Alaska Renewable Energy Fund: Round 7

App # 1001 Northwest Arctic Borough Solar PV Project

Resource: Solar PV
Proposer: Northwest Arctic Borough
Applicant Type: Local Government

Project Description

This project expands on a previous Feasibility study that has been ongoing for 3 years. In 2010 a Single 175W Solar Array was installed at the proposed location to see if Solar PV would be feasible for the Northwest Arctic. The panel has been facing south-east and is connected to a single En phase inverter that is Cogenerating with the Kotzebue Electric Association (KEA) grid. It was found that it produced 165 Kwh during 1 year average @ $ 0.54/Kwh this equals a savings of $ 89.10/year. A build-out of the array to 10 Kw would save the Northwest Arctic Borough approximately $5,091.66/year in electric bills. This would also be a good match as the Borough operate mainly day time, when the sun is available. The project aims to match the load of the building and offset just enough energy to try to get to stop the electric meter, this is important as we do not want to be paid for any generated electricity by the KEA Coop. The project would consist of 42 pc. 240 watt panel, for a total of 10 KWatts configured on the roof of the building in a configuration to match the load of the building. It would be a "fixed" array, non tracking. It would also be configured in 2 directions, southeast and south, to match the electric needs of the building, so not to overproduce with one large peak power during the day. Each individual panel will have it's own Aurora micro-inverter. The entire array will be displayed and monitored on a website that can be accessed for educational purposes.

AEA Review Comments and Recommendation

The Northwest Arctic Borough (NWAB) is requesting funds for project construction and commissioning of a 10kW array of photovoltaic (PV) modules in Kotzebue, Alaska. The array, located on the roof of the NWAB building, would provide electricity for the building. Kotzebue Electric Association, the local electric utility, does not have a net metering policy but wrote a 10/22/12 letter of support for the project that does not specify project capacity, integration details, or how KEA will view excess solar power on its grid (i.e. whether NWAB would be compensated for it or whether it would be curtailed).

The applicant did not address how it would deal with excess solar power that occurs during periods that the office is closed, for example on weekends. The application did not provide enough information to adequately analyze this project, and in response to AEA's request for one year of utility bills the applicant provided one month's utility bill. AEA recommends this project for full funding with special provisions that the applicant provide detail regarding how the solar power will be used on weekends, holidays, and other periods of low demand.

Funding & Cost

Cost of Power: $0.42 /kWh
Price of Fuel: /gal

Project Cost: $77,000
Requested Grant Funds: $76,000
Matched Funds Provided: $1,000

Matched Funds Provided: $1,000

AEA Funding Recommendation: $75,000
Alaska Renewable Energy Fund: Round 7

App # 1001  Northwest Arctic Borough Solar PV Project

Resource: Solar PV
Proposer: Northwest Arctic Borough
Applicant Type: Local Government

Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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DNR/DMLW Feasibility Comments

The Rural Energy grant should have no impacts to state land. It is for solar photovoltaic panels to be placed on the Northwest Arctic Borough building in Kotzebue which they own. There may be a minimal benefit to state resources as they will be a slight decrease in their use of diesel fuel. If the grant is carried out as described in the application, the Northwest Arctic Borough would not need any DNR authorizations.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
The proposed project would demonstrate a prototype hydrokinetic turbine through installation of a 100 kW Poncelet Kinetics™ turbine. The project will prove the design concepts employed for debris management, environmental impact, shallow water power generation, and electrical efficiency of the proposed design. The technology proposed to be used was developed by Whitestone Power and Communications under the trademark Poncelet Kinetics. The project is shovel-ready with all permits and design documents in hand.

Whitestone Power and Communications propose prototype construction and demonstration of a surface-mounted River In-Stream Energy Conversion (RISEC) device in the Tanana River. The proposed technology is a compelling alternative to other competing RISEC designs and the project team has taken a deliberate approach to the design of the project. Significantly, the project has also garnered the support of permitting agencies and holds key permits required for deployment. As can be expected with a demonstration project, the economics of initial deployment do not appear to be favorable, but may improve with subsequent deployments in areas with a higher cost of energy.

The project applied for funding in the first round of Emerging Energy Technology Fund (EETF) but was not awarded funding. A proposal was not submitted to EETF Round 2.

Although reviewers see potential benefits of demonstrating the technology, the REF proposal was evaluated by criteria used for all applications, and did not score high enough to pass Stage 2. Until the technology is proven, this type of demonstration and technology-advancing application is more appropriate for the EETF program than the Renewable Energy Fund.
Alaska Renewable Energy Fund: Round 7

App # 1002  Poncelet Kinetics RHK100 Prototype Demonstration

Resource:  Hydrokinetic
Proposer:  Whitestone Power and Communications
Applicant Type:  IPP

Proposed Project Phase:  Construction

Program Manager:  Alan Baldivieso
Energy Region:  Railbelt

Stage 3 Scoring Summary

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Stage 3 Total Weight (out of 100): 39.17

Stage 2 Total Weight (out of 100): 0.16

Benefit/Cost Ratio (Applicant): 0.16

Statewide (out of 86): 0.16

Region Rank: 0.16

Project Rank:

DNR/DMLW Feasibility Comments

Project is will be based in navigable waters, and needs land use permit for location of float, anchors to shore, and electric line. Applicant has obtained this already, and the permit is attached to the application file, starting on page 304 of the full application.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1003 Mahoney Lake Hydroelectric Phase III and IV

Resource: Hydro
Proposer: City of Saxman
Applicant Type: Local Government

Project Description
The 9.6MW Mahoney Lake hydroelectric project (FERC License P-11393) will provide Ketchikan and SEAPA-region residents and businesses with 41,743,000 KWH (41.7 GWH) of renewable hydropower per annum, allowing for continued economic and community growth while displacing use of diesel fuel. Approximately 17,900,000 KWH (17.9 GWH) of power is available between November and April as winter storage. The most recent (June, 2012) cost estimate for the project is $46,000,000 +/- 20%, making the Mahoney Lake hydroelectric project one of southeast Alaska’s most affordable options for new hydropower. This alpine lake tap project does not require construction of a dam. This application proposes State participation in the project through grant-funded cost-sharing in remaining Phase III Final Design and Permitting tasks, and initial IV construction tasks, which will help assure the Mahoney Lake can be constructed in a manner which benefits the Alaskan public, and provides the additional benefits of supporting new economic growth and job creation.

AEA Review Comments and Recommendation
City of Saxman requests funds for the Mahoney Lake Hydroelectric Project to provide for the following: revise final design and specifications, obtain permits for construction, review ways to increase storage potential of project, update cost estimate, begin power sales negotiations and prepare a business and operational plan based upon power sales agreement. Additionally, they request construction funding, with no explanation of the source of the remaining $39 M in capital project costs.

AEA has the following concerns: the market for the power is uncertain, given it would be the last to be used in the SEAPA system, including after the proposed additions of energy from Whitman Lake Hydroelectric Project and the proposed Metlakatla - Ketchikan Intertie. Additionally, potential issues could result if the FERC license is reopened to reengineer the project.

The Round 6 application (#909) was recommended for partial funding of $500,000 but did not score within the funding limit. The project did receive a $200,000 FY14 legislative grant for pre-construction activities, but that work has only recently been initiated. Work to be completed under the legislative grant includes hydrology update, license, market, operational, site, and financial reviews, design analysis, and an update of construction cost.

Given the current FY14 funding from the legislature, the project is moving forward to answer key questions; therefore, the project is not recommended for funding from the RE Fund at this time.

Funding & Cost
Cost of Power: $0.10 /kWh
Price of Fuel: /gal

Project Cost: $51,000,000
Requested Grant Funds: $4,000,000
Matched Funds Provided: $4,000,000

AEA Funding Recommendation: Not Recommended
App # 1004  Karluk Tribal Council Wind Energy System

Resource:  Wind
Proposer:  Karluk Tribal Council
Applicant Type:  Government Entity

Project Description
Karluk is located on the west cost of Kodiak Island in Alaska. The village is cut-off from any road system. Fuel oil has to be shipped by barge to Karluk. Therefore, it is a high energy cost village with fuel oil at 4.92 $/gal. This project will perform a feasibility study and complete the design & permitting for a wind energy system and a heat recovery system to serve the existing power plant in Karluk, Alaska. For the wind energy system, wind data from a meteorological monitoring tower already installed at the proposed wind turbine location will be available for the analysis and design. The wind energy systems would consist of wind turbines installed on the mountain 0.7 miles south of the existing power plant, the transmission line to the power plant, and the electric boiler for excess energy utilization. The heat recovery system would consist of upgrading the existing power plant generators with waste heat recovery units and installing a total length of up to 100011 hydronic heating loop to connect the power plant with the community buildings.

AEA Review Comments and Recommendation
Karluk Tribal Council submitted this proposal in Round 6 and again this year. The community of 37 people sits on the western coast of Kodiak Island along Karluk Anchorage and Karluk Lagoon. The wind regime ranges from relatively calm winds in town to fierce and damaging winds on the ridge 1,100 feet above and along the coast toward Cape Karluk. This project is challenging because the community electric load is so small when compared with available options for diesel generators and wind turbines. Finding an efficient diesel generator that can handle wind energy penetration will be difficult. The high wind regime up on the ridge south of town is costly to develop given the size of the overall energy system. In addition to measuring the wind resource up on the ridge, a second 10-meter tower should be installed closer to town to validate or modify the wind resource model at that location. A class 4 or 5 wind resource next to town could be easier and cheaper to develop. The feasibility schedule looks aggressive, but doable. Wind resource studies and electrical/heat load analysis should be complete and accepted by AEA prior to allocating money for the CDR.

Karluk is encouraged to work directly with AEA staff to explore the possibility of integrating wind or other energy systems into their community energy needs. Please contact AEA’s energy planning staff for direct assistance.
Did not pass minimum stage 2 scoring.

Funding & Cost
Cost of Power:  $0.60 /kWh
Price of Fuel:  /gal

Project Cost:  $1,300,000
Requested Grant Funds:  $81,000
Matched Funds Provided:  $300

AEA Funding Recommendation:
Alaska Renewable Energy Fund: Round 7

App # 1004 Karluk Tribal Council Wind Energy System

Resource: Wind
Proposer: Karluk Tribal Council
Applicant Type: Government Entity

Proposed Project Phase: Feasibility Design
Program Manager: Rich Stromberg
Energy Region: Kodiak

Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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Economic Analysis

- Stage 2 Total Weight (out of 100): 21.17
- Benefit/Cost Ratio (Applicant): 1.83
- Benefit/Cost Ratio (AEA): 0.76

Project Rank

- Stage 3 Total Weight (out of 100)
- Statewide (out of 86)
- Region Rank

DNR/DMLW Feasibility Comments

No DMLW-managed lands or permit requirements apparent from the information presented.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments

(permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Narrow Cape fault zone and Aleutian subduction zone.
The Allison Creek Project is a run of the river (ROR) alternative involving construction of a diversion structure on Allison Creek at elevation 1,300 feet. Water will be diverted from the creek into a 42/36 inch surface / buried penstock to a 6.5 megawatt powerhouse near tidewater.

**AEA Review Comments and Recommendation**

CVEA requests $5,914,491 to construct a 6.5 MW run-of-river hydroelectric project on Allison Creek. The funds would be used to complete construction of the project. The project is expected to offset up to 1.4 million gallons of diesel fuel annually.

AEA has the following concerns: A portion of the land the project will use will be purchased in the future from Alyeska Pipeline, however an agreement is in place to allow construction; and a FERC license amendment is being sought to allow penstock to be installed below grade and a portion to be within a tunnel.

Despite these concerns substantial progress has been made over the last year to advance the project including: issuance of FERC license, completion of final design, Maximum Allowable Construction Cost contract has been awarded, PM contract awarded, turbine-generator owner equipment has been awarded, and owner CM contract awarded.

AEA requires that the grantee obtain the FERC amendment prior to expending Round 7 grant funds.

The Renewable Energy Fund Advisory Committee (REFAC) on 1/7/14 advised AEA to recommend to the Legislature partial funding this project if funding is kept within the Governor's budget of $20M. REFAC further advised AEA to include the initial recommendation of full funding should the Legislature make available additional funds this year. One other hydro project, Statson Creek Diversion, was also recommended for partial funding. The primary reason was to allow the funding of six additional projects in higher cost areas of the state.

AEA recommends partial funding of $4,764,652 (80% of request) if the Renewable Energy Fund Round 7 budget is limited to $20M, and recommends this project second in line for any additional funding beyond $20M, up to the requested grant amount of $5,941,491.
Alaska Renewable Energy Fund: Round 7

App # 1015  Allison Creek Hydroelectric Project Construction

Resource:  Hydro
Proposer:  Copper Valley Electric Association, Inc.
Applicant Type:  Utility

Proposed Project Phase:  Construction

Program Manager:  Audrey Alstrom
Energy Region:  Copper River/Chugach

Stage 3 Scoring Summary

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Stage 3 Total Weight (out of 100): 68.43

DNR/DMLW Feasibility Comments

Project is on DNR/DMLW lands, requires land use authorization. A land use permit is currently being processed by DMLW. A decision favorable to the project was issued, but the land use authorization has not been issued, pending the results of the appeal period.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from Aleutian subduction zone.
Alaska Renewable Energy Fund: Round 7

App # 1018  Chignik Hydroelectric Project Design and Permitting

Resource:  Hydro
Proposer:  City of Chignik
Applicant Type:  Local Government

Project Description

This project will complete the necessary design and permitting for the recommended hydroelectric project in Chignik Bay, AK. The existing hydro project currently only serves as the community’s raw source and transmission and does not produce power for the City. The existing project is in imminent danger of failing and a replacement dam and pipeline will be required in the near future. This work will fulfill the design and permitting needs of the replacement project.

AEA Review Comments and Recommendation

The City of Chignik requests funding for permitting and final design of a hydroelectric project on Indian Lake and River to replace an existing 60 kW plant which is at the end of its useful life.

The City received a Round 1 REF grant (#2195388) for $207,500 to perform a feasibility study, conceptual design and cost estimate for a replacement hydroelectric plant. Additionally, it was funded to enter into a MOU with Trident Seafoods to transfer the FERC license for the existing hydro to the City. The license has been transferred but the study is incomplete.

AEA has the following concerns: The already funded feasibility study remains incomplete as of the date of application, with less than 45% of the grant funds expended. A preliminary 13 page report was submitted with the application but significant questions of project feasibility remain unanswered, including size of plant, project cost, project impacts to resident and anadromous fish, economy of project, etc. The requested grant funding is very high and no information has been provided to support this large amount. Therefore, AEA recommends partial funding of $500,000 to complete design and permitting.

Special provision: AEA must receive and approve the feasibility study before any grant funds for this phase be expended.

Funding & Cost

Cost of Power:  $0.48 /kWh
Price of Fuel:  /gal

Election District:  S-37 Bethel/Aleutians

Project Cost:
Requested Grant Funds:  $1,375,000
Matched Funds Provided:  $0

AEA Funding Recommendation:  $500,000
Alaska Renewable Energy Fund: Round 7

App # 1018 Chignik Hydroelectric Project Design and Permitting

Resource: Hydro
Proposer: City of Chignik
Applicant Type: Local Government

Proposed Project Phase: Design
Program Manager: Audrey Alstrom
Energy Region: Bristol Bay

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

Proposal for rehabilitation and upgrade of existing facility sited primarily on non-DMLW uplands. Applicant reports that a DMLW Water Permit and Dam Safety clearance will be required. The installed raw-water transmission line referenced in this application is approved for its crossing of Indian Creek under SCRO Easement file ADL 229178. Any design that includes placement of additional infrastructure on the creekbed should be reviewed to determine if additional SCRO Easement or Lease requirements apply (based on the navigable status of the stream at the specific location).

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from Aleutian subduction zone. Consider tsunami hazards.
Alaska Renewable Energy Fund: Round 7

App # 1019  Survey Creek Hydroelectric Project

Resource:  Hydro  Proposed Project Phase:  Recon

Proposer:  Edna Bay Community  Program Manager:  Audrey Alstrom

Applicant Type:  Local Government  Energy Region:  Southeast

Project Description

Currently, all electric power in Edna Bay is provided by private gas or diesel generators. Significant gains in efficiency and reliability would be realized with the installation of a diesel power plant integrated with a hydroelectric Archimedes type screw driven generator distribution system. The proposed project is a reconnaissance study for the potential of Survey Creek to provide Hydroelectric power to the community of Edna Bay. In addition, the feasibility of constructing a power plant and distribution system also needs to be evaluated. Besides private homes, the electric service would also serve businesses (including saw mills, the General Store, and the Post Office), the school, the church, and AP&T’s communication site.

AEA Review Comments and Recommendation

Edna Bay Community proposes reconnaissance of a 35-70 kW hydroelectric project on Survey Creek.

Edna Bay has no existing electric utility system and depends on individual privately owned generators for its local power needs. The proposal also requests funding to study the feasibility of constructing a utility system power plant and distribution system.

AEA has the following concerns: the applicant suggests an Archimedes Screw hydroelectric technology may work, but this technology has not been constructed in the U.S. and limited access to this remote site seems to make it a poor candidate to resolve application problems from an unproven technology; Survey Creek is listed as anadromous fish habitat by ADF&G; the proposed site is in the Tongass National Forest and is subject to the Roadless Rule restrictions; and it is outside the scope of the REF to evaluate the need for a conventional power plant and distribution.

AEA encourages Edna Bay to work directly with AEA staff to address the community energy needs. Please contact AEA’s energy planning staff for direct assistance.

The project did not pass the minimum Stage 2 score criteria.

Funding & Cost

Cost of Power:  $3.80 /gal

Project Cost:  $3,562,772

Requested Grant Funds:  $62,272

Matched Funds Provided:  $3,500

Electrical District:  Q-33  Ketchikan/Wrangell

AEA Funding Recommendation:
Resource: Hydro
Proposer: Edna Bay Community
Applicant Type: Local Government

Proposed Project Phase: Recon
Program Manager: Audrey Alstrom
Energy Region: Southeast

Stage 3 Scoring Summary

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Stage 3 Total Weight (out of 100) 39.33

Economic Analysis

Stage 2 Total Weight (out of 100) 39.33
Benefit/Cost Ratio (Applicant) 1.37
Benefit/Cost Ratio (AEA) 1.48

Project Rank

Statewide (out of 86)
Region Rank

DNR/DMLW Feasibility Comments

No known issues

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Fairweather fault.
### Project Description

A Phase II Feasibility Study would be carried out, including the following tasks:

- Project scoping
- Detailed energy resource analysis
- Identification of land and regulatory issues
- Permitting and environmental analysis
- Detail analysis of existing and future energy costs and markets
- Assessment of alternatives
- Conceptual design analysis and cost estimate
- Conceptual business and operations plan
- Final report and recommendations

### AEA Review Comments and Recommendation

The Haines Borough requests funds for a feasibility assessment of two hydroelectric projects totaling 3 MW, and 1.5 miles of transmission to connect to the Ocean Beauty's fish processing facility and residences in the non-organized community of Excursion Inlet. The processor and most residences are seasonal. There is no community power system, which would be necessary to distribute the power to the community.

The project received a Round 4 grant (#625) to perform a two-step reconnaissance study. The first step to determine the reach of anadromous fish habitat is now complete. Work continues on the second half of the study.

The currently funded second half of the reconnaissance study is to address fish habitat, electrical service and estimated load for the Borough subdivision, establishment of community utility, business arrangement for selling power to the fish processor Ocean Beauty, site control and land ownership, and FERC jurisdiction. It will include consideration of fish habitat issues as it affects the cost, capacity, and energy output of the project and environmental licensing concerns. While the fish habitat study has been completed, the final reconnaissance study has not been reviewed or accepted by the Authority. Because this study is not complete it provides no support for this application.

The applicant should also be aware that the Renewable Energy Fund has a strong public benefit purpose. An estimated 2 percent of the energy generated would serve the public, while 98% would serve a private company. AEA encourages Haines Borough and Excursion Inlet to work directly with AEA staff to address the community energy needs. Please contact AEA's energy planning staff for direct assistance.

The application is not recommended due to incomplete prior phases of the project.

### Funding & Cost

- **Cost of Power:** $6.00 /gal
- **Price of Fuel:** $6.00 /gal
- **Project Cost:** $14,500,000
- **Requested Grant Funds:** $213,536
- **Matched Funds Provided:** $10,000

### Election District:
P-32 Downtown Juneau

**AEA Funding Recommendation:** Not Recommended
Applicant accepted delivery of a 34-meter meteorological tower ('Met Tower') from the Alaska Energy Authority in July 2013 and seeks to conduct a reconnaissance and feasibility analysis to determine if it is feasible to use wind power to supplement the energy needs and displace diesel for the communities serviced by SEAPA. After the site assessment has determined the most suitable site for collection of raw wind data, the MET Tower will be installed to gather two (2) years of wind data for a thorough analysis. An analysis of the wind data and a final report will be performed by a qualified consultant specializing in the field.

**AEA Review Comments and Recommendation**

SEAPA submitted a similar proposal in Round 5 and has already been given a 34-meter met tower from AEA's met tower loan program. Applicant should work with AEA's anemometer loan program to get the existing met tower installed in Spring of 2014. Site assessment and selection should begin in 2013 with the assistance of the AEA met tower loan program. A permitting plan can be developed at that time. Most met towers require an FAA permit which takes a short time to complete, a preliminary meeting with US Fish & Wildlife Service and request for site access from the land owner. US Forest Service permission can be requested in 2013 at very low cost to applicant. The staff at SEAPA has experience with large energy projects. Due to size of electrical load and infrastructure in the region, a multi-megawatt scale wind project would be appropriate and allow for the best economies of scale. Recommend full funding.

**Funding & Cost**

- **Cost of Power:** $0.10 /kWh
- **Price of Fuel:** /gal

**Project Cost:** $170,583  
**Requested Grant Funds:** $158,771  
**Matched Funds Provided:** $11,812  
**AEA Funding Recommendation:** $158,771
Alaska Renewable Energy Fund: Round 7

App # 1022  SEAPA Wind Resource Assessment Phase I and II

Resource: Wind
Proposer: The Southeast Alaska Power Agency
Applicant Type: Government Entity

Proposed Project Phase: Recon Feasibility

Program Manager: Rich Stromberg
Energy Region: Southeast

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No known issues

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Swan Lake is currently comprised of a concrete arch dam, 174’ high and 430’ long at its crest, which is located approximately 3/4 mile downstream from the mouth of the original Swan Lake. SEAPA proposes a 15-foot lake raise, and a new reservoir level of 345 feet, raising the crest of the dam to 350 feet. SEAPA would install a 15-foot high Obermeyer gate system as shown below in the existing spillway to achieve the new maximum normal operating pool level of 345 feet. The intake structure would need to be raised to contain the maximum operating pool of 345 feet. This would require raising the concrete intake structure, relocating the gate hoist equipment, and increasing the gate lift shaft.

**AEA Review Comments and Recommendation**

SEAPA requests funding to perform final design and construction to raise the Swan Lake reservoir by 15 feet. This will increase the firm energy available to the SEAPA system and provide for an additional 7500 MWh of hydroelectric generation in an average water year.

SEAPA anticipates submitting the non-capacity license amendment to FERC in April 2014, begin design in May 2015, complete design in March 2015, bid construction in spring 2015 and award construction contract in summer 2015.

Given the anticipated project schedule, AEA believes it would be premature to award grant funds for construction in this round. Also, a 50% cost share will allow SEAPA to match on an equal basis through final design.

Partial funding of $560,488 is recommended to complete the final design phase.

Special Provision: Issuance of FERC non-capacity amendment and resolution of land issues before any Round 7 funds are expended.

**Funding & Cost**

| Cost of Power: | $0.10 /kWh |
| Price of Fuel: | /gal |

**Project Cost:** $13,391,869

**Requested Grant Funds:** $4,000,000

**Matched Funds Provided:** $8,813,869

**AEA Funding Recommendation:** $560,488
Alaska Renewable Energy Fund: Round 7

App # 1023  Swan Lake Reservoir Expansion Project

Resource: Hydro
Proposer: The Southeast Alaska Power Agency
Applicant Type: Government Entity

Proposed Project Phase: Design
Construction

Program Manager: Audrey Alstrom
Energy Region: Southeast

Economic Analysis

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Stage 3 Scoring Summary

Stage 2 Total Weight (out of 100): 81.17
Benefit/Cost Ratio (Applicant): 4.07
Benefit/Cost Ratio (AEA): 4.07

Project Rank

Stage 3 Total Weight (out of 100): 59.95
Statewide (out of 86): 37
Region Rank: 9

DNR/DMLW Feasibility Comments

ADL 106840 lease dam to port facility / ADL 106442 Swan Lake -Tyee Intertie. Use of additional state land required for impoundment area

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Fairweater fault.
THREA proposes to conduct a Feasibility Study and Conceptual Design in an effort to further prove the Walker Lake Hydro Project and apply for a FERC license. The Project is expected to have a 1 megawatt power output, generating 3,615 MWH of energy, using an estimated 780 feet of head and 18 cfs of flow year-round using Walker Lake as a reservoir. Two small earthen dams will raise the lake elevation from 1,180 ft to 1,195 ft, increasing the reservoir storage capacity to allow for year-round power production. A penstock will run from two small dam locations and join together to supply an 11,000 ft long buried penstock that terminates at the powerhouse next to Little Salmon River. THREA proposes to work with IPEC to provide the lowest cost power from the project to benefit of IPEC’s members in the Chilkat Valley and Klukwan service areas and the Upper Lynn Canal (ULC) grid.

