



SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

Susitna-WatanaHydro.org



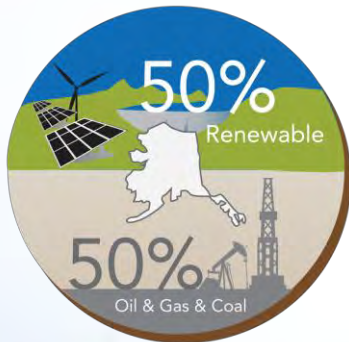
AEA Board of Directors

January 10, 2013

1. Introduction
2. Licensing Update
3. Engineering
4. Economics

Project Highlights

- Susitna-River, Mile 184
- 87 River Miles from Talkeetna
- 22-32 River Miles upstream from Devils Canyon
- ~50 percent of Railbelt's Energy Demand



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Project Highlights

Location: River mile 184, above Devils Canyon
Size: 750-foot high dam

Reservoir: About 41-miles long, 2-miles wide (at widest)

Estimated Supply: Roughly 50 percent of Railbelt electrical demand

Installed Capacity: 600 MW

Annual Energy: 2,800,000 MWh

Licensing: Federal Energy Regulatory Commission (FERC)

Project Life: 100+ years, providing long-term, stable rates



Why Susitna-Watana Hydro

- Long-term diversification
- Clean, reliable, and stable energy source
- Promotes integration of variable power sources
- Will serve nearly 80 percent of state's population
- Will annually displace an estimated 1.3 million tons of CO₂*
- 1,000 jobs during peak construction
- Stable electricity rates for businesses and consumers 100+ years

Licensing Update

- Revised Study Plan
 - Filed with FERC: Dec. 14, 2012
 - Proposed 58 studies
- FERC Study Plan Determination
 - 45 studies: Feb. 1, 2013
 - 13 remaining studies in flux (April 1 versus May 14)

2013 Field Studies

- Begin winter field studies
- Gearing up to conduct environmental summer field effort
 - Field work includes agreements with Alaska Department of Fish & Game
 - Contracting and procurement
 - Logistical support including helicopters and field camps
 - Obtaining permits from land owners



2012 Engineering Highlights

- Selection of maximum normal reservoir level - 2050' (~735' dam)
- Drilled 8 boreholes to confirm design criteria
- Installed of 4 micro-seismic stations; repeater
- Studied utility generation & transmission
- Continued design feasibility and optimization
- Updated Cost Estimate

2012 Geotechnical & Seismic

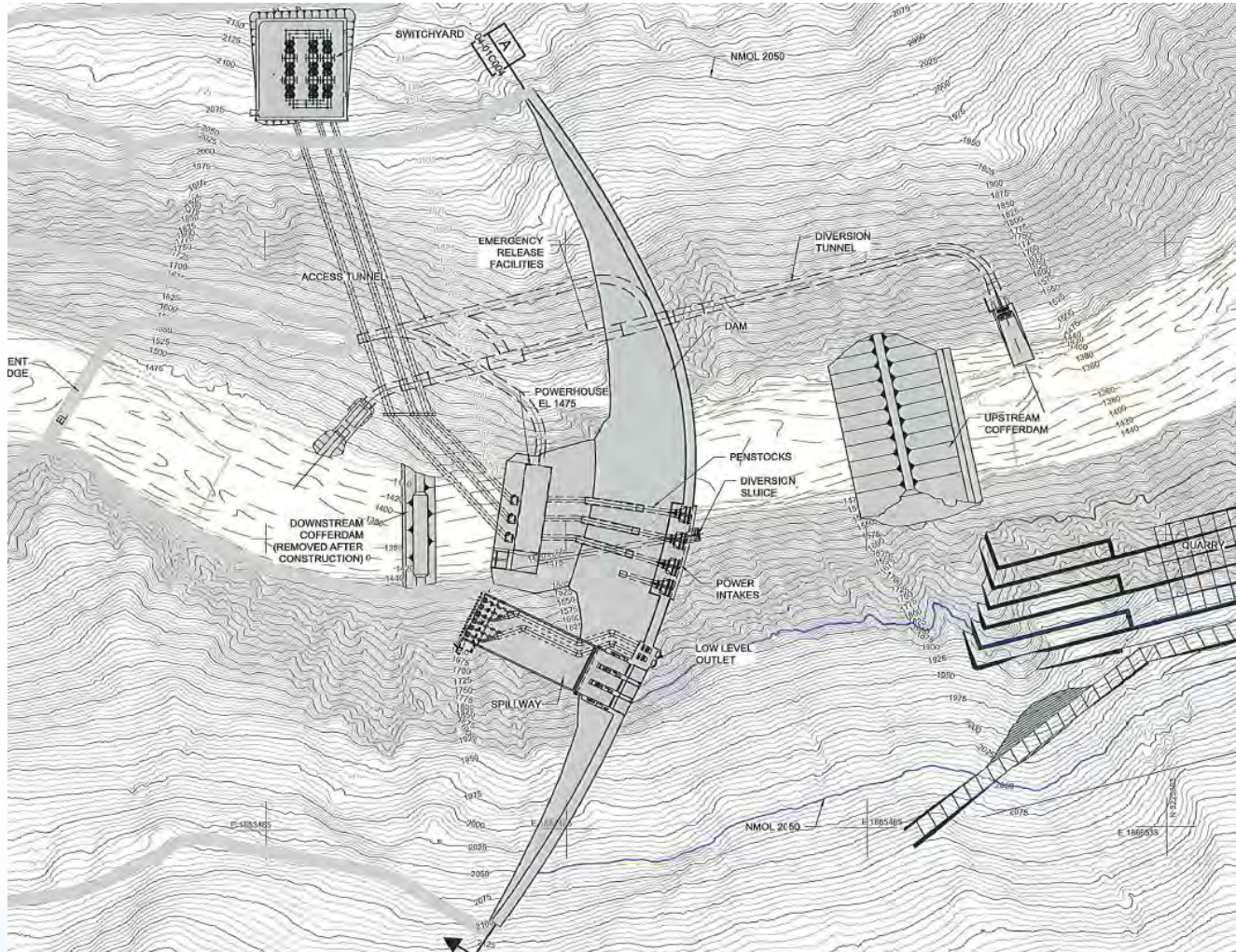
- Work to confirm suitable quarry source
- Geologic mapping and borehole information used to adjust dam arrangement
- Measuring groundwater and temperatures
- Continued characterization of seismic sources
- Collection of local seismic event data



