

Aleut Region Energy Planning:
Working Together for an Energy Policy and Energy Plan to Secure Low-cost
Sustainable Energy

Proudly serving the Aleutian / Pribilof Island Communities:

Adak
Akutan
Atka
False Pass
King Cove
Nelson Lagoon
Nikolski
Sand Point
St. George
St. Paul
Unalaska



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I. Purpose

This document is provided for the ALEUT Committee as a foundation document intended to identify energy related issues for our region and a process through which an Aleut-wide regional long-term energy self-sufficiency program can be developed and implemented. This paper has been prepared by staff of a limited ad hoc group of regional stakeholders who have a strong interest and stake in working towards solutions which will provide for the long-term energy self-sufficiency and sustainability of Aleut communities.

The purpose of this document is to:

- Summarize energy issues in the Aleut region, including logistical challenges, community needs, other energy resources; and
- Identify potential solutions to the energy related issues faced by the region.

The document is intended to generate participation, ideas and action by all interested parties. It is intended to be a “living document” that will evolve, expand and improve as more parties join the effort to work together to solve high cost energy in the Aleut region.

II. Findings

a. Logistical issues

The Aleut region starts in the east at Sand Point and stretches over a thousand miles along the Aleutian Chain to Attu in the west, and to the Pribilofs to the north. There are over 45 volcanoes as part of the Ring of Fire in the Pacific Ocean. There are over 167 named islands in the five major island groups, which include the Fox Islands, Islands of Four Mountains, Andreanof Islands, Rat Islands, Near Islands and the Eastern Islands, south of the Alaska Peninsula. Unimak Island is the eighth largest island in the United States, with Unalaska Island being the thirteenth largest.¹ The geography of the Aleut region presents fuel transportation, delivery and storage challenges, as well as energy distribution challenges.

Fuel delivery issues are a constant concern. For example, in 2007-2008 Nikolski and St. George went without their scheduled fuel deliveries for several months straight; ultimately having to choose whether to eat or buy minimal amounts of fuel to stay warm. Our communities occasionally experience cancelled or postponed fuel barge deliveries due to Bering Sea ice, rough water, entrance to harbors, or choices made by fuel delivery companies as they deal with other competing issues. These events resulted in escalated per gallon fuel costs with resulting increased costs for electricity, heating fuel and food. Several Aleut communities have experienced the need for emergency fuel conservation or other emergency measures.² Fuel costs continue to significantly exceed the costs for Railbelt residents.

These issues can only be successfully addressed through a collaborative, region-wide effort by all communities, businesses and entities. For example, APIA and APICDA have worked closely together to identify procedures for purchasing, storing and shipping bulk fuels in the

¹ TAC; www.aleutcorp.com

² APIA Energy Plan

Aleut region. The plan was developed with the intent to purchase and sell fuel at reduced prices to the consumers – by buying in bulk and sharing administrative costs – and to promote adequate and timely fuel deliveries in the Region. The plan was based in part on collected data on fuel storage capacity, condition of fuel storage facilities and fuel delivery schedules using a survey instrument developed by APIA (see Appendix A.)

The data from this survey revealed the following:

- The region generally has good fuel storage capacity;
- Fuel storage facilities are in good repair;
- Some communities need only one fuel delivery per year (e.g. Nikolski) while other communities need multiple deliveries;
- All the communities expressed interest in further development in renewable energy.

A subsequent survey is made at least twice per year and describes the current fuel on hand and next expected delivery. This survey is designed to discover potential fuel shortages well before they happen so APIA can assist in preventing communities from running short of fuel.

b. Energy Costs and Impact on Aleut region Communities and People

In the Aleut communities, energy uses are primarily composed of electricity, diesel and gasoline fuels used for space heating and transportation. As noted above, fuel storage capacity is generally adequate but these systems need constant upkeep and monitoring.

Power generation and home heating needs are primarily met using diesel fuel. When energy costs increase, as experienced in 2008, more and more people in the region had difficulty affording the cost of heat for their homes. High-energy prices reduce discretionary income and indirectly affect health care, education and other vital services to our people. The added and unpredictable costs erode our local economies and are a factor in the out-migration of residents moving from the region to urban centers. International oil market pressures, particularly competition for a finite non-renewable resource, are predicted to eventually result in new record fuel and energy costs which are likely to greatly exceed those seen in 2008³.

