RATE DESIGN APPLICATION (RDA)
MODULE 2

Workshop No. 1 Agenda

Facilitator: Anne Wilson

January 16 and 17, 2017

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Workshop No. 1 – January 16, 2017 Agenda

Approximate Time	Item	Presenter
9:00 – 9:15	Welcome and Agenda Review	Anne Wilson
9:15 – 10:15	1. RDA Module 2 Scope	Gord Doyle
10:15 – 11:00	2. Guarantees for Residential Accounts	Jeff Hardman, Daren Sanders
11:00 – 11:15	BREAK	
11:15 – 12:30	3. Transmission Service Tariffs Overview	David Keir
12:30 – 1:30	LUNCH	
1:30 – 2:45	4. Tariff Supplement 6 (TS 6)	Gord Doyle, Sam Jones
2:45 – 3:00	BREAK	
3:00 – 4:30	4. Tariff Supplement 6 (continued)	Sam Jones
4:30 – 4:45	Closing	Anne Wilson

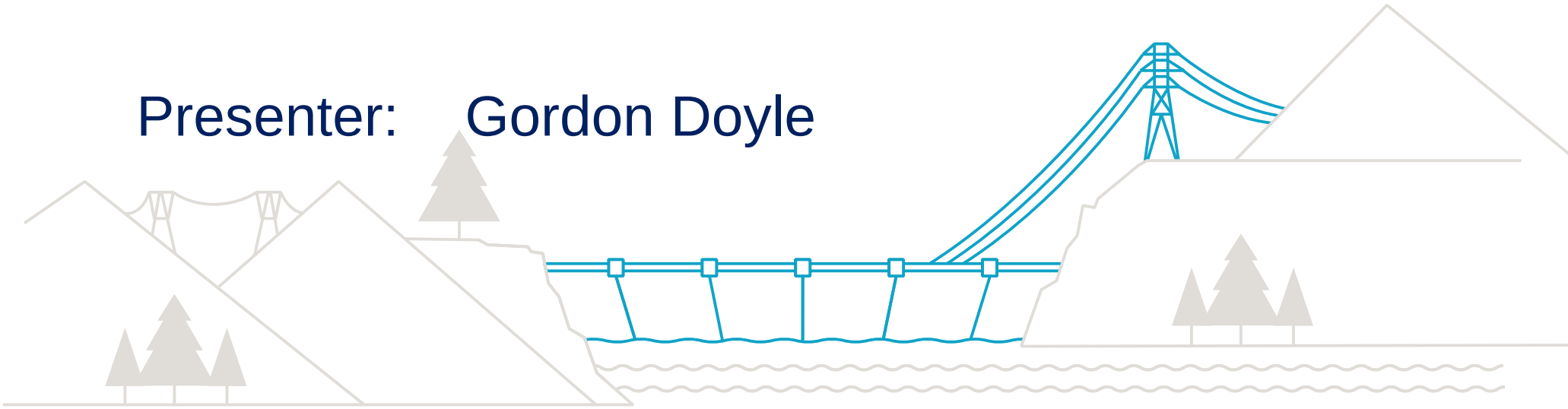
Workshop No. 1 – January 17, 2017 Agenda

Approximate Time	Item	Presenter
9:00 – 9:15	Welcome and Updates	Anne Wilson
9:15 – 10:30	4. Tariff Supplement 6 (continued)	Gord Doyle, Sunny Dhannu
10:30 – 10:45	BREAK	
10:45 – 12:00	4. Tariff Supplement 6 (continued)	Sunny Dhannu, Sachie Morii
12:00 – 1:00	LUNCH	
1:00 – 2:30	5. Tariff Supplement 5 (TS 5)	David Keir
2:30 – 2:45	BREAK	
2:45 – 3:45	5. Tariff Supplement 5 (continued)	David Keir
3:45 – 4:15	6. Interconnection Terms and Conditions	Sam Jones
4:15 – 4:30	Closing and Next Steps	Anne Wilson

RATE DESIGN APPLICATION (RDA)
MODULE 2

Module 2 Scope

Presenter: Gordon Doyle



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Agenda – Module 2 Scope

- Items Informing Module 2 Scope
- Module 2 Scope
- Engagement

Items Informing Module 2 RDA Scope

- Commitments made during Module 1 process
- Climate Leadership Plan
- Stakeholder engagement
- Previous BCUC decisions, in particular:
  - 2007 Rate Design Application
  - 2012 Dawson Creek/Chetwynd Area Transmission Project (DCAT) Certificate of Public Convenience and Necessity (CPCN) proceeding
- Relevant Industrial Electricity Policy Review (IEPR) Report recommendations and November 2013 BC Government responses

BC Hydro has an Opportunity to Support Low-Carbon Electrification

B.C. Climate Leadership Plan (2016)

"To advance efficient electrification, we are taking action by working with BC Hydro to expand the mandate of its DSM programs to include investments that increase efficiency and reduce GHG emissions."

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What is Low-Carbon Electrification?

The reduction of greenhouse gas emissions by using clean electricity instead of other forms of energy such as gasoline, natural gas and diesel

Applies to:

- New load coming onto BC Hydro's system where the base case would be non-clean fuels
- Existing customer end uses involving non-clean fuels that are converted to efficient electric technologies

Support Climate Leadership Plan

- Develop optional rates to support low-carbon electrification:
  - Address any potential disincentive to increasing load that the default rates may cause
  - Encourage customers to make changes to how they use energy (e.g., reduce emissions, use electricity during non-peak times)
- Investigate how extension policies can support low-carbon electrification

Module 2 Scope

Module 2 Commitments from 2015 Rate Design Application Module 1

- Review:
  - non-integrated area
  - farm service and irrigation
  - commercial E-Plus
  - street lighting
  - extension policies
  - voluntary residential, general service, and transmission rate options e.g., time-of-use rates, residential prepayment option, and general service interruptible rates
  - extra-large general service rate
- Application Fall 2017

Non-Integrated Area (NIA)

Background

- Non-integrated areas include two rate zones: IB (Bella Bella District) and II (all other non-integrated communities)
- Bella Bella migrated from Zone II to Zone IB in 2008 on the basis that it shares similarities with customers served on the integrated system
- The rates for non-integrated customers are different than those of the integrated system

Rate Considerations

- Should postage stamp ratemaking be applied to non-integrated area?
- What would the financial impacts be to non-integrated area customers and integrated area customers if postage stamp rates were implemented?

Terms and Conditions

- Are there unique characteristics of the non-integrated area that would justify differentiated terms and conditions from those of the integrated area?

Farm Service

Background

- Farm customers served under exempt Rate Schedule 1151, Small General Service (SGS), Medium General Service (MGS) or Large General Service (LGS) rates
- Farms not defined in the Electric Tariff or the Utilities Commission Act

Rate Considerations

- Should small residential farms continue to be exempt from the Residential Inclining Block (RIB) rate?
- Should BC Hydro change the eligibility criteria for the exempt Rate Schedule 1151 rate?
- Should larger residential farms be moved to MGS or LGS based on consumption thresholds?

Other Considerations

- What should BC Hydro's metering policy be where there is commercial activity on a residential farm?

Irrigation

Background

- Irrigation customers defined as a separate customer class with a unique cost of service that is based on irrigation customers taking service during the irrigation season and not materially contributing to BC Hydro's system peak

Rate Considerations

- Does pump capacity remain the applicable qualifier for the irrigation rate or should the rate be available more broadly?

Terms and Conditions

- Should the minimum charge be modified?

General Service E-Plus Rate

- Module 1 proposal on the residential E-Plus rate:
  - Amend the conditions of the rate to provide a practical interruptible option
- There are about 200 customers on the commercial E-Plus rate (as compared to about 8,000 customers on the residential E-Plus rate)
- Determine customer characteristics
- Await Commission Decision on the residential E-Plus rate proposal before determining the scope of the commercial E-Plus rate

Street Lighting – Rate Schedule 1701

BC Hydro Owned Street Lights

Rate Considerations

- Review appropriateness of new rates for Light Emitting Diode (LED) street lighting for customers wanting to replace High-Pressure Sodium (HPS) lights
- LED use lower energy and have lower maintenance costs but higher capital cost
- How to recover Net Book Value of lights to be retired before end-of-life?

Street Lighting – Rate Schedule 1703

Customer Owned Street Lights on BC Hydro Poles

Rate Considerations

- Rate design for pole contact charge. This is the rental charge customers pay to BC Hydro for space on poles to which they attach their lights.
  - Currently 99.84 ¢ per fixture per month
  - Lower than rental for other non-BC Hydro usages
  - Sufficient space is required to allow customer to perform maintenance safely in addition to attaching fixtures

Optional Residential Rates

Rate Considerations

- Develop rates that support low-carbon electrification:
  - Voluntary time-of-use, e.g., to encourage charging electric vehicles during off-peak hours
  - Other rates that could support electrification proposed by stakeholders/customers during Module 2 engagement
- Prepayment option:
  - Customers pay in advance of consumption
  - Review section 2.4 Security Deposits of Electric Tariff to identify changes required to support prepay billing as alternative form of account security

Optional General Service Rate Options

Rate Considerations

- Commercial Energy Consumers (CEC) interruptible rate pilot proposal:
  - BCUC Order G-128-16 - stakeholder engagement commenced in October on CEC interruptible rate pilot proposal
- Demand charge options:
  - Billing demand based on High Load Hours only
- Develop rates that support low-carbon electrification:
  - E.g., voluntary time-of-use rate

Extra Large General Service Rate

Background

- In RDA Module 1, interveners requested BC Hydro consider developing a conservation rate structure for the largest Large General Service (LGS) customers who potentially have more knowledge and resources to react to conservation rate signals

Rate Considerations

- Determine customer characteristics
- Await Commission Decision on the Medium and Large General Service rates before determining the scope of the Extra Large General Service rate

Annual Peak Demand	Number of Accounts
> 5,000 kW	38
> 4,000 kW	58
> 3,000 kW	102
> 2,000 kW	185
> 1,000 kW	468

Distribution Extension Policy

Background

- Distribution extension policy is covered under section 8 of the Electric Tariff and was last reviewed by the BCUC in the 2007 Rate Design Application
- The current BC Hydro contribution (offset) towards new connection is $200/kW for general service customers or $1,475/single family dwelling for residential customers. These offsets are based on a NPV calculation of expected revenues based on the distribution Cost of Service study.

Rate Considerations

- The Commission's 2008 reconsideration decision directed review of the following in the next Rate Design Application:
  - The principles for our extension policy
  - The discount rate used in the contribution calculation
  - The period used in NPV calculation of the contribution calculation
  - What costs are considered in the contribution calculation

Distribution Extension Policy

In addition to the calculation of BC Hydro's contribution we are also looking at:

- Recovery of system improvement cost
  - Clarify what is system improvement versus extension
- Extension fee refunds
  - Customers have asked that the current policy be reviewed

Transmission Service Tariffs

New transmission customers are supplied under Tariff Supplement 5 (Electricity Supply Agreement) and Tariff Supplement 6 (Facilities Agreement) which have remained essentially unchanged since approved in 1991

Tariff Supplement 5 (TS 5) sets out the terms and conditions on which BC Hydro will provide electricity to transmission service customers and comes into effect at the time of energization of the transmission line serving the customer

Tariff Supplement 6 (TS 6) governs the interconnection of load customers at transmission voltages (> 60kV) and sets out who is responsible to build what new infrastructure and who is responsible to pay for that infrastructure

Engagement

We will continue to build off the engagement process developed in Module 1:

- We will be engaging directly with customers to identify potential optional rates to understand their needs
- As options are identified and modeled BC Hydro will bring them forward at stakeholder workshops for feedback
- Similar feedback process as Module 1 with opportunities for stakeholder feedback and BC Hydro documenting its consideration of the feedback received

Guarantees as an Alternate Form of Security for Residential Accounts

Presenters: Jeff Hardman,
Daren Sanders

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Purpose and Context

In Module 1, BCOAPO proposed use of a surety as an alternative to providing a cash security deposit

BC Hydro committed to review the practicality of implementing a surety and then submit an application for any necessary tariff changes

BC Hydro also committed to engaging with stakeholders prior to submitting an application

Enabling a Payment Guarantee

A guarantee is a more practical solution than a surety

A “surety” would provide a contractual commitment for another individual or entity to pay; however, it would require BC Hydro to take legal action if the commitment was not met

Having another BC Hydro customer guarantee the payment is a simpler and less expensive solution:

- Allows a residential customer to name a guarantor that would agree to have an outstanding balance transferred to them
- Enables standard collection practices to be followed to obtain payment from a guarantor

Who is the Guarantor?

