

# 2015 RATE DESIGN APPLICATION (RDA) WORKSHOP NO. 9A

1. ELECTRIC TARIFF TERMS AND CONDITIONS
2. DEFAULT RESIDENTIAL RATE DESIGN

# AGENDA

## **Part 1: Electric Tariff Terms and Conditions**

1. Introduction and Standard Charge Principles
2. Update on other items from Workshop 3
3. Reconnection Charge and Re-Application for Service
4. Meter Test Charge
5. Security Deposits

## **Part 2: Default Residential Rate Design**

1. Context
2. Modelling assumptions and process
3. Status Quo (SQ) Residential Inclining Block (RIB) rate
4. Alternative designs to the RIB

# PART 1

## TERMS AND CONDITIONS

1. Introduction and Standard Charges
2. Update on other items from Workshop 3
3. Reconnection Charge and Re-Application for Service
4. Meter Test Charge
5. Security Deposits

## 1. INTRODUCTION AND STANDARD CHARGE PRINCIPLES

- Section 11 of the Electric Tariff consists of a schedule of standard charges. Other relevant sections include:

Section	Description
3.14	<ul style="list-style-type: none"> <li>Service Connections (not part of Workshop 3; limited to presenting updated costs at Workshop 7)</li> </ul>
4.2.5	<ul style="list-style-type: none"> <li>Legacy Meters and Radio-off Meters (Workshop 1: not in scope for 2015 RDA given recent British Columbia Utilities Commission (BCUC) review)</li> </ul>
6.0	<ul style="list-style-type: none"> <li>Late Payment Charge; Returned Cheque; Account Charge; Collection Charge; Call-back Charge; Reconnection Charge</li> </ul>

- COPE 378 asked BC Hydro to set out the principles informing standard charges. The principle informing BC Hydro's Standard Charges is:
  - Cost recovery for activities undertaken because of a request or action of a specific customer, whether existing or new
- Single, blended cost applied to all customers, for fairness and simplicity

## TIMING OPTIONS FOR UPDATING STANDARD CHARGES

### Option 1 – Update with RDA filings

- Comprehensive RDA filings have been infrequent; charges were last updated in 2007

### Option 2 – Update with other more periodic filings such as: (1) Rate change compliance filings or (2) Revenue Requirement Application (RRA) filings

**BC Hydro would like stakeholder feedback on the timing options for updating of Standard Charges.**

## 2. UPDATE ON OTHER ITEMS FROM WORKSHOP 3

(for which there appears to be a fair degree of stakeholder consensus)

Discussed in Workshop 3	Current Charge	Recommendation (F2017)
Non-Payment Report Charge	N/A	<ul style="list-style-type: none"> <li>Will not pursue</li> </ul>
Credit Card Charge	N/A	<ul style="list-style-type: none"> <li>Will not pursue</li> </ul>
DataPlus Service	\$360 per year	<ul style="list-style-type: none"> <li>Eliminate this Standard Charge</li> </ul>
Collection Charge	\$39	<ul style="list-style-type: none"> <li>Eliminate this Standard Charge</li> </ul>
Late Payment Charge	1.5% per month (equivalent 19.6% per annum compounded monthly)	<ul style="list-style-type: none"> <li>No amendment proposed</li> </ul>
Account Charge	\$12.40	<ul style="list-style-type: none"> <li>Update to reflect current costs (~\$13.50)</li> <li>Will not pursue differentiated charge</li> </ul>
Returned Payment Charge	Equivalent to BC Hydro's lead bank's Not-Sufficient Funds cheque charge in effect on 1 April of each year	<ul style="list-style-type: none"> <li>Update to reflect current costs (~\$6.15)</li> </ul>

- Refer to the Workshop 3 consideration memo for the rationale for charges not being pursued
- Reconnection charge remains most significant charge issue

## 3. RECONNECTION CHARGE (SECTION 6.7)

- Feedback from Workshop 3
  - Technology infrastructure costs should not be included
  - Rate should be blended to reflect both automated and manual activities
- Disconnection following non-payment is the primary activity considered
  - Costs of late payment notices, etc. are borne by all customers
  - Disconnection and reconnection costs are incurred because of the specific customer failing to pay
- Reconnection Charge
  - Update charge to reflect current costs
  - Update Terms and Conditions related to re-application for service and exclusions from when charge is applied

# MINIMUM RECONNECTION CHARGES

**\*\*Illustrative Example from Workshop 3\*\***

*Fair degree of  
stakeholder  
consensus*

Process Step	Unit Cost per Reconnection			
	Scenario 1	Scenario 2	Scenario 3	Scenario 4
	Full Costing	50% IT Disconnect	100% IT Reconnect	No IT
<b>Initiate Disconnection</b>				
Agent costs	\$6	\$6		\$6
<b>Disconnect Customer</b>				
Remote Disconnect Reconnect (RDR) Metering and Information Technology (IT)	90	45		
Manual disconnection	8	8		8
<b>Report a Payment / Initiate Reconnection</b>				
Agent costs	3	3	3	3
IT investment in self-service reconnections	6	6	6	6
<b>Reconnect Customer</b>				
RDR Metering and IT	90	90	90	
Manual reconnection	10	10	10	10
<b>Charge per Non-pay Disconnect / Reconnect</b>	<b>\$213</b>	<b>\$168</b>	<b>\$109</b>	<b>\$33</b>
<b>Total Costs Recovered</b>	<b>\$3.9M</b>	<b>\$3.1M</b>	<b>\$2.0M</b>	<b>\$0.6M</b>

Scenario 1: All costs (labour and IT) for disconnection and reconnection are allocated to the reconnection charge

Scenario 2: 50% of RDR IT costs for the disconnection are allocated to the reconnection charge

Scenario 3: No disconnection costs included; IT costs for reconnection are allocated to the reconnection charge

Scenario 4: IT excluded; costs reflect labour and vehicles for disconnection and reconnection

Note: Manual reconnection costs assume reconnections during normal working hours



# PROPOSED RECONNECTION CHARGE

## Current Estimate of Costs for Illustrative Purposes

Process Step	Cost	% of Disconnections	Blended Unit Cost
<b>Agent</b>			
Initiate disconnection	4.40	100%	\$4.40
Initiate reconnection	4.67	40%	1.87
<b>Manual Disconnect / Reconnect</b>			
Disconnection	265.46	3%	5.81
Reconnection	175.00	8%	14.00
<b>Charge per Non-pay Disconnect / Reconnect</b>			<b>\$26.07</b>

If a manual reconnection is required, a request to perform it outside of normal working hours would incur an additional cost to reflect labour rates

**One stakeholder suggested advancing the timing of this component of the 2015 RDA. BC Hydro would only be prepared to act on this if there is unanimous stakeholder view that the proposed updated Reconnection Charge adequately recovers costs. BC Hydro seeks stakeholder feedback on both the cost basis and the timing for filing concerning the proposed Reconnection Charge.**

## RECONNECTION CHARGE - OTHER WORDING CHANGES

Scenario	Application of Reconnection Charge
Vacant / Unsigned Accounts	<ul style="list-style-type: none"> <li>• Benefits all customers by limiting consumption by non account holders</li> <li>• Business practice is now to disconnect shortly after a premises is vacated; reconnection charge is no longer appropriate in many circumstances</li> </ul>
Customer-side Breaker	<ul style="list-style-type: none"> <li>• Digital meters require continuous supply of electricity</li> <li>• BC Hydro prefers customers to request disconnection rather than temporarily shutting off electricity with their breaker</li> </ul>

Changes will be proposed to Electric Tariff section 6.7 to clarify that waiving the reconnection charge as set out above is appropriate

## RE-APPLICATION FOR SERVICE (SECTION 2.6)

- If an account is re-opened by same customer within 12 months, the customer is charged the greater of:
  - the minimum reconnection charge, or
  - the sum of minimum charges that would have been paid had service not been terminated
    - E.g., the current Basic Charge for a residential account (RIB rate) is 16.64 cents per day
- BC Hydro is proposing no changes at this time except to update costs and to reflect any changes to the RIB rate (to the Basic Charge and/or separate Minimum Charge), and possibly other rates

## 4. METER TEST CHARGE

- Currently, if a customer requests an independent meter test, the customer is charged the Minimum Reconnection Charge if the meter is found to be accurate
- Provides partial recovery of costs incurred to exchange the meter and send it to Measurement Canada

### Three Meter Test Charge Options:

- Option 1 – Minimum Reconnection Charge (new proposed: ~\$26 )
  - Lower charge is far below BC Hydro's costs and will not deter frivolous requests for meter tests
- Option 2 – Service Connection Charge (new proposed: \$181)
  - More closely reflects cost recovery as the connection activities are similar
  - Higher charge may create a barrier to pursuing meter testing
- Option 3 – Prior Minimum Reconnection Charge (\$125) (new "Meter Test Charge")
  - May balance customer needs and cost recovery

**BC Hydro requests feedback on the appropriate level of cost recovery for meters that are tested by Measurement Canada at the customer's request but are found to be accurate**

## 5. SECURITY DEPOSITS (SECTION 2.4)

- New customer applicants that have not “established credit satisfactory to BC Hydro”
- Existing customers that have not “maintained a credit history satisfactory to BC Hydro”
- Currently, if BC Hydro chooses to apply a security deposit, the amount is prescriptive



2x/3x Average  
Monthly Bill

---

# DRAWBACKS

- Amount held may not match the financial risk
- Difficult to administer
- Creates difficulties applying a security deposit to the 'right' situations
  - Bad debt and aged receivables are significantly influenced by accounts with low dollar amounts
  - Currently waive security deposits <\$110, regardless of credit history

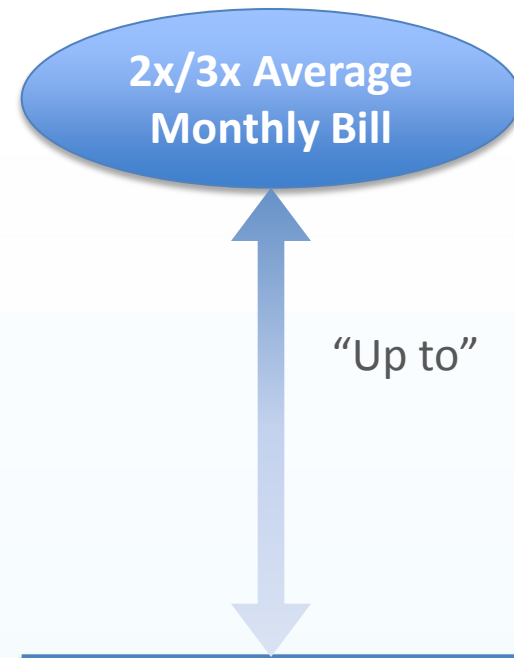


2x/3x Average  
Monthly Bill

---

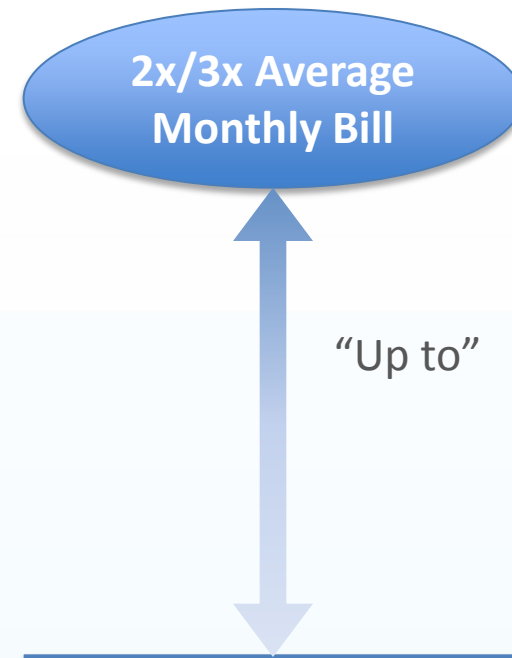
# PROPOSAL

- Proposed tariff change:
  - Up to 2x/3x the average monthly bill
  - No change to maximum
  - Allows flexibility to charge a lesser amount



