.4%
70%	-47.5%	-21.2%	-9.1%	-2.2%	1.0%	1.5%	1.9%	2.2%	2.5%	2.7%	2.8%	2.9%	3.0%	3.1%	3.2%	3.3%	3.3%
80%	-47.5%	-22.8%	-10.5%	-3.6%	0.9%	2.2%	2.6%	2.9%	3.2%	3.4%	3.5%	3.7%	3.8%	3.9%	4.0%	4.0%	4.1%
90%	-47.5%	-24.0%	-11.7%	-4.7%	-0.2%	2.8%	3.2%	3.5%	3.8%	4.0%	4.1%	4.3%	4.4%	4.5%	4.6%	4.6%	4.7%

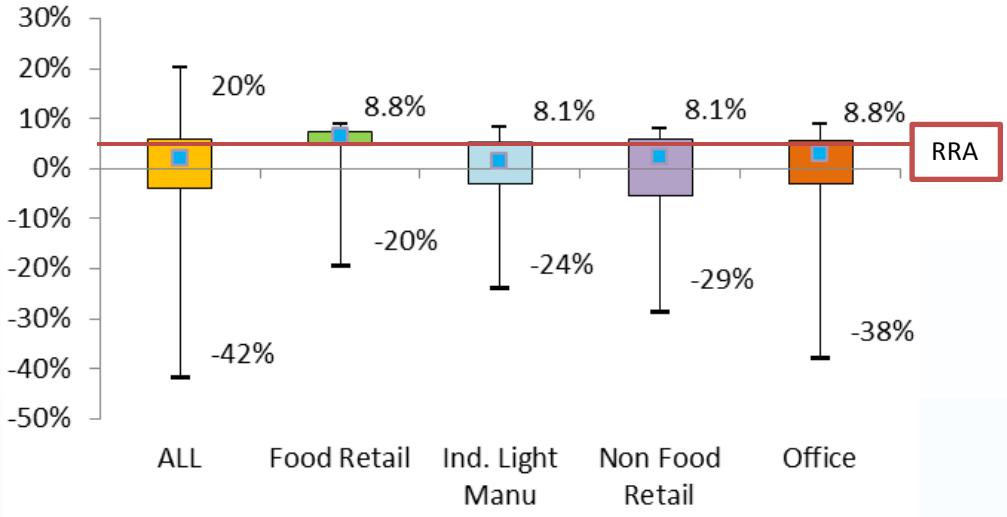
Lowest kw

Red means higher than RRA

***Note: Very high sensitivity on low load factor, lower consumption customers due to T2 kW much higher than SQ, even though T1 is free .**

BC hydro
FOR GENERATIONS

F2017 ILLUSTRATIVE BILL IMPACT



Boxes represent middle 60% of accounts

F18 and F19: Bill impact patterns similar but higher due to RRA

Most adversely impacted customer

- Low load factor, low consumption
- Even though T1 is free, T2 went up in price by almost 50%, triggering high bill impact for T2 customers
- 3% load factor , 45 MWh/yr, Office

Most benefitted customer

- Medium low load factor, consumption about 150,000 kWh
- Heavily weighted to T1 consumption, which reduced in price by 50%
- 37% load factor, 150 MWh/yr, School

BC hydro
FOR GENERATIONS

SQ LGS Simplified Energy Rate

F17 Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	44%	$ 59,538.87	$160
Food Retail	13%	$ 127,489	$2,600
Ind. Manufacturing	55%	$ 81,768	-$2,839
Non Food Retail	34%	$ 61,985	-$1,363
Office	36%	$ 69,051	-$660

Most adversely impacted customer

- Low load factor, low consumption
- Even though T1 demand is free, T2 went up in price by almost 50%, triggering high bill impact for T2 customers
- 3% load factor, 45 MWh/yr, Office

LGS Flat Energy Rate

F17 Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	59%	$66,791	$7,412
Food Retail	23%	$127,796	$2,907
Ind. Manufacturing	62%	$78,336	-$6,271
Non Food Retail	52%	$62,126	-$1,222
Office	52%	$70,984	$1,273

Most benefitted customer

- Medium low load factor, consumption about 150,000 kWh
- Heavily weighted to Part 1 Tier 1 energy consumption; Part 1 Tier 1 rate reduced in price by 50%
- 37% load factor, 150 MWh/yr, School