The following table provides a limited summary of regional gas & heating fuel cost:

| Community | Retail Gas \$/gallon in 2008 | Retail heating fuel #1 \$/gallon in 2008 |
|------------------|---|---|
| Adak | \$4.84 | \$3.98 (note #2 heating fuel) |
| Akutan | \$3.50* | \$3.36* |
| Atka | \$5.09 | \$7.99 (subsidized to \$7.24) |
| False Pass | n/a ** | #2 diesel for generator \$4.09*** |
| King Cove | n/a | #2 diesel for generator \$3.90*** |
| Nelson Lagoon | \$5.71 | \$5.96 |
| Nikolski | \$4.30* | \$6.50 |
| Sand Point | **** | **** |
| St. George | No price reported | No price reported |
| St. Paul | \$4.49 | \$4.63 (diesel #2) |

³ SWAMC energy statement; www.swamc.org

| | | |
|-----------|-------------|-----|
| Unalaska | n/a | n/a |
| Anchorage | \$4.36***** | n/a |

Source(s): Community Bulk Fuel Status Survey, APIA, 2008; OTHER SOURCES Notes: *Akutan and Nikolski use wholesale price for retail price; **n/a = not available; ***False Pass, King Cove purchases for generator only; ****Sand Point fuel tank owned by Trident*****gasbuddy.com

Additionally, in Adak there is approximately 22.1 million gallons (526,000 barrels) of fuel storage capacity in six large tanks. Approximately 70% of that storage capacity is leased to a third party. Aleut Enterprise, LLC (a wholly owned subsidiary of the Aleut Corporation) uses approximately 20% - 25% of the storage capacity for its own needs; leaving one to two million gallons of open capacity. Aleut Enterprise, LLC (AE) can store fuel on behalf of third party customers for a nominal fee, but the product must be of the same specifications as product AE is already holding.

AE, LLC has the capabilities to hold the following bulk fuel products:

- High Sulfur Diesel #2 (converting to Ultra Low Sulfur in early 2010 per the federal mandate)
- High Sulfur Jet A/Diesel Fuel #1
- Ultra Low Sulfur Diesel #1/Jet A-1

To a lesser extent AE, LLC can store unleaded gasoline as well. There is potential to store one to two million gallons for a third party depending on the products in inventory. As of today, there is no dedicated (segregated from the current fuel in inventory) storage capacity available. AE, LLC also has the capability to sell product forward as they have the option of locking in a price utilizing financial hedges if required. Furthermore, AE, LLC is in the process of trying to bring online an additional 2.5 million gallons of storage capacity in 2010 if the economics prove feasible. There is interest from a third party to lease the additional storage capacity, but as of this documents' publication no commitments have been made.

i. Energy Conservation and Energy Education

ENERGY EFFICIENCY MEANS:

- Getting the most use out of each unit of energy you purchase
- Using energy wisely
- Eliminating the ways your home wastes energy

MAKING YOUR HOME MORE EFFICIENT WILL:

- Make it more comfortable
- Make it safer
- Save you money

Perhaps the most important first and immediate step in addressing regional energy issues is to maximize the benefits to be gained from energy conservation and education. Energy conservation is the practice of decreasing the quantity of energy used, and may be achieved through either more efficient energy consumption (in which energy use is decreased while achieving a similar outcome), or by reduced consumption of energy services.

Energy conservation reduces energy costs, and can reduce the need for new or expanded power plants. The reduced energy demand can provide more flexibility in choosing the most preferred methods of energy production, particularly as to renewable alternative energy solutions. Energy conservation also facilitates the replacement of non-renewable resources with renewable energy. Energy conservation is often the most economical solution to energy

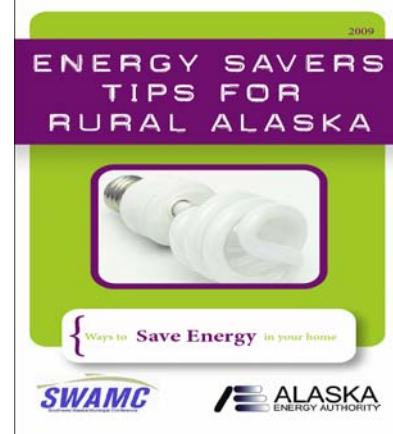
shortages, and is a more environmentally benign alternative to increased energy availability, particularly if the increased energy results from non-renewable sources.