AEA has the following concerns with this project:
1. AEA has already funded reconnaissance and feasibility assessments for possible hydro projects in the region including Connelly Lake, Schubee Lake, West Creek, and Burro Creek. These projects were found not to be economically feasible, mainly from a lack of a market to justify the capital costs.
2. The demand for the project power will be a fraction of the potential annual energy available from Walker Lake; given that, the project will spill nearly year round.
3. While the application states that THREA will sell its power to IPEC below the APC rate, it is highly likely the cost of power from Walker Lake would exceed that purchased from APC unless the project was fully funded with grants, given the rising costs of FERC licensing and construction for new hydro projects.
4. This project would displace very little diesel generation (approx. 1,500 gallons per year). 97% of the power purchased from APC (the load Walker Lake would satisfy) is generated from the following hydropower projects: Lutak, Kasidaya, Dewey, and Goat Lake.
5. The amount requested for the reconnaissance study exceeds that which can be justified. If funded, partial funding is recommended.

The project did not pass the minimum Stage 2 score criteria.

### AEA Funding Recommendation:
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<table>
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<tr>
<th>Resource:</th>
<th>Hydro</th>
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<tr>
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<td>Program Manager:</td>
<td>Audrey Alstrom</td>
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<td>Energy Region:</td>
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</table>

**Project Description**

THREA proposes to conduct a Feasibility Study and Conceptual Design in an effort to further prove the Walker Lake Hydro Project and apply for a FERC license. The Project is expected to have a 1 megawatt power output, generating 3,615 MWH of energy, using an estimated 780 feet of head and 18 cfs of flow year-round using Walker Lake as a reservoir. Two small earthen dams will raise the lake elevation from 1,180 ft to 1,195 ft, increasing the reservoir storage capacity to allow for year-round power production. A penstock will run from two small dam locations and join together to supply an 11,000 ft long buried penstock that terminates at the powerhouse next to Little Salmon River. THREA proposes to work with IPEC to provide the lowest cost power from the project to benefit of IPEC’s members in the Chilkat Valley and Klukwan service areas and the Upper Lynn Canal (ULC) grid.

### AEA Review Comments and Recommendation

THREA requests $700,000 in grant funds to perform a reconnaissance and feasibility study of a 1 MW storage or run-of-river hydro project at Walker Lake. The primary purpose of the project would be to supply IPEC's Chilkat Valley and Klukwan system with hydropower. THREA would be an IPP selling to IPEC.

IPEC applied for funding to study Walker Lake in Round 5 (#829) and Round 6 (#920) but did not score within the funding limit in either case. In October 2011 IPEC acquired the 600 kW Ten-Mile hydro project, which provides about 60% of the energy needed for the IPEC’s service area. The balance of their power needs (700,000 kWh) is purchased from AP&T’s Upper Lynn Canal grid. That grid is 97% powered by hydropower, so the amount of diesel to be saved by building Walker Lake is very limited (1,500 gallons per year).

Alaska Power Authority prepared a reconnaissance assessment for Walker Lake in 1988 with an estimated capital cost of $10.5M. Sealaska Corporation updated the assessment in 2005. Both studies concluded that the project feasibility was marginal to poor. The current application did not include an estimated project capital cost.

**Funding & Cost**

- Cost of Power: $0.62/kWh
- Price of Fuel: /gal
- Project Cost: $825,000
- Requested Grant Funds: $700,000
- Matched Funds Provided: $125,000

**Election District:** Q-34 Southeast Island
Alaska Renewable Energy Fund: Round 7

App # 1024  Walker Lake Hydro Project Feasibility

Resource: Hydro
Proposer: Tlingit-Haida Regional Electrical Authority
Applicant Type: Utility

Proposed Project Phase: Recon
Feasibility

Program Manager: Audrey Alstrom
Energy Region: Southeast

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments
ADL 108134 easement application - HSF - UA land possible access concerns

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)
All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Consider seismic ground motions from the Denali fault.
Alaska Renewable Energy Fund: Round 7

App # 1025  Gunnuk Creek Hydroelectric Feasibility Study

Resource: Hydro  Proposed Project Phase: Recon Feasibility
Proposer: Inside Passage Electric Cooperative
Applicant Type: Utility

Program Manager: Audrey Alstrom  Energy Region: Southeast

Project Description
IPEC proposes to conduct a Feasibility Study for the Gunnuk Watershed. In 1977, the Alaska Power Authority identified two potential hydroelectric projects near Kake. The focus was on the Gunnuk Creek watershed. However, the projects were never pursued due to the relatively low cost of diesel fuel which was less than $1.00 per gallon at that time. Since then, diesel has risen sharply to over $4.00 per gallon making the potential for this hydro project more attractive as a more economical power source for the community.

AEA Review Comments and Recommendation
IPEC requests funds to perform feasibility study of a hydroelectric project on Gunnuk Creek near Kake.

AEA has the following concerns: The principle study attached to the application appears to draw unsupported conclusions upon which to base award of grant funds. Because of this, AEA recommends a new reconnaissance report be prepared using a professional engineer, qualified to perform such a study.

Recommend partial funding for a reconnaissance study.

The application did not have an estimated project cost. AEA estimated a cost of $7.5 million, from which the B/C ratio of 4.44 is derived. Once the reconnaissance study is complete, a new project cost should be available, and thus a new B/C ratio. Additionally, Kake's powerhouse and bulk fuel facilities are being upgraded through AEA's RPSU program. The reconnaissance study should help determine the next course of action for Kake in regard to power generation.

Special Provisions: All available basin records be collected and meeting transcripts between USACE, ANTHC, and IPEC to provide backstop for the new study. Field collection and analysis of data shall be conducted. Study will also consider other potential renewable energy sources to serve Kake, and in comparison to the proposed Kake-Petersburg intertie. Elements of the study are to be as listed in the RFA.

Funding & Cost
Cost of Power: $0.62 /kWh  Project Cost: $300,000
Price of Fuel: /gal

Requested Grant Funds: $275,000
Matched Funds Provided: $25,000

AEA Funding Recommendation: $80,000

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Alaska Renewable Energy Fund: Round 7

App # 1025  Gunnuk Creek Hydroelectric Feasibility Study

Resource: Hydro
Proposer: Inside Passage Electric Cooperative
Applicant Type: Utility

Proposed Project Phase: Recon

Program Manager: Audrey Alstrom

Energy Region: Southeast

Stage 3 Scoring Summary

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Stage Total Weight (out of 100)

- Stage Total Weight: 68.20
- Benefit/Cost Ratio (Applicant): 73.00
- Benefit/Cost Ratio (AEA): 4.28

Project Rank

- Statewide (out of 86): 17
- Region Rank: 4

DNR/DMLW Feasibility Comments

Gunnuk Creek - Kake Hatchery-Anadromous stream/ City Water supply conservation easements created in exchanging land at Jenny Creek

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Fairweather fault.
Alaska Renewable Energy Fund: Round 7

App # 1027  Chisana Mountain Wind Feasibility Project

Resource:  Wind
Proposer:  Alaska Power Company
Applicant Type:  Utility

Proposed Project Phase:  Feasibility
Program Manager:  Rich Stromberg
Energy Region:  Yukon-Koyukok/Upper Tanana

Project Description

The Chisana Mountain Wind Feasibility Project would consist of installing a single 50 meter meteorological tower (met tower) to record wind velocities, temperature, and humidity to determine if this site is feasible for a wind turbine installation to generate electricity for the Tok power grid.

AEA Review Comments and Recommendation

The applicant has studied the wind resource in other locations south and southwest of Tok. AP&T has a very experienced staff working in Port Townsend as well as the Tok facility. APC already has a 50-meter tower staged in Tok ready for deployment to the Chisana Mtn site. Access to the proposed site is relatively easy. Met tower site is adjacent to a 15kV buried transmission line. Permitting is relatively straightforward for this project. A class 4 wind regime has been found elsewhere in the region. The electrical load allows for a fair amount of wind energy on the system. Construction costs for this project would be among the lowest for wind projects in the state do to the location on the road system. Recommend full funding.

Funding & Cost

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| Election District:            | T-39       |

| Project Cost:                | $148,800   |
| Requested Grant Funds:       | $119,000   |
| Matched Funds Provided:      | $29,800    |

AEA Funding Recommendation:  $119,000
Alaska Renewable Energy Fund: Round 7

Resource: Wind
Proposer: Alaska Power Company
Applicant Type: Utility

Proposed Project Phase: Feasibility

Program Manager: Rich Stromberg
Energy Region: Yukon-Koyukok/Upper Tanana

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No state lands are involved.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Cathedral Rapids fault.
Alaska Renewable Energy Fund: Round 7

Carlo Creek Hydroelectric Project Reconnaissance Study

Resource: Hydro
Proposer: Native Village of Cantwell
Applicant Type: Government Entity

Projected Project Phase: Recon
Program Manager: Audrey Alstrom
Energy Region: Railbelt

Project Description
The proposed project is a reconnaissance study of a 1 to 2 MW run-of-river hydroelectric project on Carlo Creek near the Parks Highway approximately 10 miles north of Cantwell. The hydro project's output would be sold to the local electric utility, Golden Valley Electric Association, Inc. (GVEA) to reduce GVEA's reliance on diesel and naptha for generation.

AEA Review Comments and Recommendation
Native Village of Cantwell requests funds for a reconnaissance study of a 1-2 MW run-of-river project on Carlo Creek to sell power to GVEA through the AK Intertie. This is similar to the Jack River hydro site recently studied in reconnaissance through Round 4 (#606).

The Village applied for funding in Round 6 (#977) but did not score within the funding level.

Partial funding recommended for reconnaissance study.

Funding & Cost
Cost of Power: $0.22/kWh
Price of Fuel: /gal

Project Cost: $8,340,000
Requested Grant Funds: $54,000
Matched Funds Provided: $6,000

Matched Funds Provided: $35,000
Alaska Renewable Energy Fund: Round 7

App # 1028  Carlo Creek Hydroelectric Project Reconnaissance Study

Resource: Hydro
Proposer: Native Village of Cantwell
Applicant Type: Government Entity

Proposed Project Phase: Recon
Program Manager: Audrey Alstrom
Energy Region: Railbelt

Stage 3 Scoring Summary

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Stage 3 Total Weight (out of 100) = 52.13

Economic Analysis

Stage 2 Total Weight (out of 100) = 61.00
Benefit/Cost Ratio (Applicant) = 1.88
Benefit/Cost Ratio (AEA) = 1.90

Project Rank

Statewide (out of 86) = 51
Region Rank = 4

DNR/DMLW Feasibility Comments

Project includes a water line and intake structures on state lands. DMLW land use authorizations will be required for these structures.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Denali fault and Park Road fault.
Alaska Renewable Energy Fund: Round 7

App # 1029 Jack River Hydroelectric Project Feasibility Study

Resource: Hydro
Proposer: Native Village Of Cantwell
Applicant Type: Government Entity

Project Description

The proposed project is a feasibility study of a 3 MW storage hydroelectric project on Jack River near Cantwell. The hydro project's output would be sold to the local electric utility, Golden Valley Electric Association, Inc. (GVEA) to reduce GVEA's reliance on diesel and naphtha for generation. Other project configurations with installed capacity ranging from 1.6 to 7.3 MW were identified in the 2013 Reconnaissance Study and may be considered in the feasibility study.

AEA Review Comments and Recommendation

The Native Village of Cantwell requests funds for feasibility assessment of a 3 MW storage hydroelectric project on Jack River.

The Village received grant funds in Round 4 (#606) for reconnaissance assessment of the project and has installed a stream gauge. The results of the funded reconnaissance report were that a hydroelectric project on Jack River is technically possible with a range of installed capacities from 1.7 to 7.3 MW. The proposed project reconnaissance report had a cost estimate of $31.5-$50.3 million. AEA used a mid-range estimate, or $40.9 million, to arrive at the benefit/cost ratio of 0.79, indicating the project is likely to have poor economics and would likely be costlier than the existing energy system.

The project was scored but did not pass minimum Stage 2 scoring.

Funding & Cost

Cost of Power: $0.22/kWh
Price of Fuel: /gal

Project Cost: $31,500,000
Requested Grant Funds: $213,750
Matched Funds Provided: $11,250

AEA Funding Recommendation:

Election District: S-38 Wade Hampton/McKinley

1/20/2014 4:00:51 PM
Alaska Renewable Energy Fund: Round 7

App # 1029  Jack River Hydroelectric Project Feasibility Study

Resource: Hydro
Proposer: Native Village Of Cantwell
Applicant Type: Government Entity

Proposed Project Phase: Feasibility
Program Manager: Audrey Alstrom
Energy Region: Railbelt

Stage 3 Scoring Summary

<table>
<thead>
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<th>Criterion (Weight)</th>
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<tr>
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<td>7) Sustainability (Max 5)</td>
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DNR/DMLW Feasibility Comments

The State of Alaska considers portions of the Jack River to be navigable and state owned. It appears that all three prospective sites are located within the navigable portions; landowner authorization would be require for all activities exceeding Generally Allowed Uses below OHW.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Denali fault.
The Flywheel Energy Storage Systems (FESS) for Kodiak Pier Electric Crane is the installation and integration of two (2) ABB modular PowerStore flywheel energy storage units at the City of Kodiak’s Pier III. Modernizing Kodiak’s shipping infrastructure with an electric crane instead of a diesel-powered crane requires KEA to install the two new ABB flywheel energy storage systems, each with one (1) megawatt (MW) of generating capacity, in order to safely integrate the crane’s electrical load demand onto KEA’s isolated grid. This project allows KEA to be the energy solution for the communities of Kodiak Island by making it possible to power a critical component of the City with locally generated, clean renewable energy. The versatile grid‐‐stabilizing flywheel generator would mitigate the sudden increase in electric load caused by the operation of a high‐‐powered electric cargo crane, and would also supplement KEA’s existing Battery Energy Storage System (BESS) for systemwide electric grid support and conserve water utilized at the hydro facility. By being first‐‐in‐‐line to respond to rapid micro‐‐second grid frequency fluctuations, the FESS optimizes the range of frequency and voltage support provided by KEA’s other renewable generation, thereby making KEA’s entire grid system more robust. This project is the next step in advancing KEA’s renewable energy vision for the benefit of all Alaskans by bringing renewable energy to more sectors of Kodiak Island and by demonstrating a new energy storage technology in Alaska.

Kodiak Electric Association (KEA) presents a compelling proposal for the incorporation of a flywheel into their grid with numerous potential benefits including accommodation of a new electric crane at Pier III, extension of the life of the utility’s battery energy storage system, and facilitated integration of future wind turbine installations. KEA is well-suited to demonstrate how flywheel systems can be used for integration of variable renewable energy sources and provide grid stability.

However, because the electric crane would serve a private entity, the offset diesel fuel by the flywheel is not included as a public benefit in AEA’s economic evaluation, dramatically reducing the application’s Benefit/Cost ratio and overall score.

The application also proposed construction of a new tie line to relieve several overloaded feeders; although this tie line could help the integration of the flywheel, its construction will be required regardless and was therefore removed from the recommended award amount. This had the effect of increasing the Benefit/Cost ratio and overall score.

Partial funding recommended, excluding construction of the proposed tie line.
Alaska Renewable Energy Fund: Round 7

App # 1030  Flywheels ESS for Kodiak Pier Electric Crane

Resource: Storage of Renewable

Proposer: Kodiak Electric Association, Inc.

Applicant Type: Utility

Proposed Project Phase: Construction

Program Manager: Alan Baldivieso

Energy Region: Kodiak

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No apparent DMLW permitting requirements from the project description provided; however the route of proposed new powerlines should be reviewed when more detailed alignment plans are available to ensure that they fall entirely within ADOT&PF or municipally-managed ROWs as currently planned.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1034  Metlakatla to Ketchikan Intertie

Resource:  Transmission  Proposed Project Phase:  Design
Proposer:  Metlakatla Indian Community  Construction
Applicant Type:  Government Entity

Program Manager:  Kirk Warren
Energy Region:  Southeast

Project Description

The proposed Metlakatla-Ketchikan Intertie is a 34.5-kV transmission line that will interconnect the electric systems of Metlakatla Power & Light (MP&L) and Ketchikan Public Utilities (KPU). The Intertie will include 14 miles of overhead wood pole transmission line on Annette Island between Metlakatla and Walden Point and an approximate three mile submarine cable crossing of Revillagigedo Channel between Walden Point and KPU’s Mountain Point Substation. The project will also include control system upgrades to allow for the integrated operation of the interconnected systems’ generating plants.

Final design of the Metlakatla – Ketchikan Intertie is underway.

Construction of the line began in June 2010 and the overhead line to the new ferry terminal at Walden Point was completed in August 2013.

The line to the ferry terminal is scheduled to be energized at 12.47-kV in the fall of 2013.

The control system upgrades were completed in July 2011.

AEA Review Comments and Recommendation

Metlakatla Indian Community (MIC) proposes construction of an intertie that connects Metlakatla to Ketchikan. AEA is providing $2 million in Renewable Energy Fund rounds 1 and 4 (applications #20 and #656). Additionally another $2 million in grant funds from the state have been awarded.

The RE Fund round 4 grant was negotiated this year (2013). Conditions of the grant support a step-wise approach to determine feasibility; conceptual design; and completion of all preconstruction activities (including final design documents, final construction cost estimate, demonstration of site control, bathymetry, NEPA, and permitting) prior to construction funding being awarded.

AEA is assisting MIC in complying with these conditions; however this work remains in process. The review team believes it is premature to allocate construction funds.

$4M has previously been provided to the requesting entity and previous grants suggest a step-wise approach. Funding for this round is not recommended until such time as the previous grant’s milestones have been met as described above.

Not recommended for funding.

Funding & Cost

Cost of Power:  $0.10 /kWh  Project Cost:  $14,510,599
Price of Fuel:  /gal  Requested Grant Funds:  $9,281,615

Matched Funds Provided:  $0

AEA Funding Recommendation: Not Recommended

Election District: Q-34  Southeast Island
The Reconnaissance Study of Tenakee Inlet Geothermal Resource funded by Alaska Energy Authority Renewable Energy Grant #7040073 was completed in July 2013. The reconnaissance study was the first time this geothermal resource had been significantly studied. The surface expression of the resource is four hot springs that occur together near the base of a hill approximately 200 feet high in a rugged, isolated, stream valley on Chichagof Island in southeast Alaska. During the field effort in September 2011, the hot springs had surface water temperatures of between 161°F to 176°F. Geochemical sampling of water and soil, a shallow temperature survey, and geological mapping occurred in this first field effort. Later fieldwork in the spring and summer of 2012 included infrared imaging of the area, additional shallow temperature survey, and CO2 gas survey.

The purpose of this phase of the project is to further evaluate the viability of the geothermal resource by 1) obtaining Light Detection and Ranging (LiDAR) data to locate faults and obtain topographical information for design; 2) drill two slim holes to about 2,500 feet each and conduct well testing; 3) conduct an environmental assessment to address agency and environmental issues; 4) prepare a conceptual design to develop the resource; and 5) refine the economic analysis based on the conceptual design and more detailed economic parameters. The primary goal of the site work during this phase would be to collect the information needed to verify resource viability and evaluate whether this project should be considered for Phase 3 investigation and development. The drill holes will be approximately 10 inches in diameter necking down to approximately 2.5 inch core hole. Each well will have a temperature/pressure survey conducted and rock chip samples will be analyzed for fluid inclusions and alterations. If the wells penetrate the reservoir we will conduct flow tests on the wells and collect water samples for chemical analysis. The location, depth, size and flow characteristics are important parameters that determine the viability of the geothermal resource. Evaluating those parameters was beyond the scope of the Phase 1 reconnaissance study. If found viable, the results of this Phase 2 investigation would provide information necessary to support the development phase of the project.

Project Description

With a Round 4 Renewable Energy Fund grant, IPEC completed a reconnaissance study to investigate the Tenakee Inlet geothermal resource. The study indicated some encouraging early signs regarding the potential resource, but also confirmed that the significant transmission line and access road costs make the project very expensive and economically unfavorable, with a benefit/cost ratio below 1.

While there does not appear to be demand for electricity produced by the project in either Pelican or Tenakee Springs, many residents of Hoonah demonstrated their support for the project. Construction of a road to the geothermal site and the addition of other large electrical loads in the area could change the economic picture for a geothermal plant, but at this point both prospects are speculative.

Without exploration wells—proposed in this application—key characteristics of the geothermal resource and the viability of a geothermal power plant will remain unknown. But absent a clear economic justification for the power plant itself (a community energy demand and an apparent cost-effective manner to generate the energy), costly geothermal exploration is inappropriate.

No funding recommended.

Funding & Cost

| Cost of Power: | $0.65 /kWh |
| Price of Fuel: | /gal |

Project Cost: $49,000,000
Requested Grant Funds: $3,378,500
Matched Funds Provided: $0

AEA Funding Recommendation:

Not Recommended
Alaska Renewable Energy Fund: Round 7

Feasibility Study of Tenakee Inlet Geothermal Resource

Resource: Geothermal
Proposer: Inside Passage Electric Cooperative
Applicant Type: Utility

Stage 3 Scoring Summary

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Economic Analysis

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<td>Region Rank</td>
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DNR/DMLW Feasibility Comments

Source- USFS land Tenakee Creek head of Tenakee Bay. Anticipates transmitting power to Hoonah & Pelican

DNR/DGGS Feasibility Comments

The proposed project plans to conduct a LIDAR survey initially to locate faults and topographical details to design a drilling program that will be also based on an earlier reconnaissance study in 2011 (Renewable Energy Grant number 7040073) that included collection of detailed water analyses, conduct a shallow temperature probe study and to locate a number of hot springs in the area. The reconnaissance study suggested that the geothermal zone at Tenakee Inlet is broader than originally thought and that water geochemistry from this site suggests temperatures of (127°C, 260°F) are sufficient for binary electrical power generation (Organic Rankine Cycle). It further suggests that ground-based geophysical studies such as SP and magnetotellurics would not be suitable because of the water saturated ground and the lower temperature of the resource. It appears that is why the Round VII proposal will add a LIDAR survey to attempt to examine local structures. This Round VII proposal includes the drilling of two slim holes to about 2,500 feet each to collect thermal temperature data and conduct well testing. This is more within the capabilities of a slim-hole drill rig than an earlier proposal (Round VI) that called for drill holes up to 4000 feet deep. The project will prepare a conceptual design to develop the resource and refine their economic analysis with the primary goal to collect the necessary data to verify resource viability and determine whether the project should move on to an investigation and development in a Phase 3. The proposal costs seem reasonable for slim-hole drilling to 2500 feet as well as the time necessary to drill two holes with a slim-hole drill rig (about 50 days for completion). We recommend that the applicant provide a detailed outline of the methodology that will use the reconnaissance thermal probe and chemistry data along with the LIDAR data to select and justify the drilling locations for the first drill hole, understanding that the second drill hole would be determined on the basis of the results of the first drill hole. It may be that after the first drill hole is completed, two 1250 ft deep holes may be necessary rather than a single 2500 foot deep hole. This is the nature of exploratory drilling. Additionally, we suggest a summary description of slim-hole drill rigs being considered and their depth capabilities and bore hole diameters should be included. It appears from the proposal that they will not be actually coring with these rigs, but rather collecting cutting chips for their studies that will include fluid inclusions.

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcnoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Fairweather fault.
Alaska Renewable Energy Fund: Round 7

App # 1036 Packers Creek Hydroelectric Project Phase II

Resource: Hydro
Proposer: Chignik Lagoon Village Council
Applicant Type: Government Entity

Project Description

The project is a high head run-of-river hydroelectric power plant on Packers Creek in Chignik Lagoon with an installed capacity of 167kW. The first phase of this project, currently under construction, includes a 480 square foot powerhouse, a 1,500 foot long access road with a bridge across Packers Creek to the powerhouse, a 3,260 foot long access trail to the intake, as well as supply of the turbine, generator, and switchgear. This grant funds the second phase of this project which includes a 9-foot tall concrete dam, a 3,260 foot long 18-inch and 16-inch diameter penstock, a 1,750 foot long overhead power line extension to the existing distribution system and 3,000 foot long control connection to the existing diesel power plant, interconnection to the existing diesel plant controls, addition of dispatchable electric heat to the existing diesel plant waste heat system feeding the school, environmental upgrades to Packers Creek at the Powerhouse location required by ADF&G, and start-up and commissioning of the new hydroelectric power plant.

AEA Review Comments and Recommendation

Chignik Lagoon Village Council requests an additional $2,352,653 to complete construction of the 167 kW Packers Creek Hydroelectric Project. The project will displace 97% of diesel fuel (521,000 kWh) used to generate power today and will also displace additional heat energy through dispatchable electrical heat to the school.

The project received grants in Round 1 for permitting and design (#14) and Round 5 for construction (#836). The project was bid and all bids received were well above the engineer's estimate. Phase I under the Round 5 grant includes construction of access roads and bridge, powerhouse, and purchase and installation of turbine, generator, and switchgear. Phase I is anticipated to be complete by August 2014. Phase II will complete the remainder of the project.

Despite the increase in cost the project still appears favorable and is expected to result in a decrease in electric costs from 75 cents to 33 cents per kWh.

The applicant calculation of their B/C ratio differed from AEA analysis in a few substantial ways. The applicant calculated using base system generation efficiency of 10 gallons/kwh; AEA analysis uses 13 gallons/kwh. Applicant analysis assumed 10,000 gallons of displaced heat load; AEA analysis assumes that no additional heat beyond that going into existing heat recovery system is used. Applicant analysis assumes generation level that is greater than current community demand; AEA analysis uses current community demand.

Recommend full funding.

