

02/05/14
Overview:
Alaska
Energy
Authority

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Energy Authority</SUBJECT><COMM>HENE28</COMM></TARGET>

**Alaska Legislature
House Special Committee on Energy**



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AGENDA

February 5, 2014

State Capitol Building, Room 124
Juneau, Alaska

8:00 AM - Call the meeting to order

1. Alaska Energy Authority (AEA),
Presenter - *Sara Fisher-Goad, Executive Director*
 - a. AEA Overview
 - b. AEA Recommendations
2. Discussion

10:00 AM - Adjourn

If you or your staff has any questions please contact Katherine Eldemar at (907) 465-4527 (katherine.eldemar@akleg.gov) or Jeff Turner at (907) 465-6588 (jeff.turner@akleg.gov).

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Alaska Energy Authority Overview

Sara Fisher-Goad, executive director

House Energy Committee

Feb. 05, 2014



Electricity Generation by Region

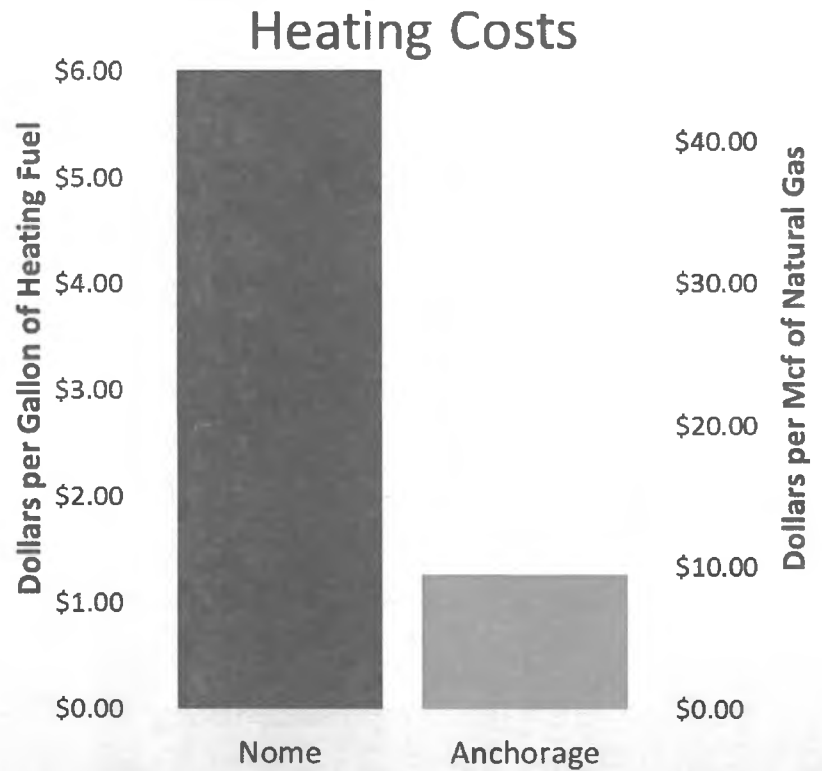
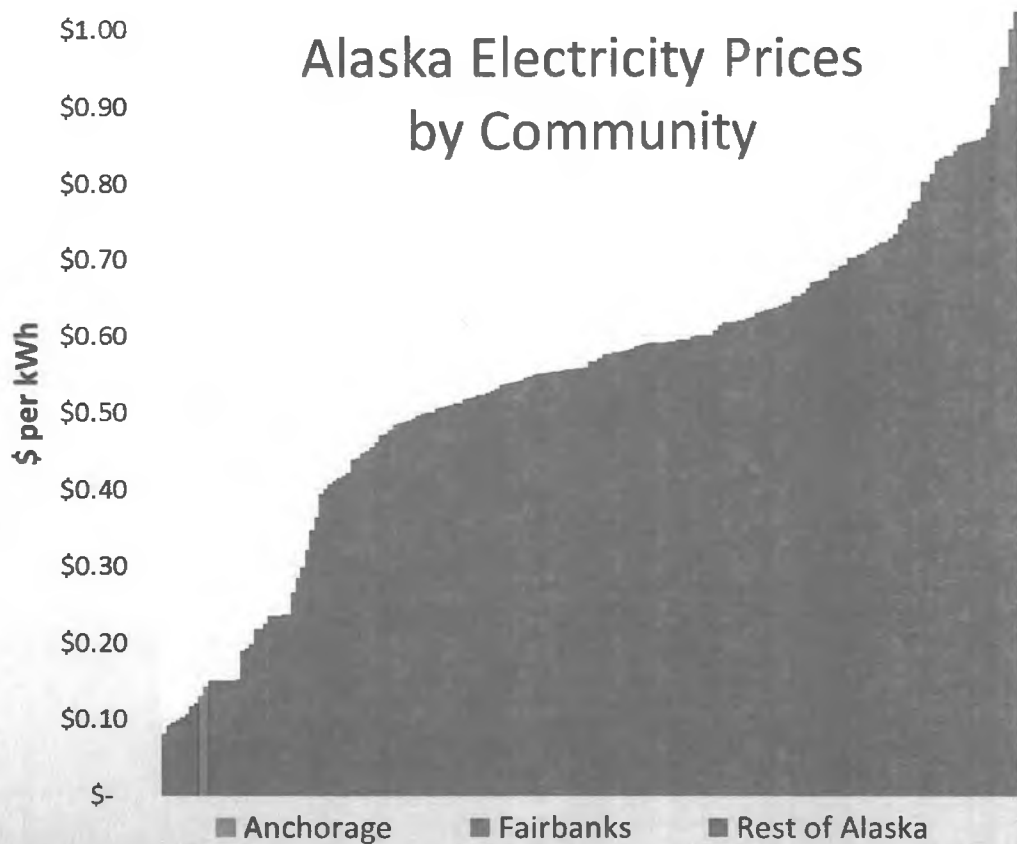
Annual Electric Generation

AEA Energy Region	MWhs per Year	Percent of Total
Aleutians	65,340	1%
Bering Straits	55,362	1%
Bristol Bay	55,145	1%
Copper River/Chugach	116,700	2%
Kodiak	150,503	2%
Lower Yukon-Kuskokwim	96,625	1%
North Slope	82,544	1%
Northwest Arctic	35,549	1%
Railbelt	5,075,507	77%
Southeast	785,190	12%
Yukon-Koyukuk/Upper Tanan	31,175	0%
Total	6,549,640	100%