2013 Engineering Goals

- Resources and Procurement Plan
- Geotechnical Exploration at Dam Site
- Utility Precedence Agreement
- Design Feasibility Report

Project Site Plan



Independent Construction Cost Estimate

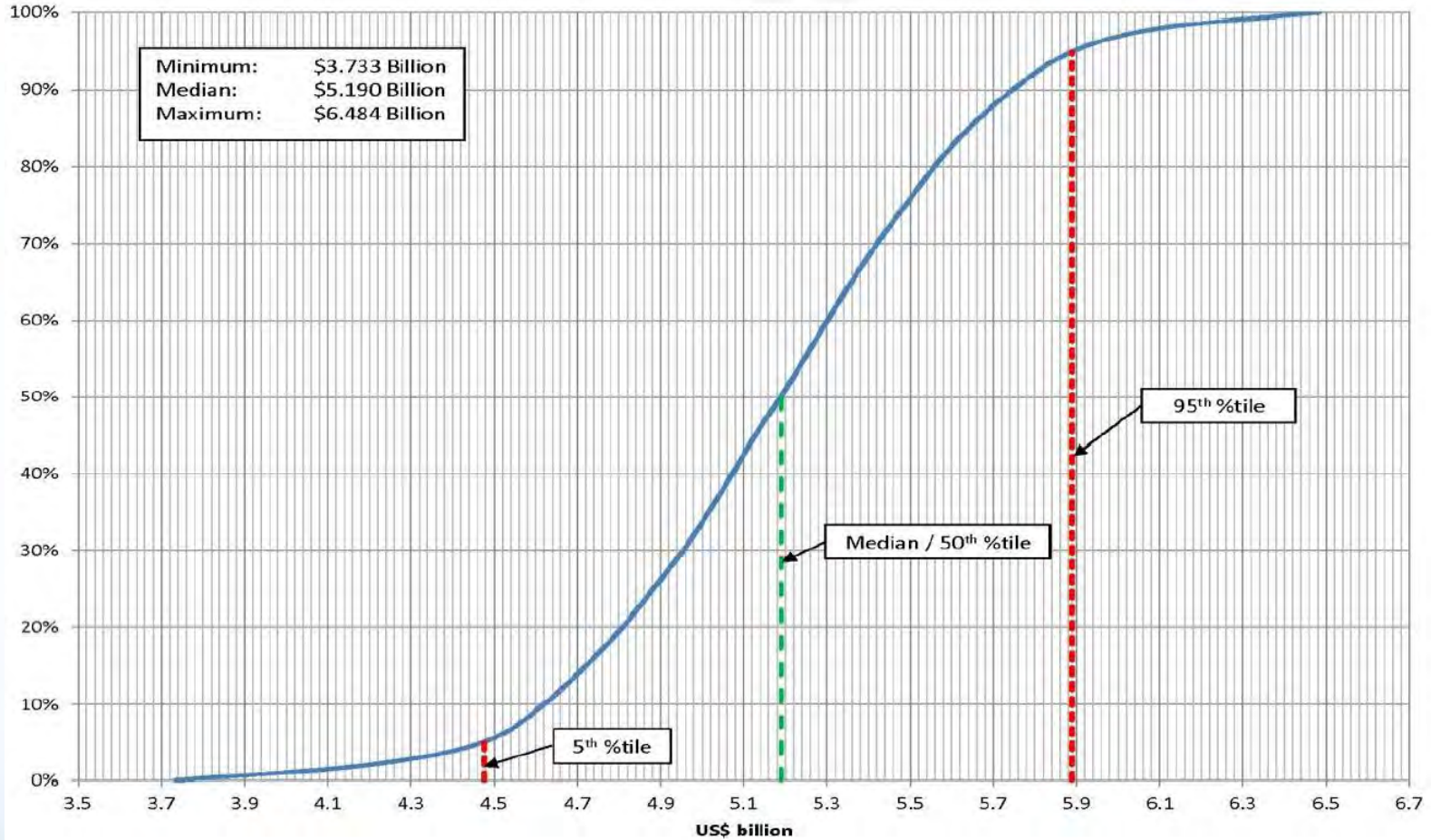
- **AECOM produced estimate**
 - Extensive hydro experience, including Arctic climates
 - Ranked as best hydroelectric developer
- **Estimate based on**
 - January 2012 conceptual design (dam, access, transmission, facilities)
 - AEA's line item list and quantities
- **Tasks and deliverables**
 - Unit price estimate by line
 - Independent construction schedule

