

## App #1 Takatz Lake Hydroelectric Feasibility

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** City & Borough of Sitka

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### Project Description

Takatz Lake Project – Alaska, a hydroelectric project approximately 27.7 MW in size capable of producing an average of about 106,900 MWH per year to serve the City of Sitka and other communities in Southeast Alaska as the communities become electrically interconnected. See the attached application to FERC dated June, 2008 for a more detailed description.

### Funding & Cost

<b>Cost of Power:</b>	\$0.11 /kWh
<b>Requested Grant Funds:</b>	\$2,000,000
<b>Matched Funds Provided:</b>	
<b>Total Potential Grant Amount:</b>	\$2,000,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$2,000,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:**

## App #1 Takatz Lake Hydroelectric Feasibility

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** City & Borough of Sitka

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### Scoring & Location



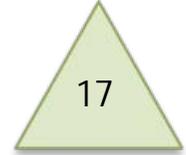
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 2, Sitka-Wrangell-Petersburg



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	4
2) Funding Resources (Max 25)	2
3) Project Feasibility from Stage 2 (Max 20)	15
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	7
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

CB of Sitka requests funding for assessing feasibility of potential 28 MW Takatz Lake hydro project. Project is consistent with findings of the 2008 Sitka Power Supply Plan and would follow less expensive alternatives, including increasing capacity of the existing Blue Lk Hydro project, in order to avoid more costly diesel generation. There is potential for developing road and marine facilities associated with the project that would provide access to eastern Baranof Island. FERC has issued a preliminary permit to Sitka to assess feasibility of Takatz.

Given the widespread interest in linking major electric generation and loads in Southeast, development of Takatz should be coordinated with the SE Alaska Regional Energy Plan. Recommend.

## App #1 Takatz Lake Hydroelectric Feasibility

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** City & Borough of Sitka

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant states there is surplus hydroelectric energy available in Sitka from existing projects. Further, the City is engaged in an expansion of its Blue Lake hydro project that will add significant new hydroelectric supply to the system. At the same time, Sitka has recently experienced significant electricity demand growth and this year commissioned a new demand forecast for the next 20 years. The highest three years were used for this evaluation. Among its assumptions are that, over the next several years, use of electric heat by residential customers will increase from about 33% to 66%, and that most of Sitka's passenger vehicles at the end of 20 years will be electric as well.

A major additional load was then added in 2022 – the anticipated first year of Takatz Lake operation. This additional load represents the use of nearly half of Takatz Lake energy to supplant 1.8 million gallons per year of heating fuel for large, “interruptible” customers such as schools, hospitals, and public buildings. This last assumption accounts for roughly 2/3 of the economic benefits estimated for the project in this evaluation. Based on these assumptions, the B/C ratio is estimated at 1.09.

## App #1 Takatz Lake Hydroelectric Feasibility

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** City & Borough of Sitka

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #2 Gulkana Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction Design

**Proposer:** Gulkana Village Council

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Project Description

This project looks at the integration of a wood fired hydronic heating system with existing boiler system in some of the buildings and retrofit hot water heat to other buildings. The project will require a greater initial investment and higher annual OM&R costs than for an equivalent oil or gas system alone; however, the savings in fuel costs (wood vs. fossil fuel) will pay for the initial investment and cover the additional OM&R costs in a relatively short period of time. After the initial investment is paid off, the project will continue to save money (avoided fuel cost) for the life of the heating system. Inflation rates for fossil fuels are typically higher than inflation rates for wood fuel, increasing inflation rates result in greater fuel savings and thus greater project viability.

### Funding & Cost

<b>Cost of Power:</b>	\$0.17 /kWh
<b>Requested Grant Funds:</b>	\$898,000
<b>Matched Funds Provided:</b>	\$0
<b>Total Potential Grant Amount:</b>	\$898,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$500,000

**AEA Funding Recommendation:** \$500,000

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #2 Gulkana Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction Design

**Proposer:** Gulkana Village Council

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Scoring & Location



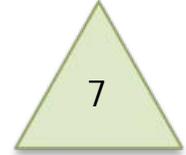
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Copper River/Chugach

**Election District:** 6, Interior Villages



**Rank within Region**  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	6
2) Funding Resources (Max 25)	0
3) Project Feasibility from Stage 2 (Max 20)	14
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	4
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

Project is low risk and potentially very beneficial. Long term wood supply is reliable and sustainable. However at \$898,000 the project is expensive compared to wood heating installations in Tanana and Ionia, so B/C is poor.

AEA would manage project per request in proposal. AEA Project manager thinks this project can be built for \$500,000. Wood storage may not be required and building cost at \$150/sf, not \$350/sf, is appropriate. Project can be coordinated with Gulkana for economy.

Recommended. At lower cost.

## App #2 Gulkana Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design

**Proposer:** Gulkana Village Council

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposed to construct a central wood heating system. Chistochina prices were used for analysis and adjusted upward by \$0.50 per gallon in the AEA analysis, per directions from AEA. AEA biomass cost calculations were linked to real price increases (forecast by ISER) as they will move upward (or downward) as a substitute for heating oil. The applicant used a compound annual growth rate of 5.0 percent on oil, 3.5 percent on wood, and 2.5 percent as a "real discount rate." Estimated B/C ratio is 0.63 by the applicant and the Evaluator's figure is 0.61.

## App #2 Gulkana Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design

**Proposer:** Gulkana Village Council

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

The Alaska Wood Energy Task Force completed the feasibility study for this project; it is a small project and easy to accomplish.

## App #3 Anchorage Waste Gasification Feasibility Study

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Project Description

Alaska Recycling Energy, LLC ("ARE") seeks funding to prepare a resource assessment, feasibility analysis and conceptual design study for the development of a state of the art clean waste gasification plant that will generate energy for Anchorage and its surrounding communities. The proposed plant project will be located at the Anchorage Municipal Landfill adjacent to Route 1 on the Glenn Highway just east of town. The project will principally serve those communities presently served by the Anchorage Solid Waste Services. This study will provide the information required to develop the feedstock sources and analysis, preliminary site layout and design, plant sizing and configuration, development plan, construction, start-up and operating costs, by product markets and operating information necessary to prepare and analyze the financial information required to finance the proposed plant and to formalize a legal relationship with the Solid Waste Services Sector for the Municipality of Anchorage. The proposed plant project will convert the Anchorage waste and landfill into electricity or fuel. Preparation of the study will involve WFT Management Company, Plasma Waste Recycling, CH2MHill, Economic Research Associates, and Alaska Recycling Energy staff in conjunction with Anchorage Solid Waste Services and City staff. If needed, additional consultants will be retained.

### Funding & Cost

<b>Cost of Power:</b>	\$0.09/kWh
<b>Requested Grant Funds:</b>	\$1,100,000
<b>Matched Funds Provided:</b>	\$100,000
<b>Total Potential Grant Amount:</b>	\$1,200,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

## App #3 Anchorage Waste Gasification Feasibility Study

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Scoring & Location



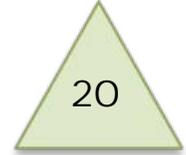
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 23, Downtown-Rogers Park



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	3
2) Funding Resources (Max 25)	14
3) Project Feasibility from Stage 2 (Max 20)	8
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	3
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	3

### AEA Review Comments

This proposal requests substantial funding for proprietary pre-commercial technology. It is one of five very similar proposals that request funding for solid waste-to-energy conversion in Anchorage, Palmer, Fairbanks, Juneau, and Ketchikan. The project team has technically competent staff. We have the following concerns about supporting demonstration of the proposed technology: 1) installed and O&M cost estimates are inadequate, 2) little information on what form of energy would be produced and who would buy it, 3) the project manager Mr. West is the managing member of Alaska Recycling Energy, president of WFT Management Company, and advisor to Plasma Waste Recycling (PWR). We are concerned that with these executive duties that he will have inadequate time to manage the project. 4) since no evidence is provided that PWR's technology has been demonstrated at either a pilot or commercial scale, technical and environmental risk is substantial. 5) at a \$200 million project cost the applicant's project savings of \$2 million/yr do not appear to predict an economically viable project., 6) while the applicant indicates informal discussions with the Anchorage Solid Waste Service (SWS), there is no formal support and, in fact, SWS is proposing a different method for recovering energy from the city waste stream.

## App #3 Anchorage Waste Gasification Feasibility Study

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



AEA surveyed capital costs for eleven recently proposed, constructed, or under construction plasma facilities. Commercial scale facilities are much more expensive in terms of both capital and operating costs than the present system of Municipal Solid Waste disposal in Anchorage. Applicant indicates that since forming the company in 2006 a patented procedure will make their process less expensive than such proposed facilities. But no evidence or estimates were submitted. The proposal was not detailed enough to calculate a B/C ratio.

