



Eastern Interconnection Planning Collaborative

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# Phase II HVDC Consideration Process

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November 4, 2011

# Initial Study

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- PAs will set initial load flow for each Scenario. PAs perform gap analysis and develop initial concepts for transmission additions.
- PAs will derive initial alternate concepts for each Scenario (including HVDC).
- PAs will develop “Sets” of transmission modifications.

# When would HVDC projects be considered as potential solutions?

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- An underground or undersea cable longer than 30 miles is required.
- Power transfer between asynchronous systems is identified as a possible solution.
- A long transmission line carrying a large amount of power is required.

# Underground and Undersea Cables

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- A cable may be used for the entire project or a small part.
- For long AC cables, capacitance builds as a function of length, and there is no way to compensate. This phenomenon does not occur for DC cables.

# Asynchronous Systems

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- Requires back-to-back HVDC system
- No transmission line
- HVDC acts as a clutch between the two systems
- Connection examples
  - ERCOT to anybody else
  - Hydro – Quebec to US
  - Hydro-Quebec to New Brunswick

# Long Transmission Line Carrying Large Amounts of Power

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- Most likely situation to arise
- Primary application is point-to-point line > 400 miles
- Considerations:
  - HVDC has no reactive losses
  - HVDC power transfer can be controlled precisely
  - HVDC transmission line conductor costs are less
  - EHV AC can deliver power as far by using switching substations
  - AC transmission line integrates well with existing system - AC power can be tapped easily
  - HVDC requires strong AC systems at both ends
  - HVDC terminals more complex than AC substations

# Conclusion

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- Ultimately, the initial results of the Phase II study will determine the need for evaluation of possible HVDC solutions.
- Questions?