ILLUSTRATIVE SENSITIVITY ANALYSIS OF BILL IMPACT

F17 Two Step Demand Charge

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%	-10.8%	-7.5%	-6.5%	-5.9%	-5.6%	-5.4%	-5.3%	-5.2%	-5.1%	-5.0%	-5.0%	-4.9%	-4.9%	-4.8%	-4.8%	-4.8%	-4.8%
20%	-18.0%	-5.1%	-3.4%	-2.6%	-2.1%	-1.8%	-1.6%	-1.4%	-1.3%	-1.2%	-1.1%	-1.0%	-0.9%	-0.9%	-0.8%	-0.8%	-0.8%
30%	-27.6%	-3.5%	-1.4%	-0.4%	0.2%	0.6%	0.9%	1.1%	1.2%	1.4%	1.5%	1.6%	1.6%	1.7%	1.8%	1.8%	1.9%
40%	-33.2%	-8.2%	0.0%	1.2%	1.8%	2.3%	2.6%	2.8%	3.0%	3.2%	3.3%	3.4%	3.5%	3.6%	3.6%	3.7%	3.7%
50%	-36.9%	-11.7%	-0.6%	2.3%	3.1%	3.6%	3.9%	4.2%	4.4%	4.5%	4.6%	4.8%	4.8%	4.9%	5.0%	5.1%	5.1%
60%	-39.6%	-14.2%	-2.9%	3.3%	4.0%	4.5%	4.9%	5.2%	5.4%	5.6%	5.7%	5.8%	5.9%	6.0%	6.1%	6.1%	6.2%
70%	-40.7%	-16.0%	-4.6%	1.8%	4.8%	5.3%	5.7%	6.0%	6.2%	6.4%	6.5%	6.6%	6.7%	6.8%	6.9%	7.0%	7.0%
80%	-40.7%	-17.5%	-6.0%	0.5%	4.7%	6.0%	6.4%	6.7%	6.9%	7.1%	7.2%	7.3%	7.4%	7.5%	7.6%	7.7%	7.7%
90%	-40.7%	-18.6%	-7.1%	-0.5%	3.7%	6.5%	6.9%	7.2%	7.4%	7.6%	7.8%	7.9%	8.0%	8.1%	8.2%	8.2%	8.3%

Lowest kw

Red means higher than CARC of 4% for F17

F17 Flat Demand Charge

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%	-6.9%	-8.8%	-9.5%	-9.8%	-10.0%	-10.1%	-10.2%	-10.2%	-10.3%	-10.3%	-10.4%	-10.4%	-10.4%	-10.4%	-10.5%	-10.5%	-10.5%
20%	-7.4%	-2.1%	-3.1%	-3.7%	-4.0%	-4.2%	-4.3%	-4.4%	-4.5%	-4.6%	-4.6%	-4.7%	-4.7%	-4.8%	-4.8%	-4.8%	-4.8%
30%	-14.0%	2.5%	1.1%	0.4%	0.0%	-0.3%	-0.5%	-0.6%	-0.7%	-0.8%	-0.9%	-0.9%	-1.0%	-1.0%	-1.1%	-1.1%	-1.1%
40%	-18.0%	-0.7%	4.1%	3.3%	2.8%	2.5%	2.3%	2.1%	2.0%	1.9%	1.8%	1.7%	1.7%	1.6%	1.6%	1.5%	1.5%
50%	-20.5%	-3.1%	4.6%	5.5%	4.9%	4.6%	4.3%	4.1%	4.0%	3.9%	3.8%	3.7%	3.6%	3.6%	3.5%	3.5%	3.5%
60%	-22.3%	-4.8%	3.9%	7.1%	6.6%	6.2%	5.9%	5.7%	5.6%	5.4%	5.3%	5.2%	5.2%	5.1%	5.1%	5.0%	5.0%
70%	-24.3%	-6.1%	1.8%	6.2%	7.9%	7.5%	7.2%	7.0%	6.8%	6.7%	6.6%	6.5%	6.4%	6.3%	6.3%	6.2%	6.2%
80%	-26.3%	-7.1%	0.8%	5.3%	8.2%	8.5%	8.2%	8.0%	7.8%	7.7%	7.6%	7.5%	7.4%	7.3%	7.3%	7.2%	7.2%
90%	-27.9%	-7.9%	0.1%	4.6%	7.5%	9.4%	9.1%	8.8%	8.6%	8.5%	8.4%	8.3%	8.2%	8.1%	8.1%	8.0%	8.0%