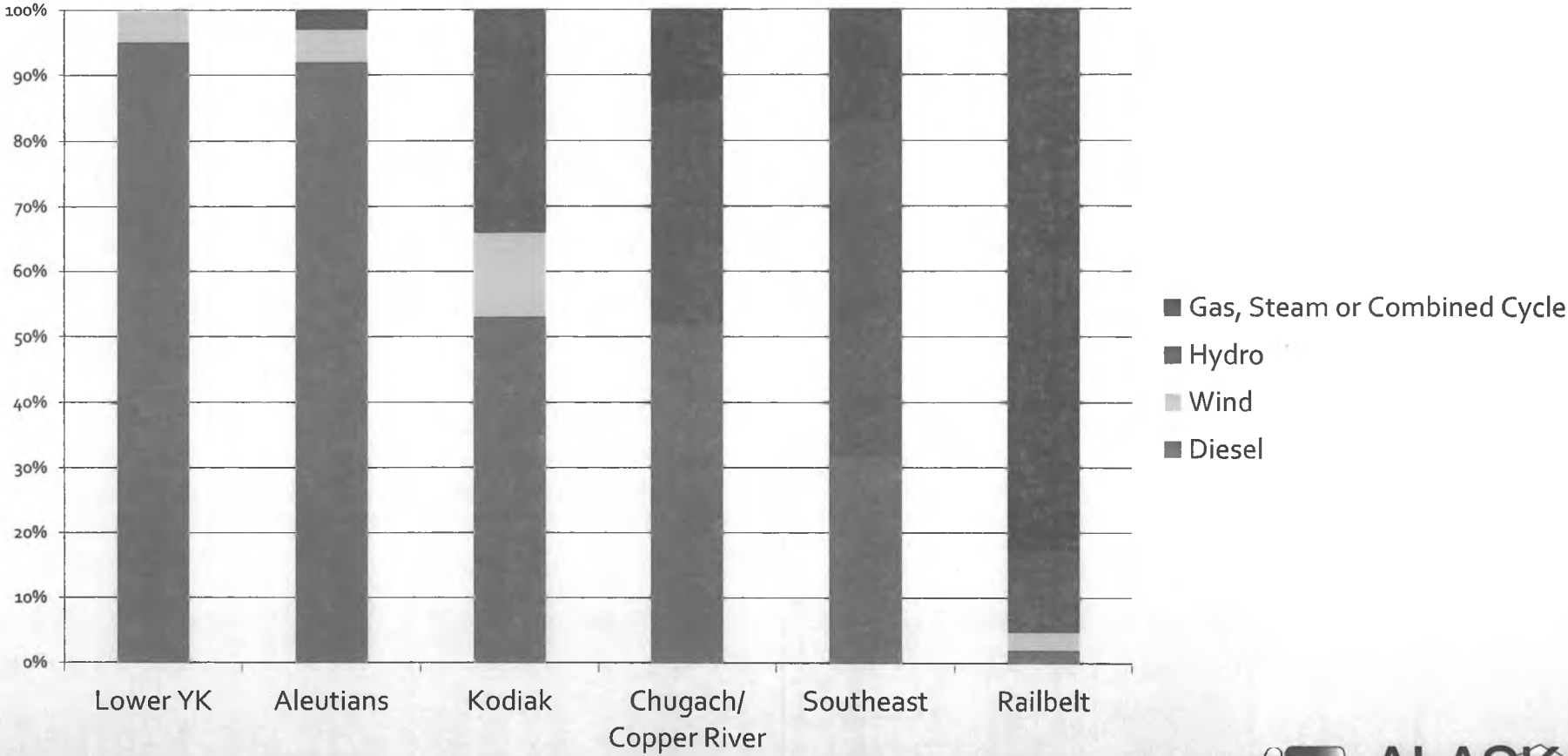
2011 Alaska Energy Statistics



Energy Costs Vary



Energy Sources Vary



Preliminary Alaska Energy Statistics Report Data





Reducing the Cost of Energy

- Energy Planning and Policy
- Investing in Alaska's Energy Infrastructure
- Diversifying Alaska's Energy Portfolio
- Technical and Community Assistance

Energy Planning and Policy

Alaska's Energy Office

- Serve as lead on Alaska's energy policy development
- Coordination of energy plans on statewide level
- Monitor State energy goals
- Coordinate multi-agency efforts
- Individual project analysis and vetting
- Transmission planning

Statutory Authorities

- 44.99.115 4(B)

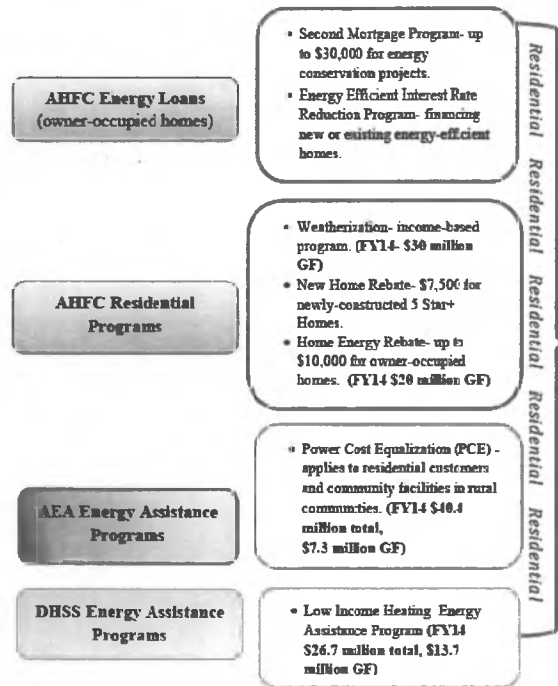
“by using one office or agency, as may be specified by law, to serve as a clearinghouse in managing the state's energy related functions to avoid fragmentation and duplication and to increase effectiveness”

Energy Program Coordination

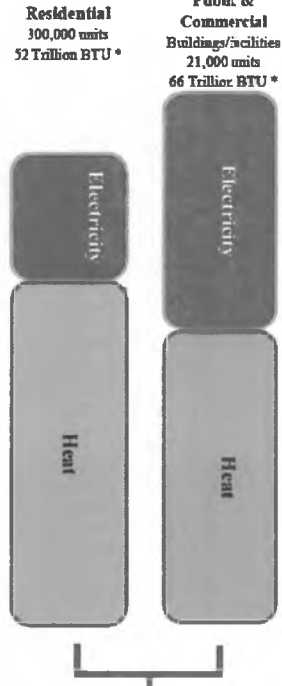


State of Alaska Energy Programs: Serving the needs of Alaska's residential and commercial energy users

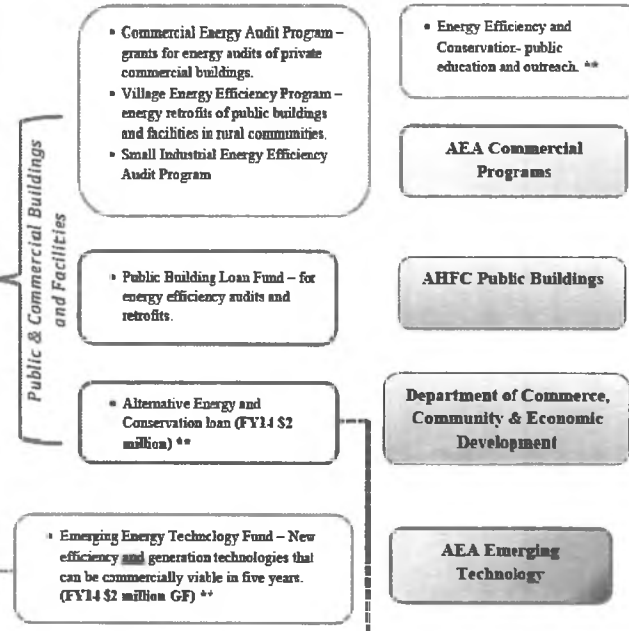
Residential Programs



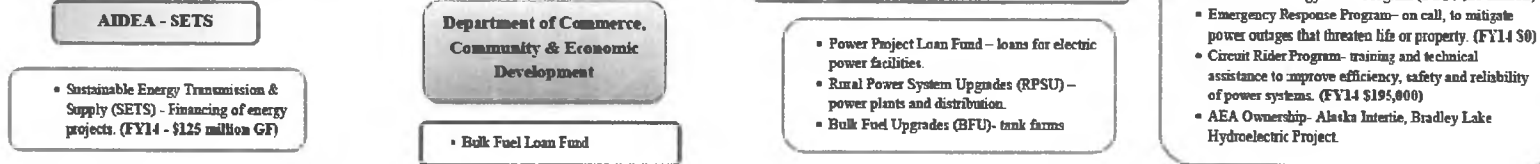
In-State Energy Use



Public and Commercial Sector Programs



SUPPLY – Energy Generation



Prepared by: Alaska Energy Authority and Office of Management and Budget (1/29/2013)

