Topics

• Background
• History of contributions
• Principles and mechanisms
• Data and cost function
• Determining a multiplier
• Rate impact
• Remaining steps
• Questions and more information

Please ask questions during the presentation!
Process

- Alberta Utilities Commission established Proceeding ID No. 1162 to review transmission contribution policy
- Commission finalized scope in July 2011
- AESO issued discussion paper and established a working group in September 2011
- Working group has met seven times to review and discuss contribution policy
  - Working group includes representatives from AltaLink, ATCO Electric, Enbridge, ENMAX, FortisAlberta, IPCAA, and UCA
- AESO now drafting contribution policy application
  - To be filed June 20, 2012
  - AESO will propose changes become effective July 1, 2012
Why do we have contributions?

- Contributions balance the economic impact of connecting a new customer between a utility’s existing customers and the new customer.

- Contributions should relate only to the connection costs of the system extension.

- “Deep” system costs are properly the responsibility of all customers, form part of the utility’s revenue requirement, and should be recovered from all customers through rates.

**Example**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Connection Costs</strong></td>
<td>$12.1 million</td>
</tr>
<tr>
<td><strong>Less “investment” (paid over time)</strong></td>
<td>– $4.5 million</td>
</tr>
<tr>
<td><strong>Construction contribution (“down payment”)</strong></td>
<td>= $7.6 million</td>
</tr>
</tbody>
</table>
## History of contribution policies

<table>
<thead>
<tr>
<th>Years</th>
<th>Tariff</th>
<th>Maximum Investment</th>
<th>Example Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Capacity</td>
<td>Amount</td>
</tr>
<tr>
<td>1996-2000</td>
<td>1996 Tariff</td>
<td>$115,000/MW for a 5-year term</td>
<td>7.5 MW</td>
</tr>
<tr>
<td></td>
<td>Effective: Jan 1, 1996</td>
<td>$200,000/MW for a 10-year term</td>
<td>17 MW</td>
</tr>
<tr>
<td></td>
<td>Approved: Order U97157</td>
<td>$265,000/MW for a 15-year term</td>
<td>40 MW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$310,000/MW for a 20-year term</td>
<td>Average</td>
</tr>
<tr>
<td>2001-2003</td>
<td>2001 Tariff</td>
<td>$2,000,000 for every five year commitment</td>
<td>7.5 MW</td>
</tr>
<tr>
<td></td>
<td>Effective: Jan 1, 2001</td>
<td>term past five years, plus</td>
<td>17 MW</td>
</tr>
<tr>
<td></td>
<td>Approved: Decision 2000-57</td>
<td>three times levelized annual revenue</td>
<td>40 MW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average</td>
<td>$8,503,073</td>
</tr>
<tr>
<td>2003-2006</td>
<td>2003 Tariff</td>
<td>$400,000/year after first five years, plus</td>
<td>7.5 MW</td>
</tr>
<tr>
<td></td>
<td>Effective: Dec 1, 2003</td>
<td>three times levelized annual revenue</td>
<td>17 MW</td>
</tr>
<tr>
<td></td>
<td>Approved: Decision 2003-077</td>
<td></td>
<td>40 MW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average</td>
<td>$8,503,073</td>
</tr>
<tr>
<td>2006-2008</td>
<td>2006 Tariff</td>
<td>$125,000/year, plus</td>
<td>7.5 MW</td>
</tr>
<tr>
<td></td>
<td>Effective: Jan 1, 2006</td>
<td>$5,000/MW/year</td>
<td>17 MW</td>
</tr>
<tr>
<td></td>
<td>Approved: Order U2005-464</td>
<td></td>
<td>40 MW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average</td>
<td>$4,650,000</td>
</tr>
</tbody>
</table>
### History of contribution policies