Funding & Cost

Cost of Power: $0.69 /kWh
Price of Fuel: /gal

Project Cost: $5,389,149
Requested Grant Funds: $2,352,653
Matched Funds Provided: $3,036,496

AEA Funding Recommendation: $2,352,653
Alaska Renewable Energy Fund: Round 7

App # 1036 Packers Creek Hydroelectric Project Phase II

Resource: Hydro
Proposer: Chignik Lagoon Village Council
Applicant Type: Government Entity

Proposed Project Phase: Construction

Program Manager: Audrey Alstrom
Energy Region: Bristol Bay

Stage 3 Scoring Summary

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Stage 3 Total Weight (out of 100) = 83.36

DNR/DMLW Feasibility Comments

A DMLW Water Permit is in force for this project under file LAS 27818. Packers Creek is not currently identified as navigable on DNR maps. If the navigability determination of this waterbody changes, impacted creekbed sites should be reviewed for potential additional easement or lease requirements from SCRO.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Aleutian subduction zone. Consider tsunami hazards.
Alaska Renewable Energy Fund: Round 7

App # 1039 Four Villages Intertie Design

Resource: Transmission
Proposer: Nuvista Light and Electric Cooperative
Applicant Type: Government Entity

Program Manager:
Energy Region: Lower Yukon-Kuskokwim

Project Description
This project will perform initial design, right-of-way planning, and environmental work for transmission lines between the communities shown in Table 2.2.1 in the region. This project will connect closest and largest population center villages shown in table 2.2.1. This initial village group connection is a critical foundation block for the region intertie system, and enables access to alternative energy options. All communities currently have diesel power plants. Subsequent phases to complete design and perform construction are contingent upon the technical findings and community acceptance under this phase.

AEA Review Comments and Recommendation
Ineligible for further review because the applicant is not an eligible party as defined in Section 1.4 of the Request for Grant Applications dated July 2, 2013.
The transmission project proposed does not “link an eligible renewable energy project or eligible natural gas project to other transmission or distribution infrastructures” as required in Section 1.5.

Funding & Cost
Cost of Power: $/kWh
Price of Fuel: $/gal
Election District: S-37 Bethel/Aleutian

Project Cost: $1,250,000
Requested Grant Funds: $1,250,000
Matched Funds Provided: $0

AEA Funding Recommendation:
Project Description

The proposed project will assess hydroelectric and hydrokinetic resource potential and economics of the Tanalian River for providing electric energy to the Community of Port Alsworth. Reconnaissance of hydroelectric at Tanalian Falls has already been complete and this project will include the feasibility and conceptual design of hydroelectric at the waterfalls. Due to land use designations at the proposed hydroelectric power plant we would also like to include a reconnaissance of in-river hydrokinetic along the Tanalian River. This portion of the proposed project has documented National Park Service support and may be a viable option for an alternate location of hydropower.

AEA Review Comments and Recommendation

The Tanalian Electric Cooperative requests funds to assess hydroelectric and hydrokinetic resource potential and economics of the Tanalian River for electrical generation for Port Alsworth.

The Tanalian River is located in Lake Clark National Park and Preserve and any hydroelectric development would require specific authorization by Congress, indicating significant permitting challenges. The application included a support letter from the National Park Service (NPS) for investigation of a potential hydrokinetic project; however, the letter was dated October 29, 2008 and was in support of a previous Round 3 grant application and applicant (#436), and did not indicate any support for a conventional hydroelectric project. It is unknown if the NPS supports hydroelectric studies in the Tanalian River. Additionally, the river is a known salmon stream and is listed as anadromous by Alaska Department of Fish & Game.

In Round 4, Alaska Green Energy submitted and was funded for a similar proposal (#436) to conduct a reconnaissance study of hydroelectric potential for Port Alsworth. However, the grant was canceled before expending any grant funds due to inactivity and inability of applicant to obtain support letters for the project and to hold community and agency meetings.

Although assessment of the hydrokinetic potential of the river was mentioned in the application, no detail was provided regarding the work to be performed, the amount budgeted for the work, or the location of interest. Even if NPS support for a hydrokinetic project had been renewed, insufficient detail was provided for consideration of this component of the proposal. Additionally, hydrokinetics is a developing technology and economics are unlikely to be positive at this time.

Until the applicant can demonstrate that a project has a reasonable chance to be developed and permitted at the location, funding is not recommended.
App # 1048  Kaktovik Wind Diesel Design and Permitting

Resource:  Wind
Proposer:  North Slope Borough
Applicant Type:  Local Government

Project Description
The North Slope Borough (NSB) envisions a wind energy and area-wide energy management system, consisting of wind diesel integration, end-use energy efficiency, automated building controls, and conservation. This phase of the project is the design and permitting phase of a three phase project which will include a phase for construction and commissioning for three anticipated wind turbines to supplement the existing power generation and distribution system for the community of Kaktovik. Participants in the project include North Slope Borough (NSB), a contracted engineering/design firm, and Northern Power Systems of Barre, Vermont (wind turbine experts and supplier). The contractor will provide overall project management and system engineering during this phase of the project. During the construction phase, NSB will recruit an engineering and construction contractor for design and installation of all civil works, erection of the wind turbines, and installation of all ancillary electrical systems. Northern Power will provide Northwind 100B model wind turbines plus startup & commissioning services.

AEA Review Comments and Recommendation
Kaktovik has received REf Round 4 funding to complete a wind resource analysis, feasibility study and conceptual design. The existing power plant is easily adaptable to integration of wind energy. Power plant description in section 3.5 and 4.2.2 of this application is one of the most detailed we've seen. Good summary of permitting and environmental concerns. NSB has a long history of maintaining village power systems at a high level of reliability and functionality. Budget is higher than standard wind project designs due to increased environmental assessment and permitting. Good wind resource. Recommend full funding.

Funding & Cost
Cost of Power:  $0.15 /kWh
Price of Fuel:  /gal

Project Cost:  $4,565,200
Requested Grant Funds:  $440,000
Matched Funds Provided:  $44,000

AEA Funding Recommendation:  $440,000
Alaska Renewable Energy Fund: Round 7

App # 1048  Kaktovik Wind Diesel Design and Permitting

Resource:  Wind
Proposer:  North Slope Borough
Applicant Type:  Local Government
Provisional Project Phase:  Design

Program Manager:  Rich Stromberg
Energy Region:  North Slope

Stage 3 Scoring Summary

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Stage 3 Total Weight (out of 100): 42.23
Stage 2 Total Weight (out of 100): 65.83

DNR/DMLW Feasibility Comments

Coastal Zone review no longer applicable since the ACMP program sunset in 2011; ADNR will not be coordinating a coastal zone management review. Project review should take place, but should be initiated by the NSB. US Fish and Wildlife Service must be included for review given endangered species, migratory birds, and proximity to the Arctic National Wildlife Refuge. No state land involved; KIC lands.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
**Project Description**

This phase of the Barrow to Atqasuk Transmission Line Project is for final design and permitting required for the construction of the transmission line as well as home and building conversions to electric space heating.

**AEA Review Comments and Recommendation**

This grant request is to fund the subject Project for final design and permitting. There is a current grant to the North Slope Borough for Feasibility and Concept Design in the amount of $210,000.

As of this current grant application review there have been $0 expended on the grant currently in place although much work has taken place. Recommend funding of this Project commensurate with substantial completion and acceptance of the previous grant documents.

**Funding & Cost**

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<tr>
<td>Price of Fuel</td>
<td>/gal</td>
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</table>

**Project Cost:** $17,342,837

**Requested Grant Funds:** $2,017,818

**Matched Funds Provided:** $201,782

**AEA Funding Recommendation:** $2,017,818
Alaska Renewable Energy Fund: Round 7

App # 1049 Atqasuk Transmission Line Design and Permitting Project

Resource: Transmission
Proposer: North Slope Borough
Applicant Type: Local Government

Proposed Project Phase: Design
Program Manager: Kirk Warren
Energy Region: North Slope

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
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<td>1) Cost of Energy (Max 35)</td>
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Economic Analysis

- Stage 2 Total Weight (out of 100): 74.17
- Benefit/Cost Ratio (Applicant): 3.55
- Benefit/Cost Ratio (AEA): 3.30
- Stage 3 Total Weight (out of 100): 52.27
- Statewide (out of 86): 50
- Region Rank: 1

DNR/DMLW Feasibility Comments

2.6 and 2.7 cost figures don’t match. No state land involved; within BLM-managed NPR-A, City of Atqasuk, ASRC, and UIC. Section 4.3.3. lists state of Alaska land use permit and easement are needed; no state land involved so no DNR authorizations are necessary.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1050  Bristol Bay Borough School District Solar PV Project

Resource: Solar PV  Proposed Project Phase: Design
Proposer: Bristol Bay Borough School District  Construction
Applicant Type: Government Entity

Program Manager: David Lockard
Energy Region: Bristol Bay

Project Description

This project will consist of a 50 kW (d.c. rating) ground-mounted photovoltaic (PV) system, to be installed next to the school building. The PV system will generate clean, renewable power for decades to come, reducing the amount of electricity the school buys from the local utility and reducing pollution associated with burning fossil fuels. The system will also provide an opportunity for the school's students and the wider community to learn about PV. The system will be composed of (200) 250-watt photovoltaic (PV) collector panels (e.g. Solarworld 250W monocrystalline or equivalent), 50 kW DC to AC power inverter capacity (multiple smaller inverters, e.g. SMA Sunnyboy 6000TL) and a data acquisition system with a graphical display inside the building and accessible through the Internet. The panels will be wired in multiple DC series circuits called strings. The strings will be wired to a combiner box, then connect to the power inverter(s) which transforms the DC power into AC power suitable for use by the building's existing electrical system. The inverter assures that the PV generated power is compatible with the power supplied by the utility grid and will disconnect from the electrical system in the event of a utility power outage to prevent “back feed” to the utility grid. The proposed system is sized to supplement current electric usage and peak demand only, as it will not store power. The proposed system will be interconnected with the electrical system and controlled to “follow” the existing systems' electrical characteristics.

A dedicated data acquisition system tied directly to the inverter will display the performance of the PV system and describe how it works through a dedicated live display setup in the lobby. A revenue grade utility meter will also be installed on the PV system to accurately measure the power generated. The existing electric systems supply 208-volt, three phase power for larger loads and 120-volt, single-phase for most of the distributed loads from a three phase service provided by NEA. The average monthly electric demand for the school is approximately 137 kW.

AEA Review Comments and Recommendation

The applicant proposes a 52kW solar photovoltaic system at the Bristol Bay Borough School in Naknek. This system would offset approximately 42,367 kWh of electricity in the first year. The applicant did not provide details regarding electric load (weekday average, weekend average, summer average, etc.) or an agreement with the utility regarding interconnection.

Naknek Electric Association provided a 10/30/13 e-mail stating that it does not offer net metering. Both the application and the utility director indicated that the applicant had not discussed the project with the electric utility to request permission to interconnect.

AEA does not recommend this project for funding due to the lack of electric load detail and the lack of an agreement with the utility that would allow the proposed system to be connected to the local grid.

AEA encourages BBB School District to work directly with AEA staff to address the community energy needs. Please contact AEA's energy planning staff for direct assistance.

Funding & Cost

Cost of Power: $0.50 /kWh  Project Cost: $235,000
Price of Fuel: /gal
Requested Grant Funds: $230,000
Matched Funds Provided: $5,000

AEA Funding Recommendation:

Election District: R-36  Dillingham/Iliamna

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Alaska Renewable Energy Fund: Round 7

App # 1054  Multiple Alternative Energy Sources for Napakiak

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<tr>
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<tbody>
<tr>
<td>Utility</td>
<td>Lower Yukon-Kuskokwim</td>
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</table>

Project Description

The applicant will work with Energy Unlimited, LLC on final design of an alternative energy system that includes a wind tower, solar panels, and an energy storage system. The products we intend to use for each of these technologies are tested, warrantied, and commercially available. However, the combination of these technologies to achieve maximum local benefits is innovative.

AEA Review Comments and Recommendation

Ineligible for further review because the applicant did not provide a conceptual design report 30 days prior to the application deadline as required and identified in Sections 1.12, 2.5 and Section 4 of the Request for Grant Applications dated July 2, 2013.

Section 4 of RFA, page 26

7. Wind applications requesting Phase III (Final Design and Permitting) or Phase IV (Construction, Commissioning, Operation and Reporting) funding will submit documentation necessary to demonstrate the fulfillment of all requirements for earlier phases of the project identified in Section 2 of the RFA [i.e. Phase II (Feasibility Analysis, Conceptual Design) or Phase III (Final Design and Permitting)] 30 days prior to the application deadline.

Funding & Cost

<table>
<thead>
<tr>
<th>Election District:</th>
<th>Cost of Power:</th>
<th>Price of Fuel:</th>
<th>Project Cost:</th>
<th>Requested Grant Funds:</th>
<th>Matched Funds Provided:</th>
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<td>/gal</td>
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</table>

AEA Funding Recommendation:

Did Not Pass Stage 1
Alaska Renewable Energy Fund: Round 7

Adak Wind Data Collection Analysis and Preliminary Design

Resource: Wind
Proposer: City of Adak, Alaska
Applicant Type: Local Government

Project Description

The proposed project is for wind field data collection, analysis and preliminary engineering design. Wind field data collection will require a one year collection period as recommended by AEA for location of wind generators. The wind data will be analyzed and used for the design of the wind generators and related facilities. The City of Adak has completed a hydroelectric power feasibility analysis and preliminary engineering prepared by McMillen LLC. The report recommends hydro – wind generation with pump storage development project that includes hydroelectric power generation, raising the Lake Bonnie Rose and Lake DeMarie dams, construction of the penstock, powerhouse (2 MW hydro), transmission lines, wind generation (4.5 MW), wind pump from L. DeMarie to L. Bonnie Rose storage, and associated facilities. Both lakes are in the same watershed. The hydro - wind generation with pump storage project will supply hydro and wind generated power to the community as well as pump water to the higher elevation Lake Bonnie Rose to store potential energy for conversion into hydropower generation to the community to meet demand (a buffering effect). The next step in the development process is wind field data collection and analysis to design the wind generation system. The hydropower feasibility component and preliminary engineering design is complete in the McMillen report.

AEA Review Comments and Recommendation

The City of Adak is proposing to conduct a feasibility analysis of including wind energy in their local energy grid. The wind resource model predicts a Class 6 wind resource at the proposed met tower site, indicating a very good wind resource. AEA is concerned that the existing community power generation and distribution system is not currently ready to incorporate wind energy, but we also recognize that Adak is addressing the energy system and is likely to be working with AEA through the Rural Power System Upgrade program in coming years. The amount of wind energy proposed for this community is much higher than AEA is comfortable pursuing. AEA believes that a 0.9 to 1.0 megawatt system would be more appropriate for this community. The cost estimate to install the met towers is twice the highest AEA has ever seen.

Weekly monitoring of the met tower site is warranted given the extreme winds possible in Adak. Electrical load data must be collected with dataloggers at the power plant and in parallel from the fish processing plant and other self-generating users not presently connected to the grid to develop a properly sized power generation system.

AEA encourages Adak to continue to work with AEA staff to address the community energy needs. Please contact AEA’s energy planning staff for direct assistance.

The project did not pass the minimum Stage 2 score criteria.

Funding & Cost

Cost of Power: $0.81 /kWh
Price of Fuel: /gal

Project Cost: $72,400,000
Requested Grant Funds: $160,000
Matched Funds Provided: $0

AEA Funding Recommendation: Did Not Pass Stage 2
Alaska Renewable Energy Fund: Round 7

App # 1056  Adak Wind Data Collection Analysis and Preliminary Design  Standard Application

Resource: Wind
Proposer: City of Adak, Alaska
Applicant Type: Local Government

Proposed Project Phase: Feasibility
Program Manager: Rich Stromberg
Energy Region: Aleutians

Stage 3 Scoring Summary

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<th>Criterion (Weight)</th>
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<td>7) Sustainability (Max 5)</td>
<td>35.33</td>
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</table>

Economic Analysis

| Stage 2 Total Weight (out of 100) | 35.33 |
| Benefit/Cost Ratio (Applicant) | 0.27 |
| Benefit/Cost Ratio (AEA) | 0.47 |

Project Rank

| Stage 3 Total Weight (out of 100) | 35.33 |
| Statewide (out of 86) |  |
| Region Rank |  |

DNR/DMLW Feasibility Comments

This project is not located on DMLW-managed land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
The Newtok community must move due to the erosion of the existing community site and based on the Mertarvik Relocation Plan, the time has arrived to begin the study and development of an efficient energy project for the new site. Ungusraq Power Company (UPC) is the independent power producer for the community of Newtok, Alaska. This proposed UPC project will begin the conceptual and preliminary design and feasibility study work necessary to utilize the least diesel fuel and to maximize the renewable energy resources for: electrical and heat generation production systems at the new Mertarvik community site.

**AEA Review Comments and Recommendation**

The community of Newtok, AK is relocating due to erosion. The new community site of Mertarvik, Alaska is Southeast of the current location and the State wind model projects a possible class four to six wind resource in the area.

Ungusraq Power Company (UPC) / Newtok Traditional Council (NTC), applying as an Independent Power Producer (IPP), proposes feasibility and conceptual design work for a diesel power plant and distribution system and to determine the advisability of installing wind turbines, solar pv, biomass and/or heat recovery in Mertarvik, Alaska.

Design work for the power plant and distribution system is ineligible for funding under the RE Fund. Conceptual design work for a wind or solar farm or heat recovery loop should be done concurrently with or after the power plant and distribution system has been addressed. A biomass feasibility study should be performed concurrently with or after a determination of which buildings could be served by a heat recovery loop.

Currently, there are two groups claiming legitimacy as the Newtok Traditional Council with the Bureau of Indian Affairs (BIA) making the determination. An initial decision was made by BIA and is being appealed. It is anticipated that a final decision from BIA will be made in the second half of 2014. Securing site control and obtaining a proper Waiver of Sovereign Immunity may be an issue until this situation is resolved.

Recommend partial funding of $75,000 to collect wind data at Mertarvik and electrical and thermal load data at Newtok, both for a minimum of one year, and to write a wind/solar resource assessment.

**Funding & Cost**

| Cost of Power: | $0.80 /kWh |
| Price of Fuel: | /gal |

**Project Cost:** $8,000,000

**Requested Grant Funds:** $375,000

**Matched Funds Provided:** $25,000

**AEA Funding Recommendation:** $75,000
Project appears to be entirely off of DNR/DMLW lands.

DNR/DOF Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Northwest Arctic Borough is seeking $447,800.00 from this Grant Program on behalf of Noatak and Alaska Village Electric Cooperative, Inc. (AVEC), to add a solar energy component to the existing diesel power generation system that serves the community. Northwest Arctic Borough will construct a new 52.5 kW array of 210 pc. 250W, Photovoltaic (PV) modules in Noatak, Alaska. The array will be inclined at 34 degrees from May through September, and 90 degrees the remainder of the year to take advantage of the solar angle at this northerly location. The annual power production of the array is estimated to be approximately 49,500 kWh (with shading). The solar array will be located on a lot of land under discussion near the powerhouse. A Feasibility study was performed for a system of similar size in 2008, see attached. A request for funding was turned in at that time for round 1, Renewable Energy Fund. Since that time fuel prices have increased and equipment (Solar Arrays) have come down in price. This have made the project more economically feasible. Considering that no other renewable energy option is available for Noatak as Wind and Hydro is below development stage, Solar-PV is a good match for this community. Additionally Solar-PV is being successfully installed and integrated for the regions Water-plants to help offset the use of Diesel fuel and lower the cost of living.

The Northwest Arctic Borough (NWAB) proposes a 52.5kW solar photovoltaic system adjacent to the Alaska Village Electric Cooperative (AVEC) powerhouse in Noatak. The NWAB intends to transfer ownership and operation of this project to AVEC. The project would generate approximately 49,500 kWh the first year with a capacity factor of 11%.

This proposal contains a number of technical deficiencies:
- There is no design, which is typically required for a project of this size
- There is no site control in place, which is required for construction projects
- The feasibility study provided, which is the basis for the application, was performed without a site visit.
- The proposed site is between the powerhouse, which is in the floodplain, and the river
- The cost estimate did not provide cost details
- The NWAB resolution authorizing the grant application was not signed
- The Noatak powerhouse needs work: the smallest genset is in poor condition, the three phase is unbalanced, and the heat recovery system is not working.

AEA does not recommend this project for funding. The AEA powerhouse program offers technical assistance to the community and utility in planning for improvement of the diesel powerhouse and heat recovery system, and AEA’s energy planning staff is also available for assistance.
Alaska Renewable Energy Fund: Round 7

App # 1059 Cosmos Hills Hydroelectric Design and Permitting

Resource: Hydro
Proposer: Alaska Village Electric Cooperative
Applicant Type: Utility
Proposed Project Phase: Design
Program Manager: Audrey Alstrom
Energy Region: Northwest Arctic

Project Description
After careful consideration of the potential hydropower sources in the Cosmos Hills, as documented in the Feasibility Study and Conceptual Design Report, AVEC has chosen to move forward with design and permitting for a hydroelectric project on the Kogoluktuk River. The Kogoluktuk River project would be a run-of-river project with a small diversion dam and intake, a long above-ground penstock pipeline, a small Kaplan turbine and powerhouse, and a tailrace back to the river. The project would also include an access road, a transformer, and a high-voltage transmission line. At this location, the upstream basin catchment area is approximately 424 square miles.

AEA Review Comments and Recommendation

AVEC requests $2,922,000 in grant funds for permitting and 65% design for a 690 kW run-of-river hydroelectric project on the Kogoluktuk River. The project would serve the communities of Ambler, Shungnak and Kobuk. Shungnak and Kobuk are interconnected at present, while Ambler is not interconnected. Ambler is 29 miles from Shungnak.

The project received a Round 1 Renewable Energy Fund grant (#74) for $1,025,000 to complete a feasibility study. A draft feasibility study was included with the application but has not been finalized and accepted by AEA.

According to the draft feasibility study, it is still unknown if the project would require FERC licensing and the project description mentions fish ladders may be required. FERC licensing adds additional costs to a project and fish ladders also create higher costs and a technical barrier for development. It is unknown if a fish ladder can be permitted and operate successfully in an Arctic environment. A feasibility study generally would be more definitive with these matters.

The requested funds of $2.9M for the design phase of work are high and unsupported. The proposal does not indicate the design team members. Additionally, small hydropower engineering and operation with long, above-ground penstocks have not been proven north of the Arctic Circle, and a major concern is system freeze-up during sustained temperatures approaching -40 to -50 deg. F. Therefore, practical successful operation of potential projects remain speculative and risky.

The project is estimated to provide 1,669,835 kWh of the electrical demand and displace approximately 45,000 gallons of diesel used for heat. The proposal estimated a total capital cost of $38.66 million; however, the cost estimate did not include the cost of a transmission line to Ambler nor the cost to implement hydro generation to be used for space heating. Although the project appears to have fairly significant benefits, the costs are more substantial and the benefit/cost ratio of 0.38 reflects this.

Considering the concerns listed above and the challenging economics, the project was not recommended for funding. The applicant appealed AEA’s decision. Staff reconsidered based upon new information and scored the project which did not meet the minimum Stage 2 score.

Funding & Cost

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</table>

Project Cost: $38,660,000
Requested Grant Funds: $2,922,000
Matched Funds Provided: $150,000

T-40  Arctic

AEA Funding Recommendation: Did Not Pass Stage 2
Alaska Renewable Energy Fund: Round 7

App # 1059  Cosmos Hills Hydroelectric Design and Permitting

Resource: Hydro
Proposer: Alaska Village Electric Cooperative
Applicant Type: Utility

Proposed Project Phase: Design
Program Manager: Audrey Alstrom
Energy Region: Northwest Arctic

Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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DNR/DMLW Feasibility Comments

Should this project move forward, a formal navigability determination should be requested to determine the status of the Kogoluktuk River. In a letter dated 8/20/2010 to AVEC, it was noted the navigability status of the river is currently unknown. If the river is navigable, state authorizations will be required.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1062 False Pass Hydrokinetic Feasibility Study

Resource: Hydrokinetic
Proposer: City of False Pass
Applicant Type: Local Government

Project Description

The City of False Pass requests Alaska Energy Authority (AEA) funding through the Renewable Energy Grant Program (RFA 2014-006) to complete Phase II Feasibility Analysis and Conceptual Design Requirements (Project) for a proposed tidal energy project at False Pass in the Isanotski Straight. The City of False Pass, like most communities of the Aleutian Islands, depends on diesel fuel to meet their electricity and heating needs. While diesel fuel is currently the most practical option for such communities, it also creates economic, energy security and environmental problems—it has a disproportionately high carbon dioxide (CO2) output compared to other power generation systems—at both local and global levels. The City of False Pass, fortunately, is situated near a significant hydrokinetic (tidal) resource at the Isanotski Strait that offers a potential to significantly reduce, or eliminate, the use of diesel fuel. The viability of this resource was confirmed through a reconnaissance study funded by the U.S. Department of Energy (DOE) Tribal Energy Program that included measurement of the current velocities in the vicinity of False Pass through a full lunar cycle. This Project proposes to build on the completed reconnaissance study to accelerate efforts to develop this tidal energy resource. The following goals will be achieved in this Project: (1) measure current velocities and collect turbulence data at 3-5 sites selected for potential deployment of tidal turbines based on University of Alaska (UAA) circulation modeling, (2) analyze the data from the field effort including extending UAA modeling efforts to select the optimal site(s) for tidal turbine placement, (3) collect existing environmental data and develop draft environmental study plans in consultation with regulatory agencies, (4) initiate stakeholder outreach efforts, (5) collect additional geophysical data required to inform engineering of the project, and (6) complete a conceptual design and economic analysis for a tidal energy project at False Pass. The Project Team is comprised of the City of False Pass; Aleutian Pribilof Islands Association, Inc. (APIA); Aleutian Pribilof Islands Community Development Association (APICDA); University of Alaska Anchorage (UAA); Benthic GeoScience, Inc.; National Renewable Energy Laboratory (NREL) and ORPC Alaska, LLC (ORPC).

AEA Review Comments and Recommendation

The City of False Pass proposed to conduct a feasibility study for a tidal power project in Isanotski Strait, building on previous reconnaissance efforts. The proposal was submitted in response to language in the Renewable Energy Fund (REF) Round 7 Request for Applications (RFA) that specifically identified reconnaissance and feasibility stage hydrokinetic projects as eligible for REF funding; this language was included in an effort to address a perceived eligibility gap between the Emerging Energy Technology Fund (EETF) and REF. This language was included at the recommendation of the REF Advisory Committee.

The proposal, which calls for additional field measurements, modeling, site selection, and preparation for permitting, was submitted on behalf of a strong project team actively involved in pioneering hydrokinetic development in the state.

