

Chikuminuk Lake Hydropower

House Energy & Resources

Committee Hearing

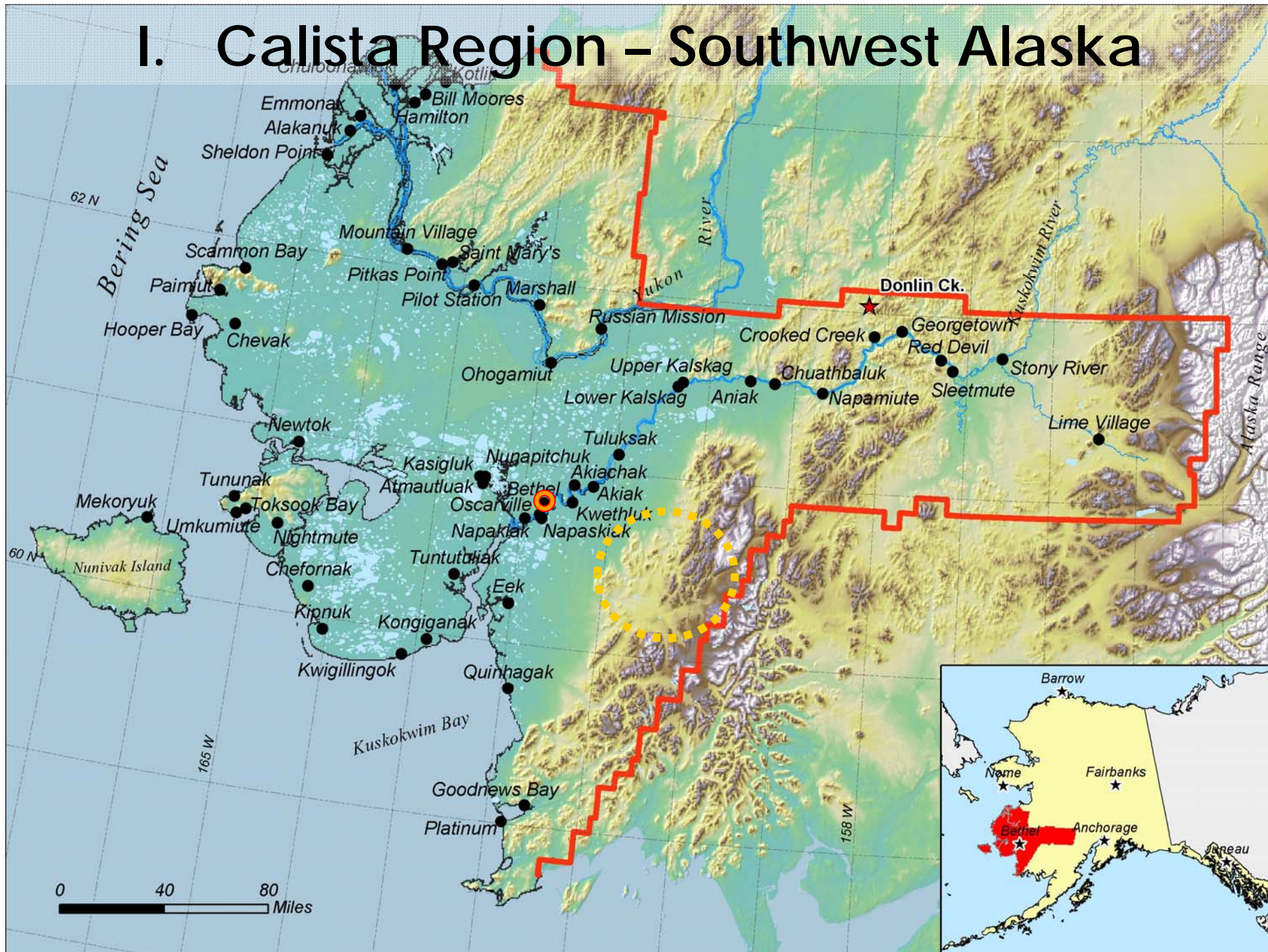
May 7, 2011

Nuvista Light & Electric Cooperative

Christine Klein, Calista EVP/COO



I. Calista Region – Southwest Alaska



I. Nuvista Electric Cooperative

Non-profit utility established '95:

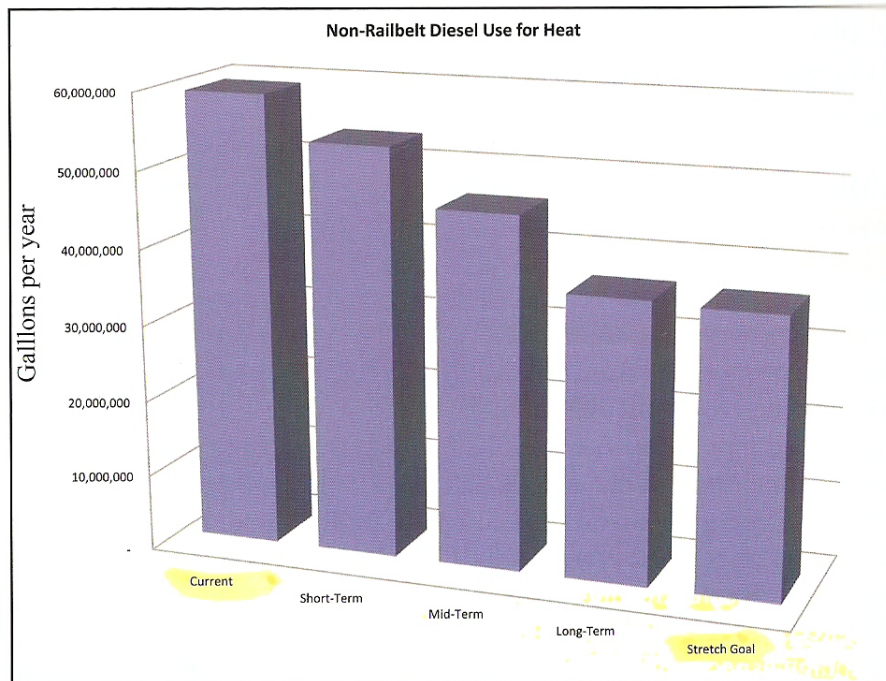
- An Electric Utility Cooperative
- Common Goal: deliver and reduce electrical costs to residents
- Assess high cost of power, demands and find stable alternatives
- Organized as a cooperative to function as a future region-wide Generation & Transmission utility
- Includes region major stakeholders

Board Members:

- Association Village Council Presidents
- Yukon Kuskokwim Health Corporation
- AVCP Regional Housing Authority
- Alaska Village Electric Cooperative
- Chaninik Wind Group
- Middle Kuskokwim Electric Coop.
- Lower Yukon Representative
- Calista Regional Corporation