Independent Construction Cost Estimate: Results

- Estimates within 9%
- Accuracy of the most probable estimate: -11% to +26%
- AECOM confirms
 - Feasible timeline
 - Roller-Compacted Concrete (RCC) dams constructible in cold climates
- AECOM recommends
 - Year-round construction (James Bay Project example)
 - Consideration of early reservoir filling for early power generation



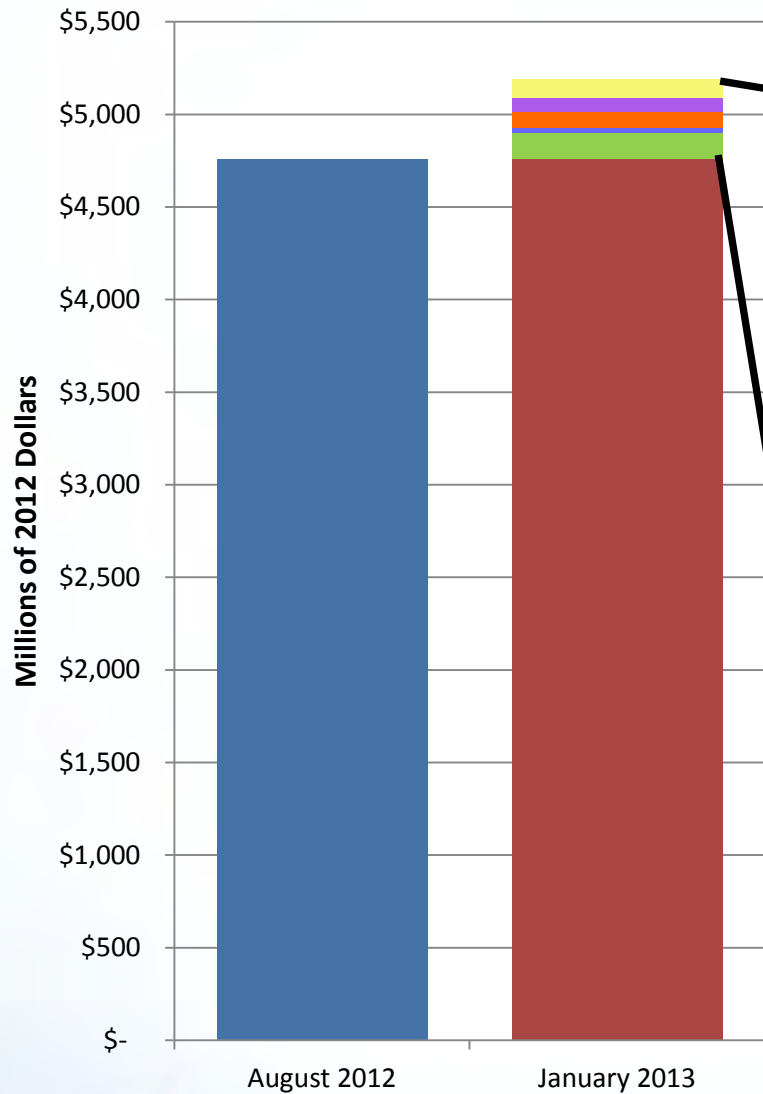
Probabilistic Range of Total Project Costs



