

App # 901 Karluk Tribal Council – Wind Energy System

Proposer: Karluk Tribal Council

Applicant Type: Government Entity

Resource: Wind

Proposed Project Phase: Feasibility Design

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

Karluk is located on the west coast 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 1000ft hydronic heating loop to connect the power plant with the community buildings.

AEA Review Comments and Recommendation

Partial Funding

Given that the existing diesel gensets are not modifiable for electronic fuel injection which is needed for integration of wind power, there is much modeling to be done for both wind and heat considerations. A new diesel generator must be chosen based on the results of the wind resource study and analysis of the electrical load (hourly data collection). The wind challenge for this project may be finding a turbine that can survive the potential harsh environment of the ridge south of town, while still being sized appropriately for the electric loads.

Due to the complexity of this system, the \$81,300 requested would not be enough to complete both the feasibility and final design phases. Recommend partial funding of \$70,000 for feasibility, but not final design and permitting. Wind resource study and electrical load analysis should be complete and accepted by AEA prior to allocating money for the CDR.

Funding & Cost		Project Cost:	\$1,300,000
		Requested Grant Funds:	\$81,000
	Cost of Power: \$0.60 /kWh	Matched Funds Provided:	\$300
	Energy Region:	Total Potential Grant Amount:	\$81,300
	Kodiak	AEA Funding Recommendation:	\$70,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	26.25
2) Matching Resources (Max 15) -	0.00
3) Project Feasibility Stage 2 (Max 20) -	5.63
4) Project Readiness (Max 5) -	4.00
5) Benefits (Max 15) -	0.38
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	2.67

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DMLW Permits or authorizations for project as currently described.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 902 Jack River Hydroelectric Project Feasibility Study

Proposer: Native Village of Cantwell

Applicant Type: Government Entity

Resource: Hydro

Proposed Project Phase: Feasibility

AEA Program Manager: Doug Ott

Project Description as defined by applicant

Cantwell is currently served by GVEA via the power transmission line between MEA and GVEA (Alaska Intertie System). The Native Village of Cantwell wishes to improve the reliability and lower the cost of the community of Cantwell's power system. To accomplish this we propose to build a storage hydroelectric project on the Jack River, a short distance from Cantwell. The reconnaissance study currently under way has identified several project configurations with capacities between 700 kW and 7 MW that may be feasible. A feasibility study is necessary to identify which of these configurations would best meet the community's needs.

AEA Review Comments and Recommendation

Full Funding

Special Provision

The Village received a grant funded in round 4 (#606) for reconnaissance assessment of the project and has installed a stream gauge. The grant reconnaissance report is not available at the date of this R6 application review.

Very little new information is provided in the application to support this request. A large number of questions are raised for this project, including the configuration of this project, licensing jurisdiction, scale and cost, economics, power sales, utility organization, financing, etc. Even the need for the project can be questioned given the pending completion of the 24 MW Eva Creek Wind Farm, re-start of 50 MW Healy Clean Coal Plant and the future 600 MW Susitna Watana project.

Despite the outstanding questions AEA supports this request for full funding.

Special provisions: AEA requires: 1) the completion and AEA acceptance of the reconnaissance study, and 2) results of the study indicate that the project should advance prior to award of any new grant funding.

Funding & Cost	Project Cost:	\$10,000,000
Cost of Power: \$0.22 /kWh	Requested Grant Funds:	\$213,750
	Matched Funds Provided:	\$11,250
Energy Region:	Total Potential Grant Amount:	\$225,000
Railbelt	AEA Funding Recommendation:	\$213,750

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	9.81
2) Matching Resources (Max 15) -	3.00
3) Project Feasibility Stage 2 (Max 20) -	11.60
4) Project Readiness (Max 5) -	2.00
5) Benefits (Max 15) -	11.75
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	1.67

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Application for hydroelectric facility. AS 38.05.850 permits/easements required for transmission lines and penstock on state land. Possible lease required for powerhouse on concrete slab. Water rights app. LAS 27738 currently on file with DMLW. State land may be in reservoir and thus flooded. May take more than the projected 6 months to authorize.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Active fault structures in the vicinity of the site include the Denali fault and associated thrust faults. (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). The dam should be designed with considerations for strong ground motions based on a seismic hazards assessment. A detailed site specific geotechnical investigation should be performed to insure that no previously unrecognized faults extend through the dam site.

App # 903 Northwest Arctic Borough Solar PV

Proposer: Northwest Arctic Borough

Applicant Type: Local Government

Resource: Solar

Proposed Project Phase: Design

Construction

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

This project expands on a previous Feasibility study that has been ongoing for 2 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 Enphase 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, 132. 00/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 10KWatts 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 enphase 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 Full Funding

Project is technically feasible. Schedule and budget look reasonable. Recommend full funding.

Funding & Cost	Project Cost:	\$75,000
Cost of Power: \$0.42 /kWh	Requested Grant Funds:	\$75,000
Energy Region:	Matched Funds Provided:	
Northwest Arctic	Total Potential Grant Amount:	\$75,000
	AEA Funding Recommendation:	\$75,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	18.25
2) Matching Resources (Max 15) -	0.00
3) Project Feasibility Stage 2 (Max 20) -	14.83
4) Project Readiness (Max 5) -	5.00
5) Benefits (Max 15) -	5.88
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	5.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Not state land

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 904 Dimond Park Library Geothermal HVAC System

Proposer: City & Borough of Juneau

Applicant Type: Local Government

Resource: Geothermal

Proposed Project Phase: Design

Construction

AEA Program Manager: Alan Baldivieso

Project Description as defined by applicant

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 Dimond Park Library. 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.

AEA Review Comments and Recommendation **Partial Funding
Special Provision**

The applicant has performed a life-cycle economic assessment of the proposed GSHP and a baseline diesel boiler (city policy prohibits installation of an electric boiler) which indicates economics that are barely favorable; however, this analysis includes health benefits not included in AEA’s analysis.

The project benefits from other successful GSHP installations in Juneau, both REF projects and other projects. This application could be strengthened by supporting performance data from the other GSHP projects (both are functioning successfully but have not produced a COP).

The proposed system would use approximately 12% of its capacity on an annual basis. A smaller heat pump system used in combination with an oil boiler could greatly reduce the capital costs while still offsetting 80% of diesel use relative to a baseline oil-only system. AEA estimates such a system would cost roughly \$500,000, an incremental cost increase of \$179,000 above the baseline system.

Recommend partial funding of \$300,000 to fund a smaller heat pump system with the following special provisions.

Special provisions:

1. Data from the Dimond Aquatic Center heat pump system must be provided to AEA before grant funded work can begin.
2. AEA must approve final system design prior to construction.

Funding & Cost	Project Cost:	\$875,000
Cost of Power: \$0.12 /kWh	Requested Grant Funds:	\$700,000
	Matched Funds Provided:	\$175,000
Energy Region:	Total Potential Grant Amount:	\$875,000
Southeast	AEA Funding Recommendation:	\$300,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	5.29
2) Matching Resources (Max 15) -	10.50
3) Project Feasibility Stage 2 (Max 20) -	15.23
4) Project Readiness (Max 5) -	2.50
5) Benefits (Max 15) -	11.13
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	4.50

Economic Analysis

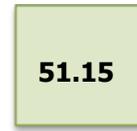


Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Not state land

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

Geothermal heat pump

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 905 HydroPower Surplus to Stored Hydrogen Feasibility Study

Proposer: The Southeast Alaska Power Agency

Applicant Type: Government Entity

Resource: Other

Proposed Project Phase: Feasibility

AEA Program Manager: Alan Baldivieso

Project Description as defined by applicant

This project will encompass performing a feasibility study to determine if a proof of concept hydrogen (or Ammonia) prototype should be designed, constructed, and operated as an alternative to spill during times of low production and high inflows of the hydroelectric plants in the SEAPA system, which serves the loads of Ketchikan, Wrangell, and Petersburg, Alaska. This stored energy would then be used for generation either by supplementing diesel combustion or through the operation of fuel cell technology during times of hydroelectric shortages. When surplus hydro generation conditions occur, typically all hydro operators in the region are not fully utilized. With an isolated system, there is no alternative other than spilling surplus energy over a spillway. The region is also experiencing significant winter load growth that has caused and will continue to cause both energy and capacity shortages. These shortages are met with diesel-electric generation that dispatches at a cost differential of four-to-one over the current hydro cost of 6.8 cents/kWh. The information obtained from performing this feasibility study will also be directly transferrable to all hydroelectric and wind utilities in Alaska.

AEA Review Comments and Recommendation Not Recommended

A successful demonstration of hydrogen production, storage, and subsequent electricity generation could have widespread applicability if proved economically viable. However, no data from existing hydrogen storage projects were provided by the applicant or found by AEA that indicate that the proposed project would have a breakeven B/C ratio. Furthermore, the seasonal nature of the utility's generation and load profiles appear to prevent full utilization of the benefits of a storage system; the hydrogen tanks would only likely be filled and emptied once annually but require the same capital costs of a system that would have multiple charge/discharge cycles in a year.

Not recommended for funding.

Funding & Cost	Project Cost:	\$244,385
Cost of Power: \$0.10 /kWh	Requested Grant Funds:	\$244,385
	Matched Funds Provided:	\$5,000
Energy Region: Southeast	Total Potential Grant Amount:	\$249,385
AEA Funding Recommendation:		

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	4.46
2) Matching Resources (Max 15) -	3.00
3) Project Feasibility Stage 2 (Max 20) -	6.20
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	1.88
6) Local Support (Max 5) -	4.00
7) Sustainability (Max 5) -	

Economic Analysis



Scoring & Project Rank



DNR/DMLW Feasibility Comments

Location is not fully identified but appears by proposal to not include state land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 906 Coffman Cove Hydropower Line Extension

Proposer: City of Coffman Cove

Applicant Type: Local Government

Resource: Transmission

Proposed Project Phase: Construction
Design

AEA Program Manager: Doug Ott

Project Description as defined by applicant

This project would provide a renewable energy intertie to part of the City of Coffman Cove, Alaska that presently are self-generating because they are not on the islands micro-grid. The City of Coffman Cove was connected to Prince of Wales Island (POW) renewable energy microgrid in 2011, shutting down the diesel generators serving the community. However, significant portions of the community are not connected to the distribution system. There are 91 privately owned lots that must self-generate at an approximate cost of \$2.35/kWh (based on the cost of residential fuel; small generator costs; and, the monthly average kWh used by those on the islands grid); the formula for determining this can be found below in the application. The renewable energy micro-grid on POW has a rate of \$0.2243/kWh for a residential rate, which would provide a significant savings to these unserved lots .

AEA Review Comments and Recommendation

Full Funding

Special Provision

City of Coffman Cove requests \$175K in grant funds for permitting and final design, and construction of a 1.75 mile single phase line extension along existing roads within the City to serve 91 privately-owned lots with renewable energy. The RE sources are from Black Bear Lake Hydro and South Fork Hydro.

Project design, permitting and construction to be by Alaska Power Company.

Special provision: Provide evidence of site control with stamped plans and recorded easement for the line extension.

Funding & Cost		Project Cost:	\$175,000
		Requested Grant Funds:	\$175,000
	Cost of Power: \$0.45 /kWh	Matched Funds Provided:	\$36,000
	Energy Region:	Total Potential Grant Amount:	\$211,000
	Southeast	AEA Funding Recommendation:	\$175,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	19.88
2) Matching Resources (Max 15) -	0.00
3) Project Feasibility Stage 2 (Max 20) -	15.40
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	11.63
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	4.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

From the application it is difficult to tell if an easement to cross State land will be needed and in all probability existing platted easements within State developed subdivision(s) will probably be used.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 907 Petersburg Community Heating System Retrofit Feasibility Study

Proposer: City of Petersburg

Applicant Type: Local Government

Resource: Biomass

Proposed Project Phase: Feasibility
Recon

AEA Program Manager: Alan Baldivieso

Project Description as defined by applicant

The proposed project will evaluate the technical and financial feasibility for integration and optimization of renewable energy based heating technologies to offset heating oil and electricity usage in the following Petersburg facilities: Stedman Elementary School, Mitkof Middle School, Petersburg High School, Petersburg Aquatic Center, Mountain View Manor Elderly Housing, and the City Municipal Building.

AEA Review Comments and Recommendation Full Funding

This study will compare heating alternatives but the applicant states that they are leaning toward heat pumps (ground and air source). Smaller GSHP projects have been rejected due to poor economics; the lower capital cost of air source heat pumps would likely make them more favorable for retrofits; AEA is currently funding a study of (residential) ASHP use in SE AK.

A feasibility study that clearly considers the benefits of biomass, heat pumps, and oil-fired boilers is a logical step.

AEA recommends full funding.

Funding & Cost	Project Cost:	\$51,360
Cost of Power: \$0.10 /kWh	Requested Grant Funds:	\$41,360
Energy Region:	Matched Funds Provided:	\$10,000
Southeast	Total Potential Grant Amount:	\$51,360
	AEA Funding Recommendation:	\$41,360

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	4.46
2) Matching Resources (Max 15) -	9.00
3) Project Feasibility Stage 2 (Max 20) -	12.77
4) Project Readiness (Max 5) -	1.17
5) Benefits (Max 15) -	9.75
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	4.50

Economic Analysis



Scoring & Project Rank



DNR/DMLW Feasibility Comments

No state land issues.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 908 Tazimina Hydroelectric Project Capacity Increase

Proposer: INN Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Hydro

Proposed Project Phase: Feasibility

AEA Program Manager: Doug Ott

Project Description as defined by applicant

INNEC proposes to conduct a feasibility study related to increasing the capacity of the existing Tazimina Hydroelectric Project by replacing either one or two of the existing generating units with larger generating units. The study will evaluate existing energy use and future energy requirements for the region. An economic analysis will compare the costs of future generation under a variety of scenarios. A procurement package will be prepared if the project is found to be feasible.

AEA Review Comments and Recommendation

Full Funding

INNEC requests grant funding to study expansion of the Tazimina Hydroelectric Project thru replacement of the turbine-generators and controls from 824 kW (existing) up to 1.5 MW total. The FERC license was issued for the larger units and the plant throughput was built with this in mind, but the smaller Francis turbine/generators were installed when the project was built in 1996. Annual energy is expected to increase up to 2,600,000 kWh. New markets for this increase in energy may include new dispatchable heating systems in private businesses and city governments at Newhalen, Iliamna and Nondalton.

If the study shows the project is feasible, procurement documents will be prepared from this phase grant funding for the replacement turbine-generators and control systems.

AEA recommends full funding.

Funding & Cost		Project Cost:	\$2,600,000
		Requested Grant Funds:	\$160,000
	Cost of Power: \$0.59 /kWh	Matched Funds Provided:	\$30,000
	Energy Region:	Total Potential Grant Amount:	\$190,000
	Bristol Bay	AEA Funding Recommendation:	\$160,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	26.01
2) Matching Resources (Max 15) -	9.75
3) Project Feasibility Stage 2 (Max 20) -	18.33
4) Project Readiness (Max 5) -	4.33
5) Benefits (Max 15) -	12.38
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	4.17

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DMLW permits or authorizations at this time - feasibility study for replacement of existing turbines only. Potential requirement for amendment of existing SCRO authorizations depending on extent of facility upgrade.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The only known potentially active fault in the project vicinity is the Lake Clark fault (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). The relative activity of this fault is unknown.

App # 909 Mahoney Lake Hydroelectric Project: Phase III

Proposer: City of Saxman

Applicant Type: Local Government

Resource: Hydro

Proposed Project Phase: Feasibility

AEA Program Manager: Doug Ott

Project Description as defined by applicant

The City of Saxman was issued a license for the Mahoney Lake hydroelectric project by the FERC on 01-22-98 (Project No. P-11393). The project was licensed to be a storage-type project with a lake tap of Upper Mahoney Lake, a tunnel-and-pipe penstock, a single unit powerhouse, and an overhead transmission line connecting to the existing KPU transmission system at the Beaver Falls substation. The licensed capacity is 9.6 MW and the estimated potential annual generation is 41.7 GWH. Design documents were submitted to FERC for review in 2001 in anticipation of starting construction in 2002. However, at that time a decision was made to construct the Swan-Tyee Intertie instead of the Mahoney Lake project; the Mahoney Lake project license was stayed until requested by Saxman, but no later than 6 years after completion of the Swan-Tyee Intertie. Saxman has until 2015 to request lifting of the stay. The design documents submitted to FERC in 2001 proposed to construct the penstock using horizontal directional drilling (HDD), which was a different penstock design than licensed and an untested technology for the hydroelectric industry. FERC had not commented on the design submittal prior to the stay being issued. Load growth in the SEAPA-interconnected systems and the potential for new industrial loads now makes it timely to resume the development of the Mahoney Lake project. However, because of the long delay, it is necessary to reexamine some aspects of the project, in particular:

- Re-evaluate the HDD-based design based on advances in the HDD industry in the last decade. It now appears possible to simplify the design and eliminate some expensive elements.
 - Re-evaluate the storage potential of the upper basin, either by lowering the lake tap in Upper Mahoney Lake or adding storage in two natural lakes above Upper Mahoney Lake. Additional storage would allow more wintertime generation by the project, which is critical for the SEAPA-interconnected system.
 - Route the transmission line north along the existing road system on Cape Fox land to an interconnection to the Swan Lake line at the White River, rather than south over USFS land to the Beaver Falls substation.
 - Review permit status, and renew or revise permit applications as appropriate.
 - Update the design drawings, specifications, and design report as appropriate for changes in the design concept.
 - Update the cost estimate and economic analysis for the project, including any revisions to the design as described above.
 - Begin power sales negotiations, and prepare a business and operational plan based on the anticipated power sales agreement.
- At the completion of this work, KEC will be ready to begin construction on the project as soon as final financing is arranged.

AEA Review Comments and Recommendation

Partial Funding

The City of Saxman has requested funding to study the Mahoney Lake Hydroelectric Project and 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.

The primary developers are a public/private partnership called Ketchikan Electric Company, whose partners are Cape Fox Corp., AP&T and City of Saxman.

The review team has the following concerns with this project: the market for the power is uncertain, given it is the last to be used in the SEAPA system, including after the proposed additions of energy from Whitman Lake Hydro project and the proposed Metlakatla - Ketchikan Intertie, and proposed issues raised if the FERC license is re-opened to re-engineer the project scheme.

The project appears to exhibit a high benefit/cost ratio if it can find a market for its hydropower. Partial funding for feasibility/conceptual design is recommended to reconfigure the project to meet potential needs of SEAPA proposed call for power and accomplish the following: (1) perform field studies to support re-opening FERC license; (2) negotiate new license terms; (3) revise engineering drawings in support of license changes; (4) negotiate power sales agreement, (5) prepare business, operational and finance plan; and (6) update cost of power, construction cost and potential available power by month.

Partial funding recommended.

Funding & Cost	Project Cost:	\$51,100,000
	Requested Grant Funds:	\$1,000,000
Cost of Power: \$0.10 /kWh	Matched Funds Provided:	\$100,000
Energy Region:	Total Potential Grant Amount:	\$1,100,000
Southeast	AEA Funding Recommendation:	\$500,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	4.46
2) Matching Resources (Max 15) -	14.25
3) Project Feasibility Stage 2 (Max 20) -	9.87
4) Project Readiness (Max 5) -	1.50
5) Benefits (Max 15) -	11.75
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	1.17

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No state land interests but water rights needed.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Queen Charlotte-Fairweather fault (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). Project should be designed to withstand appropriate ground motions.

App # 910 Igiugig Wind Turbine Design

Proposer: Lake and Peninsula Borough

Applicant Type: Local Government

Resource: Wind

Proposed Project Phase: Design

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

The Lake and Peninsula Borough seeks funding to design an approximate 1 00kW wind turbine system in the village of Igiugig. The design of the turbine will include its integration into the new generation system recently installed to maximize output and efficiency. The wind study is not complete, but the 11-month data point for the feasibility report includes the winter months when winds and demand are highest. LPB will finish the grant with a design that can be put out to bid.

The total for the project is \$250,000 and LPB is offering a \$45,000 match.

AEA Review Comments and Recommendation

Not Recommended

Because a wind study has not yet been completed and a conceptual design has not been submitted for AEA to review and accepted prior to the review period for this application, it is premature to award funding for design. Too many factors are currently unknown to assess the viability of the project. In addition, the class 2 wind regime indicated by the statewide wind model would not provide enough benefit to produce an economic project.

Not recommended for funding.

Funding & Cost	Project Cost:	\$250,000
Cost of Power: \$0.80 /kWh	Requested Grant Funds:	\$205,000
Energy Region:	Matched Funds Provided:	\$45,000
Bristol Bay	Total Potential Grant Amount:	\$250,000
	AEA Funding Recommendation:	

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	35.00
2) Matching Resources (Max 15) -	9.75
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DMLW permits or authorizations at this time - funding requested for data collection only at this time;. Possible future requirement for AS 38.05.850 permits/easements possible depending on selection of eventual project site but unlikely due to availability of village-managed lands.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Project should be designed to withstand ground motions generated by earthquakes along the Aleutian subduction zone (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>).

App # 911 Levelock Wind Reconnaissance Study

Proposer: Lake and Peninsula Borough

Applicant Type: Local Government

Resource: Wind

Proposed Project Phase: Recon

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

The Lake and Peninsula Borough seeks funding to conduct a wind reconnaissance study on the behalf of the Levelock Village Council and its utility Levelock Electric Cooperative, inc. The project will consist of the installation of a needed 10-meter wind tower within the city to gather one year of wind data. Rich Stromberg of AEA has indicated the study can be done for approximately \$10,000 using a smaller, 10-meter tower. The wind data will be analyzed by a professional firm that specializes in the interpretation of wind data. Following the completion of the data gathering, the firm will prepare a report that will give the LPB and Levelock an indication on whether or not the wind resources merit a feasibility study on the eventual construction of a wind turbine.

AEA Review Comments and Recommendation

Full Funding

While the existing wind resource model predicts only class 2 winds in Levelock, class 4 winds exist further south at the coast. There is no current wind data. The applicant proposes a low-cost method to collect valid, usable wind data. A larger met tower would be needed for any future feasibility study, but the 10-meter configuration proposed will work well for reconnaissance so long as the tower is placed in an area of minimal surrounding vegetation and away from buildings that might block the wind.

Even if only a class 3 wind site is discovered, the high cost of fuel in this community might allow for an economic medium-penetration project using a remanufactured turbine.

Full funding recommended.

Funding & Cost		Project Cost:	\$10,000
		Requested Grant Funds:	\$10,000
	Cost of Power: \$0.70 /kWh	Matched Funds Provided:	\$1,000
	Energy Region:	Total Potential Grant Amount:	\$11,000
	Bristol Bay	AEA Funding Recommendation:	\$10,000

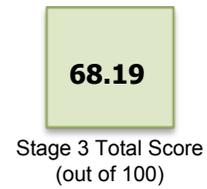
Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	30.63
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	13.40
4) Project Readiness (Max 5) -	4.67
5) Benefits (Max 15) -	4.50
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	4.00

Economic Analysis



Scoring & Project Rank



DNR/DMLW Feasibility Comments

No DMLW permits or authorizations at this time - funding requested for data collection only at this time;. Possible future requirement for AS 38.05.850 permits/easements possible depending on selection of eventual project site but unlikely due to availability of village-managed lands.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Project should be designed to withstand ground motions generated by earthquakes along the Aleutian subduction zone (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>).

App # 912 Egegik Wind Feasibility Study

Proposer: Lake and Peninsula Borough

Applicant Type: Local Government

Resource: Wind

Proposed Project Phase: Recon

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

The Lake and Peninsula Borough seeks funding to conduct a wind reconnaissance study on the behalf of the City of Egegik. The project will consist of the installation of a needed 10-meter or 30-meter, whichever is appropriate, wind tower within the city to gather one year of wind data. The wind data will be analyzed by a professional firm that specializes in the interpretation of wind data. Following the completion of the data gathering, the firm will prepare a report that will give the LPB and Egegik an indication on whether or not the wind resources merit a feasibility study on the eventual construction of a wind turbine.

AEA Review Comments and Recommendation

Partial Funding

Hill east of the old airport appears to be the best place to start measuring wind. Budget is high for a reconnaissance study - especially \$45,000 for cost of energy and market analysis. The applicant only needs money to hire a contractor to purchase and install a met tower and power house monitoring and to analyze and write a wind resource report. The report should include HOMER analysis of wind, diesel and solar against the seasonal load profile of Egegik. An RFP should be put out to see who can do this in the most cost-effective manner. Recommend partial funding of \$60,000 to collect wind, solar and electrical load data for a minimum of one year, write a wind/solar assessment report and perform some basic HOMER modeling.