With assistance from APIA and SWAMC, the Alaska Energy Authority produced and distributed the Energy Savers Tips for Rural Alaska. The booklet has been made available to all Alaska households. Additional copies are available from all three entities.

ii. Weatherization

The Aleutian Housing Authority (AHA) is currently the AHFC designated contractor for conducting all weatherization (Wx) activities in the Aleutian region. This is not an “Indian” program but is open to all residents (private as well as those in the so-called “HUD” homes) who meet the 100% of median income limits established by HUD. (E.g., a family of four could qualify if they earn up to \$70,100 if residing in the Eastern Aleutians; \$93,700 in the Western Aleutians.)

AHA uses through a three step process to implement their program: (1) solicit and approve applications; (2) conduct formal Wx assessments on the homes of each qualified applicant; (3) schedule and perform the actual Wx scope of work dictated by the assessment.



Currently (7/09), there are 160 applications on file and 101 home energy assessments have been completed. AHA hopes to complete 225 to 275 projects over the next three years. The program has been set up to last approximately four more years but AHA expects to cover the region in less time. A primary component of the program will be boiler replacements. AHA is installing a system which they feel will be very efficient for units and the Aleut region. The Wx program goal is to reduce home energy usage by 30-40 % on average. AHA intends to track the data over time to verify the Wx program energy savings.

Actual Wx program construction projects are just getting under way, with King Cove being the first community. AHA intends to have projects going in Atka, Nikolski, Akutan, Unalaska and Sand Point by late 2009, and start in the rest of the region as crews are assembled and other logistics are addressed. AHA’s goal is to have simultaneous projects going in most, if not all, communities at once, rather than just move from one community to the next.⁴

c. Other energy challenges

The Aleutian Pribilof region faces other energy challenges that need both short and long term resolve. For instance, communities, businesses and residents need to prepare for the integration of ultra low sulfur fuels along with the attendant additional cost. Furthermore, the region needs to determine how to address:

⁴ AHA; Dan Duane information re: AHA projects

- Reliance on diesel and its increasing price;
- Fuel delivery issues (weather, infrastructure);
- Environmental cost of diesel fuel on Aleut region;
- Incorporating renewable energy into the region;
- Climate change; and
- The need to be proactive in solutions for the region.

d. Energy Resources

The Aleut region has access to renewable and alternative energy resources as well as the political and economic resources to develop the energy. Common renewable energy resource opportunities found in the Aleut communities include biofuels/biomass, geothermal, hydro, tidal/wave and wind.⁵

| Organization | Energy Program | Cost/program worth??? |
|--|-------------------------|-----------------------|
| AHA (Aleutian Housing Authority) | Wx – DOE | \$6.5 M |
| Aleutian/Pribilof Tribal representatives | None | n/a |
| APIA (Aleutian Pribilof Island Assoc.) | n/a | n/a |
| APICDA Corporation | None | n/a |
| TAC (The Aleut Corporation) | Bulk fuel sales/storage | n/a |
| AEB (Aleutians East Borough) | n/a | n/a |

In addition to resources which the Aleut regional organizations have available, communities in the region have worked with regional, state and federal agencies (e.g. Southwest Alaska Municipal League, Alaska Energy Authority, Economic Development Administration, Denali Commission) to implement energy conservation, energy education and weatherization programs. These agencies as well as multiple peripheral entities have programs available to assist in the implementation of a region-wide energy plan.

III. Conclusions

As consideration is given to solutions to address the region’s current energy crisis, we must consider the relevance of the following:

- Communication and continued education;
- Conservation;
- Weatherization;
- Regional coordination to maximize regional efforts;
- Data acquisition and evaluation – helps define next steps;
- Renewable energy grant writing for pre-construction and construction ready projects;
- Transportation – rethink how we mobilize within a community and within the region;

⁵ APICDA DDS paper; www.apicda.com

- Interconnection – sub-region or regional; how we can maximize our renewable energy investment so our communities and residents benefit from low cost energy to the fullest extent possible;
- Planning strategies: What is needed to develop short, mid and long-term energy strategies, and what our region’s energy situation can look like years from now?