# BENEFITS

- Administrative simplicity
  - E.g., allows option for standardized deposit amount
- Customer acceptance
  - Allows for lesser amounts to be required when risk is not as great
- Improved financial risk management
  - Practical approach for securing low consumption accounts





## ADDITIONAL WORDING CHANGE

- A security deposit is assessed (or waived) at the time of account setup based on an assumed level of consumption
- There is no provision within the Electric Tariff to increase the amount of a security deposit if actual consumption is higher
- Will be requesting a wording change that would allow a security deposit to be assessed or increased if actual consumption is significantly greater than what was initially assumed

**BC Hydro seeks stakeholder feedback on the security deposit proposal (slide 15), the additional wording change proposal above, and whether there are any other issues.**

# PART 2

## DEFAULT RESIDENTIAL RATE DESIGN

1. Context
2. Modeling Assumptions and Process
3. SQ RIB Rate
4. Alternative Designs to the RIB

PART 2

# RESIDENTIAL RATE DESIGN

CONTEXT - STAKEHOLDER FEEDBACK AND CONSIDERATION

# ALTERNATIVE DESIGNS CARRIED FORWARD

## Three Step Inclining Block Rates

1. Workshop 3 Model:  
**(Model A)**  
Step 1/2 Threshold = 675 kWh/month (SQ)  
Step 1 rate = SQ  
Step 2 rate = Energy Long Run Marginal Cost (LRMC)  
  
*Derived: Step 2/3 Threshold & Step 3 rate (10 percent bill impact)*
2. BCOAPO Model 1:  
**(Model B)**  
Step 1/2 threshold = 250 kWh/month  
Step 2/3 threshold = 675 kWh/month  
Step 2 rate = Energy LRMC  
Step 3 rate = 10% higher than LRMC  
  
*Derived: Step 1 rate*
3. BCOAPO Model 2:  
**(Model C)**  
Step 1/2 threshold = 250 kWh/month  
Step 2/3 threshold = 2000 kWh/month  
Step 1 rate = 3 cents/kWh  
Step 3 rate = Independent Power Producer-related energy price + capacity +  
T&D loss (~13 cents/kWh)  
  
*Derived: Step 2 rate*

## ALTERNATIVE DESIGNS NOT CARRIED FORWARD

<p><b>1. Customer Specific Baseline Rate (Default)</b></p>	<ul style="list-style-type: none"> <li>• Agreement option should not be advanced because not viable</li> </ul>
<p><b>2. Flat Rate (Default)</b></p>	<ul style="list-style-type: none"> <li>• Broad agreement option should not be advanced given that the RIB rate is functioning as it should and balances a number of competing objectives</li> </ul>
<p><b>3. Seasonal Threshold (Default)</b> A higher consumption threshold targeted to winter peak season (lower effective winter rate)</p>	<ul style="list-style-type: none"> <li>• Misaligned with cost causation (lower rates in winter despite BC Hydro being a winter peaking utility)</li> <li>• Unlikely to achieve objective of moderating electric heating bills (refer to Workshop 3 slide deck presentation concerning bill impact analysis, slides 40-41)</li> <li>• No jurisdictional support (utilities with seasonal rates charge a higher rate in winter if winter peaking)</li> <li>• May conflict with and potentially dilute simple RIB conservation message</li> </ul>
<p><b>4. Seasonal Rate</b> A higher rate targeted to winter peak season (Default or Optional)</p>	<ul style="list-style-type: none"> <li>• Imposes bill impacts on winter heating customers</li> <li>• Only one Canadian jurisdiction, Newfoundland Power, offers optional season rate (higher rate in winter) – 1% participation; BC Hydro would anticipate a low participation rate under an optional structure</li> <li>• Optional structure unlikely to achieve incremental winter peak capacity or energy savings</li> </ul>
<p><b>5. Voluntary Time of Use (TOU) Rate (Optional)</b></p>	<ul style="list-style-type: none"> <li>• Near unanimous stakeholder agreement that BC Hydro should not pursue at this time</li> <li>• Self-selection - low expected participation (+ cost shifting to non-participants)</li> <li>• Low to modest expected capacity savings (+ no long-term deferral value for planning)</li> <li>• May conflict with simple RIB conservation message</li> </ul>
<p><b>6. COPE 378 Three-Step Rate (Default)</b> A higher rate to generate revenue from affluent, gluttonous customers to allow for subsidy to low income ratepayers</p>	<ul style="list-style-type: none"> <li>• No cost basis to define or target gluttonous consumption through a very high Step 3 rate</li> <li>• No cost basis to set lower rate or consumption threshold targeted to low income customers</li> <li>• BC Hydro of the view that BCUC cannot set rates based on customer income level</li> <li>• BC Hydro has brought forward three versions of a three-step rate for stakeholder input</li> </ul>

# RIB RATE-SPECIFIC DESIGN & PRICING OPTIONS

<p><b>1. SQ Step 1 / Step 2 Threshold</b></p>	<p><b>Alternative RIB rate thresholds are not carried forward from Workshop 3</b></p> <ul style="list-style-type: none"> <li>• No substantive changes to conservation from alternative thresholds</li> <li>• SQ design has the advantage of customer understanding and acceptance</li> <li>• Thresholds within a “lifeline rate” concept are considered through 3-step rate alternatives</li> </ul>
<p><b>2. SQ Basic Charge</b></p>	<p><b>In-depth rate modeling of the SQ Basic Charge is carried forward; BC Hydro does not see a basis for increasing the Basic Charge fixed cost recovery from ~45%, but seeking feedback</b></p> <ul style="list-style-type: none"> <li>• 45% cost recovery is in line with other jurisdictions - utilities generally have fixed charges</li> <li>• Stop short of 100% cost recovery due to high bill impacts and minimal jurisdictional support</li> </ul>
<p><b>3. Minimum Charge</b></p>	<p><b>In-depth rate modeling of a separate Minimum Charge = \$15/month is carried forward</b></p> <ul style="list-style-type: none"> <li>• May be warranted to reflect cost of remaining attached to system (low use / dormancy)</li> <li>• Additional cost recovery may benefit lower consuming customers (including some low income)</li> <li>• \$15/month roughly equates to average fixed cost per month assigned to the Residential class</li> <li>• Increases portion of fixed cost recovery</li> </ul>
<p><b>4. Step 2 Pricing in reference to LRMC</b></p>	<p><b>Fair degree of consensus that pricing Step 2 rate in reference to LRMC remains appropriate</b></p> <ul style="list-style-type: none"> <li>• No strict rule to set Step 2 rate equal to LRMC; balance other rate design objectives</li> <li>• BC Hydro opposes capping Step 2 at exactly the upper bound of LRMC</li> <li>• Are there reasons to intentionally set a rate above LRMC? (3-step rate design?)</li> </ul>
<p><b>5. Pricing Principle (F2017-F2019)</b></p>	<p><b>Two Options:</b></p> <ul style="list-style-type: none"> <li>• Option 1: Apply RRA rate increases equally – current principle approved by BCUC in 2013 RIB Re-pricing Application</li> <li>• Option: 2: Apply RRA rate increases to Step 1 only, given that Step 2 rate is currently above the upper bound of LRMC</li> </ul>

# ENERGY LRMC + CAPACITY

## BC Hydro

- Energy LRMC is the appropriate pricing referent for an inclining block energy rate
- While recognizing RIB-related energy savings deliver associated capacity savings included in BC Hydro's resource stack, adding capacity value would confuse the pricing of the RIB with its purpose to signal efficient energy use
- FortisBC includes energy value and capacity value of about \$35/kW-year as proxy for avoided Transmission and Distribution costs for LRMC for its Demand Side Management (DSM) initiatives – BC Hydro view: RIB-related Transmission and/or Distribution deferral benefits are uncertain
- If capacity value is included for RIB (and other rate setting) LRMC purposes, should be based on capacity generation - Revelstoke Unit 6 (Rev 6) (about \$50/kW-year), which would increase the energy LRMC by about \$11/MWh (F2013)

## Participant feedback to date

- The LRMC for RIB should include a capacity value because the RIB delivers associated capacity savings

## Approach going forward

- Assume annual inflation in the F2013 estimated range in LRMC
- Model the 3-step rate alternatives using Energy LRMC (= the Step 2 rate in Model A and Model B)
- Evaluate 3-step rate alternatives in recognition of energy LRMC with/without capacity based on Rev 6
- Examine sensitivity of RIB pricing on balance with all criteria, using LRMC with/without capacity based on Rev 6

## CUSTOMER BILL IMPACT TEST

In its Workshop 3 consideration memo, BC Hydro agreed to review the bill impact test – its purpose and the applicable customer percentile threshold

**Workshop 1:** BC Hydro’s proposal was to maintain 2013 RIB Re-pricing Application approach

- Maximum of 10% bill impact, representing all-in costs (consisting of RRA rate caps + deferral account rate rider (DARR) + rate changes due to rate rebalancing + rate changes due to rate design), to single most adversely impacted customer – to be used for modelling purposes

### Considerations

- 10% bill impact test first used in BC Hydro’s 1991 RDA as a guideline, based on a definition of rate shock
- 10% level is an amber signal and not a stop or go constraint, unless indicated otherwise
- Bill impact test is appropriate for evaluating the pricing of the SQ RIB rate because the rate is simple and there’s a clear direct relationship: the larger the customer, the larger the impact
- Applying the 10% test to any threshold level other than the most adversely impacted customer will lead to definitional problems, or will have unintended consequences

**BC Hydro is of the view that the purpose and level of the customer bill impact test remains appropriate to evaluate the trade-offs between designs, but seeks additional stakeholder feedback**



PART 2

# RESIDENTIAL RATE DESIGN

CONTEXT – JURISDICTIONAL REVIEW

## JURISDICTIONAL REVIEW – DEFAULT RESIDENTIAL RATES

- BC Hydro circulated its proposed jurisdictional selection for 2015 RDA Residential rate analysis on 12 March 2015
- BC Hydro chose jurisdictions based on:
  - Canadian geographical diversity + vertically integrated utility structure (this leaves out Alberta and Ontario only)
  - British Columbia Rate Comparison Regulation (Washington, Oregon, California) + Regional U.S. utilities in the Western Electricity Coordinating Council + utilities of a larger size (>400,000 customers)
- To date, fair degree of consensus from stakeholders that these are the appropriate jurisdictions to review
  - Requests for survey of low income-related rates and underlying legislation (*please refer to RDA Workshop 9 Discussion Guide for more information*)

## JURISDICTIONAL REVIEW – HIGHLIGHTS

- Canada:
  - Default Residential – Two-step inclining block or flat energy charge; Basic Charge typically recovers between 35%-70% fixed costs; almost all utilities have no demand charge
  - Optional Residential – few optional rates offered; low participation
- Selected U.S.
  - Default Residential – inclining block energy charges; no demand charge;
  - Optional Residential – various rates offered, including TOU and EV rates; low participation