Funding & Cost	Project Cost:	\$90,000
Cost of Power: \$0.86 /kWh	Requested Grant Funds:	\$80,000
Energy Region:	Matched Funds Provided:	\$10,000
Bristol Bay	Total Potential Grant Amount:	\$90,000
	AEA Funding Recommendation:	\$60,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	35.00
2) Matching Resources (Max 15) -	7.50
3) Project Feasibility Stage 2 (Max 20) -	14.53
4) Project Readiness (Max 5) -	2.00
5) Benefits (Max 15) -	8.50
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	4.50

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DMLW permits or authorizations at this time - funding requested for data collection only at this time;. Possible future requirement for AS 38.05.850 permits/easements possible depending on selection of eventual project site but unlikely due to availability of village-managed lands.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Feasibility study should consider design impacts of earthquakes on proposed facilities in regard to project cost.

App # 913 Stetson Creek Diversion/Cooper Lake Dam Facilities Project

Proposer: Chugach Electric Association, Inc.

Applicant Type: Utility

Resource: Hydro

Proposed Project Phase: Construction

AEA Program Manager: Doug Ott

Project Description as defined by applicant

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. A schedule showing how the project will proceed is attached.

AEA Review Comments and Recommendation Full Funding

Project will add 5,500,000 kWh annually to Cooper Lake Hydroelectric project; project also provides environmental benefits for increase in : (1) water temperature and (2) increase flows at upper reaches of Cooper Creek to enhance fish habitat.

Project bids were opened on 9/28/12; bid results to AEA are pending receipt, so bidding risk is low.

Construction of this project satisfies Settlement Agreement established in support of FERC re-license of the Cooper Cooper Lake Hydroelectric Power Project which, along with this diversion, has annual energy of 47,500,000 kWh.

Recommend full funding

Funding & Cost	Project Cost:	\$23,808,913
Cost of Power: \$0.14 /kWh	Requested Grant Funds:	\$3,453,920
Energy Region:	Matched Funds Provided:	\$17,343,267
Railbelt	Total Potential Grant Amount:	\$20,797,187
	AEA Funding Recommendation:	\$3,453,920

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	6.23
2) Matching Resources (Max 15) -	15.00
3) Project Feasibility Stage 2 (Max 20) -	18.80
4) Project Readiness (Max 5) -	5.00
5) Benefits (Max 15) -	13.00
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	5.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Applicant self-reports potential requirements for DMLW authorizations (probably Water and/or AS 38.05.850 Permits and Easements); need more specific project information to confirm.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 914 Connelly Lake Hydroelectric Project

Proposer: Alaska Power & Telephone Company

Applicant Type: Utility

Resource: Hydro

Proposed Project Phase: Feasibility

AEA Program Manager: Doug Ott

Project Description as defined by applicant

Connelly Lake is an 85 acre alpine lake, and drains into the Chilkoot River. The Project facilities will include a dam at the lake outlet, a penstock about 6,200 feet long, a 12.0 MW powerhouse with two generating units, a 14-mile-long buried 34.5 kV transmission line and a 14-mile long access road. Phase III has not been completed yet with field studies, permitting and final design continuing. The Project will be developed by the Applicant to provide additional generation to its interconnected Haines and Skagway electrical systems (existing 15-mile submarine cable), to provide backup renewable power to Haines should the submarine cable fail, or should the only other storage project in Upper Lynn Canal, Goat Lake Hydro, have a major problem with a long term shutdown. And in the early years of operations to possibly provide summer power to cruise ships moored at Haines or Skagway to help pay off any debt as quickly as possible. The Project will be on state and private land, including the Haines State Forest and Chilkat Bald Eagle Preserve.

AEA Review Comments and Recommendation

Partial Funding

APC proposes additional three new environmental studies (feasibility), final design and permitting activities for a potential 12+ MW storage hydro project at Connelly Lake. AEA and APC entered into a grant agreement for \$585,000 to support feasibility and conceptual design for the project under round 4 application (#627).

Current funded work includes concept optimization, preliminary FERC notice of intent and preliminary application document, FERC scoping activities (documents and study plans), field studies (stream gauge installation; seismic refraction surveys; fish, wildlife, botanical, wetland, and heritage surveys; water quality testing); and the final feasibility report. This work was scheduled for completion in December 2012, but some snags in the licensing process have occurred and more studies are required.

APC has challenges with site control with access through the Chilkat Bald Eagle Preserve, Haines State Forest and across several private parcels. FERC has requested they demonstrate this access to perform studies before FERC will devote any staff time on licensing for Connelly Lake. Environmental opposition to the project has been received in the past from some Haines residents.

AEA believes additional grant funding for the 3 new environmental studies is warranted, but the request to fund final design and permitting is premature, given that several additional years of data collection may be necessary and project feasibility is uncertain. AEA also finds the amount requested for the three studies is excessive and therefore recommends grant funding be limited with a 20% cash match by applicant.

Recommend partial funding.

Funding & Cost		Project Cost:	\$46,475,000
		Requested Grant Funds:	\$1,752,000
	Cost of Power: \$0.22 /kWh	Matched Funds Provided:	\$438,000
	Energy Region:	Total Potential Grant Amount:	\$2,190,000
	Southeast	AEA Funding Recommendation:	\$180,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	9.52
2) Matching Resources (Max 15) -	10.50
3) Project Feasibility Stage 2 (Max 20) -	12.10
4) Project Readiness (Max 5) -	2.00
5) Benefits (Max 15) -	11.37
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	1.83

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

This project has not changed from the previous round reviews. Possible public concern will probably be those related to the potential impact of the project to the Chilkat Bald Eagle Preserve. There may be secondary impacts with opening of the old logging road, also identified as an RS2477 in the application, increasing access into the Chilkoot valley. This could be controlled with gates. There may be some permitting challenges and resource management concerns related to the Chilkat Bald Eagle Preserve.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The project is located in the vicinity of the Eastern Denali fault (Chilkoot River section) and the Chatham Strait fault (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). Project should be designed to withstand strong ground motions related to earthquakes on these structures.

App # 915 Eagle Solar Array Project

Proposer: Alaska Power Company (APC)

Applicant Type: Utility

Resource: Solar

Proposed Project Phase: Construction

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

The Eagle Solar Array Project will provide renewable energy to the communities of Eagle and Eagle Village. The Project will consist of one hundred sixty three solar panels, six three phase inverters, a programmable logic controller, SCADA system, and diesel powerplant interface for the towns of Eagle and Eagle Village. Energy derived will be used to offset diesel fueled generation; particularly during the summer months.

AEA Review Comments and Recommendation

Full Funding

Special Provision

Project is simple, low-cost and straightforward. It takes advantage of the worldwide drop in PV module prices and cost of installation. Technology is proven and Tier 1 suppliers are selected.

The applicant may be underestimating the power output from the PV system as low temperature and ground bounce can increase the output along with improved inverter power-curve optimization technology. Likewise, the applicant may be overestimating power output if snow is not removed in a timely fashion. The utility must ensure that snow is removed from the panels to ensure the desired benefits.

Final design must be submitted to and accepted by AEA prior to allocation of construction funds. Post-construction, AEA requires the grantee to report the minimum loading of the diesel gensets at maximum solar output.

Full funding recommended.

Funding & Cost	Project Cost:	\$165,750
Cost of Power: \$0.59 /kWh	Requested Grant Funds:	\$132,600
	Matched Funds Provided:	\$33,150
Energy Region:	Total Potential Grant Amount:	\$165,750
Yukon-Koyukok/Upper Tanana	AEA Funding Recommendation:	\$132,600

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	25.85
2) Matching Resources (Max 15) -	9.75
3) Project Feasibility Stage 2 (Max 20) -	15.13
4) Project Readiness (Max 5) -	4.00
5) Benefits (Max 15) -	9.00
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	4.33

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Not on state land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 916 Hydaburg Schools Wood Fired Boiler Project

Proposer: Hydaburg City Schools

Applicant Type: Government Entity

Resource: Biomass

Proposed Project Phase: Design

AEA Program Manager: Helen Traylor

Project Description as defined by applicant

This project involves placing supplemental cord wood fired boilers in the schools. The supplemental heating system would be located at the Hydaburg City Schools in Hydaburg, AK on Prince of Wales Island in Southeast Alaska.

We intend to use wood biomass to heat the school buildings, replacing diesel as the energy source. The project involves placing two Garn type wood fired boilers adjacent to the school site and running underground pipes from the wood fired boiler to plumb into the school's heating system.

AEA Review Comments and Recommendation

Full Funding

The Hydaburg City Schools in Hydaburg, AK on Prince of Wales Island in Southeast Alaska requests funding for engineering design phase to build two cord wood heating system to 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.

Recommend full funding with the requirements that AEA must review and accept the final engineering design.

Funding & Cost	Project Cost:	\$463,216
Cost of Power: \$0.24 /kWh	Requested Grant Funds:	\$20,000
	Matched Funds Provided:	\$5,200
Energy Region:	Total Potential Grant Amount:	\$25,200
Southeast	AEA Funding Recommendation:	\$20,000

Stage 3 Scoring Summary

Criterion (Weight)	Score
1) Cost of Energy (Max 35) -	10.34
2) Matching Resources (Max 15) -	9.00
3) Project Feasibility Stage 2 (Max 20) -	18.00
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	13.00
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	4.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No state land interest.

DNR/DOF Feasibility Comments

The project is for the replacement of oil fired boilers with wood boilers that utilize either wood pellets or chips to provide heat for the Hydaburg Schools campus. The campus consists of an elementary school, high school and a gymnasium each with its own oil-fired boiler. If pellets are the chosen fuel source, Sealaska has committed to delivering pellets to Hydaburg on a bi-monthly basis shipped from Juneau to Hydaburg for about \$300/ton. A silo would house the bulk delivery of pellets in Hydaburg. This fuel delivery model is similar to what is employed in Juneau to provide pellets to the Sealaska corporate building. Hydaburg estimates \$18,000 per year in fuel savings through the conversion to pellets.

If wood chips are the chosen fuel source, Viking Lumber in Craig has committed to delivering chips to Hydaburg for \$75 per ton. Hydaburg estimates \$27,000 per year in fuel savings through the conversion to chips. This project appears to be well thought out and having two confirmed sources of delivered raw wood supply is an added bonus. The proposal however examines the total life cycle cost and when considering the increase in operation and maintenance costs associated with wood heat sources there is little economic incentive to convert the buildings to wood heating. The use of in state produced wood chips however has other economic spin offs of a positive nature to the southeast Alaska economy. This project may have a better pay back if a solid fuel wood heater such as a Garn boiler is used in a single building installation.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 917 Blue Lake Hydroelectric Expansion Project

Proposer: City & Borough of Sitka (CBS)

Applicant Type: Local Government

Resource: Hydro

Proposed Project Phase: Construction

AEA Program Manager: Doug Ott

Project Description as defined by applicant

The City & Borough of Sitka proposes to raise the project dam from spill elevation 342 feet mean sea level (msl) to elevation 425 feet msl; construct a new powerhouse containing three 5.3-megawatt (MW) units; install new intake works and a surge chamber; and modify the power conduit to accommodate higher hydraulic pressure and connect new or relocated project features. In addition, the existing 0.670-MW fish valve unit generator would be replaced with a new 1-MW unit and the existing 0.870-MW pulp mill feeder unit would be decommissioned. The total authorized capacity of the project would rise from 7.5 MW to 16.9 MW.

AEA Review Comments and Recommendation

Full Funding

Special Provision

City and Borough of Sitka request funds for construction of an expansion to the Blue Lake dam. Construction elements include 83 feet raise of existing reinforced concrete arch dam, new powerhouse with three new turbine-generator units totaling 15.9 MW capacity, a new intake and connection tunnel, and a new surge chamber.

The project construction bids came in higher than expected so the CBS is seeking additional state funding and planning to sell more revenue bonds to cover the new estimated project cost of \$145M.

Special provision: AEA will require finalized financial plan before any new grants will be put in place.

AEA recommends full funding.

Funding & Cost		Project Cost:	\$145,000,000
		Requested Grant Funds:	\$4,000,000
	Cost of Power: \$0.09 /kWh	Matched Funds Provided:	\$4,000,000
	Energy Region:	Total Potential Grant Amount:	\$8,000,000
	Southeast	AEA Funding Recommendation:	\$4,000,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	4.14
2) Matching Resources (Max 15) -	14.25
3) Project Feasibility Stage 2 (Max 20) -	18.50
4) Project Readiness (Max 5) -	5.00
5) Benefits (Max 15) -	13.00
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	5.00

Economic Analysis



Scoring & Project Rank



DNR/DMLW Feasibility Comments

Propose to raise the height of the dam to increase capacity in the reservoir, increase from 342' to 425'. Land that will be inundated is Forest Service land. No State land type interest identified.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Queen Charlotte-Fairweather fault (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). Project should be designed to withstand appropriate ground motions.

App # 918 West Creek Hydroelectric Project

Proposer: Municipality of Skagway Borough

Applicant Type: Local Government

Resource: Hydro

Proposed Project Phase: Feasibility

AEA Program Manager: Doug Ott

Project Description as defined by applicant

The Municipality of Skagway (Municipality) proposes to construct the West Creek Hydroelectric Project (Project) located on West Creek, approximately 7 miles west of Skagway and adjacent to the small community of Dyea. The primary purpose of the Project would be offsetting diesel generation by cruise ships that dock in Skagway from May through September each year. Up to five cruise ships per day dock in Skagway for 12-15 hours and continuously operate their diesel plants to provide for on-board electricity consumption. The continuous stack emissions spread a blue haze at about the 1,500 foot elevation where vegetation has been noticeably affected. The Project will improve air quality and save vegetation in the area (there may be other unknown environmental benefits). To emphasize how serious the air quality of the area is being taken, the National Park Service, Municipality of Skagway, and Alaska Power & Telephone Company (AP&T) have a cooperative agreement to place and maintain equipment at AP&T's Dewey Lakes Hydro project site to monitor this pollution. Preliminary results of this monitoring are attached as an appendix. A secondary purpose of the Project is to provide winter energy to the local utility when they have a shortfall of hydro energy from their hydroelectric projects (2011 = Dewey Lakes Hydro, Lutak Hydro, Goat Lake Hydro, Kasidaya Creek Hydro) as well as to sell winter energy to other utilities in the area.

AEA Review Comments and Recommendation

Full Funding

The Borough and Municipality of Skagway (BMS) proposes feasibility and conceptual design of a 10-25 MW hydro project at West Creek to be connected to the Upper Lynn Canal (Haines-Skagway) grid. West Creek is located near Dyea, 7 miles west of Skagway. The estimated cost of this project +\$140 million. One most costly scheme would propose a 200' dam on West Lake with a 2.5 mile power tunnel to a powerhouse on the Taiya River. The primary purpose of the project is to offset diesel generation by cruise ships that dock in Skagway in the summer. The secondary purpose is to supply power to the local grid during periods of shortfall in the winter. BMS applied for a similar project in rounds 2 (#262) and 5 (#800). AEA recommended the project for partial funding but due to low scores and limited funding availability the project did not receive funding.

The AEA review team has the following concerns about this project:

1. BMS states that a major benefit of the project is the reduced air emissions from diesel generation by the cruise ships. However, when the EPA mandated change in cruise ship fuel from bunker oil to ultra low sulfur diesel is implemented, the air quality issues associated with docking of cruise ships will decrease substantially. This, in turn, reduces the public benefit of this project.
2. AEA has previously committed funding for Connelly Lake, Schube Lake, and Burro Creek reconnaissance and feasibility assessment. These projects would compete to meet the same loads as the proposed project.
3. Given that the chief aim of the project is to supply the shore-based cruise ship load, AEA questions the amount of public benefit to be received versus the high capital cost and high technical, business, and regulatory risks of the proposed project.
4. Since the project would potentially affect the viewscapes and upstream waters of the Klondike Gold Rush National Park, there is significant permitting risk.

Funding & Cost	Project Cost:	\$140,000,000
Cost of Power: \$0.22 /kWh	Requested Grant Funds:	\$236,000
	Matched Funds Provided:	\$84,000
Energy Region:	Total Potential Grant Amount:	\$320,000
Southeast	AEA Funding Recommendation:	\$236,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	9.52
2) Matching Resources (Max 15) -	11.25
3) Project Feasibility Stage 2 (Max 20) -	8.40
4) Project Readiness (Max 5) -	1.17
5) Benefits (Max 15) -	8.25
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	1.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Municipal entitlement not complete and application rests dependency on that. Timing of that decision may affect project timelines. Secondly water rights needed.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Eastern Denali fault (Chilkoot River section) (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). Project should be designed to withstand appropriate ground motions.

App # 919 Metlakatla-Ketchikan Intertie

Proposer: Metlakatla Indian Community (MIC)

Applicant Type: Government Entity

Resource: Transmission

Proposed Project Phase: Construction
Design

AEA Program Manager: Kirk Warren

Project Description as defined by applicant

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 to be constructed on Annette Island between Metlakatla and Walden Point and an approximate three mile submarine cable crossing of Revillagiedo 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 all poles are set for the overhead line. Approximately 20% of the conductor is installed along the line. The control system upgrades were completed in July 2011.

AEA Review Comments and Recommendation

Not Recommended

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

Currently the RE Fund round 4 grant is being negotiated. Conditions of the grant will 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.

Not recommended for funding.

Funding & Cost	Project Cost:	\$14,510,599
Cost of Power: \$0.10 /kWh	Requested Grant Funds:	\$9,570,434
Energy Region:	Matched Funds Provided:	
Southeast	Total Potential Grant Amount:	\$9,570,434
	AEA Funding Recommendation:	

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	4.46
2) Matching Resources (Max 15) -	0.00
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

This is the same project that was reviewed in previous rounds. DMLW has received an application for the portion of the intertie on State tide and submerged land, case file number ADL 108139. Presently this case is in the agency/public notice step of adjudication.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 920 Walker Lake Hydro Feasibility Project

Proposer: Tlingit-Haida Regional Electric Authority

Applicant Type: Government Entity

Resource: Hydro

Proposed Project Phase: Design

AEA Program Manager: Doug Ott

Feasibility
Recon

Project Description as defined by applicant

Tlingit-Haida Regional Electrical Authority (THREA) is applying for funding to conduct feasibility, design, and obtain a FERC license for the Walker Lake Hydro Project. THREA filed a preliminary FERC permit application on June 11, 2012 since it has municipal preference. THREA proposes to work with Inside Passage Electric Cooperative (IPEC) the certificated utility for the service area of Klukwan and the Chilkat Valley in order to provide the lowest cost power for the benefit of IPEC's members/customers. The proposed project includes constructing two small dams at Walker Lake; intake and reservoir outlet works; a 24" penstock of approximately 12,000 feet in length; a powerhouse with installed capacity of approximately 1 MW; a tailrace of approximately 50' length; and a 12.4 KV underground transmission line of approximately 4 miles in length interconnecting with the existing transmission system of IPEC. The existing lake is at an elevation of 1,180 MSL and drains into Walker Creek and the Little Salmon River.

The project is located on USGS maps shown on both Skagway B-3 and B-4
Please refer to Appendix A Map of Walker Lake Hydro Project Application

AEA Review Comments and Recommendation

Did Not Pass Stage 2

THREA requests grant funds to assess 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 independent power producer (IPP) selling to IPEC. IPEC applied for funding to study Walker Lake in Round 5 of the Renewable Energy Fund (#829) but was not recommended. Since Round 5 application, in October 2011 IPEC has 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 project capital cost is not shown in this application.

The review team has the following concerns with this project:

1. 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.
2. While the application states that THREA will sell its power to IPEC for 7 cents/kWh, it is highly likely the cost of power from Walker Lake would exceed that purchased from AP&T.
3. There is no updated reconnaissance report available to ascertain if the project can be economically justified.
4. This project would displace very little diesel generation (approx. 1,300 gallons per year). 97% of the power purchased from APC (the load Walker Lake would satisfy) is generated from the Lutak, Kasidaya, Dewey, and Goat Lake hydropower projects.
5. AEA has already committed funding for Connelly Lake, Schube Lake, West Creek, and Burro Creek reconnaissance and feasibility assessment. These projects would compete to meet the same loads as the proposed project.

Project fails to pass the minimum Stage 2 score and is not recommended.

Funding & Cost		Project Cost:	\$690,000
	Cost of Power: \$0.62 /kWh	Requested Grant Funds:	\$640,000
Energy Region: Southeast		Matched Funds Provided:	\$50,000
		Total Potential Grant Amount:	\$690,000
		AEA Funding Recommendation:	

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	27.12
2) Matching Resources (Max 15) -	6.75
3) Project Feasibility Stage 2 (Max 20) -	5.90
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	0.50
6) Local Support (Max 5) -	4.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

This project is primarily on State land within the Haines State Forest. DMLW has received an application for this project and assigned it case file number - ADL 108134. The applicant is Southern Energy Inc. This is not the same entity that is seeking funding from AEA, the applicant for AEA's Renewable Energy Fund is the Tlingit-Haida Regional Electric Authority. There does not appear to be a cooperative relationship between the two entities in forwarding this project. Instead there may be a competing interest and presently we understand that both entities have applied for a FERC license. The division is not in a position to comment on the feasibility of this application because we cannot adjudicate anything until we know which party will be issued the preliminary FERC permit.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Eastern Denali fault (Chilkoot River section) (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). Project should be designed to withstand appropriate ground motions.

App # 921 AVCP RHA Wood Biomass Heating System

Proposer: AVCP Regional Housing Authority

Applicant Type: Government Entity

Resource: Biomass

Proposed Project Phase: Design

Construction

AEA Program Manager: Helen Traylor

Project Description as defined by applicant

AVCP Housing intends to construct a Wood Biomass Heating System plant within its campus to reduce high energy costs. The wood biomass heating system is expected to supplant 85% of the estimated heat usage. The current diesel fuel cost is \$6.78/gal. in Bethel. Without the benefit of a biomass heating system, it is estimated we will be using 67,766 gallons of heating fuel annually beginning in the winter of 2012-2013.

AEA Review Comments and Recommendation

Full Funding

Special Provision

AVCP Housing requests funding to design and construct a Wood Biomass Heating System within its campus to reduce high energy costs. This project will heat 12 buildings including a 16 unit assisted living home, 3 large housing complexes, 2 warehouses, a dormitory, a maintenance facility, and office buildings. The fuel source will be pellets.

This project has the potential to positively impact Bethel and the surrounding communities by providing a logistical supply of pellets to the region.

A pellet distribution plan and the final design must be accepted by AEA prior to construction funding being released. AEA will work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project.

Recommend full funding.

Funding & Cost	Project Cost:	\$3,399,387
Cost of Power: \$0.51 /kWh	Requested Grant Funds:	\$3,149,387
Energy Region:	Matched Funds Provided:	\$250,000
Lower Yukon-Kuskokwim	Total Potential Grant Amount:	\$3,399,387
	AEA Funding Recommendation:	\$3,149,387

Stage 3 Scoring Summary

Criterion (Weight)	Score
1) Cost of Energy (Max 35) -	22.24
2) Matching Resources (Max 15) -	7.50
3) Project Feasibility Stage 2 (Max 20) -	12.20
4) Project Readiness (Max 5) -	2.00
5) Benefits (Max 15) -	1.75
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	3.33

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DMLW permits or authorizations required for project as currently described.

DNR/DOF Feasibility Comments

This project would design and construct a wood pellet boiler to provide heat to an Association of Village Council Presidents Rural Housing Administration campus in Bethel. The campus provides housing for 48 low-income households, a 30-bed aviation dormitory, and a 20-bed construction worker bunkhouse. It is anticipated that 540 tons of wood pellets would be required annually. It is estimated that with shipping costs included the annual cost would be \$248,347 or \$459.90 per ton. A silo would house the bulk delivery of pellets in Bethel. AVCP estimates \$103,264 per year in fuel savings through the conversion to pellets. This is based on a diesel fuel cost of \$6.28 per gallon. At these prices and a total grant cost of almost \$3.4 million, the simple pay back time is about 33 years. Pellet costs were obtained from an engineering study investigating the use of pellet boilers at the AVCP Regional Housing Authority Complex. This study however was not included in the application. Ideally several quotes should be available for pellet delivery to Bethel since these prices form the overall cost savings assumptions used in the proposal.