**App #3 Anchorage Waste Gasification Feasibility Study**

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #4 Palmer Waste Gasification Feasibility Study

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Project Description

Alaska Recycling Energy, LLC ("ARE") seeks funding to prepare a resource assessment, feasibility analysis and conceptual design study for the development of a state of the art clean waste gasification plant that will generate energy for Mat-Su and its surrounding communities. The proposed plant project will be located at the Mat-Su Municipal Landfill in Palmer. The project will principally serve those communities presently served by the Mat-Su Solid Waste Division. This study will provide the information required to develop the feedstock sources and analysis, preliminary site layout and design, plant sizing and configuration, development plan, construction, start-up and operating costs, by product markets and operating information necessary to prepare and analyze the financial information required to finance the proposed plant and to formalize a legal relationship with the Solid Waste Division for Mat-Su. The proposed plant project will convert the Mat-Su waste and landfill into electricity or fuel. Preparation of the study will involve WFT Management Company, Plasma Waste Recycling, CH2MHill, Economic Research Associates, and Alaska Recycling Energy staff in conjunction with Mat-Su Solid Waste Services and Borough staff. If needed, additional consultants will be retained.

Alaska Recycling Energy, LLC ("ARE") seeks funding to prepare a resource assessment, feasibility analysis and conceptual design study for the development of a state of the art clean waste gasification plant that will generate energy for Mat-Su and its surrounding communities. The proposed plant project will be located at the Mat-Su Municipal Landfill in Palmer. The project will principally serve those communities presently served by the Mat-Su Solid Waste Division. This study will provide the information required to develop the feedstock sources and analysis, preliminary site layout and design, plant sizing and configuration, development plan, construction, start-up and operating costs, by product markets and operating information necessary to prepare and analyze the financial information required to finance the proposed plant and to formalize a legal relationship with the Solid Waste Division for Mat-Su. The proposed plant project will convert the Mat-Su waste and landfill into electricity or fuel.

### Funding & Cost

<b>Cost of Power:</b>	\$0.13 /kWh
<b>Requested Grant Funds:</b>	\$650,000
<b>Matched Funds Provided:</b>	\$0
<b>Total Potential Grant Amount:</b>	\$650,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

## App #4 Palmer Waste Gasification Feasibility Study

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Scoring & Location



**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 13, Greater Palmer



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	5
2) Funding Resources (Max 25)	0
3) Project Feasibility from Stage 2 (Max 20)	8
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	3
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	3

### AEA Review Comments

This proposal requests substantial funding for proprietary pre-commercial technology. It is one of five very similar proposals that request funding for solid waste-to-energy conversion in Anchorage, Palmer, Fairbanks, Juneau, and Ketchikan. The project team has technically competent staff. We have the following concerns about supporting demonstration of the proposed technology: 1) installed and O&M cost estimates are inadequate, 2) little information on what form of energy would be produced and who would buy it, 3) the project manager Mr. West is the managing member of Alaska Recycling Energy, president of WFT Management Company, and advisor to Plasman Waste Recycling (PWR). We are concerned that with these executive duties that he will have adequate time to manage the project. 4) since no evidence is provided that PWR's technology has been demonstrated at either a pilot or commercial scale, technical and environmental risk is substantial. 5) at a \$60 million project cost the applicant's project savings of \$1million/yr do not appear to predict an economically viable project.

## App #4 Palmer Waste Gasification Feasibility Study

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



AEA surveyed capital costs for eleven recently proposed, constructed, or under construction plasma facilities. Commercial scale facilities are much more expensive in terms of both capital and operating costs than the present system of Municipal Solid Waste disposal in Anchorage. Applicant indicates that since forming the company in 2006 a patented procedure will make their process less expensive than such proposed facilities. But no evidence or estimates were submitted. The proposal was not detailed enough to calculate a B/C ratio.

**App #4 Palmer Waste Gasification Feasibility Study**

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #5 Fairbanks Waste Gasification Feasibility Study

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Project Description

Alaska Recycling Energy, LLC ("ARE") seeks funding to prepare a resource assessment, feasibility analysis and conceptual design study for the development of a state of the art clean waste gasification plant that will generate energy for Fairbanks North Star Borough (FNSB) and its surrounding communities. The proposed plant project will be located at the FNSB Municipal Landfill in Fairbanks. The project will principally serve those communities presently served by the FNSB Solid Waste Division. This study will provide the information required to develop the feedstock sources and analysis, preliminary site layout and design, plant sizing and configuration, development plan, construction, start-up and operating costs, by product markets and operating information necessary to prepare and analyze the financial information required to finance the proposed plant and to formalize a legal relationship with the Solid Waste Division for FNSB. The proposed plant project will convert the FNSB waste and landfill into electricity or fuel. Preparation of the study will involve WFT Management Company, Plasma Waste Recycling, CH2MHill, Economic Research Associates, and Alaska Recycling Energy staff in conjunction with FNSB Solid Waste Services and Borough staff. If needed, additional consultants will be retained.

### Funding & Cost

<b>Cost of Power:</b>	\$0.17 /kWh
<b>Requested Grant Funds:</b>	\$775,000
<b>Matched Funds Provided:</b>	\$0
<b>Total Potential Grant Amount:</b>	\$775,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

## App #5 Fairbanks Waste Gasification Feasibility Study

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Scoring & Location



**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 9, City of Fairbanks



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	6
2) Funding Resources (Max 25)	0
3) Project Feasibility from Stage 2 (Max 20)	8
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	3
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	3

### AEA Review Comments

This proposal requests substantial funding for proprietary pre-commercial technology. It is one of five very similar proposals that request funding for solid waste-to-energy conversion in Anchorage, Palmer, Fairbanks, Juneau, and Ketchikan. The project team has technically competent staff. We have the following concerns about supporting demonstration of the proposed technology: 1) installed and O&M cost estimates are inadequate, 2) little information on what form of energy would be produced and who would buy it, 3) the project manager Mr. West is the managing member of Alaska Recycling Energy, president of WFT Management Company, and advisor to Plasman Waste Recycling (PWR). We are concerned that with these executive duties that he will have adequate time to manage the project. 4) since no evidence is provided that PWR's technology has been demonstrated at either a pilot or commercial scale, technical and environmental risk is substantial. 5) at a \$100 million project cost the applicant's project savings of \$1.5 million/yr do not appear to predict an economically viable project.

## App #5 Fairbanks Waste Gasification Feasibility Study

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



AEA surveyed capital costs for eleven recently proposed, constructed, or under construction plasma facilities. Commercial scale facilities are much more expensive in terms of both capital and operating costs than the present system of Municipal Solid Waste disposal in Anchorage. Applicant indicates that since forming the company in 2006 a patented procedure will make their process less expensive than such proposed facilities. But no evidence or estimates were submitted. The proposal was not detailed enough to calculate a B/C ratio.

**App #5 Fairbanks Waste Gasification Feasibility Study**

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #6 Lake Elva Hydropower Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Nushagak Electric & Telephone  
Cooperative, Inc

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

This project proposes a facility at Lake Elva that will consist of a dam constructed 8,500 feet downstream from the existing outlet of the lake. The powerhouse will contain two 750 kW turbines. The steel framed structure will be located approximately 1,800 feet upstream from the Elva Creek confluence with Lake Nerka. It is planned to be on a 20 by 80 foot concrete foundation with a height of 20 feet above the generator floor. This proposed project will necessitate the construction of approximately 33 miles of new three phase transmission tie line from the project site to close proximity of the village of Aleknagik.

The Nushagak Area Hydropower Project will initially serve the communities of Aleknagik, Dillingham, and Kakanak in the Nushagak and Wood River areas (future interties to Manokotak and Ekwok - New Stuyahok - Koliganek are under consideration). This first phase with inter-tie is estimated to cost \$22 million and replace 500,000 gallons of diesel fuel annually, for a yearly savings of \$2,105,700 at today's fuel prices. Currently all power in the area is generated with diesel by Nushagak Cooperative (NETC), with a current residential rate at \$0.463 cents per kilowatt hour. Nushagak Cooperative would develop, maintain, and operate the Lake Elva facility and associated infrastructure.

### Funding & Cost

<b>Cost of Power:</b>	\$0.23/kWh
<b>Requested Grant Funds:</b>	\$10,000,000
<b>Matched Funds Provided:</b>	\$12,000,000
<b>Total Potential Grant Amount:</b>	\$22,000,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$300,000

**AEA Funding Recommendation:** \$4,006,500

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #6 Lake Elva Hydropower Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Nushagak Electric & Telephone  
Cooperative, Inc

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



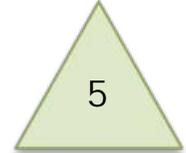
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Bristol Bay

**Election District:** 37, Bristol Bay-Aleutians



**Rank within Region**  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	9
2) Funding Resources (Max 25)	25
3) Project Feasibility from Stage 2 (Max 20)	11
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	8
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant did not provide feasibility and final design documentation to justify proceeding to construction. Project would have interacted with No. 55 - Bristol Bay Health Corp Wind project, now withdrawn. Recommend providing feasibility funding for Lk Elva project. Given scale of project and potential interaction with other projects, however, cooperative planning approach is needed between applicants, utility and community. Recommend partial funding of \$300,000 for "comprehensive feasibility assessment and ongoing consultative support" referenced in section 6 of the grant application.