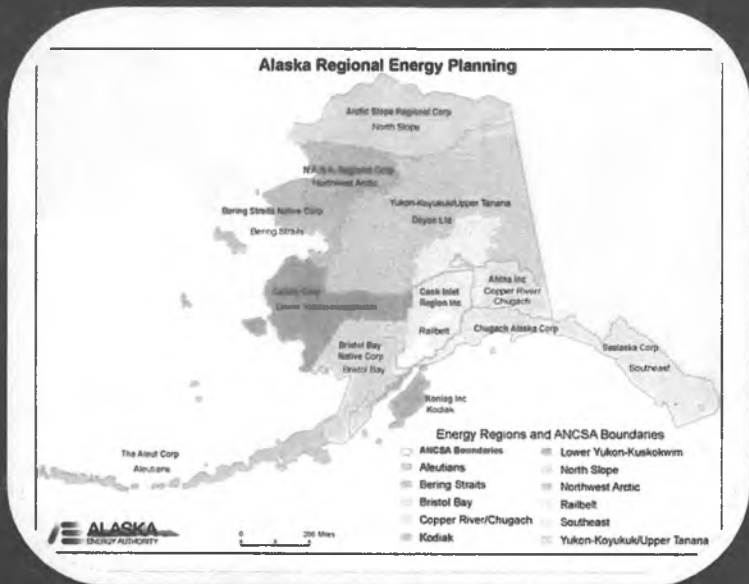
* Source: Energy Information Authority

** Note that some programs do not fall within specific categories - Public outreach and education serves both the commercial and residential markets and Emerging Technology and the Alternative Energy and Conservation loan serve both generation and efficiency

Energy Planning and Policy

Supporting Regional Solutions

- Energy Pathways led to regional planning
- Address unique challenges while capitalizing on regional resources
- Locally driven and community-vetted blueprint for sustainability
- Objective to provide specific, actionable recommendations
- Includes electric, heat and transportation energy
- Previous Plans: Railbelt Integrated Resources Plan and Southeast Integrated Resources Plan



Technical and Community Assistance

- AEA technical staff have assisted 64 communities this year
- Energy Planning
 - Technical assistance to local communities to provide synergy between planning and funding sources
 - Assist communities to move to project-ready status
 - Village Energy Efficiency Program (VEEP), Renewable Energy Grant Fund , Emerging Energy Technology Fund
- Training
 - Partnership with AVTEC in Seward
 - Circuit Rider and emergency services; Bulk Fuel Operator; Power Plant Operator; Advanced Power Plant Operator Training
- Emergency community assistance provided to about 20 communities since Sept. 2012
- Circuit rider program assisted about 50 communities in 2013

Power Cost Equalization

- Provide economic assistance in rural Alaska where electrical rates can be 3 to 4 times higher than in urban Alaska
- Available to community facilities and residential customers
- Regulatory Commission of Alaska (RCA) sets rates, calculations based on use, costs and efficiencies
- Approximately 80,000 people live in the 188 participating communities (FY 12)
- PCE program costs approximately \$41 million
- \$867 million PCE Endowment (July 1, 2013)



Alaska Intertie

Investing in Energy Infrastructure

Alaska Intertie: Improving Railbelt Transmission

- AEA owns Alaska Intertie, no outstanding debt
 - 170 miles between Willow and Healy
 - 345 kv transmission line
- Operated by AEA and Railbelt utilities through Intertie Management Committee
- Recently adopted open access and reliability language
- AEA-commissioned study identified \$900 million in priority transmission system projects
 - Un-constraining Bradley Lake Power: \$402.2 million
 - Southcentral Substations: \$20.5 million
 - Northern Intertie projects: \$480.7 million
- Annual projected savings \$146-241 million

Investing in Energy Infrastructure

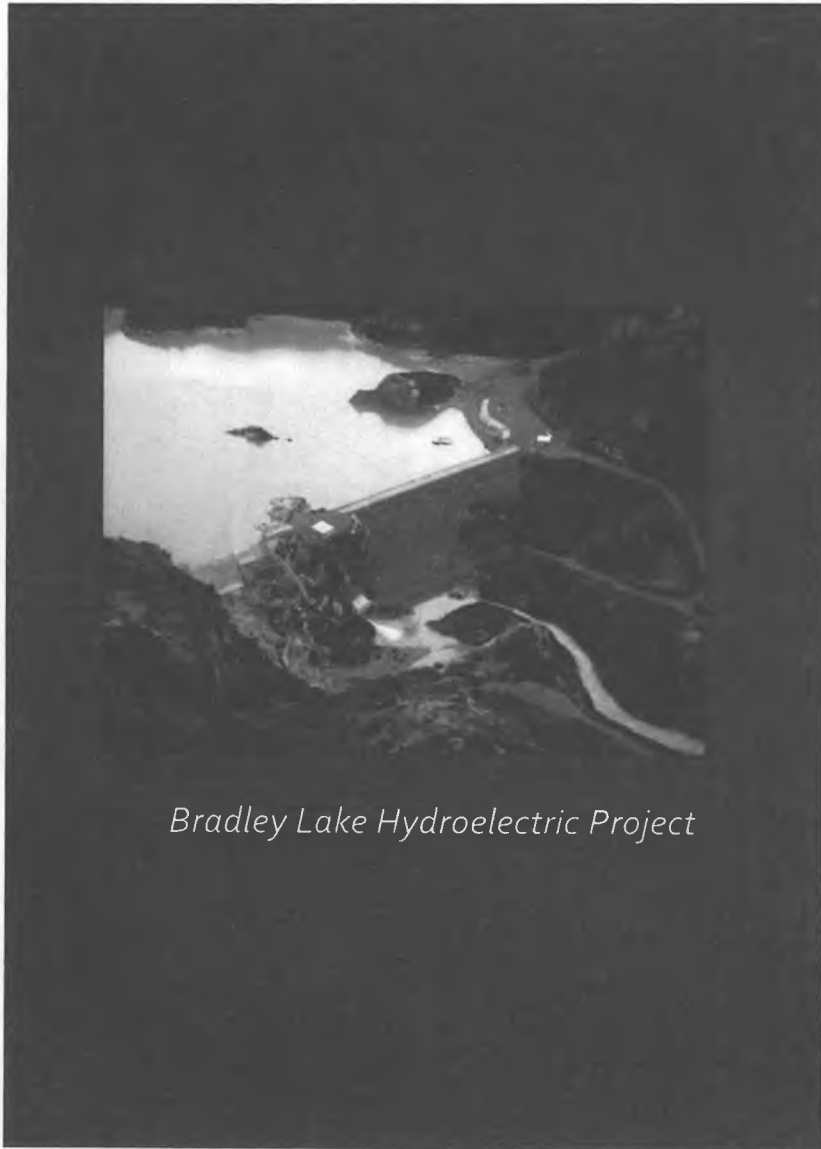
Large Projects

Bradley Lake Hydro

- Produces about 10% of Railbelt electricity
- AEA-owned asset
- Low-cost energy producer
- 120 megawatts, 4.5 cents/kWh