As required by the review protocol described in the RFA, the proposal was evaluated by the same criteria used for all REF applications, and was disadvantaged by the high costs and uncertainty associated with a nascent technology. The proposal is recommended for funding. As described in the RFA, the proposal could be recommended for funding ahead of its rank, if it demonstrated both the importance of the proposed resource area relative to other potential resource areas and evidence that tidal power shows potential for economic deployments in Alaska in the future.

While other strong and potential promising tidal resources exist in Alaska, the project team has made a convincing case that the proposed resource site is exceptional because it boasts the strongest tidal currents identified in the state being considered for power generation and is located nearby an electrical load.

With only a single grid-connected tidal installation operating in the country, it is difficult to predict how rapidly the installed costs of tidal power generation plants will decline as the technology matures. The applicant has reasoned that deployment and retrieval costs will decline dramatically as operators gain experience and equipment is improved. Although numerous challenges may remain before economic deployments can be realized in Alaska, the potential for such deployments does exist.

AEA requested the advice of the REF Advisory Committee regarding the advancement of the proposal ahead of higher ranking projects as permitted by the RFA; however, the committee did not recommend elevating the proposal beyond its scoring rank.

Funding & Cost

Cost of Power: $0.51 /kWh
Price of Fuel: /gal

Project Cost: $5,000,000
Requested Grant Funds: $428,646
Matched Funds Provided: $137,820

AEA Funding Recommendation: $428,646
DNR/DMLW Feasibility Comments

The submerged velocity monitoring research equipment referenced in this application are currently authorized by SCRO temporary permit LAS 28655.

Applicant states that "The tideland access near the airport at False Pass... is considered a municipal tideland. The area is retained in state ownership and managed by the Alaska Department of Transportation and Public Facilities. If the [proposed] transmission line route is designed within the boundaries of the airport jurisdiction, application and approvals would be needed from ADOT&PF." However, ADOT&PF acquired their airport management right from non-State upland owners rather than DNR and so do not necessarily have use of adjoining tidelands. In addition, SCRO recently issued an easement for municipal use of submerged lands near False Pass that would not have been required if an ATS to the City or Borough had been in force at the project location. Applicant

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Aleutian subduction zone. Consider tsunami hazards.
This project entails the construction of a ground-mounted, stand-alone solar energy system to manage the energy capacities of the Iliamna Village Council and adjacent maintenance buildings, eventually adding houses and/or additional community facilities to this solar energy powered system as funds permit. Further study will take place during Phase I of this project to assess the measure of insolation in our location, to determine how much sunlight will be available for solar panels to convert into electricity and how many hours of peak sunlight the location receives per day, making adjustments for Net Metering with the local power company, or for a battery-storage system. We will assess the number of devices that will be electrically powered in total for both buildings, and the total kWh and wattage consumption of these devices. An assessment must also be performed to determine an accurate cost for both buildings' heating fuel requirements. Once a thorough energy cost assessment has been completed, Phase I will meld into Phase II as further assessments are implemented to develop cost evaluations for installing a solar electric system to successfully power total electric energy consumption requirements, as well as solar energy systems to manage both buildings' heating needs, taking into account plausible separate and hybrid systems. Phase II will also entail developing a detailed evaluation intended to further assess the technical, economic, financial, and operational viability of the project. Phase II will be completed by narrowing the focus of our final ground mounted solar panel design and construction plans, to prepare for future final design and implementation of the Project, and establish pre-construction equipment, shipment costs, time-frames etc.

AEA Review Comments and Recommendation

The Iliamna Village Council has applied for an $800,000 grant with a $120,000 match for reconnaissance, feasibility and conceptual design of a ground-mounted solar photovoltaic system. The system would offset heating and electrical costs at its Village Council office and possibly adjacent buildings.

Since 2009, AEA has assisted the Iliamna-Nondalton-Newhalen Electric Cooperative (INNEC) with a series of utility upgrades to repair the hydro tailrace, rebuild hydro turbines and generators, improve the intake system, upgrade controls, and install interruptible electric boilers at the schools in Newhalen and Nondalton. These projects are intended to benefit all three communities by improving the reliability and reducing the cost of hydropower. AEA has recently funded a feasibility study to determine if the existing capacity at the Tazimina Hydro project should be increased.

AEA does not recommend this application for funding because of its high cost, minimal proposed fossil fuel savings, the lack of a utility net metering policy and procedures or endorsement of the project, and the alternative opportunity to heat with interruptible hydropower from INNEC.

AEA recommends that the applicant contact the INNEC board regarding electricity rates and the possibility of heating the applicant building with excess hydropower. Also consider energy efficiency measures in public buildings for cost-effective energy savings. The applicant may also be able to participate in the projections of future heating and power use that will be part of the Tazimina Hydro capacity increase study.
The Native Village of Chenega (aka, Chenega Bay) proposes to construct a run-of-the-river hydroelectric project on Anderson Creek. The planned 64 kW capacity project will offset power currently generated by burning diesel. The non-jurisdictional hydro will offset up to 10,406 gallons of diesel annually which translates into $56,600 in annual savings. Engineering design is 95% complete and permit applications to the appropriate agencies have been submitted.

AEA Review Comments and Recommendation

Native Village of Chenega requests $1,400,000 to construct the 64 kW hydroelectric project on Anderson Creek. The project is estimated to reduce diesel consumption for electrical generation by half.

The project received grants in Round 0 for reconnaissance study and Round 3 for final design and permitting (#455).

AEA has the following concerns: Permits and site control have not been received, the Declaration of Intent has not been submitted and it is unknown if the project is exempt from FERC licensing. Draft plans titled as 95% design were submitted with the application but did not include technical specifications, and cannot be finalized until permitting is complete. The estimated cost for construction is $1,650,000 and it is unclear where the additional funding will come from.

For these reasons we believe it is premature to grant further funding. Not recommended.
Alaska Village Electric Cooperative (AVEC), the electrical utility provider in Old Harbor, is proposing to complete final design and permitting of a hydroelectric project in Old Harbor, Alaska. The 262 kW (initial; nominal) basin diversion project will be located on East Fork Mountain Creek and Lagoon Creek Tributary. The project will be capable initially of generating an average of about 2,018,924 kWh annually and could grow to an annual generation of 2,725,646 kWh when demand warrants and an additional turbine is installed. The project will run year-round and meet all the existing and future electricity demands of the community.

AEA Review Comments and Recommendation

AVEC requests $1,092,500 to complete final design for a 262 kW hydroelectric project on East Fork Mountain Creek and Lagoon Creek at Old Harbor. The project received grants in Round 1 (#73) for $225,000 and Round 4 (#644) for $237,500 to complete a feasibility study, FERC licensing, and preliminary design. Additionally, the City of Old Harbor received a Community Development Block Grant in support of the project for $250,000 to complete the FERC License Application and permitting.

AEA has the following concerns: The FERC License Application was submitted October 2013 and it will take 18-24 months for the application to be reviewed and granted. Site control, including an easement within the Kodiak National Wildlife Refuge, and changes to the conservation easement with the Exxon Valdez Oil Spill Trustee Council, remains to be established. Additionally, project economics are marginal and the requested funds for this phase of work are extremely high and unsupported.

Recommend partial funding to complete final design.

It is suggested AVEC make every effort to keep as much of the costs down to keep this project moving ahead.

Funding & Cost

Cost of Power: $0.58 /kWh
Price of Fuel: /gal

Project Cost: $8,155,000
Requested Grant Funds: $1,092,500
Matched Funds Provided: $57,500

AEA Funding Recommendation: $400,000
Alaska Renewable Energy Fund: Round 7

App # 1065  Old Harbor Hydroelectric Project Final Design and Permitting

Resource: Hydro
Proposer: Alaska Village Electric Cooperative, Inc.
Applicant Type: Utility

Proposed Project Phase: Design
Program Manager: Audrey Alstrom
Energy Region: Kodiak

Economic Analysis

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Stage 3 Scoring Summary

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Project Rank

- Stage Total Weight (out of 100): 60.35
- Statewide (out of 86): 36
- Region Rank: 1

DNR/DMLW Feasibility Comments

Expect a water right application and DNR is aware of the project. No other authorizations appear to be needed.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Aleutian subduction zone and Narrow Cape faults.
Alaska Renewable Energy Fund: Round 7

App # 1066 Marshall Wind Energy Final Design and Permitting Project

Resource: Wind
Proposer: Alaska Village Electric Cooperative, Inc.
Applicant Type: Utility
Proposed Project Phase: Design
Program Manager: Josh Craft
Energy Region: Lower Yukon-Kuskokwim

Project Description

Building on the results of the completed Conceptual Design Report (attached in Tab G), Alaska Village Electric Cooperative, Inc. (AVEC) is proposing to complete the final design and permitting to install three Northern Power Systems NPS 100-24 turbines, each with a 95 kilowatt (kW) installed wind capacity (aggregate generating capacity of 285 kW), to the existing diesel power generation system in Marshall. Once work done under this grant is completed, AVEC will seek funding to construct the turbines. A met tower in the proposed turbine site has collected 21 months of data. A wind resource report has been completed based on data from the met tower and has revealed a Class 4 (good) wind resource at the site with an average wind speed of 6.30 m/s.

AEA Review Comments and Recommendation

Alaska Village Electric Cooperative, applying as a Utility, proposes to complete a final design of and permitting for a wind-diesel power system in the community of Marshall, Alaska. The final design would be based on a feasibility study and conceptual design report performed under a Round 4 RE Fund Grant #7040021. The draft conceptual design report was submitted and reviewed by AEA prior to the Round 7 RE Fund application deadline. A final conceptual design report has been submitted.

Recommend full funding with the special provision that the final conceptual design report be accepted by AEA prior to allocation of design and permitting funds.

Funding & Cost

Cost of Power: $0.50/kWh
Price of Fuel: $/gal

Project Cost: $3,214,875
Requested Grant Funds: $353,400
Matched Funds Provided: $18,600

AEA Funding Recommendation: $353,400

Election District:
S-38 Wade Hampton/McKinley
Alaska Renewable Energy Fund: Round 7

App # 1066  Marshall Wind Energy Final Design and Permitting Project

Resource: Wind
Proposer: Alaska Village Electric Cooperative, Inc.
Applicant Type: Utility

Proposed Project Phase: Design
Program Manager: Josh Craft
Energy Region: Lower Yukon-Kuskokwim

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No state managed land involved.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1067  Mountain Village Wind Feasibility and Conceptual Design

Resource: Wind  Proposed Project Phase: Feasibility
Proposer: Alaska Village Electric Cooperative, Inc.
Applicant Type: Utility

Project Description
AVEC proposes to complete a conceptual design report (CDR) for a wind energy project in Mountain Village. This project will move the project towards the goal of reducing fuel usage by establishing a renewable energy resource in the community. A met tower collected data east of Mountain Village from November 2009 to August 2011. A wind resource report was completed and revealed a low Class 5 (excellent) wind resource with an average wind speed of 7.62 m/s. Work under this grant will include updating the wind resource report, conducting a geotechnical investigation at a proposed wind site, completing the CDR with the preliminary design of a wind farm.

AEA Review Comments and Recommendation
Alaska Village Electric Cooperative, applying as a utility, proposes to complete a wind feasibility study and conceptual design report to study the advisability of installing wind turbines in Mountain Village, Alaska. The applicant performed a meteorological tower study from November 2009 to August 2011. A Wind Resource Analysis based on this study was submitted with the application and demonstrates a class five wind resource. Class four through seven wind regimes typically support viable wind-diesel projects in Western Alaska.

A best case scenario is often used by AEA Project Managers when evaluating the merits of a feasibility project and, in regards to this proposal, resulted in higher production estimates than the applicant. The proposed project and future design work would refine production estimates prior to construction.

Recommend full funding.

Funding & Cost
Cost of Power: $0.54 /kWh
Price of Fuel: /gal

Project Cost: $4,833,000
Requested Grant Funds: $123,500
Matched Funds Provided: $6,500

Electoral District:
S-38 Wade Hampton/McKinley

AEA Funding Recommendation: $123,500
Alaska Renewable Energy Fund: Round 7

App # 1067  Mountain Village Wind Feasibility and Conceptual Design

Resource: Wind
Proposer: Alaska Village Electric Cooperative, Inc.
Applicant Type: Utility

Proposed Project Phase: Feasibility
Program Manager: Josh Craft
Energy Region: Lower Yukon-Kuskokwim

Stage 3 Scoring Summary

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Economic Analysis

- Stage 2 Total Weight (out of 100) 79.17
- Benefit/Cost Ratio (Applicant) 1.23
- Benefit/Cost Ratio (AEA) 1.70

Project Rank

- Stage 3 Total Weight (out of 100) 70.26
- Statewide (out of 86) 12
- Region Rank 4

DNR/DMLW Feasibility Comments

No state managed land involved.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1068  Stebbins St Michael Wind Energy Final Design and Permitting

Resource: Wind

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Project Description

The proposed project is located near the village of Stebbins on St. Michael Island. Stebbins is located approximately 430 miles northwest of Anchorage, on the south side of Norton Sound. Stebbins is 8 air miles from the village of St. Michael. This project will benefit both the communities of Stebbins and St. Michael as an intertie to connect the two communities and a new joint power plant will be constructed by 2015.

AEA Review Comments and Recommendation

Alaska Village Electric Cooperative, applying as a Utility, proposes to complete a final design of and permitting for a wind-diesel power system in the community of Stebbins, Alaska. The wind-diesel system would service the communities of Stebbins and Saint Michael, Alaska. The final design will be based on a feasibility study and conceptual design report performed under a Round 4 RE Fund Grant #7040008. The feasibility study and conceptual design report have been reviewed and accepted by the AEA Wind Program.

Recommend full funding.

Funding & Cost

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Election District: T-39 Bering Straits/Interior Villages

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DNR/DMLW Feasibility Comments

Any cross country travel (winter or summer) crossing navigable water bodies may require a permit from DNR as underlying lands are state owned, even if the adjacent uplands are owned by a village or regional native corporation. It appears that the main intertie between Stebbins and St Michael will be within the road right-of-way which has an existing federal right-of-way. However, if there are spur roads/lines to the wind turbines or other areas outside the existing right-of-way and they cross navigable water bodies, an easement from DNR may be needed. For any supporting gravel mining operations, a Reclamation Plan is required for gravel mining operations even on non-state land, if the operation disturbs more than 5 acres or excavates more than 50,000 cubic yards. There may be a minimal benefit to state resources as there will be a slight decrease in their use of diesel fuel.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)
All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Bendeleben fault.
Alaska Renewable Energy Fund: Round 7

App # 1069  St Marys Pitkas Point Wind Energy Construction Project

Resource: Wind  Proposed Project Phase: Construction

Proposer: Alaska Village Electric Cooperative, Inc.  Program Manager: Josh Craft

Applicant Type: Utility  Energy Region: Lower Yukon-Kuskokwim

Project Description

AVEC proposes to complete construction, erection, startup, and commissioning of four wind turbines to supplement the existing power generation system for currently intertied communities of St. Mary’s and Pitka’s Point. As a part of this project, AVEC will upgrade the electrical distribution line between St. Mary’s and Pitka’s Point to a 3-phase line and upgrade the joint power plant to accommodate wind turbine energy generators. This project has been in planning for over 10 years, and with funding from this grant AVEC will complete the St. Mary’s wind farm.

AEA Review Comments and Recommendation

Alaska Village Electric Cooperative, applying as a utility, proposes the construction of a wind farm along the St. Mary’s/Pitka’s Point inter tie along with components necessary for the integration of wind power into the diesel power plant. The wind-diesel system would serve the communities of St. Mary’s and Pitka’s Point. The basis for the proposed wind-diesel system would be a design funded through Round 4 RE Fund grant #7040017. Permitting for the project is completed, site control has been established and a final design has been submitted to the Authority.

Recommend full funding with the special provision that the 95% design be accepted by the Authority prior to allocation of construction funds.

Funding & Cost

Cost of Power: $0.49/kWh  Project Cost: $4,782,528
Price of Fuel: /gal  Requested Grant Funds: $4,274,575

Electro District: S-38 Wade Hampton/McKinley  Matched Funds Provided: $507,953

AEA Funding Recommendation: $4,274,575
Alaska Renewable Energy Fund: Round 7

App # 1069  St Marys Pitkas Point Wind Energy Construction Project

Resource:  Wind
Proposer:  Alaska Village Electric Cooperative, Inc.
Applicant Type:  Utility
Proposed Project Phase:  Construction
Program Manager:  Josh Craft
Energy Region:  Lower Yukon-Kuskokwim

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

This project is not located on DMLW-managed Land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
TDX Power intends to build on a successful wind-diesel power system at Sand Point, Alaska, by adding an energy storage component to its Sand Point Generating power plant. The additional hardware – inverter and battery bank – will allow the utility to purchase more wind power from the existing turbines and shut off the diesel engines for approximately 30% of the year. The project includes the final design, procurement, installation and commissioning of an inverter and battery bank and integration with the existing wind-diesel power system in Sand Point, Alaska.

AEA recommends partial funding of $200,000 for a feasibility study and final design to provide additional detail on the proposed project as well as alternative savings options. Additionally, AEA recommends that the applicant consult with AEA’s powerhouse design team regarding the latest innovations in diesel efficiency, marine manifolds, heat recovery design, and dispatchable boilers for frequency control. The feasibility study should investigate the economics of expanding the heat recovery loop to the clinic, school and/or city buildings, adding marine manifolds to one or more of the gensets, adding interruptible electric heating to commercial customers, and/or adding a dispatchable electric boiler to the heat recovery loop. The study should consider repairing or replacing the smallest genset to improve system diesel generation efficiency and the potential for paralleling effectively with the wind turbines. The lessons learned from other battery installations in Alaska (Kodiak, Kotzebue, Kokhanok, etc.) will provide a valuable framework.
Alaska Renewable Energy Fund: Round 7

App # 1070  Sand Point Energy Storage Project

Resource: Storage of Renewable
Proposer: TDX Sand Point Generating, LLC
Applicant Type: Utility

Proposed Project Phase: Design
Construction

Program Manager: David Lockard
Energy Region: Aleutians

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No apparent DMLW-managed lands or permit requirements according to the project description provided.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
The Village of Igiugig seeks funding to complete the final feasibility of our wind resource and conceptual design to verify the economic viability of a wind-diesel electric generation facility. A Rural Power Systems Upgrade was completed in 2011, and a preliminary wind feasibility study was completed by Knight-Piesold Consulting in 2012. Igiugig has a class 3-4 wind resource, and with the higher cost of diesel and the increasing electrical demand, it was determined that a high-penetration wind turbine system is economically viable. A final feasibility study and conceptual design with a construction cost estimate remains to be completed. The total cost of the project is $110,000 and the Lake and Peninsula Borough has committed a $20,000 match. Igiugig Village is providing a $10,000 in-kind match, and requesting the additional $80,000 needed.

Igiugig Village Council, applying as a governmental entity, proposes to complete a feasibility study and conceptual design report to study the advisability of installing wind turbines in Igiugig, Alaska. The applicant has finished a meteorological tower study and has submitted a Wind Resource Report with the application.

Recommend full funding with the special provision that the Wind Resource Analysis and Feasibility Study be accepted by AEA prior to allocation of Conceptual Design funds.

Funding & Cost

Cost of Power: $0.80 /kWh
Price of Fuel: /gal

Project Cost: $110,000
Requested Grant Funds: $80,000
Matched Funds Provided: $30,000

AEA Funding Recommendation: $80,000
Alaska Renewable Energy Fund: Round 7

Resource: Wind
Proposer: Igiugig Village Council
Applicant Type: Government Entity

Proposed Project Phase: Feasibility
Program Manager: Josh Craft
Energy Region: Bristol Bay

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments
Applicant’s immediate funding objective is completion of a feasibility study; system plan and design efforts have not yet been undertaken. Test equipment is proposed for placement on Village Council lands so no DMLW authorizations appear to be required at this stage of project development. Applicant should provide DMLW with site location and design information when available to determine if any lease, easement, or permit authorizations are necessary for implementation.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)
All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Consider seismic ground motions from the Aleutian subduction zone.
The proposed project is an approximately 200 kW run-of-river hydroelectric project on Cascade Creek at MP 35 of the Richardson Highway. The project would provide power to CVEA via a proposed 14-mile line extension or tie into the 138 kV transmission line that runs within ½ mile of the project site.

Blue Hole Properties, LLC requests $170,000 in grant funds to complete feasibility and conceptual design of 200 kW run-of-river hydroelectric project on Cascade Creek, located at milepost 35 of the Richardson Highway and adjacent to the Tsaina Lodge. The project is estimated to cost $2.25 million to construct and would require a 14-mi transmission to interconnect to the CVEA transmission system. It does not appear the cost of interconnection has been included in the cost estimate. It would provide 1,040,000 kWh annually. How much would be purchased by the CVEA system is unknown due to the Allison Creek project currently under construction and already operational Solomon Gulch.

Recommend full funding.

Funding & Cost

- Cost of Power: $0.28 /kWh
- Price of Fuel: /gal

Project Cost: $2,250,000
Requested Grant Funds: $170,000
Matched Funds Provided: $30,000

AEA Funding Recommendation: $170,000
DNR/DMLW Feasibility Comments
Project will require water right, and possibly a land use authorization from DNR/DMLW for the water line, unless included in the water right. If the generator is outside applicant's property, it will require a land use authorization as well. Boundaries are described in USS 3905 and accompanying notes, but application is not sufficiently descriptive to determine generator location.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)
All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Consider seismic ground motions from the Aleutian subduction zone and Chugach St. Elias mountains faults.
The communities in the Upper Tanana Subregion to be served by this renewable energy project are economically distressed in part caused by the very high cost of electricity at $0.51 per kWh. These communities currently rely on diesel generation to meet their electric needs.

Renewable energy is a must for this area to remain economically viable during these difficult times. The Yerrick Creek Hydroelectric Project, first pioneered by Alaska Power and Telephone (AP&T), would be the first renewable electric energy project for the Upper Tanana Subregion and is now a collaborative effort of the Native Village of Tanacross, Tanacross, Inc. and AP&T.

The project site can be accessed at MP 1339 of the Alaska Highway.
Alaska Renewable Energy Fund: Round 7

App # 1077   Yerrick Creek Hydroelectric Project

Resource: Hydro
Proposer: Native Village of Tanacross
Applicant Type: Government Entity

Proposed Project Phase: Construction
Program Manager: Audrey Alstrom
Energy Region: Yukon-Koyukok/Upper Tanana

Stage 3 Scoring Summary

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Stage 2 Total Weight (out of 100) = 58.33

Stage 3 Total Weight (out of 100) = 70.54

Economic Analysis

Benefit/Cost Ratio (Applicant) = 9.84
Benefit/Cost Ratio (AEA) = 4.23

Project Rank

Statewide (out of 86) = 11
Region Rank = 4

DNR/DMLW Feasibility Comments

This project was originally applied for by AP&T (ADL 418154 - easement, ADL 418921 - material sale. New application states that the Yerrick Basin will be protected from outside intrusion: it is unlikely that DNR would issue authorizations that would impede the use of existing 17(b) access through Tanacross land to the state land in the remainder of the basin.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Dot "T" Johnson and Cathedral Rapids faults.
Project Description

This project proposes to install two remanufactured Vestas V20 wind turbines in the community of Koliganek. Koliganek was awarded a grant from the Alaska Energy Authority (AEA) in Renewable Energy Fund Round IV to complete a conceptual design for installation of wind turbines, with possible construction beginning in 2015. New Koliganek Village Council owns and operates the electric utility for the community of Koliganek. The moderate wind resource at this site could support a medium penetration wind-diesel system.

The Draft Conceptual Design Report for the RPSU project does not currently include the prospect of integrating wind energy. Koliganek has received $300,000 for conceptual design and design completion for the Rural Power System Upgrade (RPSU) project. The 2009 Conceptual Design Report (CDR) will be updated starting in January 2014.

This project proposes that the conceptual designs of both the wind-diesel and RPSU project proceed in coordination. If the projects are designed together, potential retrofitting expenses will be avoided and savings realized through the elimination of redundancies.

AEA Review Comments and Recommendation

The New Koliganek Village Council, applying as a governmental entity, proposes to complete a final design of and permitting for a wind-diesel power system in the community of Koliganek Alaska. The final design will be based on a feasibility study and conceptual design report performed under a Round 4 RE Fund Grant #7040011. The feasibility study has been completed and a draft conceptual design report has been reviewed by the AEA Wind Program. A final conceptual design report will be completed in early 2014 in conjunction with an AEA Rural Power System Upgrade Program power plant conceptual design report.

Recommend full funding with the special provision that a final wind-diesel conceptual design report be accepted by the Authority prior to the allocation of final design and permitting funds.

Funding & Cost

Cost of Power: $0.51 /kWh
Price of Fuel: /gal

Project Cost: $2,566,000
Requested Grant Funds: $306,000
Matched Funds Provided: $10,000

AEA Funding Recommendation: $306,000 Y
Alaska Renewable Energy Fund: Round 7

App # 1079  Koliganek Wind Diesel and Heat Recovery

Resource: Wind  Proposed Project Phase: Design
Proposer: New Koliganek Village Council
Applicant Type: Government Entity

Energy Region: Bristol Bay

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No apparent DMLW managed lands or permit requirements according to the provided project description. Proposed infrastructure planned for placement on non-State lands which ADOT&PF either previously or currently held limited management rights for operation of local airport.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
False Pass currently produces all their electricity from diesel generators and heating from burning fossil fuels. Analysis by Marsh Creek LLC confirms that, despite the ample Class 4 wind resource, a Class 3 S designation is most appropriate. Turbulence from complex terrain precludes a typical rural Alaskan wind project. This project proposes feasibility completion funding to 1) fully assess commercially available wind turbines for deployment in high turbulent locations and 2) expanding available wind resource data at the 10 meter height on proposed sites and 3) revised Conceptual Design Report (CDR) recommending the best turbine to proceed to design in Round 8. Vertical axis wind turbines (VAWTs) are potentially a mechanically and economically sound upgrade to False Pass’s current diesel generator system. This project will consider ten (10) 5 kW Kelso VAWTs in comparison to the use of either the Xzeres Skystream and Bergie options. The CDR recommendations will closely examine three potential turbines and research other potential options. The Vertical axis wind turbines (VAWTs) are potentially a mechanically and economically sound upgrade to False Pass’s current diesel generator system. This project will consider ten (10) 5 kW Kelso VAWTs in comparison to the use of either the Xzeres Skystream and Bergie options. This project seeks feasibility funding for the False Pass wind project. The feasibility funding would allow for further site testing of wind resources at the proposed system height of 10M and heat recovery analysis. Conceptual Design Report Updates will include additional HOMER analysis with wind resource data at the 10M height, Down East Heat Recovery modeling, WASP modeling, wind turbine profiles, revised economic analysis and recommendations.