<table>
<thead>
<tr>
<th>Years A</th>
<th>Tariff</th>
<th>Maximum Investment</th>
<th>Example Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Capacity</td>
<td>Amount</td>
</tr>
<tr>
<td>2008-2009</td>
<td>2007 Tariff</td>
<td>$51,400/year (\times SF), plus $28,900/MW/year for first (7.5 (\times SF)) MW</td>
<td>7.5 MW</td>
</tr>
<tr>
<td></td>
<td>Effective: Aug 1, 2008</td>
<td>$10,000/MW/year for next (9.5 (\times SF)) MW</td>
<td>17 MW</td>
</tr>
<tr>
<td></td>
<td>Approved: Order U2008-217 and Decision 2009-105</td>
<td>$5,900/MW/year for next (23 (\times SF)) MW</td>
<td>40 MW</td>
</tr>
<tr>
<td></td>
<td>$3,100/MW/year for all remaining MW</td>
<td>Average</td>
<td>$7,534,333</td>
</tr>
<tr>
<td>2010-2011</td>
<td>2010 Tariff</td>
<td>$51,050/year (\times SF), plus $34,650/MW/year for first (7.5 (\times SF)) MW</td>
<td>7.5 MW</td>
</tr>
<tr>
<td></td>
<td>Effective: Jan 1, 2010</td>
<td>$12,800/MW/year for next (9.5 (\times SF)) MW</td>
<td>40 MW</td>
</tr>
<tr>
<td></td>
<td>Approved: Decision 2010-606</td>
<td>$7,750/MW/year for next (23 (\times SF)) MW</td>
<td>Average</td>
</tr>
<tr>
<td>2011</td>
<td>2011 Tariff</td>
<td>$4,200/MW/year for all remaining MW</td>
<td>$50,050/year (\times SF), plus $34,000/MW/year for first (7.5 (\times SF)) MW</td>
</tr>
<tr>
<td></td>
<td>Effective: Jul 1, 2011</td>
<td>$12,550/MW/year for next (9.5 (\times SF)) MW</td>
<td>40 MW</td>
</tr>
<tr>
<td></td>
<td>Applied for: Feb 6, 2011</td>
<td>$7,600/MW/year for next (23 (\times SF)) MW</td>
<td>Average</td>
</tr>
<tr>
<td>Cumulative, 1996 to 2011</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Contribution policy should satisfy established principles

- Evaluated principles from recent contribution policy proceedings
- Concluded that there are three “primary” and five “secondary” principles
- Setting the appropriate investment level is a balancing act based on judgment among all principles
- No single policy will completely satisfy all principles
Primary principles

**Provides Effective Price Signals** — The contribution policy must send price signals that influence market participants to select the best long-term economic and technical alternatives for connection projects while considering good electric industry practice. The price signals should ensure that market participants consider the costs of connections when requesting system access service. An effective price signal will result in a market participant requesting:

- only those transmission facilities needed to meet the individual service requirements of the market participant, and
- transmission facilities that optimize overall costs, including the impact of siting the market participant’s own plant and equipment as well as other factors.

The contribution policy should not provide excessive investment or other incentives that would encourage market participants to request facilities beyond those needed to meet their individual service requirements.
What is the effectiveness of a contribution price signal?

- Contributions will not prevent connection projects
- Contributions support design prudence
  - Contributions may encourage optimal configuration
  - Lack of contribution may limit pursuit of optimum
- Unused investment may not be large enough to cover significant equipment (like a second transformer)
- Connection must still meet “good electric industry practice”
Primary principles (cont’d)

**Maintains Intergenerational Equity** — The contribution policy must balance what a new market participant pays as a contribution compared to what all market participants pay through related rate components. In general and consistent with historical practice, new market participants should receive a fair and sufficient level of investment such that most do not pay a contribution or, alternatively, that most contributions represent a small proportion of connection project costs. As well, a new service should not unduly burden existing services and should not place undue upward pressure on rates.
What generations should equity be maintained between?
Is Based on Cost Causation — Investment levels should be determined on the same cost causation basis as are the related rate components, to the extent practical and considering the expected life of a service. Since investment is recovered through rates, basing both on cost causation will ensure investment is appropriately recovered through rates over a broad range of market participant connections.
Cost function is cost causation basis for both investment and POD Charge in Rate DTS.
Secondary principles

**Is Based on Local Costs** — The contribution policy should directly relate to the current local connection costs of system access service and should exclude system costs. The connection costs should reflect good electric industry practice for transmission facilities to meet the individual service requirements of the market participant.

**Is Robust and Sustainable** — The contribution policy must accommodate changes to the service characteristics, functionality, and standards that apply to system access service, as those characteristics, functionality, and standards change over time.

**Treats All Load Market Participants Equitably** — The contribution policy should apply equally to owners of distribution systems, owners of industrial systems, and direct-connected market participants who receive section 101 releases. In as much as all load market participants pay the same investment-related rate components, all should be subject to the same contribution policy.
Secondary principles (cont’d)

**Compensates Utilities Equitably** — The contribution policy should provide a reasonable opportunity for transmission facility owners to invest in and be compensated for the facilities they own, operate, and maintain to provide system access service.