A letter of support from the president of AVCP acknowledges the benefits of woody biomass and considers the possible future use of biomass from the upper Kuskokwim River area.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 922 Gartina Falls Hydroelectric Project

Proposer: Inside Passage Electric Cooperative

Applicant Type: Utility

Resource: Hydro

Proposed Project Phase: Construction

AEA Program Manager: Doug Ott

Project Description as defined by applicant

The Gartina Falls Hydroelectric Project (Project) will include construction of a small diversion dam and intake structure just above Gartina Falls, installation of a steel penstock, a powerhouse at the base of the falls, a new access road, 0.1 miles of transmission line buried in conduit, and installation of power poles for 3.8 miles of overhead transmission line within the access road right-of-way. The purpose of the Project is to divert water from above the waterfall into the power plant and then discharge water back to the base of the waterfall. The new hydroelectric system will have an installed capacity of 455 kilowatts (kW) and will therefore be used to avoid an estimated 30 percent of Hoonah's current diesel-powered electricity through hydro generation.

AEA Review Comments and Recommendation

Full Funding

Special Provision

IPEC requests construction funds for Gartina Falls Hydro project. The project was previously funded for permitting and final design in round 3 (#462). Schedule proposed is aggressive and adds to the project risk of construction cost overruns.

Special provisions: AEA must approve the deliverables from the prior grant #462 before any construction funds will be reimbursed:

- 1) Proof of site control, 2) FERC license and all permits, 3) site adapted final design plans and specs, 4) construction cost estimate, 5) project budget, 6) renegotiation to lower management/PM fees and 7) schedule.

Funding & Cost		Project Cost:	\$8,009,000
		Requested Grant Funds:	\$6,694,000
	Cost of Power: \$0.62 /kWh	Matched Funds Provided:	\$15,000
	Energy Region: Southeast	Total Potential Grant Amount:	\$6,709,000
		AEA Funding Recommendation:	\$6,694,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	27.09
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	15.67
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	12.12
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	4.83

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The project sits between the Queen Charlotte-Fairweather fault and Denali fault (Chatham Strait section) (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). Project should be designed to withstand appropriate ground motions.

App # 923 Afognak Biomass Feasibility Study

Proposer: Native Village of Afognak

Applicant Type: Government Entity

Resource: Biomass

Proposed Project Phase: Recon
Feasibility

AEA Program Manager: Helen Traylor

Project Description as defined by applicant

To conduct a study on the feasibility of installing a biofuel system at the Kodiak High School to provide fuel/heat to the building, decrease the overall waste going into the Kodiak landfill and provide a biofuel education service through the Kodiak High School Career and Technical Program.

AEA Review Comments and Recommendation

Full Funding

Special Provision

The Native Village of Afognak proposes to conduct reconnaissance, feasibility and conceptual design on the opportunity of installing a biofuel system at the Kodiak High School. The system would provide fuel/heat to the school building utilizing waste from the Kodiak landfill and other biomass resources. The system would also provide a biofuel education service through the Kodiak High School Career and Technical Program.

In the application, the Native Village of Afognak recommends pursuing gasification technology from Community Power Corporation (CPC) and hiring CPC to perform the technical analysis. CPC is a wholly owned subsidiary of the Afognak Native Corporation.

AEA supports the project proposal for a reconnaissance, feasibility and conceptual design study for a biofuel system using municipal solid waste and other biomass resources, but requires that the study be conducted by an independent consultant experienced in biofuel systems. The proposed study would have to consider all potential biofuels technologies and not focus only on CPC technology.

Recommend full funding with the provision that AEA approve the selected consulting firm.

Funding & Cost	Project Cost:	\$1,633,974
	Requested Grant Funds:	\$170,974
Cost of Power: \$0.19 /kWh	Matched Funds Provided:	
Energy Region:	Total Potential Grant Amount:	\$170,974
Kodiak	AEA Funding Recommendation:	\$170,974

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	8.32
2) Matching Resources (Max 15) -	0.00
3) Project Feasibility Stage 2 (Max 20) -	11.40
4) Project Readiness (Max 5) -	0.83
5) Benefits (Max 15) -	11.88
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	3.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DMLW permits or authorizations for project as currently described.

DNR/DOF Feasibility Comments

This project submitted by the Native Village of Afognak would produce a feasibility study and conceptual design for the installation of a biofuel system to heat the Kodiak High School. The proposal seeks to explore and assess identified potential feedstock material. This focuses on the use of available recycled material in Kodiak that may consist of cardboard, other paper resources and woody material species (if required). The boiler configuration proposed is downdraft gasification technology capable of converting locally available waste streams into power used to heat the school. Project implementation will depend on the amount of material available. If it is determined that there is not enough material, then other sources such as pellets and possibly chips may be able to supplant the raw resource. Afognak Island timber harvest operations could possibly be a supplier of this resource but delivered costs are unknown at this time. The main information gathered on feedstock supply currently consists of Coast Guard base info of 707 tons of fiber waste that was recycled last year.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 924 Seward Schools Biomass Heating System

Proposer: Kenai Peninsula Borough School District (KPBSD)

Applicant Type: Local Government

Resource: Biomass

Proposed Project Phase: Design

Construction

AEA Program Manager: Helen Traylor

Project Description as defined by applicant

The proposed project will undertake final design and construction of a wood-fired hydronic heating system in three Seward schools. A Feasibility Study (FS) was completed in July, 2011 by Dan Parrent, USDA Forest Service, which served the purpose of both Reconnaissance and Feasibility. The Feasibility Study was also reviewed in a document prepared by Lew McCreery (USDA FS) of the USDA Wood Education and Resource Center (WERC). Both reports (attached to this application) attested to the viability and readiness of the project, which is now ready to proceed to Final Design and Construction Phases. This proposed Seward Schools Biomass Heating System project will implement the following multi-phased process:

- Phase III, Final Design of a wood-fired hydronic heating system to heat the combined Seward High, Middle and Elementary School campus with woody biomass fuel.
- Phase IV, Construction, Commissioning, and Operation of the heating system and follow up reporting on operation and maintenance.

The project is designed to proceed without the delay of additional grant year cycles. Reports from the 2011 feasibility assessment and a 2011 District energy evaluation will serve as the reference documents for this project. Location – latitude and longitude or street address or community / communities served: The proposed project will serve the community of Seward, AK, located on the Kenai Peninsula.

The three locations for the project are:

1. Seward Middle School, 304 Sea Lion Avenue, Seward, AK 99664 (60.132177,-149.431508)
2. William H. Seward Elementary School, 606 Sea Lion Avenue, Seward, AK 99664 (60.132209,-149.431658)
3. Seward High School, P.O. Box 1049, Seward, AK 99664 (60.133855,-149.422388)

AEA Review Comments and Recommendation

Full Funding

Special Provision

The Kenai Peninsula Borough School District is proposing final design and installation of pellet-fired boiler systems to heat three Seward schools – the elementary, middle, and high school. This project is estimated to displace a total of 120,600 gallons per year of fuel oil, using 1121 tons of pellets per year. The project has completed feasibility phase work.

The application includes substantial support from the community, USFS, and the local tribal council. This project will develop an anchor tenant for pellet supply in the Southcentral 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, with requirement of AEA acceptance of final design prior to release of construction funding.

Funding & Cost		Project Cost:	\$1,415,234
	Cost of Power: \$0.19 /kWh	Requested Grant Funds:	\$1,367,464
Energy Region: Railbelt		Matched Funds Provided:	\$47,770
		Total Potential Grant Amount:	\$1,415,234
		AEA Funding Recommendation:	\$1,367,464

Stage 3 Scoring Summary

Criterion (Weight)	Score
1) Cost of Energy (Max 35) -	8.41
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	17.80
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	12.87
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	4.83

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DMLW permits or authorizations required for project as currently described

DNR/DOF Feasibility Comments

This project undertakes final design and construction of a wood-fired hydronic heating system in three Seward schools. The project is essentially a continuation of last year's project # 834 proposal in that it seeks design and construction funds. The project was reviewed in a document similar to this last year. Briefly, in pre-feasibility reports prepared by USDA Forest Service, State and Private Forestry, a wood pellet system that replaces the oil fired boilers appears to be cost effective with a reasonable simple payback time period. Pellets would be shipped to Seward either from in state or out of state suppliers depending on price and availability. It is estimated that 80% of the annual fuel oil consumption could be replaced by wood for an annual savings of approximately \$117,330. This is based on a fuel oil cost of \$461,794 at \$3.83 per gallon. The project estimates an average wood resource demand of 1,121 tons of wood pellets per year though it is not clear at what price the pellets would be bought for. Working backwards from the amount claimed in savings, roughly \$344,464 would be spent for the pellets or \$307.28 per ton. The pre-feasibility study researched commercially available pellet providers and identified vendors from both in-state and Outside including Superior Pellets in North Pole, a small plant in Ketchikan and Pacific Northwest and Canadian sources. It also looked at BTU comparisons between pellets and fuel oil with an estimated price of \$453/ton equating to \$3.82/gallon. As mentioned above for project # 921, ideally several quotes should be available for pellet delivery to the facility to enable a range of estimated raw material costs to be calculated.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 925 Upper Tanana Biomass CHP Project

Proposer: Alaska Power & Telephone Company

Applicant Type: Utility

Resource: Biomass

Proposed Project Phase: Design

AEA Program Manager: Devany Plentovich

Project Description as defined by applicant

Alaska Power & Telephone (AP&T) proposes to conduct a Phase III project that will complete the Final Design and Permitting for a 2MWe biomass CHP (combined heat and power) system. The system will offset up to 1M gallons of fossil fuel per year and create a market for approximately \$1M of locally sourced woody biomass, much of which would otherwise be wildfire hazardous fuels. AP&T, with support from the Alaska Gateway School District, the Tok Umbrella Association, the Upper Tanana communities of Tok, Tetlin, Dot Lake and Tanacross, the State of Alaska Department of Natural Resources (DNR), and working with contracted Consultants, Foresters and Economists, is collaborating to develop a CHP system utilizing locally sourced woody biomass as fuel. The project will create the final design for the system, and thoroughly assess and prepare the permitting process for the biomass energy project.

NOTE:

Most of the detail in this grant application is from pre-feasibility work and the (full) Feasibility Study (FS Final Report pending November 2012, however excerpts are added to this document as attachments). AP&T is completing a screening level study of alternative generation strategies, as part of the Biomass CHP Feasibility Study. Also being considered in comparison to Biomass CHP are the following power generation scenarios: Diesel, Wind, Wind with pumping and storage, (trucked) Natural Gas, and Hydro.

AEA Review Comments and Recommendation

Partial Funding

The feasibility study for this application was received in December of 2012. A brief review of the study has identified the following concerns:

- Running various economic scenarios results in B/C ratios ranging from .66 to 1.49.
- The feasibility study assumes 100% displacement of electrical loads. Load following capabilities for biomass systems are a technical concern.
- There is no plan to utilize the waste heat. Without use of the waste heat, the plant will operate between 17.7% and 19.4% efficient.

While AEA supports this project, there are technical and economic questions that need to be answered before full funding for design and permitted is recommended. AEA will perform a comprehensive review of the study in the following month and provide additional feedback to AP&T to address technical and economic questions.

Recommend partial funding of \$400,000 to complete the conceptual design (35%) report, including identifying a use for the recoverable heat, further development of the capital estimate and economic analysis, and selecting a technology that will meet the specifications of the project objectives. A detailed scope for this funding will be developed after the feasibility study has been reviewed and accepted.

Funding & Cost	Project Cost:	\$18,000,000
	Requested Grant Funds:	\$1,990,000
Cost of Power: \$0.49 /kWh	Matched Funds Provided:	\$60,000
Energy Region:	Total Potential Grant Amount:	\$2,050,000
Yukon-Koyukok/Upper Tanana	AEA Funding Recommendation:	\$400,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	21.25
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	13.10
4) Project Readiness (Max 5) -	2.50
5) Benefits (Max 15) -	7.62
6) Local Support (Max 5) -	3.00
7) Sustainability (Max 5) -	2.83

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Tok biomass project. DOF issuing long-term contracts. DMLW might be involved in easements or materials sales for access.

DNR/DOF Feasibility Comments

This project submitted by Alaska Power & Telephone seeks to undertake final design and permitting of a 2MW combined heat and power system located in Tok. This project has had extensive review of the wood resource in and around Tok. The state Division of Forestry has performed work to update the Tanana Valley State Forest inventory and has also completed an analysis of wood availability within several mileage distance radii of the proposed CHP facility. In addition to the forest inventory work, Tok Area Forestry has conducted research to determine local values of total above ground wood weight by species and size class. Regression equations developed from this research will be applied to the forest inventory update to calculate green weight values in addition to more common volume measurements such as cubic and board feet. Currently the state is developing a preliminary best interest finding to determine if it should proceed with a competitive 25-year timber sale contract for biomass.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 926 AGSD District Heat Loop Project

Proposer: Alaska Gateway School District

Applicant Type: IPP

Government Entity

Resource: Heat Recovery

Proposed Project Phase: Design

Construction

AEA Program Manager: Devany Plentovich

Project Description as defined by applicant

The Alaska Gateway School District (AGSD) Heat Loop Project request is for Phase III Design and Phase IV Construction of a waste heat recovery application for AGSD's existing 5.5 MMBTU woody biomass energy facility. The project will recover waste heat which would otherwise be rejected and distribute it to ten (10) State-owned and Community building-clusters. The district heat loop will directly replace heat from the existing fossil fuel heating systems, offsetting the equivalent of 49,100 gallons of fuel oil #1 per year. Heat customers will be charged for heat on a cost-based rate, and the hydronic heat sales are exempt from RCA regulations. Over the 18-month project period, AGSD plans to explore various collaborative business structures with the local utility, Alaska Power & Telephone (AP&T) and other potential contractors to operate and maintain the heat loop. AGSD is prepared to independently operate and maintain the district heat loop.

AEA Review Comments and Recommendation

Full Funding

Special Provision

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 ten (10) State-owned and Community building-clusters. The project team would complete a final design phase and construction documents prior to construction.

This application is similar to the Round 5 submittal #866 that was recommended for funding, but below the \$25MM allotment. This Round 6 application significantly increases the number of buildings and the size of the proposed in the heat loop.

AEA is supportive of this project and continues to encourage the collaboration between the Alaska Gateway School District and the Alaska Power and Telephone biomass projects.

Recommend full funding with the provision that AEA approve the final design before construction funds are released.

Funding & Cost	Project Cost:	\$2,848,939
	Requested Grant Funds:	\$2,753,364
Cost of Power: \$0.49 /kWh	Matched Funds Provided:	\$95,575
Energy Region:	Total Potential Grant Amount:	\$2,848,939
Yukon-Koyukok/Upper Tanana	AEA Funding Recommendation:	\$2,753,364

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	21.25
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	8.40
4) Project Readiness (Max 5) -	2.00
5) Benefits (Max 15) -	1.00
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	4.17

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

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 on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 927 Galena Community Wood Heat Project

Proposer: City of Galena

Applicant Type: Local Government

Resource: Biomass

Proposed Project Phase: Construction
Design

AEA Program Manager: Helen Traylor

Project Description as defined by applicant

The City of Galena is requesting AEA Round 6 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 III Final Design and Phase IV Construction over a two (2) year period to 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.

AEA Review Comments and Recommendation

Partial Funding

The City of Galena is proposing final design and installation of chip-fired boiler systems to heat its school district and the Galena Interior Learning Academy School (GILA). This project is estimated to displace a total 230,000 of gallons per year of fuel oil, using tons 2,950 tons of chips per year. The technical feasibility phase of this project is complete, but the harvest/fuel inventory work is still in process.

The application includes substantial support from the community, the Loudon 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.

Recommend partial funding for final design and permitting and business/operational plan to allow the project team time to successful complete this stage of the project.

Funding & Cost	Project Cost:	\$2,870,635
Cost of Power: \$0.56 /kWh	Requested Grant Funds:	\$2,787,719
Energy Region:	Matched Funds Provided:	\$82,916
Yukon-Koyukok/Upper Tanana	Total Potential Grant Amount:	\$2,870,635
	AEA Funding Recommendation:	\$317,788

Stage 3 Scoring Summary

Criterion (Weight)	Score
1) Cost of Energy (Max 35) -	24.50
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	16.30
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	12.63
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	2.83

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Biomass plant is not on state land. Forest resources have not been identified on state land. Doing an inventory to determine biomass sources.

DNR/DOF Feasibility Comments

This project submitted by the City of Galena seeks to design and construct a biomass boiler for the Galena Interior Learning Academy campus. The boiler will be located at the Galena Base Steam Plant adjacent to the former Galena Air Force Base. The chosen system consists of a 4-7 MMBTU woodchip steam boiler, using wood fuels up to 40% moisture content. The projected amount needed per year is approximately 2,900 tons of woodchips which would displace 224,831 gallons of #1 fuel oil. An estimate of delivered biomass modeled for other off-the-road communities is \$175-\$200/ton. Current fuel oil at \$4.91/gallon results in an annual fuel savings of \$523,920 per year using \$200/ton for the woodchips. The Loudon Tribal Council previously conducted a feasibility study of the project. As part of the feasibility study an initial estimate of available biomass on Galena village corporation lands was conducted by Tanana Chiefs Conference Forestry Program in June 2012. The estimate confirmed that adequate supplies of biomass are available. The estimate was general in nature and a more detailed estimate has been contracted with Geographic Resource Solutions. This project would also be able to potentially harvest timber on nearby state lands however, detailed estimates of available timber volume from these lands has not been conducted. This project appears to be well thought out and likely to be successful given the fact that a significant amount of pre-planning has been undertaken. 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 on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 928 Bathymetric survey and marine geological study to refine submarine cable route

Proposer: City of Ouzinkie

Applicant Type: Local Government

Resource: Transmission

Proposed Project Phase: Design

AEA Program Manager: Kirk Warren

Project Description as defined by applicant

This phase of the overall project is recommended in the completed feasibility report regarding extending Kodiak Electric Association’s Monashaka feeder line to the City of Ouzinkie, dated April 2011. (attached) The line extension will tie KEA’s current electrical grid, including hydro and wind power generation, to the City of Ouzinkie. Necessarily, the inter-tie will include a submarine electrical cable of approximately 1 to 1.4 miles (depending on route) in length between the Island of Kodiak and Spruce Island. The report reads, “as the project moves forward, the recommendation is to perform bathymetric surveys and marine geophysical studies to refine and verify the submarine feasibility.” The City of Ouzinkie currently has both electrical and hydro power generation but of limited capacity and reliability. Connecting Ouzinkie to the KEA power grid will provide virtually unlimited, primarily renewable, reliable power to the community and thereby facility community growth and economic development. The feasibility report, attached, was jointly funded by the Ouzinkie Native Corporation and Kodiak Electrical Association.

AEA Review Comments and Recommendation

Full Funding

Special Provision

This phase of the project is to complete a bathymetric survey and marine geological study to refine cable route needed to extend Kodiak Electric Association’s feeder line to the City of Ouzinkie. The extension will tie Kodiak Electric Association’s current electrical grid to Ouzinkie. The intertie ultimately will include a submarine cable of 1 to 1.4 miles in length dependent upon the results of the survey and geological study.

AEA recommends full funding for this project conditional upon a letter of support from Kodiak Electric Association.

Funding & Cost		Project Cost:	\$6,129,000
		Requested Grant Funds:	\$356,400
	Cost of Power: \$0.41 /kWh	Matched Funds Provided:	\$25,000
	Energy Region:	Total Potential Grant Amount:	\$381,400
	Kodiak	AEA Funding Recommendation:	\$356,400

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	18.12
2) Matching Resources (Max 15) -	9.75
3) Project Feasibility Stage 2 (Max 20) -	12.50
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	4.88
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	4.67

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Feasibility study to include bathymetric survey and geological marine study. No AS 38.05.850 permits needed at this time unless coring or placement of utility lines takes place.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The proposed project does not cross any known fault zones. The closest seismic sources are the Narrow Cape fault zone and the Aleutian subduction zone. Both sources are capable of generating strong ground motions and should be considered in future project design (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>).

App # 929 Waterfall Creek Hydroelectric Project

Proposer: City of King Cove

Applicant Type: Local Government

Resource: Hydro

Proposed Project Phase: Construction

AEA Program Manager: Doug Ott

Project Description as defined by applicant

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' HOPE penstock pipeline, 16'X40' metal powerhouse on 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 seventeen years.

AEA Review Comments and Recommendation

Full Funding

Special Provision

City was awarded a \$200,000 grant (#887) in round 5 to complete permitting and final design for Waterfall Creek. These activities are underway at this time.

The City now requests construction funding to build the 1 MW run-of-river Waterfall Creek Hydroelectric project. AEA supports this request though notes that the final design and construction cost estimate are not complete at this time and the City continues further discussion with ADF&G about the amount of stream flow reserved for resident fish.

Special conditions include completion of all grant requirements of Grant 887, resolution of amount of instream flow reservation, demonstrate site control, etc. before any round 6 grant funds are disbursed.

Funding & Cost	Cost of Power: \$0.27 /kWh	Project Cost:	\$4,300,000	
	Energy Region: Aleutians		Requested Grant Funds:	\$2,600,000
			Matched Funds Provided:	\$1,300,000
			Total Potential Grant Amount:	\$3,900,000
			AEA Funding Recommendation:	\$2,600,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	11.60
2) Matching Resources (Max 15) -	12.75
3) Project Feasibility Stage 2 (Max 20) -	16.00
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	12.00
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	5.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Application for hydroelectric facility. AS 38.05.850 permits/easements required for transmission lines and penstock on state land. Possible lease required for powerhouse on concrete slab. Water rights application LAS 27738 currently on file with DMLW.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Aleutian subduction zone which is capable of generating strong ground motions at the site (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). Designs should be implemented to withstand these forces.

App # 930 Allison Creek Project

Proposer: Copper Valley Electric Association, Inc. (CVEA)

Applicant Type: Utility

Resource: Hydro

Proposed Project Phase: Construction

AEA Program Manager: Doug Ott

Project Description as defined by applicant

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 inch surface / buried penstock to a 6.5 megawatt powerhouse near tidewater. Attachment A is the Final Feasibility Study which provides details on this project as presented and approved by the CVEA Board of Directors.

AEA Review Comments and Recommendation **Full Funding
Special Provision**

CVEA requests \$6,114,000 to construct a 6.5 MW r-o-r hydroelectric power plant on Allison Creek. The funds would be used to purchase owner-furnished long lead items for the project. The project is expected to defer (annually) over 4 million gallons of diesel fuel now used for power generation.

AEA has the following reservations with this request: the FERC license application is being processed but has yet to be issued; the final design documents and a final construction estimate are not complete; the items to be purchased are not identified; CVEA already has \$10M in state capital funds to purchase long lead items needed; the project development schedule provided is quite aggressive;

Despite these shortcomings, it is a valid renewable energy project.

Special provision: Complete prior grant funded activities and acceptance by AEA for: final design documents, construction cost estimates, construction schedule and plan of finance

Funding & Cost	Project Cost:	\$38,804,000
Cost of Power: \$0.28 /kWh	Requested Grant Funds:	\$6,114,000
Energy Region:	Matched Funds Provided:	
Copper River/Chugach	Total Potential Grant Amount:	\$6,114,000
	AEA Funding Recommendation:	\$6,114,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	12.44
2) Matching Resources (Max 15) -	15.00
3) Project Feasibility Stage 2 (Max 20) -	15.87
4) Project Readiness (Max 5) -	3.50
5) Benefits (Max 15) -	12.38
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	4.83

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Hydroelectric project. AS 38.05.850 permits/easements required for electric transmission line and penstock. Easement applications ADL 231698 rec'd 10/25/2012. LAS 27334 (land use permit) and LAS 28393 (water right application) also on file for this project.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The Aleutian subduction zone, faults of the Chugach-St. Elias fold and thrust belt, and the Patton Bay fault have potential to cause strong ground motions at the site (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). Appropriate design should be implemented to withstand these forces.

App # 931 Nenana Collaborative Biomass Heating System Project

Proposer: Nenana City School District

Applicant Type: Government Entity

Resource: Biomass

Proposed Project Phase: Design

AEA Program Manager: Helen Traylor

Project Description as defined by applicant

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)

AEA Review Comments and Recommendation

Full Funding

The Nenana City School District in Nenana, AK (Interior Alaska) requests funding for engineering design phase to build a district wide heating system for 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 has the potential save the Nenana City School District in excess \$3,516,725 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.

