SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

Susitna-WatanaHydro.org

Hydraulic Power Committee Meeting
April 24, 2013

Alaska Energy Authority

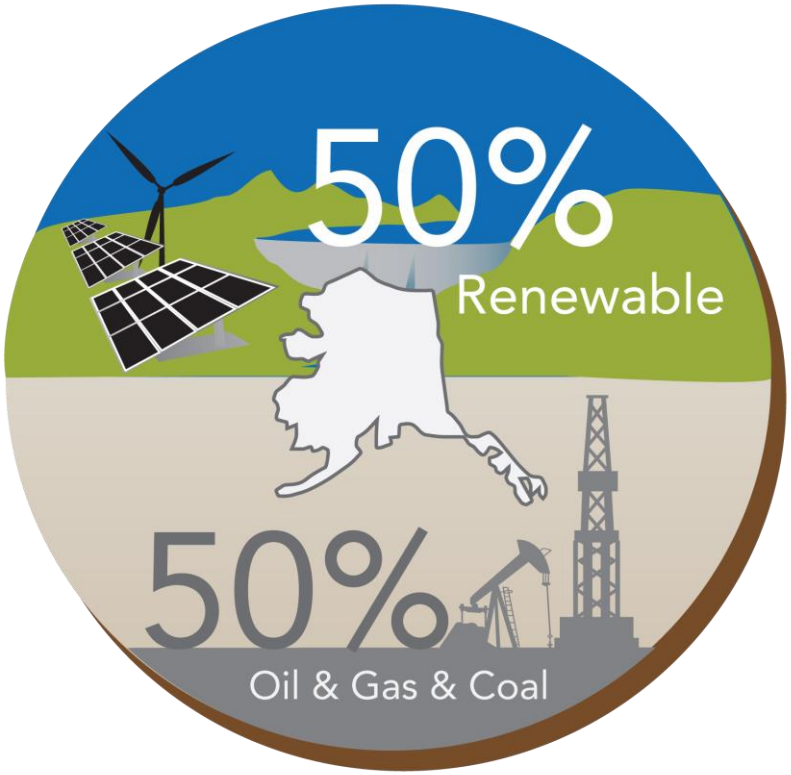
Mission: Reduce the Cost of Energy in Alaska

- Investing in Alaska's energy infrastructure
- Diversifying Alaska's energy portfolio
- Energy Planning and Policy
- Training and Technical Assistance

Alaska's Energy Challenges

- Varied energy costs by region
- Declining oil production / highly volatile fossil fuel costs
- Aging facilities
- Dispersed communities, no central grid
- Short and long-term solutions necessary

2025 Renewable Energy Goal



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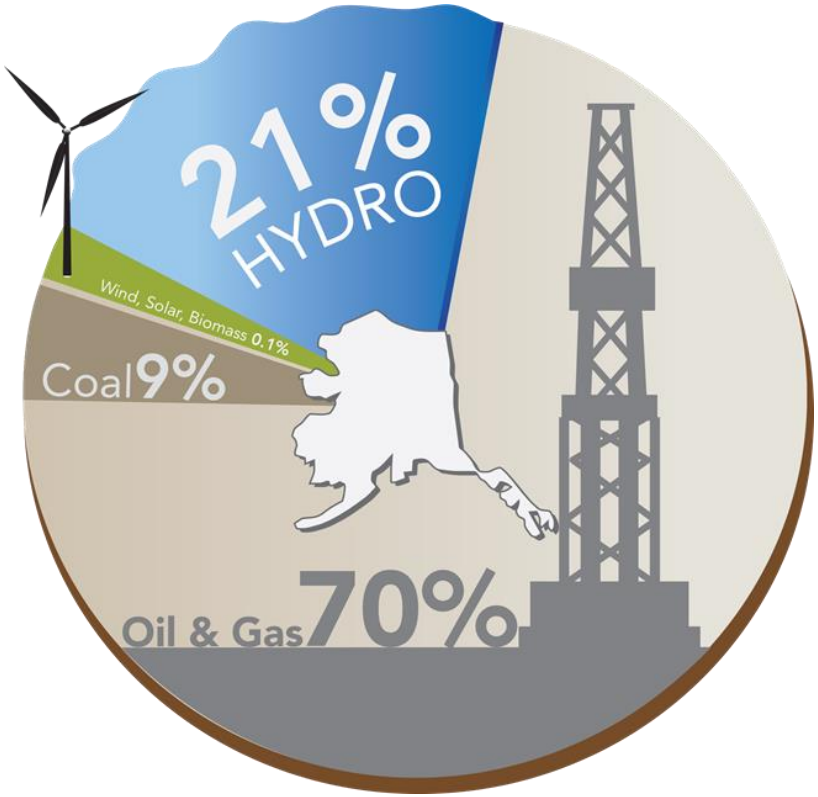
Alaska: Electricity Sources



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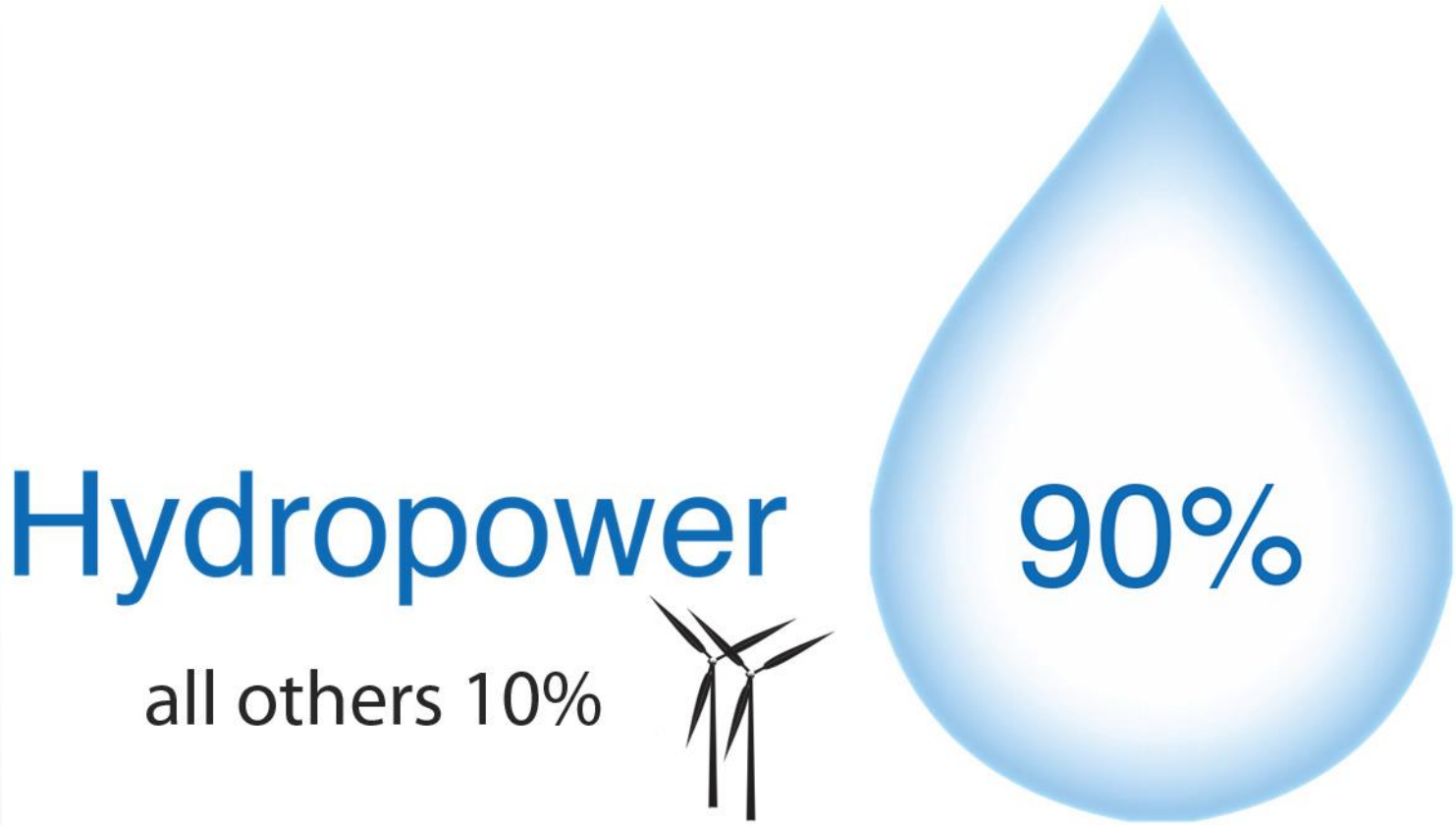
Renewable Electrical Power