Lowest kw

Red means higher than CARC of 4% for F17

***Note: Very high sensitivity on low load factor, lower consumption customers due to T2 kW much higher than SQ, even though T1 is free .**

BC hydro
FOR GENERATIONS

WORKSHOP 11B

2. GS OPTIONAL RATES

1. Voluntary TOU Rates
2. Interruptible Rates
3. Efficiency Rate Credit concept
4. Demand Charge Options

GS OPTIONAL RATES

1. Voluntary TOU Rate

   - No plan to proceed developing this option at this time for reasons set out in section 6.1 of Workshop 8A/8B consideration memo

2. Interruptible Rates

   - Assess option as part of RDA Module 2, after default GS rates determined

3. Efficiency Rate Credit concept

   - Assess option as part of RDA Module 2, after default GS rates determined

4. Demand Charge Options

   - Assess options as part of RDA Module 2, after default GS rates determined

1. VOLUNTARY TIME OF USE RATES

No plan to proceed to develop this option at this time

Issues Include:

1. Estimated small peak to off-peak differential unlikely to induce a shift in consumption
2. Participation mainly from ‘natural winners’, self-selecting customers with beneficial load shapes
3. Likely no capacity deferral value for planning purposes

2. INTERRUPTIBLE RATES

Assess interruptible rate option as part of RDA Module 2, after default GS rates determined

Possible Interruptible Rate Structure Options:

1. Modelled on Transmission Service RS 1852
   - Target transmission or distribution peak period constraints
   - Offer discounted demand charge
2. Modelled on Transmission Service RS 1880 and TS 76
   - Non-firm service provided to customers with self-generation
   - Notice provisions, energy charges, minimum service, exit and entry fees?
3. Curtailable Service (Credit)
   - Modelled on Hydro Quebec and Newfoundland Power GS options
   - Contract to reduce demand by set amount during a curtailment period and/or contract to reduce demand to a ‘Firm Demand level’ which cannot exceed maximum demand during a curtailment period?