I. Y-K Region Energy Situation



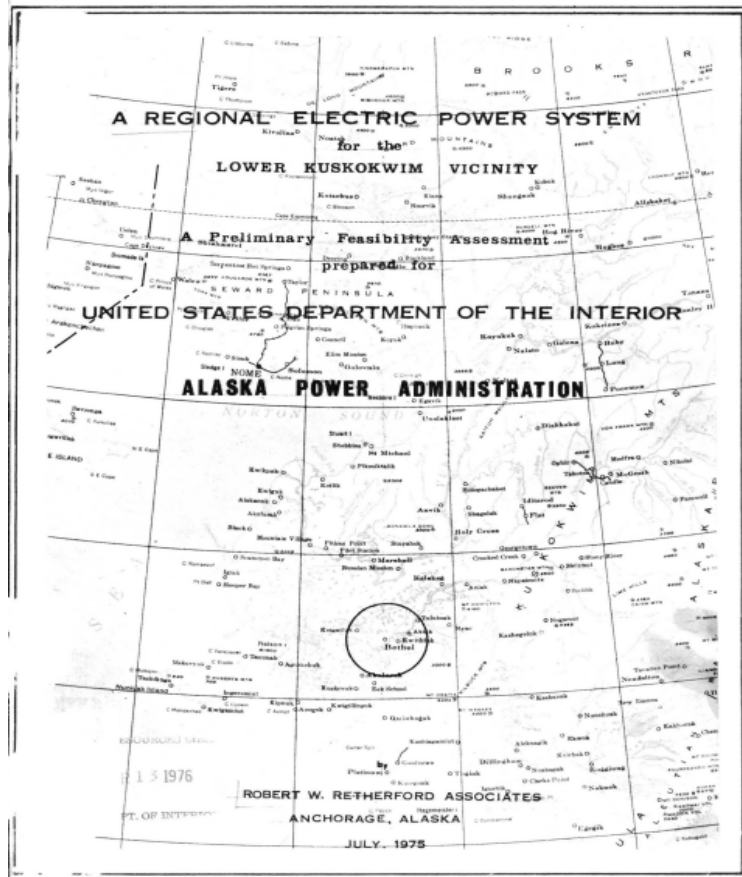
Diesel

- Primary home heating ranged \$6.14 to \$9.50/gallon in 2010 (barged in yearly)
- Expect \$7.34 to \$10.70 gallon this year
- 50% of family income goes to heating, now grown to 65 to 75% income
- Families choosing food vs. heating

Electricity

- Many small village diesel generators
- Home use is less than 50% Natl Average
- Cost = \$0.58 to \$1.05 kilowatt hour 2010
- Escalating cost of energy
- PCE cannot keep up