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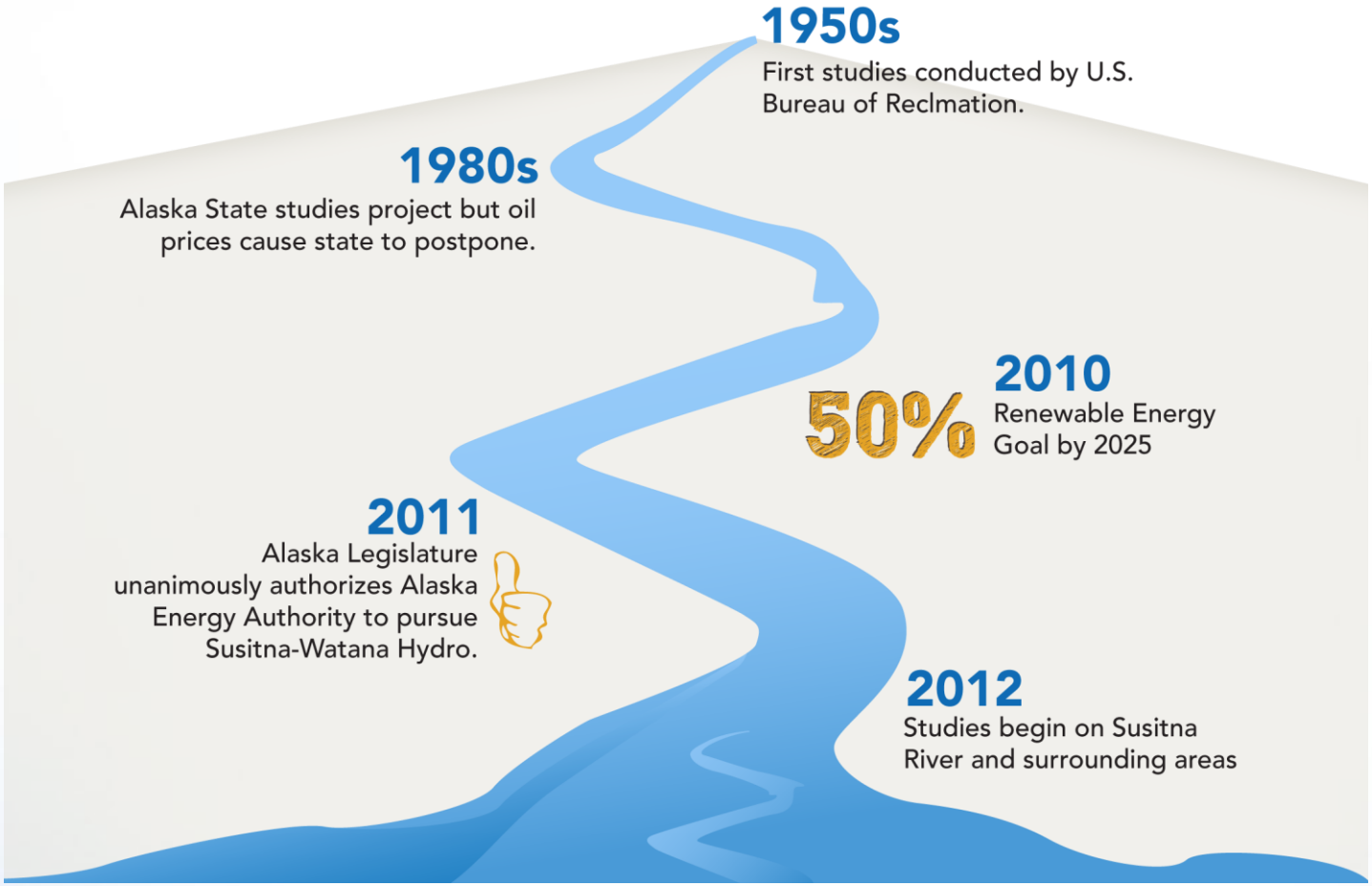
Susitna Hydro: History



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Why Susitna-Watana Hydro

- Serves ~80% of state's population
- 1,000 jobs during peak construction
- Stable electricity rates for 100+ years
- Long-term diversification
- Clean, reliable energy source
- Promotes integration of variable power sources