## App #6 Lake Elva Hydropower Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Nushagak Electric & Telephone  
Cooperative, Inc

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant states that a feasibility study of the project is currently underway and is due for completion in February 2009. Meanwhile, applicant states that all of the output from Lake Elva would displace existing diesel generation starting in its first year of operation. Based on applicant's estimates of project capital cost, net impact on system O&M, and volume of fuel displacement, the B/C ratio is estimated at 1.83.

## App #6 Lake Elva Hydropower Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Nushagak Electric & Telephone  
Cooperative, Inc

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

Wood Tikchik State Park- know of strong public opposition. Parks may have a challenge in permitting, but it is recognized as a compatible use.

## App #7 Naknek/King Salmon Fish Waste Feasibility Study

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Naknek Electric Association

**AEA Program Manager:**

**Applicant Type:** Utility

### Project Description

This proposal will examine the opportunity, analyzes the possibility, and determines the feasibility of providing a stand-alone fish waste-processing facility that produces and uses clean energy from renewable resources. It will serve the commercial fishery and processing plants (7 land based processing facilities, 3 floating processing facilities and several smaller independent seller/operators) and the community of Naknek, King Salmon, and South Naknek, Alaska. The study produced will look at a model plant that, when proven successful, will be recreated throughout the fisheries of the State and the nation, and the world.

Bristol Bay Borough and Naknek Electric Association have joined in this responsible and cooperative scientific effort in the largest sockeye salmon fishery in the world to perform this study and assess the initial, as well as its ultimate, practicality and profitability of such a facility.

### Funding & Cost

<b>Cost of Power:</b>	\$0.36/kWh
<b>Requested Grant Funds:</b>	\$80,000
<b>Matched Funds Provided:</b>	\$20,000
<b>Total Potential Grant Amount:</b>	\$100,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- ✗ Did Not Pass Stage 1
- Pending

**App #7 Naknek/King Salmon Fish Waste Feasibility Study**

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Naknek Electric Association

**AEA Program Manager:**

**Applicant Type:** Utility

**Scoring & Location**



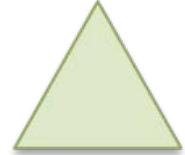
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Bristol Bay

**Election District:**



Rank within Region  
(out of )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	13
2) Funding Resources (Max 25)	18
3) Project Feasibility from Stage 2 (Max 20)	
4) Project Readiness (Max 5)	
5) Benefits (Max 10)	
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	

**AEA Review Comments**

**App #7 Naknek/King Salmon Fish Waste Feasibility Study**

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Naknek Electric Association

**AEA Program Manager:**

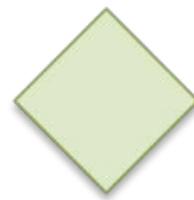
**Applicant Type:** Utility

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



**App #7 Naknek/King Salmon Fish Waste Feasibility Study**

**Resource:** Biofuels

**Proposed Project Phase:** Feasibility

**Proposer:** Naknek Electric Association

**AEA Program Manager:**

**Applicant Type:** Utility

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #8 Anchorage Geothermal District Heating Feasibility Study

**Resource:** Geothermal

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Iceland America Energy, Inc.

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

### Project Description

This is a request for reconnaissance study, followed by a more detailed feasibility study that will analyze the feasibility of supplying Anchorage with heat from geothermal energy sources. IAE has signed a memorandum of understanding (MOU) with the Municipality of Anchorage to facilitate such a study. The Municipality of Anchorage has agreed to support the feasibility study efforts by providing information about the potential for geothermal energy use in Anchorage as well as right of way information. If the results of the feasibility study prove to be positive for development, IAE will work towards developing the project. Specific focus on the market available, what type of organization will be needed for the project, technical, and financial issues.

### Funding & Cost

<b>Cost of Power:</b>	\$0.10 /kWh
<b>Requested Grant Funds:</b>	\$4,047,230
<b>Matched Funds Provided:</b>	\$4,295,580
<b>Total Potential Grant Amount:</b>	\$8,342,810
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

## App #8 Anchorage Geothermal District Heating Feasibility Study

**Resource:** Geothermal

**Proposed Project Phase:** Feasibility Recon

**Proposer:** Iceland America Energy, Inc.

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

### Scoring & Location



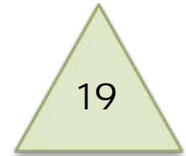
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 23, Downtown-Rogers Park



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	4
2) Funding Resources (Max 25)	24
3) Project Feasibility from Stage 2 (Max 20)	6
4) Project Readiness (Max 5)	3
5) Benefits (Max 10)	1
6) Local Support (Max 5)	3
7) Sustainability (Max 5)	2

### AEA Review Comments

Applicant proposes reconnaissance and feasibility study of a geothermal project that would tap a resource of unknown quality and extent in the Lower Sustna Basin for heating in Anchorage.

See DGGs opinion above: Geothermal resource has not been demonstrated. Therefore, the concept of piping hot water from the Susitna Valley is questionable.

The applicant's CEO, Magnus Johanneson, resigned as of 11/7/008.

Recommend no funding due to lack of evidence that a geothermal resource is available.

## App #8 Anchorage Geothermal District Heating Feasibility Study

**Resource:** Geothermal

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Iceland America Energy, Inc.

**AEA Program Manager:** David Lockard

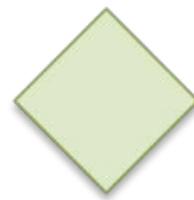
**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant estimated capital cost of building the project, including the feasibility study, is \$1,070,000,000. The applicant assumes sales price of power from this project to be between \$8.00 and \$16.00 per mmBtu over the life of the project, for an average of \$12.00 per mmBtu. The applicant also assumes the price of displaced fuel to be \$8.57 per mmBtu.

## App #8 Anchorage Geothermal District Heating Feasibility Study

**Resource:** Geothermal

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Iceland America Energy, Inc.

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

### DNR/DGGS Feasibility Comments

The Alaska Division of Geological and Geophysical surveys has reviewed this proposal and recommends against providing funding. The available geological data and regional scientific information, as well as any information provided in this proposal, does not indicate the existence of a geothermal resource, nor a reasonable chance of the existence of a sufficient geothermal resource for the planned project. If non-public information is available that indicates the existence of a geothermal resource, we encourage the proposal writers to include that in a revised proposal.

### DNR/DMLW Feasibility Comments

## App #9 Wrangell Hydro Based Electric Boilers Construction

**Resource:** Other

**Proposed Project Phase:** Construction Design

**Proposer:** City and Borough of Wrangell

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### Project Description

The City and Borough of Wrangell (City), through Wrangell Municipal Light and Power (WMLP), has established a fuel displacement rate of \$.08/KWH for all heat and hot water. There is a possibility of an interruptible rate of \$.05/KWH from the Four Dam Pool Power Agency. This special rate is due to Tye Lake Hydroelectric facilities spilling of excess water (water not used in power production). A feasibility study has been conducted by Electric Power Systems, Inc. to determine what the savings would be per year if the city buildings were converted from diesel fired boilers to electric boilers, develop a rough order magnitude cost estimate (ROM), and provide estimated engineering design fees for replacing the boilers. The study was conducted on 11 public buildings in Wrangell and the study found significant savings to progress this project to the design, permitting and construction phase. WMLP would like funding to convert these 11 public facilities from diesel fired boilers to electric boilers. Directly involved in this project is the City and Borough of Wrangell and Wrangell Municipal Light and Power.

### Funding & Cost

<b>Cost of Power:</b>	\$0.11 /kWh
<b>Requested Grant Funds:</b>	\$3,260,000
<b>Matched Funds Provided:</b>	\$123,000
<b>Total Potential Grant Amount:</b>	\$3,383,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$3,260,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$2,000,000

## App #9 Wrangell Hydro Based Electric Boilers Construction

**Resource:** Other

**Proposed Project Phase:** Construction Design

**Proposer:** City and Borough of Wrangell

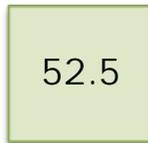
**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### Scoring & Location



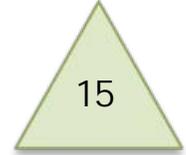
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 2, Sitka-Wrangell-Petersburg



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	4
2) Funding Resources (Max 25)	12
3) Project Feasibility from Stage 2 (Max 20)	18
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	8
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	4

### AEA Review Comments

This project would retrofit heating systems of public buildings in Wrangell to utilize interruptible power for resistance heating.