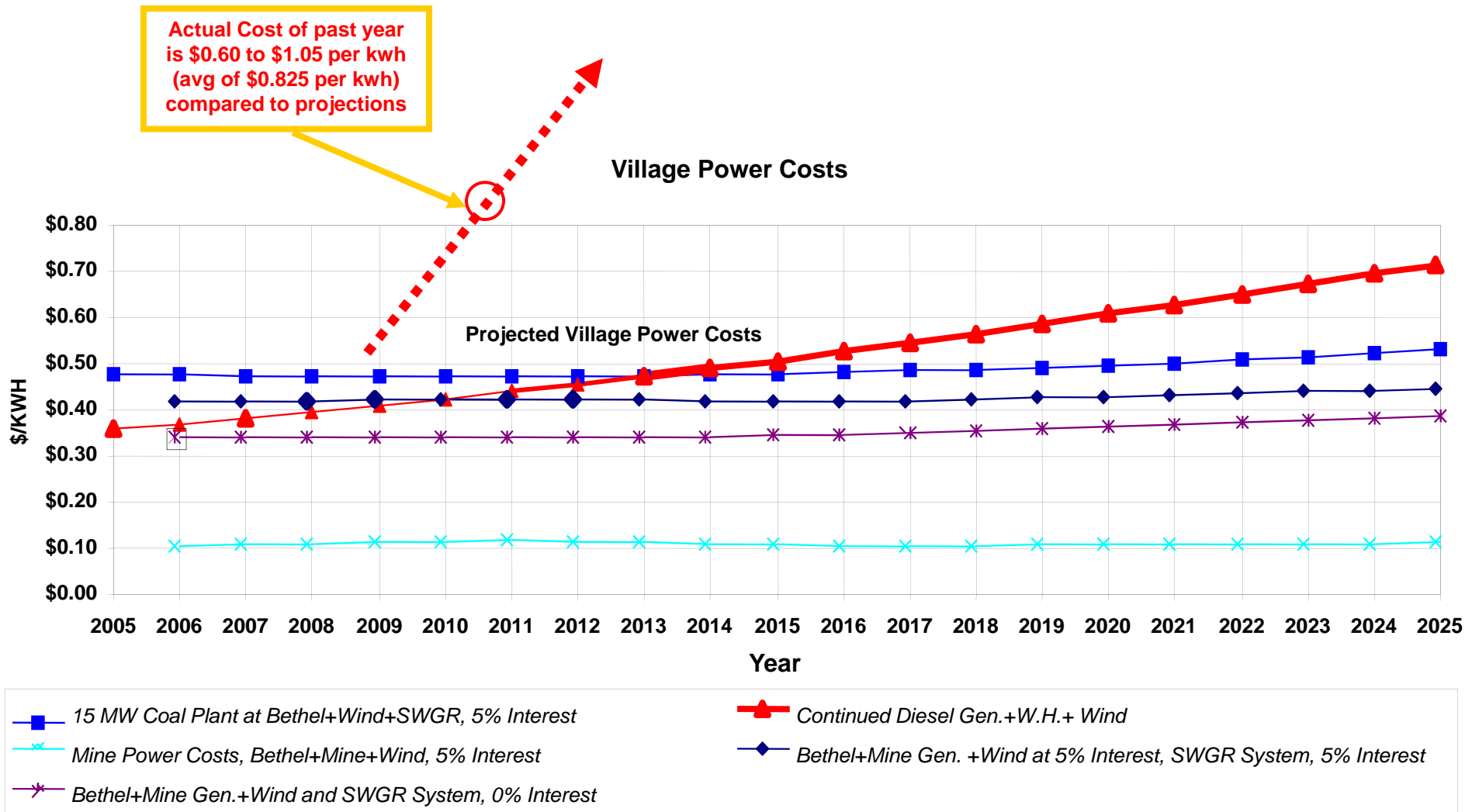
II. Where We've Been



- **Over 21** Energy Studies, Data, and Reports since '75.
- > 41 largely independent aged diesel power generator plants
- Village generators use >20 million gallons of diesel year
- Transmission lines needed
- 65Gwh electrical energy need for Bethel +13 villages by 2020
- Coal and Hydropower listed repeatedly as feasible options
- Energy costs escalating