The City of False Pass Electric Utility, applying as a local government, proposes feasibility and conceptual design work to determine the advisability of installing wind turbines on the False Pass electrical grid. This work will augment feasibility and conceptual design work already performed under a Round 4 Renewable Energy Fund Grant #7040051. The results of the Round 4 grant demonstrated that the False Pass wind regime contains enough energy to create a feasible wind project but, due to complex terrain, has high turbulence. The applicant proposes to continue wind and electrical data collection to investigate other locations in False Pass for a less turbulent wind regime and better understanding of community loads. The applicant proposes to then revise the existing Conceptual Design Report based on the aggregate findings.

Recommend full funding with the special provision that Wind Resource Assessment(s) and Feasibility Study be accepted by AEA prior to the allocation of Conceptual Design funds.

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Alaska Renewable Energy Fund: Round 7

App # 1080  False Pass Wind Energy Project

Proposed Project Phase: Feasibility

Resource: Wind
Proposer: City of False Pass Electric Utility
Applicant Type: Local Government

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No apparent DMLW managed lands or permit requirements according to the provided project description.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Aleutian subduction zone. Consider tsunami hazards.
Waste to Energy Reconnaissance Study

Applicant Type: Utility

Proposer: Chugach Electric Association, Inc.

Resource: Biofuels

Proposed Project Phase: Recon

Program Manager: Helen Traylor

Energy Region: Railbelt

Project Description

The project is the performance of a reconnaissance study to provide a preliminary assessment of the viability of a WtE plant in Anchorage. Other than some recyclables that are recovered prior to disposal, municipal solid waste (MSW) in Anchorage is largely disposed of in the municipal landfill. The quantity of refuse currently being disposed of in this manner is approximately 330,000 tons per year. There may also be an opportunity to incorporate other fuel, such as wood being disposed of in local woodlots.

WtE plants, while somewhat rare in the U.S., are very popular, efficient and environmentally effective in many European and Asian countries. If feasible, a WtE plant would be expected to provide energy, environmental, reliability, economic and community benefits

AEA Review Comments and Recommendation

Chugach Electric Association (CEA), Inc. request funding for a reconnaissance study to provide a preliminary assessment of the viability of a waste to energy project in Anchorage. A portion of the municipal solid waste minus recyclables that currently goes to the Anchorage landfill would be used as fuel for the plant.

AEA supports the concept of utilizing municipal solid waste as an energy source. The first step in clearly understanding the viability of a waste to energy project is a comprehensive assessment of the fuel resource availability. CEA has provided a match of $100,000 toward this effort. AEA recommends partial funding of design and permitting to allow Chugach Electric Association (CEA) to make an informed decision about pursing a waste to energy project in Anchorage.

AEA recommends partial funding of $50,000.

Funding & Cost

Cost of Power: $0.15 /kWh

Price of Fuel: /gal

Election District: K-22 Taku

Project Cost: $150,000

Requested Grant Funds: $100,000

Matched Funds Provided: $100,000

AEA Funding Recommendation: $50,000
Alaska Renewable Energy Fund: Round 7

App # 1081  Waste to Energy Reconnaissance Study

Resource:  Biofuels
Proposer:  Chugach Electric Association, Inc.
Applicant Type:  Utility

Proposed Project Phase:  Recon
Program Manager:  Helen Traylor
Energy Region:  Railbelt

Stage 3 Scoring Summary

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Economic Analysis

- Stage 2 Total Weight (out of 100): 61.50
- Benefit/Cost Ratio (Applicant): 1.34
- Benefit/Cost Ratio (AEA): 1.31

Project Rank

- Stage 3 Total Weight (out of 100): 48.33
- Statewide (out of 86): 57
- Region Rank: 6

DNR/DMLW Feasibility Comments

DNR/DMLW lands will not be affected by the feasibility study. The application mentions possible evolution of the current project, so if structures are to be built under this grant, re-assessment may be needed with better location information. If the project is entirely on Chugach Electric Corporation's land in Anchorage, no DNR/DMLW lands will be affected.

DNR/DOF Feasibility Comments

This project submitted by Chugach Electric Association is for a reconnaissance study to determine the feasibility of developing a waste to energy system for electricity generation. The waste to energy system would be located in Anchorage and utilize a portion of the approximately 330,000 tons of refuse disposed in the municipal landfill. At this time it is not known if the project is sustainable relying solely on the landfill. Annual usage of refuse will be determined in this study.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Project Description

As a condition of the Federal Energy Regulatory Commission (FERC) relicensing of the Cooper Lake plant in 2007, Chugach agreed to construct a project to divert water from Stetson Creek into the Cooper Lake reservoir and a related structure to release water into Cooper Creek. The project will enhance fish habitat and add water to Cooper Lake which will result in additional hydroelectric energy generation. Most importantly, constructing this project allows the license for the Cooper Lake hydro facility to be renewed for 50 years.

AEV Review Comments and Recommendation

Chugach Electric Association requests $3,453,920 to complete construction of the Stetson Creek Diversion to Cooper Lake Hydroelectric Project. Project will add 6,020,000 kWh annually. It will also provide environmental benefits for increase in 1) water temperature and 2) increase flows at upper reaches of Cooper Creek to enhance fish habitat.

Bids were opened on 9/28/12 and construction is underway. Project cost is $21,772,523. CEA received funds in Round 4 (#674) for $576,080 for design and permitting and a State appropriation for $5,825,000 in FY13 for construction. The project applied for funding in Round 6 but failed to score within the funding limit. CEA will continue to seek grant funding and finance any cost in excess of grant amounts.

Construction of this project satisfies the Settlement Agreement established in support of the FERC re-license of Cooper Lake Hydroelectric Project, which, along with this diversion, has annual energy of 48,000,000 kWh.

The Renewable Energy Fund Advisory Committee (REFAC) on 1/7/14 advised AEA to recommend to the Legislature partial funding this project if funding is kept within the Governor's budget of $20M. REFAC further advised AEA to include the initial recommendation of full funding should the Legislature make available additional funds this year. One other hydro project, Allison Creek, was also recommended for partial funding. The primary reason was to allow the funding of six additional projects in higher cost areas of the state.

AEA recommends partial funding of $1,760,019 if the Renewable Energy Fund Round 7 budget is limited to $20M, and recommends this project first in line for any additional funding beyond $20M, up to the requested grant amount of $3,453,920.

Funding & Cost

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<td>Price of Fuel:</td>
<td>/gal</td>
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Project Cost: $21,772,523
Requested Grant Funds: $3,453,920
Matched Funds Provided: $13,591,226
AEV Funding Recommendation: $3,453,920
Alaska Renewable Energy Fund: Round 7

App # 1082  Stetson Creek Diversion Cooper Lake Dam Facilities Project  Standard Application

Resource:  Hydro
Proposer:  Chugach Electric Association, Inc.
Applicant Type:  Utility
Proposed Project Phase:  Construction
Program Manager:  Audrey Alstrom
Energy Region:  Railbelt

Stage 3 Scoring Summary

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Economic Analysis

- Stage 2 Total Weight (out of 100): 94.33
- Benefit/Cost Ratio (Applicant): 0.89
- Benefit/Cost Ratio (AEA): 7.11

Project Rank

- Stage 3 Total Weight (out of 100): 68.52
- Statewide (out of 86): 15
- Region Rank: 1

DNR/DMLW Feasibility Comments

Project may involve an RS2477 trail. Applicant must apply to DNR/DMLW for any clearing, grading, or other road development within the route. This RS2477 trail is catalogued under casefile # RST 619, Stetson Creek Trail.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Aleutian subduction zone.
This project will be a modest, run-of-the-river hydroelectric facility using Waterfall Creek and consisting of a concrete diversion/intake structure, 4,500′ HDPE penstock pipeline, 16′X40′ metal powerhouse on a concrete slab, Pelton Impulse Turbine and induction generator, remote-automatic control system, and 5,000′ access road. This facility will be a working partner to the City’s existing and highly successful Delta Creek hydroelectric project, which has been operating for the last eighteen years.

City of King Cove requests an additional $800,000 to construct the 1 MW run-of-river Waterfall Creek Hydroelectric Project. The City was awarded a $200,000 grant (#887) in Round 5 to complete permitting and final design for Waterfall Creek and $2,600,000 (#929) in Round 6 for construction. Permitting, final design, site control, and bidding all remain incomplete.

AEA supports this request though notes that permitting, final design, construction cost estimate, and bidding are not complete at this time.

Special conditions include completion of all grant requirements for #887 and demonstration of site control.

Funding & Cost

| Cost of Power: | $0.28/kWh |
| Price of Fuel: | $/gal |

Project Cost: $5,500,000
Requested Grant Funds: $800,000
Matched Funds Provided: $1,900,000

AEA Funding Recommendation: $800,000
Alaska Renewable Energy Fund: Round 7

App # 1083 Waterfall Creek Hydroelectric Project

Resource: Hydro
Proposer: City of King Cove
Applicant Type: Local Government

Proposed Project Phase: Construction
Program Manager: Audrey Alstrom
Energy Region: Aleutians

Stage 3 Scoring Summary

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Economic Analysis

- Stage 2 Total Weight (out of 100): 71.17
- Benefit/Cost Ratio (Applicant): 1.87
- Benefit/Cost Ratio (AEA): 1.37

Project Rank

- Stage 3 Total Weight (out of 100): 61.95
- Statewide (out of 86): 34
- Region Rank: 2

DNR/DMLW Feasibility Comments

No apparent DMLW lands or permit requirements beyond the Water Use Permit self-reported by applicant in the project description. DNR resources do not currently identify Waterfall Creek as navigable. If this determination changes, infrastructure proposed for installation on the creekbed may need to be evaluated for additional lease or easement authorizations by SCRO.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Aleutian subduction zone. Consider tsunami hazards.
The proposed project is a run-of-river hydroelectric project located on private property along Juniper Creek, a tributary of Eagle River about 10 miles upstream from the Glenn Highway. The proposed project would include an intake/diversion structure at approximately the 1900-foot elevation and powerhouse at the 1500-foot elevation. The design flow is estimated at 10 to 20 cfs, for an estimated installed capacity of 250 to 500 kW.

Participation of adjacent downstream property owners would increase the available head from 400 feet to either 900 feet or 1,100 feet if one or two adjacent landowners were to participate. This would increase installed capacity to as much as 1,300 kW. The adjacent landowner is open to discussion, but questions the resource and impacts. Results of the feasibility study are expected to encourage local support and participation.

Ram Valley LLC requests funds for reconnaissance study of a hydroelectric project on Juniper Creek. The run-of-river project is located in high alpine terrain near Mile 10 of the Eagle River valley. Ram Valley LLC would sell Juniper Creek Hydroelectric power to Matanuska Electric Assoc. as an IPP. Several different development options are proposed for the project from 250 to 1,300 kW, some of which involve private landowners not currently committed to the project. The project would generate seasonally as proposed.

AEA recommends funds for a reconnaissance study.

Special conditions: In the course of conducting the reconnaissance study, explore and define the project scheme and obtain commitments from involved landowners.
Alaska Renewable Energy Fund: Round 7

App # 1084  Juniper Creek Hydroelectric Reconnaissance Study

Resource: Hydro
Proposer: Ram Valley, LLC
Applicant Type: IPP
Proposed Project Phase: Recon
Program Manager: Audrey Alstrom
Energy Region: Railbelt

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No DNR/DMLW lands affected.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

Projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Aleutian subduction zone and Castle Mountain fault.
This project consists of the installation and integration of 5 each Windmatic 175 turbines 95 kWe wind turbines (490 kW) into the Naterqak Light Plant diesel power grid. The integration of this wind energy includes the installation of load balancing boiler, 40 residential electric thermal storage (ETS) units, wind diesel supervisory control and data acquisition system (WDSC), and improvements to the electrical distribution system which include sectionalizing, the replacement of 3 power poles and one distribution transformer, as well as the extension of the distribution by 3 power poles to the wind site. The proposed system is similar to those installed in the neighboring villages of Kongiganak, Kwigillingok and Tuntutuliak.

**AEA Review Comments and Recommendation**

Ineligible for further review because the applicant did not provide a conceptual design report 30 days prior to the application deadline as required and identified in Sections 1.12, 2.5 and Section 4 of the Request for Grant Applications dated July 2, 2013.

Section 4 of RFA, page 26  
7. Wind applications requesting Phase III (Final Design and Permitting) or Phase IV (Construction, Commissioning, Operation and Reporting) funding will submit documentation necessary to demonstrate the fulfillment of all requirements for earlier phases of the project identified in Section 2 of the RFA [i.e. Phase II (Feasibility Analysis, Conceptual Design) or Phase III (Final Design and Permitting)] 30 days prior to the application deadline.

**Funding & Cost**

- **Cost of Power:** 
  - /kWh
- **Price of Fuel:** 
  - /gal

**Election District:**

- R-36 Dillingham/Iliamna

**Project Cost:** 

- $4,358,784

**Requested Grant Funds:** 

- $4,308,784

**Matched Funds Provided:** 

- $50,000

**AEA Funding Recommendation:**
Alaska Renewable Energy Fund: Round 7

App # 1006  NEA Stack Heat to Power Project

Proposer:  Naknek Electric Association, Inc.  Design
Applicant Type:  Utility

Project Description

The Cooperative faces an urgent need to stabilize and lower the cost of electricity to consumers. Improving fuel efficiency in its diesel generation facility NEA will install two highly efficient waste heat to power (WH2P) systems onto existing diesel-fueled reciprocating engines to increase efficiency and reduce costs. The selected WH2P systems utilize supercritical carbon dioxide (sCO2) as the working fluid for converting stack heat to electrical power without additional fuel consumption or emissions. The stack heat to power project is scheduled for completion fifteen (15) months from the authorization to proceed date, and the proposed budget supports all design, fabrication, installation, commissioning, training, management, and reporting tasks for a $1.94 million investment.

AEA Review Comments and Recommendation

The Naknek Electrical Association is proposing the feasibility, design, and construction of two Echogen stack heat recovery to power systems on the utility’s diesel generators. The estimated power generation is 2.3MM kWh annually.

Echogen is proposing a modified Organic Rankine Cycle engine with supercritical carbon dioxide as the working fluid. The stated thermal efficiency is approximately 20%.

While AEA is interested in this concept, the modified Organic Rankine Cycle is still an emerging technology. This application would be better suited for the Emerging Energy Technology Program.

AEA recommends the Naknek Electrical Association power systems be evaluated and included in AEA’s priority ranking list for Rural Power Systems Upgrade program assistance. Additionally, AEA encourages NEA to work directly with AEA staff to address the community energy needs. Please contact AEA’s energy planning staff for direct assistance.

No funding recommended.

Funding & Cost

Cost of Power:  $0.50 /kWh  Project Cost:  $1,940,379
Price of Fuel:  $3.50 /gal  Requested Grant Funds:  $1,843,379

Electron District:  R-36  Matched Funds Provided:  $97,000
Dillingham/Iliamna

AEA Funding Recommendation:  Not Recommended
The City & Borough of Juneau is proposing the design and construction of a geothermal HVAC system to serve the heating and cooling needs at the new Mendenhall Valley Library (formerly called the Dimond Park Library in prior AEA grant request). The community of Juneau recently received a $7 million grant from Alaska Department of Commerce, Community and Economic Development to construct the new library in Juneau's Mendenhall Valley. The City & Borough of Juneau Assembly is interested in reducing the carbon footprint of Juneau and reducing the operating costs of their facilities. The use of a geothermal HVAC system rather than traditional oil-fired boilers and chillers provides an opportunity to achieve both goals of the City & Borough of Juneau and to expand the use of renewable energy in city facilities.

The City and Borough of Juneau proposes to install a ground source heat pump system to heat the new Mendenhall Library. While Juneau offers a favorable climate for ground source heat pump systems, the significant cost of vertical well loop field construction has a high impact on project economics. As proposed, the Mendenhall Library heat pump system would incur high construction costs but use well below 20% of the system's total capacity on an annual basis. Because of this, the proposed system for the Mendenhall Library does not compare favorably on an economic basis to the fuel oil system used as a base case.

A similar system was proposed in REF Round 6; after consultation with the applicant, AEA recommended funding for a smaller GSHP system that relied on a supplemental oil fuel boiler for peak demand. The project did not ultimately receive funding. This suggested design was not pursued in the current application; although the proposed design is less economically attractive than it might have been, it remains technically feasible.

Full funding recommended.

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<td>Price of Fuel: $4.12/gal</td>
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| Election District: P-31 Mendenhall Valley | AEA Funding Recommendation: $660,000 |
Alaska Renewable Energy Fund: Round 7

App # 1007  Mendenhall Valley Library Geothermal HVAC System

Resource: Heat Pumps
Proposer: City & Borough of Juneau
Applicant Type: Local Government

Proposed Project Phase: Design
Construction

Program Manager: Alan Baldivieso
Energy Region: Southeast

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No known issues

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1008  Chuathbaluk Water System Heat Recovery

Resource:  Heat Recovery
Proposer:  City of Chuathbaluk
Applicant Type:  Government Entity

Proposed Project Phase:  Design
Construction

Program Manager:  Devany Plentovich
Energy Region:  Lower Yukon-Kuskokwim

Project Description

This project will provide waste heat from the existing electrical power plant to the water system. The fuel oil savings to the community water plant is projected to be 1,900 gallons of heating oil per year.

For more detailed information, see the attached Chuathbaluk, Alaska 2013 Heat Recovery Feasibility Study.

AEA Review Comments and Recommendation  Not Recommended

The Alaska Native Tribal Health Consortium and the City of Chuathbaluk are proposing to design and construct a recovered heat system from the existing power plant for heating the water system. Existing unused heat trace piping will be used to transfer the heat from the power plant to the water treatment plant.

Although the Preliminary Heat Recovery Assessment was completed in September of 2013 and showed sufficient excess heat to support this project, it did not address the energy required to pump the water through relatively small diameter pipe and long distances.

We are concerned that the energy required to pump the heated water from the power plant to the water treatment plant through the unused heat trace piping will consume more energy that the estimated savings of the project, creating an additional financial burden on the community. Additional information was requested on pumping costs but was never received.

Not recommended for funding.

Funding & Cost

| Cost of Power: | $0.85 /kWh |
| Price of Fuel: | $6.82/gal |

Project Cost:  $225,660
Requested Grant Funds:  $225,660
Matched Funds Provided:  $6,770

Electoral District:  R-36  Dillingham/Iliamna

AEA Funding Recommendation:
The “Pre-Feasibility Assessment for Integration of Wood-Fired Heating Systems Final Report” dated July 24, 2012 states that, “Connecting the school with several nearby buildings with a wood fired district heating system appears to be an economically viable project.” (p. 2 of 13) The buildings for the City of Nenana include the Water Plant and the Fire Department. The building included for the Nenana Native Council is the Youth Educational Resource Center (YERC), which houses the Early Learning, Head Start, and Youth Center programs. The school district buildings included in the project are the Nenana City Public School, the Administration Building, the Warehouse/Vocational Education Building, and the Nenana Student Living Center. Though the Nenana Student Living Center is located approximately six blocks from the Nenana City Public School, the “Pre-Feasibility Assessment” states, “The additional energy saved by connecting several buildings together offsets the significant additional cost of underground piping and pumping costs. . . . Even with the significant piping costs, the extra pumping energy, and the extra wood fuel needed to offset the heat loss of the long pipe runs, this option remains the strongest relative to other options.” (p. 2 & 3 of 13)

The Nenana City School District in Nenana, AK (Interior Alaska) requests funding for engineering design to build a district wide heating system for the following buildings: Nenana City School; Administration Building; Warehouse; Nenana Student Living Center; Nenana Native Council Day Care; City Water Plant; City Fire Department. The project is estimated to displace 87,800 gallons of fuel/year and has the potential to save the Nenana City School District in excess of $3,516,725 over the life of the project.

This project is an example of good collaboration efforts among community organizations in an effort to provide low cost heating to the entire community of Nenana. Also the local community appears to be supportive of a district biomass heating project. AEA will work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project.

Recommend full funding for design and permitting with the requirements that AEA must review and accept the final engineering design; business/operational plan with heat sales agreement; biomass storage; harvest plan; inventory plan.
Alaska Renewable Energy Fund: Round 7

App # 1009 Nenana Collaborative Biomass Heating System Project

Resource: Biomass
Proposer: Nenana School District
Applicant Type: Government Entity

Proposed Project Phase: Design
Program Manager: Helen Traylor
Energy Region: Railbelt

Stage 3 Scoring Summary

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Stage 2 Total Weight: 54.67
Stage 3 Total Weight: 48.69

Economic Analysis

- Benefit/Cost Ratio (Applicant): 1.11
- Benefit/Cost Ratio (AEA): 0.66

Project Rank

- Stage 2 Total Weight: 56
- Stage 3 Total Weight: 5
- Statewide (out of 86): 56
- Region Rank: 5

DNR/DMLW Feasibility Comments

Application references State lands within the future Nenana Tochacket Agriculture Project as a potential source of wood, noting that purchasers of state land must clear timber to prepare for cultivation - while this is true, it must be clearly understood that Ag land sold by the state of Alaska is subject to covenants, and development of the parcel (including the extent and nature of clearing) must take place consistent with a state-approved farm conservation plan.

DNR/DOF Feasibility Comments

This project was reviewed for the Round 6 application period. No changes for wood requirement have been made in the current application (approximately 1,037 green tons 30% moisture content). The approximately 20-75 acres of timber per year required for this project, depending on timber harvest equipment configuration, would be quite sustainable for this area of the Tanana Valley.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Project Description

This project will consist of engineering and layout, acquiring the machinery and installation of fuel delivery systems and biomass boilers to be integrated into the existing heat system of the Craig High School and thus eliminate the use of oil for fuel. The system will use dried wood fuel from the AEA funded dryer at Viking Lumber and benefit Viking by expanding the market base for dry wood fuel. The installed boilers would heat the 52,219 square foot high school using wood chips generated by operations at a local lumber mill. Feedstock for the mill and the resulting wood chips comes from timber logged from the nearby Tongass National Forest, Southeast Alaska State Forest, Alaska Native Corporation lands and other private lands. The project is similar in scope for the Craig Wood Fired Boiler and will share an existing contract to provide wood chips for the boiler. A Preliminary Feasibility Assessment for Conversion from Fossil Fuel Oil to Wood Heating for the Craig High School, Craig, Alaska was prepared for the Craig city School District by Robert Deering, Biomass Program Manager, USDA Forest Service, Tongass National Forest. A Copy of the study is attached to this application. An Energy Audit has been completed for the facility and is attached to this application.

AEA Review Comments and Recommendation

The Craig High School District in Craig, AK requests funding for engineering design and construction to build a low emission, high efficiency, and 3rd party tested biomass heating system for the Craig High School. The project is estimated to displace 19,459 gallons of fuel/year and has the potential to save the Craig School District in excess fuel cost savings of $2.1 million - $2.6 million over 20 years.

This project is an example of good collaboration efforts among community organizations in an effort to provide low cost heating to the entire community of Craig and surrounding communities. Also the local community appears to be supportive of a district biomass heating project. AEA will work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project.

AEA recommends partial funding of design and permitting to allow the Craig High School to make an informed decision about pursing biomass as a heating option.

Recommend partial funding for design and permitting with the requirements that AEA must review and accept the final engineering design; biomass storage; business/operational plan with heat sales agreement; harvest plan; inventory plan, $125,000.

Funding & Cost

Cost of Power: $0.29/kWh
Price of Fuel: $3.80/gal

Project Cost: $585,450
Requested Grant Funds: $492,850
Matched Funds Provided: $82,550

AEA Funding Recommendation: $125,000
DNR/DMLW Feasibility Comments

No known issues

DNR/DOF Feasibility Comments

This project is for design and construction of a new biomass boiler to heat the Craig High School. The boiler will be in addition to one that is currently operational and is heating the elementary and middle schools. The system will use dried wood fuel from the AEA funded drier at Viking Lumber. Wood supply for this project appears sustainable because Viking’s raw wood supply originates from a variety of land owners including the Tongass National Forest, Southeast State Forest and village corporation lands. The overall annual demand of the new and old boiler installations will only consume about 2% of the annual production of biomass at the mill.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1011  Sitka Centennial Hall Air Source Heat Pump

Resource: Heat Pumps
Proposer: City and Borough of Sitka
Applicant Type: Local Government

Project Description

Design and construction of an air source heat pump system to displace approximately 95% of the heating oil usage of the expansion and renovation of the 19,000 sq ft Harrigan Centennial Hall at a seasonal efficiency of 220%. The expansion and renovation, which will increase floor space approximately 5,000 sq. ft, will require the replacement of the current ventilation system. While the HVAC must be replaced, the base case assumptions include the retaining of the current fuel oil boilers, the use of natural cooling supplemented with air-cooled compressor unit, separate conventional variable air volume ventilation systems for the museum, auditorium, and office units, and thermal upgrades that would decrease energy consumption by 20% relative to the current structure.