## PART 2 – CONTEXT (CANADIAN JURISDICTIONAL REVIEW (2015))

Canadian Utility	Energy Charge	Basic Charge (& % of total allocated fixed costs)	Demand Charge	Optional Rate
SaskPower	Flat 12.346 c/kWh City 12.369 c/kWh Rural	\$/month \$20.22 City (22%) \$29.19 Rural	No	No
Manitoba Hydro	Flat 7.381c/kWh	\$/month \$7.28 < 200 Amp (34%) \$14.56 > 200 Amp (68%)	No	No
Hydro Quebec	Inclining Block (two-tier) < 30 kWh/day: 5.57 c/kWh Remaining energy: 8.26 c/kWh	\$/day 40.64 c/day (55%) (\$12.30/month)	> 50 kW demand \$6.21/kW/mo Winter \$2.52/kW/mo Summer	Dual Energy Discount to alternative fuels when very cold (-13C or -15C)
Nova Scotia Power	Flat 14.947 c/kWh	\$/month (62%) \$10.83	No	TOU (3% participation) Restricted to defined electrical heating end-use
Newfoundland Power	Flat 11.178 c/kWh	\$/month (65%) \$15.68 < 200 Amp \$20.68 > 200 Amp	No	Seasonal Rate (1% participation) Winter – premium Non-winter – credit
New Brunswick Power	Flat 10.25 c/kWh	\$/month \$20.48 City (100%) \$22.46 Rural (100%)	No	No
ATCO Electric Yukon	Inclining Block (three-tier)(Non-gov.) < 1000 kWh/mo. 12.14 c/kWh 1001-2500 kWh/mo. 12.82 c/kWh > 2500 kWh/mo. 13.99 c/kWh	\$/month \$14.65 (39%)	No	No
FortisBC	Inclining Block (two-tier) < 1600 kWh 9.093 c/kWh (60 day) > 1600 kWh 13.543 c/kWh (60 day)	\$/60 day billing \$30.33 (44%)	No	No (TOU – closed with introduction of Inclining Block) (0.1% participation)
BC Hydro	Inclining Block (two-tier) < 675 kWh/mo. 7.52 c/kWh > 675 kWh/mo. 11.27 c/kWh	\$/day (45%) 16.64 c/day (\$5/month)	No	No

**PART 2 – CONTEXT (U.S JURISDICTIONAL REVIEW (2015) (\$US))**

Western U.S. Utility > 400,000 customers	Energy Charge	Basic Charge	Demand Charge	Optional Rate
<b>Puget Sound Energy</b> (1 million customers)	<b>Inclining Block (two-tier)</b> < 600 kWh/mo. 8.5578 c/kWh > 600 kWh/mo. 10.4157 c/kWh	<b>\$/month</b> \$7.49 single phase \$17.99 three phase	<b>No</b>	<b>No</b>
<b>Seattle City Light</b> (400,000 customers)	<b>Inclining Block (two-tier, seasonal threshold)</b> First block 5.57 c/kWh End block 11.89 c/kWh Apr-Sept: 10 kWh/day; Oct-Mar: 16 kWh/day	<b>\$/day</b>  \$0.1451 (\$4.41/month)	<b>No</b>	<b>No</b>
<b>Pacific Power Oregon (PacifiCorp entity)</b> (500,000 customers)	<b>Inclining Block</b> Combined Effective Rate: < 1000 kWh/mo.: 9.884 c/kWh > 1000 kWh/mo.: 11.859 c/kWh	<b>\$/month</b>  \$9.61	<b>No</b>	<ul style="list-style-type: none"> <li>• <b>Separate meter EV charging</b> (rates=default)</li> <li>• <b>Seasonal TOU</b></li> <li>• <b>Renewable portfolio charges</b> (energy supply / habitat restore)</li> </ul>
<b>Portland General Electric</b> (830,000 customers)	<b>Inclining Block (two-tier)</b> Combined Effective Rate: < 1000 kWh/mo.: 10.672 c/kWh > 1000 kWh/mo.: 11.394 c/kWh	<b>\$/month</b>  \$10.00	<b>No</b>	<ul style="list-style-type: none"> <li>• <b>TOU - whole premise (0.3% participation)</b> or separately meter EV (<b>zero participation</b>)</li> <li>• <b>Renewable portfolio charges</b></li> </ul>
<b>Idaho Power</b> (500,000 customers)	<b>Inclining Block (seasonal three-tier)</b> Summer (S): June – August Non-summer (NS): all other months <800 kWh: 8.5748¢ (S) 7.9675¢ (NS) 801-2000 kWh: 10.3108¢ (S) 8.7839¢ (NS) > 2000 kWh 12.2486¢ (S) 9.7280¢ (NS)	<b>\$/month</b>  \$5.00	<b>No</b>	<b>No</b>
<b>Public Service Company of Colorado</b> (Xcel Energy) (1.4 million customers)	<b>Inclining Block (summer two-tier)</b> Summer: Jun – Sept < 500 kWh/mo. 4.604 c/kWh > 500 kWh/mo. 9.0 c/kWh Winter: Oct – May: 4.604 c/kWh	<b>\$/month</b>  <b>\$6.75</b> “Service and Facility Charge”	<b>No</b>	<ul style="list-style-type: none"> <li>• <b>Seasonal Demand charge</b></li> <li>• <b>Outdoor Area Lighting</b></li> <li>• <b>TOU</b></li> <li>• <b>Peak Time Rebate</b></li> <li>• <b>Critical Peak Pricing</b></li> </ul>
<b>Public Service Company of New Mexico</b> (500,000 customers)	<b>Inclining Block (seasonal three-tier)</b> S: June – August NS: all other months First 450 kWh/mo. 9.06237 c/kWh (S + NS); Next 450 kWh/mo. 13.73455 c/kWh (S) 11.85101/kWh (NS); Remaining kWh/mo. 15.76960 c/kWh (S) 12.8352 c/kWh (NS)	<b>\$/month</b>  \$5.00	<b>No</b>	<ul style="list-style-type: none"> <li>• <b>Seasonal TOU</b></li> <li>• <b>Renewable energy supply</b></li> </ul>

## PART 2 – CONTEXT (U.S JURISDICTIONAL REVIEW (2015) (\$US))

Utility	Energy Charge	Basic Charge	Demand Charge	Optional Rate
<p><b>Pacific Gas and Electric Company</b> (5.1 million electric customer accounts)</p>	<p><b>Inclining Block (four-tier)</b> Tier 1 = Baseline allocation kWh (16.2 c/kWh) Tier 2 = 101%-130% of baseline (18.5 c/kWh) Tier 3 = 131%-200% of baseline (27.3 c/kWh) Tier 4 = &gt; 200% of baseline (33.3 c/kWh)</p> <p><b>Baseline allocation</b></p> <ul style="list-style-type: none"> <li>Reflects essential portion of energy use (~50-60% of reasonable need)</li> <li>established by California Public Utilities Commission (CPUC); based on region, season and all electric versus electric + gas</li> </ul> <p><b>CARE (California Alternate Rates for Energy)</b></p> <ul style="list-style-type: none"> <li>Separate lower rates (under three tiers) for qualified customers</li> </ul> <p><b>Medical Baseline Allowance</b></p> <ul style="list-style-type: none"> <li>Qualifying customers with special heating, cooling or life support needs</li> </ul>	<p><b>\$/meter/day</b> (Minimum Energy Charge)</p> <p>\$0.14784 (\$4.50/month)</p>	<p><b>No</b></p>	<p><b>TOU (~2% participation (2012))</b></p> <ul style="list-style-type: none"> <li>Summer (<b>S</b>)(May-Oct); Winter (<b>W</b>)(Nov-Apr)</li> <li>Peak and Off-Peak rates</li> <li>All four tiers</li> </ul> <p><b>EV TOU (~0.05% participation (2012))</b></p> <ul style="list-style-type: none"> <li>Summer and Winter periods</li> <li>Peak, Partial-Peak and Off-Peak rates</li> <li>Single energy charge \$/kWh – no tiers</li> </ul> <p><u>EV TOU Example (no meter charge):</u></p> <p>Peak: 2pm-9pm Mon-Fri 3pm-7pm Sat-Sun, Holidays <b>S</b> \$0.43 <b>W</b> \$0.29</p> <p>Partial Peak: 7am-2pm: Mon-Fri 9pm-11pm: Mon-Fri <b>S</b> \$0.22 <b>W</b> \$0.17</p> <p>Off-Peak: All other hours <b>S</b> \$0.098 <b>W</b> \$0.101</p>
<p><b>Southern California Edison</b> (14 million customers)</p>	<p><b>Inclining Block (four-tier)</b> Tier 1 = Baseline allocation kWh (15 c/kWh) Tier 2 = 101%-130% of baseline (+4 c/kWh) Tier 3 = 131%-200% of baseline (+11 c/kWh) Tier 4 = &gt; 200% of baseline (+16 c/kWh)</p> <p><b>Baseline allocation (as above)</b></p> <p><b>CARE (California Alternate Rates for Energy)</b></p> <ul style="list-style-type: none"> <li>Separate lower rates (under three tiers) for qualified customers</li> </ul> <p><b>Medical Baseline Allowance</b></p> <ul style="list-style-type: none"> <li>Qualifying customers with special heating, cooling or life support needs</li> </ul>	<p><b>\$/month</b></p> <p>\$0.93/month</p>	<p><b>No</b></p>	<p><b>Three TOU options</b></p> <ol style="list-style-type: none"> <li>Three periods and pricing targeted to generally lower consumers (&lt;700kWh/mo.)</li> <li>Three periods and pricing targeted to generally higher lower consumers (&gt;700kWh/mo.)</li> <li>Two periods and pricing targeted to high-usage and self-generation customers</li> </ol> <p><b>Three EV options</b></p> <ol style="list-style-type: none"> <li>Residential Plan (Default or TOU above)</li> <li>Residential Plan Time-of-Use Plan (D) (offers a super off-peak period / low rate)</li> <li>EV Rate Plan through separate meter</li> </ol> <p><u>Participation in TOU/EV not recorded, likely because very low</u></p>

Utility	Energy Charge	Basic Charge	Demand Charge	Optional Rate
<p><b>San Diego Gas and Electric</b></p> <p>(1.4 million electric customer accounts)</p>	<p><b>Inclining Block (four-tier) - Summer and Winter</b>                      Tier 1 = Baseline allocation kWh                      Tier 2 = 101%-130% of baseline                      Tier 3 = 131%-200% of baseline                      Tier 4 = &gt; 200% of baseline</p> <p><b>CARE (California Alternate Rates for Energy)</b></p> <ul style="list-style-type: none"> <li>Separate lower rates (under three tiers) for qualified customers</li> </ul> <p><b>Medical Baseline Allowance</b></p> <ul style="list-style-type: none"> <li>Qualifying customers with special heating, cooling or life support needs</li> </ul>	<p><b>Minimum Bill</b></p> <p>\$0.170/kWh</p>	<p><b>No</b></p>	<ul style="list-style-type: none"> <li><b>TOU</b> (seasonal on/semi/off peak + baseline adjustments)</li> <li><b>TOU – Distributed Energy Resources</b> (seasonal 4 tier)</li> <li><b>TOU – Solar Energy Systems</b> (seasonal on/semi/off peak)</li> <li><b>TOU – EV</b> (seasonal on/off/super peak)</li> <li><b>TOU – Plus (event response)</b> (seasonal on/semi/off peak + baseline adjustments)</li> </ul>

PART 2

# RESIDENTIAL RATE DESIGN

CONTEXT – DSM AND LOW INCOME PROGRAMS / RATES



## DSM INITIATIVES AND LOW INCOME PROGRAMS

As part of its Workshop 3 consideration memo, BC Hydro committed to providing information on:

1. Role of the RIB rate in comparison to the other two DSM tools (codes and standards, and programs); and
2. Information on BC Hydro's low income DSM programs

As part of the lead-up to this workshop, BC Hydro circulated its proposed residential rate jurisdictional selection and asked if stakeholders wanted a survey of low income rates including statutory underpinnings

- Several stakeholders asked BC Hydro to conduct such a survey
- For purposes of this workshop, BC Hydro surveyed Canadian utilities and focuses on Ontario and Nova Scotia as the subject of court decisions
- Overview provided at slide 37 - ***Please refer to RDA Workshop 9 Discussion Guide for more information***

# RIB RATE, CODES AND STANDARDS AND PROGRAMS

Residential DSM: Forecast Cumulative Energy Savings F2015 – F2021 (Gigawatt hours)				
	Codes and Standards	Programs	Rate Structures	Total
Residential	1,488	266	142	1,896

**Code and standards** - Public policy instruments enacted by governments to influence energy efficiency

Examples:

- B.C. Building Code (amendments effective 19 December 2014 introduce new energy efficiency requirements to Part 9 for houses)
- Energy efficiency regulations such as B.C. Energy Efficiency Standards Regulation (purpose is to improve energy efficiency of among other things various household appliances and structures such as doors and windows)
- Local government zoning and building permitting processes

**Programs** – Designed to support rate structures and codes and standards, as well as to address remaining barriers to energy efficiency and conservation after rate structures and codes and standards

- BC Hydro residential DSM programs are: Low Income; Behaviour; Refrigerator Buy-Back; New Home; Residential Rebate; Renovation Rebate; and Load Displacement

**BC Hydro will submit a section 44.2 *Utilities Commission Act* DSM expenditure schedule as part of its next RRA**

## DSM REGULATION AND BC HYDRO LOW INCOME PROGRAMS

- On 10 July 2014, Demand Side Measures Regulation (DSM Regulation) was amended as follows with respect to DSM low income initiatives:
  - Low income program eligibility Low Income Cut-Off threshold raised to 130% of nominal values
  - List of pre-qualified recipients of various government income and housing assistance programs
  - Benefit calculation in the Total Resource Cost cost-effectiveness test for low income programs increased from 130% to 140%

**BC Hydro anticipates that 21% of BC Hydro customers are eligible under the DSM Regulation changes (as compared to 11% prior to the changes)**

## TWO BC HYDRO LOW INCOME DSM PROGRAMS

### 1. Energy Saving Kit Program

- Simple to install energy savings products including compact fluorescent light bulbs, weather-stripping, fridge and freezer thermometers, and high efficiency shower heads

### 2. Energy Conservation Assistance Program

- Available to renters and home owners

Eligibility: Annual household income below the following income thresholds							
Household Size	1	2	3	4	5	6	7 or more
Household Income	\$30,800	\$38,300	\$47,100	\$57,200	\$64,800	\$73,100	\$81,400

- Provides free:
  - Personalized home energy evaluation
  - Installation of energy saving products by a qualified contractor (Some homes qualify for new Energy Star Fridge and/or insulation upgrades or furnace replacement)
  - Personalized energy efficiency advice

## LOW INCOME RATES

- In prior RDA workshops, BC Hydro articulated its view that sections 58-61 of the *Utilities Commission Act* do not allow the BCUC to reduce power rates based on the income level of customers
  - Low income rates likely to be seen as unduly preferential to low income customers or unduly discriminatory to the remaining customers who would be subsidizing the low income rates
- Stakeholders requested review of other individual jurisdiction's legal regime(s) in respect of low income rates or programs
  - Other than Ontario, cost-based ratemaking is the most widely-used standard for evaluating whether rates are 'fair, just and not unduly discriminatory' in Canada
  - Canadian jurisdictions typically offer low income DSM programs, but no rate discounts (e.g., waiver of charges) or specific low income rate designs (low-income energy customers are charged a different rate for electricity) – examples are Manitoba Hydro, Hydro Quebec, New Brunswick Power
  - Nova Scotia Power - There is no specific low income rate designs; Nova Scotia Power through section 6.6 of its terms and conditions of service does not require a deposit from customers receiving social assistance or similar types of income security payments unless there is a history of bad credit

***Please refer to RDA Workshop 9 Discussion Guide for more information***

PART 2

# RESIDENTIAL RATE DESIGN

MODELING ASSUMPTIONS AND PROCESS

## KEY MODELLING ASSUMPTIONS AND COMMENTS

Element	Assumptions and Comments
Fiscal Year Modeled	F2017, F2018, F2019
Effective Years for Modelling Purposes	New Rates Effective F2017, No Phase-in. F2018 and F2019 Rates escalated by same proportion for all steps to recover revenue (~RRA) for all alternatives <u>except for Pricing Principle Option 2: Apply RRA increases to Step 1</u>
Billing Data Used	F2013 Customer Billing Data
Representative Sample	10,000 randomly drawn F2013 customers used where abstraction is needed.
Precision of values estimated from Sample vs. population	The slight load shape differences between the sample and the load forecast (which takes an average of consumption between F2010 and F2014), yields a precision of about <b>0.15 cents/kWh</b> (~\$15/year for median BC Hydro Customer).  The precision in cumulative conservation is about <b>13 GWh (2.8%) in F2017</b> , on Sample vs. SQ.
Maximum Bill Impact criteria (where required)	10%. Note that bill impact is not a constraint unless specified in the design.  (Inclusive of Revenue Requirements, DARR, rate changes due to rate rebalancing, and rate changes due to rate design)
Revenue Neutrality	Rates from new models are revenue neutral to SQ target revenue on forecasted load for all years
LRMC Excludes Capacity and Includes Distribution (D) Loss (6%) and is inflated	<p><u>Upper End</u></p> <p>11.23 c/kWh \$F2017 11.45 c/kWh \$F2018 11.68 c/kWh \$F2019</p> <p>Equivalent to 10c/kWh + D loss in \$F2013  <math>= 10\text{c/kWh} \times (1+\text{D Loss}) \times (1+ \text{F14 Inf.}) \times (1+\text{F15 fcst}) \times (1+\text{F16 fcst}) \times (1+\text{F17 fcst}) \times (1+\text{F18 fcst}) \times (1+\text{F19 fcst})</math>  <math>= 10\text{c/kwh} \times (1+6\% ) \times (1+ 0.2\% ) \times (1+1.6\% ) \times (1+2.0\% ) \times (1+2.0\% ) \times (1+2.0\% ) \times (1+2.0\% )</math></p> <p><b>Note:</b> <b>References to LRMC are to Energy LRMC unless otherwise stated</b></p>

# SQ RIB RATE EVALUATION

## Key Findings of F2009-F2012 Evaluation

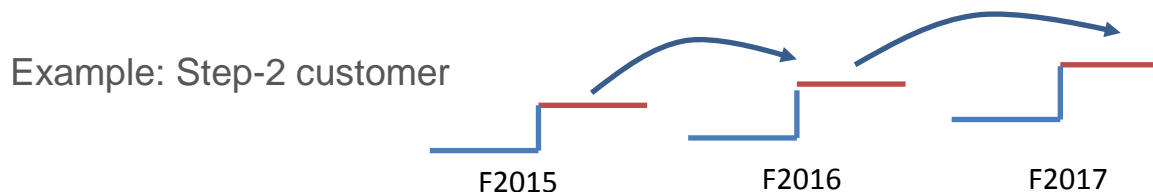
- Three econometric models support current elasticity assumption of -0.1
- Price elasticity generally higher for customer segments with higher consumption
- 50% of residential customers aware of the RIB rate
- RIB rate appears to be achieving its overall objective of encouraging conservation



## CONSERVATION MODELING - Forecast model based on most recent evaluation outcomes

Conservation estimates from price response are generally based on

1. Changes in **real marginal prices** from one year to the next (inflation removed)



2. **Forecasted class marginal consumption** at each step

3. **Elasticity** as estimated by BC Hydro's Evaluation models (-0.10 for Step 2; Step 1 is inconclusive)



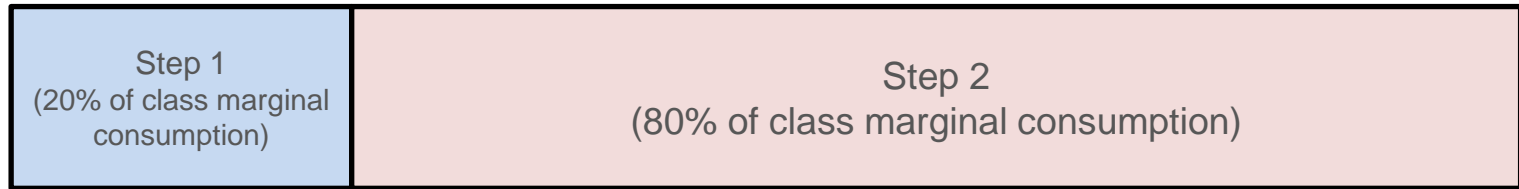
Total Conservation from price response – Natural conservation = **Rate Structure Conservation**



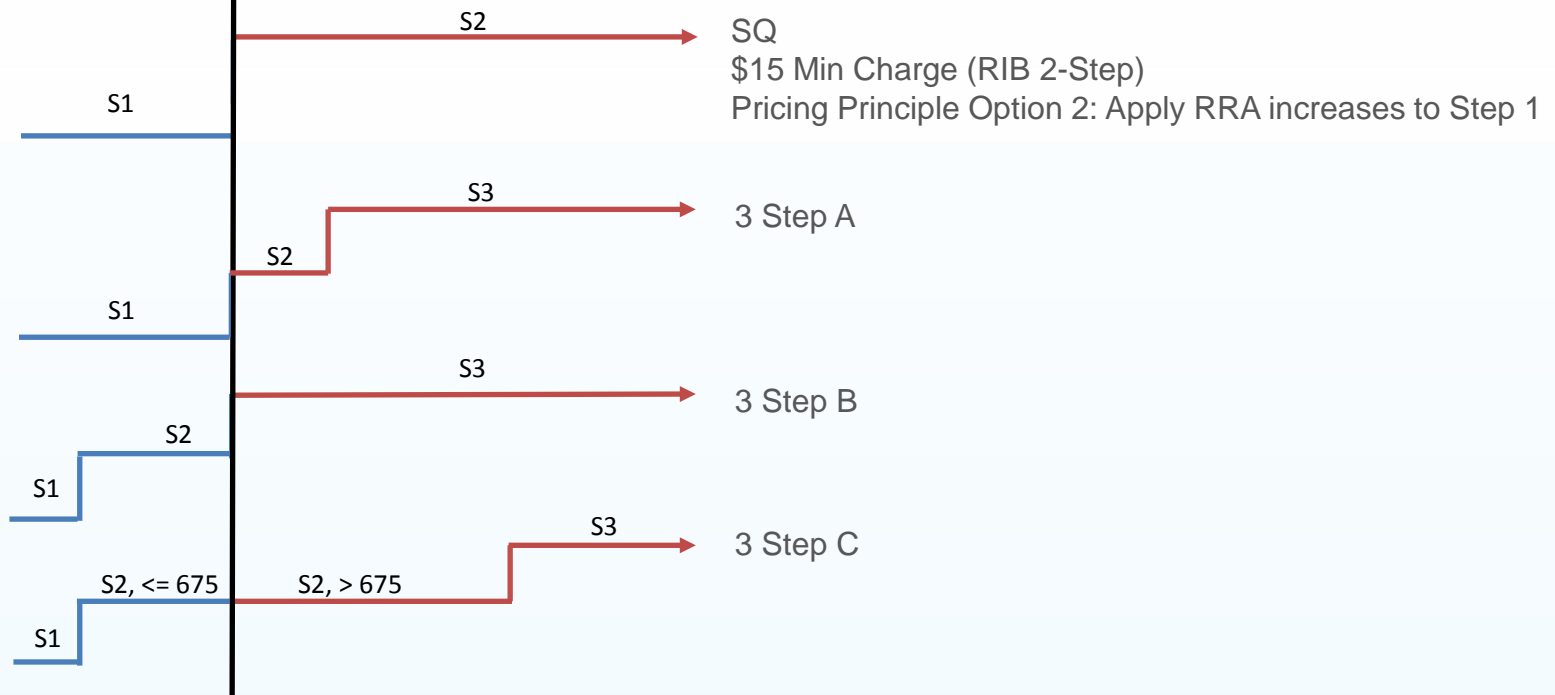
- Conservation due to general rate increases
- Assumed to have elasticity of -0.05: 2008 Long-term Acquisition Plan

# CONSERVATION MODELING - Applying the Model to Rate Design Alternatives

675 kWh/mo



- Elasticity is not stat. significant
- Assume no conservation
- **Elasticity of -0.10 (Chose the mid-point elasticity modelled from evaluation)**
- All rate structure conservation assumed to come from consumption in this step.