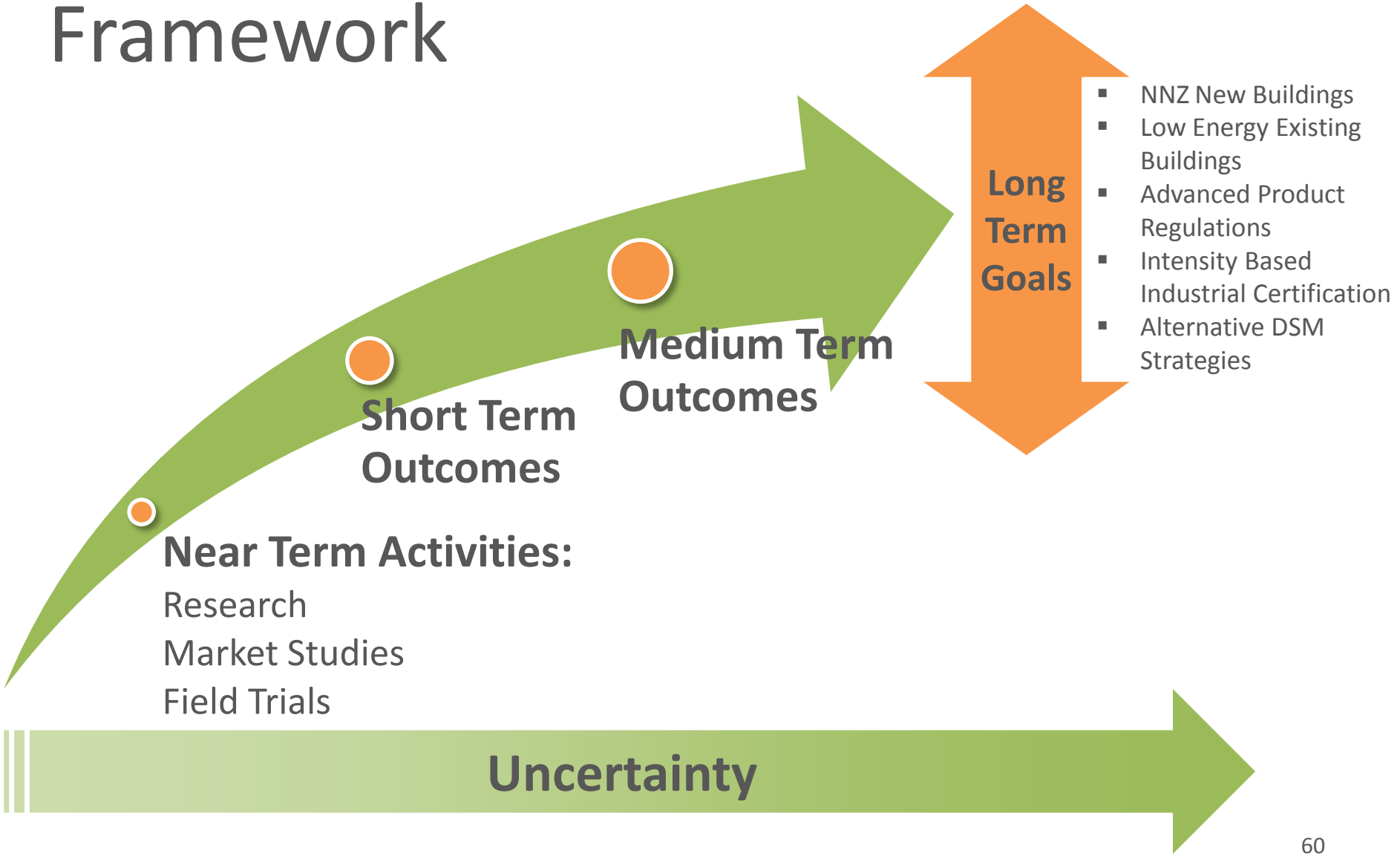
3. EFFICIENCY RATE CREDIT

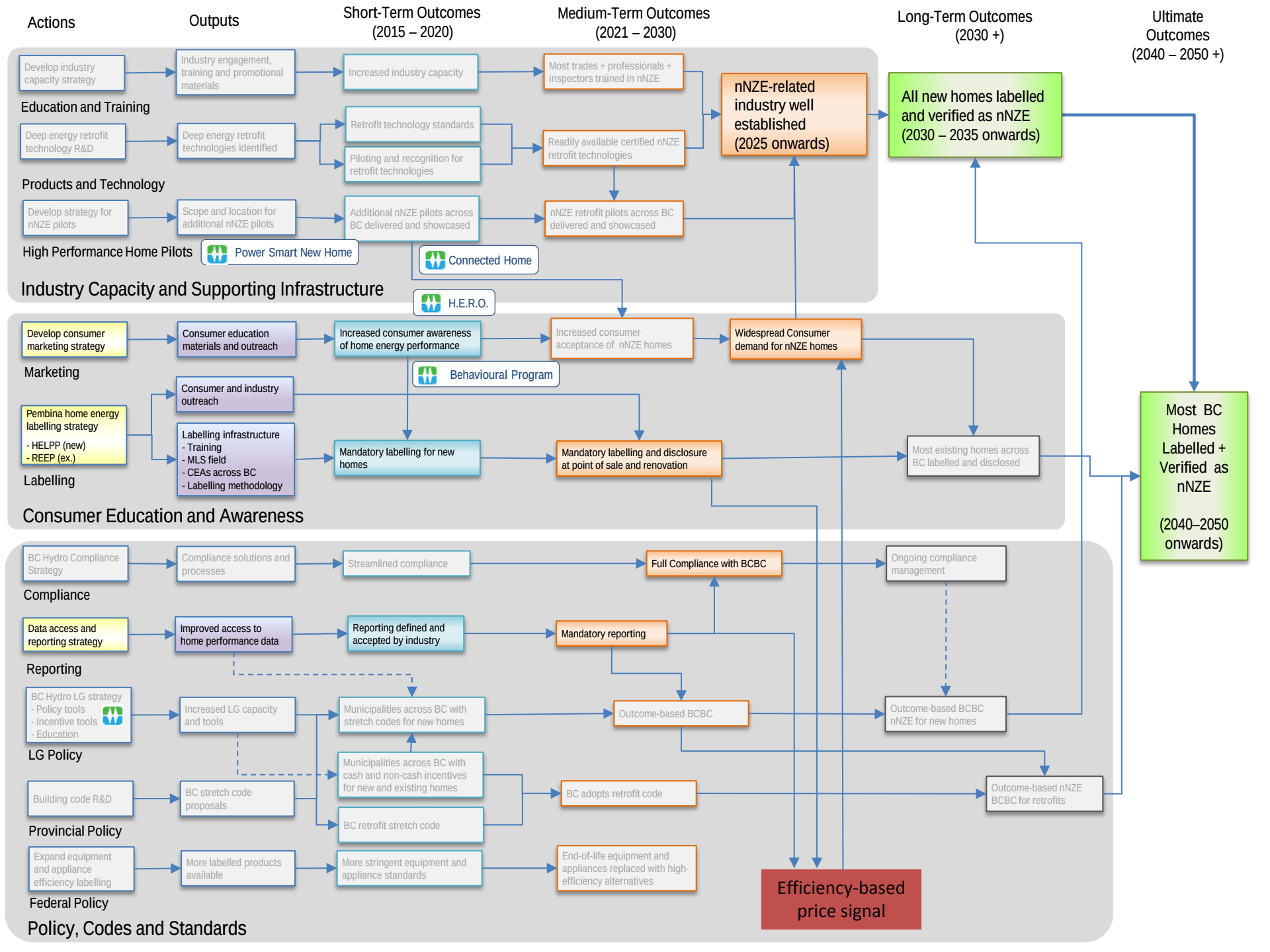
Assess efficiency rate credit concept as part of RDA Module 2, after default GS rates determined