The cost of fuel, electricity, food and transportation are high and continue to rise. Impacts of high energy costs to residents, businesses and the communities are debilitating. The Aleut communities have an opportunity to collectively define a path to energy self sufficiency and collaboratively capitalize on opportunities through low cost renewable energy options, energy conservation and bulk fuel purchases.

High energy costs negatively impact program delivery for all businesses in the region, make it more difficult to maintain and operate infrastructure, and threatens further economic development opportunities.

Collectively, the Aleut region has considerable resources to address and solve these problems. The ALEUT Committee is a significant step in providing a proactive approach to addressing these critical energy issues. Individual communities have begun efforts to solve their local issues. Regional organizations such as the ALEUT Committee are beginning to provide a more coordinated regional effort. These local and regional efforts can be further coordinated with comprehensive statewide and national energy policies and plans. In an attempt to minimize or eliminate the aforementioned issues and concerns, the following options should be considered.

IV. Recommendations

Energy Summit

- Consider an energy conference for Aleut communities to address the current state of energy – topics could include:
 - Identify the entities that do or should play a role in addressing the energy crisis in the Aleut region;
 - Develop a program to effectively assist residents to become more knowledgeable of the current energy crisis and what it means to their communities;
 - Identify the highest priority community concerns and strategies for addressing these concerns;
 - Develop a regional consensus on a process for developing and implementing a region-wide energy strategy with a clear and agreed to timeline that ensures delivery of lower cost energy solutions;
 - General break-out sessions to include, among other issues:
 - Conservation, energy efficiency and weatherization
 - Options for alternative and renewable energy resources
 - Community, sub-regional and regional scale planning

- Funding resources and options

Regional Comprehensive Energy Planning

- Develop a regional short, median and long term energy strategy that builds on current efforts and processes, promotes coordination and communication of all stakeholders, and avoids costly duplication of efforts. Many regions across the state have developed or are developing energy policies and plans. As an example, the Southwest Alaska Municipal Conference's (SWAMC) Energy Task force provided the SWAMC Board with recommendations and direction regarding a Comprehensive Energy Development Policy. They have created several documents that outline a long term Energy Policy and Implementation Strategy. Such a strategy must include coordination with the State's comprehensive planning efforts to ensure that the Aleutian/Pribilof interests are recognized.

Energy Conservation - can & should be done NOW!

- Energy conservation should be employed by all residents and commercial entities in the region as a critical first step in addressing the energy issues under consideration. This can and should be done on both small and large scales!
(www.akenergyauthority.org/PDF%20files/alaska_tips_final.pdf.)

Energy Efficiency – can be done now!

- AHA's Wx program is underway and should be supported in every way possible by all regional partners. A strong education and outreach effort should be conducted to make sure all possible eligible applicants are included in the program. Individual choices to not participate (whether from laziness, not wanting to fill out paperwork, etc.) should not be acceptable since such choices not only have a negative impact on the individual but the entire community and region. We should have a collective mindset that regional and community interests in conservation are equally important and inseparably linked to those of individuals.

Resource Assessment – now and for the future!

- Assessments for all potentially viable alternative energy solutions in each of our communities should be completed as soon as practical. Renewable energy resource assessments should be included in both short and long-term community strategic plans. Once that information is secured, we are then able to develop a project priority plan recognizing project planning attributes such as:
 - Alternative energy recommendations by community;
 - Project equipment costs/installs etc., with return on investment analysis;
 - Potential funding sources, and;
 - Adequate and realistic lead time for implementation and construction.

Funding Sources

- Projects will come together with adequate funding. Whether funding is provided through a loan, private investment, grants or other, it is important to have a source identified in advance so unnecessary delays are avoided. The amount of renewable energy funding available through the Obama Administrations Recovery Act or the Alaska Energy Authority's renewable energy grant fund can address many of the Region's energy crisis situations if we can jointly work within a well structured plan. Financial feasibility studies must be done to determine which projects show a positive cash flow that could justify private investment, municipal bond financing, etc.