BC Hydro's proposal: Another BC Hydro customer that can demonstrate sufficient creditworthiness to mitigate the additional liability of the non-paying customer

- Could be residential or general service customer (e.g., community organization)

This is different than BC Hydro's ability to waive security deposits on the basis of participating in designated programs

- BC Hydro determines when a customer can't demonstrate acceptable credit
- Agreements with the Ministry of Social Development and Social Innovation (MSDSI) or other social assistance programs may provide sufficient assurance of payment to allow waiver of a security deposit without requiring use of a guarantor

Conceptual Business Process

1. If a security deposit is assessed, the customer is informed of the option to provide a guarantor
2. The guarantor completes and submits an authorization form
3. BC Hydro determines if the guarantee is a suitable alternative to a cash deposit
   - The guarantor must have a good payment history; they would be subject to ID verification and may be asked to provide additional credit information depending on the expected consumption of the account
4. Normal billing and dunning activities are followed with the customer
   - With the customer's permission the guarantor could be linked to the customer's account online, to allow them to view bills and be copied on dunning notices
5. If the account has been paid on-time for 2 years then the guarantee would be cancelled
6. If the account is closed, the guaranteed balance would be transferred to the guarantor after approximately 60 days (i.e., rather than being sent to a collection agency)
   - Requires the customer to 'move out' without a 'move in' – a move between accounts would follow the current practice of transferring an outstanding balance to the new account, with the addition of having the guarantee also transfer with the move
   - Also applicable if BC Hydro closes the account after a customer is disconnected for non-payment and doesn't make payments to be reconnected

Proposed Tariff Changes

BC Hydro proposes to amend the Electric Tariff to do the following:

- Specify that, in lieu of a security deposit, an existing BC Hydro customer may act as a guarantor for another customer taking residential service
- Specify that BC Hydro has the right to apply an amount to the guarantor's account
- Clarify that the guarantor may be disconnected for failure to pay a transferred amount

Details of the guarantor option will be included in the on-line description of business practices that is currently being developed

Other Considerations Requiring Input

1. What are the limits on liability to the guarantor?
   - Complete outstanding balance? Maximum of 3X the customer's average monthly bill? Other?
2. What are the conditions under which the guarantee would be cancelled?
   - E.g., guarantor ceases to be a customer or if its creditworthiness deteriorates
   - If BC Hydro determines that a security deposit is still necessary, the customer would have the option of establishing another guarantor
3. Should there be a limit on the number of guarantees a customer could provide?
   - In general this is unlikely to be a significant issue but will be monitored

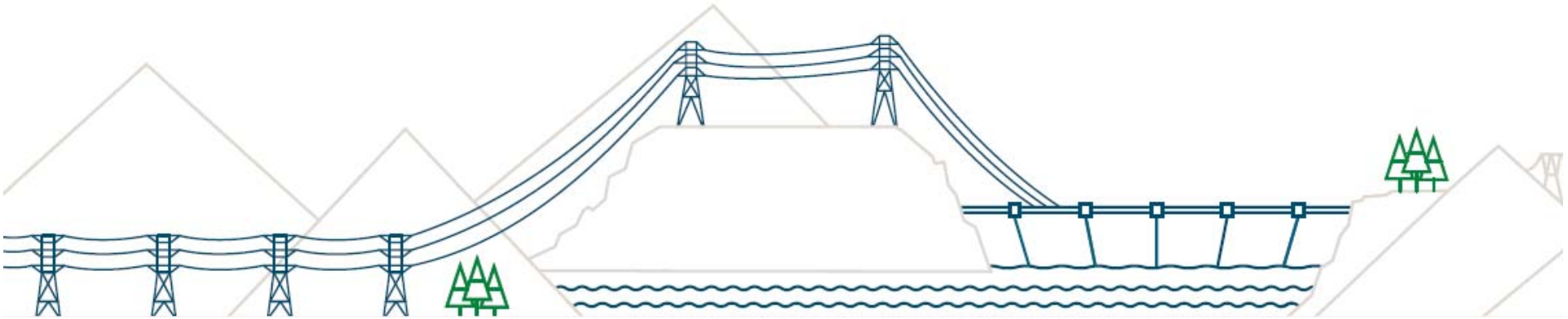
Next Steps

BC Hydro:

1. Requests comments back **by January 30, 2017**
2. Will submit an application for the proposed tariff changes in February
3. Will request a streamlined approval process using a written process

Transmission Service Tariffs

Presenter: David Keir



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Workshop Structure

Day 1

- Overview of Transmission Service Tariffs
- Review Tariff modernization concepts
- Review Tariff Supplement 6 (Facilities Agreement) and review and discuss areas under consideration

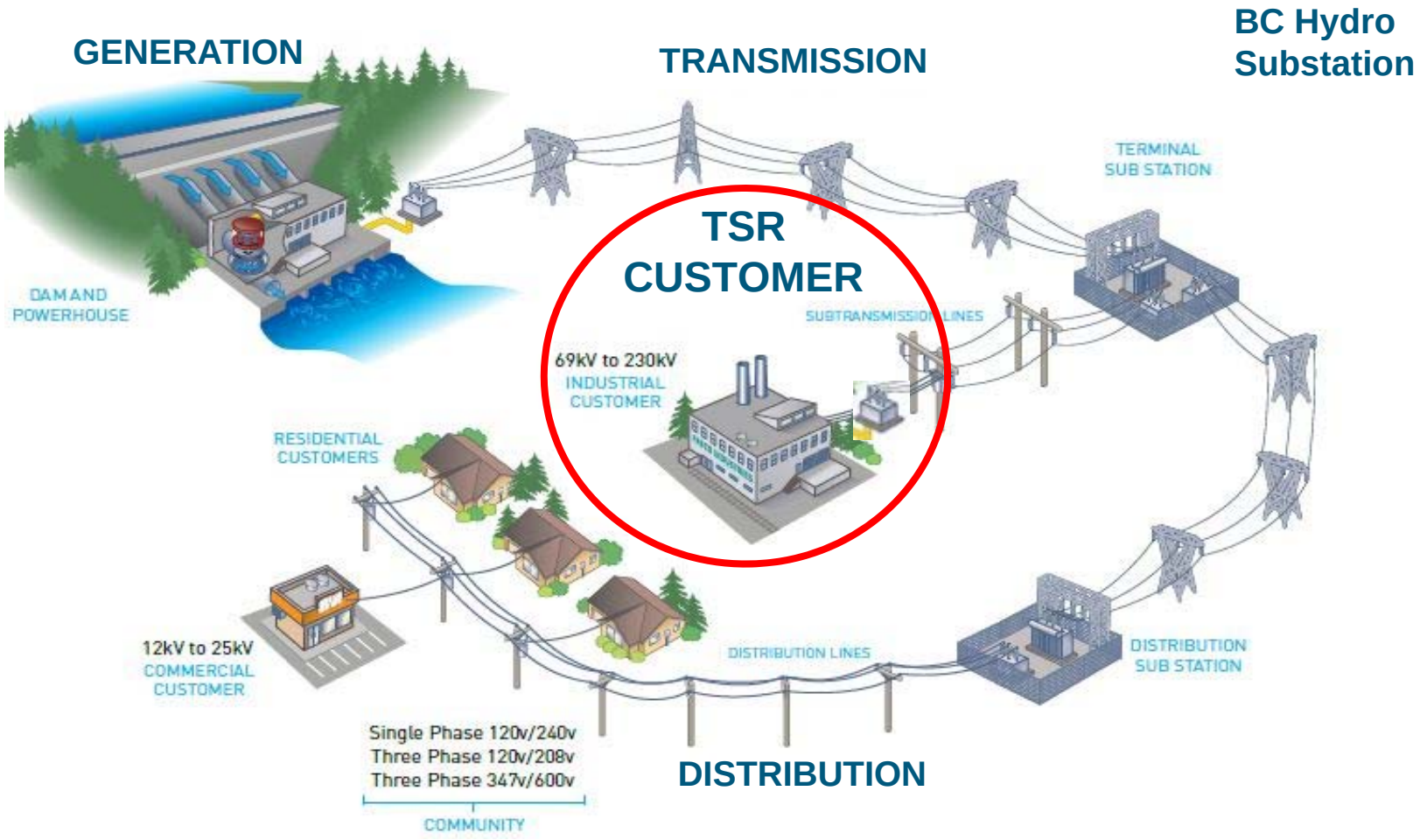
Day 2

- Review Tariff Supplement 6 (continued)
- Review Tariff Supplement 5 (Electricity Supply Agreement) and consider questions and comments
- Review and consider prospective opportunities for Tariff Supplement 5 amendment (form and content)
- Review the Interconnection Terms and Conditions concept

Day 1 Agenda

Approximate Time	Item	Presenter(s)
11:15 – 11:45	Transmission Service Tariff Background	David Keir
11:45 – 12:30	Modernization of Tariffs	David Keir
12:30 – 1:30	Lunch	
1:30 – 2:45	Tariff Supplement 6	Gord Doyle / Sam Jones
2:45 – 3:00	Break	
3:00 – 4:30	Tariff Supplement 6 (continued)	Sam Jones

Transmission Voltage Service



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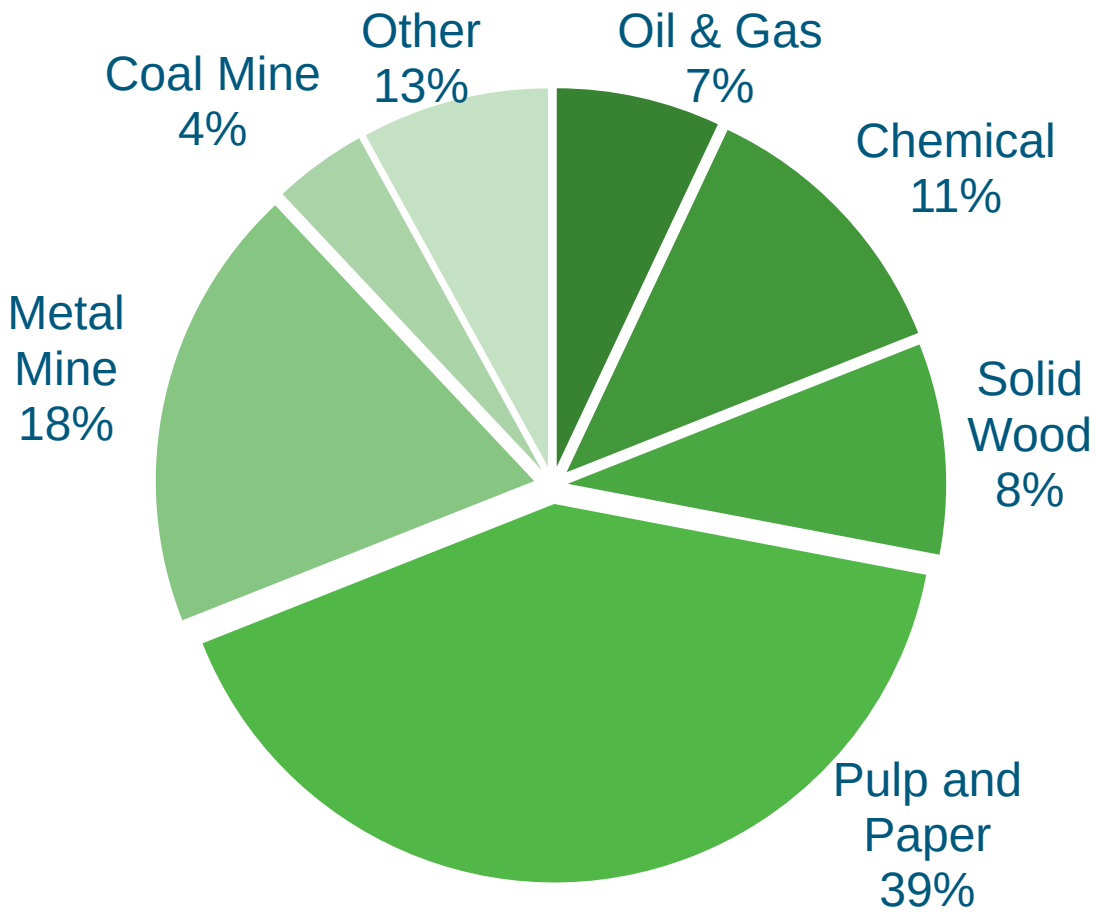
Transmission Load Customers (F2016)