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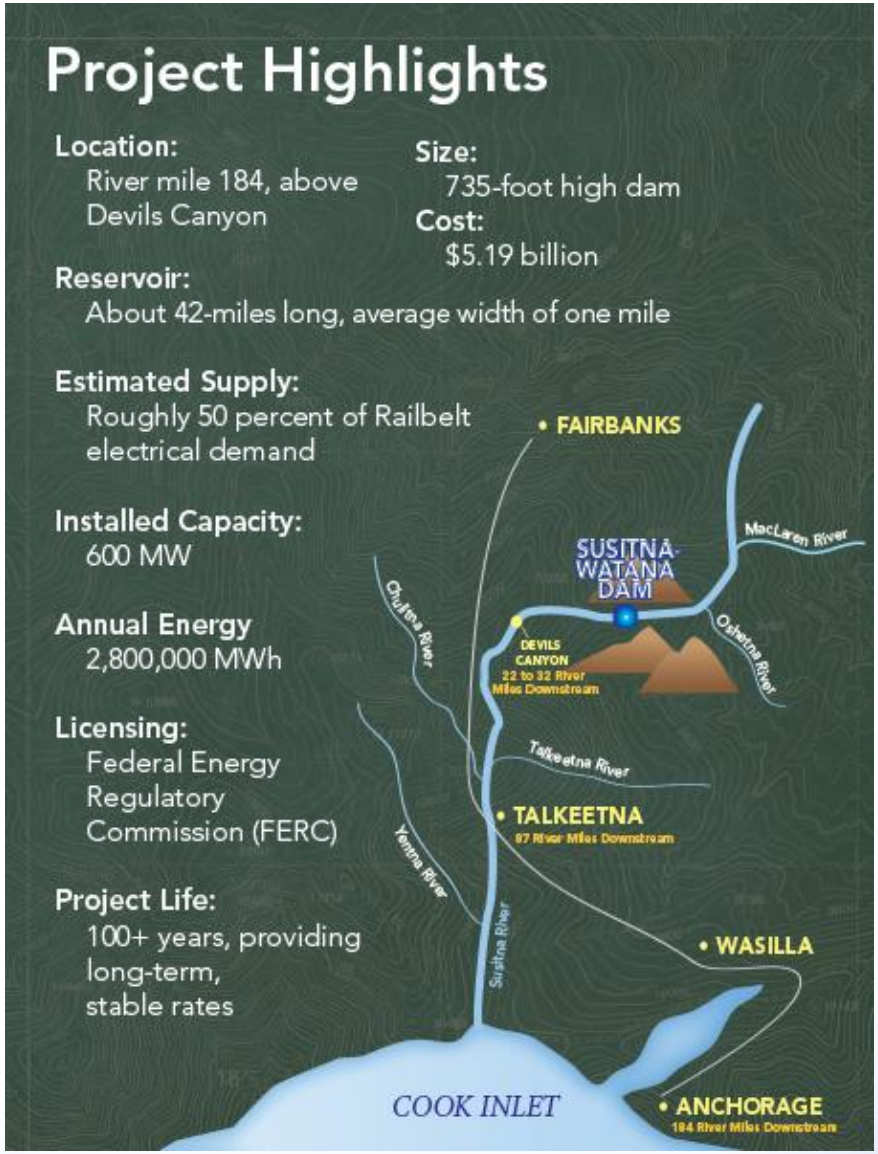
Project Highlights

- 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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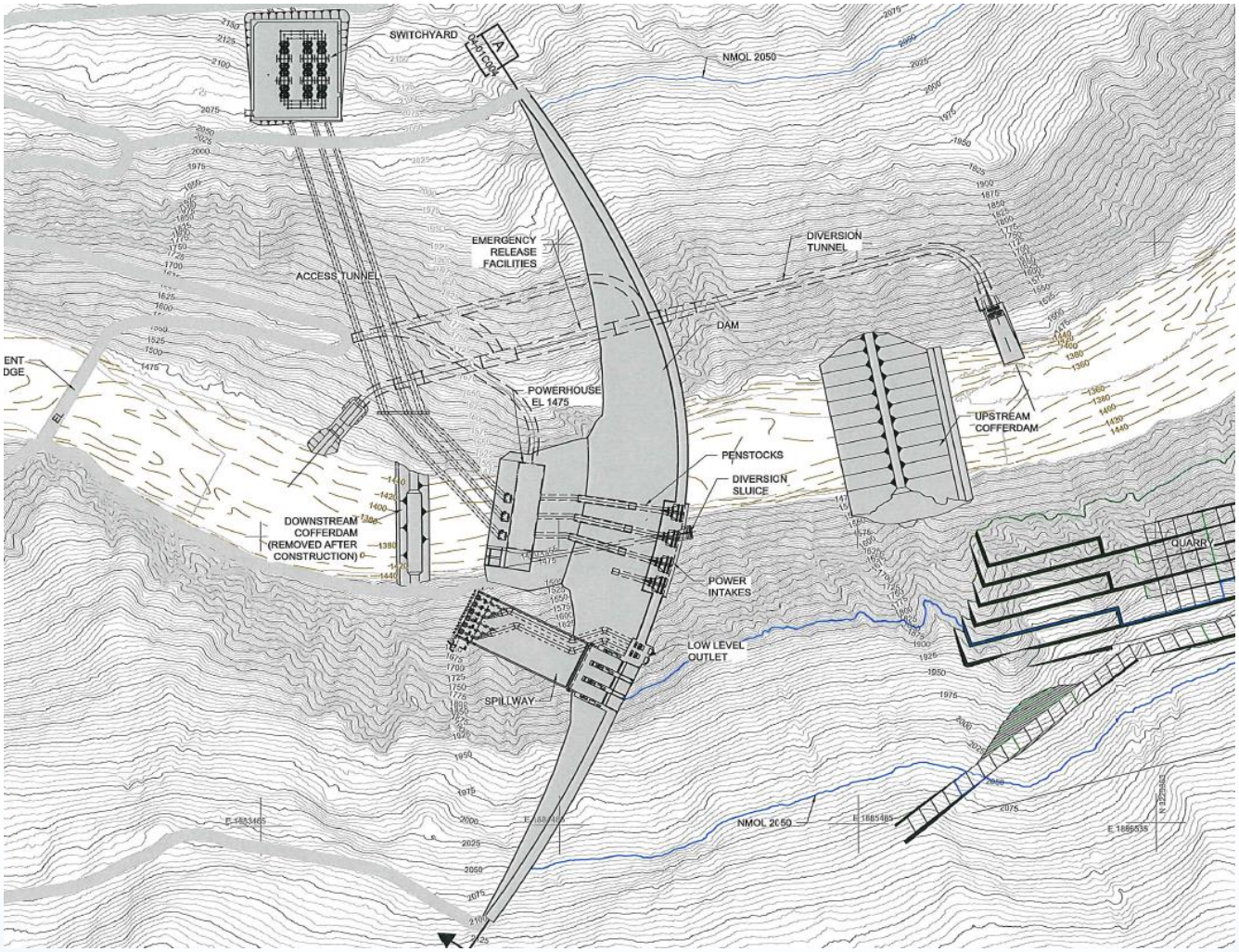
Project Site Plan