The six air-to-water heat pump units would be situated outdoors and a variable refrigerant flow (VRF) system would pipe refrigerant to the 16 indoor fan coils to provide heating or cooling to the building. Ventilation air would be supplied by energy recovery ventilators that transfer heat from the exhaust or relief air to the fresh air being supplied to each fan coil unit. The outdoor heat pump assembly would be housed within a louvered enclosure to protect the equipment and lessen noise issues.

Backup heat would be supplied by electric heating coils with a total capacity of 930 MBH.

This proposal is a direct result of the attached Renewable Energy Feasibility Analysis, which was completed July 2012 under a RE Fund Round 3 grant. See Attachment 1.

AEA Review Comments and Recommendation

The City and Borough of Sitka proposes to install an air source heat pump system as a part of an extensive renovation of Centennial Hall.

Although air source heat pump performance in southeast Alaska is not well documented, the economies of the project appear favorable under a range of different conservative assumptions. The planned renovation offers a good opportunity to replace the existing fuel oil boilers with an air source heat pump system and could provide valuable data of the performance of newer air source heat pump models in southeast Alaska.

Full funding recommended.

Funding & Cost

Cost of Power: $0.09 /kWh
Price of Fuel: $3.59 /gal

Project Cost: $232,620
Requested Grant Funds: $232,620
Matched Funds Provided: $1,021,393

AEA Funding Recommendation: $232,620
Alaska Renewable Energy Fund: Round 7

App # 1011  Sitka Centennial Hall Air Source Heat Pump

Resource:  Heat Pumps
Proposer:  City and Borough of Sitka
Applicant Type:  Local Government

Proposed Project Phase:  Design Construction
Program Manager:  Alan Baldivieso
Energy Region:  Southeast

Stage 3 Scoring Summary

Criteria (Weight)  Score
1) Cost of Energy (Max 35)  15.71
2) Matching Resources (Max 15)  15.00
3) Project Feasibility from Stage 2 (Max 20)  16.10
4) Project Readiness (Max 5)  5.00
5) Benefits (Max 15)  10.75
6) Local Support (Max 5)  5.00
7) Sustainability (Max 5)  4.83

DNR/DMLW Feasibility Comments

No known issues

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1012  Sitka Wastewater Treatment Plant Effluent Heat Pump

Resource: Heat Pumps  Proposed Project Phase: Design
Proposer: City and Borough of Sitka  Construction
Applicant Type: Local Government
Program Manager: Alan Baldivieso
Energy Region: Southeast

Project Description

Design and construction of an effluent heat pump system to displace approximately 95% of the heating oil usage at the Wastewater Treatment Plant on Japonski Island in the City and Borough of Sitka at a seasonal efficiency of 400%. The existing oil fired boilers have reached the end of their useful life and need to be replaced. The effluent, with an average temperature nearing 50°F, passes by the boiler room, easing the integration of the heat resource. The effluent from the wastewater treatment plant would pass through an in-line screen prior to going through a stainless steel plate-and-frame heat exchanger; an antifreeze solution would be heated by the effluent on the other side of the heat exchanger. The refrigerant from the 868 MBH water-to-water heat pump unit would be heated by the antifreeze solution in the evaporator. Using the vapor compression cycle, the heat pump would then "lift" this heat to 115°F during the compression cycle, and then transfer that heat to the condenser loop to supply heating appliances. 220 gallons per minute of effluent will be required to provide sufficient heat to the evaporator under design load conditions. A variable frequency drive on the existing recycled effluent pump will provide the correct flow of effluent to the heat exchanger under varied heat load conditions. As the Wastewater Treatment Plant is currently designed for 180°F in its heating system, the air handlers, unit heaters, cabinet unit heaters, and baseboard heaters would need to be replaced to increase the amount of surface area of heating coils to compensate for the 115°F temperature hydronic water supplied by the heat pump system. Backup heat would be supplied by a new 955 MBH fuel oil boiler in conjunction with a storage tank. This proposal is a direct result of the attached Renewable Energy Feasibility Analysis completed by Alaska Energy Engineering, LLC in July 2012 under a RE Fund Round 3 grant. See Attachment 1.

AEA Review Comments and Recommendation

The City and Borough of Sitka proposes to install an effluent source heat pump system in the waste water treatment facility to decrease reliance on the fuel oil boiler.

The proposal to use waste water effluent as a source for a heat pump system is a compelling use of an otherwise unused heat source, and could serve as a model for similar systems in other parts of the state. The high temperature and availability of effluent would result in a higher heat pump COP than seen in ground or sea water source installations. Unfortunately, a combination of high anticipated capital costs and low overall annual heat demand make the economics of the project less beneficial than in a location with year round heating needs. If possible, AEA suggests incorporating other heating loads into the system in order to take full advantage of the proposed system’s capacity which would improve the project economics.

Full funding recommended.

Funding & Cost

Cost of Power: $0.09 /kWh
Price of Fuel: $3.59/gal
Requested Grant Funds: $849,984
Matched Funds Provided: $113,000

Project Cost: $962,984
Matched Funds Provided: $113,000
AEA Funding Recommendation: $849,984

Election District: Q-34 Southeast Island
DNR/DGLS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.
Alaska Renewable Energy Fund: Round 7

App # 1013  Sitka Kettleson Library Air Source Heat Pump

Resource:  Heat Pumps  Proposed Project Phase:  Design
Proposer:  City and Borough of Sitka  Construction
Applicant Type:  Local Government

Project Description
Design and construction of an air source heat pump system to displace approximately 95% of the heating oil usage of the expansion and renovation of the 7,752 sq ft Kettleson Memorial Library at a seasonal efficiency of 220%. The expansion and renovation, which will increase the building to 12,400 sq. ft., will require the replacement of the current constant volume ventilation system. While the HVAC must be replaced, the base case assumptions include the retaining of the current fuel oil boilers, the use of natural cooling, a conventional variable air volume ventilation system, and thermal upgrades that would decrease energy consumption by 20% relative to the current structure.

The two air-to-water heat pump units would be situated outdoors and a variable refrigerant flow (VRF) system would pipe refrigerant to the ten indoor fan coils to provide heating or cooling to the building. Ventilation air would be supplied by energy recovery ventilators that transfer heat from the exhaust or relief air to the fresh air being supplied to each fan coil unit. The outdoor heat pump assembly would be housed within a louvered enclosure to protect the equipment and lessen noise issues.

Backup heat will be supplied by 360 MBH electric heating coils.

This proposal is a direct result of the attached Renewable Energy Feasibility Analysis, which was completed in July 2012 under a RE Fund Round 3 grant. See Attachment 1.

AEA Review Comments and Recommendation
Full Funding

The City and Borough of Sitka proposes to install an air source heat pump system as a part of a renovation of the Kettleson Library.

Although air source heat pump performance in southeast Alaska is not well documented, the planned renovation offers a good opportunity to replace the existing fuel oil boilers with an air source heat pump system and could provide valuable data of the performance of newer air source heat pump models in southeast Alaska. While there is little doubt regarding the technical feasibility of the proposed system, full project payback appears highly dependent on fuel oil prices.

Full funding recommended.

Funding & Cost

| Cost of Power: | $0.09 /kWh |
| Price of Fuel: | $3.59/gal |

Project Cost: $230,200
Requested Grant Funds: $230,200
Matched Funds Provided: $192,891

AEA Funding Recommendation: $230,200

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Alaska Renewable Energy Fund: Round 7

App # 1013  Sitka Kettleson Library Air Source Heat Pump

Resource:  Heat Pumps
Proposer:  City and Borough of Sitka
Applicant Type:  Local Government

Proposed Project Phase:  Design Construction

Program Manager:  Alan Baldivieso
Energy Region:  Southeast

Stage 3 Scoring Summary

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Stage 3 Total Weight (out of 100)  59.53

DNR/DMLW Feasibility Comments

No known issues

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments  (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Native Village of Tazlina proposes final design and construction of a biomass boiler system to supply a small district heating system consisting of four buildings: Community Hall; Clinic; Office and Shop. The system would consume approximately 116 cords per year and displace 8,078 gallons of fuel oil per year. Reconnaissance assessment through the Alaska Wood Energy Development Task Group indicates a viable project. NVT has select the best biomass system for the existing structures: chips or cordwood.

AEA is concerned by the lack of a specific fuel supply plan and formal land usage agreement for the project. However, we recognize the existing fuel wood market in the Tazlina and Cooper Valley area. AEA will work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project. AEA recommends partial funding of design and permitting to allow the Community of Tazlina to make an informed decision about pursing biomass as a heating option.

Recommend partial funding for final design and permitting with requirements that AEA must review and approve the final design; fuel supply plan; business/operation plan; biomass storage; harvest/inventory plan, $125,000.

Funding & Cost

- Cost of Power: $0.28 /kWh
- Price of Fuel: $4.17/gal
- Project Cost: $278,150
- Requested Grant Funds: $267,150
- Matched Funds Provided: $11,000
- AEA Funding Recommendation: $125,000
Alaska Renewable Energy Fund: Round 7

App # 1014  Wood Chip Boiler for The Native Village of Tazlina

Resource: Biomass
Proposer: Native Village of Tazlina
Applicant Type: Government Entity

Proposed Project Phase: Design
Construction

Program Manager: Helen Traylor
Energy Region: Copper River/Chugach

Stage 3 Scoring Summary

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Stage 3 Total Weight (out of 100) 53.39

Stage 2 Total Weight (out of 100) 64.50

Benefit/Cost Ratio (Applicant) 1.84
Benefit/Cost Ratio (AEA) 1.19

Benefit/Cost Ratio 1.19

Project Rank
Statewide (out of 86) 46
Region Rank 2

Economic Analysis

DNR/DMLW Feasibility Comments
Project appears to be entirely off of DNR/DMLW lands. No permits required.

DNR/DOF Feasibility Comments
This project is for design and construction of a wood chip fired boiler at Tazlina. The system would be used to heat four collocated community public buildings. The supply of chips is expected to come from NRCS funded moose habitat clearings occurring on Ahtna lands and on BIA funded hazard fuel breaks. Roughly 116 green tons will be required annually. Based on state lands inventory data collected in the Glennallen area, roughly 30 green tons per acre of above ground biomass is present on the forest lands. The amount of raw material required for Tazlina would be quite sustainable if harvested in the Copper River Basin area. In the event these publicly funded projects are unable to provide biomass, Tazlina is willing to procure the raw material at an estimated cost of $90.00/green ton. They would also be willing to purchase fuel wood locally at $250-300 per cord and then chip prior to burning. At a fuel price of $90.00/ green ton, the annual fuel purchase price would be $10,400. This amount is significantly lower than the annual cost ($39,582) of 8,078 gallons of fuel oil. One good aspect of this proposal is that although ease of stoking is achieved by a chip system, Tazlina expects to use information from the Mentasta village use of a similar system for trial. If it does not perform adequately for Mentasta then Tazlina may default to a more standard Garn solid wool boiler. A commitment from Ahtna to provide the moose clearing residue at no cost other than chipping was stated in the application with attachment. The attached letter was not available for this review.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)
All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
The Hydaburg City Schools in Hydaburg, AK on Prince of Wales Island in Southeast Alaska requests funding for engineering design to build a low emission, high efficiency, and 3rd party tested cord wood heating system for the school buildings: gym; elementary school; high school. The project has the potential to save the Hydaburg School District in excess of $500,000 over the life of the project.

AEA will work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project. AEA recommends partial funding of design and permitting to allow the Hydaburg City Schools to make an informed decision about pursing biomass as a heating option.

Recommend partial funding for final design and permitting with the requirements that AEA must review and accept the final engineering design and business/operational plan; biomass storage; harvest/inventory plan, $125,000.

**Funding & Cost**

- **Cost of Power:** $0.24 /kWh
- **Price of Fuel:** $4.20 /gal

- **Project Cost:** $627,900
- **Requested Grant Funds:** $583,900
- **Matched Funds Provided:** $44,000

- **AEA Funding Recommendation:** $125,000
Alaska Renewable Energy Fund: Round 7

App # 1016  Hydaburg Schools Wood Fired Boiler Project

Resource: Biomass

Proposer: Hydaburg City School District

Applicant Type: Government Entity

Proposed Project Phase: Design Construction

Program Manager: Helen Traylor

Energy Region: Southeast

Stage 3 Scoring Summary

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Stage 2 Total Weight (out of 100): 77.83

Stage 3 Total Weight (out of 100): 63.95

Project Rank

Statewide (out of 86): 29
Region Rank: 8

Economic Analysis

Benefit/Cost Ratio (Applicant): 2.45
Benefit/Cost Ratio (AEA): 1.91

DNR/DMLW Feasibility Comments

No State land - installs at existing facilities.

DNR/DOF Feasibility Comments

This project is for design and construction for 4 Garn wood fired boilers adjacent to the Hydaburg school site. The units would plumb into the school’s heating system, four teacher housing units and a greenhouse. It is estimated that 200 cords of wood per year would be required to fire the Garn units. This is well within the realm of sustainability as the Tongass National Forest is stated to have an annual resource availability of 60-70 million board feet. It is not clear what firewood vendors are in place to supply this volume but the project proposal states that the Howard Valentine School in Coffman Cove purchased 200 cords from a commercial vendor. If vendors are available to supply the raw material, and the Forest Service offers up volume, then there should be sufficient biomass available for the project.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Our project will serve four school communities and we intend to use wood biomass and replacing diesel as the energy source by installing wood fired boilers. We anticipate the result of greatly reduced heating costs for the schools and associated buildings. Thorne Bay School received a grant in 2009 to install two Garn wood fired boiler units, and while the system has been operating, it has proven too small for the job. The units currently in use, (proto-types), can easily be moved with a forklift, so part of the proposal is to install them at two other school sites, Whale Pass and Hollis Schools. In order to heat the facility in Thorne Bay which includes a teacher housing unit and a hydroponic greenhouse, the current system would be replaced with 2 Garn 3200's, and a structure built to house the boilers. Very little reconstruction would be necessary in Thorne Bay due to the portability of the current Garn Pacs. In Whale Pass and Hollis, structures would be built to house the boilers. Wood storage buildings will also be constructed. At Naukati School we would install a wood fired boiler and build the housing for it as well as for wood storage. The Naukati School is the same size as Howard Valentine School, Coffman Cove, in our district, where we have an operating Garn system. Naukati will be modeled after the Coffman Cove set-up. Money saved on the fuel costs will be re-invested in the school, resulting in more direct service to our students.
This project is for upgrade of two Garn boilers at the Thorne Bay School to larger capacity units. The original units would be moved and installed in the Whale Pass and Hollis Schools. The project would also fund a Garn installation at the Naukati School. All of the schools are located within the Tongass National Forest on Prince of Wales Island. The proposal states that approximately 20-40 million board feet is available sustainably per Forest Service estimates. A vendor has been delivering wood to the Thorne Bay School and it appears other vendors are available. A sustainable wood supply for the approximately 265 annual cord consumption does not seem to be a problem.
Project Description


AEA Review Comments and Recommendation

The Haines Borough is proposing final design and installation of low emissions; high efficiency; 3rd party tested pellet-fired boiler systems to heat Borough-owned buildings; Haines School and Pool, Chilkat Center, Sewer Treatment Plant, Water Treatment Plant, Vocational Education Building, The Library, old City Shop, new City Shop, The Public Safety Building and The Sheldon Museum. This project is estimated to displace a total of 80,000 gallons per year of fuel oil, using 695 tons of pellets per year. The project has completed feasibility/conceptual design phase work.

The application includes substantial support from the community and Borough. Haines Borough has already purchased and installed a pellet system at the Borough Senior Center. This project will develop an anchor tenant for pellet supply in the Southeast Alaska region and will potentially support the development of pellet manufacturing infrastructure.

AEA will work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project.

Recommend full funding for design, permitting, and construction with requirements of AEA acceptance of final design, fuel supply plan, biomass storage, and business/operational plan before construction funds are released.

Funding & Cost

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Alaska Renewable Energy Fund: Round 7

App # 1021  Haines Borough Municipal Buildings Biomass Project

Resource: Biomass
Proposer: Haines Borough
Applicant Type: Local Government

Proposed Project Phase: Construction Design
Program Manager: Helen Traylor
Energy Region: Southeast

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No known issues

DNR/DOF Feasibility Comments

This project submitted by the Haines Borough seeks funding to conduct construction of ten wood pellet boilers and storage silos in several Borough-owned buildings. It is expected that the pellet boilers will displace 80,000 gallons of fuel oil annually for a savings of $59,000. This is based on a pellet delivered price of between $300 and $360 per ton and consuming about 695 tons of pellets. The borough is working with Sealaska and other potential pellet suppliers to provide a secure, long-term supply of pellets. Pellets are sourced from Washington and delivered by Sealaska of Juneau. This project appears to be well thought out and likely to be successful given the fact that the Sealaska Corporation already is utilizing a significant amount of pellets with a proven fuel delivery system. The proposal also mentions that Chilkoot Indian Association in Haines is considering the construction of a pellet plant in Haines. If this materializes, it could provide another source of pellets to the borough. Timber resources in the Haines State Forest are adequate to provide a significant local source of raw material for pellet production. The State Division of Forestry is currently updating the Haines State Forest inventory to be able to more accurately describe the volume estimates of its lands.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1026  Atka Dispatchable Heat

Resource: Hydro to Heat  Proposed Project Phase: Construction
Proposer: City of Atka  Program Manager: Audrey Alstrom
Applicant Type: Local Government  Energy Region: Aleutians

Project Description
This project consists of the installation of a dispatchable electric energy system to supply electric space heat to designated buildings regularly used by the general public of Atka. The energy to power the system will come from excess electricity available from the recently completed Chuniixsax Creek hydroelectric plant. The existing hydro-electric controls will be reprogrammed to support the dispatchable system. Each installation will include replacement of the existing electric meter with a duplex meter base to meter dispatched energy separate from building power; a new dispatchable energy panel and controller; an electric boiler; unit heaters or baseboards; wiring; and hydronic heating connections.

AEA Review Comments and Recommendation
City of Atka requests $114,965 in grant funds to install dispatchable electrical heating systems in public buildings to utilize excess hydroelectric generation from the Chuniisax Creek Hydroelectric Project. The project is expected to displace 8,300 gallons of diesel fuel annually.

The City completed permitting and design under a Round 3 REF grant (#7030001) for $80,000.

AEA has the following concerns: The environmental report did not investigate the potential for encountering lead based paint and asbestos containing materials in the installation of the new heating equipment in the older buildings to be served. This oversight may add risk to the project, since, if found, these would require specialty subcontractors to remediate. Also, it appears the powerhouse load bank will still be in use for frequency regulation, which will continue to “waste” electricity.

AEA recommends making energy efficiency improvements to the buildings that will receive hydro heat, further enhancing the benefit of the hydro energy.

Recommend full funding.

Funding & Cost
Cost of Power: $0.70 /kWh  Project Cost: $135,254
Price of Fuel: $7.65 /gal  Requested Grant Funds: $114,965

Matched Funds Provided: $20,289

AEA Funding Recommendation: $114,965

S-37 Bethel/Aleutian

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Alaska Renewable Energy Fund: Round 7

App # 1026 Atka Dispatchable Heat

Resource: Hydro to Heat
Proposer: City of Atka
Applicant Type: Local Government

Proposed Project Phase: Construction
Program Manager: Audrey Alstrom
Energy Region: Aleutians

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

A DMLW Water Permit was issued for this project in 2005 under file LAS 23103. According to the information presented, currently proposed work will be limited to modification of existing facilities (no new construction). No DMLW-managed lands or permit requirements apparent.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Funding is being requested to help support the costs of final design, permitting and construction of a ground source heat pump system to displace approximately 75% of the heating oil usage of the 17,191 sq. ft. Seldovia House Senior Housing Complex. Seldovia House is an 18-unit housing complex serving low income senior citizens living in Seldovia. The total annual cost for heating oil for 2012 heating season (Jan 2012-Dec 2012) was $56,461. A field of ten vertical wells, 6" diameter x 300 ft. depth, will be located under the existing parking area and will serve as the heat source. A manifold loop of buried HDPE piping with methanol/water mixture will connect the wells to two high efficiency water to water heat pumps installed in the existing mechanical room. One of the existing heating oil boilers will be replaced by the two new heat pumps. On the load (hot) side of the heat pumps, buffer tanks will be heated from 130F to 145F, these will in turn supply heat to both hydronic space heating and domestic hot water. A heat pump/boiler controller will integrate the heating oil boiler such that supplemental heat will be provided when the heat pump capacity is exceeded on cold winter days. The goal of the ground source heat pump project is to displace approximately 75% of the heating oil currently used annually in the building for space heating and domestic hot water heating.

The Cook Inlet Housing Authority proposes to install a ground source heat pump system in the Seldovia House housing complex in order to reduce the building’s heating oil consumption.

Despite some unknowns regarding ground source heat pump performance on the Kenai Peninsula, the economics of the proposed installation appear to hold up to a range of conservative assumptions. The project could provide useful GSHP performance data for the Kenai Peninsula in addition to demonstrating the effectiveness of a hybrid heat pump/fuel oil system. The high cost of fuel oil in Seldovia makes the potential savings of a ground source heat pump attractive despite higher local electricity costs.

Full funding recommended.

Funding & Cost

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Alaska Renewable Energy Fund: Round 7

App # 1031 Seldovia House Ground Source Heat Pump Project

Resource:  Heat Pumps
Proposer:  Cook Inlet Housing Authority
Applicant Type:  Government Entity

Proposed Project Phase:  Design
Construction

Program Manager:  Alan Baldivieso
Energy Region:  Railbelt

Stage 3 Scoring Summary

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Stage 3 Total Weight (out of 100) | 67.93 |

Economic Analysis

Stage 2 Total Weight (out of 100) | 58.17 |
Benefit/Cost Ratio (Applicant) | 0.94 |
Benefit/Cost Ratio (AEA) | 1.12 |

Project Rank

Stage 3 Total Weight (out of 100) | 67.93 |
Statewide (out of 86) | 19 |
Region Rank | 2 |

DNR/DMLW Feasibility Comments

No DNR/DMLW lands affected.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1032  Biomass Heat for Minto Community Buildings  Heat Application

Resource: Biomass  Proposed Project Phase: Design
Proposer: Village of Minto  Construction
Applicant Type: Government Entity

Program Manager: Helen Traylor  Energy Region: Yukon-Koyukok/Upper Tanana

Project Description

The project is the installation of a single biomass heating system serving the Minto Multi-Purpose Building/Lodge and the Health Clinic. The project will reduce the cost of heat by offsetting 11,400 gallons of fuel oil with 99 cords of firewood per year. The biomass heat system will be located in a stand-alone building (new construction) located adjacent to the project buildings. The project site and all project buildings are controlled by the Village of Minto. The wood fuel will be sourced from nearby forests owned by Sethy-De-Ya-Ah Corporation, which has provided a letter of commitment for the project. Fuel harvests will be completed by Minto's trained wildfire crew, and the crew boss has provided a letter of support for the project. A harvest plan will be completed by Tanana Chiefs Conference, and is included as part of the project budget. The project emerges from significant community energy planning efforts and project prioritization, including the US DOE Strategic Technical Assistance Response Team (START) program and wood energy assessment supported by the Alaska Wood Energy Development Task Group.

AEA Review Comments and Recommendation

Village of Minto proposes final design and construction of a biomass boiler system that is low emission, high efficiency, and 3rd party tested to supply heat to the Minto Multi-Purpose Building/Lodge and the Health Clinic. The system would consume approximately 99 cords per year and displace 11,400 gallons of fuel oil per year.

Reconnaissance assessment through the Alaska Wood Energy Development Task Group indicates a viable project. Village of Minto is supplying a building to house the boiler(s) as a match.

AEA is concerned by the lack of a harvest/operations plan for the project, but it is a deliverable. However, we recognize the existing fuel wood market in the interior Region. AEA will work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project.

Recommend full funding for final design, permitting, and construction with requirement that Minto provide a harvest plan; business/operations plan; biomass storage; final design that must be reviewed and approved by AEA before construction funds are disbursed.

Funding & Cost

| Cost of Power: $0.59 /kWh | Project Cost: $403,550 |
| Price of Fuel: $5.00 /gal | Requested Grant Funds: $274,750 |

Matched Funds Provided: $278,800  AEA Funding Recommendation: $274,750

Electro District: S-38 Wade Hampton/McKinley
Alaska Renewable Energy Fund: Round 7

App # 1032  Biomass Heat for Minto Community Buildings

Resource: Biomass
Proposer: Village of Minto
Applicant Type: Government Entity

Proposed Project Phase: Design

Program Manager: Helen Traylor

Energy Region: Yukon-Koyukok/Upper Tanana

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

The facility and supporting biomass harvest are proposed to take place on Village or Native Corporation lands, therefore no state lands are directly affected. Roads to facilitate timber harvest are described; any direct road connection to the Elliott Highway may require driveway permitting through DOT/PF.

DNR/DOF Feasibility Comments

This project submitted by the Minto Village Council seeks final design and construction funding to install a hydronic wood boiler serving the multi-purpose building and the health clinic. The actual boiler type will be determined in consultation with the Council and AEA. The proposal states that the wood will be sourced from local forests owned by the village corporation, Seth-do-ya-ah. A forest inventory conducted by the Tanana Chiefs Conference Forestry Program concludes that a project using about 100 cords per year could easily source all its fuel within one mile of the Elliot Highway. Wood species would primarily be fire killed spruce with some green timber as well. TCC will also assist the village in developing a harvest and operations plan to ensure sustainability of the project. It is expected that 11,400 gallons of fuel oil will be offset by the use of wood. Oil prices average about $5 per gallon and the delivered wood price is estimated at $200 per cord however this amount seems low for Interior Alaska and may be closer to $250 per cord. An important aspect of the project is a statement from the executive director of the village corporation supporting the project and committing to resource supply. The letter states that the corporation supports harvest in the burn area that is located approximately 40 miles north of the village.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Project Description

The City and Borough of Sitka is applying for design and construction of a sea water source heat pump system to displace 100% of the heating oil usage of the existing 11,000 sq ft historic Sage Memorial Building that has been home to the Sitka Sound Science Center (SSSC) since 2010.