~150
Customer sites

13,669
GWh

$766M
Revenue

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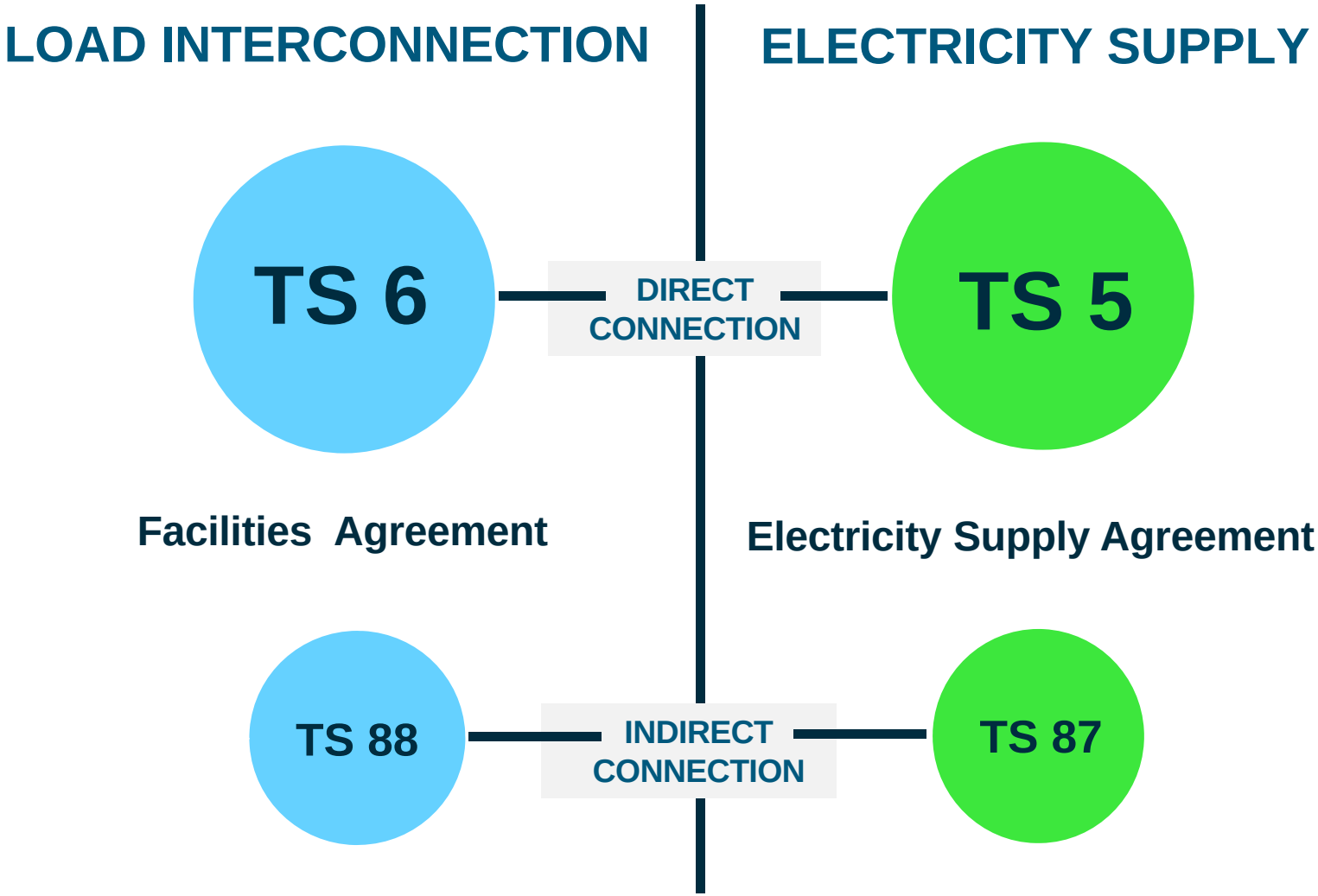
Transmission Service Tariffs



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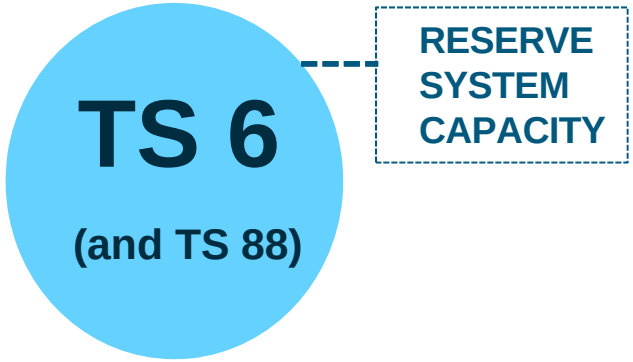
Transmission Tariff Overview

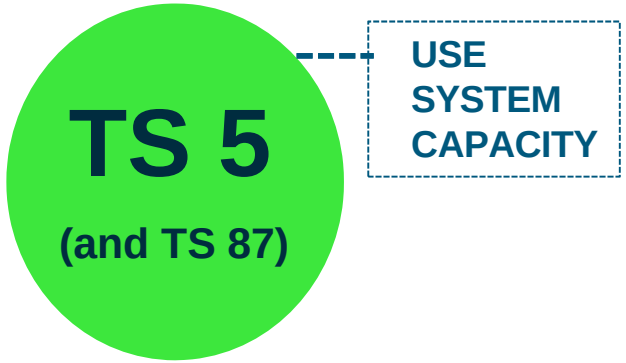
LOAD INTERCONNECTION



Facilities Agreement

- Stipulates the terms, conditions, and cost allocation for the construction of BC Hydro and private transmission facilities required to serve new load
- Reflects a contractual commitment for reservation of system capacity.
- Customer is responsible to secure costs of BC Hydro system reinforcement
- In force until all payments have been made and security returned

ELECTRICITY SUPPLY



Electricity Supply Agreement

- Sets out terms and conditions under which BC Hydro will provide electricity
- Takes effect once the transmission line serving the customer load is energized
- Reflects a dedicated right for use of BC Hydro system capacity by the customer
- Includes basic provisions re: aspects of the interconnection of BC Hydro system with the customer's facilities

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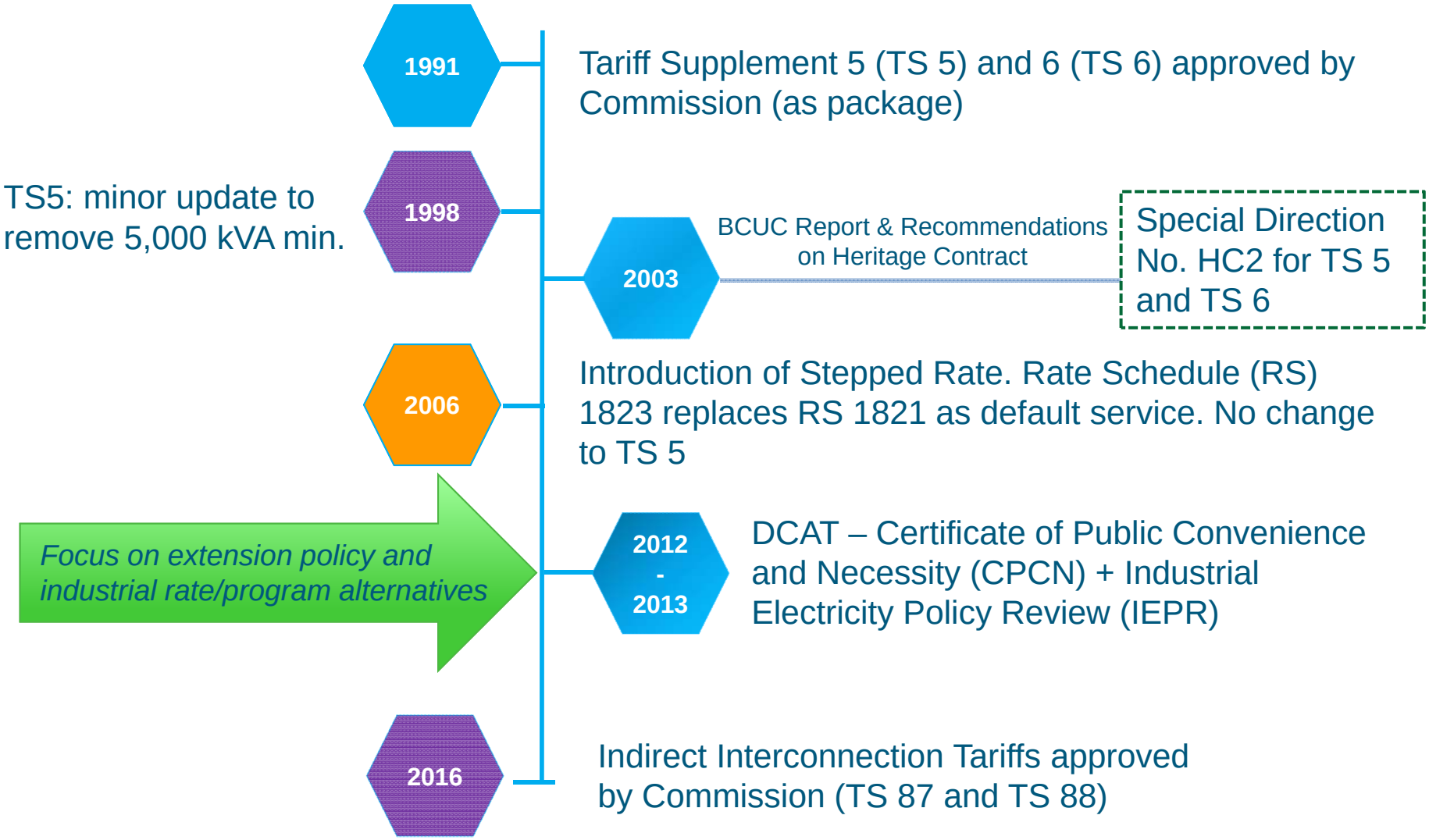
Regulatory Background



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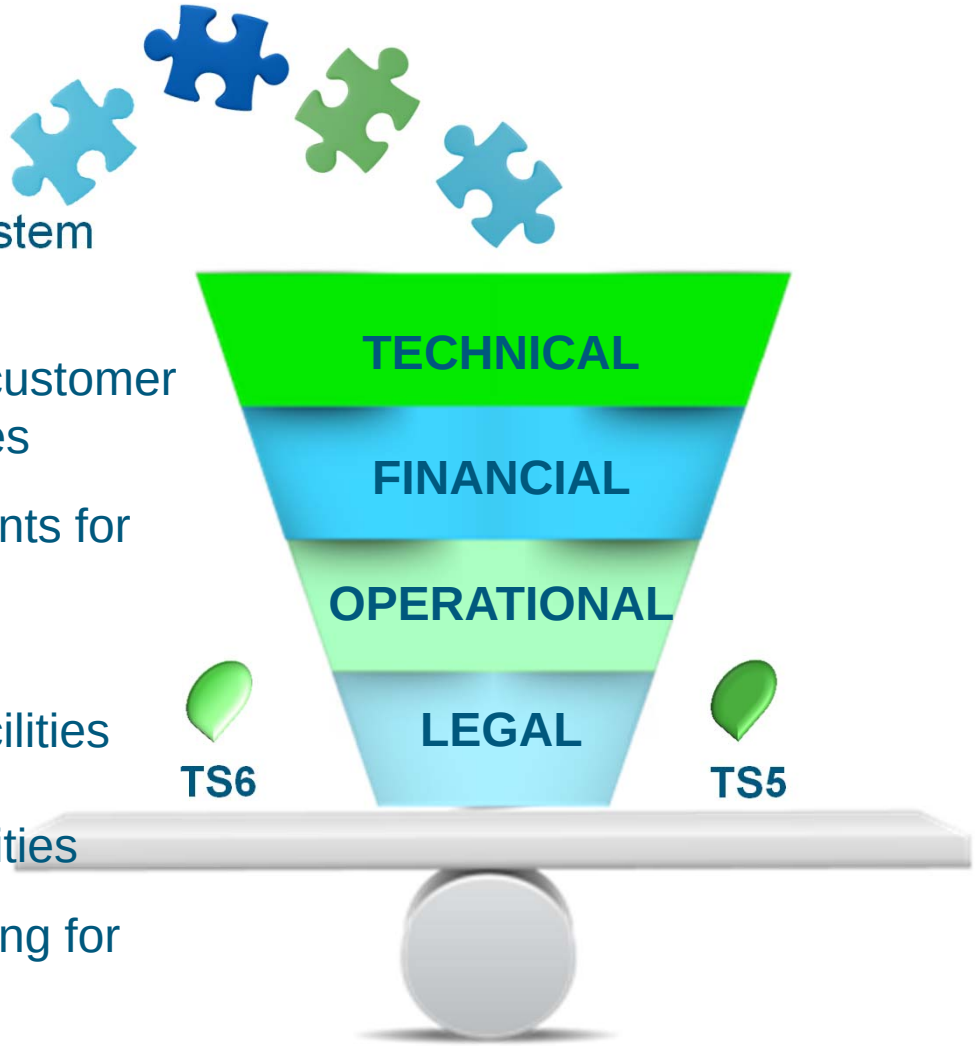
Background: Tariff Interactions

Scope, Schedule and Cost Considerations:

- Local and area transmission system reinforcements
- Construction of BC Hydro and customer facilities / use of existing facilities
- Cash and/or security requirements for capacity ‘reservation’
- Interconnection and physical energization of transmission facilities
- Ownership of transmission facilities
- Use of system capacity and billing for electricity supply



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Background: Tariff Interactions

BC Hydro is considering how best to clarify the rights and obligations as between BC Hydro and customers for the efficient interconnection and supply of transmission voltage electricity

IN PRACTICE:

Customer provides cash and/or security for interconnection under TS 6. Customer pays for actual electricity supply in accordance with TS 5 and prevailing rate schedules.

- Purpose of TS 6 is to allocate costs and obligations related to grid interconnection and reservation/allocation of transmission system capacity
- Purpose of TS 5 is to address terms and conditions for provision of electricity supply and billing under prevailing supply tariffs such as RS 1823
- Customer requests for new transmission system capacity (including reinstatement of prior capacity) must be approved before a contract demand can be established under TS 5
- 'Commencement Date' under TS 5 reflects physical energization of the transmission line serving customer load. This is when BC Hydro's service obligation and billing for electricity supply starts.