II. Electrical Cost Projections 2002



II. Found Energy Needs Varied

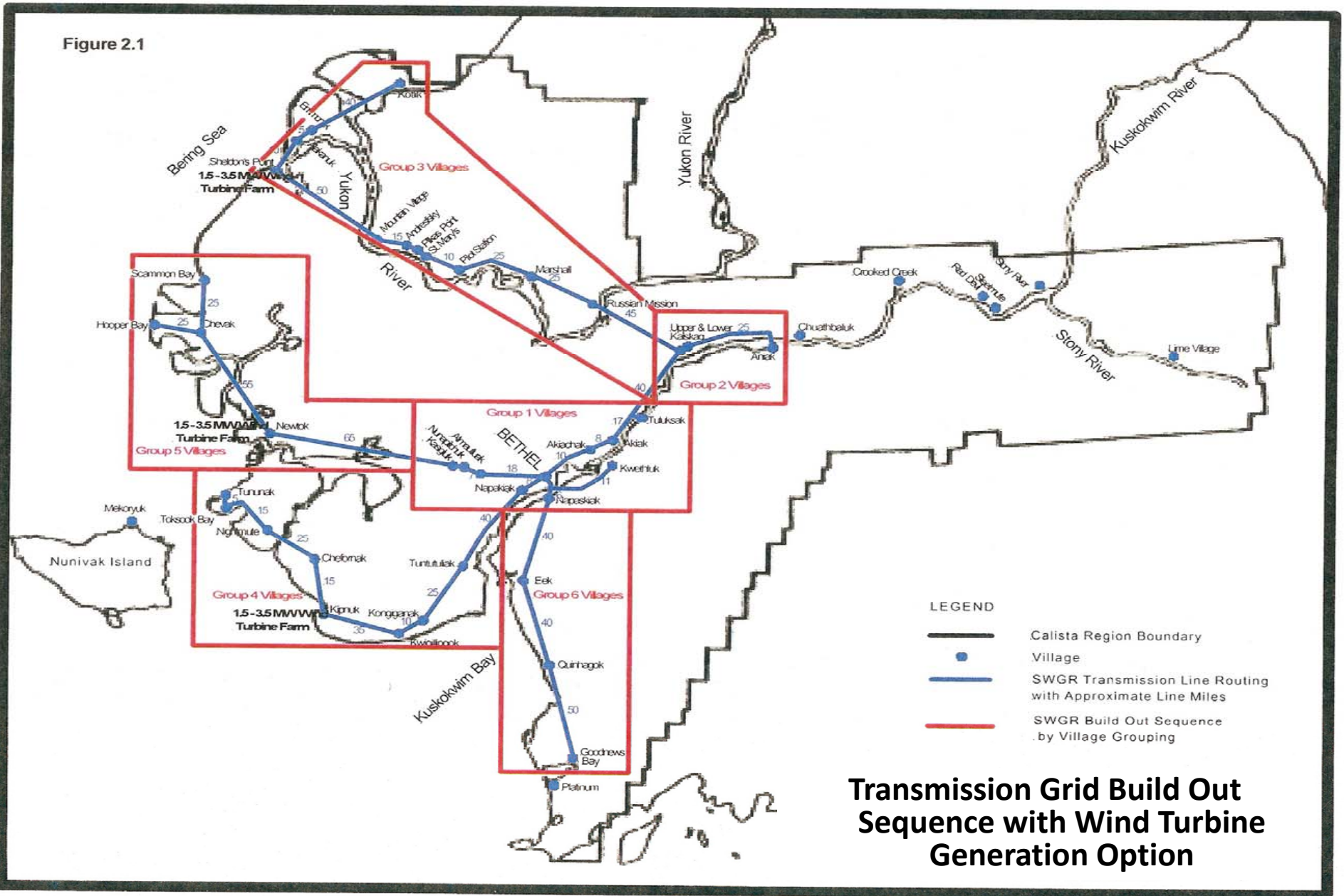
Region Villages Vary:

- Diverse Village options
- Conservation Underway but not the complete solutions
- Some Coastal Villages proceed w/wind generation but there's limited application in region
- Some villages have small needs
- ***One size doesn't fit all!***
- Sub-region Bethel +13 villages
65Gwh electrical energy need by year 2020



II. Transmission System Needed

Figure 2.1



Transmission Grid Build Out Sequence with Wind Turbine Generation Option

II. Previous Alternatives Considered

<i>Alt. Energy Type</i>	<i>Cost to Construct</i>	<i>Cost to Operate</i>	<i>Use Cost per Kw</i>	<i>Capacity to Demand 65kw</i>	<i>Public Perception</i>	<i>Likelihood or Feasibility</i>
Diesel	Existing	High	High	Same	-	Existing
Geothermal	High	Low	-	None	Positive	Small
Wind Power	Medium	High	Low	Low	Positive	Limited
Hydropower	High	Low	Medium	High	Positive	High
Coal Power Plant	High	Medium	Low	High	Negative	Medium to Low
Nuclear Power	Low	Low	Low	High	Very Negative	Poor to None



III. Future - Remaining Candidates

- **Wind Turbines**

Variable – region precedent, low power production capacity, augments needs, does not work for all areas of region.

- **Coal Power Plant**

Bethel 15-60 Mw Plant - negative public perception, would provide the cheapest and greatest energy capacity.