Recommend full funding with the requirements that AEA must review and accept the final engineering design; business plan with heat sales agreement; harvest plan; inventory plan.

Funding & Cost		Project Cost:	\$3,006,607
	Cost of Power: \$0.22 /kWh	Requested Grant Funds:	\$466,890
Energy Region: Railbelt		Matched Funds Provided:	\$19,200
		Total Potential Grant Amount:	\$486,090
		AEA Funding Recommendation:	\$466,890

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	9.81
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	16.83
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	13.13
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	4.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

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

Three entities including the Nenana City School District, the City of Nenana, and the Nenana Native Council have submitted this project for design of a wood fired district heating system. Toghothtele Corporation owns a significant amount of timber land near Nenana and has offered support for this project and is interested in participating in sales of the raw resource. The area is also close to the Tanana Valley State Forest which maintains a logging road infrastructure and offers timber sales in the Nenana area. This raw resource woodshed combined with volume potentially from state land agriculture clearings and Mental Health Trust Authority lands should ensure a sustainable harvest operation. It is anticipated that this project will utilize a woodchip boiler that requires approximately 1,037 green tons (30% moisture content). The Tanana Valley State Forest Inventory update estimates 59 tons of above ground biomass per acre. Thus approximately 20 acres of timber per year would be required for this project. The amount would be quite sustainable for this area of the Tanana Valley.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 932 Design and Construction of Biomass Systems in Interior Villages

Proposer: Interior Regional Housing Authority

Applicant Type: Government Entity

Resource: Biomass

Proposed Project Phase: Design

Construction

AEA Program Manager: Helen Traylor

Project Description as defined by applicant

The project will design and construct wood heating systems in three Interior Alaska rural communities. IRHA has conducted eight feasibility assessments including forest inventories and wood harvest assessments in eight Interior communities. Based on the feasibility studies, design and construction of biomass systems and wood storage facilities will begin design and construction in spring 2013 in Nikolai, Koyukuk, and Anvik. Round 6 funding is being requested for three more biomass systems in three more communities in the region. Projects will be selected based the likelihood of successful project implementation which includes identification of a project champion in the community, projected simple payback and adequate, sustainable forest inventory. IRHA will partner with Alaska Native Tribal Health Consortium and the individual tribes. Renewable Energy Fund Round 4 IRHA received funding for biomass feasibility studies for: Koyukuk Nikolai Anvik Holy Cross Nulato Hughes Ruby Kaltag Renewable Energy Fund Round 5 IRHA received funding for design and construction for three biomass projects to be determined by Round 4 feasibility studies(completed in August 2012) Nikolai, Anvik and Koyukuk are selected for design and construction based on the highest annual savings, lowest simple payback and biomass stocking figures that indicate sustainable harvest plans. Renewable Energy Fund Round 6 IRHA submitting a Round 6 application for construction of three more biomass projects to be determined suing feasibility studies and forest inventories. IRHA submitting a Round 6 application for feasibility studies for seven more communities in the Interior- Alatna, Allakaket, Beaver, Stevens Village, Grayling, Shageluk and Northway. The location of the three biomass systems to be designed and constructed will be in three of the following communities: Hughes (66.048890 N, 154.255560W), Ruby (64.739440 N 155.486940W), Nulato (64.719440 N 158.103060 W), Kaltag (64.327220 N 158.721940 W), Holy Cross(62.199440 N 159.771390 W), Alatna (66 .566920 N 152.666390 W), Allakaket (66.562610 N 152.647560 W), Shageluk (62.682220 N 159.561940 W), Grayling (62.903610 N 160.064720 W), Northway (62.982220 N 141.951670 W), Beaver (66.359440 N 147.396390 W) or Stevens Village (66.006390 N 149.090830 W).

AEA Review Comments and Recommendation Not Recommended

The Interior Regional Housing Authority (IRHA) requests funding for the design and construction of wood biomass heating systems for three communities to be identified in the future from feasibility studies that were conducted with funding from the Renewable Energy Fund Round 4.

Interior Regional Housing Authority was funded for the construction of three communities in Round 5. IRHA is currently selecting these communities.

AEA is supportive of small scale biomass heating systems in Interior Alaska that are economically viable within sustainable communities. The review team considered this application premature and the applicant should wait for the completion of the next round of feasibility studies to assure that the proposed projects are economically viable and sustainable.

Not recommended for funding.

Funding & Cost	Project Cost:	\$1,314,380
Cost of Power: \$0.65 /kWh	Requested Grant Funds:	\$1,314,380
	Matched Funds Provided:	\$108,313
Energy Region: Yukon-Koyukok/Upper Tanana	Total Potential Grant Amount:	\$1,422,693
AEA Funding Recommendation:		

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	28.22
2) Matching Resources (Max 15) -	7.50
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Biomass resource ownership not identified. If on state land, resource sale likely required. Even if not on state land, state easements or permits may be required depending on access routes.

DNR/DOF Feasibility Comments

This project submitted by Interior Regional Housing Authority would design and construct wood heating facilities in three Interior Alaska communities out of a total of 12 that have conducted or will conduct feasibility assessments. The studies include forest inventories and wood harvest assessments prepared by Tanana Chiefs Conference Forestry Program and use a combination of existing inventory data and classified satellite imagery. Tanana Chiefs has currently assessed the villages of Hughes, Ruby, Nulato, Kaltag, and Holy Cross. The selection process will also look at village capacity to help ensure a particular project's success. It is likely that the wood heating systems will be similar to the village of Tanana which utilizes Garn boilers. Many of these villages are within forested areas along the Yukon River. A sustainable supply of wood is generally thought to be available for the scale of these projects.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 933 Biomass Feasibility Studies in Public Facilities, Interior Region

Proposer: Interior Regional Housing Authority

Applicant Type: Government Entity

Resource: Biomass

Proposed Project Phase: Feasibility

AEA Program Manager: Helen Traylor

Project Description as defined by applicant

The seven communities named in this proposal- Alatna, Allakaket, Northway, Grayling, Shageluk, Beaver and Stevens Village- have all participated in energy planning meetings with IRHA and other organizations and have identified wood heating in public facilities as a key opportunity to displace fuel oil, reduce energy costs, utilize locally available renewable resources and create local employment. This proposal calls for feasibility assessments that include the study of public facilities where wood heating may be applicable, pre-engineering analysis of the size and type of boilers that would be required (including "boiler in a box" option), estimated fuel displacement and cost savings, capital cost and payback period, and forest inventory and wood harvest plan. Of the seven communities selected for this project, Stevens Village, Beaver and Northway had Preliminary Feasibility Assessments conducted in 2008. The 2008 studies suggested that biomass was a viable option for the communities, but that further analysis was necessary. For these three communities, the 2008 studies will be updated and expanded upon. Forest inventories will be completed as well. For the communities of Shageluk, Allakaket, Alatna and Grayling, IRHA proposes a two-pronged approach: (1) subcontract with a qualified biomass energy specialist to conduct a 1-2 day site visits in each community and prepare a feasibility assessment for each community, (2) subcontract with Will Putman, head forester for Tanana Chiefs Conference to conduct forest inventory and wood harvest planning. Following completion of these reports, project staff Kim Carlo and Nadine Winters of IRHA will continue to communicate with residents of the communities and facilitate their internal planning processes to determine whether each community wants to move forward with final design and construction phases of the respective wood-heating projects, pending available funding . It bears mentioning that this proposal is identical in scope to one submitted by IRHA under Round 4 of the Renewable Energy Fund. It was funded and eight biomass feasibility studies are completed as a result. This represents a deliberate approach whereby the applicant is proceeding in stages with conducting feasibility work prior to conceptual design, final design and construction. It is anticipated that the phased approach will allow IRHA to conduct full assessments for most communities in the region.

Alatna 66.566920 N 152.666390 W, Allakaket 66.562610 N 152.647560 W, Shageluk 62.682220 N 159.561940 W, Grayling 62.903610 N 160.064720 W, Northway 62.982220 N 141.951670 W, Beaver 66.359440 N 147.396390 W, Stevens Village 66.006390 N 149.090830 W

AEA Review Comments and Recommendation Full Funding

The Interior Regional Housing Authority (IRHA) requests funding for feasibility assessments and forest inventories in 7 communities to evaluate the potential use of biomass systems for heating. This is the 3rd application for feasibility assessments. A project for 8 communities was funded through Round 4, and a project for 7 communities was recommended for funding through Round 5, but was not funded. The proposed communities for this round are: Grayling, Northway, Beaver, Shageluk, Allakaket, Alatna, and Stevens Village.

IRHA has assembled a strong team with biomass energy and resource experience. AEA believes that the proposed approach is well-conceived.

Recommend full funding of \$168,959 for feasibility and biomass energy resource assessment.

Funding & Cost	Project Cost:	\$168,959
Cost of Power: \$0.66 /kWh	Requested Grant Funds:	\$168,959
Energy Region:	Matched Funds Provided:	
Yukon-Koyukok/Upper Tanana	Total Potential Grant Amount:	\$168,959
	AEA Funding Recommendation:	\$168,959

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	28.96
2) Matching Resources (Max 15) -	0.00
3) Project Feasibility Stage 2 (Max 20) -	15.30
4) Project Readiness (Max 5) -	2.00
5) Benefits (Max 15) -	9.63
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	1.50

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Appears to be study only, with no development. If development were to occur, the biomass resource ownership not identified. If on state land, resource sale likely required. Even if not on state land, state easements or permits may be required depending on access routes.

DNR/DOF Feasibility Comments

This project submitted by Interior Regional Housing Authority will provide feasibility studies for additional Interior villages. The project is essentially a continuation of last year's project # 822 proposal. It will provide for a feasibility study of seven Interior villages and for pre-engineering analysis of the size and type of boilers required. The studies will examine the use of proposed cordwood fueled Garn boiler heating systems similar to the facility in use for the village of Tanana but, the analyses are not limited to these systems. The proposal seeks to acquire forest inventory data from Tanana Chiefs Conference Forestry Program. The studies will include forest inventories and wood harvest assessments prepared by TCC and will use a combination of existing inventory data and classified satellite imagery. This project will continue work to determine an operable sustainable biomass resource supply for individual communities within the region.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 934 Savoonga Heat Recovery System - Power Plant to Water Plant

Proposer: City of Savoonga

Applicant Type: Local Government

Resource: Heat Recovery

Proposed Project Phase: Construction

AEA Program Manager: Devany Plentovich

Project Description as defined by applicant

Currently, AVEC is not utilizing either the jacket heat from its diesel engines or the heat generated by the electric boiler installed to dispose excess wind energy. This project would recover heat from both sources at the AVEC plant and send that heat to the water treatment plant to heat the building, the circulated water loops, and the water storage tank. The AVEC power plant and the Savoonga water treatment plant are located next to each other in Savoonga. A feasibility study has been done for this project, the design has been completed and a construction cost estimate has been prepared. These are attached. Funds are being requested for construction only.

AEA Review Comments and Recommendation **Full Funding Special Provision**

The City of Savoonga in collaboration with ANTHC is proposing the construction a waste heat recovery system to connect recovered heat from the AVEC power plant and an excess wind electric boiler to the water treatment plant, water loop, and water storage tank. This project is estimated to displace 100% of the current fuel oil usage of 8800 gallons.

The feasibility study for this project was completed in 2011 and the heat recovery design was completed in 2012. The wind design of this project must be completed.

The heat recovery system will be operated and maintained through the Alaska Rural Utility Collaborative program.

Recommend full funding contingent on a heat sales agreement and accepted final design. AEA will also work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project.

Funding & Cost	Project Cost:	\$425,701
Cost of Power: \$0.49 /kWh	Requested Grant Funds:	\$425,701
	Matched Funds Provided:	\$11,752
Energy Region:	Total Potential Grant Amount:	\$437,453
Bering Straits	AEA Funding Recommendation:	\$425,701

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	21.48
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	16.30
4) Project Readiness (Max 5) -	3.50
5) Benefits (Max 15) -	11.63
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	4.33

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 935 Atmautluak Washeteria Heat Recovery Project

Proposer: Atmautluak Traditional Council

Applicant Type: Local Government

Resource: Heat Recovery

Proposed Project Phase: Construction

AEA Program Manager: Devany Plentovich

Project Description as defined by applicant

This project will provide waste heat from the existing electrical power plant to the washeteria. Waste heat infrastructure will include waste heat transmission lines and upgrades necessary in the power house and washeteria. For more detailed information, see the attached feasibility study by Alaska Energy and Engineering.

AEA Review Comments and Recommendation

Full Funding

Special Provision

The Native Village of Atmautluak in collaboration with ANTHC is proposing the construction of a waste heat recovery system to connect recovered heat from the community power plant to the washeteria. This project is estimated to displace 4395 gallons of the annual fuel oil usage of 4800 gallons.

The feasibility study for this project was completed in 2011 and the design was completed in 2012. The project is ready to purchase long lead items and to proceed into construction.

Recommend full funding contingent on the successful negotiation of a heat sales agreement. AEA encourages the grantee to accelerate the installation so that the system can be operational for the 2013 heating season.

Funding & Cost		Project Cost:	\$360,500
	Cost of Power: \$0.70 /kWh	Requested Grant Funds:	\$350,000
		Matched Funds Provided:	\$10,500
	Energy Region:	Total Potential Grant Amount:	\$360,500
	Lower Yukon-Kuskokwim	AEA Funding Recommendation:	\$350,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	30.63
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	14.73
4) Project Readiness (Max 5) -	4.00
5) Benefits (Max 15) -	6.00
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	4.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Project is not on DMLW managed land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 936 Heat Recovery for the Water System

Proposer: City of Chuathbaluk

Applicant Type: Local Government

Resource: Heat Recovery

Proposed Project Phase: Design

Construction

AEA Program Manager: Devany Plentovich

Project Description as defined by applicant

This project will provide waste heat from the existing electrical power plant to the water system. The estimated fuel oil savings to the community water plant is projected to be 1,400 gallons of heating oil per year. For more detailed information, see the attached Chuathbaluk, Alaska 2012 Heat Recovery Feasibility Study.

AEA Review Comments and Recommendation

Full Funding

Special Provision

The City of Chuathbaluk in collaboration with ANTHC is proposing the design and construction of a waste heat recovery system to connect recovered heat from the community power plant to the water treatment water loop and water storage tank. This project is estimated to displace 1400 of the current fuel oil usage of 1834 gallons.

The feasibility study for this project was completed in 2012.

AEA is concerned that there is no preliminary heat sales agreement and there is no mention of the operations and maintenance plans for the new system.

Recommend full funding contingent of a heat sales agreement and an O&M plan. Construction funding is contingent on acceptance of the final design. AEA will work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project.

Funding & Cost	Project Cost:	\$199,863
Cost of Power: \$0.85 /kWh	Requested Grant Funds:	\$199,863
	Matched Funds Provided:	\$5,996
Energy Region:	Total Potential Grant Amount:	\$205,859
Lower Yukon-Kuskokwim	AEA Funding Recommendation:	\$199,863

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	35.00
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	11.93
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	1.00
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	2.67

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Project is not on DMLW managed land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 937 Heat Recovery for the Water Treatment Plant and Washeteria

Proposer: Native Village of Kwinhagak

Applicant Type: Local Government

Resource: Heat Recovery

Proposed Project Phase: Design

Construction

AEA Program Manager: Devany Plentovich

Project Description as defined by applicant

This project will provide waste heat from the existing electrical power plant to the washeteria and combined utility building. The estimated fuel oil savings to the combined utility building and washeteria is projected to be 14,200 gallons of heating oil per year. For more detailed information, see the attached Quinhagak, Alaska 2012 Heat Recovery Feasibility Study.

**AEA Review Comments and Recommendation Full Funding
Special Provision**

The Native Village of Quinhagak in collaboration with ANTHC is proposing the design and construction a waste heat recovery system to connect recovered heat from the AVEC power plant to the water treatment plant/combined utility and washeteria. This project is estimated to displace 62% or 14,200 gallons of the current fuel oil usage per year.

The feasibility study for this project was completed in 2012. The fuel displacement is based on converting the existing diesels to marine jacketed configurations. A project is currently underway to prove the viability of marine jackets on Detroit Diesel Series 60 generators. Without this conversion, the financial benefit of this project will be significantly less.

Recommend full funding contingent on the success of proving the viability of marine jacketed Detroit Diesel Series 60 generators. Construction funding is contingent on AEA accepting the final design and the business/operating plan with heat sales agreements. AEA will also work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project.

Funding & Cost	Project Cost:	\$668,350
Cost of Power: \$0.54 /kWh	Requested Grant Funds:	\$668,350
	Matched Funds Provided:	\$20,050
Energy Region:	Total Potential Grant Amount:	\$688,400
Lower Yukon-Kuskokwim	AEA Funding Recommendation:	\$668,350

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	23.65
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	16.80
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	12.75
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	4.33

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Project is not on DMLW managed land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 938 Feasibility Study and Conceptual Design of Tenakee Inlet Geothermal Resource

Proposer: Inside Passage Electric Cooperative

Applicant Type: Utility

Resource: Geothermal

Proposed Project Phase: Feasibility

AEA Program Manager: Alan Baldivieso

Project Description as defined by applicant

The purpose of this project is to further investigate the known geothermal resource at Tenakee Inlet and evaluate its potential to produce power and to evaluate alternative uses of the source. Hot springs encountered during our reconnaissance study have the highest recorded surface temperature (176° F) of any of the numerous geothermal springs tested on Chichagof Island. The reconnaissance study has indicated a viable resource with fluids having encountered subsurface temperatures of 260° F, and that the resource is larger in size than originally anticipated. We request funding for a feasibility study and conceptual design project with a timeline of approximately 28 months. We are currently completing a reconnaissance study that included mapping, remote sensing, and geochemical sampling of water and soils. A paper presented at the Geothermal Resource Council in October 2012 is attached. We also submitted a draft interim report to AEA in December 2011 with all of the data collected at that point. We propose for this feasibility study to continue our investigations by advancing one to two slim drill holes, conducting a feasibility analysis and developing a conceptual design of how best to develop the resource. Future work would include production level drilling, permitting, and power plant and infrastructure construction.

AEA Review Comments and Recommendation Not Recommended

A reconnaissance study was funded in Round 4 of the Renewable Energy Fund. The conceptual model and economic analysis from the reconnaissance study are due after this review was conducted; the final report from the applicant is due in June 2013.

As a low-temperature geothermal resource, Tenakee Inlet remains potentially promising and continued exploration would contribute to a greater understanding of geothermal resources in Southeast AK. Development of a small-scale ORC (organic Rankine cycle) geothermal plant would help determine the viability of additional and possibly larger scale geothermal plants in the region and in other parts of the state.

Tenakee Springs is currently pursuing construction funding for a run-of-river hydroelectric project which would supply 90% of the existing load. That project scored well in this Round 6 REF recommendation program and will be a recommended project. Pelican is in the midst of an AEA-managed upgrade of its hydro plant to cover 100% of its current load.

Transmission line costs, potential access routes, and SeaAlaska's involvement/the development of tourism facilities are large unknowns which could significantly impact the economics of the project; however, there is no clear indication that any of these factors will bring down project costs in the near future. Funding for the second phase of a project should be justified by the results of the first phase. Because the first phase has not been completed—in particular the economic component—additional funding would be premature.

Not recommended for funding.

Funding & Cost	Project Cost:	\$27,000,000
Cost of Power: \$0.62 /kWh	Requested Grant Funds:	\$3,485,000
Energy Region: Southeast	Matched Funds Provided:	
	Total Potential Grant Amount:	\$3,485,000
	AEA Funding Recommendation:	

Stage 3 Scoring Summary

Criterion (Weight)	Score
1) Cost of Energy (Max 35) -	27.09
2) Matching Resources (Max 15) -	0.00
3) Project Feasibility Stage 2 (Max 20) -	7.00
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	1.75
6) Local Support (Max 5) -	4.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Feasibility study and no State land type interest identified.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

The proposed project plans to conduct mostly slim-hole drilling for up to two drill holes, each to about 4000 feet, to evaluate the geothermal resources. An earlier Renewable Energy Grant (grant number 7040073) provided funds to conduct a reconnaissance study in 2011 that included collection of detailed water analyses, conduct a shallow temperature probe study and to locate a number of hot springs in the area. This study suggests that the geothermal zone is broader than originally thought and that water geochemistry suggests temperatures (127°C, 260°F) 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. A conceptual model has been developed as the result of the earlier study, and the geothermal resource may be shallow rather than deep. The proposal costs seem reasonable for slim-hole drilling as well as the time necessary to drill two holes with a slim-hole drill rig (60-75 days). We recommend that the applicant should provide a detailed outline of the methodology that will be used to select and justify the drilling locations for the drill holes. Additionally, a description of slim hole drill rigs being considered and their depth capabilities and bore hole diameters should be included, along with information on drill coring (continuous or selective) and how these cores will be used in the study.

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Queen Charlotte-Fairweather fault (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). Project should be designed to withstand appropriate ground motions.

App # 939 Stebbins Heat Recovery Project

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Heat Recovery

Proposed Project Phase: Design

Construction

AEA Program Manager: Devany Plentovich

Project Description as defined by applicant

This project will provide recovered heat from the new AVEC power plant to the new water treatment plant {WTP}, existing WTP, washeteria, clinic, Head Start Building, and school. The estimated fuel reduction for the six buildings combined is estimated to be 57,000 gallons a year with an expected savings of \$240,000 annually.

AEA Review Comments and Recommendation

Full Funding

Special Provision

The Alaska Village Electrical Cooperative in collaboration with ANTHC and the community of Stebbins is proposing the design and construction a waste heat recovery system to connect recovered heat from the community power plant to the new Water treatment plant, existing water treatment plant, washeteria, head start building, clinic, and school. This project is estimated to displace 57,000 gallons of fuel oil out of an annual usage of 69,000 gallons.

The feasibility study for this project was completed in 2012. AEA will work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project.

Recommend full funding. Construction funding is contingent on AEA accepting the final design and the business/operating plan with heat sales agreements.

Funding & Cost		Project Cost:	\$1,341,063
		Requested Grant Funds:	\$1,319,088
	Cost of Power: \$0.56 /kWh	Matched Funds Provided:	\$21,975
	Energy Region:	Total Potential Grant Amount:	\$1,341,063
	Bering Straits	AEA Funding Recommendation:	\$1,319,088

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	24.35
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	17.47
4) Project Readiness (Max 5) -	3.17
5) Benefits (Max 15) -	12.75
6) Local Support (Max 5) -	4.00
7) Sustainability (Max 5) -	2.83

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DNR land authorizations appear to be required.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 940 Heat Recovery for the Water Treatment Plant and Community Store

Proposer: City of Marshall

Applicant Type: Local Government

Resource: Heat Recovery

Proposed Project Phase: Design

Construction

AEA Program Manager: Devany Plentovich

Project Description as defined by applicant

This project will provide waste heat from the existing electrical power plant to the water treatment plant and village store. The estimated fuel oil savings to these two facilities is projected to be 7,700 gallons of heating oil per year. For more detailed information, see the attached Marshall, Alaska 2012 Heat Recovery Feasibility Study.

**AEA Review Comments and Recommendation Full Funding
Special Provision**

The City of Marshall in collaboration with ANTHC is proposing the design and construction a waste heat recovery system to connect recovered heat from the AVEC power plant to the Water treatment plant and Community Store. This project is estimated to displace 100% or 7,700 gallons of the current fuel oil usage per year.

The feasibility study for this project was completed in 2012. The fuel displacement is based on converting the existing diesels to marine jacketed configurations. A project is currently underway to prove the viability of marine jackets on Detroit Diesel Series 60 generators. Without this conversion, the financial benefit of this project will be significantly less.

Recommend full funding contingent on the success of proving the viability of marine jacketed Detroit Diesel Series 60 generators. Construction funding is contingent on AEA accepting the final design and the business/operating plan with heat sales agreements. AEA will also work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project.

Funding & Cost	Project Cost:	\$183,200
Cost of Power: \$0.51 /kWh	Requested Grant Funds:	\$183,200
	Matched Funds Provided:	\$6,000
Energy Region:	Total Potential Grant Amount:	\$189,200
Lower Yukon-Kuskokwim	AEA Funding Recommendation:	\$183,200

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	22.27
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	16.53
4) Project Readiness (Max 5) -	2.67
5) Benefits (Max 15) -	12.75
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	3.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

AS 38.05.850 permits/easements needed for transmission lines on state land. Possible lease needed for community store.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 941 Heat Recovery for the Water Treatment Plant

Proposer: City of Noorvik

Applicant Type: Local Government

Resource: Heat Recovery

Proposed Project Phase: Design

Construction

AEA Program Manager: Devany Plentovich

Project Description as defined by applicant

This project will provide waste heat from the existing electrical power plant to the water treatment plant. The estimated fuel oil savings to the community water plant is projected to be 18,600 gallons of heating oil per year. For more detailed information, see the attached Noorvik, Alaska 2012 Heat Recovery Feasibility Study.