AEA has concern that widespread use of resistance heating will exhaust available hydro capacity and energy. However we recognize value of this project for demonstration.

Therefore, recommend full funding with the following provisions: 1) Prior to final design analyze relative merits of heat pump vs resistance heating design concepts, 2) Make results available in near future for regional integrated resource plan.

## App #9 Wrangell Hydro Based Electric Boilers Construction

**Resource:** Other

**Proposed Project Phase:** Construction Design

**Proposer:** City and Borough of Wrangell

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant states Swan-Tyee intertie is scheduled for completion in 2010, at which time the communities of Petersburg, Wrangell, and Ketchikan will be tied together in a single electrical grid. Energy projects in any of these communities must therefore be evaluated in the context of this interconnected system.

The basis for this economic evaluation is that, at the time of the proposed conversion of Wrangell municipal facilities from oil-fired boilers to electric boilers, there is sufficient surplus hydroelectricity available from the Tyee Lake project to serve all of the new heating demand. The cost of providing this surplus energy is zero. Therefore, at least initially, the economic benefit of the conversion is essentially equal to the entire cost of the displaced heating fuel.

The question that arises is whether this economic benefit continues to be realized once the Tyee Lake surplus is used up as a result of load growth. The load forecast that has been used for the evaluation of proposed projects in the interconnected system of Wrangell, Petersburg, and Ketchikan is the "reference" forecast used in the 2007 AK-BC Intertie Feasibility Study. According to these projections, the existing hydro surplus is used up by 2014. New hydro projects can be built but the energy from these new projects cannot be considered "free." Increasing diesel generation would be costly. It is also much more fuel efficient to supply heat with oil-fired boilers than with electricity produced from diesel generators. This evaluation therefore assumes that the City of Wrangell municipal facilities would switch back to its oil-fired boilers within several years after the hydro surplus is used up. Specifically, it is assumed that the City would realize fuel displacements benefits from the proposed electric boilers for a period of 10 years but would then switch back to oil-fired boilers. At that point, according to the load forecast s, system electricity demand would exceed the existing hydro resource by over 20 GWh, approx. 4 GWh of which is due to the City's proposed electric heat conversions. Based on these and other assumptions, the B/C ratio is estimated at 1.91.

## App #9 Wrangell Hydro Based Electric Boilers Construction

**Resource:** Other

**Proposed Project Phase:** Construction  
Design

**Proposer:** City and Borough of Wrangell

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #10 Falls Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** Gustavus Electric Company

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

The Falls Creek Hydro Electric Project is an 800 kW run-of-river hydroelectric facility, located in Gustavus Alaska, which will provide electric power to the community of Gustavus. The project is being built by Gustavus Electric Company to displace existing diesel generation. Construction of the project is approximately 90% complete and will provide 90% of the community electric needs.

### Funding & Cost

<b>Cost of Power:</b>	\$0.77 /kWh
<b>Requested Grant Funds:</b>	\$750,000
<b>Matched Funds Provided:</b>	\$0
<b>Total Potential Grant Amount:</b>	\$750,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$750,000

**AEA Funding Recommendation:** \$750,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #10 Falls Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** Gustavus Electric Company

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



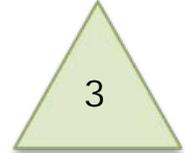
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 5, Cordova-Southeast Islands



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	29
2) Funding Resources (Max 25)	1
3) Project Feasibility from Stage 2 (Max 20)	20
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	10
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

This 800 kW hydro project is 90% complete but needs additional funding for completion. Recommend full funding.

## App #10 Falls Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** Gustavus Electric Company

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The Falls Creek project has been under construction since April 2006 and is expected to begin producing power by the end of 2008. As in all of the economic evaluations, sunk costs are excluded from the analysis since, having already been incurred; they are common to all possible scenarios. The B/C ratio benefits from the fact that nearly all of the project cost has already been spent, leaving only \$750,000 as the capital cost needed to complete the project. The project is expected to provide 90% of the electricity demand in Gustavus, all of which is presently supplied by diesel generators. Given the value of this diesel displacement and the fact that most of the project cost is "sunk," the B/C ratio is estimated at 22.06.

## App #10 Falls Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** Gustavus Electric Company

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #11 Aleutians East Borough Renewable Energy Reconnaissance

**Resource:** Other

**Proposed Project Phase:** Recon

**Proposer:** Aleutians East Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Project Description

This project requests funding to conduct a renewable energy reconnaissance report for the smaller (populations less than 100) communities of Cold Bay, False Pass and Nelson Lagoon which require assistance to decrease their energy costs and reduce their dependence on diesel fuel. This region, called "the birthplace of the winds", renewable energy resources abound -- not only wind power, but also hydro, geo-thermal, current and tidal. Some waste heat recovery opportunities also exist. A reconnaissance report will summarize the assessment and findings. This project will be administered and managed by the Aleutians East Borough (AEB) and will be conducted by a consultant chosen by the AEB.

### Funding & Cost

<b>Cost of Power:</b>	\$0.57 /kWh
<b>Requested Grant Funds:</b>	\$25,000
<b>Matched Funds Provided:</b>	\$15,000
<b>Total Potential Grant Amount:</b>	\$40,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$25,000

### AEA Recommendation

- × Full Funding
- Partial Funding
- × Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$25,000

## App #11 Aleutians East Borough Renewable Energy Reconnaissance

**Resource:** Other

**Proposed Project Phase:** Recon

**Proposer:** Aleutians East Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Scoring & Location



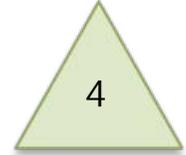
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Aleutians

**Election District:** 37, Bristol Bay-Aleutians



**Rank within Region**  
(out of 5 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	21
2) Funding Resources (Max 25)	21
3) Project Feasibility from Stage 2 (Max 20)	11
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	2
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	4

### AEA Review Comments

Proposal requests assistance for recon assessment of alternatives in Cold Bay, False Pass, and Nelson Lagoon.

The proposal plans to look at current and tidal potential; these options should only be covered briefly in the study since there is little chance of immediate help from these emerging technologies.

Recommend full funding with condition of AEA review and approval of RFP and consultant before AEA disbursement of grant funds.

## App #11 Aleutians East Borough Renewable Energy Reconnaissance

**Resource:** Other

**Proposed Project Phase:** Recon

**Proposer:** Aleutians East Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The three areas combined use about 289,000 gallons per year in diesel fuel to generate electrical power at prices estimated to exceed \$6.00 per gallon in the coming years by ISER. Two of the three area generators reported efficiencies barely over 12 kWh per gallon. Nelson Lagoon represents about 10% of that fuel consumption whereas False Pass is about 15%, and Cold bay is 75%.

It is very likely alternative energy will be cost-effective for the generation of power in this region. There are scoping-level questions such as the implications of bird migration on the potential for wind power in Nelson Bay this study will address. For illustration a \$10 million aggregate investment would need to produce about one-third of the kWh of generation across the three communities to have a B/C ratio of 1 for projects that had 20 year horizons. B/C ratio cannot be calculated since potential projects are not defined.

**App #11 Aleutians East Borough Renewable Energy Reconnaissance**

**Resource:** Other

**Proposed Project Phase:** Recon

**Proposer:** Aleutians East Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #12 Juneau Waste Gasification Reconnaissance Study

**Resource:** Biofuels

**Proposed Project Phase:** Recon

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Project Description

Alaska Recycling Energy, LLC ("ARE") seeks funding to prepare a reconnaissance study prior to pursuing a Resource Assessment, Feasibility Analysis and Conceptual Design for the development of a state of the art clean waste gasification plant that will generate energy for Juneau and its surrounding communities. The proposed plant project location is at the Juneau Landfill currently owned and operated by Waste Management. The project will principally serve Juneau and those communities that the proposed study shows can be reasonably served. This study will provide the information about present patterns for disposal of municipal solid waste and other types of waste in the general area, logistics considerations, feedstock sources that can be identified and evaluated that would be available to support the proposed plant and such other information that can lead to a feasibility analysis, how such a proposed plant would supplement, integrate into or supplant existing energy resources, potential markets for such a plant and its products, possible site and cost analysis for future studies addressing the preliminary site layout and design, plant sizing and configuration, development plan, construction, start-up and operating costs, by product markets and operating information necessary to prepare and analyze the financial information required to finance the proposed plant and to meet future grant applications for such a study and project. The proposed plant project will convert the Juneau waste, landfill and sanitary sludge into electricity or fuel. Preparation of the study will involve WFT Management Company, Robert Loescher, and Alaska Recycling Energy in conjunction with Juneau City and Borough staff and the Southeast Conference. If needed, additional consultants will be retained.