Battle Creek Diversion

- Produce more energy by diverting Battle Creek
- FERC-license amendment process
- Estimated ~\$61 million
- 28,496 MW/hours annually
- Investigating financing models



Bradley Lake Hydroelectric Project

Investing in Energy Infrastructure

Rural Energy

Bulk Fuel and Rural Power System Upgrades

- Help utilities improve efficiency, safety and reliability of power systems
 - Promote local hire and training
- Completed \$304 million in rural bulk fuel and rural power system upgrade projects since 2000, in partnership with Denali Commission
- Common to see 30 to 40% increase in fuel savings after a Rural Power Systems Upgrade is completed



Investing in Energy Infrastructure

Power Project Fund

- Low-interest loans to upgrade or develop small-scale electric power facilities
- Includes bulk fuel storage, transmission and distribution, waste energy, energy conservation, energy efficiency and alternative energy facilities and equipment
- State assistance for a project more than \$5 million requires Legislative approval
- \$35 million in Power Project Fund (~half in application process)

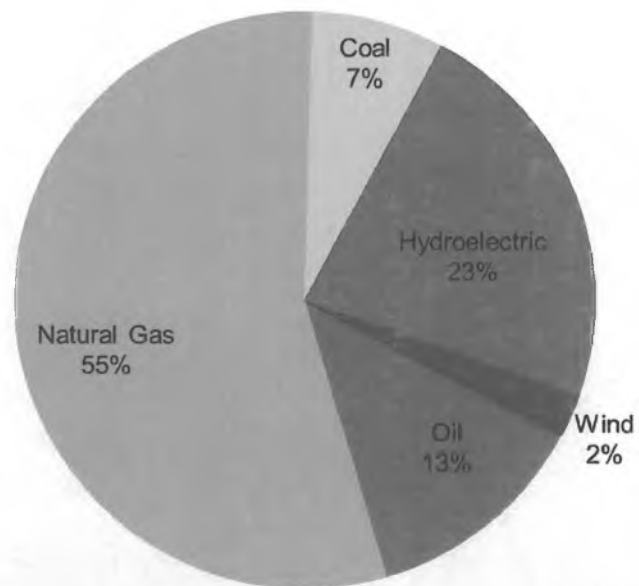


Prince of Wales: Run-of-River Hydro

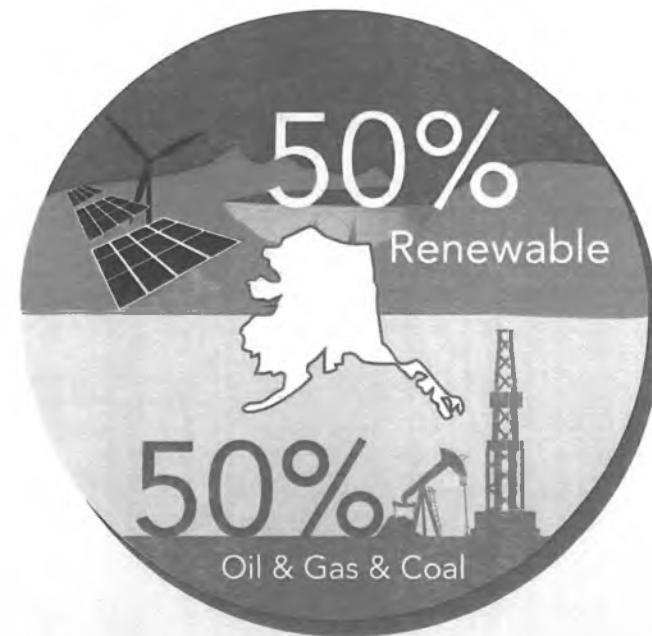


Chena Hot Springs: Geothermal

Diversifying Alaska's Energy Portfolio



Alaska's Electrical Generation
Preliminary Alaska Energy Statistics Report Data



Diversifying Alaska's Energy Portfolio

Emerging Energy Technology Fund

- Provides funds for projects that can demonstrate commercial viability within 5 years
- Includes renewable and alternative energy
- First successful year 2012-2013
 - Sixteen projects selected for funding
- Round 2 process underway
 - Twenty-seven applications received
- Projects in Juneau, Fairbanks, Kodiak, Delta Junction, Nenana, Nikiski, Igiugig, Tuntutuliak, Kwiglingok and Kotzebue



Altaeros Energies Helium Balloon Wind Turbine

Diversifying Alaska's Energy Portfolio

Renewable Energy Grant Fund

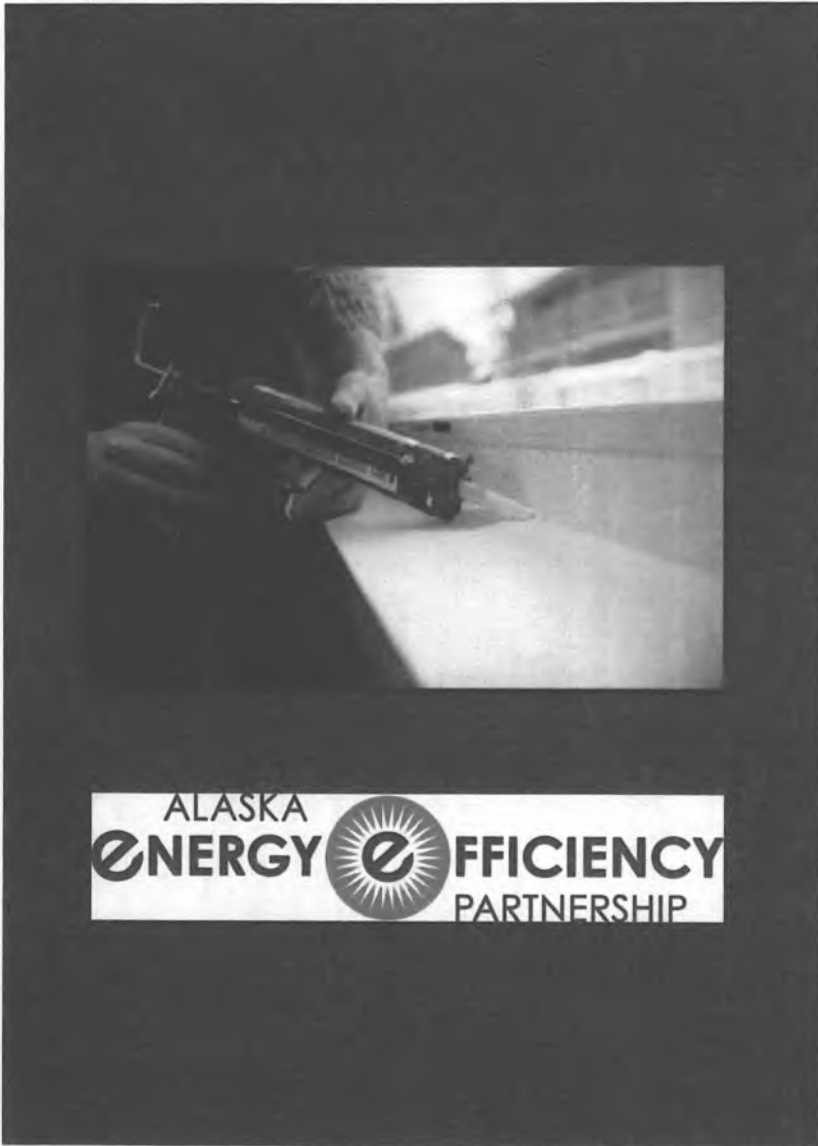
- Includes heat recovery, hydro, wind, geothermal, biomass, solar, wind and transmission
- 251 projects approved totaling \$277.5 million
- More than 60 projects currently under construction
- In 2013 more than 11 million gallons of diesel and natural gas equivalent will be displaced
- Results: \$45 million in annual savings



