



Photo by: Cassandra Cerny, GVEA

Alaska Transmission Issues

Alaska Energy Authority
House Energy Committee Hearing on HB 340
March 19, 2014



Railbelt Distances, Cost and Governance

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



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 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

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

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
Upgrade Stations: Wilson & Gold Hill	230 kV upgrade	\$10.3
Upgrade Stations: Nenana, Ester, Eva & Clearly	Station updgades	\$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

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

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**

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%

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

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

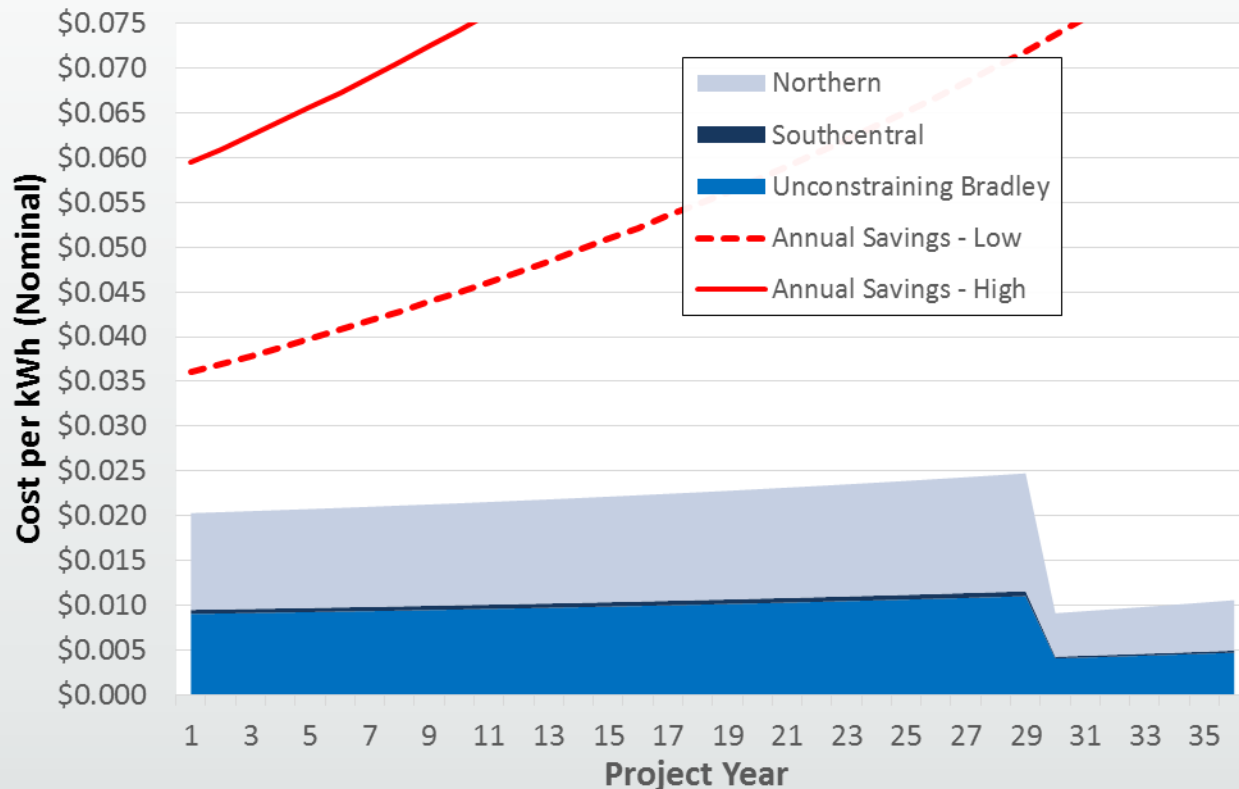
Net Rate Savings (**Costs**) (\$/kWh)

	\$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

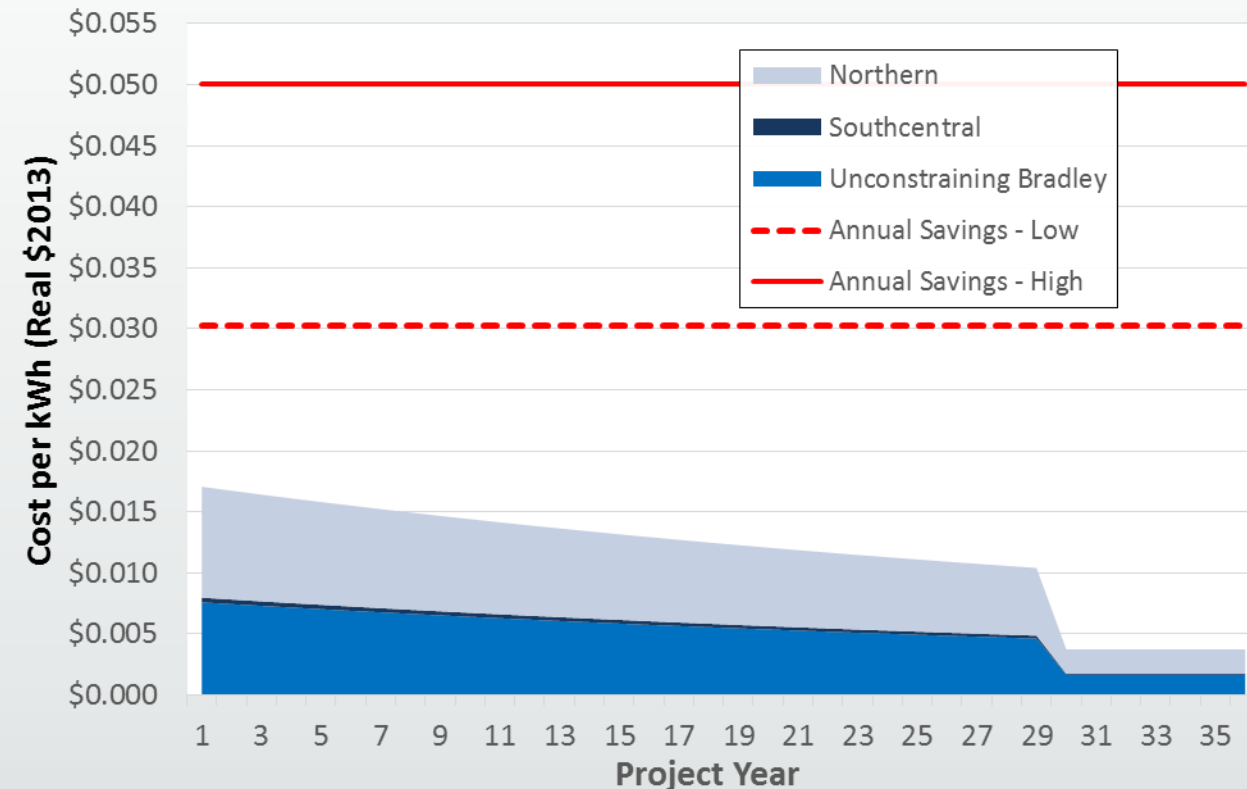
**(2013) means adjusted for inflation to today's dollars*

Impact on Rates: Nominal vs. Real

Nominal Dollars



Real Dollars (2013)



- 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

Next Steps – Policy Direction

- AEA will work with all stakeholders to make recommendations for transmission system
- Formal coordination with transmission system users/stakeholders (utilities, independent power producers, potential independent system operator, military)
 - File transmission system reliability standards
 - File transmission system open access language

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