The Science Center has already conducted significant feasibility and reconnaissance work on this project. With the help of the Rasmuson Foundation and Foraker Group, they have conducted an energy audit, a heat pump evaluation, and a master plan for the facility. A significant amount of funds have been raised to improve the energy efficiency of the structure through renovations of roof, windows and exterior. These renovations will compliment the project proposed here. Raw sea water flow of up to 85 gallons per minute will serve as the heat source. The sea water is drawn from a depth of 65 ft via an existing 8” intake line and shoreside pump station. A buried manifold pipe delivers sea water in to the basement of the building where the heat pump system will be located. The sea water will transfer heat thru a titanium plate heat exchanger to a glycol loop that in turn will serve as the source side of the new heat pumps. Three 84,000 BTU/hour high efficiency water to water heat pumps will be installed in the existing mechanical room. The existing heating oil boiler and electric boiler will be replaced by the three new heat pumps. On the load (hot) side of the heat pumps, two buffer tanks will be heated from 115F to 145F, these will in turn supply hydronic heat to new low temperature baseboards also included in the project. A heat pump controller will modulate the temperature of the hydronic heat based on outdoor air temperature. This project will be the first sea water source heat pump system in Sitka, and the first water source heat pump system in Sitka to displace 100% of its existing annual heating oil and electric resistance heat. The proposed heat pump system is anticipated to perform with a seasonal COP of 3 or greater, due in great part to the reliably warm sea water from Sitka Sound.

Project Location: 834 Lincoln Street, Sitka AK 99835

AEA Review Comments and Recommendation

The City and Borough of Sitka proposes to install a sea water source heat pump system at the Sitka Sound Science Center.

Because the Science Center is already equipped with a sea water intake to supply its aquarium and hatchery, the proposed project represents a lower cost opportunity to install a sea water source heat pump system relative to other buildings.

According to AEA’s review, given the anticipated capital costs of the proposed system, the size of the building and existing heat loads would not result in the displacement of a sufficient quantity of diesel for system payback. However, the possibility of expansion of the system to provide heat to additional nearby buildings could make the project more economically compelling. AEA recommends funding for the design portion of the project with the requirement that incorporation of additional loads be considered in order to improve overall project economics.

Partial funding recommended.
Alaska Renewable Energy Fund: Round 7

App # 1033  Sitka Sea Water Source Heat Pump Project

Resource: Heat Pumps
Proposer: City and Borough of Sitka
Applicant Type:

Proposed Project Phase: Design Construction
Program Manager: Alan Baldivieso
Energy Region: Southeast

Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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Stage 2 Total Weight: 54.83
Stage 3 Total Weight: 55.34

Economic Analysis

- Benefit/Cost Ratio (Applicant): 0.52
- Benefit/Cost Ratio (AEA): 0.50
- Project Rank: Statewide (out of 86) - 42, Region Rank - 12

DNR/DMLW Feasibility Comments

No known issues

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Ketchikan Gateway Borough seeks to secure its future energy independence through the construction of two biomass-fired building heating systems. The woody biomass fired boilers will replace outdated heating oil boilers, which are costly to maintain and run on heating oil number 2, which is more expensive than locally sourced woody biomass. These systems will, in turn help to stabilize and secure the forest products industry of Southeast Alaska through the sourcing of locally-produced wood pellets.

The Ketchikan Gateway Borough requests funding for construction to build two biomass heating system for the Ketchikan Airport and Ketchikan High School. The project is estimated to displace 111,033 gallons of fuel/year and has the potential to save the Ketchikan Gateway Borough fuel costs in excess of $8.0 million over 20 years.

Due to the differing economics of the two proposed projects, AEA recommends partial funding for the Ketchikan Airport pellet system installation only.

Before any funding is released to the grantee, AEA must review and accept the final design for the pellet system, the business/operations plan, and a biomass fuel supply plan. The system must meet AEA’s biomass program requirements of low emissions, high efficiency, third party tested, and UL listed (the product meets public safety requirements as designated by the Underwriters Laboratories).

Ketchikan Gateway Borough should reevaluate the potential for a biomass system at the high school after the final design has been completed. AEA encourages Ketchikan to work directly with AEA staff in the coming year to continue to examine the implementation of biomass at the school.

AEA recommends partial funding of $620,000.
Alaska Renewable Energy Fund: Round 7

App # 1037  Ketchikan Gateway Borough Biomass Heating Project

Resource:  Biomass
Proposer:  Ketchikan Gateway Borough
Applicant Type:  Local Government

Proposed Project Phase:  Construction
Program Manager:  Helen Traylor
Energy Region:  Southeast

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No State Land - replaces existing boilers

DNR/DOF Feasibility Comments

This project submitted by the Ketchikan Gateway Borough requests construction funding to install two pellet fired boilers. One boiler would be installed in the Ketchikan Airport and the other in the Ketchikan Gateway Borough High School. The boilers would be designed to use standard grade pellets which allow for higher ash content. The total combined demand is approximately 1,230 tons per year at an average price of $275 per ton. Discussions for a long term pellet supply contract have been made with Tongass Forest Enterprises that is offering contracts up to 5 years in length for volumes exceeding 500 tons per year. A silo would house the bulk delivery of pellets in Ketchikan. This successful fuel delivery model is similar to what is employed in Juneau to provide pellets to the Sealaska corporate building.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Resource: Biomass
Proposer: City of Kotzebue
Applicant Type: Local Government

Project Description

The objective of the Kotzebue Paper and Wood Waste to Energy Project is to replace fuel oil fired boilers with refuse derived fuel (RDF) and wood fired boilers in two city owned buildings. Feedstock for this system will consist of sorted and separated cardboard, newspaper, mixed paper, and wood materials from the city of Kotzebue waste stream. The city's waste management equipment will be used to collect materials, either as source-separated material from the producers or mixed with the city's MSW waste stream. RDF fuel will be separated from the waste stream in the Bailer building, in conjunction with an aluminum and tin recycling program.

Project Location: 258 Third Avenue Kotzebue, Alaska

AEA Review Comments and Recommendation

The City of Kotzebue is proposing installation and commissioning of a refuse derived fuel (RDF) and low emission, high efficiency, and 3rd party tested biomass fired boilers in two city owned buildings. This project is estimated to displace a total 98,000 of gallons per year of fuel oil, using 2,300 tons of chips per year. The technical feasibility phase of this project is complete, but the final design and harvest/fuel inventory work is still in process.

AEA will work with the grantee to ensure that building energy efficiency and air quality is addressed in conjunction with this project. AEA recommends partial funding of design and permitting to allow the City of Kotzebue to make an informed decision about pursuing biomass as a heating option.

Recommend partial funding with the requirements that AEA must review and accept the final engineering design; business/operational plan; biomass storage; biomass inventory assessment, $270,000.

Funding & Cost

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AEA Funding Recommendation: $270,000
Alaska Renewable Energy Fund: Round 7

App # 1038  Kotzebue Paper and Wood Waste to Energy Project

Resource: Biomass
Proposer: City of Kotzebue
Applicant Type: Local Government

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No state lands are affected, as the project is proposed for City property.

DNR/DOF Feasibility Comments

This project submitted by the City of Kotzebue requests final design and construction funding for a refuse derived wood fired boiler that would also be capable of burning wood pellets. The project will utilize 300 tons of refuse derived fuel. If wood pellets are used as a supplemental feed stock, the price is anticipated to be around $300 per delivered ton. This project appears to be sustainable in that the roughly 22 million BTUs of paper waste are generated per day in Kotzebue. This project requires about 3,442 million BTUs per year or about 40% of the total yearly generated paper waste.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

1/20/2014 3:52:02 PM
Alaska Renewable Energy Fund: Round 7

App # 1040  Brevig Mission Water System Heat Recovery

Resource:  Heat Recovery
Proposer:  City of Brevig Mission
Applicant Type:  Government Entity

Project Description

This project will provide waste heat from the existing electrical power plant to the water treatment plant and washeteria. The project will install marine manifolds on the existing diesel generators and provide the recovered heat to the water system. The current estimate of fuel savings is 14,726. However, an intertie of the power system is planned with the neighboring village of Teller. If that project proceeds, available heat may be increased to up to 33,000 gallons of equivalent heat. For more detailed information, see the attached, updated Brevig Mission, Alaska 2013 Heat Recovery Feasibility Study.

AEA Review Comments and Recommendation

The Alaska Native Tribal Health Consortium and the City of Brevig Mission are proposing to design and construct a recovered heat system from the existing power plant to the Water Treatment Plant and the Washeteria/City Office. The Heat Recovery System will require the installation of a marine manifold on one of the existing generators.

The Preliminary Heat Recovery Assessment was completed in September of 2013 and showed sufficient excess heat to support this project.

The intertie to Teller was damaged and AVEC is working with FEMA on repairs. Significant more recoverable heat will be available when the intertie is repaired, and the heat recovery system should be designed to handle this heat load.

The uninsulated AVEC power plant modules should be insulated to maximize available heat.

Recommend full funding.

Funding & Cost

Cost of Power:  $0.54 /kWh
Price of Fuel:  $5.29/gal

Project Cost:  $753,313
Requested Grant Funds:  $731,372
Matched Funds Provided:  $21,941

AEA Funding Recommendation:  $731,372
Alaska Renewable Energy Fund: Round 7

**App # 1040 Brevig Mission Water System Heat Recovery**

**Resource:** Heat Recovery  
**Proposer:** City of Brevig Mission  
**Applicant Type:** Government Entity  
**Proposed Project Phase:** Design  
**Energy Region:** Bering Straits  
**Program Manager:** Devany Plentovich

### Stage 3 Scoring Summary

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#### Economic Analysis

- **Stage 2 Total Weight (out of 100):** 83.00
- **Benefit/Cost Ratio (Applicant):** 2.01
- **Benefit/Cost Ratio (AEA):** 1.51
- **Stage 3 Total Weight (out of 100):** 68.16
- **Statewide (out of 86):** 18
- **Region Rank:** 2

### DNR/DMLW Feasibility Comments

There are no apparent conflicts with rights-of-ways for the arctic piping between the power plant and the end-user buildings, as the route is entirely within existing road rights-of-way and on city, school, and AVEC property. Rhino-Flex pipe will be buried between the washeteria and the AVEC power plant. This route includes one creek crossing at Sherman Creek. COE and ADF&G permits are being requested. It is not navigable; therefore, not state managed land. The application mentions the possibility of increasing the potential fuel savings with the heat recovery system if a planned intertie of the power system with the neighboring village of Teller is constructed. It appears that the intertie is a separate proposal.

### DNR/DOF Feasibility Comments

### DNR/DGGS Feasibility Comments

### DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

### DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1041  Chevak Water and Vacuum Plant Heat Recovery

Resource:  Heat Recovery
Proposer:  City of Chevak
Applicant Type:  Government Entity

Project Description

This project will provide waste heat from the existing electrical power plant to the Water Treatment Plant and Vacuum Sewer Plant. The estimated fuel oil savings to the water treatment plant and vacuum sewer plant is projected to be 12,500 gallons of heating oil per year. For more detailed information, see the attached updated Chevak, Alaska 2013 Heat Recovery Feasibility Study.

AEA Review Comments and Recommendation

The Alaska Native Tribal Health Consortium and the City of Chevak are proposing to design and construct a recovered heat system from the existing power plant to the Water Treatment Plant and Vacuum Sewer System.

The Preliminary Heat Recovery Assessment was completed in September of 2013 and showed sufficient excess heat to support this project.

ANTHC has funding for an electric heater for excess wind. The design should take into account the integration of wind-to-heat. The design should also consider the opportunity for marine jacketed engines supplying heat to additional community buildings.

Recommend full funding.

Funding & Cost

Cost of Power:  $0.48/kWh
Price of Fuel:  $4.30/gal

Project Cost:  $558,814
Requested Grant Funds:  $558,814
Matched Funds Provided:  $16,765

AEA Funding Recommendation:  $558,814

Election District:  S-38  Wade Hampton/McKinley
Alaska Renewable Energy Fund: Round 7

App # 1041 Chevak Water and Vacuum Plant Heat Recovery

Resource: Heat Recovery
Proposer: City of Chevak
Applicant Type: Government Entity

Proposed Project Phase: Design
Construction

Program Manager: Devany Plentovich
Energy Region: Lower Yukon-Kuskokwim

Stage 3 Scoring Summary

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Stage 3 Total Weight (out of 100)

Stage 2 Total Weight (out of 100)

Economic Analysis

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<td>(AEA)</td>
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Project Rank

Stage 3 Total Weight (out of 100)

Region Rank

Statewide (out of 86)

DNR/DMLW Feasibility Comments

This project is not located on DMLW-managed land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1042  Eek Water System Heat Recovery

Resource:  Heat Recovery
Proposer:  City of Eek
Applicant Type:  Government Entity

Proposed Project Phase:  Design
Program Manager:  Devany Plentovich
Energy Region:  Lower Yukon-KuskoKwim

Project Description

This project will provide waste heat from the existing electrical power plant to the water system via a heating connection into the circulating water distribution loop. The fuel oil savings to the community water system is projected to be 4,000 gallons of heating oil per year. For more detailed information, see the attached updated Eek, Alaska 2013 Heat Recovery Feasibility Study.

AEAn Review Comments and Recommendation

The Alaska Native Tribal Health Consortium and the City of Eek are proposing to design and construct a recovered heat system from the existing AVEC power plant to the circulating water distribution loop and the water storage tank.

The Preliminary Heat Recovery Assessment was completed in September of 2013 and showed sufficient excess heat to support this project.

AVEC is investigating the feasibility of wind power in the City of Eek. The design should take into account the integration of wind-to-heat.

Recommend full funding.

Funding & Cost

Cost of Power:  $0.60 /kWh
Price of Fuel:  $3.89 /gal

Project Cost:  $297,408
Requested Grant Funds:  $288,745
Matched Funds Provided:  $8,663

AEA Funding Recommendation:  $288,745

Election District:
S-37  Bethel/Aleutians
Alaska Renewable Energy Fund: Round 7

App # 1042  Eek Water System Heat Recovery

Resource:  Heat Recovery
Proposer:  City of Eek
Applicant Type:  Government Entity

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

The listed location of this project is incorrect (lat/long given in application are the same as project 1005). Based on project description this is on lands owned by the city of Eek and is not located on DMLW-managed land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
This project will provide waste heat from the AVEC electrical power plant to the city shop, water circulation loops, cold storage/hotel, and city office buildings. The expected annual fuel savings is 15,726 gallons, which is approximately equivalent to the total heat demand of three buildings plus the water system. For more detailed information, see the attached St. Mary’s, Alaska 2013 Heat Recovery Feasibility Study.

AEA Review Comments and Recommendation

The Alaska Native Tribal Health Consortium and the City of Saint Mary’s are proposing to design and construct a recovered heat system from the existing AVEC power plant to City Shop, Water Circulation Loop, Cold Storage/Hotel, and City Office Building.

The Preliminary Heat Recovery Assessment was completed in September of 2013 and showed sufficient excess heat to support this project.

Recommend full funding.

Funding & Cost

<table>
<thead>
<tr>
<th>Cost of Power:</th>
<th>$0.49 /kWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price of Fuel:</td>
<td>$4.60 /gal</td>
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</table>

| Project Cost: | $757,299 |
| Requested Grant Funds: | $735,242 |
| Matched Funds Provided: | $22,057 |

| AEA Funding Recommendation: | $735,242 |

Election District: S-38  Wade Hampton/McKinley
Alaska Renewable Energy Fund: Round 7

App # 1043  St Marys Heat Recovery System

**Resource:**  Heat Recovery

**Proposer:**  City of St. Mary's

**Applicant Type:**  Government Entity

**Proposed Project Phase:**  Design

**Program Manager:**  Devany Plentovich

**Energy Region:**  Lower Yukon-Kuskokwim

**Stage 3 Scoring Summary**

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<thead>
<tr>
<th>Criterion (Weight)</th>
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**Stage 3 Total Weight**  67.41

**Economic Analysis**

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**Project Rank**

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**DNR/DMLW Feasibility Comments**

This project is not located on DMLW-managed land.

**DNR/DOF Feasibility Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DGGS General Comments (permanent construction sites and potential geohazards)**

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

**DNR/DGGS Geohazards Comments**
Project Description

This project will provide waste heat from the existing electrical power plant to the newly constructed clinic. The fuel oil savings to the clinic is projected to be 2,300 gallons of heating oil per year. For more detailed information, see the attached updated Venetie, Alaska 2013 Heat Recovery Feasibility Study.

AEA Review Comments and Recommendation

The Alaska Native Tribal Health Consortium and the Village of Venetie are proposing to extend the use of recovered heat from the existing Venetie power plant for heating the newly constructed clinic. Recovered heat is already being used to heat the Washeteria and Water Treatment Plant.

The Preliminary Heat Recovery Assessment was completed in September of 2013 and showed sufficient excess heat to support this project.

Recommend full funding.

Funding & Cost

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Project Cost: $204,428
Requested Grant Funds: $198,474
Matched Funds Provided: $11,908

AEA Funding Recommendation: $198,474
Alaska Renewable Energy Fund: Round 7

App # 1044  Venetie Clinic Heat Recovery

Resource:  Heat Recovery
Proposer:  Village of Venetie
Applicant Type:  Government Entity

Proposed Project Phase:  Design
Construction

Program Manager:  Devany Plentovich
Energy Region:  Yukon-Koyukok/Upper Tanana

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments
Initial land status research indicates the project will not impact state land. The applicant indicates that pipes carrying heat between the power plant and the clinic will be installed along existing Rights Of Ways (ROW) on City property. A brief search for Alaska Department of Transportation (DOT) involvement in roads in Venetie resulted in identifying a 2011 DOT document that listed two roads in Venetie as “rural major collector” and “rural minor collector.” It is not clear if these DOT designations as “rural collectors” means these roads include DOT ROWs. The applicant should verify who holds the right-of-way and coordinate with that entity.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)
All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

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Project Description

This project will provide waste heat from the AVEC electrical power plant to water treatment plant (WTP). The expected annual savings is 5,261 gallons, or approximately half of the total heat demand. For more detailed information, see the attached Grayling, Alaska 2013 Heat Recovery Feasibility Study.

AEA Review Comments and Recommendation

The Alaska Native Tribal Health Consortium and the City of Grayling are proposing to design and construct a recovered heat system from the existing power plant to the Water Treatment Plant.

The Preliminary Heat Recovery Assessment was completed in September of 2013 and showed sufficient excess heat to support this project.

The uninsulated AVEC power plant modules should be insulated to maximize available heat.

Recommend full funding.

Funding & Cost

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<td>Price of Fuel:</td>
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Project Cost: $332,590
Requested Grant Funds: $322,903
Matched Funds Provided: $19,374

AEA Funding Recommendation: $322,903
Alaska Renewable Energy Fund: Round 7

App # 1045  Grayling Heat Recovery System

Resource:  Heat Recovery
Proposer:  City of Grayling
Applicant Type:  Government Entity

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

This project is not located on DMLW-managed land. (This is not the project that was previously reviewed as #932 during round 6.)

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
The City of Galena is requesting AEA Round VII funding to provide a sustainable and predictable energy resource for its school district. The Galena Community Wood Heat Project will substantially reduce high costs for heat for the Galena Interior Learning Academy School (GILA) by utilizing woody biomass harvested and processed from local forests. The project will implement Phase IV Construction over an eighteen (18) month period to construct and install a biomass boiler system for the GILA campus. Local coordination among the stakeholders group is strong, infrastructure and administrative resources are in place to support the project, and the Galena City School District has committed to purchasing the resulting heat. Existing Feasibility Studies and strategic community planning documents align with the project.

The City of Galena is proposing installation and commissioning of a low emission, high efficiency, and 3rd party tested chip-fired boiler system to heat its school district and the Galena Interior Learning Academy School (GILA). This project is estimated to displace a total 203,850 gallons per year of fuel oil, using 2,300 tons of chips per year. The technical feasibility phase of this project is complete, but the final design and harvest/fuel inventory work is still in process.

The application includes substantial support from the community, the Louden Tribal Council, Galena City School District, and Gana’A-Yoo Limited. AEA will work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project. Also, AEA must review and approve Phase III – Final Design.

Recommend full funding with the requirements that AEA must review and accept the final engineering design funded in Round 6, including the decreased load resulting from end-use efficiency measures; business/operational plan with heat sales agreement; harvest plan; biomass storage; inventory plan prior to the release of construction funds.

Funding & Cost

| Cost of Power: $0.56 /kWh | Project Cost: $3,144,200 |
| Price of Fuel: $6.02 /gal | Requested Grant Funds: $3,096,898 |

Matched Funds Provided: $47,302

AEA Funding Recommendation: $3,096,898
Alaska Renewable Energy Fund: Round 7

App # 1047  Galena Community Wood Heat Project

Resource: Biomass
Proposer: City of Galena
Applicant Type: Local Government

Proposed Project Phase: Construction
Program Manager: Helen Traylor
Energy Region: Yukon-Koyukok/Upper Tanana

Stage 3 Scoring Summary

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Economic Analysis

- Stage 2 Total Weight (out of 100): 88.00
- Benefit/Cost Ratio (Applicant): 3.96
- Benefit/Cost Ratio (AEA): 4.31
- Stage 3 Total Weight (out of 100): 77.40
- Statewide (out of 86): 4
- Region Rank: 2

DNR/DMLW Feasibility Comments

Application states that biomass resources would be obtained from adjacent Native Corporation lands, therefore, no state forest resources are expected to be impacted. The application states that this project is on land owned by the City of Galena, however Alaska Mapper shows that this is within OSL 328. OSL 328 was granted to DOT&PF on 2/7/1966 under the Omnibus Act and DNR records do not show that this parcel has been transferred. Regardless, this is in no case on DMLW-managed lands.

DNR/DOF Feasibility Comments

This project submitted by the City of Galena requests construction funding for a biomass boiler for the Galena Interior Learning Academy campus. The projected amount of biomass needed per year is 2,500 tons with a delivery cost of $200 per ton. An updated forest inventory completed by Tanana Chiefs Conference in 2012 reported biomass dried tons within various radii of Galena. A sustainable annual harvest level of over 3,600 tons is available within a 4 mile radius indicating ample resource availability for the project. The village corporation has signed a letter of support and is willing to enter into a contract for the sale of timber which will support procurement of the biomass. This commitment combined with nearby state lands that would also be available as a raw wood supply should provide a means for a sustainable timber harvest operation in this area of Alaska.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1051 AGSD Extension of Heating Loop

Resource: Heat Recovery
Proposer: Alaska Gateway School District
Applicant Type: Government Entity

Proposed Project Phase: Design

Program Manager: Devany Plentovich

Energy Region: Yukon-Koyukok/Upper Tanana

Project Description

The project will include extending a new hot water heating loop from the recently completed Biomass Heating Plant to two (2) additional buildings on the Tok School Campus and will include the required integration work within the two buildings.

The first building is the multipurpose building which houses an ice hockey rink and shooting range. The intent is to use the biomass plant to heat the shooting range and toilet group portion of the multipurpose building, approximately 10,000 square feet.

The second building is the Zamboni garage which would approximately 1,400 square feet. The heating loop will connect to the Tok School Biomass Plant that was completed in the fall of 2010. (The Tok School Biomass Plant was developed using AEA Round I Grant Funding.)

The project consisted of a Biomass heating facility that contained an automated biomass heating system that now provides heat to the existing K-12 School. Since the completion of the Tok School Biomass Plant a steam turbine and electrical generation system have been added to create a combined heat and power (CHP) system. The original biomass boiler was sized to allow for the CHP expansion and the additional load of the multipurpose building and Zamboni garage. The CHP project was completed the fall of 2012. When the CHP system is in operation it generates a substantial amount of heat as a byproduct. The heat created currently surpasses the required heat demand of the existing K-12 School. The intent is to recover the surplus heat and supply it to meet the heating demand of the additional buildings mentioned above. The cost for maintenance and operation as well as for biomass fuel will be negated for this project due to the current operation of the CHP system.

Project Location: 249 Jon Summer Road

AEA Review Comments and Recommendation

Alaska Gateway School District proposes adding on a heat loop off the newly-completed wood-fired heating system at the Tok School to provide heat to two school buildings – the multipurpose building housing the ice rink and shooting range and the Zamboni building. The project team would complete a final design phase and construction documents prior to construction.

This application is similar to the Round 6 submittal #926 that was recommended for funding, but below the $25MM allotment. This Round 7 application significantly decreases the number of buildings and the size of the proposed in the heat loop.

Recommend full funding with the provision that AEA approve the final design before construction funds are released.

Funding & Cost

| Cost of Power: | $0.49 /kWh |
| Price of Fuel:  | $3.79/gal |

Project Cost: $629,000
Requested Grant Funds: $625,000
Matched Funds Provided: $4,000

AEA Funding Recommendation: $625,000

Election District: T-39 Bering Straits/Interior Villages
Alaska Renewable Energy Fund: Round 7

App # 1051  AGSD Extension of Heating Loop

Resource:  Heat Recovery  Proposed Project Phase:  Design
Proposer:  Alaska Gateway School District  Construction
Applicant Type:  Government Entity  Program Manager:  Devany Plentovich

Energy Region:  Yukon-Koyukok/Upper Tanana

Stage 3 Scoring Summary

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Stage 2 Total Weight (out of 100) = 59.83
Stage 3 Total Weight (out of 100) = 47.92

Economic Analysis

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Project Rank

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DNR/DMLW Feasibility Comments

Proposal for waste heat recovery system for AGSD's existing woody biomass energy facility. Possible AS 38.05.850 permits/easements needed for transmission lines on state land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1052  Nunam Iqua Heat Recovery Project

Resource: Heat Recovery
Proposer: City of Nunam Iqua
Applicant Type: Local Government

Proposed Project Phase: Construction
Program Manager: Devany Plentovich
Energy Region: Lower Yukon-Kuskokwim

Project Description

This project will provide recovered heat from the new Nunam Iqua power plant to the washeteria/water treatment plant for building heat; the water treatment plant for process heat; and to the Clinic, Community Hall and Corporation Store for building heat. The delivery system will include supply and return lines; BTU meters, heat exchangers and unit heaters. The estimated combined fuel reduction is 18,000 gallons per year with an expected annual savings of roughly $79,000.