## ANALYSIS UNDERTAKEN

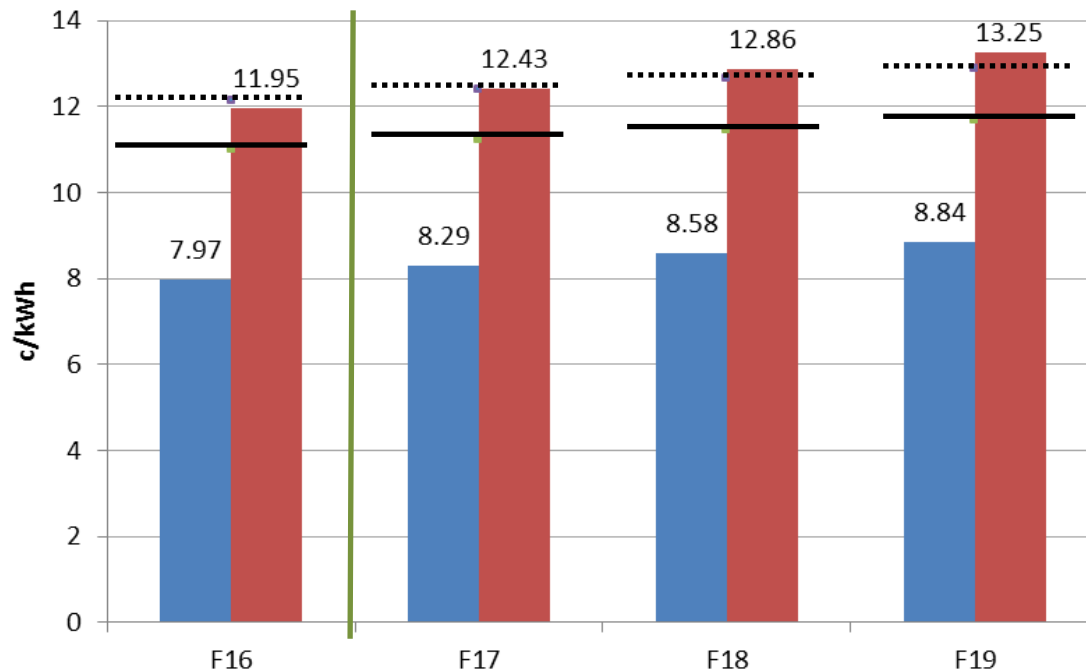
- Rates Simulation, F2017 to F2019
- Bill Impact for F2017, illustrative bills
- Cumulative Bill Impact to F2019, illustrative bills
- Cumulative Conservation

PART 2

# RESIDENTIAL RATE DESIGN

SQ RIB RATE

# SQ RIB RATE (PRICING PRINCIPLE OPTION 1: ALL RATE COMPONENTS INCREASE BY RRA)



## Observations

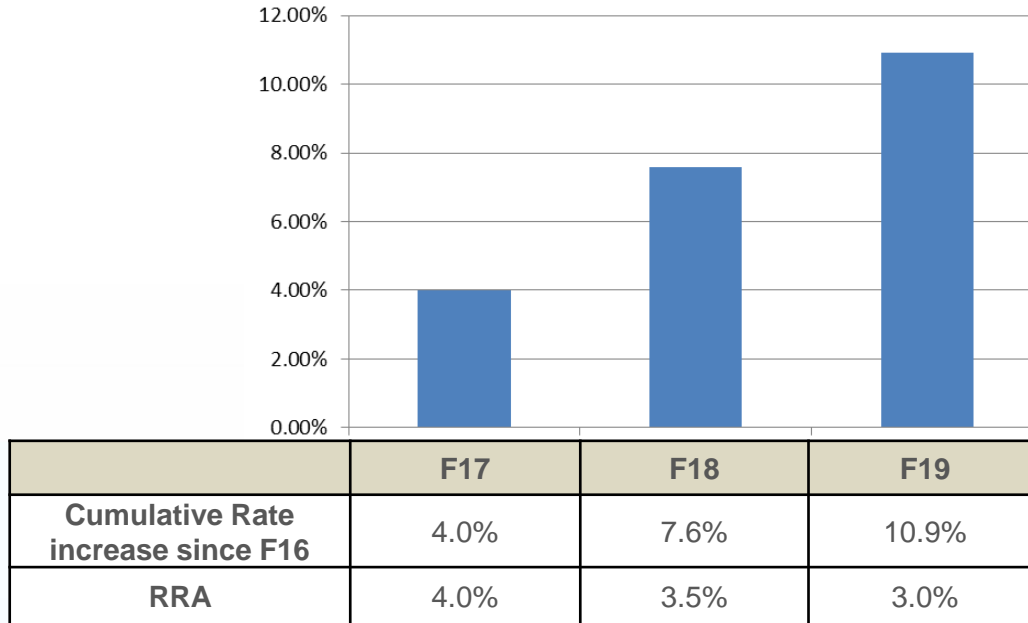
- Pricing Principle Option 1 continues with 2013 RIB Re-pricing Decision pricing principle
- Step 2 exceeds LRMC upper limit
- Cumulative rate increases by 10.9% between F16 and F19
- All customers experience same bill impact

- Step 1
- Step 2 (Threshold = 675kWh/mo)
- Energy LRMC (Upper Limit)
- ⋯ Illustrative Reference: Energy LRMC + Unit Capacity Cost of Rev 6<sub>7</sub> ~1.1c/kWh

	F16 Rates Reference	F17	F18	F19
Basic Charge	\$ 0.1764/day	\$ 0.1835/day	\$ 0.1899/day	\$ 0.1956/day
Energy LRMC (Upper Limit)	11.01	11.23	11.45	11.68
Cumulative Conservation since F2008 (GWh)		About 463	About 476	About 488

## SQ BILL IMPACT

Cumulative Bill Impacts since F16 under SQ is the same as RRA per 2013 RIB Re-pricing Application



Illustrative Customer Bills (using median kWh of segments from modelling sample)

Customer Segments	Annual kWh	F17	F18	F19
All Customers	8,514	\$852	\$882	\$909
Low Income	6,012	\$594	\$614	\$633
Apartment	4,021	\$420	\$435	\$448
Electric Heat	10,025	\$1,053	\$1,090	\$1,122

## BONBRIGHT ASSESSMENT OF SQ RIB RATE STRUCTURE

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>• SQ RIB rate is an economically efficient rate that exposes a majority of residential customers to a price signal set in reference to the energy LRMC</li> <li>• Step 2 rate exceeds the upper end of the range of the energy LRMC</li> <li>• F17 forecast cumulative conservation = 463 GWh (since 2008)</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>• SQ RIB Step1/Step 2 threshold (675 kWh/month) is generally reflective of typical residential consumption; equal to about 90% of median residential consumption on an ongoing, stable basis</li> <li>• Basic Charge recovers about 45% of fixed Distribution and Customer Care costs – in line with other jurisdictions</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>• Two-step rate is relatively simple and sends a clear price signal to consumers</li> <li>• 50 percent of residential customers are aware of the RIB rate, and 80 percent of those customers believe it serves as an incentive to manage electricity consumption</li> <li>• Many jurisdictions have two-step inclining block rate for residential customers</li> <li>• Recent North West Side Ratepayers Association complaint that Step 2 impacts electrically space heated homes with no alternatives to reduce consumption</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>• RIB rate in place since October 2008</li> <li>• Effective in collecting the revenue requirement</li> </ul>

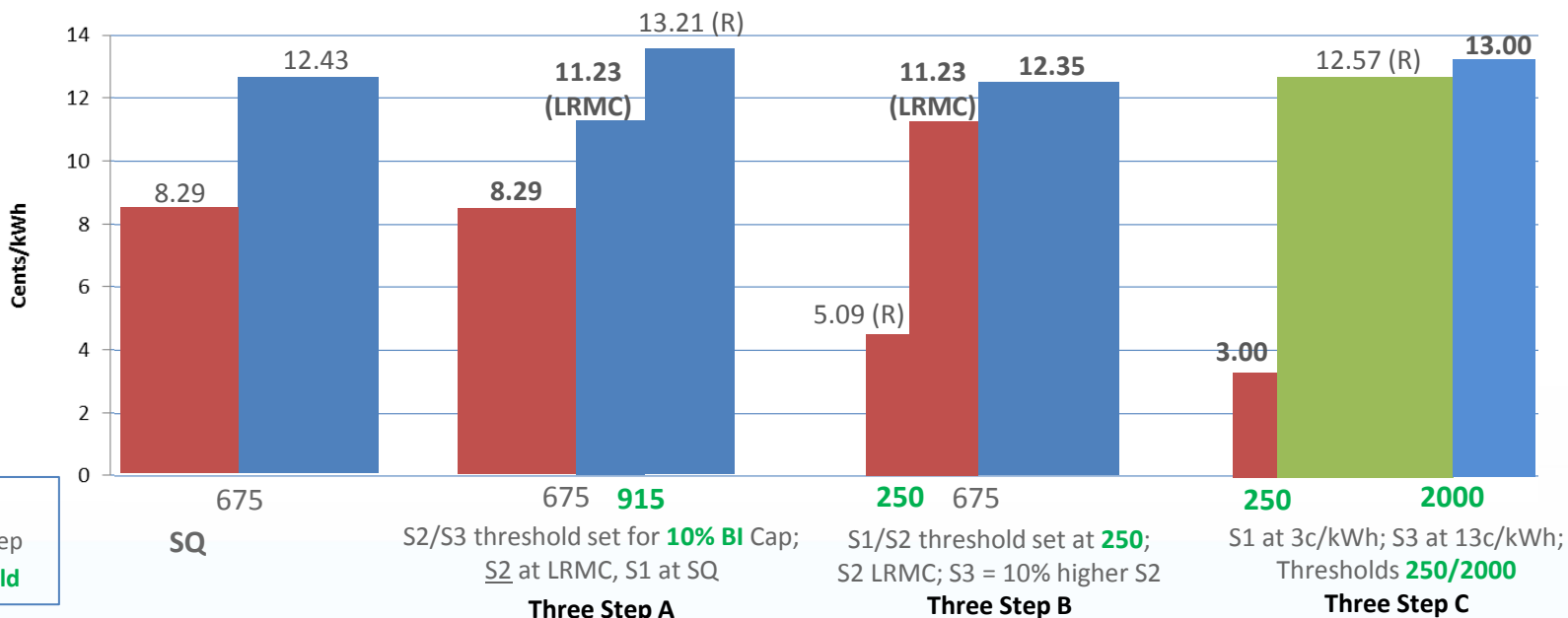
PART 2

# RESIDENTIAL RATE DESIGN

ALTERNATIVE DESIGNS TO THE RIB



# THREE STEP RATES F2017



Percent Change in rates by Step (kWh/Month) Vs. F16 Reference

Monthly Consumption	F16 Rates Reference	Status Quo	Three Step A	Three Step B	Three Step C
First 675 kWh/month	7.97 c/kWh	4.0% (RRA)	4.0% (First 675)	-36.2% (First 250)	-62.4% (First 250)
				40.9% (250 – 675)	57.7% (250 – 675)
Additional kWh/month	11.95 c/kWh	4.0% (RRA)	-6.0% (675-915)	3.4% (675+)	5.2% (675 – 2000)
			10.6% (915+)		8.8% (2000+)
Basic Charge (\$0.1835/day)	\$0.1764/day	4.0% (RRA)	4.0%	4.0%	4.0%
Cumulative Conservation vs. SQ			+34 GWh	-21 GWh	+19 GWh
Key driver of conservation variance vs. SQ			Higher 3 <sup>rd</sup> Step	Lower 3 <sup>rd</sup> Step	Overall higher marginal prices for consumption >675kWh/mo.
Notes				Assumed higher marginal prices under 675kWh/mo. does not impact conservation forecasts because evaluation has found no statistically significant conservation in Step 1	