### Funding & Cost

<b>Cost of Power:</b>	\$0.11 /kWh
<b>Requested Grant Funds:</b>	\$95,000
<b>Matched Funds Provided:</b>	
<b>Total Potential Grant Amount:</b>	\$95,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

## App #12 Juneau Waste Gasification Reconnaissance Study

**Resource:** Biofuels

**Proposed Project Phase:** Recon

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Scoring & Location



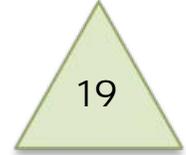
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 3, Juneau-Downtown-Douglas



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	4
2) Funding Resources (Max 25)	0
3) Project Feasibility from Stage 2 (Max 20)	5
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	3
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	3

### AEA Review Comments

This proposal requests substantial funding for reconnaissance work in assessing application of proprietary pre-commercial technology. It is one of five very similar proposals that request funding for solid waste-to-energy conversion in Anchorage, Palmer, Fairbanks, Juneau, and Ketchikan. The project team has technically competent staff. We have the following concerns about supporting demonstration of the proposed technology: 1) installed and O&M cost estimates are inadequate, 2) little information on what form of energy would be produced and who would buy it, 3) since no evidence is provided that PWR's technology has been demonstrated at either a pilot or commercial scale, technical and environmental risk is substantial. 4) the proposal does not tie-in with the ongoing Juneau Solid Waste Management Strategy and would likely duplicate existing efforts., 5) the budget of \$25,500 for travel, meals, and Per Diem appears excessive, 6) the remaining budget of \$64,500 for contractual services is unspecified and no technical consultant is identified.

**App #12 Juneau Waste Gasification Reconnaissance Study**

**Resource:** Biofuels

**Proposed Project Phase:** Recon

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

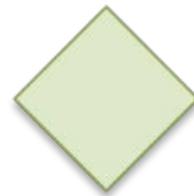
**Applicant Type:** IPP

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant submitted no data other than what is included in the project description. There is a pre-existing regional reconnaissance study by DMC Technologies applicant did not cite, and it also appears Klawock has done some investigation of Plasma technology for MSW disposal. DMC study was technical feasibility and not economic feasibility per se.

AEA assesses the potential for cost savings in processing of MSW exists in the region based on technical feasibility report by DMC Technologies. But AEA cannot do reasonable benefit/cost calculation without its own report.

## App #12 Juneau Waste Gasification Reconnaissance Study

**Resource:** Biofuels

**Proposed Project Phase:** Recon

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #13 Ketchikan Waste Gasification Reconnaissance Study

**Resource:** Biofuels

**Proposed Project Phase:** Recon

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Project Description

Alaska Recycling Energy, LLC ("ARE") seeks funding to prepare a reconnaissance study prior to pursuing a Resource Assessment, Feasibility Analysis and Conceptual Design for the development of a state of the art clean waste gasification plant that will generate energy for Ketchikan and the communities of the Southeast Conference. The proposed plant project location must be determined but initial consideration is being given to a site at Ward Cove, site of the old Ketchikan Pulp Mill. The project will serve Ketchikan and those communities that the proposed study shows can be reasonably served. This study will provide the information about present patterns for disposal of municipal solid waste and other types of waste in the general area, logistics considerations, feedstock sources that can be identified and evaluated that would be available to support the proposed plant and such other information that can lead to a feasibility analysis, how such a proposed plant would supplement, integrate into or supplant existing energy resources, potential markets for such a plant and its products, possible site and cost analysis for future studies addressing the preliminary site layout and design, plant sizing and configuration, development plan, construction, start-up and operating costs, by product markets and operating information necessary to prepare and analyze the financial information required to finance the proposed plant and to meet future grant applications for such a study and project.

The proposed plant project will convert the waste, landfill and the Ketchikan Pulp Mill superfund site into electricity or fuel. Preparation of the study will involve WFT Management Company, Robert Loescher, Richard Smith and Alaska Recycling Energy in conjunction with Ketchikan City and Borough staff and the Southeast Conference. If needed, additional consultants will be retained.

### Funding & Cost

<b>Cost of Power:</b>	\$0.10 /kWh
<b>Requested Grant Funds:</b>	\$105,620
<b>Matched Funds Provided:</b>	
<b>Total Potential Grant Amount:</b>	\$105,620
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$0

## App #13 Ketchikan Waste Gasification Reconnaissance Study

**Resource:** Biofuels

**Proposed Project Phase:** Recon

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Scoring & Location



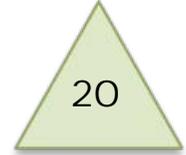
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 1, Ketchikan



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	4
2) Funding Resources (Max 25)	0
3) Project Feasibility from Stage 2 (Max 20)	6
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	3
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	3

### AEA Review Comments

This proposal requests substantial funding for reconnaissance work in assessing application of proprietary pre-commercial technology. It is one of five very similar proposals that request funding for solid waste-to-energy conversion in Anchorage, Palmer, Fairbanks, Juneau, and Ketchikan. The project team has technically competent staff. We have the following concerns about supporting demonstration of the proposed technology: 1) installed and O&M cost estimates are inadequate, 2) little information on what form of energy would be produced and who would buy it, 3) since no evidence is provided that PWR's technology has been demonstrated at either a pilot or commercial scale, technical and environmental risk is substantial. 4) the budget of \$35,220 for travel, meals, and Per Diem appears excessive, 5) the remaining budget of \$65,400 for contractual services is unspecified and no technical consultant is identified.

## App #13 Ketchikan Waste Gasification Reconnaissance Study

**Resource:** Biofuels

**Proposed Project Phase:** Recon

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant submitted no data other than what is included in the project description. There is a pre-existing regional reconnaissance study by DMC Technologies applicant did not cite, in addition to feedstock supply report for Sealaska. It also appears Klawock has done some investigation of Plasma technology for MSW disposal. DMC study was technical feasibility and not economic feasibility per se.

AEA assesses the potential for cost savings in processing of MSW exists in the region based on technical feasibility report by DMC Technologies. But AEA cannot do reasonable benefit/cost calculation without its own report.

**App #13 Ketchikan Waste Gasification Reconnaissance Study**

**Resource:** Biofuels

**Proposed Project Phase:** Recon

**Proposer:** Alaska Recycling Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #14 Chignik Lagoon Hydroelectric Final Design

**Resource:** Hydro

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Chignik Lagoon Power Utility (CLPU)

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

The Chignik Lagoon Hydroelectric Project is located on Packers Creek in Chignik Lagoon. The 190 kW project can provide for most of the communities current power needs, which peak at about 125 kW. The plant would eliminate about 85% of 50,000 gallons of diesel consumed by the generators annually. There will also be excess energy that could be used for heating the school and other local structures. The project would also enable the community to add a freezer/processing facility to further improve the local economy.

### Funding & Cost

<b>Cost of Power:</b>	\$0.52 /kWh
<b>Requested Grant Funds:</b>	\$150,000
<b>Matched Funds Provided:</b>	
<b>Total Potential Grant Amount:</b>	\$150,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$150,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$150,000

## App #14 Chignik Lagoon Hydroelectric Final Design

**Resource:** Hydro

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Chignik Lagoon Power Utility (CLPU)

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



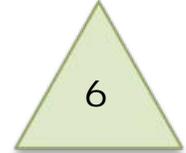
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Bristol Bay

**Election District:** 37, Bristol Bay-Aleutians



**Rank within Region**  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	19
2) Funding Resources (Max 25)	0
3) Project Feasibility from Stage 2 (Max 20)	18
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	9
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	4

### AEA Review Comments

Note that app# 14 Chignik Lagoon hydro, app# 62 Chignik hydro/wind feas, and app#40 Chignik Hydro all address the same subregion. Recommend this proposed feasibility study be funded up to \$150,000 and that the three applicants be required to coordinate on data collection, study and milestones.

## App #14 Chignik Lagoon Hydroelectric Final Design

**Resource:** Hydro

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Chignik Lagoon Power Utility (CLPU)

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant states that the project would displace 85% of the 50,000 gallons per year now consumed for diesel power generation. Based on this estimate as well as the applicant's estimates of project capital and O&M costs, the B/C ratio is estimated at 3.13.

## App #14 Chignik Lagoon Hydroelectric Final Design

**Resource:** Hydro

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Chignik Lagoon Power Utility (CLPU)

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #15 Chistochina Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Cheesh'na Tribal Council

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Project Description

The project will be located at the mile 33 of the Tok Cutoff Highway in Chistochina, Alaska and will be managed and owned by the Cheesh'na Tribal Council (CTC). The project provides a (cordwood) biomass system to provide heat and hot water for all community facilities located in a "campus" area. Existing facilities that will be served by the project are owned and operated by CTC and include the CTC Tribal Office Building, Chistochina Community Hall and the Education/Library facility. Two new facilities that will be served by the project are scheduled to be constructed in the coming year; Mt Sanford Tribal Consortium multiuse facility with health clinic and CTC's Washateria.