- Proposed by Commercial Energy Consumers Association of British Columbia (CEC)
- Purpose would be to enable delivery of appropriate price signals for conservation and efficiency
- Rate savings to GS customers who undertake measures to be energy efficient
- Credit based on value of energy savings, independently verified and measured against a baseline level of DSM

- BC Hydro, and through its Electricity Conservation and Efficiency Advisory Committee (EC&E), is working to establish efficacy and level of credibility in efficiency ratings and standards as well as potential infrastructure required to implement them
- This work must be undertaken first before consideration can be given to whether an Efficiency Rate Credit can be designed in concept to potentially link these ratings
- BC Hydro will continue to pursue the topic of efficiency ratings and standards with EC&E and CEC

IRP Action 3 Strategic Framework




Actions
Outputs
Short-Term Outcomes (2015 – 2020)
Medium-Term Outcomes (2021 – 2030)
Long-Term Outcomes (2030 +)
Ultimate Outcomes (2040 – 2050 +)
Develop industry capacity strategy
Industry engagement, training and promotional materials
Increased industry capacity
Most trades + professionals + inspectors trained in nNZE
Education and Training
Deep energy retrofit technology R&D
Deep energy retrofit technologies identified
Retrofit technology standards
Piloting and recognition for retrofit technologies
Readily available certified nNZE retrofit technologies
Products and Technology
Develop strategy for nNZE pilots
Scope and location for additional nNZE pilots
Additional nNZE pilots across BC delivered and showcased
nNZE retrofit pilots across BC delivered and showcased
High Performance Home Pilots
Power Smart New Home
Connected Home
H.E.R.O.
nNZE-related industry well established (2025 onwards)
All new homes labelled and verified as nNZE (2030 – 2035 onwards)
Industry Capacity and Supporting Infrastructure
Develop consumer marketing strategy
Consumer education materials and outreach
Increased consumer awareness of home energy performance
Increased consumer acceptance of nNZE homes
Widespread Consumer demand for nNZE homes
Marketing
Behavioural Program
Consumer and industry outreach
Pembina home energy labelling strategy
- HELPP (new)
- REEP (ex.)
Labelling infrastructure
- Training
- MLS field
- CEAs across BC
- Labelling methodology
Mandatory labelling for new homes
Mandatory labelling and disclosure at point of sale and renovation
Most existing homes across BC labelled and disclosed
Labelling
Consumer Education and Awareness
Most BC Homes Labelled + Verified as nNZE (2040–2050 onwards)
BC Hydro Compliance Strategy
Compliance solutions and processes
Streamlined compliance
Full Compliance with BCBC
Ongoing compliance management
Compliance
Data access and reporting strategy
Improved access to home performance data
Reporting defined and accepted by industry
Mandatory reporting
Reporting
BC Hydro LG strategy
- Policy tools
- Incentive tools
- Education
Increased LG capacity and tools
Municipalities across BC with stretch codes for new homes
Outcome-based BCBC
Outcome-based BCBC nNZE for new homes
LG Policy
Municipalities across BC with cash and non-cash incentives for new and existing homes
Building code R&D
BC stretch code proposals
BC retrofit stretch code
BC adopts retrofit code
Outcome-based nNZE BCBC for retrofits
Provincial Policy
Expand equipment and appliance efficiency labelling
More labelled products available
More stringent equipment and appliance standards
End-of-life equipment and appliances replaced with high-efficiency alternatives
Federal Policy
Efficiency-based price signal
Policy, Codes and Standards

4. DEMAND CHARGE OPTIONS

Assess rate options as part of RDA Module 2, after default GS rates determined

1. **Charge MGS or LGS customers for peak demand in High Load Hours only?**
   - Modelled on RS 1823 demand charge
   - Self-selection, revenue loss, impact on non-participants?