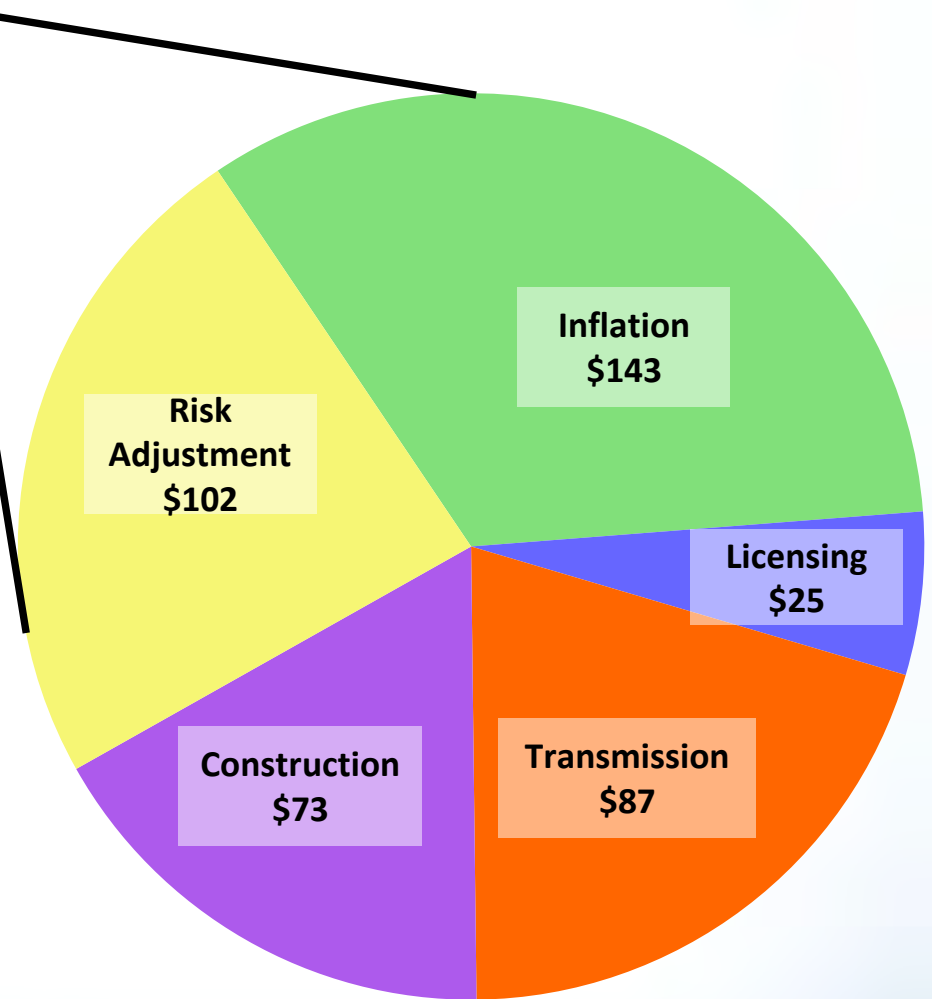
Capital Cost Takeaway

- Slight increase in cost estimate since last year, yet the range of probable costs reduced.
- AEA remains committed to providing the most accurate cost information possible.

Comparing Cost Estimates



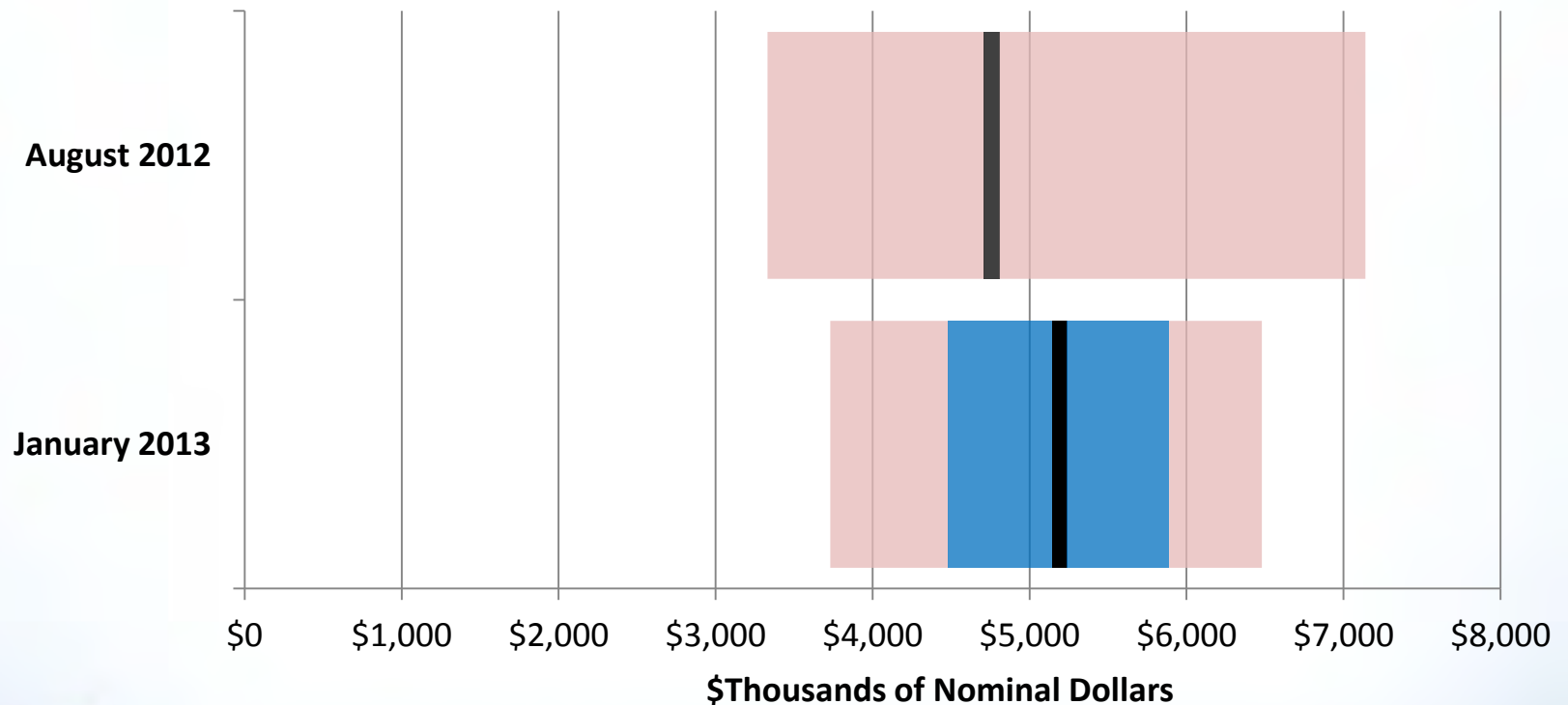
Components of Cost Update (\$millions)