### Funding & Cost

<b>Cost of Power:</b>	\$0.69/kWh
<b>Requested Grant Funds:</b>	\$827,000
<b>Matched Funds Provided:</b>	\$12,000
<b>Total Potential Grant Amount:</b>	\$839,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$500,000

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$500,000

## App #15 Chistochina Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Cheesh'na Tribal Council

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Scoring & Location



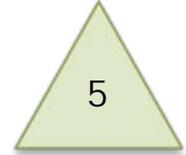
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Copper River/Chugach

**Election District:** 6, Interior Villages



Rank within Region  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	26
2) Funding Resources (Max 25)	10
3) Project Feasibility from Stage 2 (Max 20)	15
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	4
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	5

### AEA Review Comments

Project is low risk and potentially very beneficial. Long term wood supply is reliable and sustainable. However at \$839,000 the project is expensive compared to wood heating installations in Tanana and Ionia, so B/C is poor.

AEA would manage project per request in proposal. AEA Project manager thinks this project can be built for \$500,000. Wood storage may not be required and building cost at \$150/sf, not \$350/sf, is appropriate. Project can be coordinated with Gulkana for economy.

Recommended. At lower cost.

**App #15 Chistochina Central Wood Heating Construction**

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Cheesh'na Tribal Council

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposed to construct a cord wood biomass heating system that will provided heat and hot water to community buildings. The capital costs provided in the application were used without modification. The new system will negate the need to spend \$25,000 to repair or replace the existing boiler. To account for this savings \$25,000 was added to the base case scenario for both the applicant and AEA calculations. Wood fuel prices are assumed to remain constant. The difference in the AEA and Applicant B/C calculation is that AEA assumes the project is operational one year sooner than the applicant. Estimated B/C ratio is 0.44 by the applicant and the Evaluator's figure is 0.45.

## App #15 Chistochina Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Cheesh'na Tribal Council

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #16 Mt. Redoubt/Mt. Spur Geothermal Construction

**Resource:** Geothermal

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Cook Inlet Power

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

### Project Description

This project proposes the first 10 MW Utility-Grade Geothermal Development in Alaska. This 10 MW project would be able to extract geothermal power from the base of either Mt. Redoubt or Spurr by 2105.

### Funding & Cost

<b>Cost of Power:</b>	\$0.10 /kWh
<b>Requested Grant Funds:</b>	\$950,000
<b>Matched Funds Provided:</b>	\$97,200,000
<b>Total Potential Grant Amount:</b>	\$98,150,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #16 Mt. Redoubt/Mt. Spur Geothermal Construction

**Resource:** Geothermal

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Cook Inlet Power

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

### Scoring & Location



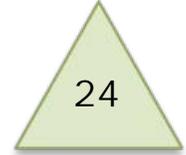
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 6, Interior Villages



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	4
2) Funding Resources (Max 25)	0
3) Project Feasibility from Stage 2 (Max 20)	2
4) Project Readiness (Max 5)	1
5) Benefits (Max 10)	1
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	0

### AEA Review Comments

Agree with DGGS comments regarding access and the pre-existing rights of Ormat at Mt. Spurr. Applicant has limited background in geology and development of geothermal powerplants.

No economic analysis was prepared for this project. Not enough information is available to justify funding.

**App #16 Mt. Redoubt/Mt. Spur Geothermal Construction**

**Resource:** Geothermal

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Cook Inlet Power

**AEA Program Manager:** David Lockard

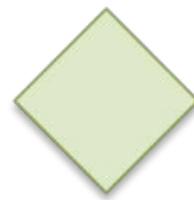
**Applicant Type:** IPP

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposes a reconnaissance study to look at supplement or replacement of some of the lowest cost energy in the state. There is a very high capital cost. No B/C ratio could be determined with the information provided.

**App #16 Mt. Redoubt/Mt. Spur Geothermal Construction**

**Resource:** Geothermal

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Cook Inlet Power

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

Reject because of no identified method of accessing geothermal resources

**DNR/DMLW Feasibility Comments**

They didn't get geothermal bids - Ormat did. Where do they get access to the geothermal resources? Probably major show stopper.

## App #17 Jack River Hydroelectric Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Native Village of Cantwell

**AEA Program Manager:**

**Applicant Type:** Government Entity

### Project Description

The Native Village of Cantwell proposes to improve the reliability and lower the cost of the community of Cantwell's power system. Currently Cantwell obtains power from the line between MEA and GVEA. To accomplish improved reliability, we propose to build a hydroelectric project on the Jack River a short distance from Cantwell. The installed capacity of this plant will be in excess of 1 MW. This project will be comprised of a dam and a short tunnel. A feasibility design and scoping are required to provide the parameters of the project.

### Funding & Cost

<b>Cost of Power:</b>	\$0.21 /kWh
<b>Requested Grant Funds:</b>	\$194,540
<b>Matched Funds Provided:</b>	\$5,460
<b>Total Potential Grant Amount:</b>	\$200,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- ✗ Did Not Pass Stage 1
- Pending

**App #17 Jack River Hydroelectric Feasibility Study**

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Native Village of Cantwell

**AEA Program Manager:**

**Applicant Type:** Government Entity

**Scoring & Location**



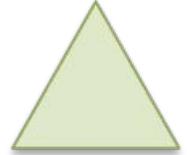
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Railbelt

**Election District:**



Rank within Region  
(out of )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	8
2) Funding Resources (Max 25)	10
3) Project Feasibility from Stage 2 (Max 20)	
4) Project Readiness (Max 5)	
5) Benefits (Max 10)	
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	

**AEA Review Comments**

**App #17 Jack River Hydroelectric Feasibility Study**

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Native Village of Cantwell

**AEA Program Manager:**

**Applicant Type:** Government Entity

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



## App #17 Jack River Hydroelectric Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Native Village of Cantwell

**AEA Program Manager:**

**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #18 Pike's Ridge Geothermal Final Design

**Resource:** Geothermal

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Naknek Electric Association

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Project Description

The Southwest Alaska Regional Geothermal Energy Project is a long-term energy solution to rising and unpredictable costs of energy in rural and remote regions with geothermal energy potential. The next phase of the project and the subject of this application is geothermal energy resource confirmation and qualification. Phase III includes design, engineering and construction of a deep well preceded by funding and permit acquisition, road and well site improvements and drilling and drill management contracts. Subsequent to resource confirmation and qualification, NEA proposes constructing a 25 MW geothermal plant and interconnection infrastructure that will supply 25+ communities in the Bristol Bay and Lake Region with low-cost electricity that effectively decreases the cost of power 70% by displacing 5.4 million gallons of diesel fuel currently used to meet regional electrical and heating energy requirements. The project will be the first utility grade geothermal development in Alaska establishing long-term firm, reliable and cost effective alternative energy that will enhance rural sustainability and the development of renewable and strategic natural resources.

### Funding & Cost

<b>Cost of Power:</b>	\$0.36/kWh
<b>Requested Grant Funds:</b>	\$5,000,000
<b>Matched Funds Provided:</b>	\$5,000,000
<b>Total Potential Grant Amount:</b>	\$10,000,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #18 Pike's Ridge Geothermal Final Design

**Resource:** Geothermal

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Naknek Electric Association

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Scoring & Location



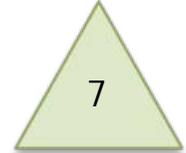
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Bristol Bay

**Election District:** 37, Bristol Bay-Aleutians



**Rank within Region**  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	13
2) Funding Resources (Max 25)	24
3) Project Feasibility from Stage 2 (Max 20)	6
4) Project Readiness (Max 5)	0
5) Benefits (Max 10)	0
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	0

### AEA Review Comments

The major weakness of this application is the lack of evidence of a geothermal resource, per the DGGS opinion. For this reason we cannot assess economic feasibility or other benefits. Other aspects, including the proposed team, are impressive and would bode well for a successful project.

AEA does not recommend this project for further consideration.

## App #18 Pike's Ridge Geothermal Final Design

**Resource:** Geothermal

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Naknek Electric Association

**AEA Program Manager:** David Lockard

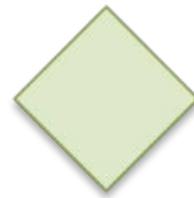
**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposes one 25 MW generator, with the option to bring on another 25 MW generator as demand warrants. In the applicant's B/C analysis, they assumed an average of 37.5 MW of generation capacity for the life of the project. For the AEA B/C analysis, the score is zero because of DNR's opinion that there is no evidence of a geothermal resource at this site.