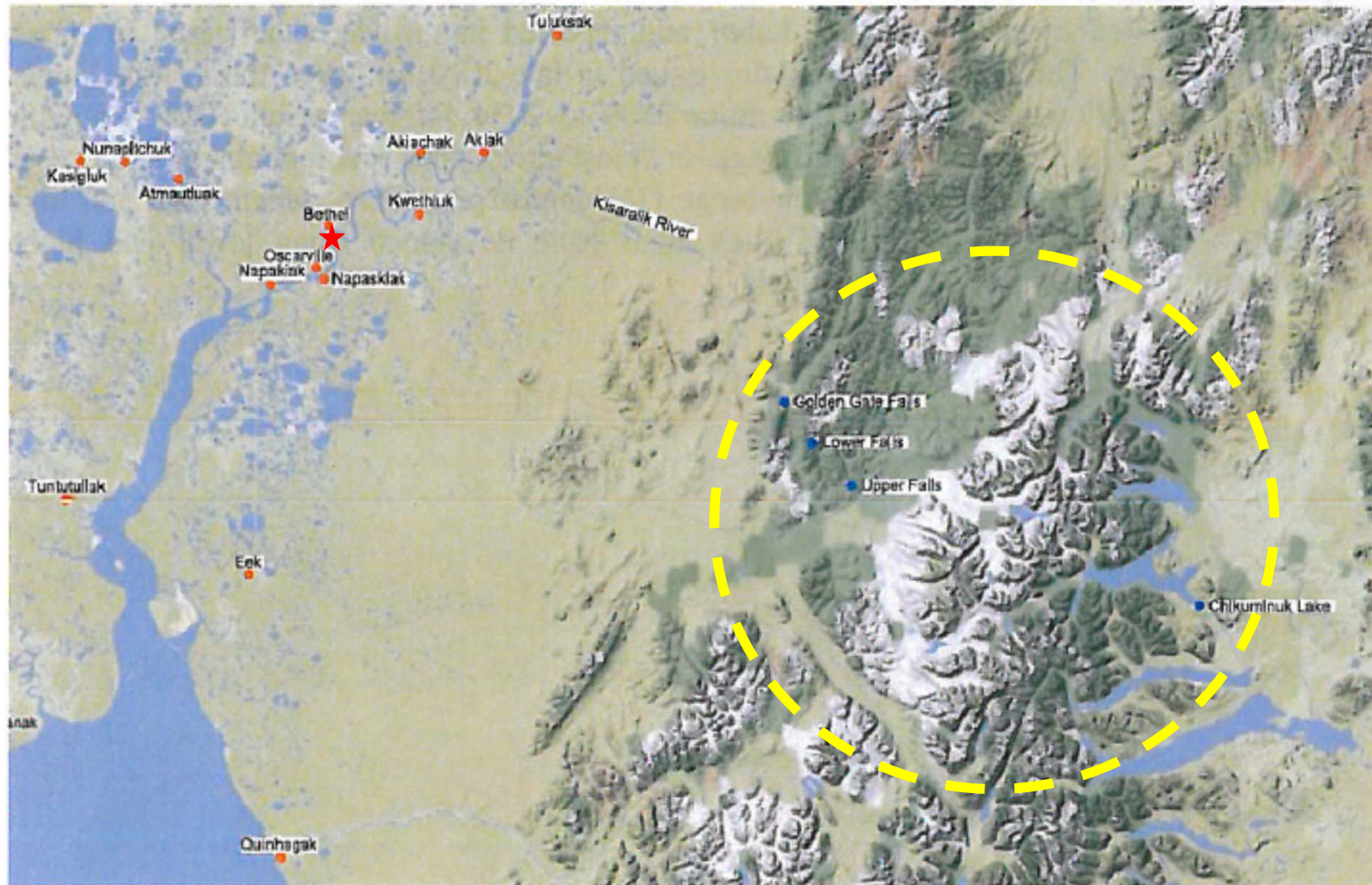
- **Hydroelectric Power**

Kisaralik River – 3 sites Yukon Delta National Wildlife Refuge

Chikuminuk Lake - in Wood Tikchik State Wilderness park, could provide clean, mid cost, proven alternative energy.