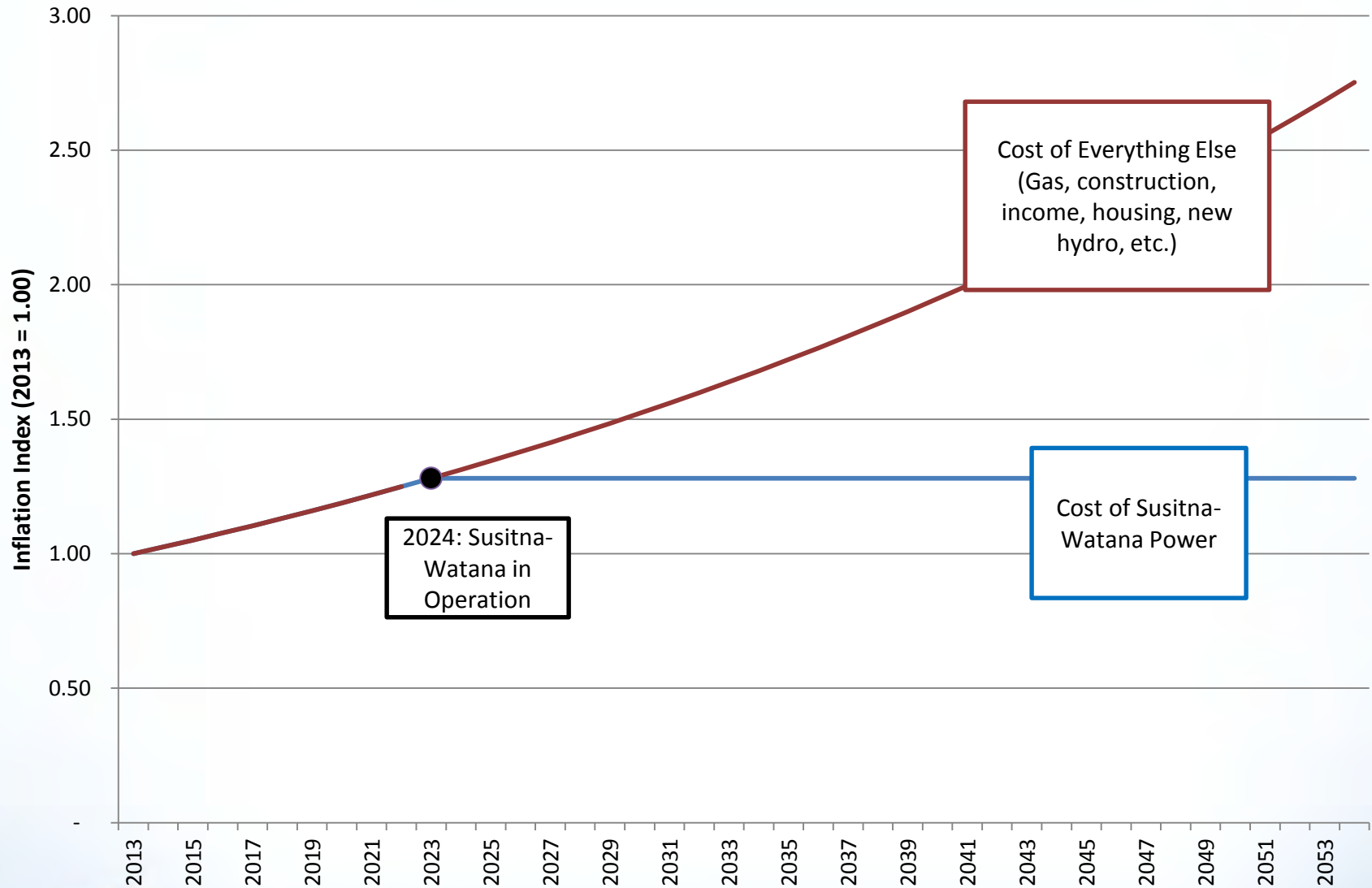
Cost Update

	Best Estimate	Low Estimate*	High Estimate*	Minimum Cost	Maximum Cost
August 2012	\$4,760			\$3,332	\$7,140
January 2013	\$5,190	\$4,480	\$5,890	\$3,733	\$6,484

*Low and High Estimates represent a 90% probability



Impacts of Inflation on Susitna-Watana Power Costs



Susitna-Watana Hydro Power Cost

- The method for projecting Susitna-Watana Hydro power costs same as last year
- Capital costs is the only variable to change
- Capital cost increase resulted in a small increase in the power cost
- Assumes no direct State financing

Base Case Economic Assumptions

Capital Costs (\$mill)	\$5,190
Power Production (GWh)	2,800
Interest Rate	5.00%
Debt Term (years)	30
Annual O&M Costs (\$mill)	\$16
Operation Start Year	2024