## App #18 Pike's Ridge Geothermal Final Design

**Resource:** Geothermal

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Naknek Electric Association

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

## DNR/DGGS Geohazards Comments

## DNR/DGGS Feasibility Comments

The Alaska Division of Geological and Geophysical Surveys (ADGGS) has reviewed this proposal and recommends against providing funding. The available geological data and regional scientific information, as well as the information provided in this proposal, does not provide sufficient evidence for the existence of a sufficient geothermal resource, nor does it provide sufficient evidence for the potential of such a resource in the project area. If other data exists that provides reasonable evidence of a geothermal resource, ADGGS would be willing to include such new data in the interpretation and re-evaluate the potential for the project's success.

## DNR/DMLW Feasibility Comments

## App #19 Gustavus/Angoon/Wrangell/Nikiski Tidal Feasibility Study

**Resource:** Ocean/River

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Alaska Tidal Energy Company

**AEA Program Manager:** David Lockard

**Applicant Type:** Other

### Project Description

This project is a combination of selective reconnaissance, prototype testing, conflict assessment and comprehensive feasibility assessment to establish the feasibility of prospective pilot tidal energy development projects at four sites where Preliminary Permits have been issued by the Federal Energy Regulatory Commission (FERC). The four sites and respective communities served are: Icy Passage Icy Straits, serving the community of Gustavus; Angoon, serving the local Kootznoowoo community; Wrangell Narrows, potentially serving the community of Petersburg; and Central Cook Inlet near Nikiski, potentially supplying the communities in the service area of the Homer Electric Association.

### Funding & Cost

<b>Cost of Power:</b>	\$0.41 /kWh
<b>Requested Grant Funds:</b>	\$1,940,000
<b>Matched Funds Provided:</b>	\$515,000
<b>Total Potential Grant Amount:</b>	\$2,455,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

## App #19 Gustavus/Angoon/Wrangell/Nikiski Tidal Feasibility Study

**Resource:** Ocean/River

**Proposed Project Phase:** Feasibility Recon

**Proposer:** Alaska Tidal Energy Company

**AEA Program Manager:** David Lockard

**Applicant Type:** Other

### Scoring & Location



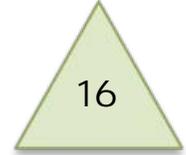
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 5, Cordova-Southeast Islands



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	15
2) Funding Resources (Max 25)	19
3) Project Feasibility from Stage 2 (Max 20)	6
4) Project Readiness (Max 5)	3
5) Benefits (Max 10)	2
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	1

### AEA Review Comments

The proposal is detailed and there is significant interest in tidal energy development for Alaska.

However, Gustavus will have hydro by 2009, Wrangell already has hydro, Angoon has an undeveloped hydro resource with the potential to provide excess and baseload power, and Nikiski has relatively cheap railbelt grid power as well as other alternatives (wind and hydro) that are commercial technologies. Although this is a demonstration project, the sites selected are less than optimal.

The recon portion of the project could be useful for gathering energy planning data.

Not recommended for funding.

## App #19 Gustavus/Angoon/Wrangell/Nikiski Tidal Feasibility Study

**Resource:** Ocean/River

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Alaska Tidal Energy Company

**AEA Program Manager:** David Lockard

**Applicant Type:** Other

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant provides information that merits a feasibility study. However, Petersburg (in Wrangell Narrows) has an excess of low-cost renewable hydroelectric energy, Gustavus is expected to bring a low-cost hydroelectric plant on line in early 2009, and Nikiski is connected to the Railbelt low-cost energy grid. The economics of these three projects are not likely to show a favorable benefit/cost ratio due to the existing infrastructure. No B/C ratio could be determined for this project with the information provided.

## App #19 Gustavus/Angoon/Wrangell/Nikiski Tidal Feasibility Study

**Resource:** Ocean/River

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Alaska Tidal Energy Company

**AEA Program Manager:** David Lockard

**Applicant Type:** Other

### DNR/DGGS Geohazards Comments

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

The Gustavus portion of the project may have certain issues that may effect National Park land and waters, depending on where they place it. Permitting challenges will be high for any project that is in park waters or are seen as directly affecting marine life going into the park. Gustavus just got a hydro project funded (part of another grant proposal) and in construction that may supply all power needs. Beluga whales were just placed on the endangered species list and therefore permitting just became more difficult for the Nikiski portion. This project has good merit but may have some permitting challenges.

## App #20 Metlakatla-Ketchikan Intertie Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction Design

**Proposer:** Metlakatla Indian Community

**AEA Program Manager:** Doug Ott

**Applicant Type:** Government Entity

### Project Description

This application proposes a Metlakatla-Ketchikan Intertie with 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 16 miles of overhead wood pole transmission line to be constructed on Annette Island between Metlakatla and Race Point and an approximate one mile submarine cable crossing of Revillagigedo Channel between Race 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. The Metlakatla-Ketchikan Intertie will provide benefits to both Ketchikan and Metlakatla, allowing for significantly improved utilization of Metlakatla's existing hydroelectric generating resources while reducing diesel generation in Ketchikan.

### Funding & Cost

<b>Cost of Power:</b>	\$0.10 /kWh
<b>Requested Grant Funds:</b>	\$7,152,000
<b>Matched Funds Provided:</b>	\$500,000
<b>Total Potential Grant Amount:</b>	\$7,652,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$820,000

**AEA Funding Recommendation:** \$820,000

### AEA Recommendation

- Full Funding
- ✗ Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #20 Metlakatla-Ketchikan Intertie Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction Design

**Proposer:** Metlakatla Indian Community

**AEA Program Manager:** Doug Ott

**Applicant Type:** Government Entity

### Scoring & Location



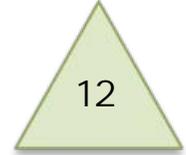
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 5, Cordova-Southeast Islands



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	4
2) Funding Resources (Max 25)	13
3) Project Feasibility from Stage 2 (Max 20)	19
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	9
6) Local Support (Max 5)	3
7) Sustainability (Max 5)	5

### AEA Review Comments

This project would follow an existing road and require a short submarine cable to interconnect the hydro resources of Metlakatla with the Ketchikan electric system. With the completion of the Swan-Tyee intertie this would extend the southern Southeast electrical network to Metlakatla. This project is one of a number of transmission and generation projects that would interconnect with the existing network. Because the Swan-Tyee intertie is expected to go into operation in late 2009, substantial excess Tyee hydro power will be available to Ketchikan. Therefore the Metlakatla-Ketchikan intertie may not be needed in the near term.

Permitting and design documents would be useful in the preparation of a regional integrated resource plan for the southern Southeast network. However, an integrated resource plan should be prepared before significant construction funding is provided to projects to be interconnected to this network. If the project receives state funds, AEA will require as a grant condition that ratepayers of all connected utilities receive equal generation and transmission rate treatment.

Recommend partial funding for design and permitting (tasks 1-3).

## App #20 Metlakatla-Ketchikan Intertie Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction Design

**Proposer:** Metlakatla Indian Community

**AEA Program Manager:** Doug Ott

**Applicant Type:** Government Entity

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant estimates that the project will provide for an offset of around 600,000 gallons of diesel fuel annually with 8,500,000 kWh or average annual energy delivered over the intertie. The applicant's reported B/C calculations, with intertie in operation in 2011, estimated the available diesel generation that could be displaced in Ketchikan at greater than 18,000,000 kWh/year and increasing, thus providing the opportunity for full utilization of MIC surplus capacity. Using Applicant's estimated fuel costs for Ketchikan of \$3.10/gallon (escalated at AEA rates) and a replacement energy cost to Ketchikan of \$0.085/kWh, the B/C ratio is 6.19.

An AEA analysis uses the same capital cost, but assumes 13 kWh /gal., the AEA fuel price estimate of \$5.07, escalated, and replacement energy at the Applicant expected cost of \$0.085/kWh beginning in 2011, the anticipated first year of intertie operation. However, the sales potential to Ketchikan is limited, as Tyee surplus will meet additional energy requirements for the foreseeable future. An assumption of 98% availability of Swan Lake and Tyee surplus to meet the needs provides a market opportunity of approx. 2,000,000 kWh. At that level of sales, the B/C is 2.26.