AEA Review Comments and Recommendation

Full Funding

Special Provision

City of Noorvik in collaboration with ANTHC is proposing the design and construction of a waste heat recovery system to connect recovered heat from the AVEC power plant to the water treatment plant. This project is estimated to displace 87% or 18,600 gallons of the current fuel oil usage per year.

The heat recovery system will be operated and maintained through the Alaska Rural Utility Collaborative (ARUC) program.

The feasibility study for this project was completed in 2012. The fuel displacement is based on converting the existing diesels to marine jacketed configurations. A project is currently underway to prove the viability of marine jackets on Detroit Diesel Series 60 generators. Without this conversion, the financial benefit of this project will be significantly less.

Recommend full funding contingent on the success of proving the viability of marine jacketed Detroit Diesel Series 60 generators. Construction funding is contingent on AEA accepting the final design and the business/operating plan with heat sales agreements. AEA will also work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project.

Funding & Cost		Project Cost:	\$985,808
	Cost of Power: \$0.62 /kWh	Requested Grant Funds:	\$985,805
Energy Region: Northwest Arctic		Matched Funds Provided:	\$29,580
		Total Potential Grant Amount:	\$1,015,385
		AEA Funding Recommendation:	\$985,805

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	27.00
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	15.77
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	10.88
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	4.67

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DNR land authorizations appear to be required.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 942 Heat Recovery for the Water Treatment Plant/Washeteria Building

Proposer: Native Village of Tuntutuliak

Applicant Type: Government Entity

Resource: Heat Recovery

Proposed Project Phase: Design

Construction

AEA Program Manager: Devany Plentovich

Project Description as defined by applicant

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 6,000 gallons of heating oil per year. For more detailed information, see the attached Tuntutuliak, Alaska 2012 Heat Recovery Feasibility Study.

**AEA Review Comments and Recommendation Full Funding
Special Provision**

The Native Village of Tuntutuliak in collaboration with ANTHC is proposing the design and construction a waste heat recovery system to connect recovered heat from the community power plant to the water treatment plant and washeteria. This project is estimated to displace 6000 gallons of fuel oil.

The feasibility study for this project was completed in 2012. AEA will work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project.

Recommend full funding. Construction funding is contingent on AEA accepting the final design and the business/operating plan.

Funding & Cost	Project Cost:	\$438,585
Cost of Power: \$0.65 /kWh	Requested Grant Funds:	\$425,811
	Matched Funds Provided:	\$12,774
Energy Region:	Total Potential Grant Amount:	\$438,585
Lower Yukon-Kuskokwim	AEA Funding Recommendation:	\$425,811

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	28.44
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	14.30
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	7.13
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	2.17

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Project is not on DMLW managed land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 943 OIT Inc Waste Heat Turbine Project

Proposer: OIT Inc.

Applicant Type: IPP

Resource: Heat Recovery

Proposed Project Phase: Construction Design

AEA Program Manager: Karl Reiche

Project Description as defined by applicant

Organic Incineration Technology (OIT) incinerates non-hazardous petroleum contaminated soils, absorbent pads and sludges generated by Alaskan industries in a regulated, environmentally safe facility in Moose Creek, AK. The waste treatment process generates a substantial amount of energy which is currently exhausted and therefore wasted. Through the installation of a heat recovery steam generator (HRSG), a steam turbine generator system and condenser, OIT intends to capture the waste heat from the existing incineration process and turn that energy into electricity to be used on-site and placed onto the grid for use by the surrounding community. Through the implementation of this system, OIT would be utilizing an existing energy resource to reduce the community's dependence on traditional utility power sources fueled by the burning of fuel oil.

AEA Review Comments and Recommendation

Partial Funding Special Provision

AEA will partially fund the completion of the final design, permitting, business plan, and power sales agreement.

The proposed energy recovery project is promising as it would be an addition to an operating waste incineration facility near Fairbanks, AK. Applicant proposes to generate electric power (via a steam generator) for both on-site use and for resale to GVEA. Proposer indicates the upgrade will allow the business to operate year-round vs. present half-year. Project costs (including construction) are estimated to be \$3,258,000: funded half by an AEA grant and half through OIT (cash, revenue, and bank loans). Proposer indicates that reconnaissance, feasibility, and conceptual design have been completed.

Prior to evaluating for funding of construction in future rounds, proposer will be requested to provide copies of:

- The feasibility study
- Conceptual design
- A loan approval letter from a bank (mentioned pg 16)
- A copy of OIT's business plan

The business plan should address OIT's operational history, long term contracts, a financial pro forma, SWOT discussion, and written confirmation from GVEA regarding the power purchase rate and terms.

Funding & Cost		Project Cost:	\$3,258,447
		Requested Grant Funds:	\$1,629,223
	Cost of Power: \$0.22 /kWh	Matched Funds Provided:	\$1,629,223
	Energy Region:	Total Potential Grant Amount:	\$3,258,446
	Railbelt	AEA Funding Recommendation:	\$225,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	9.81
2) Matching Resources (Max 15) -	14.25
3) Project Feasibility Stage 2 (Max 20) -	15.07
4) Project Readiness (Max 5) -	1.83
5) Benefits (Max 15) -	12.50
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	2.83

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DNR land authorizations appear to be required.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 944 New Stuyahok Heat Recovery

Proposer: Southwest Region School District

Applicant Type: Government Entity

Resource: Heat Recovery

Proposed Project Phase: Construction
Design

AEA Program Manager: Jim Vail

Project Description as defined by applicant

This project includes upgrades to the AVEC power plant cooling system, installation of heat exchangers at the AVEC plant and school boiler module with appropriate pumps and controls at both sites and 700 feet of underground piping between the plant and school boiler module.

AEA Review Comments and Recommendation

Full Funding

Special Provision

The Alaska Village Electrical Cooperative and the Southwest Region School District are proposing to provide recovered heat from the existing New Stuyahok power plant for heating the adjacent New Stuyahok High School, built in 2007.

The Preliminary Heat Recovery Assessment for the AVEC Power Plant and New Stuyahok School project was completed in 9/19/12.

Recommend full funding contingent on a heat sales agreement and accepted final design.

Funding & Cost		Project Cost:	\$548,000
		Requested Grant Funds:	\$486,000
	Cost of Power: \$0.62 /kWh	Matched Funds Provided:	\$62,000
	Energy Region:	Total Potential Grant Amount:	\$548,000
	Bristol Bay	AEA Funding Recommendation:	\$486,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	27.24
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	17.93
4) Project Readiness (Max 5) -	4.33
5) Benefits (Max 15) -	12.87
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	4.83

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Project is not on DMLW managed land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 945 St. Mary's / Pitka's Point Wind Energy Project

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Construction

AEA Program Manager: Josh Craft

Project Description as defined by applicant

Alaska Village Electric Cooperative, Inc. (AVEC) is seeking \$5,538,592 from this Grant Program to add a wind energy component to the existing diesel power generation system that presently serves St. Mary's and Pitka's Point. The project will construct one 900 kW EWT turbine at a location 2.5 miles from St. Mary's and 1 mile east of Pitka's Point, and will connect it to the existing power generation system. The EWT is expected to produce 2,717,000 kWh annually at 80% turbine availability. This project would also involve upgrading the existing power line between St. Mary's and the new wind turbine site from 2-phase to 3-phase. The total estimated project cost is \$6,153,991 with AVEC contributing \$615,399 as its match. This project, using previously awarded REF funds, is currently under design. Geotechnical work has been completed and permit applications have been submitted. The FAA approval has been obtained. Permits are expected to be in hand by December 2012. Final design will be completed by the end of 2012.

AEA Review Comments and Recommendation

Full Funding

Special Provision

Alaska Village Electric Cooperative (AVEC) is proposing the construction of a Wind-Diesel system to serve the interconnected communities of St. Mary's and Pitka's Point. AVEC has also filed applications for interties from this St. Mary's/Pitka's Point wind project to Mountain Village (#954-design) and to Pilot Station (#955-construction). The size of the proposed turbine could serve two or all four communities.

AVEC is currently working on a 95% design for the proposed Wind-Diesel system under RE Fund Grant #7040017.

Recommend full funding with the special provision that the 95% design under grant #7040017 be accepted by AEA prior to allocation of construction funds.

Funding & Cost	Project Cost:	\$6,153,991
Cost of Power: \$0.50 /kWh	Requested Grant Funds:	\$5,538,592
	Matched Funds Provided:	\$615,399
Energy Region:	Total Potential Grant Amount:	\$6,153,991
Lower Yukon-Kuskokwim	AEA Funding Recommendation:	\$5,538,592

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	21.88
2) Matching Resources (Max 15) -	9.00
3) Project Feasibility Stage 2 (Max 20) -	12.33
4) Project Readiness (Max 5) -	3.50
5) Benefits (Max 15) -	4.50
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	3.67

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Proposed project access road and tower 62Y07 (see proposal page 59 and 71) appear to be potentially located on top of a portion of RST 120 (Kotlik-Marshall). The issues with locating RS2477s can add complexity to the permitting as there may be disagreement between parties regarding location of the easement. Rest of land private.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Kaltag fault (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). However, this fault is located north of the project and likely should not affect the proposed project.

App # 946 Shungnak Solar Energy Construction Project

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Solar

Proposed Project Phase: Construction

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

Alaska Village Electric Cooperative, Inc. (AVEC) is seeking \$585,000 from this Grant Program to add a solar energy component to the existing diesel power generation system that serves two communities. It will construct a new 50kW array of 288 Photovoltaic (PV) modules in Shungnak, 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, and would serve Shungnak and Kobuk via an existing electrical intertie. The annual power production of the array is estimated to be approximately 44,623 kWh (with shading). The solar array will be located on a lot just northwest of the existing Shungnak power plant which has been committed to AVEC for this use. Total project cost is \$650,000 and AVEC is prepared to match grant funds with \$65,000.

AEA Review Comments and Recommendation

Not Recommended

Even with the high fuel costs in Shungnak and Kobuk, the economics of this project as proposed are poor. A similar project in Ambler was cancelled due to poor economics driven in part by the high cost of a triodetic mounting structure. Nationwide and worldwide, solar PV panels, inverters and mounting systems costs have dropped by more than half. Similarly, balance of plant costs have dropped as installers adopt mounting systems that require less time to install.

While remote Alaska will always be more expensive to install energy systems, the significant drop in component costs should be seen in Alaska even when labor costs do not change. This project proposed a cost of \$13 per watt. Other solar PV projects have been proposed this year with costs in the \$4 to \$7.50 per watt range for top tier PV and inverter suppliers. Those price ranges begin to make solar PV cost effective in areas of Alaska with the highest cost of fuel. AVEC's Kaltag (previously funded) and Upper Kalskag (not funded) proposals came in at \$10 per watt over the past two years.

While the proposal is feasible from a technical perspective, a less expensive approach is needed to improve the economics of this project.

Not recommended for funding.

Funding & Cost	Project Cost:	\$650,000
Cost of Power: \$0.80 /kWh	Requested Grant Funds:	\$585,000
	Matched Funds Provided:	\$65,000
Energy Region:	Total Potential Grant Amount:	\$650,000
Northwest Arctic	AEA Funding Recommendation:	

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	35.00
2) Matching Resources (Max 15) -	8.25
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DNR land authorizations appear to be required.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 947 Marshall Wind Energy Design and Permitting Project

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Design

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

Building on the results of the already completed Concept Design Report (attached in Tab F), Alaska Village Electric Cooperative, Inc. (AVEC) is proposing to complete the final design and permitting to install two Northern Power Systems Northern Power 100 ARCTIC turbines for a 200 kilowatt (kW) installed wind capacity, to the existing diesel power generation system in Marshall. Once work done under this grant is completed, AVEC would seek funding to construct the turbines.

AEA Review Comments and Recommendation

Full Funding

Special Provision

Alaska Village Electric Cooperative proposes the design of a Wind-Diesel system in the community of Marshall. The design would be based on Conceptual Design work funded through a round 4 Renewable Energy Fund Grant (#7040021).

The review team has the following concerns:

- 1) The applicant has not completed the minimum 12 month long meteorological "met" tower study.
- 2) The Wind Resource Assessment submitted with the application is based on an incomplete met tower study.
- 3) The Conceptual Design Report submitted with the application is based on an incomplete Wind Resource Assessment and does not address a variety of wind turbine models and quantity configurations as required by Grant #7040021.

Completion of RE Fund Grant #7040021 will address these concerns.

Recommend full funding with the following stipulation. A final Conceptual Design Report, which addresses all criteria laid out in the "Alaska Wind Program Guidelines for Conceptual Design Reports", must be accepted by AEA prior to negotiating the proposed grant.

Funding & Cost	Project Cost:	\$2,509,850
Cost of Power: \$0.51 /kWh	Requested Grant Funds:	\$332,500
	Matched Funds Provided:	\$17,500
Energy Region:	Total Potential Grant Amount:	\$350,000
Lower Yukon-Kuskokwim	AEA Funding Recommendation:	\$332,500

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	22.27
2) Matching Resources (Max 15) -	6.75
3) Project Feasibility Stage 2 (Max 20) -	8.53
4) Project Readiness (Max 5) -	2.50
5) Benefits (Max 15) -	0.00
6) Local Support (Max 5) -	4.00
7) Sustainability (Max 5) -	2.50

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Proposed project site potentially within right-of-way for RST 168 (Paimute-Marshall). ; unclear if RST and project are colocated. If not, lands are private, no DMLW authorizations needed. The issues with locating RS2477s can add complexity to the permitting as there may be disagreement between parties regarding location of the easement.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Kaltag fault (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). However, this fault is located north of the project and likely should not affect the proposed project.

App # 948 Wales Wind Energy Feasibility and Conceptual Design Project

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Feasibility

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

AVEC proposes to install two wind meteorological (met) towers and complete geotechnical work to determine the feasibility of installing wind turbines in Wales in order to get a better understanding of the good wind regime in Wales. The work will involve obtaining a letter of non-objection from the landowner for the placement of the met towers and geotechnical fieldwork, permitting, transporting and installing met towers at two locations, studying the wind resource for one year, and conducting a geotechnical investigation to determine the soil conditions and needed engineering at the sites. A conceptual design at one site will be created based on the outcome of the met towers' recordings and geotechnical investigation. Permits and site control will be obtained for the project.

AEA Review Comments and Recommendation **Partial Funding**

Even though Wales was known to have strong winds, which was the prime motivator for development of the original project, there are many aspects of a wind regime that must be quantified - such as turbulence, severe winds, Weibull K distribution, and other factors - before an optimum wind-diesel system can be constructed. Further, study of the existing power system and electric loads is needed to design a proper solution. The original intent of the Wales pilot project was to demonstrate the capability of running in diesel-off mode. To that extent, the project was a success, but long term operation proved complex and some components were difficult to maintain. The system produced a modest amount of power in 2005/6 and only 1,198 kWh in 2009. The old system is in need of major repairs, plus at least one turbine foundation is compromised due to settling or frost jacking.

AEA supports the applicant's willingness to start over and pursue a new course in Wales with a wind resource analysis and conceptual design. Later stage funding will remain unallocated until a met tower study and wind resource analysis have been accepted by AEA. AEA recommends funding of this feasibility project to the amount that the remaining Denali Commission funds will not cover. Applicant requested \$190,000; there is approximately \$120,000 of Denali Commission funding remaining. AEA recommends \$75,000 REF grant with a \$7,500 match from the applicant.

Funding & Cost	Project Cost:	\$1,020,000
Cost of Power: \$0.64 /kWh	Requested Grant Funds:	\$190,000
	Matched Funds Provided:	\$10,000
Energy Region:	Total Potential Grant Amount:	\$200,000
Bering Straits	AEA Funding Recommendation:	\$75,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	28.10
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	12.40
4) Project Readiness (Max 5) -	3.33
5) Benefits (Max 15) -	3.75
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	3.50

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Actual Met tower placement appears to be on non-state land, however state easements or permits may be required depending on access routes and equipment type.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Bendleben fault (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). However, this fault is located north of the project and likely should not affect the proposed project.

App # 949 Kotlik Wind Energy Feasibility and Conceptual Design Project

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Feasibility

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

AVEC proposes to install a wind meteorological (met) tower and complete geotechnical work to determine the feasibility of installing wind turbines in Kotlik. The work will involve obtaining a letter of non-objection from the landowner for the placement of the met tower and geotechnical fieldwork, permitting, transporting and installing a met tower at this location, studying the wind resource for one year, and conducting a geotechnical investigation to determine the soil conditions and needed engineering at the site. A conceptual design will be created based on the outcome of the met tower recordings and geotechnical investigation. Permits and site control will be obtained for the conceptual design of this project.

AEA Review Comments and Recommendation **Full Funding**

A class 4 wind resource is possible according to the wind resource model and is assumed for this analysis. This feasibility will provide data to confirm or revise that assumption. AEA believes that the wind resource study and electrical load data collection should be completed prior to additional money being spent due to the presence of lower wind regimes in the vicinity.

Permitting plan, budget and schedule look reasonable although \$23,750 appears to be high for a geotech recon study. AVEC should collect village electric load data simultaneously with wind met tower study. Applicant should ensure that the conceptual design report addresses all the factors listed in the Alaska Wind Program Guidelines for Conceptual Design Reports <http://www.akenergyauthority.org/Useful%20documents/Alaska%20Wind%20Program%20Guidelines%20for%20Conceptual%20Design%20Reports%20-%20Rev%202.docx>

AEA agrees closely with power assumptions, although not all power in a 31% penetration system will be used to offset electricity. Some (~11%) will need to be diverted to a heat load at a lower economic benefit. AEA projects 39,761 gallons of diesel displaced and 1,849 gallons of heating fuel.

Recommend funding with the caveat that the wind resource analysis and electrical load analysis be completed before allocation of remaining funds.

Funding & Cost	Project Cost:	\$3,060,000
Cost of Power: \$0.59 /kWh	Requested Grant Funds:	\$142,500
	Matched Funds Provided:	\$7,500
Energy Region:	Total Potential Grant Amount:	\$150,000
Lower Yukon-Kuskokwim	AEA Funding Recommendation:	\$142,500

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	25.78
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	11.83
4) Project Readiness (Max 5) -	1.50
5) Benefits (Max 15) -	3.38
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	3.67

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Insufficient information to review. Request for funding for feasibility study. No location selected for placement of meteorological study tower at this time. DMLW permit required if DNR managed land selected.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Kaltag fault (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). However, this fault is located north of the project and likely should not affect the proposed project.

App # 950 Russian Mission Wind Feasibility and Conceptual Design Project

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Feasibility

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

AVEC proposes to install a wind meteorological (met) tower and complete geotechnical work to determine the feasibility of installing wind turbines in Russian Mission. The work will involve obtaining a letter of non-objection from the landowner for the placement of the met tower and geotechnical fieldwork, permitting, transporting and installing a met tower at this location, studying the wind resource for one year, and conducting a geotechnical investigation to determine the soil conditions and needed engineering at the site. A conceptual design will be created based on the outcome of the met tower recordings and geotechnical investigation. Permits and site control will be obtained for the conceptual design of this project.

AEA Review Comments and Recommendation Not Recommended

The review team is concerned that there is no developable wind site near Russian Mission. Our best estimate for in/near town is only a class 2 which would not result in an economically viable project. In addition, the presence of tall trees around Russian Mission prevents the possible use of a low-cost 10-meter met tower. The closest potentially viable wind regime is approximately 5 miles southwest. The cost of a transmission line would likely make the project economically infeasible. Since both the wind resource model and the airport data reflect class 1 wind speeds, this project is deemed high risk and unlikely to produce an economically feasible project.

Not recommended for funding.

Funding & Cost	Project Cost:	\$1,530,000
Cost of Power: \$0.55 /kWh	Requested Grant Funds:	\$142,500
	Matched Funds Provided:	\$7,500
Energy Region:	Total Potential Grant Amount:	\$150,000
Lower Yukon-Kuskokwim	AEA Funding Recommendation:	

AEA Funding Recommendation:

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	23.86
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Insufficient information to review. Request for funding for feasibility study. No location selected for placement of meteorological study tower at this time. DMLW permit required if DNR managed land selected.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 951 St. Michael/Stebbins Wind Energy Final Design and Permitting Project

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Design

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

Building on the results of the already completed wind resource (V3 Energy LLC), economic modeling (Northern Economics, Inc.) and conceptual design reports (HDL Engineering Consultants), Alaska Village Electric Cooperative, Inc. (AVEC) is proposing to complete the final design and permitting to install one EWT 900 wind turbine to supplement the existing diesel-fired power generation systems in St. Michael and Stebbins. Work under this grant would also be expended to design necessary wind integration controls for the power generation system at the new power plant in Stebbins. AVEC has completed the final design and obtained permits for the intertie between St. Michael and Stebbins. Once work done under this grant is completed, AVEC could seek funding to construct the turbines and an intertie to serve both communities.

AEA Review Comments and Recommendation Not Recommended

Alaska Village Electric Cooperative proposes the design of a Wind-Diesel system in the community of Stebbins. The Stebbins Wind-Diesel system would supply power to St. Michaels via a proposed intertie expected to be constructed in 2013. The design would be based on Conceptual Design work funded through RE Fund Grant #7040008.

The review team has the following concerns:

- 1) The applicant has not completed the minimum 12 month long meteorological "met" tower study at the proposed wind turbine site.
- 2) A complete Wind Resource Assessment has not been accepted by AEA.
- 3) A complete Conceptual Design Report has not been accepted by AEA.

Completion of RE Fund Grant #7040008 will address these concerns.

Not recommended for funding.

Funding & Cost	Project Cost:	\$5,000,000
Cost of Power: \$0.56 /kWh	Requested Grant Funds:	\$332,500
	Matched Funds Provided:	\$17,500
Energy Region: Bering Straits	Total Potential Grant Amount:	\$350,000
AEA Funding Recommendation:		

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	24.35
2) Matching Resources (Max 15) -	6.75
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Proposed wind turbine is not on state land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Kaltag fault (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). Due its close proximity to the fault, appropriate design considerations should be employed for seismic shaking.

App # 952 Cosmos Hills Wind Resource and Intertie Assessment

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Feasibility
Recon

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

The Northwest Arctic Borough is very large and the communities are small and isolated. Typically larger transmission systems have not been possible due to challenging construction and steep economics. Constructing an intertie is a large capital investment but can reap significant benefits in the form of reduced energy costs. This proposed project will include the completion of a Wind Resource Assessment in Cosmos Hills near Wesley Creek. The placement of the met tower will be north of Shungnak approximately five miles. In order to fully reap the benefits of wind energy in the Upper Kobuk region, and to reduce the cost of electricity for those communities, an intertie between Ambler and Shungnak will also be evaluated. All three communities are members of Alaska Village Electric Cooperative (AVEC) who has completed other similar studies for greater community benefit. AVEC has installed numerous interties between communities, some with wind turbine generators, and has been able to successfully reduce the cost of power.

AEA Review Comments and Recommendation

Partial Funding

\$233,000 is a lot of money to spend for an area with no validated wind resource. The ridge tops of the Cosmos Hills likely have strong winds, but the 1,500 to 2,500-ft elevation change and steep terrain make these sites difficult to develop. Significant wind reconnaissance should be performed to find suitable project sites prior to expending more money. The communities have great need due to their very high costs of power, but the high costs to intertie all communities represents a significant barrier.

Recommend partial funding of \$40,000 to purchase, ship and install one 34-meter met tower and up to three 10-meter met towers to collect data for one year or longer (longer is advised due to data from the wind model and airport) and write a wind resource analysis report. Hourly electrical load data should be collected in all three communities simultaneous with wind data collection.