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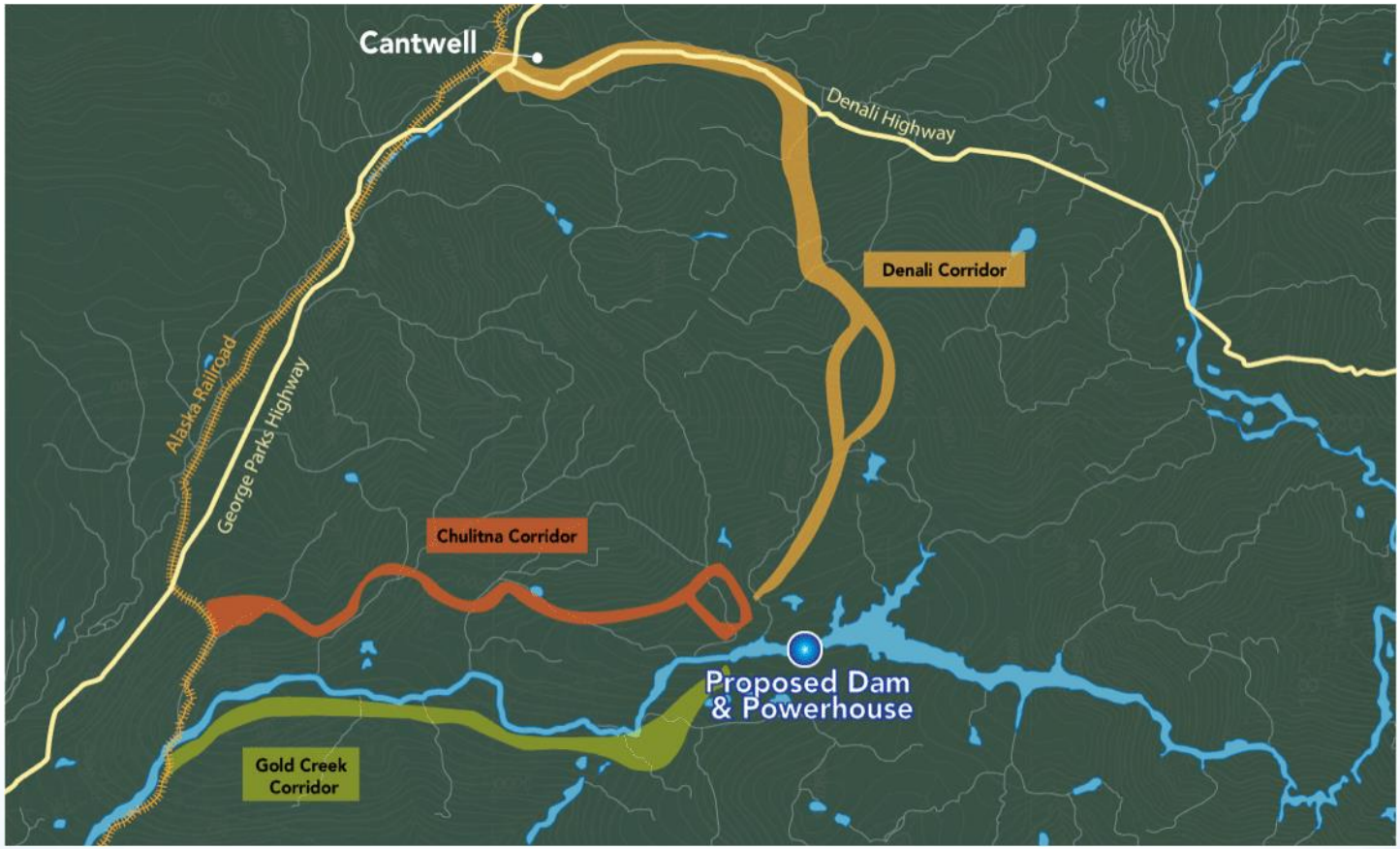
Access and Transmission Alternatives



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Project Timeline

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2012 Environmental Study Accomplishments

- Development of an Environmental Study Plan
- Revised Study Plan
  - Proposed 58 studies
  - Significant stakeholder involvement
- Federal Energy Regulatory Commission Study Plan Determination
- Initiated early 2012 field work
- Synthesized historical 1980s information

2012 ADULT SALMON DISTRIBUTION & HABITAT UTILIZATION

LOWER RIVER TAGGED CHINOOK SALMON: 442

Classified by Destination: 371

- To Tributaries: 97%
- To Mainstream Susitna: 3%

MIDDLE-UPPER RIVER TAGGED CHINOOK SALMON: 352

Classified by Destination: 317

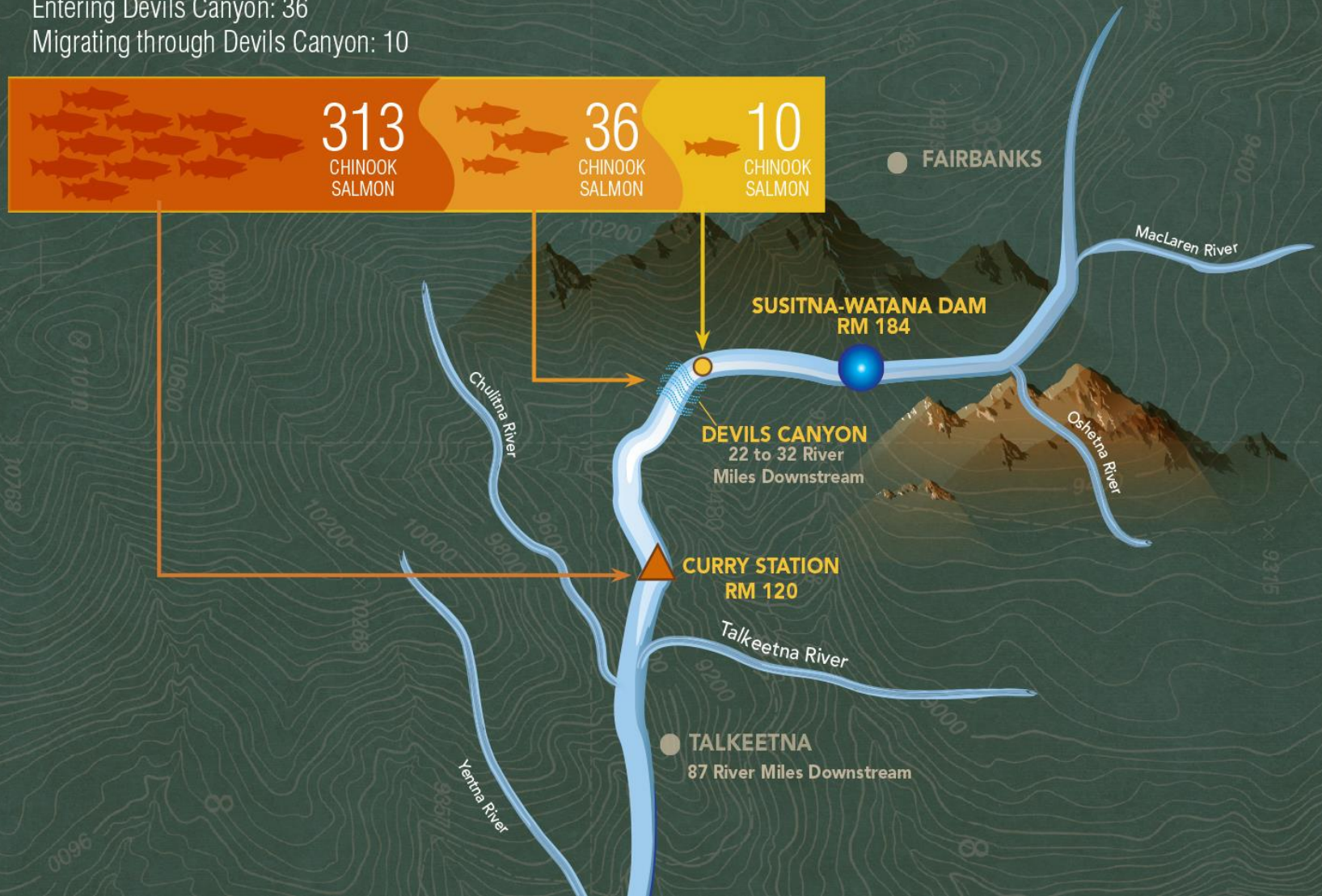
- To Tributaries: 90%
- To Mainstream Susitna: 10%