III. Remaining Hydroelectric Sites



III. Hydroelectric Feasibility Findings

<i>Potential Hydropower Site</i>	<i>Distance from Bethel (miles)</i>	<i>Head ft</i>	<i>Generating Capacity (MW)</i>	<i>Year Around, or Seasonal Energy Production</i>	<i>Useable Hydro Energy GWh</i>
Chikuminuk Lake Allen River Outfall	118	91	13.4	Y	65+
Kisaralik River Upper Falls	70	149	27.7	S	39.7
Kisaralik River Lower Falls	62	122	34.1	S	46.9
Kisaralik River Golden Gate	57	78	27.0	S	38.8



IV. Moving Forward & Ahead

Selection of Option(s):

- Nuvista Team & Stakeholders Reviewed latest Findings
- Public Meetings found Chikuminuk Site Positive and Preferred
- Board Unanimous Decision to move ahead with Hydropower Design Feasibility
- Chikuminuk Lake has year around capability to supply ½ region's population, 13+ villages, and displace 10M gallons diesel

A. Bethel Area Sub-Region

Complete plan and project(s) underway to stabilize and reduce energy costs, and integrate with Region-Wide plan

B. Region-Wide Alternative Energy Plan

Beginning a comprehensive region wide alternative energy plan that integrates work done and underway to guide future development