Funding & Cost		Project Cost:	\$233,000
		Requested Grant Funds:	\$221,350
	Cost of Power: \$0.74 /kWh	Matched Funds Provided:	\$11,650
	Energy Region:	Total Potential Grant Amount:	\$233,000
	Northwest Arctic	AEA Funding Recommendation:	\$40,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	32.38
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	8.00
4) Project Readiness (Max 5) -	2.00
5) Benefits (Max 15) -	0.38
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	3.67

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Most uplands in the area of the project are not state lands; however, if geotechnical work/future intertie cross state-owned beds of navigable waterways, then DMLW authorizations may be needed.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 953 Hotham Peak Wind Resource and Intertie Assessment

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Feasibility

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

The Northwest Arctic Borough is very large and the communities are small and isolated. Typically larger transmission systems have not been possible due to challenging construction and steep economics. Constructing an intertie is a large capital investment. The intertie between Noorvik, Kiana, and Selawik would intertie three AVEC utilities and would be over 50 miles in length. The construction of an intertie could reduce the cost of energy in the community by equalizing the cost of diesel to that of the community with the cheapest fuel: in this case, Noorvik. Additionally, an intertie would provide generation support and increased reliability for the overall electrical system. The construction of an intertie would also allow for installation of distributed generation at the most ideal location, in this case Hotham Peak which, through observations and modeling, has a superb wind resource. A greater wind resource provides the opportunity for installation of larger scale wind turbines. According to modeling completed in the 2012 Noorvik Wind-Diesel Conceptual Draft Report, the most ideal location for a larger turbine would be on the southwest slope of Hotham Ridge, between Noorvik and Selawik.

AEA Review Comments and Recommendation

Full Funding

This proposal has the potential to conflict with two other REF projects that have already been awarded funds. The first, grant agreement 2195377 from REF 1 totaling \$10.8 million, was awarded to the Northwest Arctic Borough allowing up to \$4 million in design and construction funds for Noorvik along with similar funding guidelines for Buckland and Deering. The second, grant agreement #7040030 awarded \$85,000 to AVEC in Round 5, provides for a feasibility study to evaluate the potential to upgrade/replace the existing AOC wind turbines in Selawik.

A draft conceptual design report has already been completed for Noorvik under the NWAB grant.

The economics on this project are difficult to pin down at this phase with many unknowns for the actual cost of interties and the wind energy potential at the proposed site. Presently, there is a lot of value in the learning from this feasibility study, so a B/C ratio of less than 1.0 isn't a large negative at this phase of the project. These communities have few options for renewable energy nearby, so wind from a centralized location with transmission lines may be their best option.

Recommend funding, but with the provision that the proposed site must complete a wind resource study prior to allocating the remainder of funds. The NWAB and key stakeholders in Noorvik will need to be consulted to gain buy-in and consensus on this proposal since it creates a delay/change in the 2195377 project.

Funding & Cost	Project Cost:	\$23,000,000
	Requested Grant Funds:	\$207,100
Cost of Power: \$0.62 /kWh	Matched Funds Provided:	\$10,900
Energy Region:	Total Potential Grant Amount:	\$218,000
Northwest Arctic	AEA Funding Recommendation:	\$207,100

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	27.13
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	9.37
4) Project Readiness (Max 5) -	3.50
5) Benefits (Max 15) -	1.13
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	4.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

As this project is in the assessment phase, exact locations for the facilities and intertie routes, geotech work, etc and not specified - while most uplands in the vicinity of the project are not state lands, DMLW authorizations may be needed if project work involves state-owned beds of navigable waterways.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 954 St. Mary's / Mountain Village Wind Energy Intertie Final Design

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Design

AEA Program Manager: Josh Craft

Project Description as defined by applicant

Alaska Village Electric Cooperative, Inc. (AVEC) is seeking \$332,500 from this Grant Program to (final) design and permit an electrical intertie between the communities of St. Mary's and Mountain Village. AVEC will contribute \$17,500 as a cash match. The intertie will be designed with fourteen (14) miles of new connection along the existing gravel road that connects the two communities and will require an upgrade from single-phase to three-phase of an existing eight (8) miles. The conceptual design work indicates the intertie will not require any water crossings; it can be constructed in summer months and will need pole spacing of 125 feet. At present, St. Mary's and Pitka's Point are connected by a distribution power line, but Mountain Village is a stand-alone diesel powered community. This project would electrically intertie Mountain Village to the St. Mary's/Pitka's Point system. Standby generation capability will be maintained in Mountain Village but primary generation will be delivered by the existing St. Mary's power plant. AVEC has submitted another Round 6 Renewable Energy Grant Program application to build a wind energy system for the intertied communities of St. Mary's and Pitka's Point. This project will add Mountain Village, about 20 miles from St. Mary's, to that wind system.

AEA Review Comments and Recommendation **Full Funding
Special Provision**

Alaska Village Electric Cooperative is proposing the final design and permitting of an intertie between the communities of Mountain Village and St. Mary's. AVEC has also filed applications for a wind project in St. Mary's/Pitka's Point (#945-construction), and an intertie to Pilot Station (#955-construction). The size of the proposed turbine could serve two or all four communities.

Recommend full funding with the special provision that a 35% design, including construction cost estimates, be accepted by AEA prior to the allocation of the remaining funds.

Funding & Cost	Project Cost:	\$7,449,000
Cost of Power: \$0.57 /kWh	Requested Grant Funds:	\$332,500
	Matched Funds Provided:	\$17,500
Energy Region:	Total Potential Grant Amount:	\$350,000
Lower Yukon-Kuskokwim	AEA Funding Recommendation:	\$332,500

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	24.94
2) Matching Resources (Max 15) -	6.75
3) Project Feasibility Stage 2 (Max 20) -	9.00
4) Project Readiness (Max 5) -	2.50
5) Benefits (Max 15) -	0.00
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	3.50

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DMLW permitting requirements evident. Land not state owned.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 955 St. Mary's / Pilot Station Wind Energy Intertie Construction Project

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Construction

AEA Program Manager: Josh Craft

Project Description as defined by applicant

Alaska Village Electric Cooperative, Inc. (AVEC) is seeking \$5,581,800 from this Grant Program to construct an electrical intertie between the communities of St. Mary's and Pilot Station, the total cost of which is \$6,202,000. AVEC will contribute \$625,000 cash as its match. The intertie will be designed with 14 miles of new connection through undeveloped terrain. The completed design work-to-date indicates the three-phase electrical intertie will require two river crossings and six slough/lake crossings, must be constructed in winter months, and will need pole spacing of 185 feet. Completed design work on the intertie is included in Tab F. At present, St. Mary's and Pitka's Point are connected by a distribution power line, but Pilot Station is a stand-alone, diesel-powered community. This project would connect the electric system of Pilot Station to the St. Mary's/Pitka's Point system. Standby generation capability will be provided with a new standby generation module in Pilot Station, but primary generation will be delivered by the existing St. Mary's power plant and an EWT wind turbine. Another Round 6 Renewable Energy Grant Program application requests funding to build a wind energy system for the intertied communities of St. Mary's and Pitka's Point. This project will add Pilot Station, about eleven miles from St. Mary's, to that proposed wind system.

AEA Review Comments and Recommendation **Full Funding
Special Provision**

Alaska Village Electric Cooperative is proposing the construction of an intertie between the communities of St. Mary's and Pilot Station to connect to the renewable energy source of the proposed St. Mary's wind farm. AVEC has also filed applications for a wind project in St. Mary's/Pitka's Point (#945-construction), and an intertie to Mountain Village (#954-design). The size of the proposed turbine could serve two or all four communities.

Recommend full funding with the special provision that the St. Mary's (#945) project be funded or constructed prior to the allocation of funds for this project.

Funding & Cost	Project Cost:	\$6,202,000
Cost of Power: \$0.52 /kWh	Requested Grant Funds:	\$5,581,800
	Matched Funds Provided:	\$620,200
Energy Region:	Total Potential Grant Amount:	\$6,202,000
Lower Yukon-Kuskokwim	AEA Funding Recommendation:	\$5,581,800

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	22.75
2) Matching Resources (Max 15) -	9.00
3) Project Feasibility Stage 2 (Max 20) -	10.43
4) Project Readiness (Max 5) -	2.67
5) Benefits (Max 15) -	1.13
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	3.50

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DMLW permitting requirements evident. Land owned by four village corporations.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 956 Goodnews Bay Wind Energy Feasibility and Conceptual Design Project

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Feasibility

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

AVEC proposes to install a wind meteorological (met) tower and complete geotechnical work to determine the feasibility of installing wind turbines in Goodnews Bay. The work will involve obtaining a letter of non-objection from the landowner for the placement of the met tower and geotechnical fieldwork, permitting, transporting and installing a met tower at this location, studying the wind resource for one year, and conducting a geotechnical investigation to determine the soil conditions and needed engineering at the site. A conceptual design will be created based on the outcome of the met tower recordings and geotechnical investigation. Permits and site control will be obtained for the conceptual design of this project.

AEA Review Comments and Recommendation Full Funding

A class 5 wind resource is assumed and supported by the 30-meter wind resource model developed by AEA/NREL/AWSTruepower. This feasibility will provide data to confirm or revise that assumption. Permitting plan, budget and schedule look reasonable, except that \$23,750 is probably high for a geotech reconnaissance study. AVEC should collect village electric load data simultaneously with wind met tower study. Later stage funding will remain unallocated until a met tower study and wind resource analysis have been accepted by AEA.

AEA agrees closely with power assumptions, although not all power in a 47% penetration system will be used to offset electricity. Some will need to be diverted to a heat load at a lower economic benefit. AEA projects 26,216 gallons of diesel displaced and 760 gallons of heating fuel. The challenge in the CDR phase will be to find a turbine solution with good economic payback.

Recommend full funding.

Funding & Cost	Project Cost:	\$1,530,000
Cost of Power: \$0.58 /kWh	Requested Grant Funds:	\$142,500
	Matched Funds Provided:	\$7,500
Energy Region:	Total Potential Grant Amount:	\$150,000
Lower Yukon-Kuskokwim	AEA Funding Recommendation:	\$142,500

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	25.46
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	11.13
4) Project Readiness (Max 5) -	2.00
5) Benefits (Max 15) -	0.00
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	3.83

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DMLW permitting requirements evident. Land not state owned.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Denali fault (Togiak-tikchik section) (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). Consideration of seismic shaking should be done in assessing project costs during feasibility studies.

App # 957 Shishmaref Wind Energy Feasibility and Conceptual Design Project

Proposer: Alaska Village Electric Cooperative, Inc.

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Feasibility

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

AVEC proposes to install a wind meteorological (met) tower and complete geotechnical work to determine the feasibility of installing wind turbines in Shishmaref. The work will involve obtaining a letter of non-objection from the landowner for the placement of the met tower, geotechnical fieldwork, permitting, transporting and installing a met tower at this location, studying the wind resource for one year, and conducting a reconnaissance-level geotechnical investigation to determine the soil conditions and needed engineering at the site. A conceptual design will be created based on the outcome of the met tower recordings and geotechnical investigation. This project will also consider other turbines that can be relocated, if the village decides to move to another location.

AEA Review Comments and Recommendation Full Funding

A class 5 wind resource is assumed and supported by the 30-meter wind resource model developed by AEA/NREL/AWSTruepower. This feasibility will provide data to confirm or revise that assumption. Permitting plan, budget and schedule look reasonable, except that \$23,750 is probably high for a geotech reconnaissance study. AVEC should collect village electric load data simultaneously with wind met tower study.

AEA believes that this site is a class 5 wind regime as opposed to a class 6 proposed. AEA projects 31,298 gallons of diesel displaced and 1,268 gallons of heating fuel. The challenge in the CDR phase will be to address concerns over possible village relocation.

Recommend funding with the caveat that the wind resource analysis and electrical load analysis be completed before allocation of remaining funds.

Funding & Cost	Project Cost:	\$2,040,000
Cost of Power: \$0.59 /kWh	Requested Grant Funds:	\$142,500
	Matched Funds Provided:	\$7,500
Energy Region:	Total Potential Grant Amount:	\$150,000
Bering Straits	AEA Funding Recommendation:	\$142,500

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	25.79
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	10.87
4) Project Readiness (Max 5) -	1.50
5) Benefits (Max 15) -	0.00
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	2.67

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Exact location of project site is still undetermined, but most uplands in the area are not state-owned.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Bendleben fault (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). However, this fault is located south of the project (>140 miles) and likely should not affect the proposed project.

App # 958 Wrangell Power Plant Upgrade

Proposer: City & Borough of Wrangell

Applicant Type: Local Government

Resource: Hydro

Proposed Project Phase: Design

AEA Program Manager:

Feasibility

Construction

Project Description as defined by applicant

Wrangell has recently experienced an unprecedented increase in our electrical distribution load. The increase is a result of customers removing their expensive diesel fuel burning heating systems and replacing them with lower cost (hydro) electric units. During the 2011/2012 winter season Wrangell had a record peak load demand of 9.5 MW. Currently the Wrangell Power Plant is capable of producing 8 MV A. If there were a catastrophic event that disrupted Wrangell's hydroelectric power supply from Tyee, such as the landslide that affected the Juneau area in January of 2009, our standby generators could not supply electricity to all of our customers. Preliminary indications are that Wrangell must install an additional standby generator. This project will evaluate, recommend, design and install the upgrades needed at the Wrangell Power Plant that will insure our ability to continue to support all of our customers and their renewable energy choices.

AEA Review Comments and Recommendation

Did Not Pass Stage 1

Funding & Cost		Project Cost:	\$117,136
	Cost of Power: /kWh	Requested Grant Funds:	\$117,136
Energy Region: Southeast		Matched Funds Provided:	
		Total Potential Grant Amount:	\$117,136
		AEA Funding Recommendation:	

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	0.00
2) Matching Resources (Max 15) -	
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No state land interest.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The proposed upgrades should consider seismic shaking from the Queen Charlotte-Fairweather fault in design considerations (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>).

App # 959 Ticasuk Brown School Pellet Boiler Project-Phase 2

Proposer: Fairbanks North Star Borough (FNSB)

Applicant Type: Local Government

Resource: Biomass

Proposed Project Phase: Construction

AEA Program Manager: Devany Plentovich

Project Description as defined by applicant

The Fairbanks North Star Borough (FNSB) proposes the installation of a wood pellet boiler at the Ticasuk Brown Elementary School. Phase 1 of this project is currently underway through an AEA managed grant agreement with the FNSB. The \$550,000, funding for Phase 1 of this project was provided by the 2012 Legislature through a DCCED grant to AEA. This proposed project, or Phase 2 of this project, will be comprised of: 1) Modular pellet boiler unit anchored to concrete sleepers, 2) heat loop to existing school boiler room. The boiler room is to be equipped with new heat exchanger for heat transfer to school system, including heat exchanger, manifolding, controls and re-circulating pump, 3) connection of electrical service from a panel in the existing boiler room, assuming required electrical capacity is available and 4) install pellet silo and auger system for pellet fuel storage and fuel supply stream. To ensure project continuity, the FNSB proposes this final phase of the project also be an AEA Managed Project.

AEA Review Comments and Recommendation

Partial Funding

The FNSB is proposing Phase II for the installation of pellet-fired boiler systems to heat Ticasuk Brown Elementary School. Phase I: Design and heat module procurement was funded through State of Alaska Legislature Appropriation. This project is estimated to displace a total of 20,000 gallons per year of fuel oil.

The application includes substantial support from the community and the Borough. This project will develop an anchor tenant for pellet supply in the Interior 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. Grantee requested AEA continue to manage the project. AEA concurs.

Recommend partial funding.

Funding & Cost	Project Cost:	\$350,000
	Requested Grant Funds:	\$350,000
Cost of Power: \$0.22 /kWh	Matched Funds Provided:	
Energy Region:	Total Potential Grant Amount:	\$350,000
Railbelt	AEA Funding Recommendation:	\$250,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	9.81
2) Matching Resources (Max 15) -	0.00
3) Project Feasibility Stage 2 (Max 20) -	17.43
4) Project Readiness (Max 5) -	3.17
5) Benefits (Max 15) -	13.00
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	4.50

Economic Analysis



Scoring & Project Rank



DNR/DMLW Feasibility Comments

No state land.

DNR/DOF Feasibility Comments

This project submitted by the Fairbanks North Star Borough seeks additional funding to continue with the construction of a wood pellet boiler for the Ticasuk Brown Elementary School in North Pole. It is expected that 20,000 gallons of fuel oil will be displaced annually by the wood boiler. The installation of a pellet boiler is expected to save the school district an estimated \$31,000 per year. The supply of pellets should not be a problem since Superior Pellet Fuels is located only a short distance from the school and manufactures pellets for the Fairbanks area. The supply of raw wood to the pellet plant is also sustainable and is in part being sourced from state timber sales in the Tanana Valley State Forest. In the project proposal it mentions working with the local supplier of pellets and alternative sources if the local provider is unable to meet demand. This is a plus for this project to have multiple supply sources identified. The proposal provides an estimate of \$295 per ton as the delivered price of pellets to the wood boiler.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 960 TidGen™ Array Project

Proposer: ORPC Alaska 2, LLC

Applicant Type: IPP

Resource: Other

Proposed Project Phase: Construction

AEA Program Manager: Alan Baldivieso

Project Description as defined by applicant

ORPC Alaska 2, LLC, a wholly-owned subsidiary of Ocean Renewable Power Company, LLC, (collectively, ORPC), is a global leader in the development of hydrokinetic power systems and ecoconscious projects that harness the power of ocean and river currents to create clean, predictable renewable energy. ORPC works in partnership with coastal and river communities to create and sustain local jobs while promoting energy independence and protecting the environment. Its technology includes the proprietary TidGen™ Power System, which includes one or more TidGen™ devices connected to an on-shore station with power and data cables. In ORPC's TidGen™ Array Project, ORPC will install a four-device TidGen™ Power System in Cook Inlet with a rated generating capacity of 600 kW in a 6-knot current. ORPC's REF Round 4 grant (award document signed) will help fund the first device of what eventually will be a four device TidGen™ Power System. REF Round 6 funding will help fund the TidGen™ Array Project to expand to a four-device system by adding an array of three TidGen™ devices.

AEA Review Comments and Recommendation

Not Recommended

ORPC has demonstrated a commitment to a sustained presence in Alaska and has been a pioneer in hydrokinetic development in Alaska and in the country, and has a track record of hiring local contractors. Significant work has gone into resource evaluation and permitting for what will be the first tidal installation in Alaska. ORPC has garnered significant local support, including that of Homer Electric Association.

Initial costs are high and projected to drop for subsequent installations. The benefit/cost ratio increases as the project expands (roughly \$4M for the first unit, and \$4M for the next 3 units). However, according to AEA's analysis, the B/C ratio remains below 1 even for a 100 MW plant.

Given the high risk associated with the installation of a new technology in Cook Inlet and the uncertainty surrounding costs, it is logical to wait for the results of the installation of the first turbine before committing funds to expand the project.

Not recommended for funding.

Funding & Cost		Project Cost:	\$8,696,494
		Requested Grant Funds:	\$2,000,000
	Cost of Power: \$0.20 /kWh	Matched Funds Provided:	\$6,696,494
		Total Potential Grant Amount:	\$8,696,494
Energy Region: Railbelt	AEA Funding Recommendation:		

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	8.63
2) Matching Resources (Max 15) -	14.25
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Currently under permit for study phase (LAS 28046). Additional AS 38.05.850 permits or lease will be required for Phase VI (the post study phase).

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The proposed project should consider shaking from earthquakes along Cook Inlet fault-cored folds and Aleutian subduction zone (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>).

App # 961 Atka Wind Power Project

Proposer: City of Atka

Applicant Type: Local Government
Utility

Resource: Wind

Proposed Project Phase: Feasibility
Recon

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

This project seeks funding for completion of a reconnaissance and feasibility study for wind generated energy in Atka. The study will analyze whether wind power used in combination with the recently completed Chunixsax Creek Hydro-Electric project and diesel generated power can provide additional power needed to support electric heat to the entire Atka community and a planned expansion of Atka Pride Seafoods (APS) to a year-round processing operation with increased energy needs. Atka Pride Seafoods is a subsidiary of the Aleutian/Pribilof Community Development Association (APICDA) and is partially owned by the community of Atka. The ultimate goal is to meet 90% or more of Atka energy needs using renewable energy sources.

AEA Review Comments and Recommendation Not Recommended

The City of Atka has recently completed a hydroelectric project under the Renewable Energy Fund. A detailed understanding of the new electrical load demand and diesel demand is not presently known. Work needs to be done to quantify the electrical load profile for Atka Pride Seafood (APS). Aleutian Pribilof Island Community Development Association (APICDA) has already agreed to purchase and install a met tower near the community.

City of Atka is not current with Power Cost Equalization (PCE) reporting and this raises concerns.

Not recommended for funding. Wind program managers will work with APICDA to analyze met tower data using Windographer(TM) software and hourly electrical load data collected for the city and for APS using HOMER(TM) software.

Funding & Cost	Project Cost:	
Cost of Power: \$0.70 /kWh	Requested Grant Funds:	\$140,000
	Matched Funds Provided:	\$50,000
Energy Region: Aleutians	Total Potential Grant Amount:	\$190,000
AEA Funding Recommendation:		

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	30.80
2) Matching Resources (Max 15) -	11.25
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No state land or authorization for this wind project.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The feasibility study should consider the impacts of strong seismic shaking due to earthquakes on the Aleutian subduction zone on project design costs (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>).

App # 962 Manokotak Wind & Heat Feasibility Study

Proposer: Manokotak Power Company

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Feasibility

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

The Manokotak Wind & Heat Feasibility Project proposes a further look at the viability of wind to produce electricity for residential and non-residential uses. A 2009 wind resource report written by V3 Energy, LLC indicates a mid-Class 2 (marginal) resource, but given the position of the community in relation to nearby elevation (for a higher wind class) and an old landing strip (for a solid foundation) a further look is warranted. The project proposes using the Wind Atlas Analysis and Application Program (WAsP), a software application from Denmark, to further analyze the current met tower data and investigate options for the installation of 3-4 small met towers for additional resource data collection and analysis. The end result would be a conceptual design report in compliance with the Alaska Wind Program Guidelines for Conceptual Design Reports that includes in broad categories a wind resource analysis, electrical system overview, and heat load overview.

AEA Review Comments and Recommendation

Partial Funding

The proposed budget is 30% larger than comparable wind feasibility studies. Recommended funding is capped at \$143,000 in line with similar projects elsewhere in the state.

There may be an economic wind resource in the community if a developable wind resource is found. One 10-meter met tower should be placed at the same site as the original 30-meter met tower. 10-meter met towers may need to be equipped with NRG dataloggers and sensors in order to quantify turbulence. Electrical load data should be collected at the powerhouse simultaneous with the new met towers. A new wind resource study (that may include WAsP analysis) should be completed and accepted by AEA prior to allocation of funds for later-stage activities.

Conceptual design report should follow AEA guidelines for CDRs posted on the wind program Web page.

Recommend partial funding of \$143,000.

Funding & Cost	Project Cost:	\$1,020,000
Cost of Power: \$0.55 /kWh	Requested Grant Funds:	\$193,000
	Matched Funds Provided:	\$7,000
Energy Region:	Total Potential Grant Amount:	\$200,000
Bristol Bay	AEA Funding Recommendation:	\$143,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	24.06
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	9.60
4) Project Readiness (Max 5) -	4.00
5) Benefits (Max 15) -	1.38
6) Local Support (Max 5) -	4.00
7) Sustainability (Max 5) -	3.83

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Insufficient information regarding location of study towers. Possible authorizations required if on DMLW managed land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 963 Mount Makushin Geothermal Project

Proposer: The Aleut Corporation

Applicant Type: IPP

Resource: Geothermal

Proposed Project Phase: Construction

AEA Program Manager: Alan Baldivieso

Design
Feasibility
Recon

Project Description as defined by applicant

Mount Makushin geothermal energy potential has been discussed and evaluated by the State of Alaska and others for the last twenty or so years. An exploratory drilling program, funded by the Department of Energy in the early 1980s made the determination that the Makushin geothermal resource is the only proven high temperature geothermal system in Alaska that could be used for power generation. While the data has been encouraging there has not been a sustained effort to develop the resource beyond its current status since 1995 when the design and permitting reports were completed for a 12MW power plant for which the financing was approved by the Alaska State legislature. This grant will help the Aleut Corporation re-characterize the Makushin resource and develop the preliminary design of a production facility with the intention of building and operating a geothermal plant on Unalaska for the benefit of the Island. The cost elements in this grant are based on a 30MW plant – which we expect to be the maximum size project (likely project size range 10-30 MW). During this phase we will evaluate all options and determine the optimum size of the project as well as the optimal location of the steam field and other facilities.

AEA Review Comments and Recommendation

Not Recommended

The geothermal resource on Mount Makushin at the USGS ST-1 Test Well has been demonstrated to exist at a high temperature and high pressure. Significant access and transmission challenges are posed by the remoteness of the location and the rugged terrain; these challenges complicate the economics of the project, particularly for the development of a smaller plant sized to meet only the City’s load.