**Is Simple, Consistent, and Transparent** — The contribution policy must be simple to administer and update. It must also be able to be applied consistently and transparently.
Different mechanisms or approaches can be used to establish a contribution policy

• Seven mechanisms examined
  – Project coverage at specific percentage ("80/20 rule")
  – Multiple of average cost (current "multiplier" approach)
  – Revenue test (investment supported by new revenue)
  – Line length (investment to maximum distance from system)
  – Percentage of costs (invest a specific percentage of costs)
  – Zero contribution (100% investment)
  – Zero investment (100% contribution)

• Mechanisms were assessed against the principles

• Concluded continuation of "multiplier" approach best satisfies the principles overall
How well do the criteria satisfy the principles?

<table>
<thead>
<tr>
<th></th>
<th>Provides effective price signals</th>
<th>Maintains I/G equity</th>
<th>Based on cost causation</th>
<th>Based on local costs</th>
<th>Robust and sustainable</th>
<th>Equitable treatment of all load MPs</th>
<th>Compensate utilities equitably</th>
<th>Simple, consistent and transparent</th>
</tr>
</thead>
<tbody>
<tr>
<td>“80/20” rule</td>
<td>1 / 3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Multiplier</td>
<td>1 / 3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Revenue test</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Line length</td>
<td>3</td>
<td>1</td>
<td>1 / 3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>% of costs for all projects</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Zero contribution</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Zero investment</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>
Should distribution utilities continue to pay contributions for transmission access?

• “Zero contribution” approach fails to satisfy several principles
  – Compared to “multiplier” approach

• Doesn’t provide effective price signals

• Doesn’t maintain intergenerational equity

<table>
<thead>
<tr>
<th></th>
<th>Provides effective price signals</th>
<th>Maintains I/G equity</th>
<th>Based on cost causation</th>
<th>Based on local costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiplier</td>
<td>1 / 3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Zero contribution</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
What is in the impact on market participants?

• Contribution policy applies to about 20 load projects per year
  – About 6 greenfield and 14 upgrade projects per year
• About $160 million of connection project capital per year
• Current policy provides about $70 million of investment
  – Requires about $90 million of contributions
  – 85% of projects pay contributions
  – Higher proportions than under previous policies
• All load services pay the same Rate DTS for system access service
  – Market participants feel existing policy is inequitable
  – Market participants challenge application of policy
  – Contributions do not prevent services from connecting
What are we doing differently this time?

• Refinement of the base cost function
  – Updated the data
  – Adopted a different inflation factor
  – Added in average upgrade costs

• Updated the approach to setting the investment level
  – Used both greenfield and upgrade projects
  – Used only “recent” projects to evaluate multiplier level
Data set now contains 215 projects

<table>
<thead>
<tr>
<th></th>
<th>Greenfield</th>
<th>Upgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of projects</td>
<td>87</td>
<td>128</td>
</tr>
<tr>
<td>Average capacity (MW)</td>
<td>21.4</td>
<td>7.9</td>
</tr>
<tr>
<td>Total capacity (MW)</td>
<td>1,860.1</td>
<td>1,017.5</td>
</tr>
<tr>
<td>Average cost ($ 000 000)</td>
<td>$11.7</td>
<td>$3.0</td>
</tr>
<tr>
<td>Total cost ($ 000 000)</td>
<td>$1,017.6</td>
<td>$387.7</td>
</tr>
</tbody>
</table>
We adopted a new inflation index.
Project costs vary due to combinations of several factors

- Delays in regulatory approvals
- AUC Rule 007’s participant involvement and consultation adding to project timelines
- Geographic location
- Outsourcing the construction (due to lack of in-house resources)
- High distributed and indirect costs
- Changes in functionality or reliability standards
- Bulk system build impacts
First we determined a greenfield cost function

\[ y = 2.1087x^{0.5442} \]

\[ R^2 = 0.3796 \]
Then we add average upgrade project costs to greenfield costs.
Resulting in this cost function:

\[ y = 1.9558x^{0.5827} \]
In 2007, investment covered 56% of greenfield projects and 88% of costs.
We use 68 recent greenfield AND upgrade projects to help us establish the multiplier.
Today, investment covers 15% of recent greenfield and upgrade projects and 43% of total costs
1.00 multiplier covers 28% of recent projects and 58% of costs
1.25 multiplier covers 41% of recent projects and 67% of costs
1.50 multiplier covers 49% of recent projects and 75% of costs
1.75 multiplier covers 54% of recent projects and 80% of costs
2.00 multiplier covers 65% of recent projects and 83% of costs
Project coverage increases gradually as multiplier is increased.

