02/12/14 Presentation: Alaska Energy Authority - Transmission Issues

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Alaska Transmission Issues

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House Energy Committee

Feb. 12, 2014

Railbelt Distances, Cost and Governance

- Distance
  - Homer to Fairbanks – 580 miles
- Governance
  - Reliability Standards
  - Open Access Provisions
- Needed Upgrades
  - Evaluate Cost/Benefit Ratio

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Unconstraining Bradley Projects

Project	Description	Cost ($mill)
New HVDC Line: Bernice Lake to Beluga	100 MW HVDC intertie	$185.0
Anchorage Area Battery	25 MW/14MWh BESS	$30.2
New Line: Bradley to Soldonta	115 kV line and substation	$72.4
Reconstruct Line: University to Dave's Creek	Reconstruct line to 230 kV	$70.5
Upgrade Substations: University & Dave's Creek	Convert line to to 230 kV	$31.1
Upgrade Line: Dave's Creek to Quartz Creek	Upgrade line to rail conductor	$13.0
Total		**$402.2**

Benefits

- Physically move Bradley energy off of the Kenai Peninsula
- Reduce transmission losses and provide voltage control
- Increase reliability to N-1

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Southcentral Projects

Project	Description	Cost ($mill)
Fossil Creek Substation	New 115 kV substation	$10.7
Eklutna Hydro Substation	New 115 kV substation	$9.8
Total		**$20.5**

Benefits

- Allow for energization of Anchorage to Eklutna "express" circuit
- Allow for future transmission additions and upgrades

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Northern Projects

Project	Description	Cost ($mill)
New Stations: Lorraine & Douglas	230 kV station	$73.4
New Line: Lorraine to Douglas	230 kV dbl circuit line	$55.9
New Stations: Gold Creek & Healy	230 kV station	$35.8
New Line: Douglas to Healy	230 kV line opearted at 138 kV	$188.1
Communication	Communication for control	$15.0
Healy Additions	2 new transformers	$5.7
Ugrade Stations: Wilson & Gold Hill	230 kV upgrade	$10.3
Ugrade Stations: Nenana, Ester, Eva & Clearly	Station updgrades	$10.8
Upgrade Line: Healy to Gold Hill	Convert line to 230 kV	$85.7
Total		**$480.7**

Benefits

- More firm/low cost power from Anchorage to Fairbanks
- System stabilization and voltage control
- Increase reliability to N-1

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Transmission Projects: Potential Railbelt Consumer Impact

- This presentation is for discussion purposes and not an AEA position.
- Demonstration of impact to consumers if cost of projects recovered in electric rates

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Transmission Upgrade: Potential Impact

	CAPEX ($mill)
Unconstraining Bradley	$402.2
Southcentral Projects	$20.5
Northern Projects	$480.7
Total Cost	**$903.4**

- Transmission system upgrades benefits entire Railbelt system
- Project separated into two phases
  - The State has not provided funding for first stage of project
- Costs from May 9, 2013 EPS Presentations
- **Analysis of impact on rates of transmission upgrades**

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Transmission Upgrade: Costs

Base assumptions

- Full capital cost recovered through rates
- Annual operating costs are 2% of capital costs
- Entirely funded with commercial rates
- Costs shared proportionally by all utilities

CAPEX ($millions)	$903
OPEX (2% OPEX)	$18.1
Interest Rate	5.00%
Bond Term (Years)	30
Output (GWhs)	4,817
Inflation	2.50%

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Transmission Upgrades: Benefits

Base assumptions

- The annual cost savings from transmission upgrades will lower rates
- Range of annual savings has been estimated by Electric Power Systems, Inc. (EPS) (May 9, 2013)
  - Low savings: $146 million
  - High savings: $241 million
  - Estimates are being refined by AEA/EPS
- Savings shared proportionally by all utilities

	Annual Savings ($millions)
Low Savings	$146
High Savings	$241

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Impact on Railbelt Rates: Net Effect

- Annual costs and savings are spread across all Railbelt kWh's
- Majority of upgrade costs are fixed while savings increase with inflation
  - Larger savings over time
- $146 million savings
  - Immediate positive impact on rates
- $241 million savings
  - Immediate and significant positive impact on rates

Net Rate Savings (Costs) ($/kWh)

	$146 MM Savings	$241 MM Savings
Year 1 (Nominal)	$0.016	$0.039
Year 1 ($2013)	$0.013	$0.033
10 Yr Ave ($2013)	$0.015	$0.034
25 Yr Ave ($2013)	$0.016	$0.036
50 Yr Ave ($2013)	$0.021	$0.041

**($2013) means adjusted for inflation to today's dollars*

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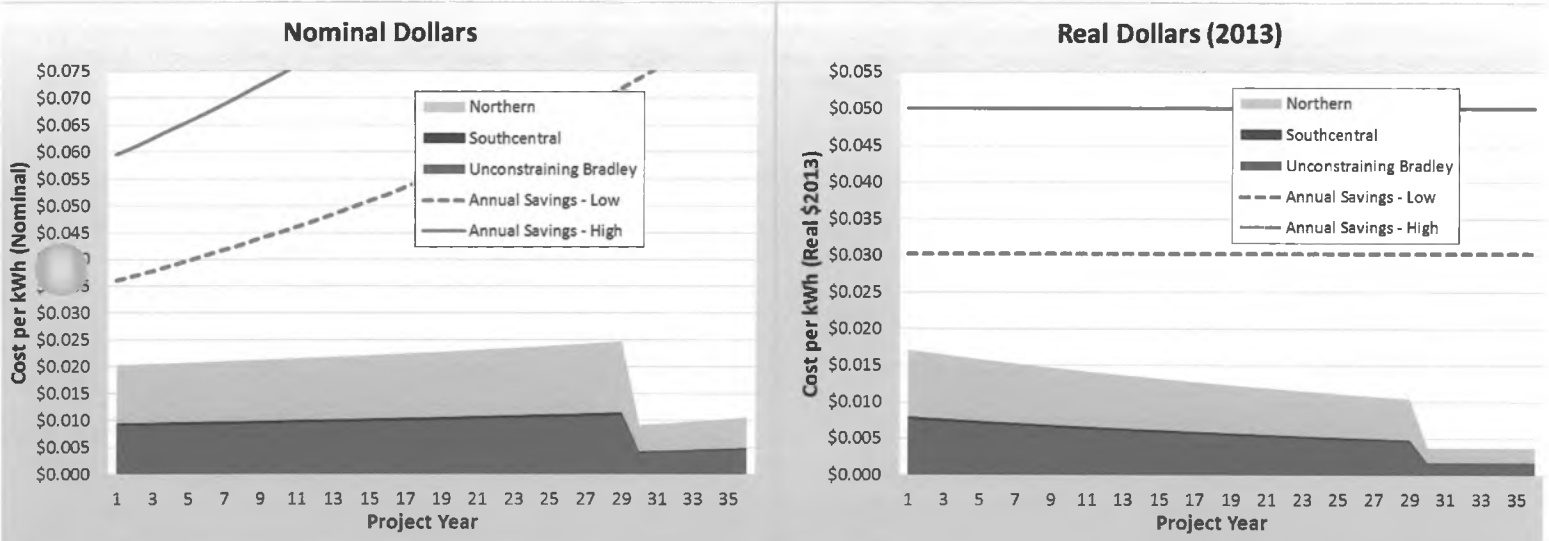
Impact on Rates: Nominal vs. Real



- When annual savings exceed costs – positive impact on rates
- $146 million annual savings – immediate positive impact on rates
- $241 million annual savings - immediate and significant positive impact on rates

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