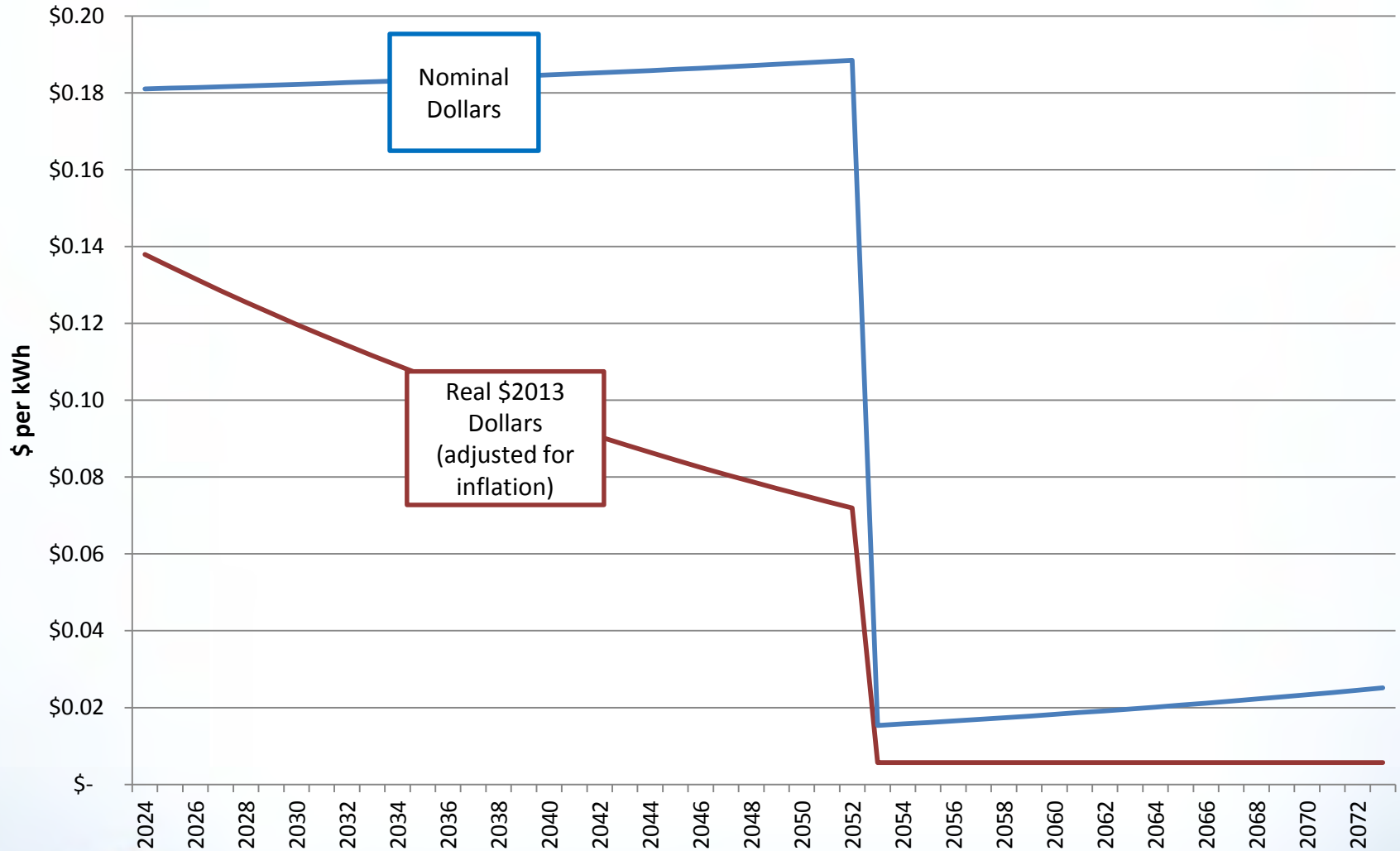
Susitna-Watana Power Costs (\$/kWh)

Year 1 Rate (\$2024)	\$0.181
Year 1 Rate (\$2013 Real)	\$0.138
10 Year Ave Rate (\$2013 Real)	\$0.124
25 Year Ave Rate (\$2013 Real)	\$0.106
50 Year Ave Rate (\$2013 Real)	\$0.061

Real= Adjusted for Inflation

Assumes no Direct State Financing

Susitna-Watana Power Costs: Real vs. Nominal (Assumes no Direct State Financing)



Natural Gas Generation Comparison

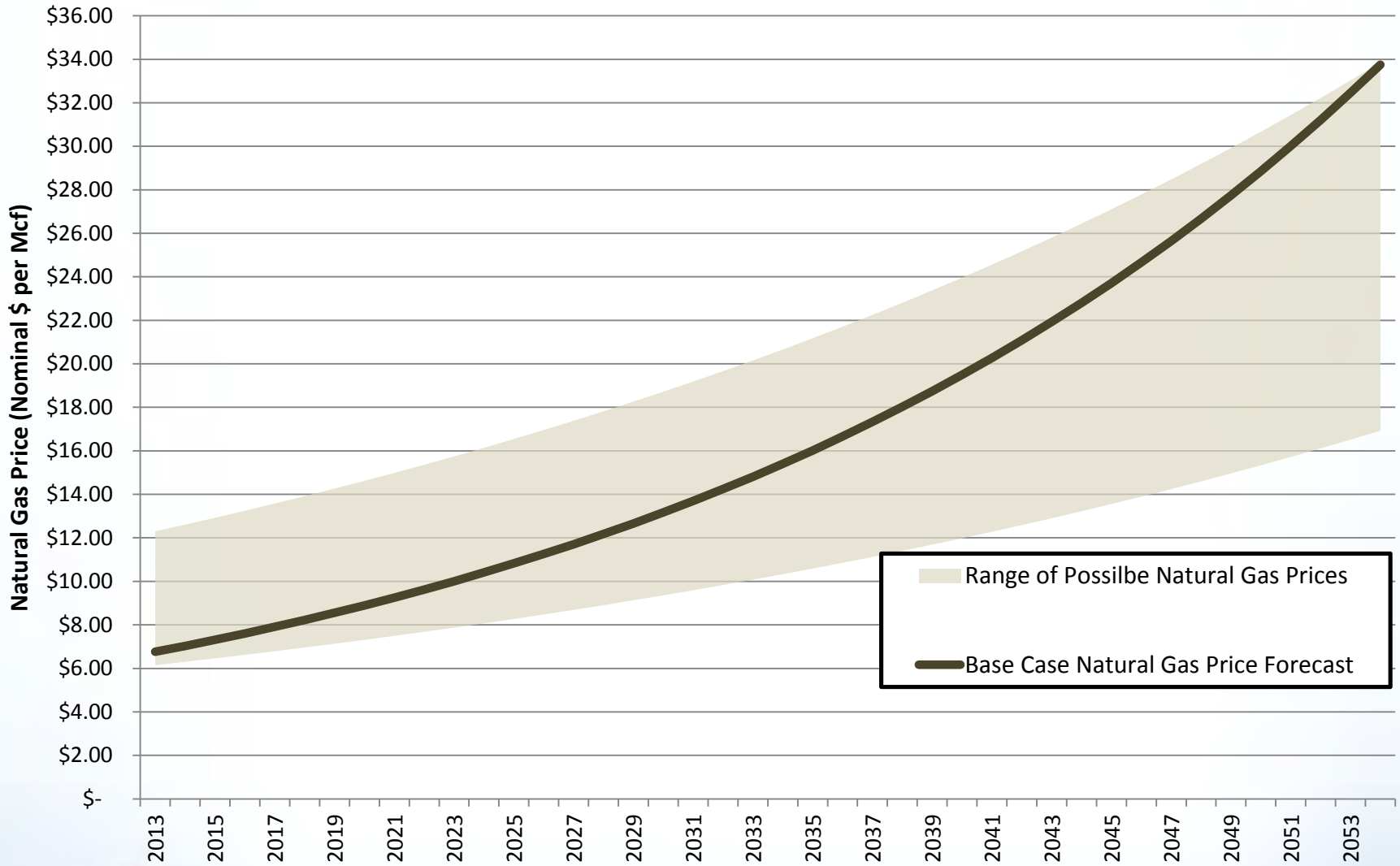
- Competitive with natural gas in the early years, much lower cost over long term
- Future natural gas prices are unknown
- Assume a constant efficiency and non-fuel cost for natural gas generation
 - Heat rate of 8,000 (Btu/kWh)
 - Non-fuel cost of \$0.03 per kWh