Prospective Tariff Changes

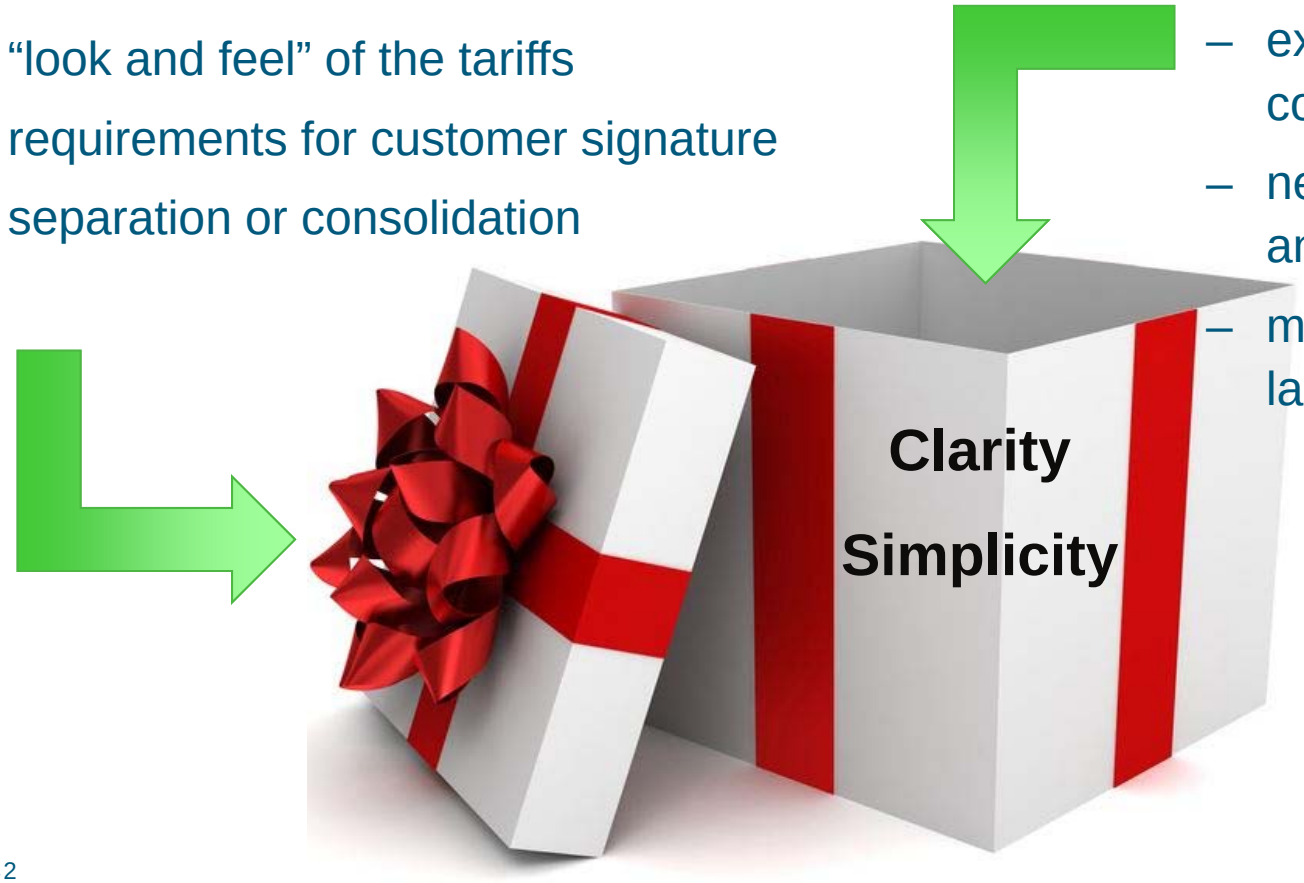
BC Hydro is seeking feedback regarding the 'form' and 'content' of its transmission tariffs (TS 5 and TS 6)

TARIFF FORM

- "look and feel" of the tariffs
- requirements for customer signature
- separation or consolidation

TARIFF CONTENT

- existing terms and conditions
- new/revised terms and conditions
- modernization of language



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Customer-Specific Information

FORM

BC Hydro is considering how best to clearly distinguish unique customer-specific requirements under TS 5 and TS 6 from standard 'boilerplate' tariff terms and conditions

ISSUE:

- TS 5 and TS 6 have standard 'boilerplate' terms and conditions interspersed with requirements for unique customer-specific information to be inserted
- The entire tariff document requires customer signature

CONSIDERATIONS:

- Separate standard terms and conditions from customer-specific information
- Append the customer site-specific information in a '2-page' agreement template for review and signature
- Examples include customer legal name, contact address, site location, point of interconnection, contract demand, power factor, etc.

FOR REVIEW AND DISCUSSION

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Update of Terms and Conditions

CONTENT

BC Hydro is considering how best to update and modernize the provisions and language in TS 5 and TS 6 for improved clarity and transparency

ISSUE:

- Given that TS 5 and TS 6 are over 25 years old, many of the existing terms and conditions are outdated and would benefit from modernization
- Some linkages with BC Hydro's Electric Tariff exist

CONSIDERATIONS:

- BC Hydro is considering whether to apply modern legal terms for provisions such as force majeure, insurance, liability limitations, default provisions, and updated statutory references
- BC Hydro is also considering the need to address gaps in the current terms and conditions of both tariffs (e.g., contract demand reduction).

Update of Terms and Conditions

CONTENT

FOR REVIEW AND DISCUSSION

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Ongoing System Interconnection and Operating Requirements

CONTENT

BC Hydro is considering how to manage the ongoing system interconnection and operating requirements not presently addressed under TS 6 and TS 5

ISSUE:

- TS 6 expires once the customer is connected and all financial obligations are met
- Neither TS 6 or TS 5 have adequate language regarding the operation of the customer's transmission system with BC Hydro's transmission system

CONSIDERATIONS:

- Update terms and conditions in TS 5 and/or TS 6 to properly address these requirements
- Introduce new load interconnection terms and conditions* to address transmission system interconnection and operating requirements (i.e., how the BCH and customer systems work together)

***Load interconnection terms and conditions will be discussed in more detail on Day 2**

Ongoing System Interconnection and Operating Requirements

FORM AND CONTENT

FOR REVIEW AND DISCUSSION

Update provisions in TS 5 and TS 6

Update and expand existing terms in TS 5 and TS 6 to address system operating requirements and conditions that BC Hydro considers to be outdated

Put all system operating provisions in one tariff (TS 5 or TS 6)

Update and expand the existing terms but put them all in one tariff

Put all system operating provisions into a new load interconnection terms and conditions

Separate tariffs for interconnection (TS 6), supply (TS 5) and transmission system operation

Transmission Tariff Centralization

FORM AND CONTENT

BC Hydro is considering whether to maintain separate tariffs for system interconnection and electricity supply and to maintain the linkages to the Electric Tariff or whether to centralize all terms and conditions for transmission service into a single tariff

ISSUE:

- TS 6 is for transmission system construction and interconnection
- TS 5 is for electricity supply
- BC Hydro's Electric Tariff applies to distribution connected customers, but also houses the rate schedules applicable to transmission voltage customers

CONSIDERATIONS:

- Is there merit in consolidating all terms and conditions for transmission service into a single tariff
- Making wholesale changes to tariff content and form simultaneously have significant time and resource implications

Transmission Tariff Centralization

FORM AND CONTENT

FOR REVIEW AND DISCUSSION

Status quo

Retain existing separate tariff forms (i.e., TS 5 and TS 6) for interconnection and supply, including linkages to BC Hydro Electric Tariff

Partial tariff re-organization

Retain separate tariffs, but with significant updates (i.e., modernization, transfer of terms from BC Hydro Electric Tariff, new load interconnection terms and conditions, etc.)

Wholesale tariff re-organization

Replace existing tariffs with a single (bundled) electric tariff for transmission service. Reflects a wholesale re-organization of form and content.

Transition Rules

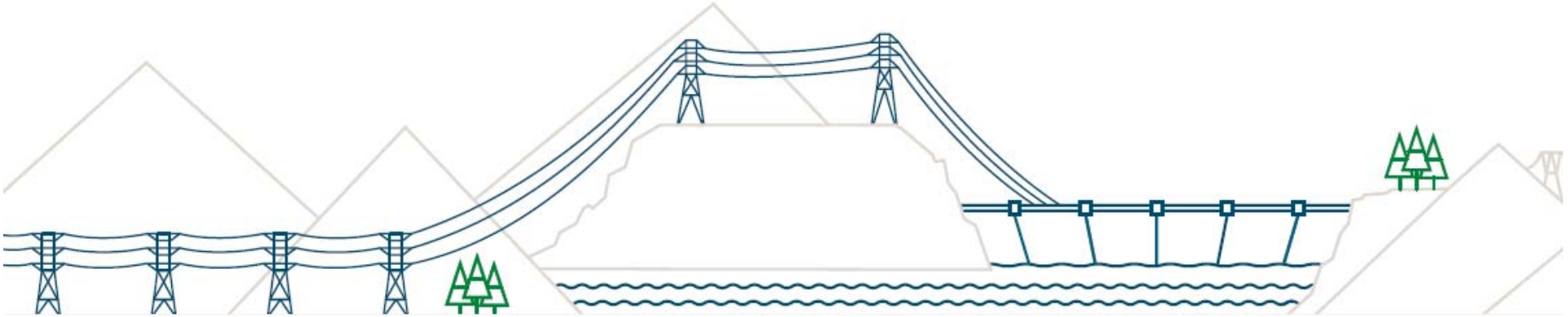
- BC Hydro recognizes rules for transitioning from the current tariffs to new tariffs are important and that changes to contribution policies and other tariff provisions will affect the extent that transition rules should be considered

- Therefore, we believe it is more appropriate to defer further discussion on transition rules until we have advanced other tariff provision discussions sufficiently

Tariff Supplement 6 (TS 6)

Facilities Agreement for Transmission Voltage Load Customers

Presenters: Sunny Dhannu, Gord Doyle
Sam Jones, Sachie Morii



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Tariff Supplement 6 Agenda

Approximate Time	Item	Presenter(s)
1:30 – 2:00	Overarching Objectives for Extension Policy	Gordon Doyle
2:00 – 2:45	Contribution Models	Sam Jones
2:45 – 3:00	Break	
3:00 – 4:00	Contribution Models (continued)	Sam Jones
4:00 – 4:30	150 MVA Threshold	Sam Jones

Tariff Supplement 6

Overarching Objectives

Presenter: Gordon Doyle

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Transmission Service Tariffs

Why are the Tariffs being reviewed now?

- In 2013 the BCUC recommended, in its reasons for decision on the DCAT CPCN project, that BC Hydro undertake a review of TS 6. This decision was the impetus for government to initiate the Industrial Electricity Policy Review (IEPR) which included a review of TS 6 and transmission interconnection processes.
- The IEPR taskforce recommended that BC Hydro review TS 6 under a commission led process. However, Direction 7 limits the BCUC from making changes to TS 6 but rather requires a government direction to make changes. Under the proposed Section 5 review, the BCUC will make recommendations to government but ultimately government will decide on any changes.
- Although TS 5 was not specifically addressed in either of these venues it was deemed to be in scope as the tariff needed modernization to provide more clarification of its terms and condition as well as reflect the interrelation with TS 6

Overarching Objectives

- BC Hydro puts forward the following principles for discussion to be applied in determining its transmission extension policy:
  - That the tariff continue to balance the financial impacts between new and existing customers;
  - That the tariff be more transparent and simplified to the extent possible;
  - That the tariff provide sufficient flexibility to allow BC Hydro to address region specific issues through participation in the transmission extension; and
  - That the tariff supports the Climate Leadership Plan for low-carbon electrification

Application of Bonbright Criteria to Extension Policy

In prior engagements we reviewed and sought feedback on the following Bonbright criteria to supplement other objectives. The following criteria were identified as potentially primary considerations for informing transmission extension policy:

- **Fairness**
  - Fair apportionment of costs among customers
  - Avoidance of undue discrimination
  - Protection of postage stamp rates
- **Customer understanding and acceptance/Practical and cost-effective to administer**
  - Customer understanding and acceptance
  - Freedom from controversies as to proper interpretation
  - Practical and cost effective to implement
- **Revenue and Rate Impacts**
  - Rate and bill stability
- **Efficiency**
  - In respect of clustered load

Are these key criteria valid and how should they be prioritized?

Discussion: Extension Policy Modifications

How can Tariff Supplement 6 (Transmission Extension Policy) be modified to support low-carbon electrification?