2. **Limited Use of Billing Demand?**
   - Offered by Manitoba Hydro to its low load factor GS customers
   - Lower demand charges, higher energy charges to benefit low load factor customers with lower impact on system peak demand and associated costs
   - BC Hydro seeks feedback, especially from low load factor customers with concerns about default LGS/MGS demand charge

3. **Subscription Rate?**
   - Subscribe for certain demand level based on a specific $/kW charge + higher charges for exceeding contracted levels
   - Could mitigate risk of unexpected load growth
   - Rationale and justification for the excess demand charge?

WORKSHOP 11B

3. OTHER ISSUES

1. Minimum Charges (Demand Ratchet)
2. Transformer Ownership Discount (TOD)

2. MINIMUM CHARGES (DEMAND RATCHET)

- Existing minimum charge is based on 50% of peak monthly demand registered in most recent winter period (November to March)
- Ensures customers with high winter consumption and low summer consumption pay an appropriate share of BC Hydro's costs to maintain infrastructure related to winter peak
- Ratchet was reduced from 75% to 50% effective 1 April 1980
- Based on F2014 data:
  - MGS minimum charges: ~$135,000 on total revenue of ~ $329 million (~0.04%)
  - LGS minimum charges: ~$1.6 Million on about $764 million excluding rate rider (~0.2%)
- BCUC FortisBC 2009 RDA decision: should be consistency between classes – demand ratchet for BC Hydro Transmission Service customers is 75%
- All Canadian jurisdictions surveyed to date have minimum demand charges
  - Demand ratchets applicable in about half of surveyed Canadian jurisdictions, ranging from 25% to 100%; a Basic Charge additionally or otherwise applicable
- **BC Hydro proposes to address Demand Ratchet as part of RDA Module 1 and is seeking feedback on the current Demand Ratchet**

3. TOD AND TRANSFORMER RENTALS

- TOD rate is $0.25 per month per kW of billing demand if customer supplies transformation from primary potential to secondary potential - in place for many years
- Last review of $0.25 /month discount was completed in August 2004

- **BC Hydro proposes to evaluate TOD in conjunction with Distribution Extension Policy as part of RDA Module 2**
  - Size and application of discount is more connected to Distribution extension policy than default MGS or LGS rates
  - No pressing urgency expressed on behalf of customers to date
  - **BC Hydro seeks feedback on this recommended approach**

CONCLUSION – REQUEST FOR FEEDBACK

BC Hydro seeking feedback on the following:

1. **LGS**
   - Which of the four energy rate structure alternatives (SQ LGS Energy Rate, SQ LGS Simplified Energy Rate, LGS Flat Energy Rate, LGS TSR-like Rate) is preferred (with reasons)?
   - Which of the three demand charge structure alternatives (SQ Inclining 3 Step Demand Charge, Flat Demand Charge, Two Step Demand Charge) is preferred (with reasons)?
2. **Optional Rates**
   - BC Hydro's proposal to review GS optional rates as part of Module 2
   - Preliminary comments on options identified to date (with reasons) and if there are any other GS rate options BC Hydro should consider
3. **Other Issues**
   - Timing of review of and any alternatives to current Demand Ratchet
   - Timing of review of TOD

NEXT STEPS

- 30 day written comment period for both 25 June (Workshop 11A) and 26 June (Workshop 11B) workshops to commence with posting of draft 26 June workshop summary notes
- 30 July 2015 – Wrap up workshop, including additional segmentation analysis
- Late August 2015 Workshop 11A/11B consideration memo – identify preferred SGS, MGS and LGS rate structures
- 17 September 2015 – BC Hydro files 2015 RDA Module 1 with BCUC

THANK YOU

SEND COMMENTS TO:
bchydroregulatorygroup@bchydro.com

For further information,
please contact:
BC Hydro Regulatory Group
bchydroregulatorygroup@bchydro.com
(604) 623-4046

BC hydro
FOR GENERATIONS

Find BC Hydro at:

Facebook Flickr YouTube Twitter

www.bchydro.com