Devils Canyon, a natural fish barrier

2012 ADULT SALMON DISTRIBUTION & HABITAT UTILIZATION

CHINOOK SALMON AND DEVILS CANYON

Tagged at Curry: 313
Entering Devils Canyon: 36
Migrating through Devils Canyon: 10



Revised Study Plan

- Unprecedented effort
- Proactive approach
- 58 studies

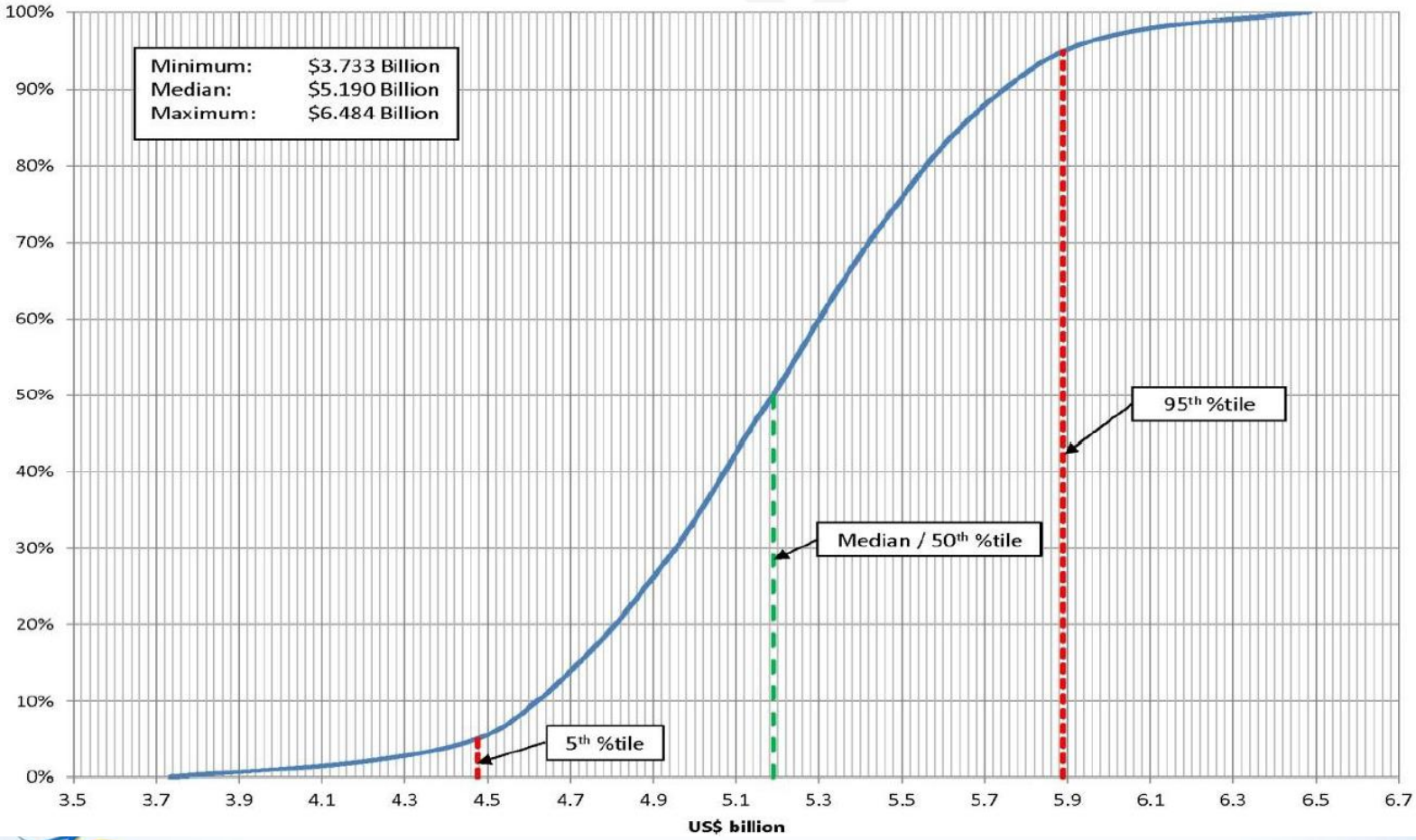
2012 Engineering and Geotechnical Highlights

- Worked to further confirm project feasibility and construction schedule
- Optimized dam height
- Developed independent cost estimate
- Studied utility generation & transmission
- Work to confirm suitable quarry source
- Measured groundwater and temperatures
- Collection of local seismic event data

2013 Goals and Milestones

- Continued stakeholder and landowner outreach
- Implement the Revised Study Plan
  - Field work agreements with Alaska Department of Fish & Game
  - Logistical support, including helicopters and field camps
  - Obtaining permits from land owners
- Resources and Procurement Plan
- Utility Precedence Agreement
- Geotechnical exploration

Probabilistic Range of Total Project Costs



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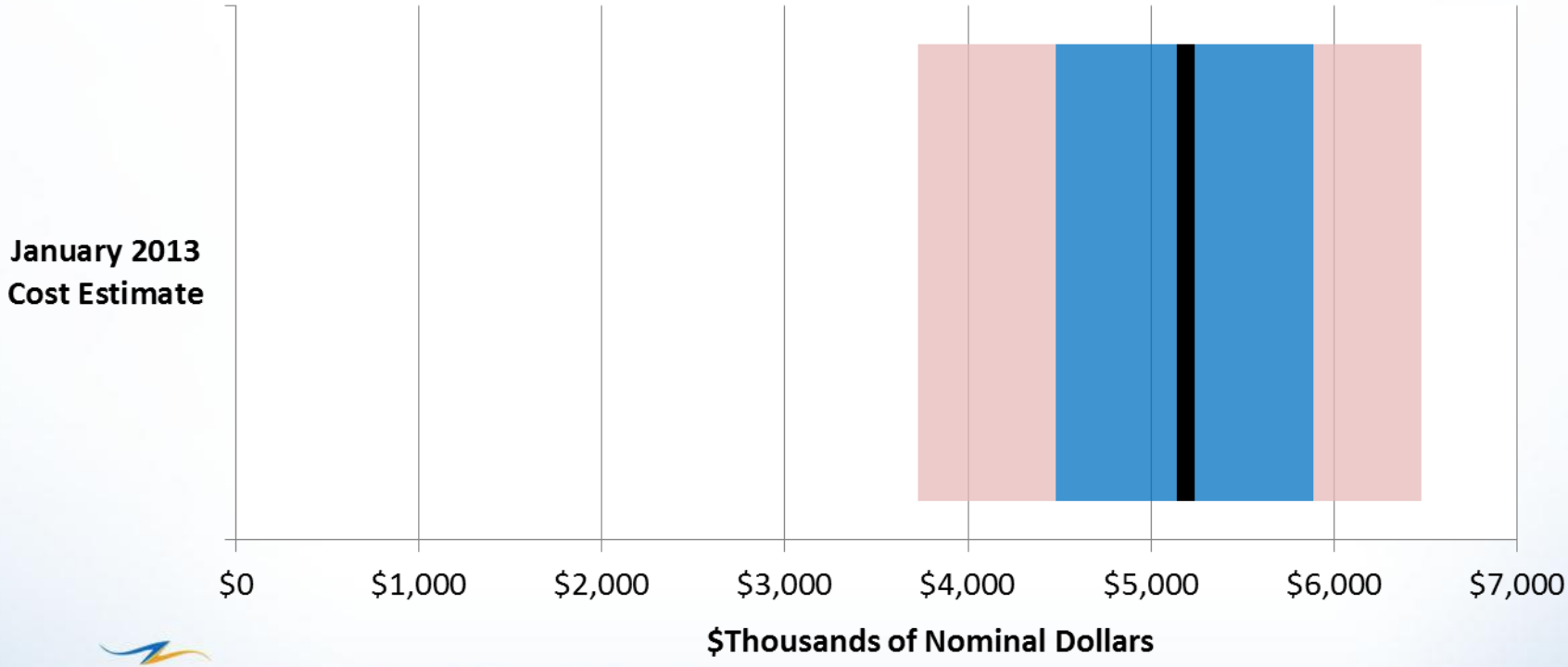
Susitna-Watana Captial Costs