1. Provide flexibility to allow BC Hydro to take proactive steps to support electrification, such as construction and ownership of the customer transmission extension by BC Hydro in certain circumstances
2. Support electrification by making it easier to do business with us
    - Simplification of contribution model
    - Clarification of terms and conditions
    - Improved cost certainty

Tariff Supplement 6

Contribution Models

Presenter: Sam Jones

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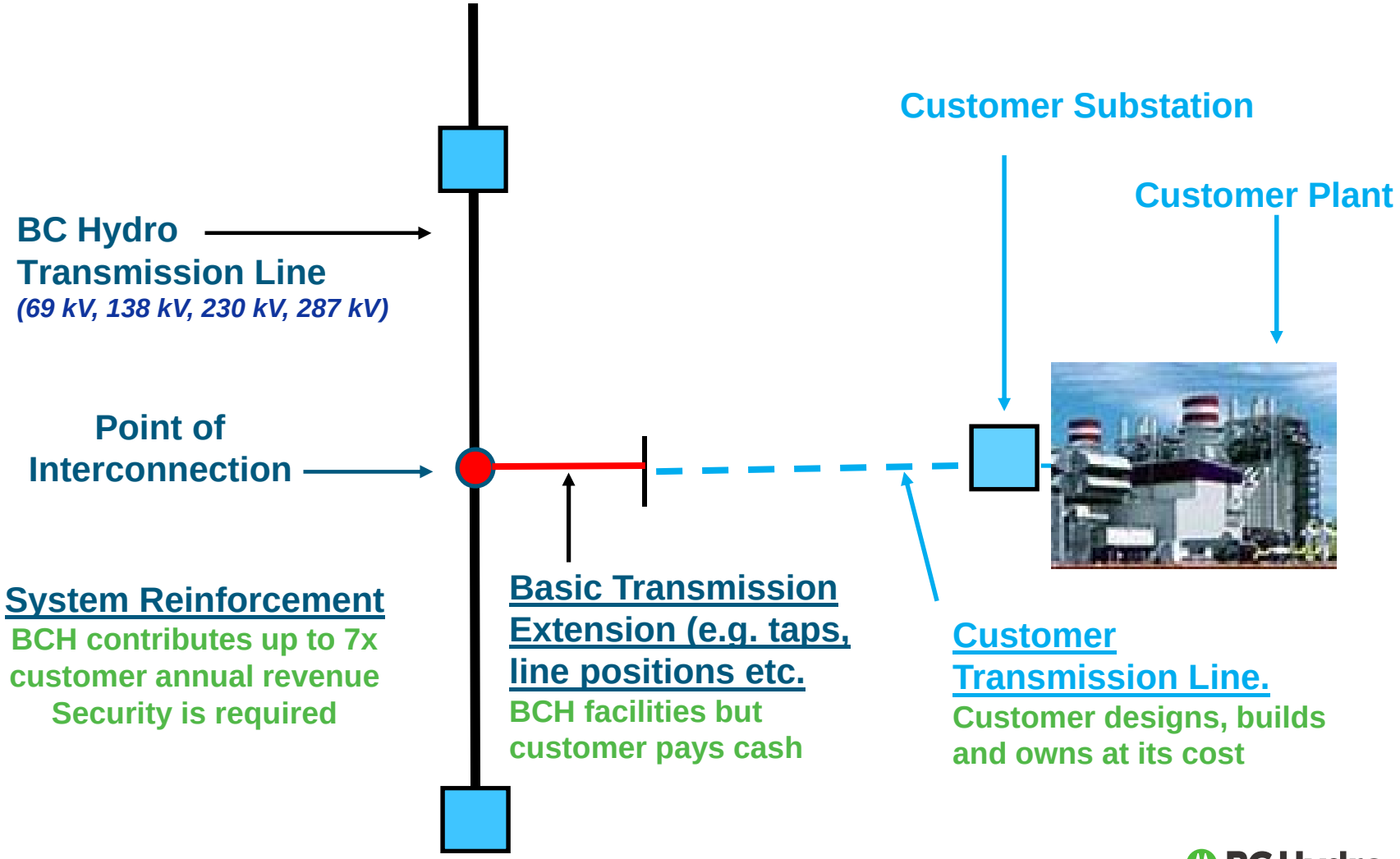
Contribution Policy

Issue

- Stakeholders, including the 2013 Industrial Electricity Policy Review panel and the BCUC, have all noted that the contribution formula in Tariff Supplement 6 needs to be reviewed as it has not be reviewed since approved in 1991

- Stakeholders also referenced there being no regulatory record for the basis of the annual revenue multiplier of 7.4 years or what the shareholders goals and objectives were for the extension policy as further support for undertaking a review

Typical Transmission Load Connection



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Contribution Models Categories

Background

- In the RDA Module 1 November 2014 workshop, we presented 11 contribution models, which we subsequently grouped into 4 categories in our summary and consideration of feedback
- The Status Quo TS 6 was carried forward from those discussions as a single category, but is now included in category #1 as defined below, for a total of 3 categories:

1. **Category #1** – Customer pays for SR with utility contribution based on a revenue test; customer pays for customer transmission line/BTE. This category had 5 contribution models.
2. **Category #2** – Utility pays for SR; customer pays for customer transmission line/BTE. This category had one contribution model.
3. **Category #3** – Utility pays for SR; customer pays for customer transmission line/BTE with a utility contribution. This category had 5 contribution models.

Contribution Models

Options

The following 5 options are being brought forward for further review across the 3 categories. These are discussed in further detail in the slides that follow.

Option	Contribution Model	Category
1	Status Quo	1
2	Transmission incremental revenue model - capital only	1
3	Utility pays for SR; customer pays for customer transmission line/BTE	2
4	Variable contribution - adjusting NPV evaluation period based on risk assessment	3
5	Fixed contribution	3

Option 1 - Status Quo

(Category 1 – Customer pays for SR with utility contribution based on a revenue test, and pays for the transmission line/BTE)

Background

- BC Hydro provides a revenue offset towards SR based on a formula - total revenue (demand and energy) expected over approximately. 7.4 year period (adjusted for operation and maintenance costs)
- Since TS 6 was approved, all customers that connected have had sufficient forecasted revenues for projects to cover the cost of the SR which means customers have not had to contribute to SR directly

Feedback

- Majority of workshop participants agreed that Status Quo TS 6 should be carried forward for the purpose of providing a comparison point for options analysis

Option 2 - Transmission Incremental Revenue

(Category 1 – Customer pays for SR with utility contribution based on a revenue test, and pays for the transmission line/BTE)

Background

- This model bases the offset on a Net Present Value (NPV) calculation of forecasted transmission revenues that are derived from the transmission capital costs, adjusted for life expectancy of customer's facility, as opposed to forecasted revenue (energy and demand) as is done in TS 6

- This model is the closest to how the distribution contribution is derived as it uses the same methodology for determining what revenues are used in Net Present Value calculation

Option 2 - Transmission Incremental Revenue

(Category 1 – Customer pays for SR with utility contribution based on a revenue test, and pays for the transmission line/BTE)

Background (continued)

- The table below shows what the maximum contribution would be for the various NPV evaluation periods

Estimated life of new connection	Transmission incremental revenue – capital only ($ / kVA)
5 years	$ 200
10 years	$ 342
15 years	$ 443
20 years	$ 516
25 years	$ 567
30 years	$ 604

Note: Based on F2017 approved interim rates and a nominal discount rate of 7%

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Option 1 and 2 - Feedback

(Category 1 – Customer pays for SR with utility contribution based on a revenue test, and pays for the transmission line/BTE)

Feedback

- There was some support for the idea that customers may have to pay something for System Reinforcements, but there is no agreement on how much
- Other stakeholders strongly disagree with customers contributing anything to System Reinforcements and referred to the jurisdictional assessment for support of this position

Comparison of Option 1 and Option 2

(Category 1 – Customer pays for SR with utility contribution based on a revenue test, and pays for the transmission line/BTE)

Analysis

Using historical data of the 53 projects that have either been energized or completed a facilities study in the last 10 years, we compared the Status Quo with the Transmission Incremental Revenue contribution models

	Option 1 Status Quo TS 6 ($ million)	Option 2 Transmission Incremental Revenue ($ million)
Aggregated maximum offset available	$5,086	$869
Aggregated SR costs	$629	$629

Comparison of Option 1 and Option 2

(Category 1 – Customer pays for SR with utility contribution based on a revenue test, and pays for the transmission line/BTE)

Analysis (continued)

Although on an aggregated basis both contribution models resulted in more projected revenues than costs, on an individual project basis option 2 resulted in 10 projects not having sufficient revenues to cover the costs of the SR triggered by the addition of their new load

	Option 1 Status Quo TS 6	Option 2 Transmission Incremental Revenue
Number of customers whose offset covered SR costs	53	43

Comparison of Option 1 and Option 2

(Category 1 – Customer pays for SR with utility contribution based on a revenue test, and pays for the transmission line/BTE)

Analysis (continued)

Of the 10 projects which did not have sufficient projected revenues to cover their SR costs under the Transmission Incremental Revenue model, the aggregated shortfall in revenues that the 10 customers would have had to cover with a capital contribution would have been approximately $233 million

Should either the Status Quo or Transmission Incremental Revenue models be carried forward for additional review?

Option 3 - Utility Pays for System Reinforcement; Customer Pays for Transmission Line/BTE

(Category 2)

Background

- This model has resulted in the same practical outcome as the Status Quo, as BC Hydro's contribution has been sufficient to cover the System Reinforcement costs for all customers that have connected

Feedback

- General stakeholder agreement to advance this model
- Several participants supported this model on the basis of simplicity in that the outcome most closely resembles the actual outcome of TS 6
- Some participants expressed reservations for this model on the basis that it has no cap on the System Reinforcement costs for which the utility could be responsible

Option 3 - Utility Pays for System Reinforcement; Customer Pays for Transmission Line/BTE
(Category 2)

Consideration

- This model has the most jurisdictional support as almost all utilities reviewed cover the cost of System Reinforcement
- A safety valve or threshold (i.e. 150 MVA) could minimize rate impacts
- Compared to the Status Quo, this model is a simpler method for achieving the same result

Option 4 - Variable Contribution Model

(Category 3 – Utility pays for SR; customer pays for transmission line/BTE with a utility contribution)

Background

- Utility covers the System Reinforcement costs
- Utility contributes towards the BTE and transmission line costs (if the assets are owned by the utility) based on the NPV of the forecasted customer revenue over an evaluation period that varies based on a risk assessment (credit rating score) of the customer
- For example, the variable period could be:
    - 5 years for high-risk connections (B+ or below, or unrated)
    - 10 years for medium-high-risk connections (BB- to BB+)
    - 15 years for medium-low-risk connections (BBB- to AA+)
    - 25 years for low-risk connections (AAA- and above)
- When the ownership of the BTE and the transmission line rest with the utility, the costs are entered into the rate base and the utility has tariffed demand charges to recover the costs of these facilities

Option 5 – Fixed Contribution Model

(Category 3 – Utility pays for SR; customer pays for transmission line/BTE with a utility contribution)

Background

- Similar to Option 4, the utility covers the System Reinforcement costs and contributes towards the BTE and transmission line related costs; however, instead of adjusting the utility contribution to reflect customer revenues over a variable period based on a risk assessment, this model fixes the evaluation period for all customers and applies a fixed contribution ($/MW).

- The costs of BTE and the transmission line are entered into the rate base and recovered through demand charges

Options 4 and 5 – Variable and Fixed Contribution Models

(Category 3 – Utility pays for SR; customer pays for transmission line/BTE with a utility contribution)

Feedback

- There was uniform agreement that both variable and fixed contribution models merit further analysis
- November 2014 workshop participants highlighted the relative simplicity of the fixed model and that the variable model gives both the customer and the utility options in terms of extension building and ownership
- One stakeholder raised concern with the Category 3 approach, stating that it gives rise to concerns regarding fairness and rate stability as there is no cap on BC Hydro's potential SR cost responsibility and it will also require BC Hydro to make a contribution towards the customer transmission line/BTE

Options 4 and 5 – Consideration

(Category 3 – Utility pays for SR; customer pays for transmission line/BTE with a utility contribution)

Consideration

- This model would require BC Hydro to either design, build and own the extensions or to force lines to be transferred. This has potential schedule and cost implications for customers.
- BC Hydro also has concerns with cross subsidization between customers within the class as well as potential upward rate impacts initially as costs for extensions would be entering the rate base upfront.
- This model requires extension cost information from which to build a data set to base a contribution; given that BC Hydro has not gathered this type of customer cost information we are unable to move forward with this model in this rate design application.

Based on the complexities with Category 3 and Options 4 and 5, should we continue to review for potential future implementation?

Contribution Model - Feedback

Please provide comments on how the various contribution models would align with the objectives identified for discussion (slide 55):

- **That the tariff continue to balance the financial impacts between new and existing customers;**
- **That the tariff be more transparent and simplified to the extent possible;**
- **That the tariff provide sufficient flexibility to allow BC Hydro to address region specific issues through participation in the transmission extension; and**
- **That the tariff supports the Climate Leadership Plan for low-carbon electrification**

Basic Transmission Extension (BTE)

- BTE is the infrastructure that connects the customer's transmission line to the BC Hydro transmission system
- This infrastructure is usually either a transmission tap or a line position in a BC Hydro substation and includes the first 90 meters of transmission line
- BTE is the responsibility of BC Hydro to design, build, own, operate, and maintain; however the customer is responsible for the costs of the BTE.