Successful development of the Makushin geothermal resource will require, at a minimum, agreement and participation between land owners, subsurface rights holders, and the City of Unalaska. Failed negotiations over the past five years between the City, the applicant, and the land owners have prevented additional exploration and development; a 2008 legislative appropriation of \$1.5 million for additional geothermal exploration remains unspent due to failed negotiations.

Without the support of all parties or a clear indication of a forthcoming agreement, no additional funding is warranted.

Not recommended for funding.

Funding & Cost	Project Cost:	\$311,304,000
Cost of Power: \$0.45 /kWh	Requested Grant Funds:	\$32,464,000
	Matched Funds Provided:	\$540,000
Energy Region:	Total Potential Grant Amount:	\$33,004,000
Aleutians	AEA Funding Recommendation:	

AEA Funding Recommendation:

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	19.64
2) Matching Resources (Max 15) -	6.75
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Water permit, tideland lease and possible AS 38.05.850 permits required.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

The proposed project is requesting ~\$32.5 million for geothermal reconnaissance that will include drilling, feasibility, design and permitting and construction of a road to the drilling area. \$20 million is indicated for drilling of test wells. The proposal plans to design a field exploration campaign to delineate the geothermal system as accurately as possible and will use reservoir modeling and other tools to analyze the exploration and drilling data as the project proceeds. The proposal lacks sufficient information to review the approach that will be used to select the drilling sites in the reconnaissance phase. The applicants should provide a detailed outline of the methodology for this proposed study, what necessary information it will provide that will directly lead to development of the geothermal resource, and provide a detailed list of the planned drilling and geothermal testing operations. This information should include a description of the current data that indicates the existence and quality of a geothermal resource in the planned project area, any planned non-drilling mapping of the field, how the wells will be located, the type of drill rig and diameter of the drill holes for the test wells (i.e. are these production test well size?), and how the geothermal reservoir and flow testing will be evaluated. Additionally, it will be important for the applicant to show how these operations will change what is currently known about the resource from work performed in the 1980s. It is not possible to evaluate this proposal without significant additional information.

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Facilities should incorporate design to withstand strong ground shaking due to the Aleutian subduction zone (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>).

App # 964 Excursion Inlet Hydro Project- Phase II

Proposer: Haines Borough

Applicant Type: Local Government

Resource: Hydro

Proposed Project Phase: Feasibility

AEA Program Manager: Doug Ott

Project Description as defined by applicant

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

Did Not Pass Stage 2

The Haines Borough proposes feasibility assessment of two run-of-river hydro projects totaling 3 MW and 1.5 miles of transmission to connect to Ocean Beauty's fish processing facility and residences in the non-organized community of Excursion Inlet. The processor and most residences are seasonal; population is 14. There is no community power system.

The project received a round 4 Renewable Energy Fund grant (#625) to perform a two-step reconnaissance study. The first step to determine the reach of anadromous habitat has been completed and work on the second half of that study has begun. As the proposal notes "barriers to project development will include anadromous fish concerns.... Major concerns with protection of these species include minimum flows below a diversion facility and the potential need for fish passage at the intake structures". The balance of that grant-funded work remains incomplete.

The reconnaissance study will 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 affects the cost, capacity, and energy output of the project and environmental licensing concerns.

This application did not score high enough to pass Stage 2 review. Not recommended for funding.

Funding & Cost		Project Cost:	\$15,900,000
	Cost of Power: /kWh	Requested Grant Funds:	\$213,536
Energy Region: Southeast		Matched Funds Provided:	\$10,000
		Total Potential Grant Amount:	\$223,536
		AEA Funding Recommendation:	

Stage 3 Scoring Summary

Criterion (Weight)	Score
1) Cost of Energy (Max 35) -	0.00
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	5.97
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	3.63
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

This is the same project as reviewed in the previous rounds. This project proposes to put two small dams, one on South Excursion Inlet Creek (type is rockfill 5' high by 40' long) and the other on North Excursion Inlet Creek (type is concrete diversion 5' x 70'). The two proposed locations of the dams are on Federal land but both streams have mean annual flows of about 120 cfs, comparable to Montana Creek. The gradients from the topo map indicate a relatively low gradient and both streams are identified as anadromous. The division may recommend that a navigability determination be made for these two streams. For North Excursion Inlet Creek a portion of the project is on state land the improvements includes portions of the flume, the powerhouse, and portions of the transmission line. For the South Excursion Inlet Creek it is more difficult to determine but a short section of the flume may have to go into State land. There may be some resource concerns regarding the flumes that would divert water from fairly significant lengths of both streams and if there would be sufficient remaining water to support the fish.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Feasibility should consider ground motions due to earthquakes on the Denali fault (Chilkoot River section) for design purposes.

App # 965 Haines Borough Pellet Heating Project

Proposer: Haines Borough

Applicant Type: Local Government

Resource: Biomass

Proposed Project Phase: Design

Construction

AEA Program Manager: Helen Traylor

Project Description as defined by applicant

Project funds will be used to design, purchase and install six wood pellet boilers and storage silos at the following Borough-owned buildings: sewage treatment plant, human resources I preschool building, Haines Borough School District vocational education building (also referred to in this application as voc-tec building), swimming pool, Borough administrative offices, and visitor center.

AEA Review Comments and Recommendation

Full Funding

The Haines Borough is proposing final design and installation of pellet-fired boiler systems to heat Borough-owned buildings: sewage treatment plant; human resources/pre-school building; Haines Borough School District vocational education building; swimming pool; Borough administrative offices; and visitor center. This project is estimated to displace a total of 30,745 gallons per year of fuel oil, using 263 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.

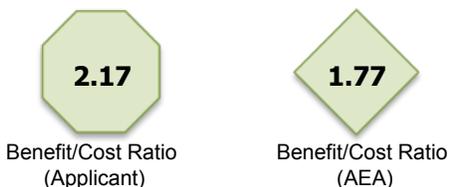
Recommend full funding, with requirement of AEA acceptance of final design, logistics plan, and operational plan.

Funding & Cost	Project Cost:	\$517,000
	Requested Grant Funds:	\$472,000
Cost of Power: \$0.22 /kWh	Matched Funds Provided:	\$45,000
Energy Region:	Total Potential Grant Amount:	\$517,000
Southeast	AEA Funding Recommendation:	\$472,000

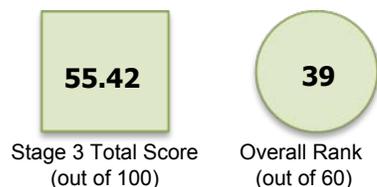
Stage 3 Scoring Summary

Criterion (Weight)	Score
1) Cost of Energy (Max 35) -	9.52
2) Matching Resources (Max 15) -	6.75
3) Project Feasibility Stage 2 (Max 20) -	17.07
4) Project Readiness (Max 5) -	3.50
5) Benefits (Max 15) -	12.75
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	3.83

Economic Analysis



Scoring & Project Rank



DNR/DMLW Feasibility Comments

The consultant identifies that the Haines State Forest will be the majority provider of pellets for this project. Forestry should comment.

DNR/DOF Feasibility Comments

This project submitted by the Haines Borough seeks funding to conduct design and construction of six wood pellet boilers and storage silos in several Borough-owned buildings. It is expected that the pellet boilers will displace 31,000 gallons of fuel oil annually for a savings of over \$50,000. This is based on a pellet delivered price of \$350 per ton. 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 on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	35.00
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	14.80
4) Project Readiness (Max 5) -	4.83
5) Benefits (Max 15) -	12.25
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	3.50

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Insufficient info regarding scope of project and land ownership to determine if DMLW authorizations required. If all development sites are within the community, no state land is affected.

App # 967 Cold Bay Waste Heat Recovery Project

Proposer: G&K Electric Utility

Applicant Type: IPP

Resource: Heat Recovery

Proposed Project Phase: Feasibility

AEA Program Manager: Devany Plentovich

Project Description as defined by applicant

Cold Bay requests funding for this waste heat recovery study as a step towards supplementing the high cost of diesel generators currently in use. The waste heat recovery study will satisfy Phases I, Reconnaissance and Phase II, Feasibility, and the study will result in a feasibility report on the technical, economic, financial and operational viability and guidelines of implementing the next three phases of a waste heat recovery system. The grant would be managed by the Aleutians East Borough and calls for the solicitation of a contractor to perform the analysis and a community meeting with the contractor for presentation, review and discussion of the results. Participants in the project will include:

1. G&K Electric Utility
2. Aleutians East Borough who will provide overall project management.
3. A contracted firm who will provide civil and electrical system engineering.

AEA Review Comments and Recommendation

Partial Funding

G&K Electric Utility proposes a Feasibility/Conceptual Design study for the implementation of diesel heat recovery at their existing power plant. The grant will be managed by the Aleutians East Borough.

This Cold Bay utility is a good candidate for a heat recovery system as identified in the Alaska Energy Pathway. AEA has worked extensively with heat recovery feasibility studies in the past few years. A feasibility study with sufficient information to qualify for Design and Construction funding through the Renewable Energy Fund should not cost more than \$30,000.

Recommend partial funding of \$30,000.

Funding & Cost		Project Cost:	\$114,765
		Requested Grant Funds:	\$109,765
	Cost of Power: \$0.72 /kWh	Matched Funds Provided:	\$5,000
		Total Potential Grant Amount:	\$114,765
Energy Region:	Aleutians	AEA Funding Recommendation:	\$30,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	31.34
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	16.47
4) Project Readiness (Max 5) -	2.00
5) Benefits (Max 15) -	10.50
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	4.50

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DMLW authorizations required.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 968 False Pass Wind Energy Project

Proposer: City of False Pass Electric Utility

Applicant Type: Local Government

Resource: Wind

Proposed Project Phase: Design

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

False Pass currently produces all their electricity from diesel generators and heating from burning fossil fuels. Data from a met tower set up several years ago was compromised and has data gaps when bears damaged the equipment, but the data still may be useful if analyzed using appropriate assumptions and software. The wind resource may prove to be good, but we won't know until the data is analyzed and a wind resource report is completed. In addition, an avian study will determine if birds will be of concern and/or if mitigation measures are necessary.

This project seeks design and permitting for the False Pass wind project. The design and permitting phase will include project scoping and community solicitation for planning and design, permit applications and acceptance, final environmental assessments and mitigation plans, resolution of land rights and right of way, final system design, engineers cost estimate, updated economic and financial analysis, and final business plan and operational plans.

AEA Review Comments and Recommendation

Not Recommended

A similar application was received and reviewed in round 4 of the Renewable Energy Fund. AEA's comments at the time were as follows: "False Pass may need to do extensive feasibility work to find the right solution given the wind resource, terrain, small population, avian and FAA issues. Alternatives from residential systems to high penetration should be considered. Community may need additional funding to complete this work. B/C is difficult to calculate due to the variables. Estimating actual construction costs on a very hypothetical configuration is difficult. Wind resources in the region warrant a feasibility and CDR and the budget looks reasonable."

AEA does not have a conceptual design to review prior to the submission of this REF round 6 request and thus we do not have enough information to decide whether to move the project forward to the design phase. US F&WS requires more detailed study but the scope has not been quantified, and actual site selection (which may include additional met tower data collection if the proposed turbine site is moved considerably relative to the terrain that is causing high turbulence) is still undetermined.

Not enough research has been conducted in the feasibility phase for this application to be reviewed for final design. Guidance on this step can be found at AEA's web site under the wind program: <http://www.akenergyauthority.org/programwindanalysisdata.html>

Not recommended for funding.

Funding & Cost	Project Cost:	\$190,195
Cost of Power: \$0.51 /kWh	Requested Grant Funds:	\$185,195
	Matched Funds Provided:	\$5,000
Energy Region:	Total Potential Grant Amount:	\$190,195
Aleutians	AEA Funding Recommendation:	

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	22.40
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No State land involved for this wind project.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Feasibility study should incorporate impacts of strong ground shaking due to earthquakes along the Aleutian subduction zone on design costs and design plan (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>).

App # 969 Nelson Lagoon Wind Energy Project

Proposer: Nelson Lagoon Electric Cooperative

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Design

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

Nelson Lagoon requests funding for this wind study as the first step towards supplementing the high cost of diesel generators currently in use. The wind study will result in a feasibility report on the technical, economic, financial, and operational viability and guidance of implementing the next three phases of a wind energy system. The grant would be managed by the Aleutian East Borough and calls for the solicitation off a contractor to perform the analysis and a community meeting with the contractor for presentation, review and discussion of the results Participants in the project will include:

1. Nelson Lagoon Electrical Cooperative (owned by the Native Village of Nelson Lagoon)
2. Aleutians East Borough who will provide overall project management
3. A contractor firm who will provide civil and electrical system engineering.

AEA Review Comments and Recommendation

Not Recommended

The lack of an accepted conceptual design prohibits awarding funds for design activity as AEA is unable to properly assess the viability of the wind resource, the powerhouse, the electrical distribution system, community heat loads and the various wind turbine and integration options evaluated. The applicant should proceed with the feasibility and conceptual design work already funded through round 4 of the Renewable Energy Fund.

Not recommended for funding.

Funding & Cost	Project Cost:	
Cost of Power: \$0.77 /kWh	Requested Grant Funds:	\$218,195
	Matched Funds Provided:	\$5,000
Energy Region:	Total Potential Grant Amount:	\$223,195
Aleutians	AEA Funding Recommendation:	

AEA Funding Recommendation:

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	33.50
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No DMLW authorizations required if existing facility selected.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Feasibility study should incorporate impacts of strong ground shaking due to earthquakes along the Aleutian subduction zone on design costs and design plan (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>).

App # 970 Kipnuk Wind Diesel Power Generation and Heating

Proposer: Kipnuk Light Plant

Applicant Type: Utility

Resource: Wind

Proposed Project Phase: Design

Construction

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

Kipnuk Light Plant is proposing to complete the final design, permitting and construction of a community wind diesel system for the community of Kipnuk, Alaska. The project will be owned and operated by the Kipnuk Light Plant and the community of Kipnuk. Construction of the wind plant will be conducted in conjunction with the construction of a new school, powerplant and bulk fuel facility in the community. The new school is currently under construction and is anticipated to be completed in late 2013, early 2014. Funding has been received for a new diesel powerplant and bulk fuel storage facility. The new powerplant construction will take place in the winter of 2014. The wind project would be completed at the same time. The design of the wind system has been completed and is straightforward, in that it is similar to the systems which have been installed in Kongiganak, Kwigillingok and Tuntutuliak. The only design elements remaining to be completed, are: the installation and wiring diagrams for the specific installation of the load balancing boiler, system master control, communications gateways and static var compensation in the new powerplant. These design elements will be conducted concurrently with the design and construction of the new diesel powerhouse.

AEA Review Comments and Recommendation

Not Recommended

The review team's concerns remain virtually unchanged from feedback in Renewable Energy Fund rounds 4 and 5. 1) A meteorological tower study and wind resource assessment have not been completed at the proposed turbine location. 2) An acceptable conceptual design report that covers the planned diesel and wind generation and distribution systems has not been prepared (see AEA CDR guidelines at <http://www.akenergyauthority.org/programwindanalysisdata.html>) 3) a more accurate electrical and heat load model is needed for the community 4) Final design and permitting need to be completed prior to approving construction funds. AEA offered the community a met tower in 2012 through the state anemometer loan program.

AEA expects the funds from the 2009 Legislative appropriation to be spent on a met tower study, a wind resource analysis, a conceptual design report and final design and permitting activities prior to requests for construction funds.

Not recommended for funding.

Funding & Cost	Project Cost:	\$4,067,778
Cost of Power: \$0.58 /kWh	Requested Grant Funds:	\$2,567,778
	Matched Funds Provided:	\$1,500,000
Energy Region:	Total Potential Grant Amount:	\$4,067,778
Lower Yukon-Kuskokwim	AEA Funding Recommendation:	

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	25.18
2) Matching Resources (Max 15) -	12.75
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No State land involved or DMLW authorizations required.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 971 Eastern Copper Basin Geothermal Assessment

Proposer: Copper Valley Development Association

Applicant Type: Government Entity

Resource: Geothermal

Proposed Project Phase: Recon

AEA Program Manager: Alan Baldivieso

Project Description as defined by applicant

This project will conduct the much delayed follow up on the Wescott report. In 1985 Wescott and Turner study published the results of their geothermal investigations in the Copper Basin during the 1982 field season. They recommended that additional detailed gravity and self-potential data be taken at the confluence of the Tazlina where a high helium anomaly was located. In addition they also recommended self-potential surveys in two other anomaly areas and one area was recommended as a prime drilling target.¹ We are requesting funds to do further reconnaissance by completing the recommended studies using modern tools and efficiencies as well as compiling other research and exploration that has been done since 1985 in the Eastern Copper Basin

AEA Review Comments and Recommendation Not Recommended

A reconnaissance-level investigation of the geothermal potential of the area could be a valuable addition to the work done to date based on recommendations from previous studies and anecdotal reports of high surface temperatures. However, the likelihood of identifying a geothermal resource capable of powering a 250 MW plant is remote.

No work plan detailing the survey methods that would be used in the reconnaissance is identified in the application and no justification for the proposed budget is provided. The applicant does not present supporting evidence indicating that a geothermal plant of any size could be economically favorable; without such evidence, funding exploration work is not justified.

Not recommended for funding.

Funding & Cost	Project Cost:	\$0
Cost of Power: \$0.28 /kWh	Requested Grant Funds:	\$695,950
Energy Region:	Matched Funds Provided:	
Copper River/Chugach	Total Potential Grant Amount:	\$695,950
	AEA Funding Recommendation:	

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	12.44
2) Matching Resources (Max 15) -	0.00
3) Project Feasibility Stage 2 (Max 20) -	5.43
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	1.75
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	

Economic Analysis



Scoring & Project Rank



DNR/DMLW Feasibility Comments

Project describes usage of state managed land. Possible .850 permits may be required during the study phase.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

This project proposes to conduct detailed gravity and SP geophysics in several areas where a study published in 1985 suggested there are helium anomalies that may denote geothermal potential. One area in the 1985 study was suggested as a drilling target. The proposed project states on page 18, under .Milestone or Task 2c "Conduct geothermal resource studies". In order to complete our review of the geologic feasibility of this proposal, the applicant needs to provide details on the specific geothermal resource studies they plan to conduct, what geological and/or geophysical methods will be used, what are the results these methods will report, and where these studies will be conducted (including location maps). Additionally, the proposal should address their plan for transmitting energy from the proposed geothermal sites to the local power grid.

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 972 Akiak Wind Resource Assessment

Proposer: Akiak Native Community/ Akiak IRA Council

Applicant Type: Government Entity

Resource: Wind

Proposed Project Phase: Feasibility

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

This project is a feasibility study to evaluate the potential wind resource in Akiak.

AEA Review Comments and Recommendation

Not Recommended

The wind resource is likely poor-to-marginal in the Akiak region. The initial data coming in from the Kwethluk and Akiachak met towers support the wind resource model estimates, which show a poor wind resource, and the wind regime continues to drop off the further upriver one goes on the Kuskokwim. The economics look poor for developing either a class 2 wind site near town or a class 3 wind site 4 miles east of town. The latter would involve a 4-mile transmission line across poor soils and involve an approximate half-mile span across the Kuskokwim which would be very costly.

Not recommended for funding.

Funding & Cost	Project Cost:	\$2,000,000
Cost of Power: \$0.63 /kWh	Requested Grant Funds:	\$181,000
	Matched Funds Provided:	
Energy Region:	Total Potential Grant Amount:	\$181,000
Lower Yukon-Kuskokwim	AEA Funding Recommendation:	

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	27.56
2) Matching Resources (Max 15) -	0.00
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Insufficient info regarding scope of project and land ownership to determine if DMLW authorizations required. No final site has been determined. The proposed site involves no state land, nor would any site within approximately 10 miles of central Akiak.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 973 Elim Geothermal Resource Assessment I Feasibility

Proposer: City of Elim

Applicant Type: Local Government

Resource: Geothermal

Proposed Project Phase: Recon

AEA Program Manager: Alan Baldivieso

Project Description as defined by applicant

The AEA Energy Pathway 2010 indicates hot springs located on Elim Native Corporation land surrounding Elim are potential energy sources, but only comprehensive analysis can determine how, and under what conditions, geothermal energy might be viable. The City of Elim, the Native Village of Elim, Elim Native Corporation, and the University of Alaska Fairbanks propose a Resource Assessment (Reconnaissance) I Feasibility Analysis of Elim geothermal sites. It will use low cost airborne and ground-based reconnaissance and mapping techniques to develop a conceptual model. Feasibility, cost analysis, and design of viable solutions will follow.

AEA Review Comments and Recommendation

Not Recommended

The reconnaissance-level geothermal exploration proposed is well-planned and reasonable and would contribute to the understanding of the region’s geology and geothermal potential. Use of the area’s geothermal resources for power and/or heating for Elim has been the subject of considerable speculation due to the presence of numerous hot springs; a better understanding of the potential capacity of the resource and a more detailed assessment of the costs to develop it could assist the community in its energy planning.

However, the estimated cost of transmission from the resource to the community, the small size of the community energy demand, and the distance to other possible communities makes the economics of a geothermal project look poor under every scenario.

Not recommended for funding.

Funding & Cost	Project Cost:	\$10,000,000
	Requested Grant Funds:	\$527,908
Cost of Power: \$0.59 /kWh	Matched Funds Provided:	
Energy Region:	Total Potential Grant Amount:	\$527,908
Bering Straits	AEA Funding Recommendation:	

AEA Funding Recommendation:

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	25.67
2) Matching Resources (Max 15) -	0.00
3) Project Feasibility Stage 2 (Max 20) -	0.00
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	0.00
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No state land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

The proposal seeks to explore near the village of Elim for low to moderate temperature geothermal resources to determine their potential for binary (Organic Rankine Cycle - similar to Chena Hot Springs) electrical power generation for the community. The proposal recognizes the need to locate a nearby geothermal source that is of sufficient temperature to be economically viable to generate electricity using a binary system. They propose a 4 stage approach to evaluate any potential geothermal resource: 1.) Thermal Infrared Mapping and Analysis; 2) Ground Based Reconnaissance-water chemistry and geologic mapping. 3) Develop a Conceptual Model of the System; and 4) Preliminary Design Analysis and Cost. We concur that collecting new chemistry data for Clear Creek hot springs is an important step and would show if there are any changes in the predicted reservoir temperatures from the earlier 1970's era chemistry and is a valuable component of this proposal. Visiting the other four springs identified in Figure 1 and collecting water temperature and water chemistry data is important as well. Assuming those results are positive, the next step in evaluating the potential geothermal resource, after the reconnaissance investigation is completed, would be to determine the best location to conduct test drilling. It is not clear in the proposal how these determinations will be made, and we recommend that the applicant provide details on how the thermal and geologic mapping will be used to select the best drill sites with the highest chance of encountering the active hydrothermal system, and sufficient porosity and permeability to evaluate the resource potential.

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Feasibility study should incorporate impacts of strong ground shaking due to earthquakes on the Bendlebeden fault on design costs and design plan (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>).

App # 974 Neck Lake Hydro Project

Proposer: Alaska Power Company (APC)

Applicant Type: Utility

Resource: Hydro

Proposed Project Phase: Feasibility Design

AEA Program Manager: Doug Ott

Project Description as defined by applicant

APC proposes to construct a small run-of-river hydroelectric project at Neck Lake, a 1,000 acre lake located 1.5 miles southwest of the community of Whale Pass on Prince of Wales Island. The Project would supply power to the community of Whale Pass, and would offset diesel generation, which is currently the sole source of electricity. The relatively high and modulated flows from the lake combined with the steep drop at the lower end of the outlet stream provide a good opportunity for a small run-of-river hydroelectric development. Facilities would include an access road, intake structure, 400 feet of penstock, a containerized power plant, a tailrace channel, and upgrade of 4 miles of transmission line. The hydroelectric facilities will be designed to avoid interference with the existing salmon rearing and collection facilities operated at Neck Lake by the Southern Southeast Regional Aquaculture Association (SSRAA). APC conducted a reconnaissance study of the site in 2008, and determined that there is sufficient potential to almost always provide enough generation for Whale Pass loads (see Section 11 for a copy of the reconnaissance report). The Project will provide clean, renewable electricity, as well as rate stabilization and lower rates for APC's Whale Pass customers.