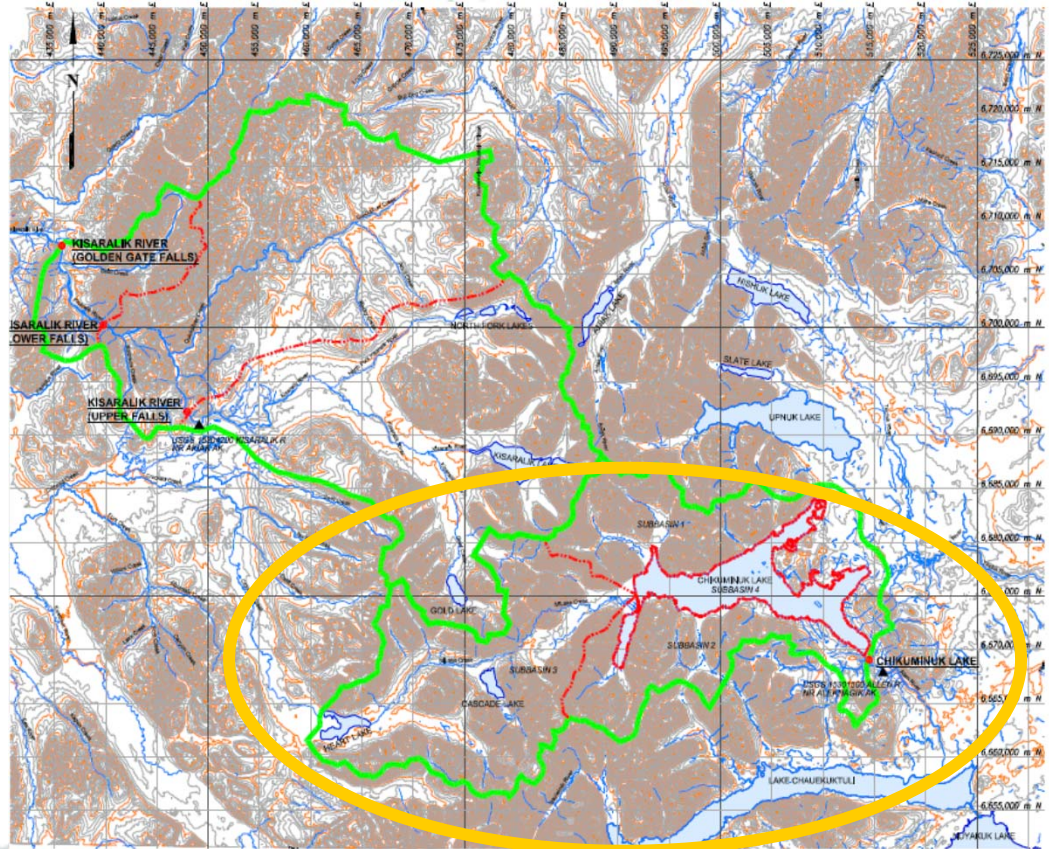
IV. Preferred Alternative

<i>Site</i>	<i>Construction Cost w Transmission in 2010 dollars</i>	<i>Design Cost</i>	<i>Total Project Cost</i>	<i>Estimated 20 year Cost/Kwh</i>	<i>Meets Bethel Sub-Region 2020+ Demand?</i>
Chikuminuk Lake Outfall	\$391.7 M	\$91.3 M	\$483 M	\$0.70-0.58	Yes
Kisaralik River Upper Falls	\$386.4 M	\$92.6 M	\$479 M	\$0.70-0.65	No
Kisaralik River Lower Falls	\$329.5 M	\$78.5 M	\$408 M	\$0.70-0.65	No
Kisaralik River Golden Gate	\$305.5 M	\$72.5 M	\$378 M	\$0.70-0.65	No



IV. Current and Next Tasks

- Completed Phase I- Hydro Reconnaissance & Feasibility Study - 1/2011
- Public and Nuvista Board Decision to Proceed Ahead
- Hiring Project Manager to develop scope, oversee work, lead process - 5/2011
- Initiate Federal FERC preliminary licensing and ROW Processes
- Begin standard AEA project Phase II process: Detailed Feasibility & Design



IV. Next Steps: Capital Request

Hydroelectric Energy Tasks	Lead Agency	Schedule	Funding	Cost (millions)
1a Detailed Feasibility, Geotech, FERC Licensing (PAD), Surveying, Engineering Plans...	Nuvista, FERC	2011 2014	State Private	\$5.88M
1b Preliminary Engineering Design, Site Field Investigations, Specs	Nuvista AEA	2011 2016	State	\$11.75M <u>\$17.6M</u>
2. Transmission rights-of-ways, and land easements	Nuvista DOI/BLM	2012- 2015	DOI	\$7.83M
3. Final Designs, Permitting, Modifications, and Bidding	Nuvista AEA	2016 2018+	AIDEA, BIA Bonds	\$35.25M
4. Hydropower and transmission system project Construction	TBD	2018 2022	Mix, DOE Bonds	\$391.7 M
<i>(-10 to +25%)</i> Total Project Estimated Cost:	TBD	2012 2022	Mixture	\$460M to \$630M \$483M

IV. FY2012 Capital Request

Region: Calista/AVCP Southwest Alaska

Project: Chikuminuk Hydroelectric Alternative Energy

Scope: Complete Detailed Feasibility Report, Site Field Investigations, Hydrologic Monitoring, Surveys, Permitting, Engineering Plans, FERC Licensing, and 35% Design Specifications (Standard AEA Phasing)

Cost: \$17,630,000.



Chikuminuk Questions Answered

- How much local support do you have for your project?
 - Region wide support represents 56 villages, and numerous stakeholder letters to legislature.
- How much local matching funds/other do you have, expect, or may be available for project?
 - TBD with BIA, DOE, BLM, AIDEA, others. Nuvista invested >\$650,000. private funds since '02
- What are the total costs of your project?
 - \$483 Million is the engineering estimate, over the period of 2012 to 2022
- What is the funding plan over next five years? *See formal presentation*
- How many years work is funded in this appropriation and how many years remain?
 - Request is 2 years due to legislative approval timelines & seasonal work sequencing. Further fund requests in 3 parts noted in presentation (ROW acquisitions, final design, construction)
- What phase is project in now and what phase or phases addressed by this appropriation?
 - Phase II Feasibility and 35% Design
- Upon completion, what are expected costs to rate payers compared with current cost?
 - Anticipated conservative (high end) cost (without use for heat) = \$0.58-\$0.70 kwh;
 - Compared to current electrical costs = \$0.60-\$1.05 per kwh.
- Where is your project on the priority list of the area's regional energy plan?
 - Highest priority or #1 for region as a whole, documented option since 1975
- Has your project been vetted by AEA? If so, how?
 - AEA has funded approx. \$2.28 million since '96, and been a partner on conceptual design.