Considerations / Options

- Based on the overarching objectives of simplification and supporting electrification, we are seeking feedback as to whether our treatment of BTE costs should be changed
- The following three options are identified and assessed in the following slides:
  1. Maintain the status quo treatment
  2. Redefine BTE as part of System Reinforcements
  3. Develop a fixed fee for BTE

BTE Option 1 – Status Quo

- Keep the current definition of BTE
- Keep the existing allocation of costs to the customer

Analysis

- No rate impact - aligns costs for sole use facilities to entity triggering them

BTE Option 2 – Redefine as Part of SR

- As the BTE is a BC Hydro asset, treat these costs as System Reinforcements which are also BC Hydro assets
- Costs would be rolled into rate base and customers would be required to provide security

Analysis

- Shifts costs from customer to ratepayers
  - Based on a review of projects connected in the last 10 years, this option would have resulted in an average of $4.5 million/year entering the rate base

BTE Option 3 – Fixed Fee

- Develop a fixed fee for the BTE and limit BTE to a transmission tap or line position
- Vary depending on the type of connection (transmission tap or line position) and the voltage of the transmission line being connected to
- Need a process to review actual costs incurred and update cost estimate on a regular basis (e.g., annually or every 2 years)

Analysis

- Fee may be impacted by timing as well as location and types of historical projects which could result in significant swings in the fee
- Should be revenue neutral on an aggregate basis as some customers will pay more than what they otherwise would have and others will pay less.

Should BC Hydro consider changing the treatment of BTE? If so, do you have a preference for which option(s) are advanced for further review?

Tariff Supplement 6

150 MVA Threshold

Presenter: Sam Jones

BC Hydro
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150 MVA Threshold - Background

Background

Under TS 6:

- For projects less than 150 MVA, costs for reinforcement of system assets up to but not including bulk system assets are included. Generation plant costs are also excluded

- For projects over 150 MVA, BC Hydro may include additions or alterations to generation plant and associated transmission, or transmission lines at 500 kV and over

150 MVA Threshold - Background

Issue

- No regulatory record as to the rationale for setting the threshold at 150 MVA
- Considered by many stakeholders as an impediment to economic development
- Creates opportunity for gaming
- No jurisdictional support for threshold
- General support that generation capital costs should not be included

150 MVA Threshold - Options

Four options for addressing the 150 MVA threshold were identified and discussed at the RDA Module 1 November 2014 workshop:

1. Status quo
2. Develop new threshold for allocation of generation and bulk system costs
3. No threshold with “safety valve”
4. No threshold and no “safety valve”

Two other jurisdictions have threshold concepts:

- Hydro Quebec has a threshold over which its obligation to serve is considered (50 MW)
- Ontario has provision whereby the utility can go to regulator to request transmission costs be assigned to new customer

150 MVA Threshold - Options

Feedback

- There was a fair degree of stakeholder consensus, including submissions to the 2013 IEPR task force, that the Status Quo "150 MVA threshold" is problematic, arbitrary and subject to gaming
- There was limited support for a new threshold
- There was no consensus on whether generation costs should be included
- The strongest stakeholder support was for Option 3 "no threshold with safety valve", although there was no consensus on the mechanism

150 MVA Threshold – Safety Valve Alternatives

Stakeholder preference for Option 3 ”No Threshold with Safety Valve”

- Two broad concepts for implementing a safety valve:

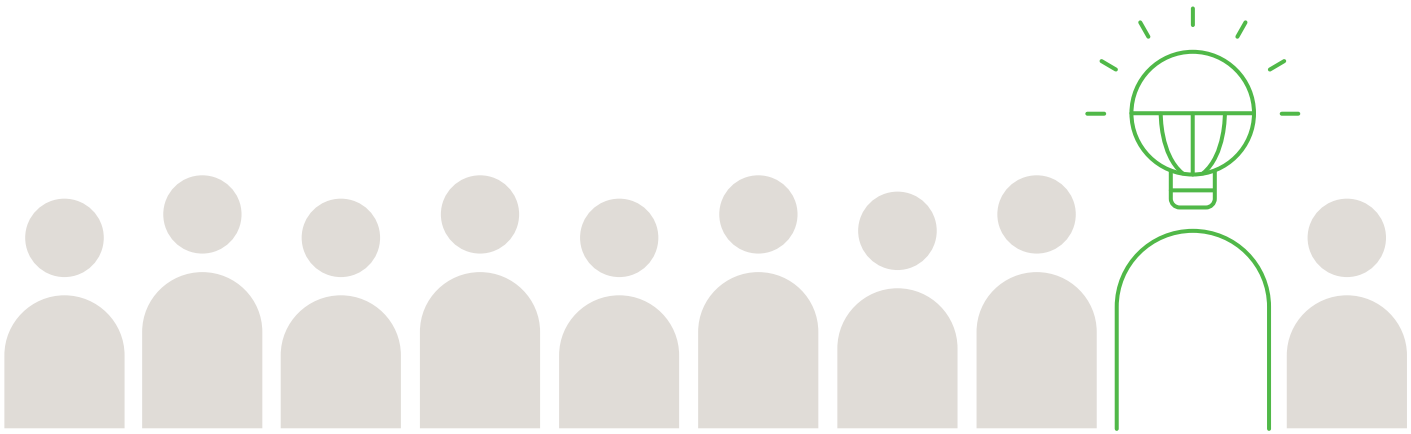
1. Incorporate an explicit safety valve concept in the tariff based on a defined factor other than the 150 MVA threshold - e.g., rate impact of an interconnection project; if a project triggers the filing of a Certificate of Public Convenience and Necessity application; if a project meets a certain revenue test (costs to revenues ratio) etc.; or

2. Leave the safety valve undefined in the tariff so that BC Hydro could apply it when appropriate but provide oversight of this application of discretion by either the BCUC or the province.

Thoughts or comments on these two concepts?

RATE DESIGN APPLICATION (RDA) MODULE 2

Facilitator: Anne Wilson



January 17, 2017

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Day 2 Agenda

Approximate Time	Item	Presenter(s)
9:00 – 9:15	Welcome and Updates	Anne Wilson
9:15 – 10:00	Extensions Rights and Obligations	Gordon Doyle
10:00 – 10:30	Line Transfers	Sunny Dhannu
10:30 – 10:45	Break	
10:45 – 11:05	Pioneer Rights	Sunny Dhannu
11:05 – 11:35	Security	Sachie Morii
11:35 – 12:00	Delays in In-Service Dates	Sachie Morii
12:00 – 1:00	Lunch	
1:00 – 2:30	Tariff Supplement 5	David Keir
2:30 – 2:45	Break	
2:45 – 3:45	Tariff Supplement 5 (continued)	David Keir
3:45 – 4:15	Interconnection Terms and Conditions	Sam Jones
4:15 – 4:30	Closing and Next Steps	Anne Wilson

Tariff Supplement 6

Transmission Extension Rights and Obligations

Presenter: Gordon Doyle

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Transmission Extension Rights and Obligations

Issue

- There may be circumstances when a transmission extension has broader provincial and/or BC Hydro transmission system interests, supporting low-carbon electrification, promoting economic development, or optimizing the transmission system

- Under the current tariff, there are limited provisions under which BC Hydro can participate in an extension, cause an extension to be transferred, or build and own an extension.

Under what circumstances would you support BC Hydro developing and owning the extension?

Transmission Extension Rights and Obligations

Background

- In the November 2014 workshop, we posed our preliminary thoughts on how extension costs could be treated if BC Hydro were to participate in a transmission extension

Options

1. BC Hydro builds the common transmission extension and charges first customer for the extension and then receives pioneer rights to recoup costs when other customers connect
2. BC Hydro builds the common transmission extension and charges each customer an upfront payment based on a prorated basis – new load over total capacity of line or new load over total load connected
3. BC Hydro builds the common transmission extension and puts the cost in the rate base. Security provisions could be established to mitigate the risk of stranded assets.

Transmission Extension Rights and Obligations

Cluster Load Feedback

- The ability of future customers to commit should be a factor, e.g., a group of customers that are willing to commit to taking service together could be treated differently than if the new customers are uncommitted when extensions are being approved/designed

- All options should be available for consideration depending on the drivers for participating in the extension such as economic development opportunities, broader economic contributions, likelihood, and timing of additional customer connections

Are there additional factors that should be considered when allocating costs between BC Hydro and the new customers connecting if BC Hydro were to own the extension

Transmission Extension Rights and Obligations

Cluster Load Feedback (continued)

- We also sought feedback regarding cost allocation options for when BC Hydro wanted the common line extension to be built to a higher capacity than required for the initial load(s) as follows:
    - The initial customer(s) contributes based on the avoided cost of the transmission extension required to serve its load(s). The incremental cost would be allocated to future customers based on their load over the incremental capacity from the large capacity line; or
    - All customers would be allocated costs based on their load over the total capacity of the line built

Transmission Extension Rights and Obligations

Feedback

- The majority of responses indicated a preference for the initial customer contributing based on their avoided cost of the line required to service its load. The incremental cost would be allocated to future customers on a prorated basis (e.g., new load/incremental capacity).

Are there additional factors that should be considered when allocating costs between BC Hydro and the new customers when BC Hydro is building a line with greater capacity than needed to serve the initial customer?

Tariff Supplement 6

Line Transfers

Presenter: Sunny Dhannu

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Line Transfer

Background

Under Tariff Supplement 6, a customer has the option to transfer ownership of its transmission line to BC Hydro:

- Customer must declare its intent to transfer prior to designing the line
- Line must be built to BC Hydro standards (engineering, First Nations consultation, Right-of-Way, environmental requirements, etc.)
- BC Hydro assumes the costs for operating and maintaining the line
- The line is transferred to BC Hydro for a nominal value
- The line transfer will be documented in a separate agreement

Line Transfer

Issues

- In the November 2014 workshop we sought feedback as to whether BC Hydro should be able to require a line transfer under TS 6
- We also discussed whether BC Hydro should be able to decline the transfer of a line that has no ability to serve other customers, provide a system benefit, serve provincial interests, or that will put unreasonable costs on BC Hydro

Line Transfer

Feedback

- General agreement that BC Hydro should have more discretion in initiating and/or rejecting the transmission line transfer
- Disagreement on how much discretion BC Hydro should have in forcing/rejecting a line transfer
- Most feedback supported that if BC Hydro was requesting a line transfer then the customer who built the line should be compensated fairly
- Operating and maintaining transmission lines are not core functions of most customers and having to do so adds additional burdens/complexities for customers.

Line Transfer

Analysis

- Based on feedback from the November 2014 workshop and further consideration BC Hydro recognizes the potential challenges with BC Hydro having the right to require a customer to transfer a line

- The discussion of ownership of customer extension addresses a number of the reasons behind BC Hydro having a right to build and own an extension

Line Transfer

Analysis (continued)

Considerations with BC Hydro rejecting a line transfer

- There can be situation where an extension to a new customer would not have the ability to serve other load or provide a system benefit and if these lines were transferred to BC Hydro they would cause BC Hydro to bear additional cost with no benefits.

Should BC Hydro have the right to reject a line transfer that does not create a provincial or system benefit or cannot be used to serve other customers?

Line Transfer

Consideration - Right of First Refusal

- Private line owners wanting to sell their lines to third parties create a challenge for indirect connected customers as this may introduce new contractual, financial, or reliability issues
- To address this we would propose having the right of first refusal if the owner of a transmission line connected to BC Hydro's transmission system wants to sell the transmission line
- This option will also provide BC Hydro with options for expanding the transmission system to meet provincial or BC Hydro system interests
- How compensation would be determined still needs to be developed

Are there concerns with BC Hydro having the right of first refusal?

Tariff Supplement 6

Pioneer Rights

Presenter: Sunny Dhannu

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Pioneer Rights

Background

- Tariff Supplement 6 provides pioneer rights to the customer who provides a payment for Basic Transmission Extension (BTE), security/payment towards System Reinforcement (SR), and who transfers a line to BC Hydro
- For System Reinforcements:
  - Where a customer has made payment towards a SR, the original customer can receive a refund if subsequent customers connect to BC Hydro system and benefit from the same facilities within the first 5 years
  - If only security is provided for System Reinforcements, the original customer's revenue guarantee will be released earlier as the incremental revenue from the new customer are taken into account in the annual security release calculation

Pioneer Rights

Background (continued)

- For Basic Transmission Extension and transferred transmission extensions:
  - The original customer can recoup some of their cost if BC Hydro uses excess capacity to supply subsequent customers, or BC Hydro uses the same facilities to realize other BC Hydro system benefits
  - The tariff does not address how long the pioneer rights exist, however we have interpreted pioneer rights to exist as long as there is a net book value remaining on the facilities
  - The original customer receives a refund based on the depreciated value of the facilities in proportion to the new customer's contract demand as compared to the total contract demands for all connected facilities
  - New customer will be charged for a share of the replacement cost, in proportion of new customer's contract demand to the total contract demands

Pioneer Rights

Issue

- The main issues with the current pioneer rights are:
  - Some current tariff terms lack clarity and consistency across System Reinforcements, Basic Transmission Extension, and transmission extensions transferred to BC Hydro
  - The lack of clarity and consistency makes it difficult to implement pioneer rights

Pioneer Rights

Analysis

- Changes in contribution policy could remove / modify the pioneer rights requirements for the System Reinforcements and Basic Transmission Extension; however, pioneer rights for transferred transmission extensions may still be required.