Ruby: Hydrokinetic



Unalakleet: Wind



Energy Efficiency and Conservation

- AEA's focus: commercial buildings, rural public buildings, industrial facilities and electrical efficiency
- Statewide outreach and education AKEnergyEfficiency.org
- Coordination between State agencies

Results:

- \$1,534,062 and 282,938 diesel equivalent gallons in projected savings
- Average immediate savings of implemented efficiency measures: \$0.29 cents/ \$1 invested, 300% ROI after 10 years
- Alaska Commercial Energy Audit Program measures produce 30% savings with 6.2 year simple payback

Alaska Energy Authority

Projects Under Construction

Summer 2013

Renewable Energy Fund

- Heat Pump
- Solar
- Transmission
- Hydro
- Heat Recovery
- Wind
- Biomass or Biofuels

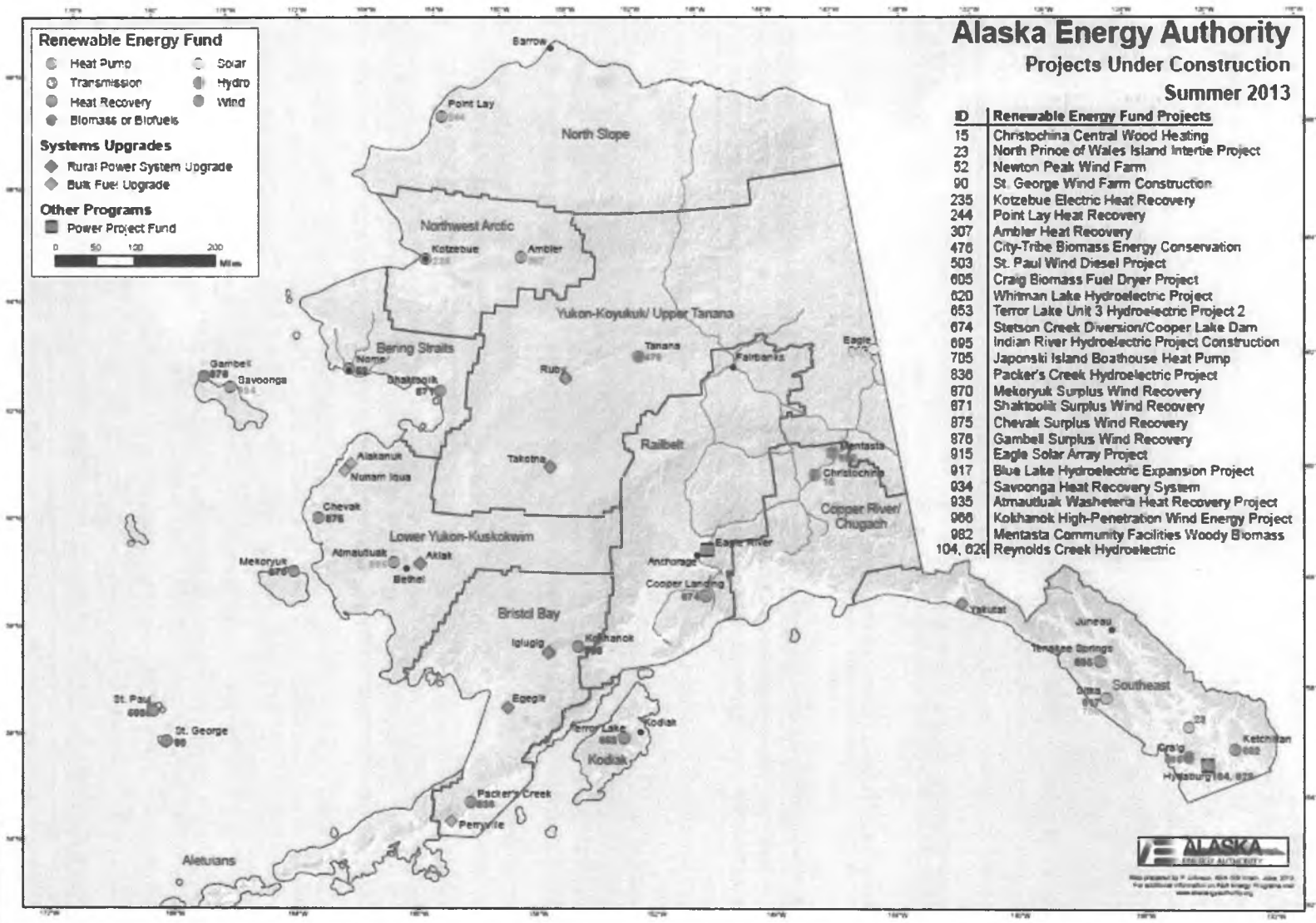
Systems Upgrades

- ◆ Rural Power System Upgrade
- ◆ Bulk Fuel Upgrade

Other Programs

- Power Project Fund

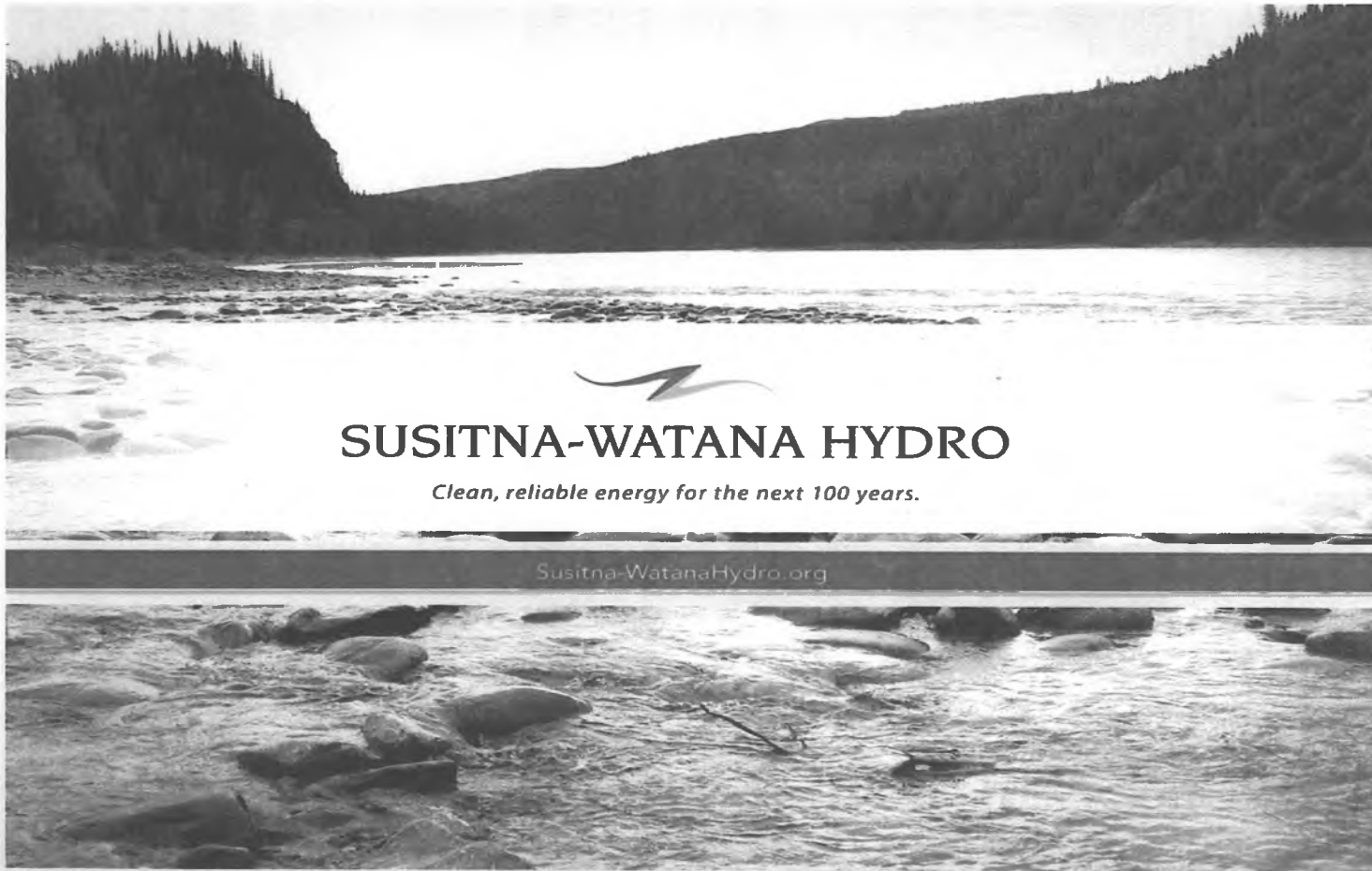
0 50 100 200 Miles



ID	Renewable Energy Fund Projects
15	Christochina Central Wood Heating
23	North Prince of Wales Island Intertie Project
52	Newton Peak Wind Farm
90	St. George Wind Farm Construction
235	Kotzebue Electric Heat Recovery
244	Point Lay Heat Recovery
307	Ambler Heat Recovery
476	City-Tribe Biomass Energy Conservation
503	St. Paul Wind Diesel Project
605	Craig Biomass Fuel Dryer Project