AEA Review Comments and Recommendation

The Community of Nunam Iqua is proposing the design and construction of a recovered heat system from the new power plant to the washeteria/water treatment plant for building heat; the water treatment plant for process heat; and to the Clinic, Community Hall and Corporation Store for building heat. This project is proposed to be managed by AEA in conjunction with the design and construction of the new power plant.

The preliminary heat recovery assessment performed in September 2013 showed sufficient excess heat to support this project.

Recommend full funding.

Funding & Cost

Cost of Power: $0.53 /kWh
Price of Fuel: $4.38 /gal

Project Cost: $603,000
Requested Grant Funds: $450,000
Matched Funds Provided: $153,000

AEA Funding Recommendation: $450,000
Alaska Renewable Energy Fund: Round 7

App # 1052  Nunam Iqua Heat Recovery Project

Resource:  Heat Recovery
Proposer:  City of Nunam Iqua
Applicant Type:  Local Government

Proposed Project Phase:  Construction

Program Manager:  Devany Plentovich
Energy Region:  Lower Yukon-Kuskokwim

Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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DNR/DMLW Feasibility Comments

This project is not located on DMLW-managed Land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Primary heat sources in three municipal publicly accessible buildings will be replaced with two Garn WHS2000 boilers, which will use locally sourced cordwood biomass to provide heat through a supply loop linking all buildings. Existing antiquated hydronic heating systems in each building will be replaced and upgraded to improve efficiency an estimated 25%. Concurrent to this project, VEEP projects (Yakutat is a 2013 VEEP recipient) will be conducted to increase envelope efficiency per AEA statewide goal of 15%. AEA-required performance metering is addressed through ACEP subcontract. With significant local match and good project partners, we are seeking the funding for Phases III and IV: final design, purchase and installation of 2 Garn WHS2000 boilers, pipe installation and associated link up plumbing to all three buildings in the district heating loop. The project also includes construction of a separate boiler building and a cordwood storage/drying building. Per standard practice, existing oil furnaces will remain as supplemental and emergency back-up heat systems. The City and Borough of Yakutat, along with Yak-tat-Kwaan, want to ensure that we install the most effective technologically and economically appropriate equipment for our biomass district heating loop. We are pleased to have the interest of Garn Boiler Company in participating in this application based on the estimate for the equipment they suggested as most appropriate for the buildings involved. Garn has a proven track record of installing and operating their equipment in several locations in Alaska, including at least two that we know of in the coastal SE Alaska environment. It is our plan to also closely monitor developments in the biomass energy world, and we recognize that this technology sector is evolving. During the 9th month period of AEA review, legislative approval and appropriation, CBY and Yak-tat-Kwaan will continue to monitor technological development. One of our goals for the project is to link Yak-tat Kwaan’s forest management program and the biomass products produced with the installed boiler technology and have the best opportunity for expansion and integration of future biomass projects. CBY is prepared to operate and maintain this project, and has demonstrated ability to operate energy infrastructure through the electric utility, Yakutat Power.

Project Locations in Yakutat, AK:
City Hall Building: 309 Max Italio Drive, Court House Building: 120 Max Italio Drive,, Yakutat Community Center: 100 Ridge Road.

**AEA Review Comments and Recommendation**

The City and Borough of Yakutat is proposing final design and installation of low emissions; high efficiency; 3rd party tested cordwood boiler systems to heat three City/Borough-owned buildings: City Hall Building; Court House Building; Yakutat Community Center. This project is estimated to displace a total of 7,238 gallons per year of fuel oil, using 38 cords of wood per year. The project has completed a feasibility study.

This project is an example of good collaboration efforts among community organizations in an effort to provide low cost heating to the entire community of Yakutat. Also the local community appears to be supportive of a district biomass heating project. AEA will work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project. AEA recommends partial funding of design and permitting to allow the City and Borough of Yakutat to make an informed decision about pursuing biomass as a heating option.

Recommend partial funding with the requirements that AEA must review and accept the final engineering design; biomass storage; business/operational plan; harvest plan; inventory plan, $103,000.

**Funding & Cost**

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**Project Cost:** $335,456

**Requested Grant Funds:** $286,166

**Matched Funds Provided:** $49,290

**AEA Funding Recommendation:** $103,000
Alaska Renewable Energy Fund: Round 7

App # 1053 Yakutat Biomass District Heating Loop

Resource: Biomass
Proposer: City and Borough of Yakutat
Applicant Type: Local Government

Proposed Project Phase: Design
Construction

Program Manager: Helen Traylor
Energy Region: Southeast

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No State Land - replaces existing boilers in Community Buildings

DNR/DOF Feasibility Comments

This project submitted by the City and Borough of Yakutat requests design and construction funds for two Garn 2000 boilers. The boilers will displace about 7,000 gallons of diesel and consume 38 cords of wood. Forest Service and village corporation lands are nearby with an extensive road network built from previous harvest operations. From recent inventory analysis as stated in the proposal, a sustainable annual supply of 800 cords is available. Stands are generally second growth on previous cut over lands. Many of the forest stands are in need of pre-commercial thinning. The Village Corporation and Forest Service have committed to making the timber available. The current rate of fuelwood in Yakutat is $200 per cord. It is not clear in the proposal of who would provide this material or what firewood vendors are currently doing business in the area.

DNR/DGGGS Feasibility Comments

DNR/DGGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGGS Geohazards Comments
The City of Seward is the owner of the Alaska SeaLife Center (ASLC), which is leased and operated by the Seward Association of Marine Science (SMMS), doing business as the Alaska SeaLife Center. In conjunction with SMMS, the City proposes installation of an innovative heat recovery system that captures waste heat from exhaust fans EF-4 & EF-5, minus 80 tissue freezers, IT server room, electrical and mechanical room, fan coils and animal and necropsy refrigeration. Heat recovered will be directed to the front end of the seawater heat pump system and this will increase the coefficient of performance (COP) of this system.

The City of Seward proposes to install a run around heat recovery loop in the Alaska SeaLife Center to recover wasted heat from exhaust fans, appliances, and overheated rooms and deliver it into the building’s sea water source heat pump system, resulting in improved heat pump performance.

The calculated benefit derived from improved heat pump performance expected with the addition of the recovered heat into the system appears to be marginal, even assuming a dramatically increased heat pump output than is currently used. However, the additional benefit of avoiding the costs of a dedicated split cooling system for the overheated rooms is substantial. Even using more conservative assumptions regarding performance increase, the project appears to be economic. Full funding recommended.

### Funding & Cost

- **Cost of Power:** $0.11/kWh
- **Price of Fuel:** /gal

### Full Funding

- **Project Cost:** $250,000
- **Requested Grant Funds:** $225,000
- **Matched Funds Provided:** $25,000
- **AEA Funding Recommendation:** $225,000
DNR/DMLW Feasibility Comments

No apparent DMLW-managed lands or permit requirements apparent from review of the project materials provided.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)
All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments

Consider seismic ground motions from the Aleutian subduction zone. Consider tsunami hazards.
This project will provide waste heat from the existing electrical power plant to the water treatment plant/washeteria. The estimated fuel oil savings to the community water plant and washeteria is projected to be 3794 gallons of heating oil per year.

For more detailed information, see the attached updated Holy Cross, Alaska 2013 Heat Recovery Feasibility Study.
Resource: Heat Recovery
Proposer: City of Holy Cross
Applicant Type: Government Entity

Proposed Project Phase: Design

Program Manager: Devany Plentovich
Energy Region: Yukon-Koyukok/Upper Tanana

Stage 3 Scoring Summary

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Stage 2 Total Weight (out of 100) = 57.67
Benefit/Cost Ratio (Applicant) = 0.74
Benefit/Cost Ratio (AEA) = 0.55
Stage 3 Total Weight (out of 100) = 61.90
Statewide (out of 86) = 35
Region Rank = 7

DNR/DMLW Feasibility Comments
This project is not located on DMLW-managed Land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)
All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
This project will provide waste heat from the existing electrical power plant to the water treatment plant, the City Office, and the Boys and Girls Club. The estimated fuel oil savings to these facilities is projected to be 18,879 gallons of heating oil per year. For more detailed information, see the attached updated Emmonak, Alaska 2013 Heat Recovery Feasibility Study. (Note that the potential savings noted above are contingent on the completion of proposed renovations to the power plant.)

The Alaska Native Tribal Health Consortium and the City of Emmonak are proposing to design and construct a recovered heat system from the AVEC power plant planned for 2015 to the Water Treatment Plant, Boys and Girls Club, and the City Office/Hotel. The Preliminary Heat Recovery Assessment was completed in September of 2013 and showed sufficient excess heat to support this project. The design should consider the opportunity for marine jacketed engines supplying heat to additional community buildings.

Recommend full funding.

Funding & Cost

Cost of Power: $0.55 /kWh
Price of Fuel: $5.77/gal

Project Cost: $689,251
Requested Grant Funds: $689,251
Matched Funds Provided: $20,677

AEA Funding Recommendation: $689,251
Alaska Renewable Energy Fund: Round 7

App # 1061 Emmonak Heat Recovery System

Resource: Heat Recovery
Proposer: City of Emmonak
Applicant Type: Government Entity

Proposed Project Phase: Construction Design
Program Manager: Devany Plentovich
Energy Region: Lower Yukon-Kuskokwim

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

This project is not located on DMLW-managed Land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Kwigillingok Wind Heat Electrical Thermal Storage

Resource: Wind to Heat  
Proposer: Kwig Power Company  
Applicant Type: Utility  

Project Description
This project expands existing Kwigillingok Wind Heat Smart Grid System by expanding electric thermal storage (ETS) devices from 20 to 50 units. The ETS units proposed for installation in this project are in use in 27 homes in Kwigillingok (Kwig). Kwig has an operational, utility scale wind turbine project that produces excess wind capacity. Additional ETS units will maximize the use of wind power to displace diesel fuel for both power generation and heating.

AEA Review Comments and Recommendation
Kwigillingok received REF Round 1 and direct legislative appropriation funding to install five Windmatic 17S 95-kilowatt wind turbines, completing that project in 2012. This proposal would make use of excess electricity by diverting surplus kilowatts to residential heat loads. Applicant and contractor have prior experience installing ETS units. Average benefits seen for existing 27 installations will be somewhat lower when aggregated among 50 homes. Residents see full benefits of heat savings. Final determination and survey of homes for install (community designation) must be accepted by AEA prior to release of additional funds. Project needs to integrate with a separate project to upgrade the village distribution system as a condition of funding. Applicant has not been timely in submitting required quarterly operations and maintenance reports on the existing wind energy project. Applicant needs to meet reporting requirements on existing project from this point forward to receive funding. Recommend full funding.

Funding & Cost
Cost of Power: $0.60 /kWh  
Price of Fuel: $5.95/gal  

Project Cost: $302,737  
Requested Grant Funds: $293,737  
Matched Funds Provided: $9,000  

AEA Funding Recommendation: $293,737  

Election District: R-36 Dillingham/Iliamna
Alaska Renewable Energy Fund: Round 7

App # 1071  Kwigillingok Wind Heat  Electrical Thermal Storage

Resource:  Wind to Heat
Proposer:  Kwig Power Company
Applicant Type:  Utility

Proposed Project Phase:  Construction
Program Manager:  Rich Stromberg
Energy Region:  Lower Yukon-Kuskokwim

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

This project is not located on DMLW-managed Land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1073 Kongiganak Wind Heat Electrical Thermal Storage

Resource: Wind to Heat
Proposer: Puvurnaq Power Company
Applicant Type: Utility

Program Manager: Rich Stromberg
Energy Region: Lower Yukon-Kuskokwim

Project Description
This project expands existing Kongiganak Wind Heat Smart Grid System by adding additional electric thermal storage (ETS) devices. The units themselves have been in production since the mid-1980's as electric heat sources, but have only recently been advanced to include Grid Interactive Controls for renewable energy sources. Currently, the units and their controls are considered “off the shelf” technology and are readily available. The ETS units proposed for installation in this project are already in use in 20 homes in Kongiganak (Kong) and have realized those homes 30-50% fuel decreases (in home heating fuel) in the 10 months they have been in use. Kong has operational, utility scale, wind turbine project that produces excess wind capacity. This capacity needs to be used or the turbine production must be governed in a way that energy is wasted. Additional ETS units will provide an outlet to maximize the use of wind power to displace diesel fuel for both power generation and heating.

AEA Review Comments and Recommendation
Kongiganak received REF Round 1 and direct legislative appropriation funding to install five Windmatic 17S 95-kilowatt wind turbines, completing that project in 2012. This proposal would make use of excess electricity by diverting surplus kilowatts to residential heat loads. Applicant and contractor have prior experience installing ETS units. Average benefits seen for existing 20 installations will be somewhat lower when aggregated among 50 homes. Residents see full benefits of heat savings. Final determination and survey of homes for install (community designation) must be accepted by AEA prior to release of additional funds. Project needs to integrate with a separate project to upgrade the village distribution system as a condition of funding. Recommend full funding.

Funding & Cost

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AEA Funding Recommendation: $311,456
## Alaska Renewable Energy Fund: Round 7

**App # 1073** Kongiganak Wind Heat Electrical Thermal Storage

### Resource:
Wind to Heat

### Proposer:
Puvurnaq Power Company

### Applicant Type:
Utility

### Proposed Project Phase:
Construction

### Program Manager:
Rich Stromberg

### Energy Region:
Lower Yukon-Kuskokwim

### Stage 3 Scoring Summary

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### Economic Analysis

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### DNR/DMLW Feasibility Comments

This project is not located on DMLW-managed Land.

### DNR/DOF Feasibility Comments

### DNR/DGGS Feasibility Comments

### DNR/DGGS General Comments (permanent construction sites and potential geohazards)
All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

### DNR/DGGS Geohazards Comments
App # 1074  Tuntutuliak Wind Heat Electrical Thermal Storage  Heat Application

Resource: Wind to Heat  Proposed Project Phase: Construction
Proposer: TCSA Electrical Services  
Applicant Type: Utility

Project Description
This project expands the Tuntutuliak Wind Heat Smart Grid System by from 30 to 50 electric thermal storage devices (ETS). ETS units are used to capture and store surplus wind energy and use it to displace home heating fuel. The increase in the number of residential ETS units is needed to absorb wind generated energy during modest to high wind periods, which occur in throughout the fall and winter, when heating requirements are the greatest. The addition of 20 ETS units increases the productivity and efficiency of the existing wind system.

AEA Review Comments and Recommendation
Tuntutuliak received REF Round 2 and direct legislative appropriation funding to install five Windmatic 17S 95-kilowatt wind turbines, completing that project in 2012. This proposal would make use of excess electricity by diverting surplus kilowatts to residential heat loads. Unlike the other two project proposed for Kongiganak and Kwigillingok, the economics of this project suffer from the lower residual energy available having already installed 30 stoves instead of just 20 stoves in Kong and Kwig, plus Tuntutuliak’s ~10% lower wind regime, plus their lower cost of diesel fuel. Applicant and contractor have prior experience installing ETS units. Average benefits seen for existing 30 installations will be somewhat lower when aggregated among 50 homes. Residents see full benefits of heat savings. Final determination and survey of homes for install (community designation) must be accepted by AEA prior to release of additional funds. Project needs to integrate with a separate project to upgrade the village distribution system as a condition of funding. Applicant has not been timely in submitting required quarterly operations and maintenance reports on the existing wind energy project. Applicant needs to meet reporting requirements on existing project from this point forward to receive funding. Recommend full funding.

Funding & Cost
Cost of Power: $0.65 /kWh  Project Cost: $259,817
Price of Fuel: $6.80/gal

Requested Grant Funds: $250,817
Matched Funds Provided: $9,000

Matched Funds Provided: $9,000

AEA Funding Recommendation: $250,817

Election District: R-36 Dillingham/Iliamna

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Alaska Renewable Energy Fund: Round 7

Resource: Wind to Heat
Proposer: TCSA Electrical Services
Applicant Type: Utility

Proposed Project Phase: Construction

Program Manager: Rich Stromberg
Energy Region: Lower Yukon-Kuskokwim

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

This project is not located on DMLW-managed Land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Alaska Renewable Energy Fund: Round 7

App # 1076    NWAB School District Solar Thermal Systems

Resource: Solar Thermal
Proposer: Northwest Arctic Borough School District
Applicant Type: Government Entity

Proposed Project Phase: Construction
Program Manager: David Lockard
Energy Region: Northwest Arctic

Project Description

This project focuses on installing a solar hot water thermal system in each of the eleven Northwest Arctic Borough schools to provide a year around economical source of hot water. Currently, each school’s hot water heater is part of the heating plant, which is separate from each building. For example, the Kotzebue school’s hot water is heated indirectly with hot glycol from a boiler module, which also provides space heating. The boiler water heats the school's two huge plate and frame heat exchangers where the school's glycol/water-heating medium is heated. Hot glycol is then circulated through a plate type heat exchanger (for 115 degree water) and an Amtrol hot water maker for 140-degree hot water.

During the warmest months of the school year, the school must run a boiler to make hot water. One boiler contains 385 gallons of water, the piping that connects it with the plate and frame heat exchangers contain approximately 200 gallons. Thus there are times when the school does not need space heating, but does have need for hot water; just as all the other school's do.

AEA Review Comments and Recommendation

The Northwest Arctic Borough School District (NWABSD) applied for a grant to fund the construction of solar thermal water heating systems at eleven schools. Grant funds of $456,252 were requested with a match of $11,000 for a total project cost of $467,252. The project is intended to allow the boilers at the eleven schools to be turned off during summer months. It would also offset water heating fuel use during other periods of the year.

AEA does not recommend this project for funding. The applicant made an error in reading solar panel output on p.39 of the application. 3.1 kWh/m^2/day is the solar insolation on the panel. The panel thermal output is 3.2 kWh/panel/day. A confusion between the energy output expressed in units of ‘per panel’ and the insolation expressed in terms of energy per square meter resulted in an over-estimation of energy that would be generated. Also, the application did not include enough detail regarding school occupancy during school days, summer months and on weekends, and associated water heating requirements, to calculate the related fuel use and potential savings.

AEA recommends that NWABSD investigate advanced controls, alternative sources of water heating, and energy efficiency measures to reduce water heating fuel use at these facilities.

AEA encourages NWABSD to work directly with AEA staff to address the community energy needs. Please contact AEA’s energy planning staff for direct assistance.

This project is not recommended for funding.

Funding & Cost

Cost of Power: $0.63 /kWh
Price of Fuel: $6.35 /gal

Requested Grant Funds: $456,252
Matched Funds Provided: $11,000

Project Cost: $467,252

Electrical Distribution:
T-40 Arctic

AEA Funding Recommendation: Not Recommended
Alaska Renewable Energy Fund: Round 7

App # 1078 Chickaloon Solar Thermal and Biomass Mass Project

Resource: Biomass
Proposer: Chickaloon Native Village
Applicant Type: Government Entity

Project Description

The proposed project is to build and install a Combined Solar Thermal and Wood Pellet Boiler System that would provide heat for both a 3,200 sq ft shop/office and a 1,160 sq ft administrative building. Included in the project is construction of a building addition to house the boiler system, purchase and installation of solar thermal panels and pellet boiler, and focused monitoring and evaluation. The project will also be used as a demonstration project for the community to learn about solar thermal and wood pellet boiler systems and to encourage the use of renewable resources for heating.

Project location: 21117 Myers Avenue Sutton, Alaska 99674

AEA Review Comments and Recommendation

The Chickaloon Native Village proposes construction of a pellet and solar heating system to supply heat for both a 3,200 sq. ft. shop/office and a 1,160 sq. ft. administrative building. Included in the project is construction of a building addition to house the boiler system, purchase and installation of solar thermal panels and pellet boiler, and focused monitoring and evaluation.

AEA recommends partial funding for Chickaloon Native Village pellet system installation only because the thermal only capital cost is less than the solar/thermal capital cost; the benefits and savings are the same when comparing solar/thermal and thermal technology.

Before any funding is released to the grantee, AEA must review and accept the final design for the pellet system, the business/operations plan, and a biomass fuel supply plan. The system must meet AEA’s biomass program requirements of low emissions, high efficiency, third party tested, and UL listed.

AEA recommends partial funding of $97,000.

Funding & Cost

Cost of Power: $0.15 /kWh
Price of Fuel: $3.71/gal

Project Cost: $152,867
Requested Grant Funds: $127,065
Matched Funds Provided: $25,802

AEA Funding Recommendation: $97,000

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Alaska Renewable Energy Fund: Round 7

App # 1078  Chickaloon Solar Thermal and Biomass Project

Resource: Biomass
Proposer: Chickaloon Native Village
Applicant Type: Government Entity

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No DNR/DMLW lands affected.

DNR/DOF Feasibility Comments

This project is a resubmittal of a Round 5 proposal for construction of a combined wood pellet boiler and solar thermal system that would provide heat for both a 3,200 square foot shop/office building and a 1,160 square foot administration building. This is a similar system that is installed in the Ionia community located in Kasilof. It is expected that this combined system will displace 1,818 gallons of diesel fuel per year and 1,022 gallons of propane for a combined savings of $11,560. Wood pellets would come from either in-state suppliers such as Superior Pellets in North Pole or from Gulkana Village's small pellet plant. Pellets may also be purchased from local building supply stores. Given the relatively small annual pellet requirement, sourcing a reliable supply should not present a problem. The project proposal lists a purchase price of pellets at approximately $250.00/ton and a 15 ton requirement which totals $3,750 per year in pellet costs.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
This project will provide waste heat from the existing electrical power plant to the water treatment plant/washeteria. The estimated fuel oil savings to the community water plant and washeteria is projected to be 6,600 gallons of heating oil per year. For more detailed information, see the attached updated Tuntutuliak, Alaska 2013 Heat Recovery Feasibility Study.

The Alaska Native Tribal Health Consortium and the Native Village of Tuntutuliak are proposing to design and construct a recovered heat system from the existing power plant planned to the Water Treatment Plant and Washeteria.

The Preliminary Heat Recovery Assessment was completed in September of 2013 and showed sufficient excess heat to support this project.

The utility has funding for an electric heater for excess wind. The design should take into account the integration of wind-to-heat.

Recommend full funding.

Funding & Cost

Cost of Power: $0.65/kWh  
Price of Fuel: $6.80/gal

Project Cost: $469,311  
Requested Grant Funds: $455,642  
Matched Funds Provided: $13,669

AEA Funding Recommendation: $455,642
Alaska Renewable Energy Fund: Round 7

App # 1085  Tuntutuliak Heat Recovery

Resource:  Heat Recovery  
Proposer:  Native Village of Tuntutuliak  
Applicant Type:  Government Entity  

 Proposed Project Phase:  Design  
Construction  

Program Manager:  Devany Plentovich  
Energy Region:  Lower Yukon-Kuskokwim  

Stage 3 Scoring Summary

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Stage 3 Total Weight (out of 100)  

81.33  

Economic Analysis

| Benefit/Cost Ratio (Applicant) | 2.32 |
| Benefit/Cost Ratio (AEA) | 1.54 |

Project Rank

Stage 2 Total Weight (out of 100)  

71.97  

Statewide (out of 86)  

Region Rank

8  

This project is not located on DMLW-managed land.

DNR/DMLW Feasibility Comments

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments
Kake Community Energy (KCE), a project of the Organized Village of Kake (OVK), is a community-scale thermal energy services company providing affordable biomass heat to critical public institutions and (later) businesses in Kake, AK while creating local employment and enhancing forest restoration on Tribal and National Forest lands. It is designed to achieve the economies of scale, customer convenience and price stability of traditional district energy systems, while allowing the adaptability and flexibility needed to serve a community with a spatially extensive development pattern, typical of Southeast Alaska.

AEA Review Comments and Recommendation

The Organized Village of Kake is proposing final design and permitting for a low emission, high efficiency, and 3rd party tested district wood-fired heating loop for a tribal government office building, Kake City School District, Tlingit and Haida Senior Center, the City of Kake’s Bingo Hall, and a lodge owned by the Organized Village of Kake (OVK), a federally recognized tribe. This project is estimated to displace approximately 35,000 gallons per year of fuel oil. The application includes substantial support from the community and endorsement from the Kake Community Energy Committee. AEA recommends partial funding of design and permitting to allow the Organized Village of Kake to make an informed decision about pursuing biomass as a heating option.

AEA recommends partial funding for the final design and permitting includes business/operations plan; biomass storage; biomass resource inventory assessment; harvest plan, $175,000.

Funding & Cost

| Cost of Power: | $0.62/kWh |
| Price of Fuel: | $5.85/gal |

Project Cost: $1,423,292
Requested Grant Funds: $208,073
Matched Funds Provided: $20,000
AEA Funding Recommendation: $175,000
Alaska Renewable Energy Fund: Round 7

App # 1087  Kake Community Energy

Resource: Biomass
Proposer: Organized Village of Kake
Applicant Type: Government Entity

Proposed Project Phase: Design
Program Manager: Helen Traylor
Energy Region: Southeast

Stage 3 Scoring Summary

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DNR/DMLW Feasibility Comments

No State Land

DNR/DOF Feasibility Comments

This project is for final design of a wood chip fired boiler to heat several buildings within the Organized Village of Kake tribal government campus. The boiler is expected to displace 60,000 gallons of fuel with 1,000 tons of biomass fuel sourced from forest stewardship thinning activities on adjacent Kake Tribal, Sealaska and Forest Service lands on an annual basis. Although the availability of the raw resource appears to be sustainable, there is no mention in the proposal of a pool of vendors to supply the chips or if there are any issues in supply if potentially publically funded pre-commercial activities do not materialize.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments (permanent construction sites and potential geohazards)

All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.

DNR/DGGS Geohazards Comments