Any comments?

BC Hydro will come back to stakeholders for thoughts and comments when the contribution model is determined.

Tariff Supplement 6

Security

Presenter: Sachie Morii

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Security

Background

- Customers are required to provide security in the amount of BC Hydro's contribution toward System Reinforcement costs
- The purpose of the current security arrangements is to cover the risk that projected revenues do not materialize to offset BC Hydro's costs
- BC Hydro's maximum contribution is calculated on an estimated revenue stream over approximately 7.4 years. However, the customer has up to 12 years for the revenues to materialize before BC Hydro will call on the security
- The customer's security is released annually as revenue is realized.
- In most instances where customers are required to post security, the security has been fully released within 2 – 4 years after energization

Security

Background

A customer must provide security for full amount of the BC Hydro contribution, in a form which has prior approval of BC Hydro which may include:

- Irrevocable letter of credit;
- Contract bond;
- Guarantee by a corporation other than the customer;
- Bank term deposit, to be deposited in trust for BC Hydro;
- Negotiable bearer bond, that is government guaranteed at face value; or
- Prepayment on account

Release of Security Options

Jurisdictional Review

- Most utilities require security in the amount of their investments and the security is released shortly after energization (usually within 12 months of energization)
- Security was used to manage the stranded asset risk during the construction phase, which is deemed to the period during which the stranded asset risk is the highest
- Hydro One and SaskPower use a risk evaluation to determine the amount of security required.
- Manitoba Hydro bases the release of security on a risk assessment and based on this assessment may hold the security for up to 5 years after energization

Release of Security Options

Feedback

- All stakeholders supported some form of security requirement, with general support for a security requirement based on actual System Reinforcement costs
- General but not unanimous support for the release of security after the risk of stranded assets has been reduced significantly
- General support for a range of security options, with acceptable forms of security to be based on credit risk
- Some feedback indicated the issue was not how soon the security was returned but rather the ability to get, and the cost of, the security

BC Hydro is interested in hearing your comments on and experiences with the security provisions of TS 6.

Release of Security Options

Security for Shared System Reinforcement

TS 6 does not address the allocation of security for System Reinforcements when there are multiple customers (clustered loads) committing to connect at the same time. In these cases we need to determine:

- How to allocate security amongst the customers
- When to collect security
- When and how to release security

What should BC Hydro consider in the allocation and release of security in a clustered load situation?

Tariff Supplement 6

Delays in In-Service Dates

Presenter: Sachie Morii

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Delays in In-Service Dates

Background

- Tariff Supplement 6 has no provisions to deal with delays in in-service dates and there are no business practices that limit how long a customer can delay their in-service date without penalty or removal from the interconnection queue after they sign a Facilities Agreement

Issue

- This creates the potential of blocking capacity from others who are ready to take service
- We recognize that during construction, customers can experience unexpected issues that can result in delays to their in-service dates

Delays in In-service Dates

Considerations

- We are considering defining customers' rights to defer their in-service date (suspension rights) and BC Hydro's rights for removing projects from the interconnection process if they are not proceeding in a timely manner

- The goal would be to balance the fairness of treatment of a specific customer and other customers who want to connect to the same system and maximize the usage of BC Hydro system

Delays in In-service Dates

Considerations

- What could a suspension period look like?
  - The first suspension period
    - To address construction, scheduling, typical project management issues
    - Up to 1 year suspension
    - No questions asked
  - Further suspension
    - Subject to BC Hydro approval depending on whether there are other customers ready to connect
    - Costs or other considerations

Comments?

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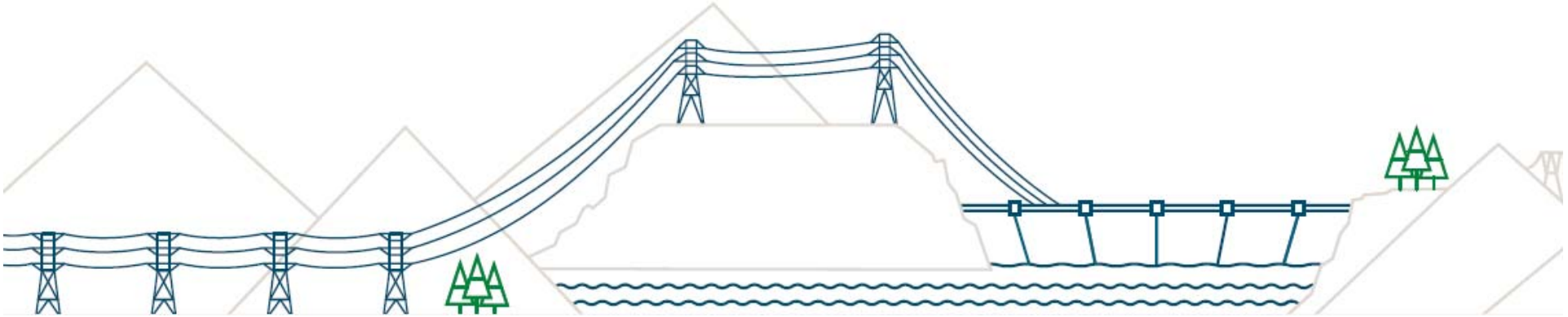
Tariff Supplement 5 (TS 5)

Electricity Supply Agreement for Transmission Voltage Load Customers

Presenter: David Keir



January 17, 2017

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Agenda

Approximate Time	Item	Presenter
1:00 – 2:30	Introduction and Objectives TS 5 Overview (Electricity Supply Agreement) Tariff Form and Content Refresher Service Obligations Questions and Feedback	David Keir
2:30 – 2:45	Break	
2:45 – 3:45	Contract Demand Customer Perspectives Supply Tariff Interactions Questions and Feedback	David Keir

Objectives

1. Review Tariff Supplement 5 (Electricity Supply Agreement) and related rates and tariffs for transmission voltage electricity supply

2. Consider your questions, comments and feedback regarding prospective changes to Tariff Supplement 5 (form and content)

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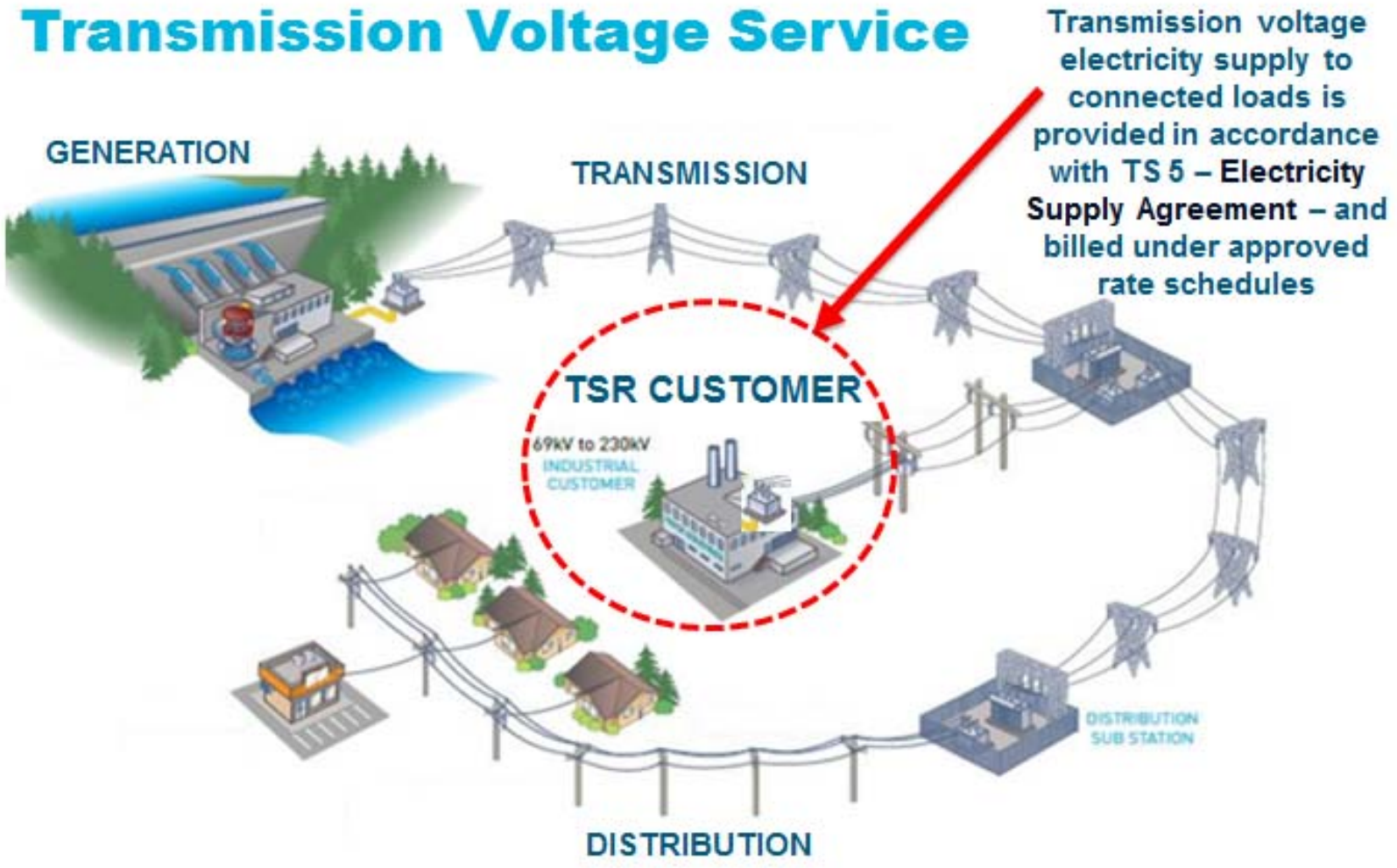
Transmission Voltage Service



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Transmission Voltage Service

Electricity Supply Agreement

DIRECT CONNECTION

TS 5

Customer owns transmission infrastructure that connects to BC Hydro system

INDIRECT CONNECTION

TS 87

3rd Party owns transmission infrastructure that connects to BC Hydro system

CBL DETERMINATION GUIDELINES

TS 74

Rate Schedules (RS) for Firm Service:

- **RS 1823: Stepped Rate (default service)**
- **RS 1825: Time of Use Rate**
- **RS 1827: Exempt Rate**
- **RS 1852: Modified Transmission Demand**

BILLING FORMULA FOR CUSTOMERS WITH CONTRACTED GENERATION

TS 89

Rate Schedules (RS) for Interruptible Service:

- **RS 1853: IPP Station Service**
- **RS 1880: Maintenance & Standby Rate**
- **RS 1891: Shore Power Rate**
- **RS 1892: Freshet Rate (pilot)**

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Guiding Principles – Electricity Supply

1. Tariff Supplement 5 sets out the terms and conditions for electricity supply to all load customers taking service at transmission voltage
2. Tariff Supplement 5 treats 'existing' and 'new' transmission load customers the same
3. Rate Schedule 1823 is the default rate for firm electricity supply to transmission load customers and is available to all customers on a postage stamp basis
4. Any prospective changes to Tariff Supplement 5 should not impact existing cost-of-service allocations for the transmission customer class

For Review & Discussion:

- ***Do you agree with these guiding principles?***
- ***Questions/comments/observations?***

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Existing Tariff Supplement 5 Overview

- Existing tariff review (high-level page turn); link below
- 29 provisions/clauses, plus site-specific appendices and rate schedules

https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/appcontent/your_account/Electric_Tariff_Supplement_Number_5.pdf

For Review & Discussion:

- ***Have you identified any issues with the existing Tariff Supplement 5?***
- ***For existing customers, what has been your experience with Tariff Supplement 5?***
- ***For prospective new customers, what are your views on Tariff Supplement 5?***
- ***Questions/comments/observations?***