Natural Gas Price Forecast

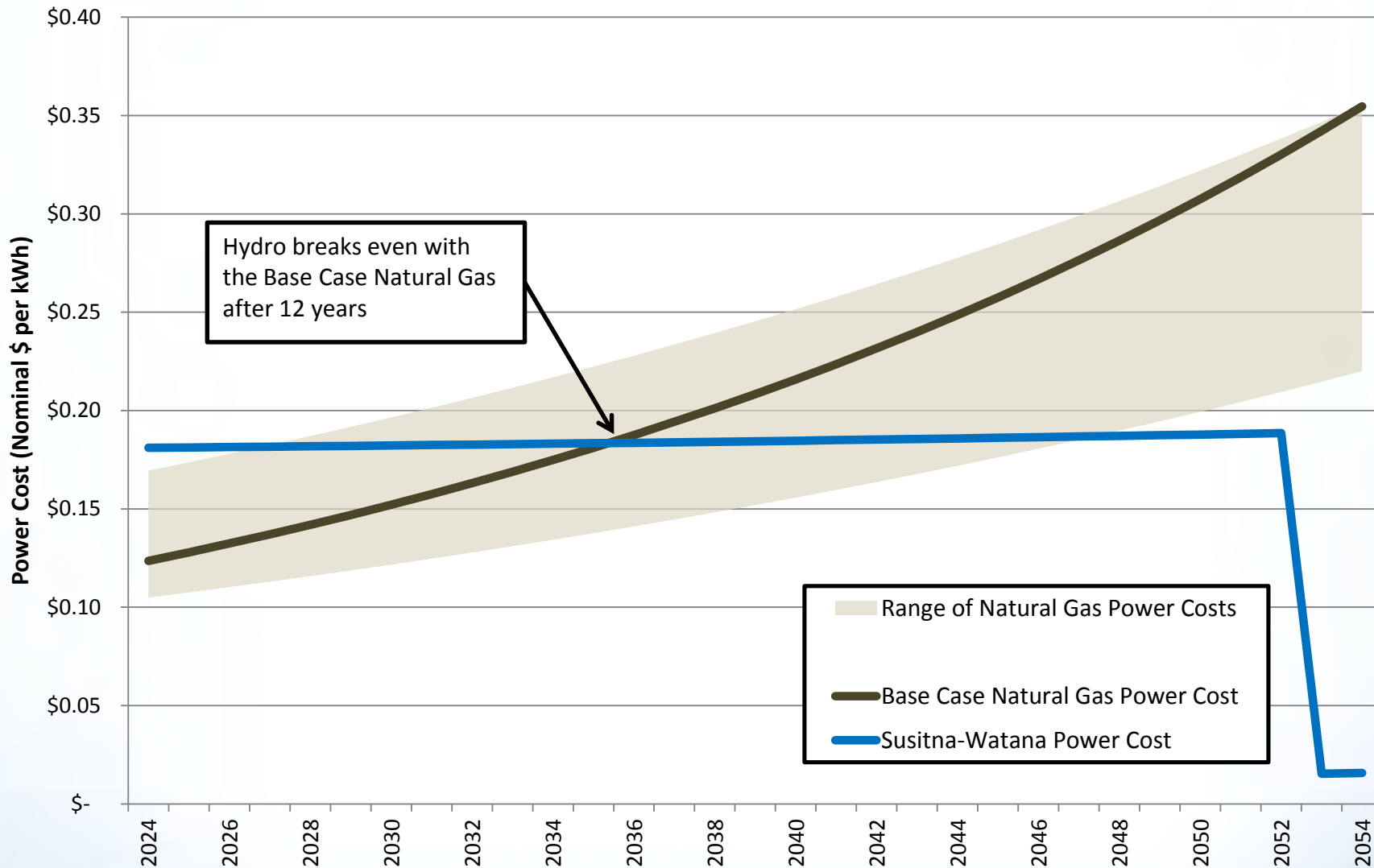
- A single forecast was needed for a “Base Case” comparison
 - \$6.50 per Mcf in 2012
 - Increases at 4% annually (1.5% greater than inflation)
- Realistically, future natural gas prices are better represented with a range
 - Prices can range \$6.00 to \$12.00 per Mcf in 2013
 - Range increase with inflation (2.5% annually)