620	Whirman Lake Hydroelectric Project
653	Terror Lake Unit 3 Hydroelectric Project 2
674	Stetson Creek Diversion/Cooper Lake Dam
695	Indian River Hydroelectric Project Construction
705	Japonski Island Boathouse Heat Pump
830	Packer's Creek Hydroelectric Project
870	Mekoryuk Surplus Wind Recovery
871	Shaktolik Surplus Wind Recovery
875	Chevak Surplus Wind Recovery
876	Gambell Surplus Wind Recovery
915	Eagle Solar Array Project
917	Blue Lake Hydroelectric Expansion Project
934	Savoonga Heat Recovery System
935	Atmautuaq Washeteria Heat Recovery Project
960	Kokhanok High-Penetration Wind Energy Project
982	Mentasta Community Facilities Woody Biomass
104, 626	Reynolds Creek Hydroelectric



Map created by P. Johnson, AEA, 08/08/13. July 2013
For additional information on AEA energy programs visit
www.aea.gov/energy



SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

Susitna-WatanaHydro.org

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
- Maximizes the value of Alaska's fossil fuels
- Promotes integration of variable power sources

Project Highlights

Location:
River mile 184, above
Devils Canyon

Size:
735-foot high dam

Cost:
\$5.19 billion

Reservoir:
About 42-miles long, average width of one mile

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)

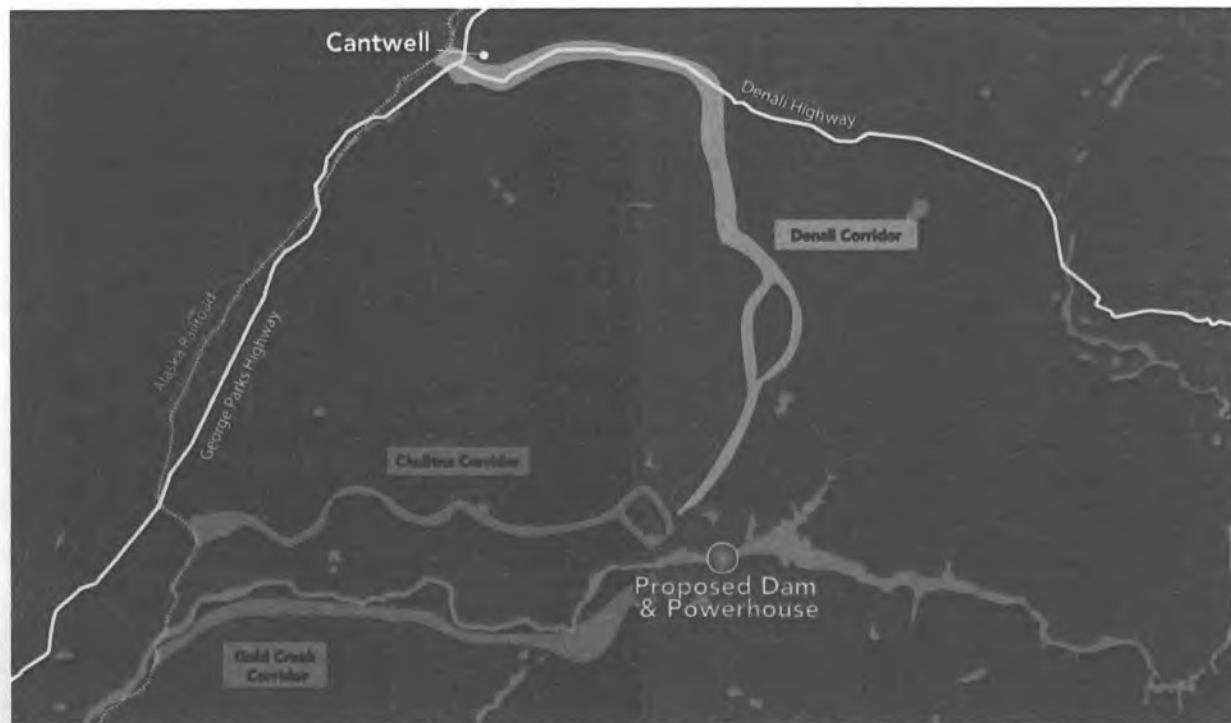
Project Life:
100+ years, providing
long-term,
stable rates



