



# Heartland Transmission Project

# Update on 500 kV Underground Feasibility Study

November 24, 2009

# *Update on Underground*

- **What we will cover**
  - Engagement with key stakeholders
  - Study and extent of work done to date
  - Challenges and mitigations
  - Next steps

# The Study

- As a result of concerns raised by stakeholders during phase 1 consultation, the AESO is studying the feasibility and life cycle cost of 500 kV AC underground for the Heartland Project

## The Feasibility Study Team

- The Alberta Electric System Operator (AESO)
  - Cable Consulting International
  - Teshmont Consultants
- The Heartland Project Team
  - AltaLink and EPCOR



# *Engagement with Key Stakeholders*

- Summer 2009 - Meetings between RETA, EuropaCable and Heartland Team
  - Focus on scope and extent of study
- Underground Technology Information Session jointly hosted by AESO and Partnership team with key stakeholders (including RETA)
  - Update on work done and information available

# *Extent of the Study Work*

- Study the integration of a 500 kV AC underground solution with the existing transmission system
- Determine optimal underground cable from available technologies
- Determine solutions for transition station designs
- Determine geographic considerations and potential construction techniques
- Develop life cycle cost estimates
- Identify the challenges and mitigative measures associated with underground

# Challenges – Experience at 500 kV



Visited existing system in Tokyo, Japan



# ***Challenges – Experience at 500 kV***

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- What we found in Tokyo
  - Similar operating voltage
  - Similar cable technology
  - Long lengths with cable joints
  - In service for nearly 10 years
  - No major operational problems

# ***Challenges and Mitigations – Climate***

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- Alberta has extreme winter operating conditions, no similar 500 kV system worldwide operates at these conditions
  - Requires prototype testing of system components
  - Gas Insulated Substation (G.I.S.)
    - Enclosed transition station design

# ***Challenges and Mitigations – Cost***

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- Obtain information from experienced utilities, suppliers and contractors
  - Contacted 13 suppliers worldwide for cable prices (including splicing joints and laying of cable)
  - Collecting prices from major civil contractors with experience in constructing below ground facilities (pipelines)
  - Discussions with utilities regarding operability and reliability

# ***Next Steps – Heartland Project Team***

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- If the AESO determines that using underground transmission presents a technically feasible option, then the Heartland Transmission Project will include an underground option in its Facility Application filed with the Alberta Utilities Commission (AUC)
- It is the Commission's decision whether to approve the transmission line siting and if any portion of the line will be underground

# ***Next Steps – AESO***

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- Further meetings with key stakeholders, EuropaCable, RETA etc. to review findings to date
- Release of study

# *Questions*

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