## THREE STEP RATE F2017 TO F2019

### Notes

- F2018 and F2019 rates are F2017 rates escalated by RRA, for all rate steps
- Shape and differential between steps maintained

Three Step Model A	F17	F18	F19	F19 SQ
<b>S1</b> (c/kWh) Up to 675 kWh/Mo	8.29	8.58	8.84	8.84
<b>S2</b> (c/kWh) 675 – 915 kWh/Mo	11.23	11.62	11.97	13.25
<b>S3</b> (c/kWh) 915+ kWh/Mo	13.21	13.67	14.08	
Basic (\$/day)	0.1835	0.1899	0.1956	0.1956
% Change, Year/Year		3.5%	3.0%	
Cumulative Conservation vs. SQ	+34 GWh	+33 GWh	+33 GWh	

Three Step Model B	F17	F18	F19	F19 SQ
<b>S1</b> (c/kWh) Up to 250 kWh/Mo	5.09	5.27	5.42	8.84
<b>S2</b> (c/kWh) 250 – 675 kWh/Mo	11.23	11.62	11.97	13.25
<b>S3</b> (c/kWh) 675+ kWh/Mo	12.35	12.79	13.17	
Basic (\$/day)	0.1835	0.1899	0.1956	0.1956
% Change, Year/Year		3.5%	3.0%	
Cumulative Conservation vs. SQ	-21 GWh	-19 GWh	-19 GWh	

### Observations

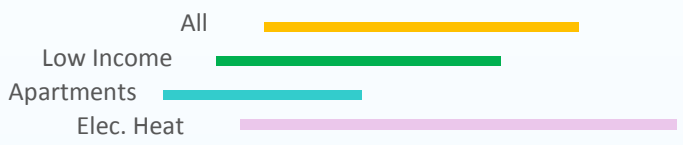
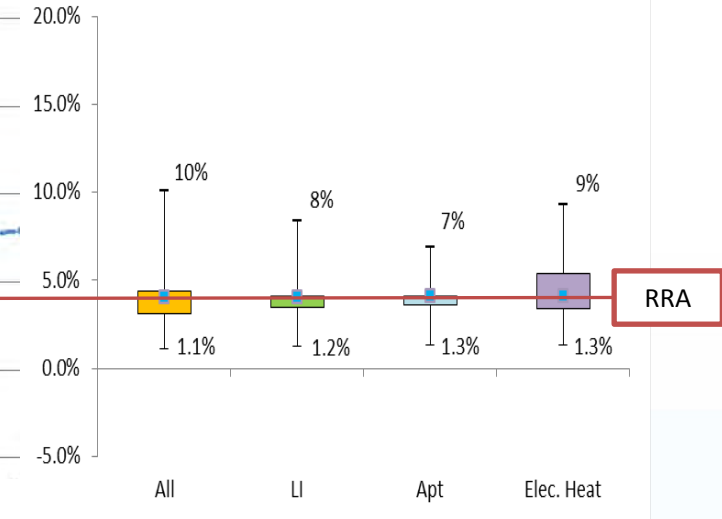
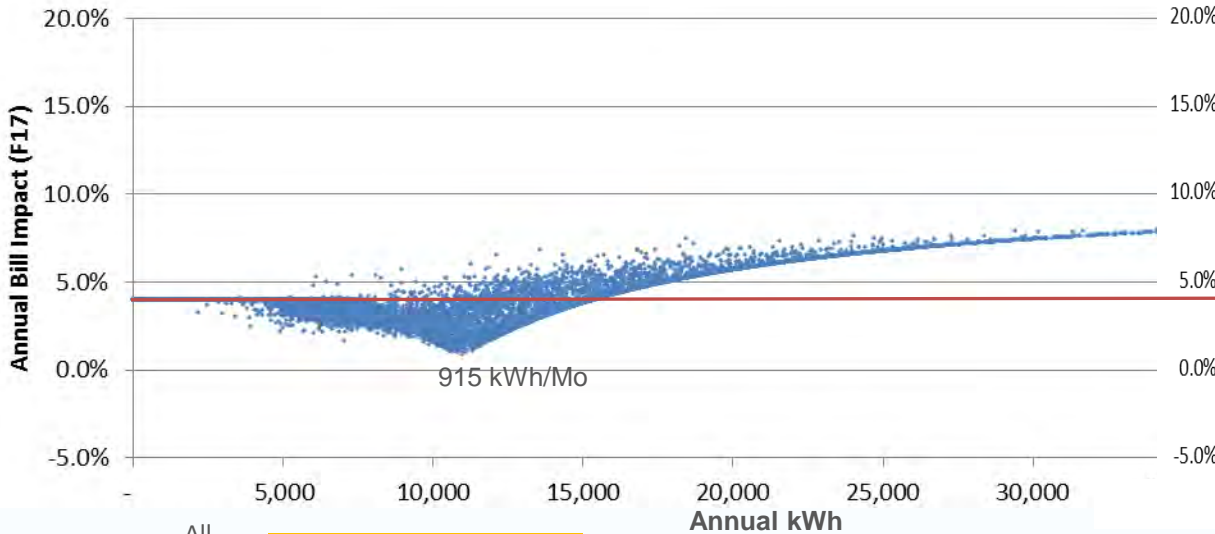
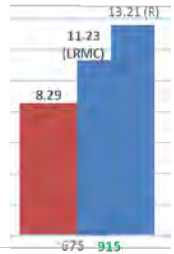
- S2 and S3 for all options above upper range of LRMC by F2019
- Most bill impacts and conservation outcomes are from a result of rate structure change in F2017

Three Step Model C	F17	F18	F19	F19 SQ
<b>S1</b> (c/kWh) Up to 250 kWh/Mo	3.00	3.10	3.20	8.84
<b>S2</b> (c/kWh) 250 – 2000 kWh/Mo	12.57	13.01	13.40	13.25
<b>S3</b> (c/kWh) 2000+ kWh/Mo	13.00	13.46	13.87	
Basic (\$/day)	0.1835	0.1899	0.1956	0.1956
% Change, Year/Year		3.5%	3.0%	
Cumulative Conservation vs. SQ	+19 GWh	+18 GWh	+20 GWh	

# THREE STEP RATE MODEL A (675 / 915)

## BILL IMPACT DISTRIBUTIONS F2017

S2/S3 threshold set for **10% BI Cap**;  
S2 at LRMC, S1 at SQ



Bill Impact of customer segment  
 Color Bar: Middle 60%

Annual Consumption Range for the middle 60% of each customer segment

Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	37%	\$841	(\$12)
Low Income	28%	\$594	(\$0)
Apartment	24%	\$420	(\$0)
Electric Heat	31%	\$1,043	(\$10)

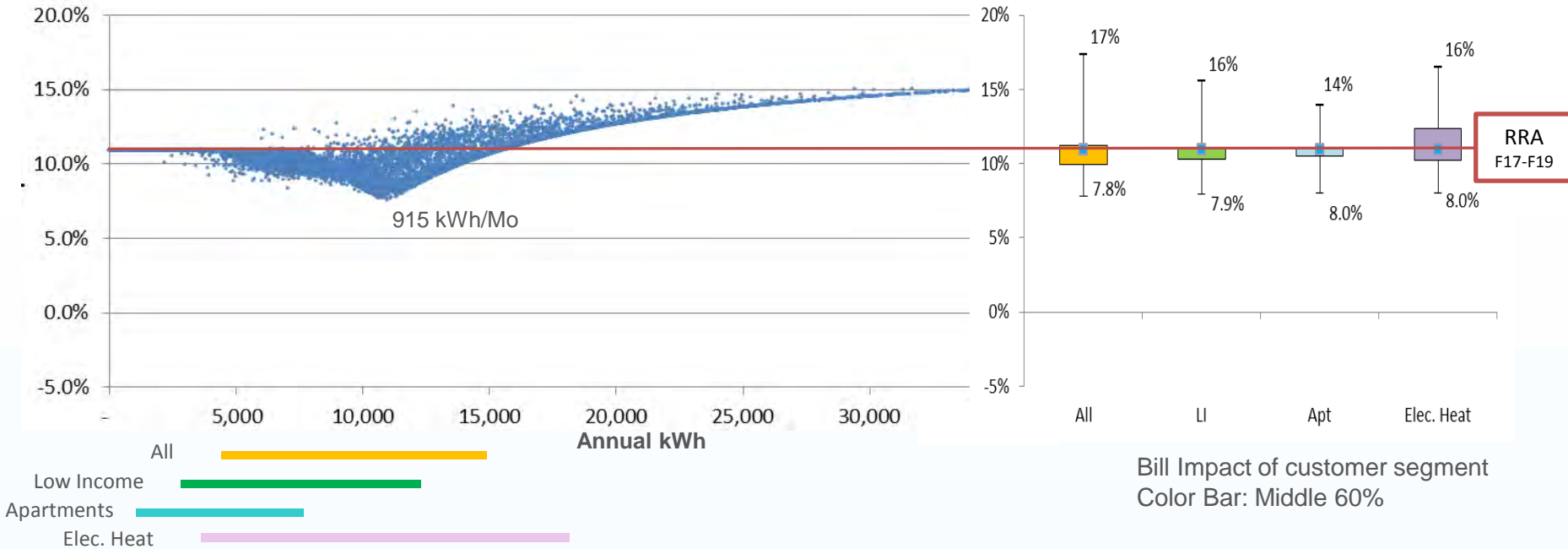
\* "Better off" = at least 1% lower than SQ bill

### Observations

- Helps lower bills for customers who have typical consumption
- Max impact = 10% by design (Largest customer)

# THREE STEP RATE MODEL A (675 / 915)

## CUMULATIVE BILL IMPACT DISTRIBUTIONS TO F2019 (3 YEARS)



Annual Consumption Range for the middle 60% of each customer segment

Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	36%	\$896	(\$12)
Low Income	27%	\$633	(\$0)
Apartment	23%	\$448	(\$0)
Electric Heat	30%	\$1,112	(\$11)

\* "Better off" = at least 1% lower than SQ bill

### Observations

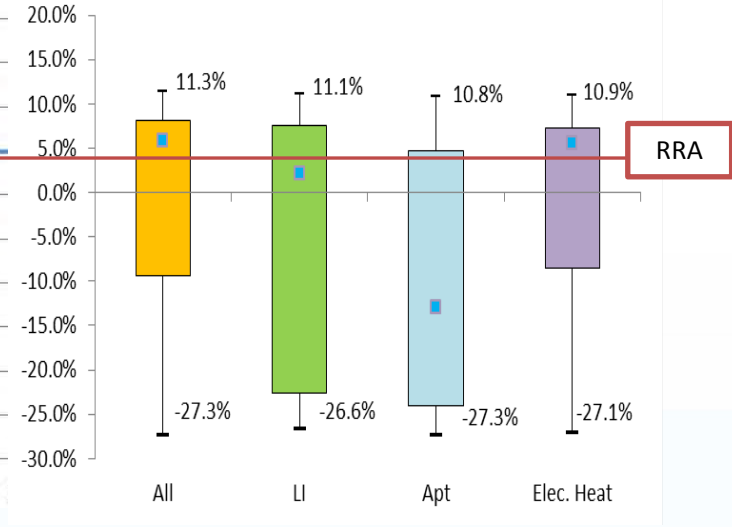
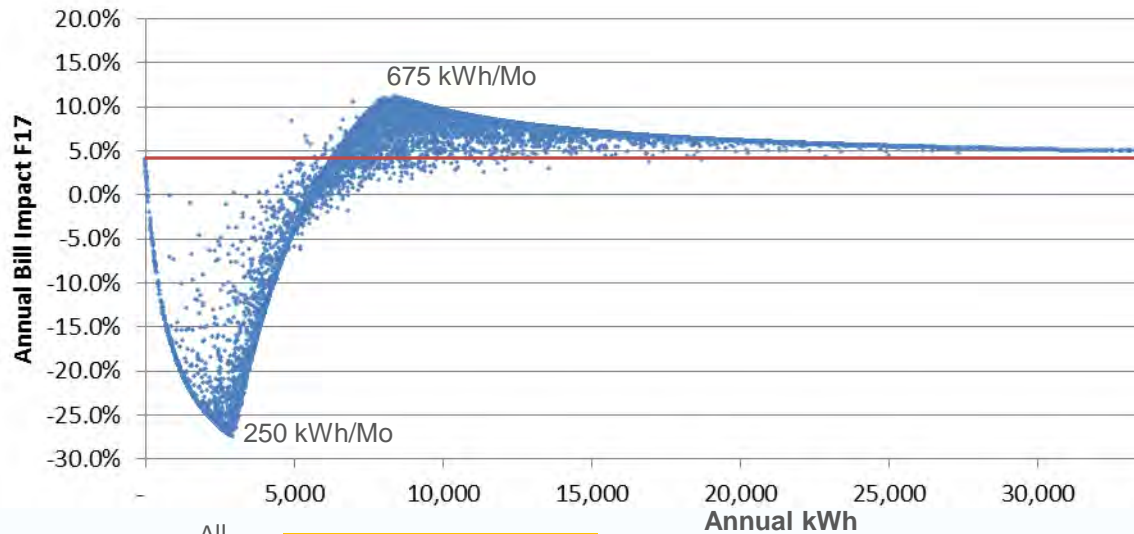
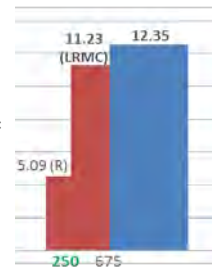
- Similar trend as in F17