Data Collection

- Good data is critical to any successful energy conservation and transition strategy or plan. An assessment needs to be conducted to determine what energy related data is available and currently being collected, and what data is in need of collection. A viable strategy then needs to be developed to begin gathering the necessary and missing data. Regional data should be collected to fill any existing data gaps, including wind data, river or stream flow, temperature for geothermal, solar power assessments, and biodiesel production (e.g., fish oil utilization).

Study Alternative Residential Construction and Sustainability Options

- In addition to addressing the direct energy related costs of homeownership, such as home heating and electrification, the staggering cost of residential construction (which can run from \$325 to almost \$400 per sq. ft.) must be addressed. This is necessary to ensure that region residents will be in a position to upgrade and maintain energy-efficient housing over the long-term. Great strides have been made in building science technologies. The Cold Climate Housing Research Center in Fairbanks has developed one new prototype model which should be considered for application in our region.⁶ The model is actually a modern variation of a "barabara." Overall energy usage is extremely low relative to conventionally constructed homes, with an annual average estimated fuel usage of 110 gallons/year compared to other homes in the same community (averaging 1,400 gallons/year).
- As renewable energy sources are developed there should be a rapid transition to electric heating systems such as electric radiant floor heating, electric baseboard heating or electric heated carpets.

Transportation

- More effective energy education needs to be conducted to encourage a reduction in vehicle energy usage. Reduction strategies could include, driving less, turning off the vehicle when parked for long periods, driving "light" and, keeping a vehicle running efficiently by regular routine maintenance. Analysis should be conducted to

⁶ Details of the CCHRC model are available at: www.cchrc.org

determine the feasibility of greater dependence on battery powered vehicles and off road vehicles (such as electric powered four wheelers) as an alternative to gasoline or hybrid vehicles, thus reducing the consumption of petroleum. Electric fork lifts and other electric utility style vehicles may be worth considering for city, tribal or municipal use.

V. Suggested Next Steps

The ALEUT committee members should identify the high cost of energy as a priority regional issue to solve. Further, the ALEUT committee should consider a Regional Energy summit to accurately identify the critical energy issues that negatively impact the region and devise a program and strategy to address those issues. This summit could lead to the development and adoption of an Aleut Region Energy Policy that leads, in turn, to a coordinated Aleut Region Energy Plan based on the energy policy. Ultimately, the region needs a ‘go-to’ agency responsible for the implementation of a strategy identifying the resources to execute an Aleut Region Energy Policy and Plan.

The regional entities should identify a mechanism that shifts the villages’ primary reliance of energy production away from non-renewable energy – primarily diesel based energy generation – and redefine how each of our communities heat, electrify and transport themselves in the communities they live. Some key energy principles include the following:

- Energy conservation must be encouraged and practiced by all Aleut communities and residents;
- Energy must be affordable, reliable, and long-term;
- Energy alternative research and development must be encouraged and supported;
- Energy providers and producers must plan collectively for energy infrastructure development, and;
- The Aleut region should set a goal for energy self-sufficiency as soon as possible.

Taken together, these principles could form the basis for an energy policy and implementation strategy that guides the development and implementation of lower cost and sustainable energy production within the Aleut region.

ALEUT Committee members:

AHA – Aleutian Housing Authority
Aleutian/Pribilof Tribal representatives
APIA – Aleutian Pribilof Island Association
APICDA Corporation – Aleutian Pribilof Island Community Development Association
TAC – The Aleut Corporation
AEB – Aleutians East Borough

Other future participants in the development of an Aleut region energy strategy to address regional energy issues:

Alaska Energy Authority
Alaska Federation of Natives Emergency Energy Group
BIA – Bureau of Indian Affairs
EPA – Environmental Protection Agency
Fuel Transportation companies
Local utilities
Renewable Energy Alaska Project (REAP)
Southwest Alaska Energy Task Force Committee
Southwest Alaska Municipal Conference (SWAMC)
USDA – United States Department of Agriculture
US Department of Energy