AEA Review Comments and Recommendation

Did Not Pass Stage 2

AP&T proposes to perform a feasibility study, permitting and final design for a 124 kW run-of-river hydroelectric facility on Neck Lake to serve Whale Pass. The proposed plant would be co-located adjacent to the SSRAA aquaculture facility on State lands. The project received funding in round 2 of the Renewable Energy Fund (#223) to perform reconnaissance study and again in round 3 (#440) to perform feasibility study. AP&T later returned most of the round 3 grant after FERC jurisdiction was declared, however they now plan to utilize FERC's expedited small hydro licensing approach and have once again requested feasibility funds. SSRAA has a lease for the site and has expressed reservations about impacts to their operations from the proposed project. The population in Whale Pass has declined from 58 in year 2000 to 31 today.

The application fails to pass Stage 2 due to low scores. In particular the benefit/cost ratio of 0.74 indicates that the project would cost more than the accrued benefits.

Funding & Cost		Project Cost:	\$2,777,885
	Cost of Power: \$0.60 /kWh	Requested Grant Funds:	\$297,600
Energy Region: Southeast		Matched Funds Provided:	\$74,400
		Total Potential Grant Amount:	\$372,000
	AEA Funding Recommendation:		

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	26.17
2) Matching Resources (Max 15) -	9.75
3) Project Feasibility Stage 2 (Max 20) -	5.77
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	0.12
6) Local Support (Max 5) -	3.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

This is the same project as proposed in previous rounds and AP&T has worked with the Southern Southeast Regional Aquaculture Association (SSRAA) and developed a better project description and layout with respect to where the project components will be located and integrated with SSRAA's existing aquaculture facility.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Project should consider earthquakes along the Queen Charlotte-Fairweather fault in project design (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>).

App # 975 Juniper Creek Hydroelectric Project Feasibility Study

Proposer: Ram Valley LLC

Applicant Type: IPP

Resource: Hydro

Proposed Project Phase: Recon

AEA Program Manager: Doug Ott

Project Description as defined by applicant

The proposed project is a run-of-river hydroelectric project located on private property along Juniper Creek in the Eagle River Valley, approximately 10 miles from Eagle River, Alaska. 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 head available for the project from 400 feet to either 900 feet or 1,100 feet if one or two adjacent land owners were to participate. This would increase installed capacity to as much as 1,300 kW. Ram Valley expects to determine the participation status of these land owners prior to the start of the feasibility study.

AEA Review Comments and Recommendation

Partial Funding Special Provision

The r-o-r project is located in high alpine terrain near Mi. 10 of the Eagle River valley. Ram Creek Valley LLC would sell Juniper Creek Hydroelectric power to MEA 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.

Given that no prior formal reconnaissance report has been prepared for this site, AEA recommends this report be prepared and the project scheme be explored before requesting funds to advance into feasibility study.

Special conditions: In the course of conducting the recon study, explore and define the project scheme and obtain commitments from involved landowners.

Funding & Cost		Project Cost:	\$4,300,000
		Requested Grant Funds:	\$127,900
	Cost of Power: \$0.14 /kWh	Matched Funds Provided:	\$44,800
	Energy Region:	Total Potential Grant Amount:	\$172,700
	Railbelt	AEA Funding Recommendation:	\$30,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	6.23
2) Matching Resources (Max 15) -	11.25
3) Project Feasibility Stage 2 (Max 20) -	12.00
4) Project Readiness (Max 5) -	4.83
5) Benefits (Max 15) -	8.13
6) Local Support (Max 5) -	4.00
7) Sustainability (Max 5) -	3.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Water permit required. While the physical project is on private land, the effected lands could include Chugach State Park, possibly requiring additional DNR authorizations.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Project should consider earthquakes along the Castle Mountain fault in project design (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>).

App # 976 Knutson Creek Hydroelectric Project Design and Permitting

Proposer: Pedro Bay Village Council

Applicant Type: Utility

Resource: Hydro

Proposed Project Phase: Design

AEA Program Manager: Doug Ott

Project Description as defined by applicant

The proposed project is an approximately 150 kW run-of-river hydroelectric project on Knutson Creek near Pedro Bay. The hydro project will provide most of the electricity needs of the village, as well as providing a significant amount of interruptible energy to heat the tribal council building, church, school, and potentially other buildings.

AEA Review Comments and Recommendation **Full Funding Special Provision**

A recon study was completed in 2009 for the Knutson River Hydroelectric Project in Pedro Bay. Since then the school and clinic have closed and the village population decreased to 44. A feasibility study has been drafted. Neither of these studies were funded by the Renewable Energy Fund. The proposed 150 kW r-o-r hydro project appears to be oversized for community needs, especially since village is losing residents. Additionally, there is > 1 mile of Knutson Creek with anadromous and resident fish habitat which will be affected by the proposed project leading to substantial licensing challenges. It is unknown if the project will be found jurisdictional by FERC.

Recommend special provisions as follows: (1) AEA to receive feasibility study and must review and approve its findings before any REF funds committed; and (2) project size to be re-evaluated based upon current village population reduction.

Funding & Cost	Project Cost:	\$3,400,000
Cost of Power: \$0.91 /kWh	Requested Grant Funds:	\$290,000
Energy Region:	Matched Funds Provided:	\$2,500
Bristol Bay	Total Potential Grant Amount:	\$292,500
	AEA Funding Recommendation:	\$290,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	35.00
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	9.57
4) Project Readiness (Max 5) -	2.50
5) Benefits (Max 15) -	11.88
6) Local Support (Max 5) -	4.00
7) Sustainability (Max 5) -	2.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Water permit. No additional authorizations needed.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Lake Clark fault (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>). The relative activity of this structure is unknown.

App # 977 Carlo Creek Hydroelectric Project Reconnaissance Study

Proposer: Native Village of Cantwell

Applicant Type: Government Entity

Resource: Hydro

Proposed Project Phase: Recon

AEA Program Manager: Doug Ott

Project Description as defined by applicant

Cantwell is currently served by GVEA via the power transmission line between MEA and GVEA (Alaska Intertie System). The Native Village of Cantwell wishes to improve the reliability and lower the cost of the community of Cantwell's power system. To accomplish this we propose to study a run-of-river hydroelectric project on Carlo Creek, approximately 10 miles north of Cantwell along the Parks Highway.

AEA Review Comments and Recommendation

Partial Funding

The Native Village of Cantwell proposes a reconnaissance study of a 1.5 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 now being studied in reconnaissance by NVC through the Renewable Energy Fund.

Partial funding recommended for reconnaissance study.

Funding & Cost	Cost of Power:	\$0.22 /kWh	Project Cost:	\$7,500,000
	Energy Region: Railbelt		Requested Grant Funds:	\$66,500
			Matched Funds Provided:	\$3,500
			Total Potential Grant Amount:	\$70,000
			AEA Funding Recommendation:	\$30,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	9.81
2) Matching Resources (Max 15) -	6.00
3) Project Feasibility Stage 2 (Max 20) -	7.90
4) Project Readiness (Max 5) -	2.00
5) Benefits (Max 15) -	1.25
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	3.33

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

While most uplands in the vicinity of the project are not state lands, DMLW authorizations may be needed if project work involves state-owned beds of navigable waterways.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Earthquakes on the Denali fault and Park Road fault should be considered in project design (see Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>).

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	30.16
2) Matching Resources (Max 15) -	9.00
3) Project Feasibility Stage 2 (Max 20) -	16.10
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	11.00
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	5.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

This project has not changed from the previous rounds. DMLW is now in a position to issue an Early Entry Authorization under case file number – ADL 108047. This permit will allow the City of Tenakee Springs to construct the project and then complete the as-built survey of it so DMLW will be able to issue the easement. DMLW public notice process is done and no public comments expressing concerns were received.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 979 Waste-to-Energy Feasibility Study

Proposer: Chugach Electric Association, Inc.

Applicant Type: Utility

Resource: Biofuels

Proposed Project Phase: Feasibility

AEA Program Manager: Helen Traylor

Project Description as defined by applicant

This project is to perform a feasibility study, including a conceptual design, to assess the viability of a WtE plant. Other than some recyclable materials, 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 375,000 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

Partial Funding

Chugach Electric Association, Inc. proposes to fund a feasibility study and conceptual design to assess the viability of a waste to energy plant. A portion of the municipal solid waste that currently goes to the Anchorage landfill would fuel the plant.

AEA supports the concept of utilizing municipal solid waste as an energy source. The first step in accessing the viability of waste to energy is a thorough understanding of the resource availability through a waste stream characterization study.

AEA recommends partial funding of \$40,000 for a waste characterization study/resource inventory.

Funding & Cost	Project Cost:	
Cost of Power: \$0.14 /kWh	Requested Grant Funds:	\$550,000
Energy Region:	Matched Funds Provided:	\$150,000
Railbelt	Total Potential Grant Amount:	\$700,000
	AEA Funding Recommendation:	\$40,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	6.23
2) Matching Resources (Max 15) -	10.50
3) Project Feasibility Stage 2 (Max 20) -	9.13
4) Project Readiness (Max 5) -	0.00
5) Benefits (Max 15) -	8.88
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	3.50

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Feasibility study only with no final site selected. No authorizations needed at this time.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 980 Bristol Bay Borough School District Energy Project

Proposer: Bristol Bay Borough School District

Applicant Type: Government Entity

Resource: Solar

Proposed Project Phase: Design

Construction

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

1. **Solar PV Installation** This project will consist of a 50 kW (DC) 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 (185) 270-watt photovoltaic (PV) collector panels, (1) 50 kW DC to AC power inverter 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 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.

2. **Heat Recovery from Exhaust Air** Sensible heat-recovery systems that transfer sensible (dry-bulb) heat from the exhaust air to the supply air entering the building are proposed to be installed for the fresh air supply air handling units using cross flow heat exchangers. This system transfers energy through a crossover grid or through plate heat exchangers made of metal or plastic. Warm air passing between the plates transfers its energy by conduction through the material to another grid or plate where the air is warmed. The plates form alternating exhaust and ventilation air pathways. Efficiencies (also referred to as effectiveness) of these systems vary from around 60% to 70%. It is proposed to install flat plate heat recovery units for (7) fresh-air units, to pre-heat roughly 12,000 cfm of fresh air with the exhaust air from the space. The HR units would be tied to existing building management system to ensure proper functioning and provide visibility to building operator.

AEA Review Comments and Recommendation

Not Recommended

Technically, this solar photovoltaic (PV) project is simple to install and integrate within the Naknek power system. The key questions surround the accuracy of cost estimates for an installed 50kW system along with how the power is valued for economic benefit. The standard maximum net metered system is 25 kilowatts of nameplate capacity. If Naknek Electric will allow net metering for 50kW, then the benefit can be calculated using retail electrical savings. We would need a letter from Naknek Electric in support of this approach.

Other solar PV projects and heat recovery projects recommended for funding had provided initial drawings, calculations and cost estimates from a qualified contractor. The applicant has not provided that level of detail. Without more information, it is risky to recommend for funding.

Not recommended for funding.

Funding & Cost	Project Cost:	\$460,000
Cost of Power: \$0.51 /kWh	Requested Grant Funds:	\$45,000
	Matched Funds Provided:	\$10,000
Energy Region: Bristol Bay	Total Potential Grant Amount:	\$55,000
	AEA Funding Recommendation:	

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	22.13
2) Matching Resources (Max 15) -	5.25
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No state land involved or DMLW authorizations required.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 981 Tanana Solar Domestic Hot Water Heating Project

Proposer: City of Tanana

Applicant Type: Local Government

Resource: Solar

Proposed Project Phase: Construction

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

The Tanana Solar Public Facilities Heating Project seeks to implement the market transformative benefits of combining biomass space heating technologies currently being installed at Tanana’s public facilities with solar thermal collectors. This Round 6 Renewable Energy Fund application has been revised since its original submission during Round 5 and limit solar thermal application to best “low hanging fruit at Tanana which is the large domestic hot water demand at the Tanana Tribal Elders Residential complex and the City’s Senior housing four-plex. The synergistic benefits of the village existing biomass thermal storage capacity with solar thermal collectors will serve to result in reduced imported petroleum consumption and also serve to optimize operation of the biomass boilers currently being installed at Tanana.

Heat energy is, by far, the greatest financial burden facing Alaskans, and particularly those in rural Alaska. It is also the most critical as heat during Alaska’s extreme winters is a matter of survival. Many rural communities in Alaska are moving in the direction of biomass as an alternative to fuel oil for heat energy generation. Tanana has become a model in Alaska for demonstrating the effective use of renewable energy to reducing heat energy operational costs. Tanana was one of the first villages in Alaska to incorporate the use of GARN biomass boilers for offsetting the high expense of fuel oil for generating hot water in the community washeteria. In 2011, as a part of a major biomass expansion project, systems are being installed in numerous commercial and residential scale buildings.

Solar thermal is an excellent complement to the biomass boilers. During the winter months the heat energy generated by the biomass boilers offsets a substantial amount of the fuel oil normally required. The cordwood fuel source also allows many of the operating costs to remain in the community since the supply of the cordwood and manpower required to feed and boilers is local. During the summer the biomass boilers are a less desirable alternative. The focus and energies of the community are diverted to essential traditional cultural activities. The solar thermal, which is a passive heat energy source that can operate largely unattended, allows those activities to continue uninterrupted. Thus it is an excellent companion to the biomass and can contribute substantially to the heat energy requirement for at least nine months of the year. The combination of the two heat energy sources virtually eliminates the dependency on fuel oil as the heat energy source.

AEA Review Comments and Recommendation

**Full Funding
Special Provision**

Technically, the project is feasible. This project does not degrade the economic benefit of the biomass project. Schedule and overall budget look reasonable. Contractor has experience in this scope of work. AEA must accept design prior to construction funding.

Recommend full funding.

Funding & Cost	Project Cost:	\$81,700
Cost of Power: \$0.71 /kWh	Requested Grant Funds:	\$81,700
Energy Region:	Matched Funds Provided:	\$50,000
Yukon-Koyukok/Upper Tanana	Total Potential Grant Amount:	\$131,700
	AEA Funding Recommendation:	\$81,700

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	31.23
2) Matching Resources (Max 15) -	12.00
3) Project Feasibility Stage 2 (Max 20) -	11.47
4) Project Readiness (Max 5) -	2.17
5) Benefits (Max 15) -	0.38
6) Local Support (Max 5) -	2.00
7) Sustainability (Max 5) -	4.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No state land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 982 Community Facilities Woody Biomass Space Heating Project

Proposer: Mentasta Traditional Council

Applicant Type: Government Entity

Resource: Biomass

Proposed Project Phase: Construction
Design

AEA Program Manager: Helen Traylor

Project Description as defined by applicant

Mentasta’s predicament, as is the case for most of rural Alaska, is its dependence on imported expensive petroleum for space heating of community facilities. Mentasta’s community facilities are centrally located and can be serviced by one woody biomass heating plant strategically located adjacent to Mentasta’s clustered public facilities (see Map - Attachment II). The project is estimated to cost \$460,000 of Round VI funds and donated building space with estimated value of \$50,000 and will serve the school, teen center, clinic and tribal offices/post office building and are expected to displace approximately 22,000 gallons of heating oil.

AEA Review Comments and Recommendation **Full Funding
Special Provision**

Mentasta Village Council proposes final design and construction of a cordwood boiler system to supply a small district heating system consisting of the school, teen center, council building, post office, and clinic. The system would consume approximately 220 cords per year and displace 22,000 gallons of fuel oil per year.

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

AEA is concerned by the lack of a specific fuel supply plan for the project. However, we recognize the existing fuel wood market in the Tok area. AEA will work with the grantee to ensure that building energy efficiency is addressed in conjunction with this project.

Recommend full funding with requirement that Mentasta provide a fuel supply plan and final design acceptable to AEA before construction funds are disbursed.

Funding & Cost	Project Cost:	\$510,000
Cost of Power: \$0.67 /kWh	Requested Grant Funds:	\$460,000
Energy Region:	Matched Funds Provided:	\$50,000
Copper River/Chugach	Total Potential Grant Amount:	\$510,000
	AEA Funding Recommendation:	\$460,000

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	29.38
2) Matching Resources (Max 15) -	8.25
3) Project Feasibility Stage 2 (Max 20) -	16.40
4) Project Readiness (Max 5) -	3.00
5) Benefits (Max 15) -	12.63
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	3.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Possible Forestry permit if wood harvested from DMLW managed lands.

DNR/DOF Feasibility Comments

This proposal submitted by Mentasta Traditional Council (MTC) seeks construction funding for the installation of a cordwood fueled Garn boiler heating system for four community facilities located centrally in the village of Mentasta. MTC has consulted with the City of Tanana and Gulkana Village Council which both have operating Garn units. This project hopes to displace approximately 22,000 gallons of heating oil. This would require the burning of about 220 cords annually to meet the heating loads of the four facilities. The amount of wood stoking may be somewhat optimistic given that the village of Tanana is burning between 35 and 50 cords per Garn unit. However, this depends on the number of times per day each Garn boiler is fired.

Seasoned cord wood sells for \$200 per cord in Mentasta. This supply is expected to come from vendors in the Tok area. Harvest of Tok fuel wood is managed on a sustainable basis by the State Division of Forestry, Tok Area Office. The harvest generally occurs on Tanana Valley State Forest lands which have established an annual allowable harvest amount. The delivery of 220 cords annually would not exceed this amount.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 983 Wood Heat Feasibility Study and Conceptual Design for the Organized Village of

Proposer: Organized Village of Kake

Applicant Type:

Resource: Biomass

Proposed Project Phase: Feasibility

AEA Program Manager: Helen Traylor

Project Description as defined by applicant

This proposal will focus on a feasibility assessment and conceptual design for a wood heating system and district heating loop for an office building and lodge owned by the Organized Village of Kake (OVK), a federally recognized tribe. The overall goal of the feasibility study is to determine what kind of wood heating system will best meet the objective of the tribe’s energy planning targets which are to: reduce the cost of energy, reduce the environmental impacts of energy consumption, explore locally sourced sustainable energy supplies and to provide energy related job opportunities. The assessment will expand on previous reconnaissance work performed by Dan Parrent in 2008 (Preliminary Feasibility Assessments for High Efficiency Low Emission Wood Heating in Kake, Alaska) for the Kake School and Community building and provide an analysis of the economic and social benefits of high efficiency low emission cordwood/multifuel systems (e.g. Garn and Wood Master) versus pellet systems for the two tribal buildings. The scope of the feasibility study will include assessing the suitability and economics of various wood boiler systems including storage and delivery infrastructure, comparing the costs of locally sourced cord-wood and imported bulk fuel, conducting a thorough resource inventory for local cord-wood production and evaluating and comparing the potential of locally sourced wood and imported pellets to create jobs. This feasibility study will also include collaboration with efforts of the Renewable Energy Alaska Project to determine how, if at all, efficiency measures may decrease the OVK campus energy loads and influence the final system design, as well as to what degree switching to biomass heating may help to recirculate money back into the community that would otherwise be spent on imported fuel oil. The outcome of the feasibility study will be a conceptual design and final system recommendation based on the economic, logistical, environmental and social objectives of the community. The state recently released a regional energy plan (Southeast Integrated Resource Plan) that recommends significant conversions from fuel oil to wood based heat. The tribe also recognizes the potential of wood based heat to support a sustainable community energy portfolio by offsetting imported fuel oil with renewables, reducing costs, creating local job opportunities and aiding in forest health. The tribe has identified wood heating as one of four energy priorities in its Community Economic Development Strategy Plan (CEDS updated 2012) and during its ongoing energy planning process as part of DOE’s START (Strategic Technical Assistance Response Team) program. In addition, the tribe has taken a significant leadership role in the community on energy issues and biomass specifically, and in June 2012 invited a number of technical experts to educate the community on the types of technologies available and lessons learned from projects throughout the state. The information resulting from this feasibility study will be a significant contribution in the community’s energy planning and project efforts.

AEA Review Comments and Recommendation

Full Funding

The Organized Village of Kake is proposing a feasibility assessment and conceptual design for a wood heating system and district heating loop for an office building and lodge owned by the Organized Village of Kake (OVK), a federally recognized tribe. This project is estimated to displace a total 4,800 gallons per year of fuel oil; the fuel source will be determined in the study. The application includes substantial support from the community and the endorsement from the Kake Community Energy Committee.

Recommend full funding for feasibility study/conceptual design.

Funding & Cost	Project Cost:	
Cost of Power: \$0.62 /kWh	Requested Grant Funds:	\$30,700
	Matched Funds Provided:	\$5,000
Energy Region:	Total Potential Grant Amount:	\$35,700
Southeast	AEA Funding Recommendation:	\$30,700

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	27.01
2) Matching Resources (Max 15) -	9.00
3) Project Feasibility Stage 2 (Max 20) -	12.10
4) Project Readiness (Max 5) -	2.33
5) Benefits (Max 15) -	1.38
6) Local Support (Max 5) -	5.00
7) Sustainability (Max 5) -	3.00

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No state land interest.

DNR/DOF Feasibility Comments

This project is for feasibility and design of a wood heating system and district heating loop for an office building and lodge owned by the Organized Village of Kake. The assessment will expand on previous reconnaissance level work performed by Dan Parrent in 2008. The scope of the study will include examining the suitability and economics of various wood boiler systems, comparing costs of locally sourced cordwood and imported bulk fuel and conducting a resource inventory for local cordwood production. The study will also compare job creation attributes between locally sourced wood and imported pellets. At this time no known sources of forest inventory information exist for this area but potential sources could include the Forest Service, since much of the surrounding area is within the Tongass National Forest. Sealaska or the Division of Forestry may also maintain some useable inventory data. It is expected that adequate biomass resources are available to sustain the project given that the project proposal estimates a demand of 53 cords per year.

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

App # 984 Noatak Wind Resource Assessment

Proposer: Noatak IRA

Applicant Type: Government Entity

Resource: Wind

Proposed Project Phase: Feasibility
Design

AEA Program Manager: Rich Stromberg

Project Description as defined by applicant

This project is a feasibility study to evaluate the potential wind resource in Noatak

AEA Review Comments and Recommendation

Not Recommended

\$181,000 is a large amount of money to spend in an area with no validated wind resource. Both airport data and the statewide wind resource model suggest that class 1 winds are in the region.

Not recommended for funding.

Funding & Cost

Cost of Power: \$0.74 /kWh

Energy Region:

Northwest Arctic

Project Cost:

\$2,000,000

Requested Grant Funds:

\$181,000

Matched Funds Provided:

Total Potential Grant Amount:

\$181,000

AEA Funding Recommendation:

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	32.55
2) Matching Resources (Max 15) -	0.00
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	0.00
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

No state land.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments

Alaska Renewable Energy Fund: Round 6



App # 985 Electrical Power Lines -Western Alaska

Proposer: Nuvista Light & Electric Cooperative, Inc.

Applicant Type: Government Entity

Resource: Transmission

Proposed Project Phase: Recon

AEA Program Manager: Kirk Warren

Project Description as defined by applicant

This project will involve exploration and research regarding installation of transmission lines between the communities shown in Table 2.2.1 in the Nuvista region. Some of the communities have wind turbines and all communities have diesel power plants. The final report will present a plan for connecting communities into small power grids to increase efficiency and reliability.

AEA Review Comments and Recommendation

Did Not Pass Stage 1

Funding & Cost

Cost of Power: /kWh

Energy Region:

Lower Yukon-Kuskokwim

Project Cost: \$82,000

Requested Grant Funds: \$82,000

Matched Funds Provided:

Total Potential Grant Amount: \$82,000

AEA Funding Recommendation:

Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 35) -	0.00
2) Matching Resources (Max 15) -	
3) Project Feasibility Stage 2 (Max 20) -	
4) Project Readiness (Max 5) -	
5) Benefits (Max 15) -	
6) Local Support (Max 5) -	
7) Sustainability (Max 5) -	

Economic Analysis



Benefit/Cost Ratio
(Applicant)



Benefit/Cost Ratio
(AEA)

Scoring & Project Rank



Stage 3 Total Score
(out of 100)



Overall Rank
(out of 60)

DNR/DMLW Feasibility Comments

Preliminary study, no authorizations needed at this time. Utility easements and other DMLW authorizations would be required if project moves forward.

DNR/DOF Feasibility Comments

DNR/DGGS Feasibility Comments

DNR/DGGS General Comments on Hazards Applicable to all Projects

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://www.dggs.alaska.gov/pubs/id/23944>

DNR/DGGS Geohazards Comments