	Best Estimate	Low Estimate*	High Estimate*	Minimum Cost	Maximum Cost
January 2013	$5,190	$4,480	$5,890	$3,730	$6,480

**Low and High Estimates represent a 90% probability*



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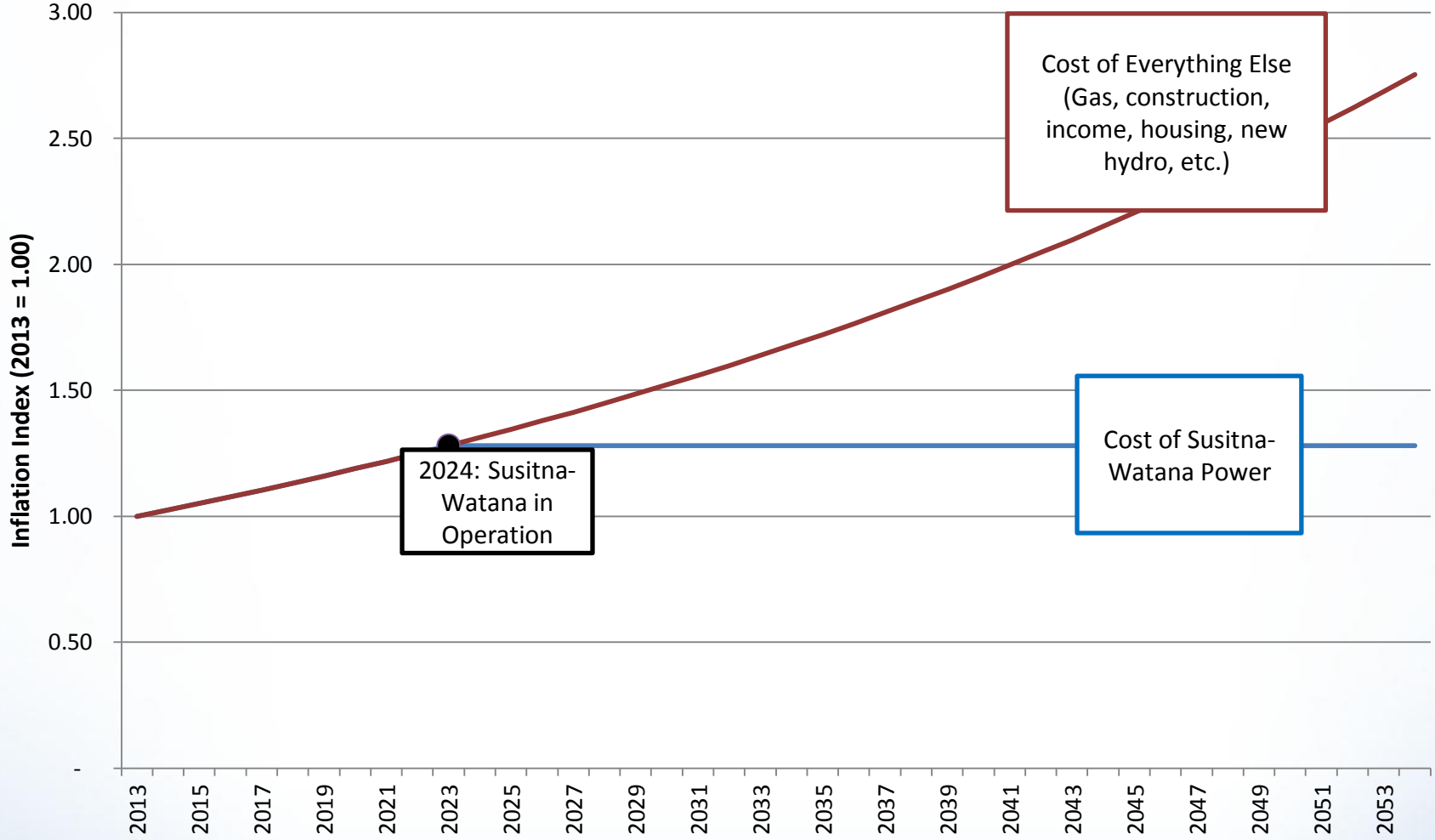
Impacts of Inflation on Susitna-Watana Power Costs



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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