![Project and Cost Coverage With Different Multiplier Levels](chart.png)
Total investment increases as a power function with increase in multiplier.
Contribution decreases in mirror image

Project and Cost Coverage With Different Multiplier Levels

- Contribution
- Investment
- Projects Covered

Cost Function Multiplier

Percentage of All Projects

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

0.0 0.5 1.0 1.5 2.0 2.5 3.0
Unused investment increases exponentially

Project and Cost Coverage With Different Multiplier Levels

Cost Function Multiplier

Percentage of All Projects

Unused Investment

Projects Covered

Investment

Contribution

0% 0.0 0.5 1.0 1.5 2.0 2.5 3.0
Multiplier produces “reasonable” investment between 1.25 and 1.75
AESSO proposes a multiplier of 1.50

Project and Cost Coverage With Different Multiplier Levels

- AESO Proposed
- Projects Covered
- Unused Investment
- Contribution
- Investment

Cost Function Multiplier

Percentage of All Projects

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

0.0 0.5 1.0 1.5 2.0 2.5 3.0
AESO proposes a 1.50 multiplier, to provide investment for 75% of project costs.
Proposed investment level provides about 75% more investment than existing level

<table>
<thead>
<tr>
<th>Tier</th>
<th>Existing</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substation fraction (for new points of delivery only)</td>
<td>$50,050/year</td>
<td>$32,450/year</td>
</tr>
<tr>
<td>First (7.5 × substation fraction) MW of contract capacity</td>
<td>$34,000/MW/year</td>
<td>$58,950/MW/year</td>
</tr>
<tr>
<td>Next (9.5 × substation fraction) MW of contract capacity</td>
<td>$12,550/MW/year</td>
<td>$30,500/MW/year</td>
</tr>
<tr>
<td>Next (23 × substation fraction) MW of contract capacity</td>
<td>$7,600/MW/year</td>
<td>$21,500/MW/year</td>
</tr>
<tr>
<td>All remaining MW of contract capacity</td>
<td>$4,100/MW/year</td>
<td>$14,000/MW/year</td>
</tr>
</tbody>
</table>
Maximum investment will increase by 100% on average for 0-80 MW capacity.
Additional investment will be recovered through gradual increase to POD Charge

- Multiplier of 1.50 (75% of costs covered) results in a 75% increase in investment over 2011 level and an average 0.15% per year increase in Rate DTS
- Existing services will pay slightly more than otherwise
  - As will new services with no contribution under existing policy
- Services with contribution will pay slightly less in total
Examples: investment will increase by 50-100% under proposed contribution policy

<table>
<thead>
<tr>
<th>Project Type</th>
<th>2011 Investment</th>
<th>2011 Contribution</th>
<th>Proposed Investment</th>
<th>Proposed Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 MW Project</td>
<td>$15 million</td>
<td>$5 million</td>
<td>$15 million</td>
<td>$5 million</td>
</tr>
<tr>
<td>15 MW Project</td>
<td>$16 million</td>
<td>$6 million</td>
<td>$16 million</td>
<td>$6 million</td>
</tr>
<tr>
<td>35-80 MW Staged Project</td>
<td>$35 million</td>
<td>$10 million</td>
<td>$35 million</td>
<td>$10 million</td>
</tr>
</tbody>
</table>
Remaining steps

• Draft distributed to working group      May 24
• Comments from working group           June 1
• Final working group meeting           June 7
• Application filing date               June 20
• Regulatory review schedule established by Commission
• Decision expected in late 2012 or early 2013
• Changes proposed to be effective retroactively to July 1, 2012
For more information

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  403-539-2465 or john.martin@aeso.ca

• Lee Ann Kerr  
  Manager, Tariff Applications  
  403-539-2741 or leeann.kerr@aeso.ca

• Consultation documents on AESO web site at www.aeso.ca  
  Tariff ▶ Current Consultations ▶ Contribution Policy
Thank you