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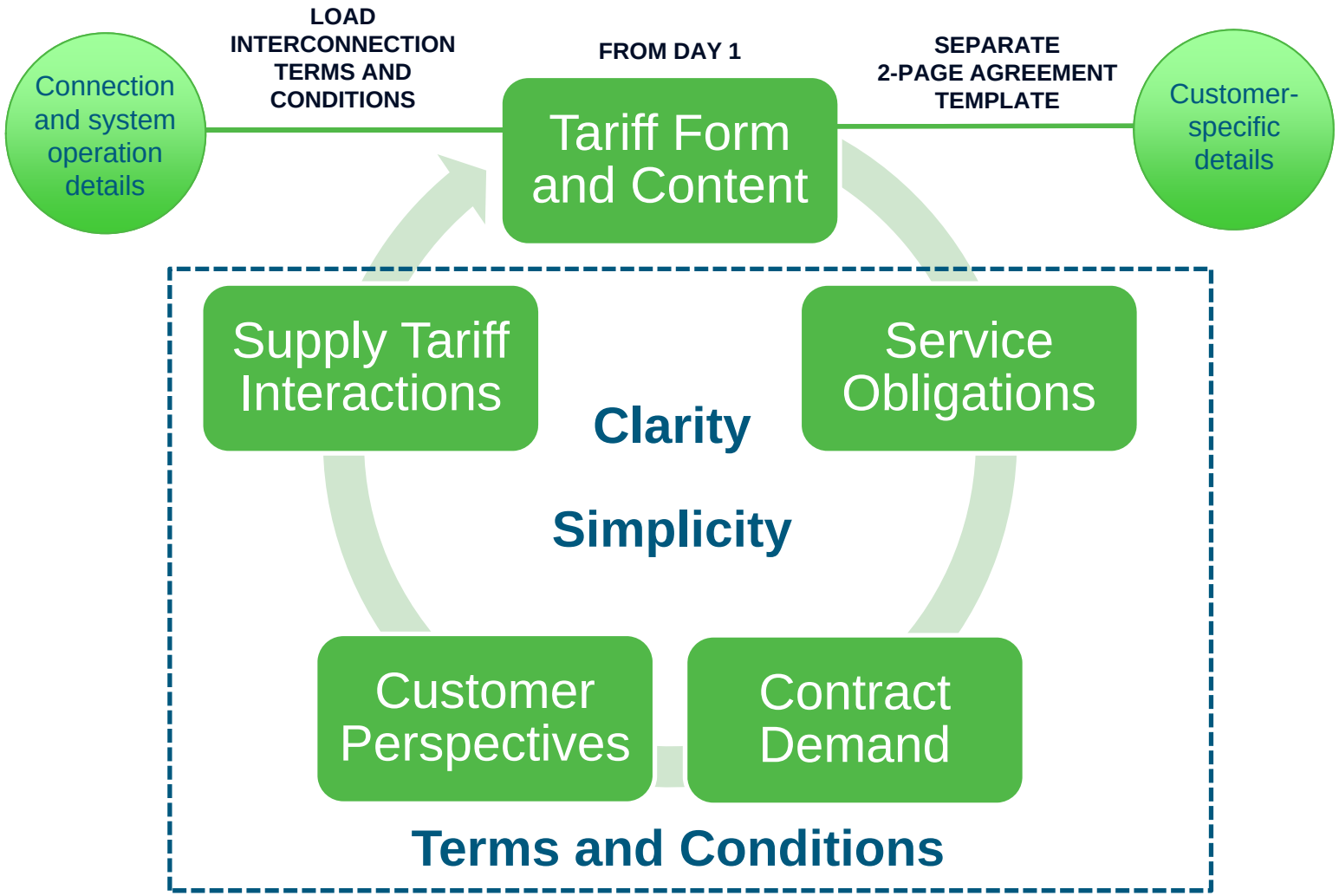
Prospective Tariff Changes



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Tariff Supplement 5 Review

Tariff Form and Content

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Day 1 Review: Form and Content

REFRESHER

BC Hydro is seeking feedback regarding the 'form' and 'content' of its transmission tariffs (Tariff Supplements 5 and 6)

1

Customer-specific Information

- How to clearly distinguish unique customer-specific requirements from standard 'boilerplate' tariff terms and conditions

2

Terms and Conditions

- How to update and modernize terms, conditions and language

3

System Interconnection and Operating Requirements

- How to manage system interconnection and operating requirements not presently addressed under Tariff Supplement 5 or Tariff Supplement 6

4

Transmission Tariff Centralization

- Whether to maintain separate tariffs for system interconnection, electricity supply and system operations or centralize all terms and conditions for transmission service into a single tariff

Tariff Supplement 5 Review: Terms and Conditions

Service Obligations

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Service Obligations: *existing tariff language*

BASIC OBLIGATIONS

2.(a) B.C. Hydro will supply Electricity to the Customer up to the Contract Demand at the Point of Delivery and the Customer will pay for Electricity, all in accordance with the provisions of this Agreement which incorporates, by reference, Schedule 1821 and the Appendix containing provisions respecting transmission extensions and the site specific matters.

FIRM SERVICE

Replaced by Rate Schedule 1823

(b) B.C. Hydro may also supply additional Electricity for emergency, maintenance and special supply purposes to the Customer at the Point of Delivery and the Customer will pay for such Electricity, all in accordance with the provisions of this Agreement which incorporates, by reference, Schedule 1880.

NON-FIRM SERVICE

Non-firm service for a specific defined circumstance is effected via approved rate schedule

Rate Schedule 1880 - Generator Standby and Maintenance

Rate Schedule 1892 – Freshet Rate

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Service Obligations: *conceptual approach*

BC Hydro is considering how to provide additional clarity to customers regarding its electricity service obligations under Tariff Supplement 5

temporary service

NON FIRM, INTERRUPTIBLE SERVICE

- Additional electricity for emergency, maintenance, and special supply
- Provided only where BC Hydro has available energy and capacity to do so

ESA Contract Demand

permanent service

FIRM SERVICE

- For normal electricity supply under Rate Schedule 1823 or other approved tariff
- Contract Demand conveys right for dedicated use of capacity

For Review & Discussion:

- ***Would this service distinction be helpful to clarify in Tariff Supplement 5?***
- ***What issues/risks/benefits should be considered?***
- ***Other questions/comments/observations?***

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Tariff Supplement 5 Review: Terms and Conditions

Contract Demand

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Contract Demand

BC Hydro is considering how best to 'right size' or match Contract Demand with unique customer operating requirements

OPERATING SCENARIOS

- Construction
- Commissioning
- Normal operations
- Shutdowns and restarts
- Staging/phasing of loads
- Changes in existing self-generation

PRINCIPLE

The customer does not own firm system capacity, but has a dedicated right to use it in order to be supplied with electricity for a specified period of time and at a level that reflects the customer's operating requirements

For Review & Discussion:

- ***Questions/comments/feedback on this approach?***
- ***What issues/risks/benefits should be considered?***

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Contract Demand: *illustrative examples*

PLANT COMMISSIONING

1. Tariff Supplement 5 does not consider the establishment of a lower contract demand during site construction or plant commissioning
2. Under Rate Schedule 1823, new customers are charged billing demand for the initial 2 billing periods (60 days) using the average of the daily highest kV.A demands for the customer's plant
3. BC Hydro recognizes that start-up and commissioning of large industrial customer plants to reach full load operations can be complex and take significantly longer than 60 days

Contract Demand: *illustrative examples*

STAGED LOAD SCENARIO

Commencement Date	Contract Demand	Requirement
1 April 2016	2 MVA	Construction Power
1 October 2016	10 MVA	Commissioning Power
1 January 2017	30 MVA	Full Load (Phase 1)
1 January 2019	40 MVA	Load Increase (Phase 2)

Load interconnection study and Facilities Agreement (Tariff Supplement 6) commitments are typically based on the maximum expected load (i.e., 40 MVA)

Contract Demand: *illustrative examples*

PLANT SHUTDOWN / RESTART

1. Tariff Supplement 5 does not include a provision for contract demand reduction when plants shutdown (temporary or indefinite shutdowns)
2. Contract demand reductions are implemented via termination of the existing Electricity Supply Agreement and replacement with a new Electricity Supply Agreement
3. Section 4(b) of the Electricity Supply Agreement requires the customer to provide 6 months written termination notice
4. Plant restart would require the customer to make a new load interconnection request and a new Electricity Supply Agreement would be required

Tariff Supplement 5 Review: Terms and Conditions

Customer Perspectives

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Customer Perspectives

Are there any other specific aspects of Tariff Supplement 5 that you would like to discuss or provide feedback on?

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Tariff Supplement 5 Review: Terms and Conditions

Supply Tariff Interactions

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Tariff Interactions: Supply Rate Schedules

BC Hydro is considering what flow-through changes to transmission service rate schedules might be required to reflect possible amendments to Tariff Supplement 5

EXAMPLES:

- Rate Schedule 1823 billing demand provisions (such as average demand for 2 billing periods) may need to be amended to align with changes in the customer's operating requirements (such as plant commissioning)
- Provisions in certain interruptible tariffs (such as Rate Schedule 1880) may need to be amended to properly reflect the interaction of firm and non-firm supply obligations and associated electricity pricing
- Provisions in Tariff Supplement 74 (the CBL Determination Guidelines) may need to be amended to address certain impacts (such as requests for contract demand reduction and treatment of non-firm energy taken while on interruptible tariffs such as Rate Schedule 1880)

For Review & Discussion:

- ***Questions/comments/feedback on this approach?***
- ***What issues/risks/benefits should be considered?***

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Tariff Supplement 6

Potential Load Interconnection Terms and Conditions

Presenter: Sam Jones

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Potential Load Interconnection Terms and Conditions

Issue

- Tariff Supplement 6 expires once the customer is connected and all financial obligations are met
- Tariff Supplement 5 contains limited language governing the ongoing operation of the interconnection issues of the customer and BC Hydro systems

Consideration

- BC Hydro is considering adding new load interconnection terms and conditions that will govern BC Hydro and the customer with respect to how they will operate their interconnected systems – the technical, operational, and commercial aspects of the "joining" of BC Hydro's and a customer owned private transmission systems

Potential Load Interconnection Terms and Conditions

The potential new terms and conditions would:

- Clarify and formalize the ongoing operational requirements around interconnection in a tariff and the customer will sign an agreement containing customer and site specific information.

- The terms and conditions would be in effect for as long as the customer's system and BC Hydro's system are interconnected.

Potential Load Interconnection Terms and Conditions

The new terms and conditions could include:

- Definition and clarification of ongoing technical and operational interconnection requirements
    - Adherence to the BC Hydro interconnection requirement (e.g., harmonics, voltage swells and fluctuations, reactive power)
    - Customer's Protection & Control equipment requirements
    - Operation and maintenance of Remedial Action Schemes
    - Protection of and access to BC Hydro meters
- Changes to the BC Hydro/Customer systems and interconnection requirements
    - Obligations and cost responsibilities for any additions, modifications, replacements, operation, maintenance and repair of the systems

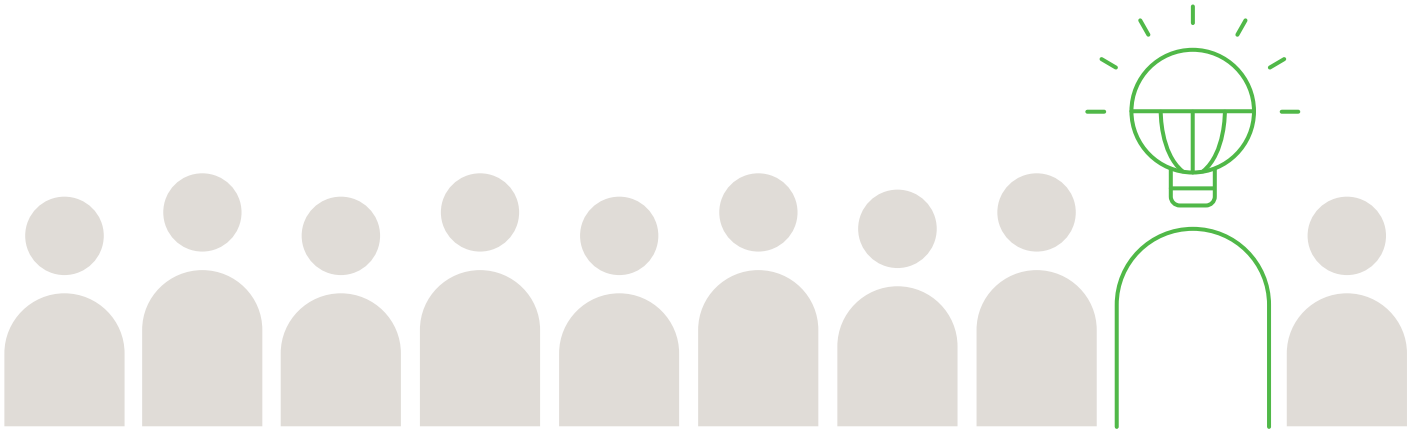
Potential Load Interconnection Terms and Conditions

The new terms and conditions could include:

- Rights and obligations in regards to planned and unplanned disconnection
- BC Hydro access rights to customer premises (site access)
- Operating Committee roles and responsibilities
    - General operating commitments and resolution of operating issues
- The Operating Order
    - The potential terms and conditions will specify the basic terms of the Operating Order and would specify how the Operating Order will be established, reviewed and amended

Next Steps

Facilitator: Anne Wilson



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Next Steps

Feedback

- Feedback on guarantees requested **by January 30, 2017**;
  - Application filing expected in February 2017
- Feedback requested on Module 2 Scope, Tariff Supplements 5 and 6 and Load Interconnection Terms and Conditions **3 weeks after** the workshop summary notes are posted
  - Analysis of options for Tariff Supplements 5 and 6 to be reviewed in late Spring/early Summer 2017

Next Steps

Contact Information

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