# THREE STEP RATE MODEL B (250 / 675)

## BILL IMPACT DISTRIBUTIONS F2017

S1/S2 threshold set at **250**; S2 LRM; S3 = 10% higher S2

Low Step 1 computed residually



Bill Impact of customer segment  
Color Bar: Middle 60%

Annual Consumption Range for the middle 60% of each customer segment

Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	38%	\$892	\$40
Low Income	52%	\$586	(\$8)
Apartment	77%	\$351	(\$69)
Electric Heat	36%	\$1,089	\$36

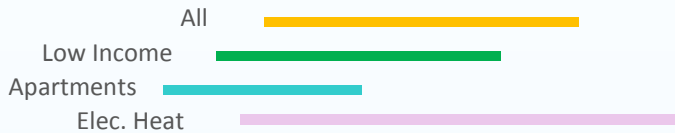
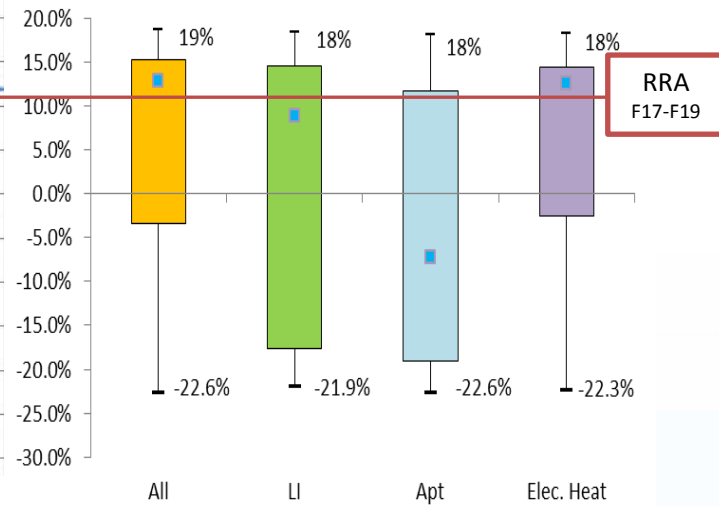
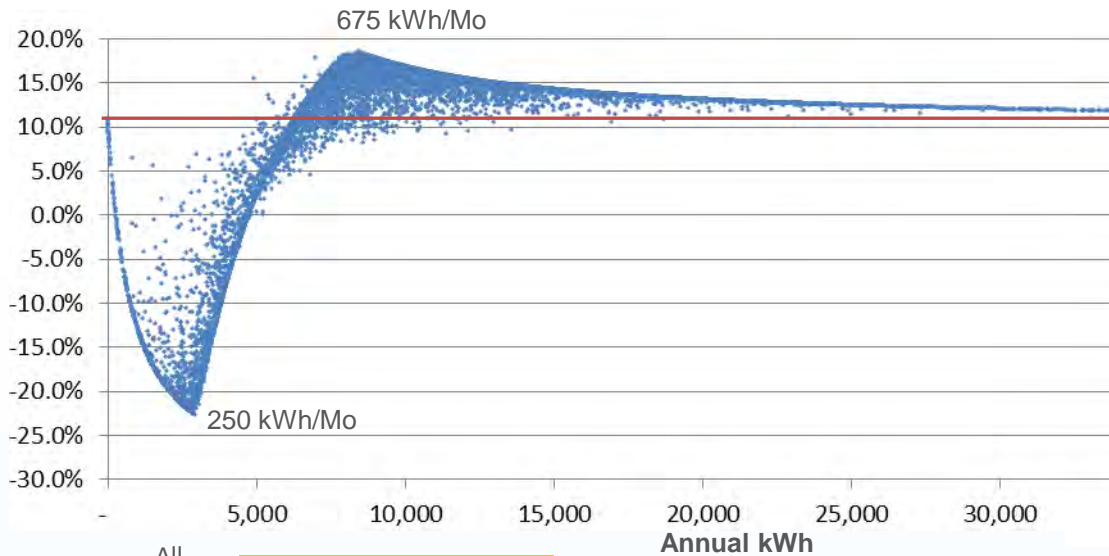
### Observations

- Bill impact patterns are not directly related to size
- Low S1 reduced bill for customers near the first threshold
- Customers near the median have the highest bill impact because SQ S1 is much lower than the new S2.
- Highly sensitive bill impact

\* "Better off" = at least 1% lower than SQ bill

# THREE STEP RATE MODEL B (250 / 675)

## CUMULATIVE BILL IMPACT DISTRIBUTIONS TO F2019 (3 YEARS)



Bill Impact of customer segment  
Color Bar: Middle 60%

Annual Consumption Range for the middle 60% of each customer segment

Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	38%	\$951	\$42
Low Income	52%	\$625	(\$8)
Apartment	77%	\$374	(\$74)
Electric Heat	36%	\$1,161	\$38

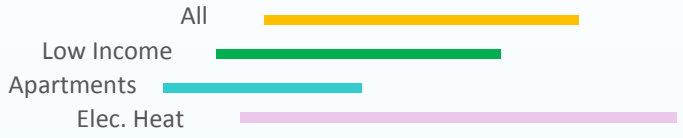
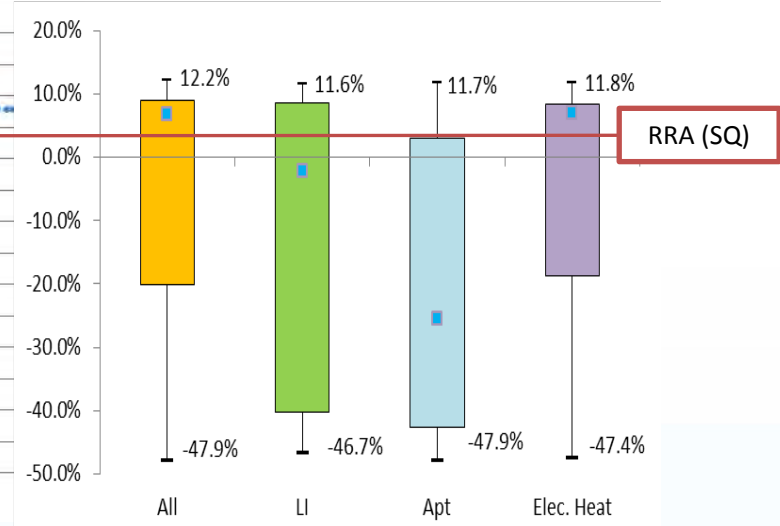
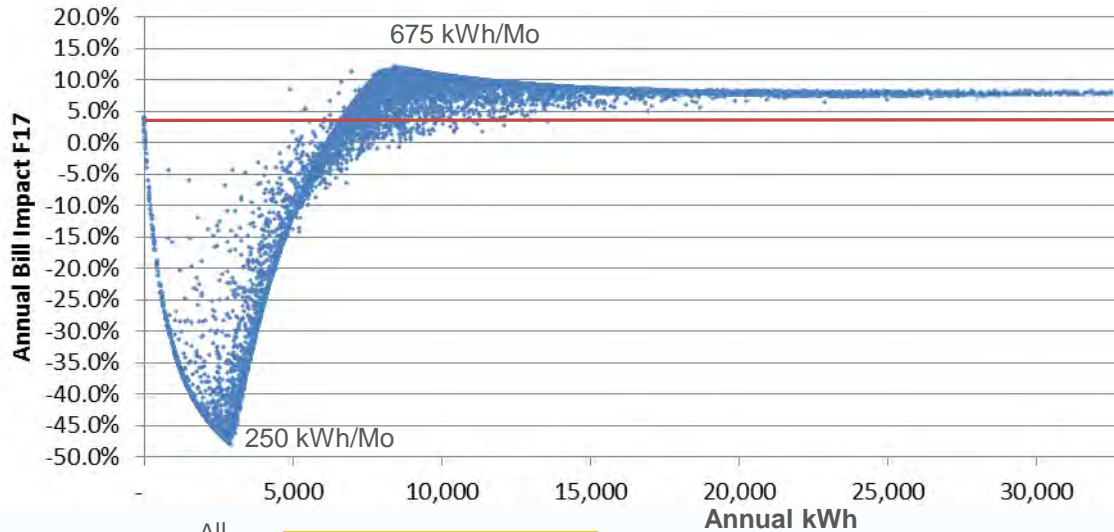
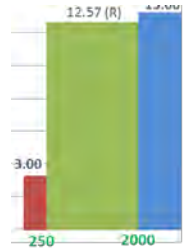
### Observations

- Same patterns as F17

\* "Better off" = at least 1% lower than SQ bill

# THREE STEP RATE MODEL C (250 / 2000) BILL IMPACT DISTRIBUTIONS F2017

S1 at 3c/kWh; S3 at 13c/kWh;  
Thresholds **250/2000**



Annual Consumption Range for the middle 60% of each customer segment

Bill Impact of customer segment  
Color Bar: Middle 60%

Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	42%	\$893	\$40
Low Income	57%	\$562	(\$31)
Apartment	82%	\$300	(\$121)
Electric Heat	40%	\$1,092	\$39