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

Access and Transmission Alternatives



Susitna-Watana Hydro Artists Rendering



Boots on the Ground in 2013

2013 was a highly-successful field season

- 385: total individuals contracted to work on Susitna-Watana Hydro (not AEA employees)
- 300: estimated number of individuals in the field summer 2013
- Majority of workers are Alaskans
- Elements of all 58 studies conducted this year

Winter Studies



- Ice Processes
- Hydrology studies
- Bed sampling
- Fish sampling

- Aerial surveys for moose, caribou, furbearers



Fish Studies



- Extensive fish sampling and tagging throughout accessible portions of Upper, Middle and Lower Basin



Chinook and Devils Canyon

Only one salmon species has been documented within 35 miles of the project site.



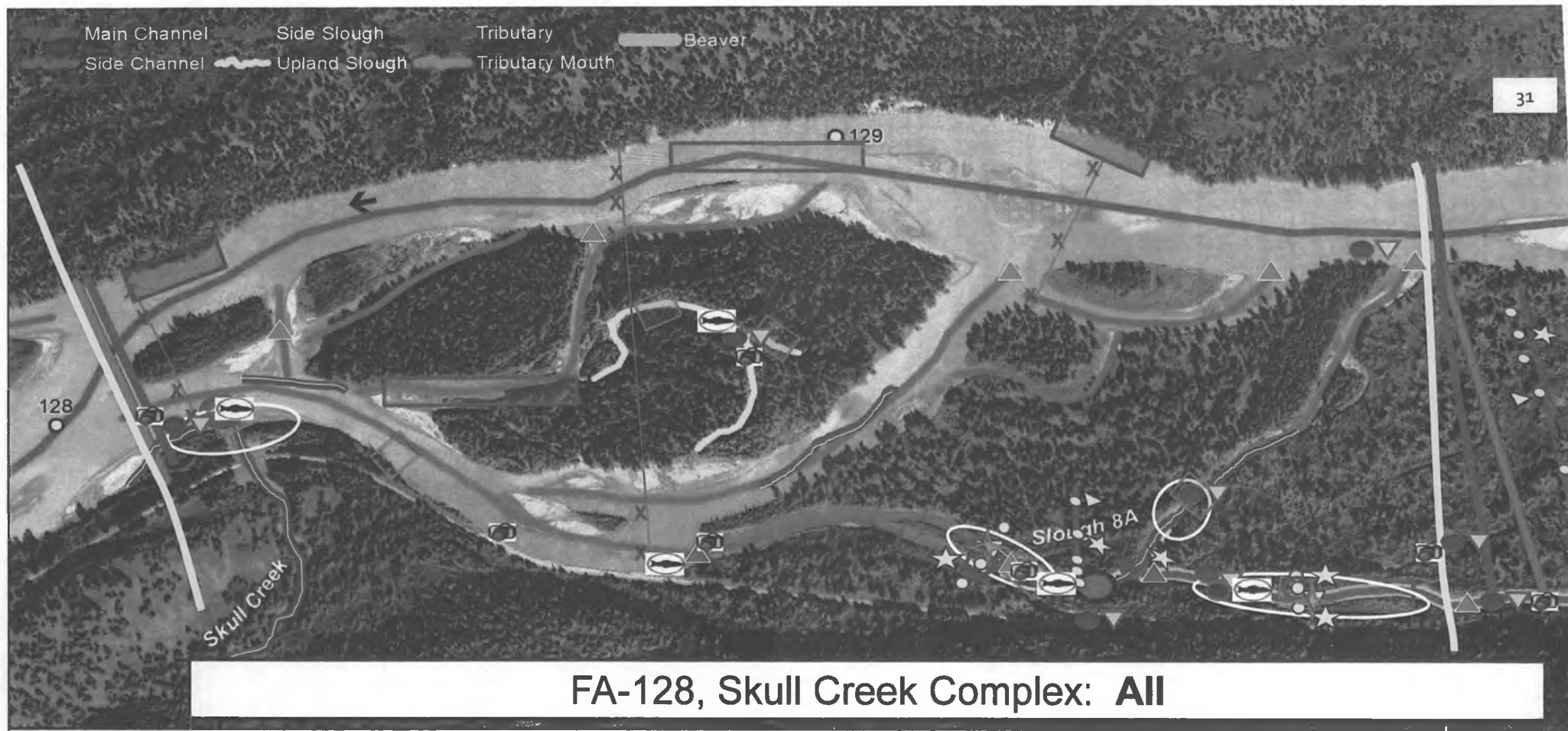
Of the Chinook tagged at Curry 94 percent headed up the tributaries, 6 percent stayed in the Mainstem.