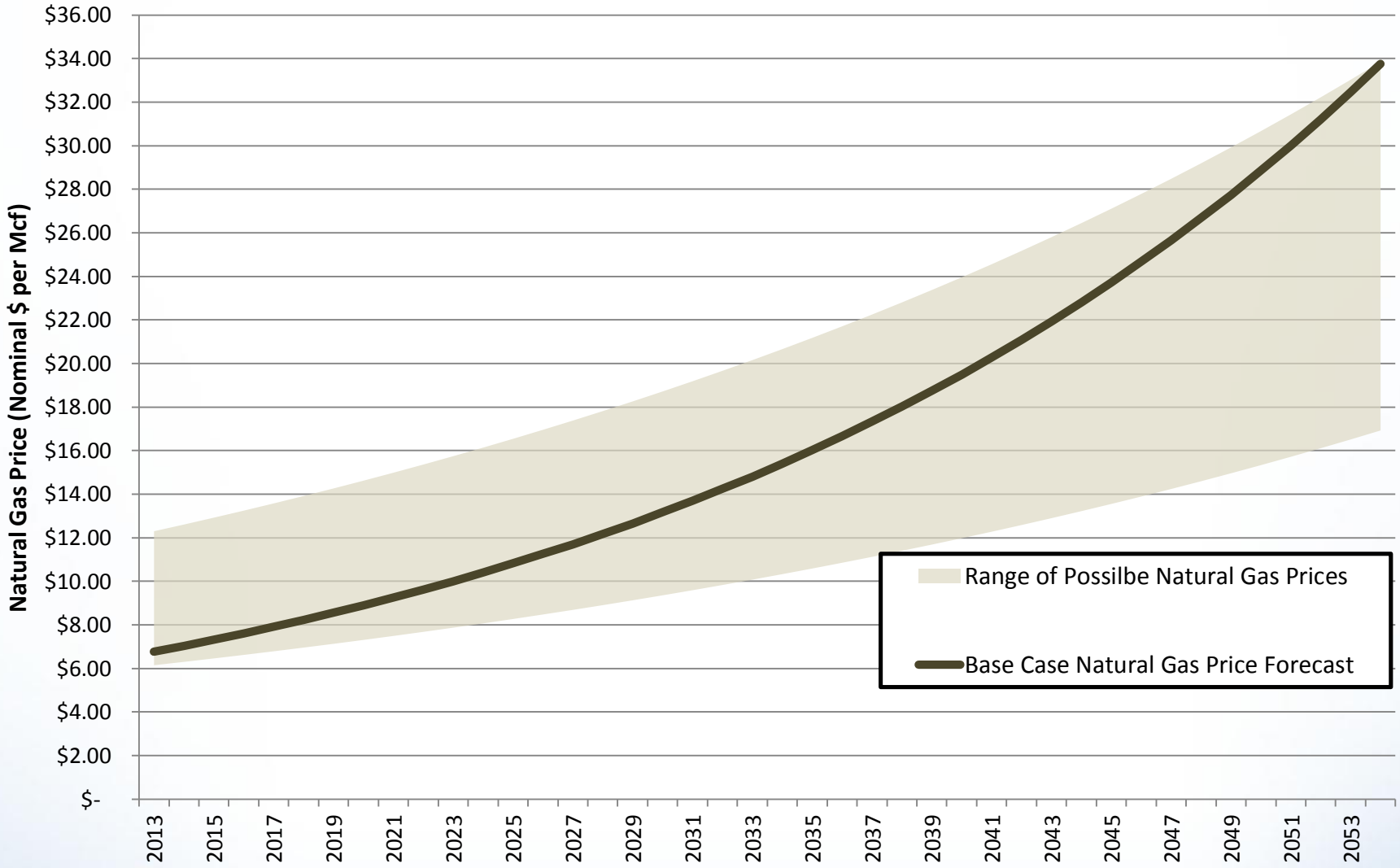
Real= Adjusted for Inflation

Assumes no Direct State Financing

Natural Gas Generation Comparison

- Competitive with natural gas in the early years, much lower-cost over long-term
- Assume a constant efficiency and non-fuel cost for natural gas generation
- 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

Natural Gas Price Forecast and Range



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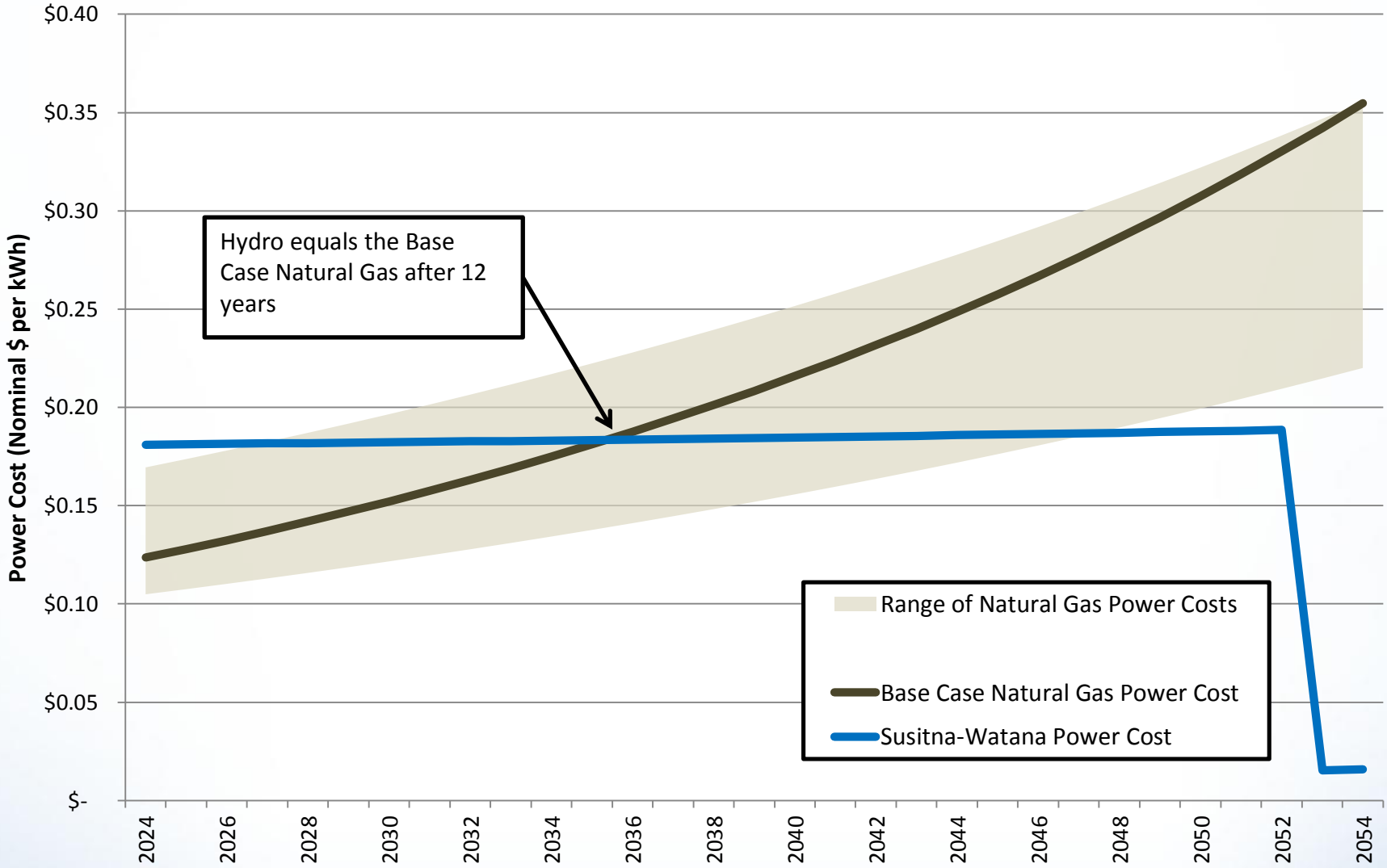
Susitna-Watana vs. Natural Gas Power Costs



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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