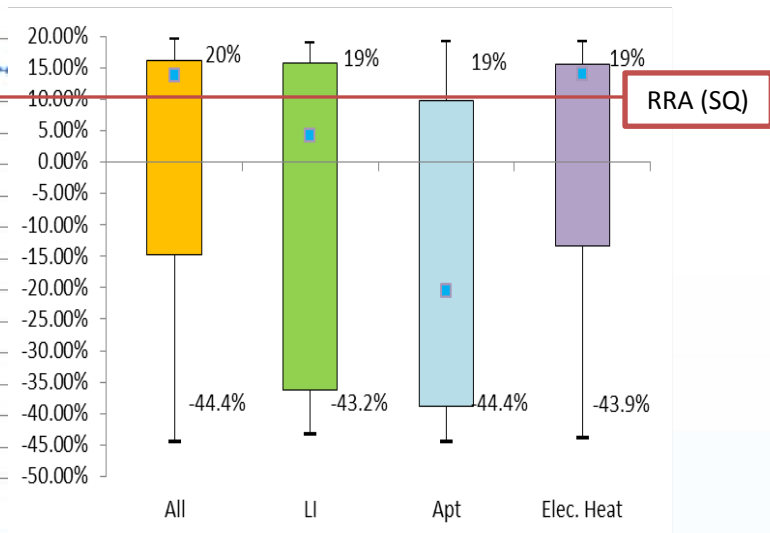
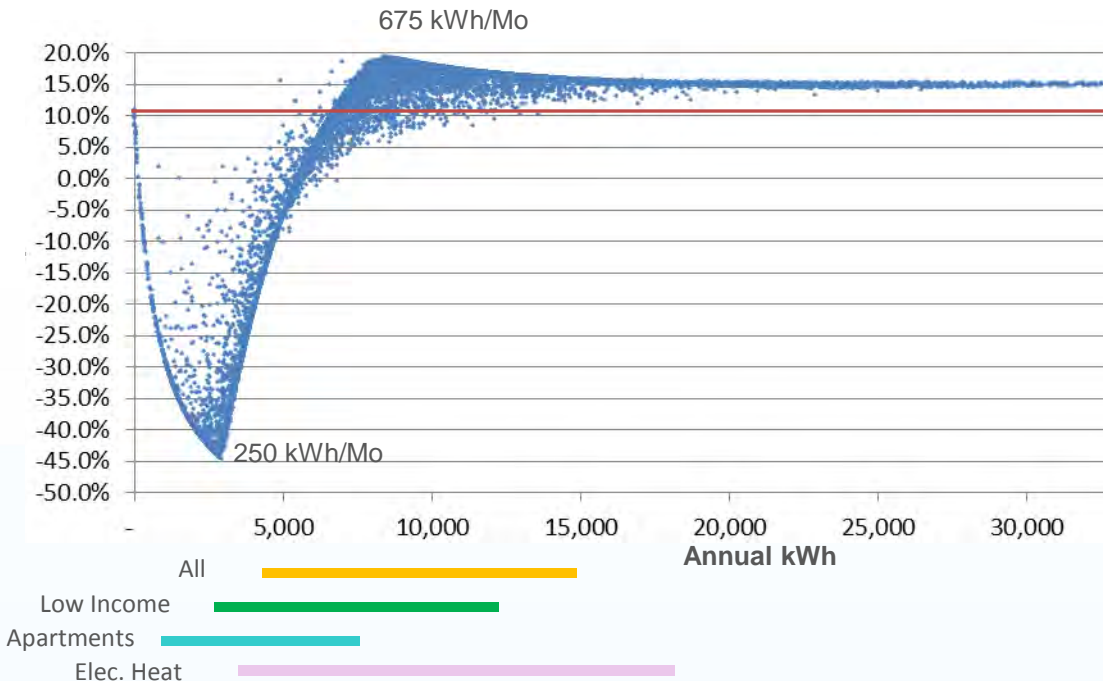
## Observations

- Bill impact patterns are not directly related to size
- Low S1 reduced bills for customers near the first threshold
- Customers near the median have the highest bill impact because SQ S1 is much lower than the new S2.

\* "Better off" = at least 1% lower than SQ bill

# THREE STEP RATE MODEL C (250 / 2000)

## CUMULATIVE BILL IMPACT DISTRIBUTIONS TO F2019 (3 YEARS)



Bill Impact of customer segment  
Color Bar: Middle 60%

Annual Consumption Range for the middle 60% of each customer segment

Customer Segments	Proportion Better off than SQ	Median Bill of Segment	Median Bill Difference from SQ
All Customers	42%	\$952	\$43
Low Income	58%	\$600	(\$33)
Apartment	82%	\$319	(\$129)
Electric Heat	40%	\$1,164	\$42

FOR GENERATIONS

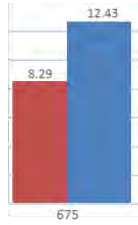
\* "Better off" = at least 1% lower than SQ bill

### Observations

- Same patterns as F17



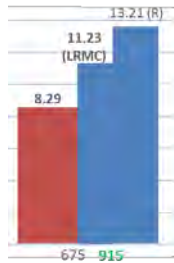
SQ



Cumulative Conservation F17 Forecast

= 463 GWh

A



Cumulative Conservation F17 vs. Status Quo

= +34 GWh

- Explained by higher 3<sup>rd</sup> step

B

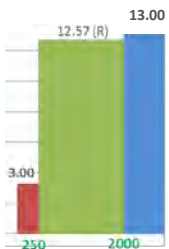


Cumulative Conservation F17 vs. Status Quo

= -21 GWh

- Explained by lower 3<sup>rd</sup> step

C

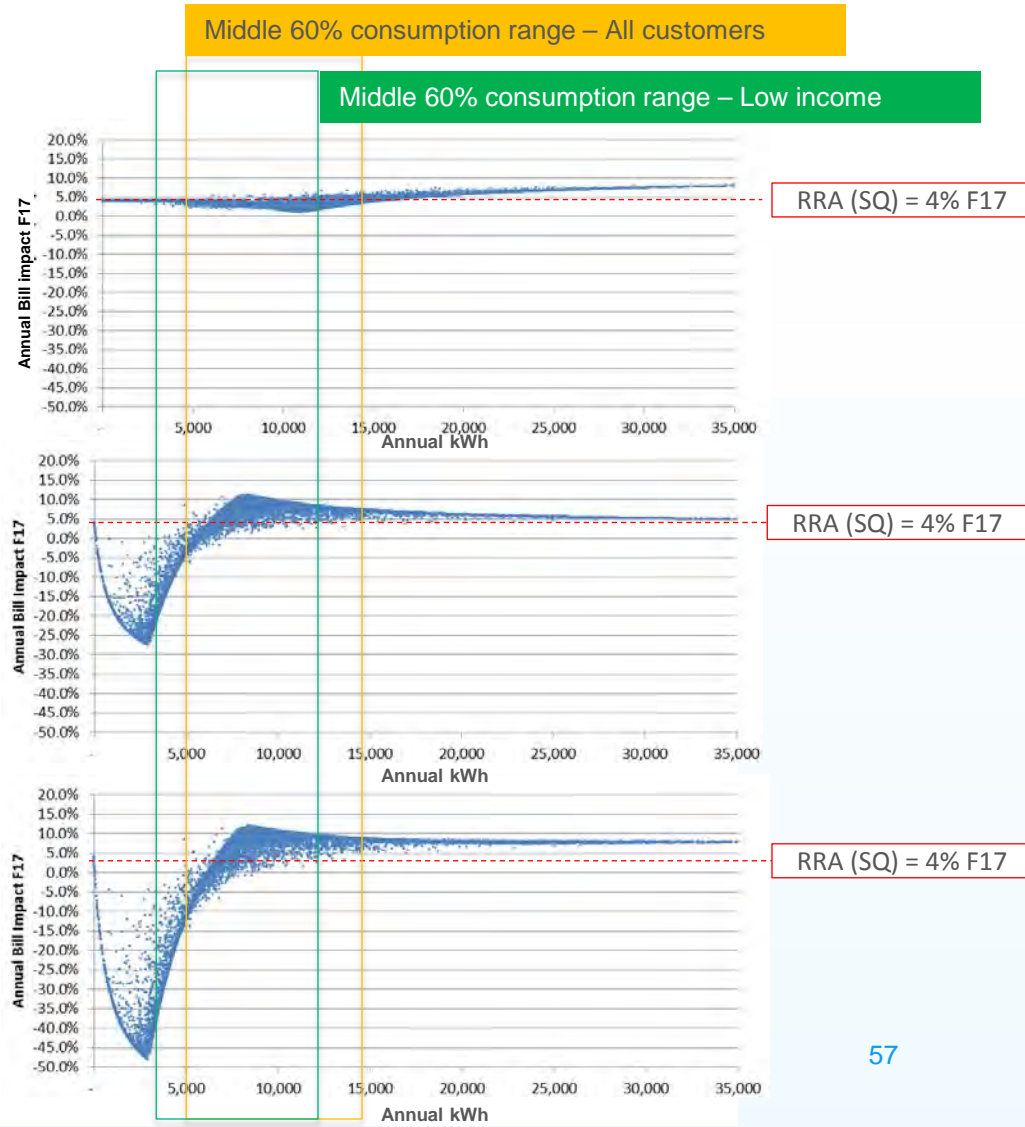


Cumulative Conservation F17 vs. Status Quo

= +19 GWh

- Explained by higher marginal prices for consumption > 675 kWh/month

**F17 Bill Impact Distributions versus Status Quo**



# THREE STEP RATES

## Summary

Criteria	Comments
<b>Economic Efficiency</b>	<ul style="list-style-type: none"> <li>• Step 3 &gt; LRMC, but small differences overall compared to RIB price signal</li> <li>• Negligible changes in conservation, within uncertainty range of elasticity estimates</li> </ul>
<b>Fairness</b>	<p>Model A:</p> <ul style="list-style-type: none"> <li>• Highest bill impacts to larger consumers (up to 10%)</li> <li>• Typical customers in the range of median consumption: lowest bill impacts</li> <li>• Impacts are generally low; small differences overall compared to SQ RIB</li> </ul> <p>Models B &amp; C</p> <ul style="list-style-type: none"> <li>• Typical customers in the range of median consumption: highest bill impacts</li> <li>• Low/very low consuming customers benefit; not necessarily low income</li> <li>• New thresholds are arbitrary</li> </ul>
<b>Practicality</b>	<ul style="list-style-type: none"> <li>• Decrease in customer understanding</li> <li>• Increase in administration complexity</li> </ul>
<b>Stability</b>	<ul style="list-style-type: none"> <li>• May increase revenue uncertainty</li> <li>• Increase in rate setting uncertainty</li> </ul>

## OPTIONS TO CARRY FORWARD TO 2015 RDA FILING

	Economic Efficiency	Fairness	Practicality	Stability
<p><b>SQ RIB Rate</b></p> <p><b>BC Hydro Preferred Option</b></p>	<ul style="list-style-type: none"> <li>Exposes a majority of residential customers to a LRMC price signal</li> <li>Step 2 rate currently exceeds the upper end of range of the energy LRMC</li> <li>F17 forecast cumulative conservation = 463 GWh (since 2008)</li> </ul>	<ul style="list-style-type: none"> <li>675 kWh/month threshold is generally reflective of typical residential consumption; equal to about 90% of median residential consumption on an ongoing, stable basis</li> </ul>	<ul style="list-style-type: none"> <li>Relatively simple</li> <li>50 percent of residential customers are aware of the RIB rate, and 80 percent of those customers believe it serves as an incentive to manage electricity consumption</li> <li>Many jurisdictions have two-step inclining block rate for residential customers</li> </ul>	<ul style="list-style-type: none"> <li>RIB rate in place since October 2008</li> </ul>
<p><b>3-Step Rate</b></p> <p><b>BC Hydro proposes no further modeling of Models A, B or C and asks for stakeholder comment</b></p>	<p><b>Worse than SQ</b></p> <ul style="list-style-type: none"> <li>No basis to deliberately set in isolation a Step 3 rate to further exceed LRMC</li> <li>Relatively small increase or decrease in conservation compared to SQ, depending on design; an outcome more of price level than rate structure</li> </ul>	<p><b>Worse than SQ</b></p> <ul style="list-style-type: none"> <li>No basis to target bill savings to median and lower consuming customers through higher rates charged to average and higher consuming customers</li> <li>New thresholds are arbitrary</li> </ul>	<p><b>Worse than SQ</b></p> <ul style="list-style-type: none"> <li>Adds complexity - and may be seen as attempt to hide rate increases (focus groups)</li> <li>Only one Canadian jurisdiction - Yukon Electric - has a 3-step rate</li> <li>California utilities seeking to reduce number of rate tiers</li> </ul>	<p><b>Worse than SQ</b></p> <ul style="list-style-type: none"> <li>A move from SQ rates degrades rate stability, particularly when SQ rates are generally performing well</li> </ul>

# THANK YOU

SEND COMMENTS TO:

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

For further information,

please contact:

BC Hydro Regulatory Group

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

(604) 623-4046



FOR GENERATIONS

Find BC Hydro at:



[www.bchydro.com](http://www.bchydro.com)