Wildlife Studies



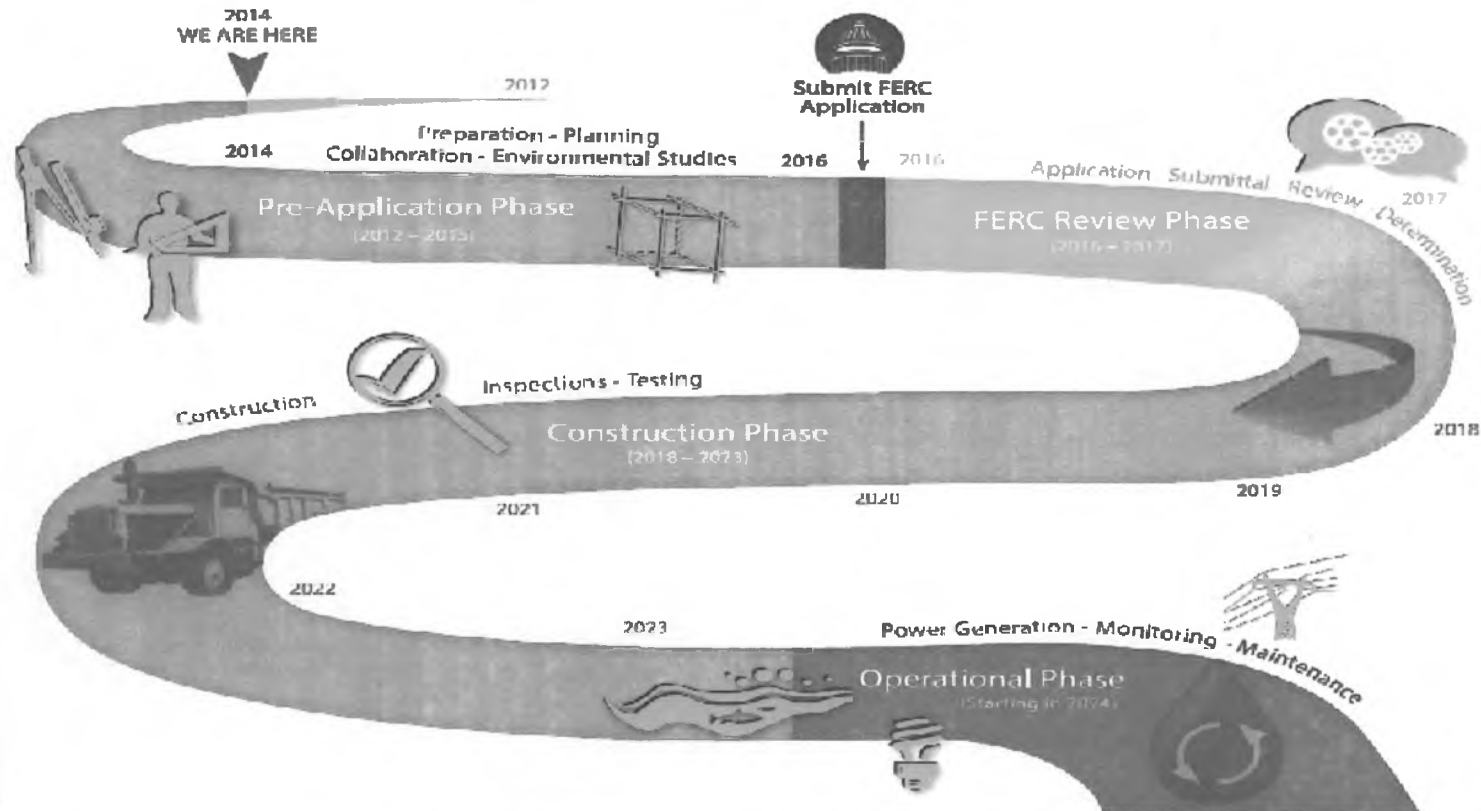
- Collaring moose, caribou
- Raptors
- Little Brown Bat
- Wood Frog
- Waterbirds, landbirds and shorebirds
- Dall's sheep





Example of Intensive Interdisciplinary Study Site (Focus Area)
 Equipment and instrumentation has been installed at the 7 accessible sites

Project Phases



Financing and Cost/Kilowatt Hour

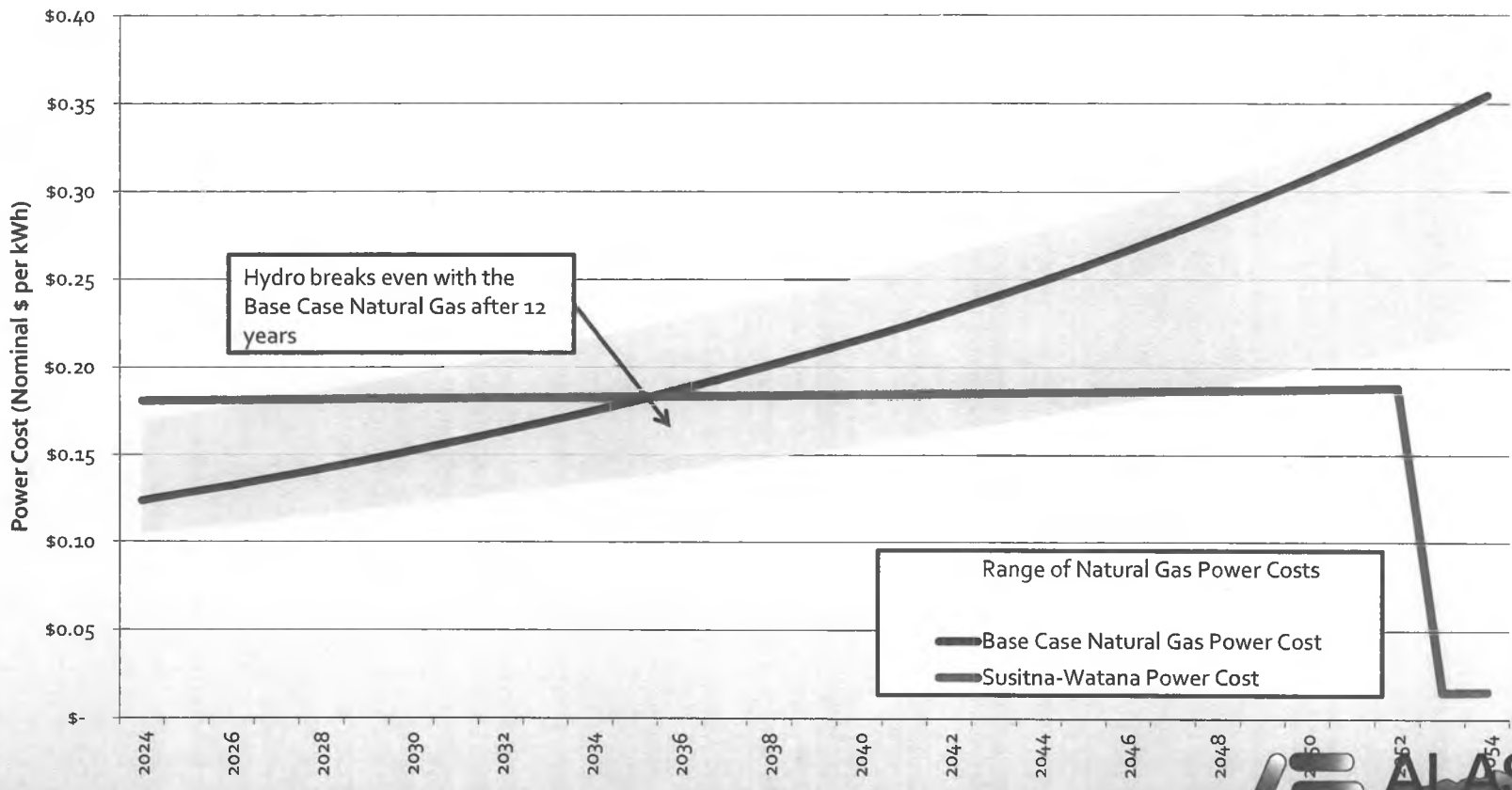
- Hired financial advisor firm who has confirmed:
 - Susitna-Watana Hydro is economic and financeable
 - original economic assumptions are valid
- Will develop potential financial models

Year 1 Rate (\$2024)	\$0.181
Year 1 Rate (\$2013 Real)	\$0.138
10- Year Average Rate (\$2013 Real)	\$0.124
25-Year Average Rate (\$2013 Real)	\$0.106
50-Year Average Rate (\$2013 Real)	\$0.069

Real= Adjusted for Inflation

Assumes No Direct State Financing

Susitna-Watana Hydro Compared to Natural Gas Power Costs



Susitna-Watana Hydro: Next Steps

- Licensing and Engineering Milestones
 - Filed draft Initial Study Report on Feb. 3
 - Resource Management and Procurement Plan
 - Owner's Engineer RFP
 - Feasibility Report
- Continued Work on Financing Plan and Economics
- Utility Coordination
- Stakeholder Engagement

AKEnergyAuthority.org