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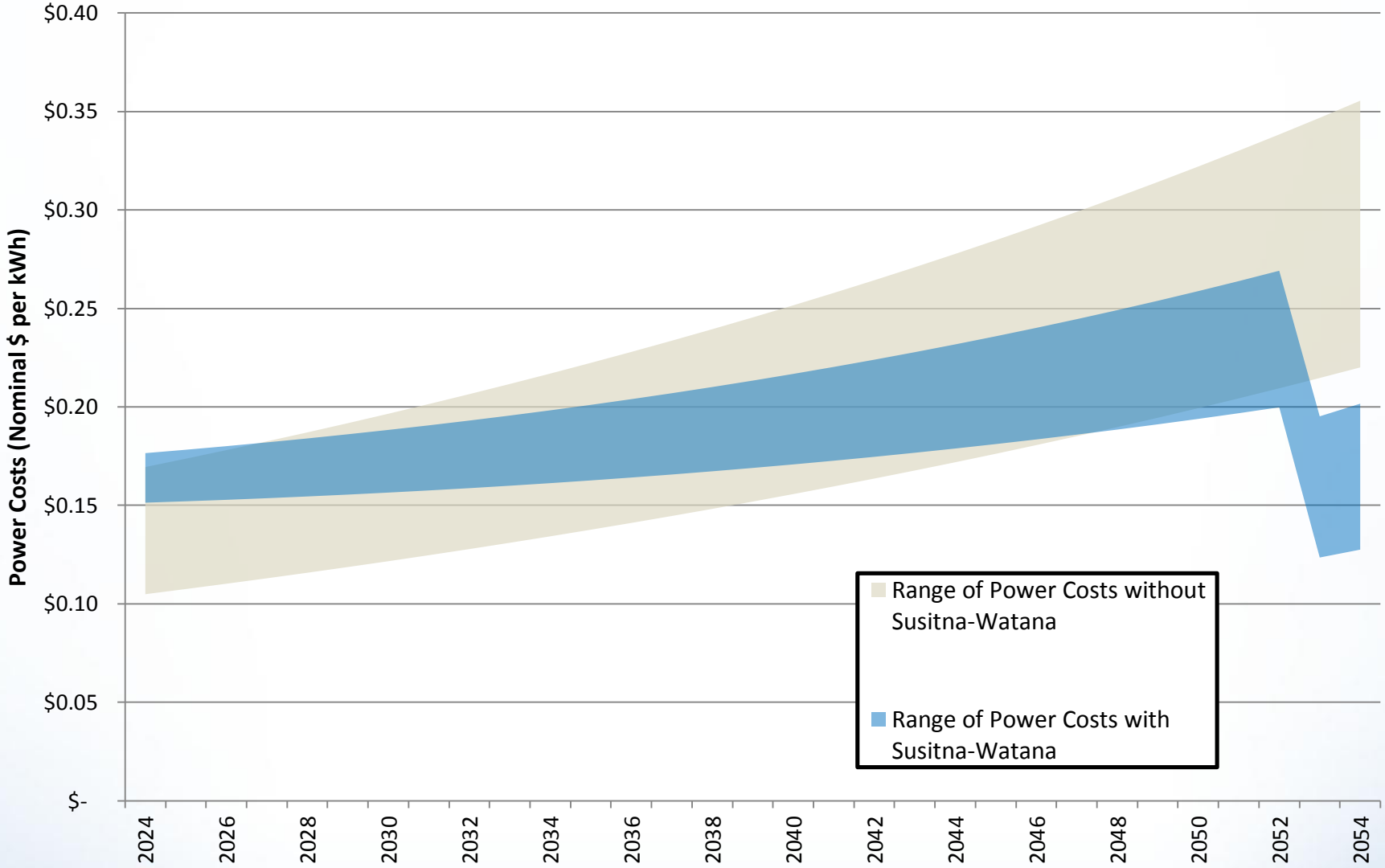
Power Costs Under Range of Natural Gas Prices



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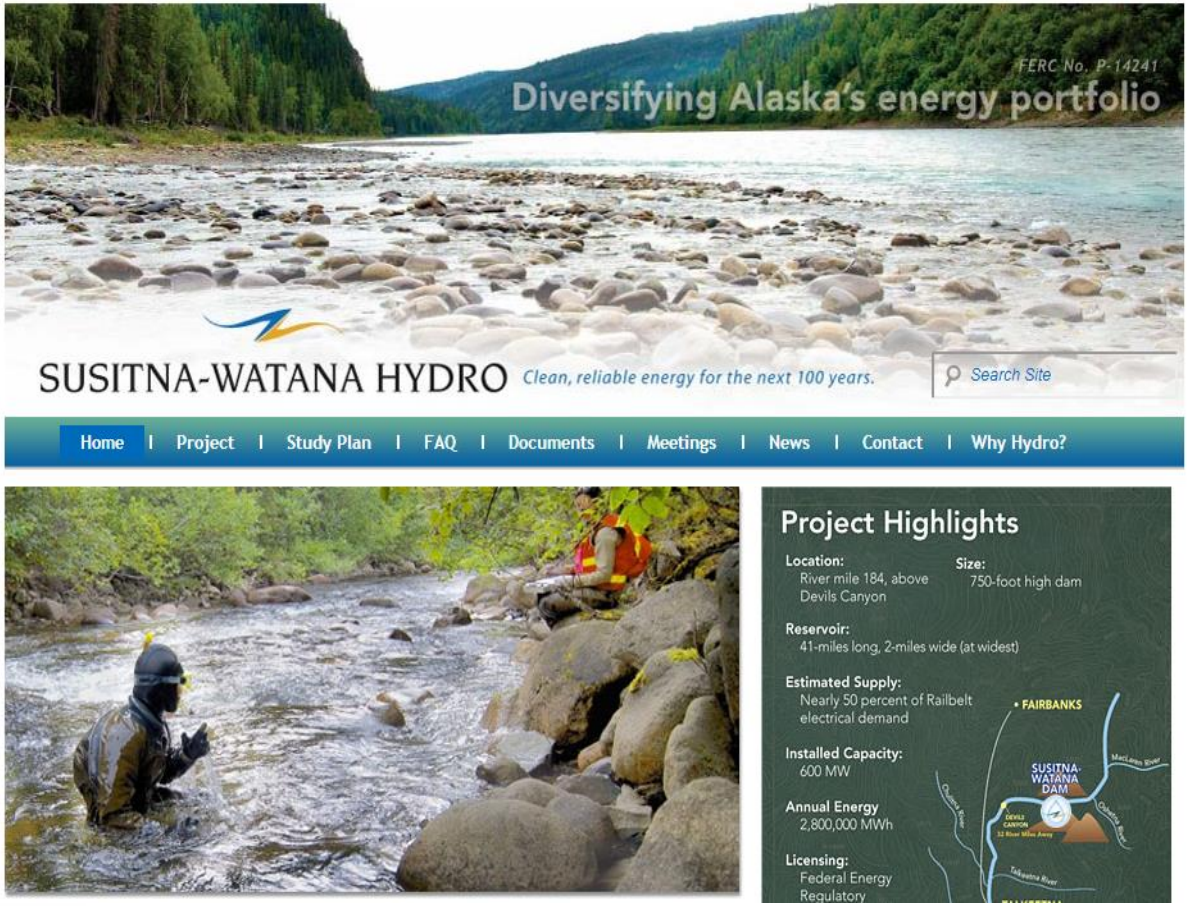
Economic Takeaways

- Susitna-Watana Hydro can significantly reduce future power cost uncertainty
- Competitive with natural gas in the early years, much lower-cost over long-term
- Equals the price of base case natural gas after 12 years without any direct State financing



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