Natural Gas Price Forecast and Range



Susitna-Watana vs. Natural Gas Power Costs

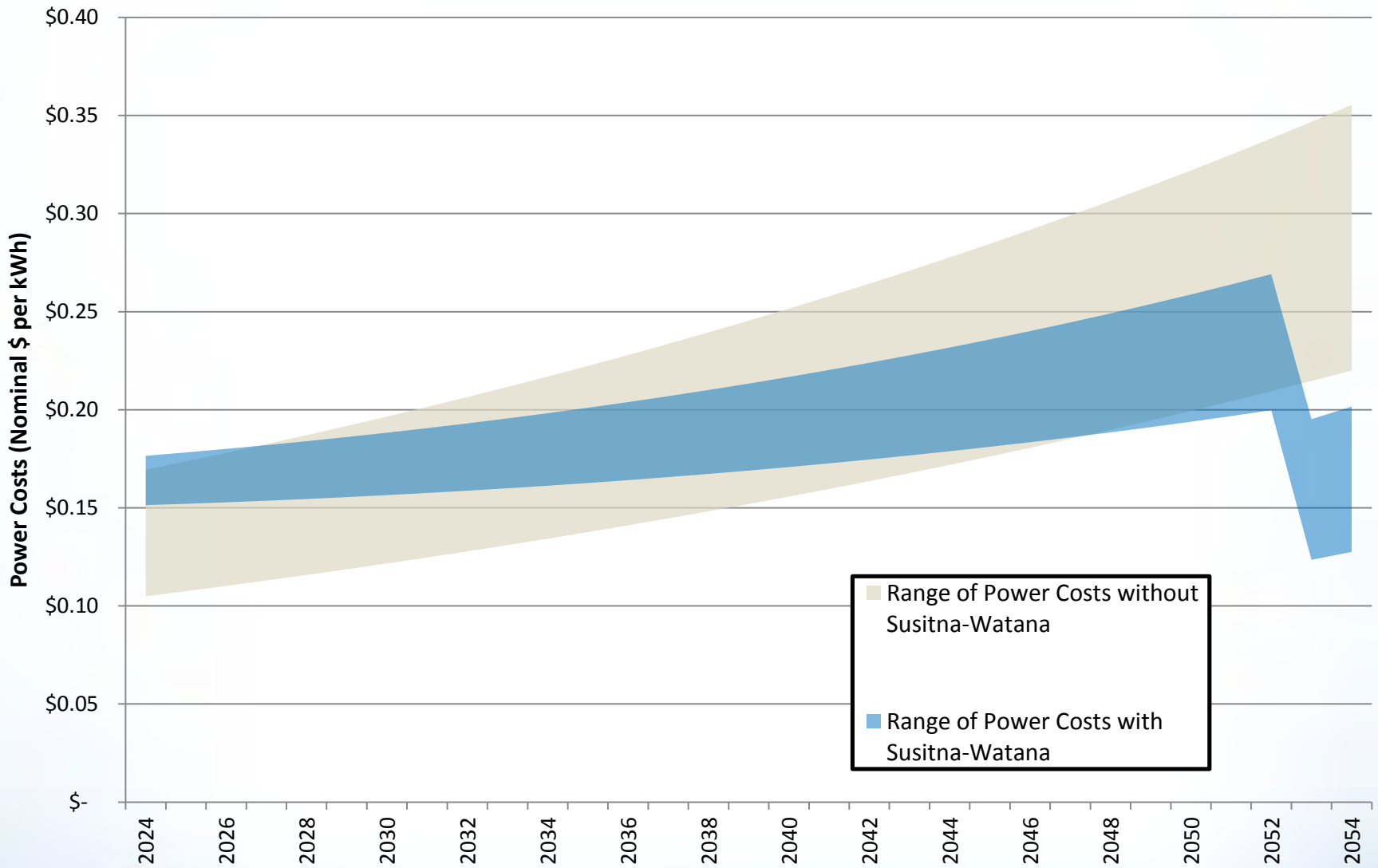


Susitna-Watana Hydro Reduces Power Price Uncertainty

- Hydropower reduces electricity price uncertainty and volatility
- Following chart compares the impact of the range of natural gas prices on the average power costs under two scenarios
 - First scenario assumes 100% natural gas generation
 - Second scenario assumes 50% hydro and 50% natural gas generation



Power Costs Under Range of Natural Gas Prices



Economic Takeaways

- Project cost estimate increase was largely a result of inflation and risk adjustments
- Susitna-Watana power remains cost competitive with natural gas in the early years, and will cost much less over the project life
- Breaks even with natural gas after 12 years without any direct State financing
- Susitna-Watana Hydro can significantly reduce future power cost uncertainty

Diversifying Alaska's energy portfolio

FERC No. P-14241



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