## App #20 Metlakatla-Ketchikan Intertie Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction  
Design

**Proposer:** Metlakatla Indian Community

**AEA Program Manager:** Doug Ott

**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #21 Humpback Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction Design

**Proposer:** Cordova Electric Cooperative

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

After a decade of declining performance and three years of no operation (2005 – 2008), due to unstable site geology and flooding, Cordova Electric Cooperative (CEC) has focused intense efforts on re-designing its Humpback Creek hydro-electric facility. Humpback Creek, named for the pink salmon that spawn in its mouth, is located five miles north of Cordova and is accessible only by boat. Submarine cable from the plant to Cordova City limits, and buried transmission lines to the CEC plant, connect the facility to Cordova. Because of its steep grade, fish are not able to migrate upstream and thus no fish populations will be affected by this project. From the original in-take structure to tidewater, Humpback Creek flows about 0.7 miles and drops from an elevation of 276 feet to where it enters saltwater Orca Inlet. Site visits by the project team to other small hydro-electric projects with a variety of in-take arrangements and a project workshop held in December, 2007 culminated in a new design with an intake/diversion that includes a tunnel, conventional side intake with provisions for sluicing sediment and a diversion dam with a sluice gate that will allow removal of stream bed material that may collect outside the intake. The new location facilitates much-improved access, a location with shallower bedrock substrate, and a better hydrological analysis. This project has been CEC's and the community of Cordova's top priority for the past three years, ever since October, 2006's 3,500-year return period flood event destroyed the intake/diversion facility. Project partners include the City of Cordova, the Federal Emergency Management Agency (FEMA), and the Eyak Corporation (for access).

### Funding & Cost

<b>Cost of Power:</b>	\$0.32 /kWh
<b>Requested Grant Funds:</b>	\$5,500,000
<b>Matched Funds Provided:</b>	\$6,100,000
<b>Total Potential Grant Amount:</b>	\$11,600,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$5,500,000

**AEA Funding Recommendation:** \$4,000,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #21 Humpback Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction Design

**Proposer:** Cordova Electric Cooperative

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



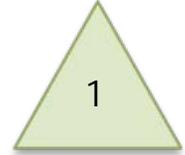
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Copper River/Chugach

**Election District:** 5, Cordova-Southeast Islands



**Rank within Region**  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	12
2) Funding Resources (Max 25)	25
3) Project Feasibility from Stage 2 (Max 20)	19
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	9
6) Local Support (Max 5)	4
7) Sustainability (Max 5)	5

### AEA Review Comments

Cordova Electric proposes to relocate and refurbish the existing Humpback Creek hydro project, currently inoperational after a fire and a flood in 2005 and 2006 thus doubling the life of the project and increasing energy output by 60%. 90% design is complete, and there is substantial support from the local Native corporation and fish procesors, cost share by FEMA. FERC has issued or soon will issue a license for the rebuild. Construction schedule indicates completion by end of 2009. Recommend full funding of \$5,500,000.

## App #21 Humpback Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction Design

**Proposer:** Cordova Electric Cooperative

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Humpback Creek functioned successfully in Cordova as a run-of-river project until rendered inoperative by flooding and unstable site geology. The capital improvement now underway involves not only repair but also upgrade and revision of the project to protect it from future damage from similar events and conditions. The B/C ratio benefits from the fact that \$4 million of the total \$11.6 million cost has already been spent.

Most of the project's potential output will displace an equivalent amount of diesel generation in Cordova as soon as the project comes back online. A small surplus from the project will still be available in the summer and may be absorbed by increased demand from fish processing operations. This evaluation, however, is based solely on the displacement of current diesel generation at the current level of electricity demand in Cordova. Based on these assumptions on remaining capital cost and the benefit of diesel generation displacement, the B/C ratio is estimated at 4.54.

## App #21 Humpback Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design

**Proposer:** Cordova Electric Cooperative

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #22 Cordova Heat Recovery Construction

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction Design

**Proposer:** Cordova Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

Cordova Electric Cooperative (CEC) proposes to serve as a model for rural Alaska utilities by installing an ORC heat recovery unit that will capture waste heat and increase diesel generator electrical production by an additional four to six percent. The average electric production efficiency of CEC's Orca Power Plant is 13.65 kWh/gallon of diesel. CEC has placed a deposit on a new, 3.6 MW rated, EMD 710 series, 20 cylinder diesel generator. The efficiency of the new generator is expected to peak at 15 kWh/gallon. Cordova Electric Cooperative desires fit the EMD with an organic Rankine Cycle (ORC) heat recovery system that will capture additional BTUs that would otherwise be wasted energy. CEC is the sole provider of power to the City of Cordova, Alaska.

### Funding & Cost

<b>Cost of Power:</b>	\$0.32/kWh
<b>Requested Grant Funds:</b>	\$1,780,000
<b>Matched Funds Provided:</b>	\$3,480,000
<b>Total Potential Grant Amount:</b>	\$5,260,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$1,780,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$1,780,000

## App #22 Cordova Heat Recovery Construction

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction Design

**Proposer:** Cordova Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



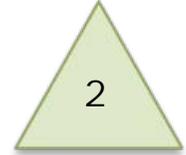
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Copper River/Chugach

**Election District:** 5, Cordova-Southeast Islands



Rank within Region  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	12
2) Funding Resources (Max 25)	24
3) Project Feasibility from Stage 2 (Max 20)	18
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	10
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	5

### AEA Review Comments

Project appears viable but proposer does not provide adequate level of detail on design, cost estimate, ORC equipment and integration, and schedule. Recommend full funding and careful review of final design by AEA project manager prior to release of construction funds.

## App #22 Cordova Heat Recovery Construction

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction Design

**Proposer:** Cordova Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant capital cost figures were reviewed and accepted, totaling \$5,260,000 for installation of the complete waste heat recovery system. In this analysis, only the heat recovery efficiency gains were weighed against the \$1.78 million in capital costs for this component of their project. Construction is expected to be completed in 2009 and heat recovery operational in fall of 2009. Operation and maintenance expenditures were forecasted to be the same as current O&M. The Benefit/Cost calculation relies on the capital cost vs. future fuel savings.

In the B/C analysis no fuel savings were calculated for 2009, it is conservative. The efficiency gains replace about 880,000kWh of generation annually, and the estimated annual savings exceed \$300,000. The technology is well known, the applicant clearly capable of performing the work and the benefits carefully measured. Benefit cost ratio 2.33.

**App #22 Cordova Heat Recovery Construction**

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction  
Design

**Proposer:** Cordova Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #23 Coffman Cove-Naukati Intertie Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction

**Proposer:** Alaska Power & Telephone Company

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

This proposal is for the North Prince of Wales Island Intertie Project (Project). Alaska Power and Telephone (AP&T) proposes to construct a line extension to the communities of Coffman Cove and Naukati Bay, placing these communities on the Prince of Wales Island (POW) electric grid which is supplied with renewable energy from two hydroelectric projects. Both of these communities currently rely on 100% diesel generation for electricity. The total line is to be 48 miles (Coffman Cove = 37 miles; Naukati Bay = 11 miles) of overhead 4/0 ACSR three-phase 34.5 kV line with a 1/0 ACSR neutral conductor on single pole wood structures. This line extension will come off the existing 34.5 kV line from between Klawock and Thorne Bay, near Control Lake. Naukati Bay is 11 miles off the main road to Coffman Cove.

### Funding & Cost

<b>Cost of Power:</b>	\$0.60/kWh
<b>Requested Grant Funds:</b>	\$3,752,181
<b>Matched Funds Provided:</b>	\$2,402,838
<b>Total Potential Grant Amount:</b>	\$6,155,019
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$3,752,181

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$3,752,181

## App #23 Coffman Cove-Naukati Intertie Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction

**Proposer:** Alaska Power & Telephone Company

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



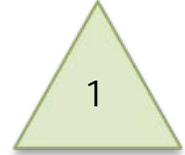
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 1, Ketchikan



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	23
2) Funding Resources (Max 25)	24
3) Project Feasibility from Stage 2 (Max 20)	19
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	10
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	5

### AEA Review Comments

Applicant proposes to construct an intertie from southern to northern Prince of Wales Island, thus providing hydropower to Naukati and Coffman Cove, currently generating with diesel. Balance of project funding \$2,402,838 is provided by the Denali Commission under the Energy Cost Reduction Program announced in 2008.

Recommend up to full funding of \$3,752,181.

## App #23 Coffman Cove-Naukati Intertie Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction

**Proposer:** Alaska Power & Telephone Company

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



For evaluation of the Reynolds Creek hydro project, an electricity demand forecast was used that shows significant growth for all communities on Prince of Wales (POW) Island. This forecast is the “reference case” developed for the 2007 AK-BC Intertie Feasibility Study, adjusted upwards for expected demand from a new cold storage facility in Craig and for significant conversions from oil to electric heat starting in 2012 rather than 2020.

For consistency, this forecast is used to evaluate the proposed North POW intertie that would connect Coffman Cove and Naukati Bay to the existing grid. However, by assuming such demand growth, the existing surplus of hydroelectric energy on POW Island would be quickly used up. Since the rationale of the North POW intertie is to displace diesel generation in Coffman Cove and Naukati Bay with surplus hydroelectric power, this demand growth assumption quickly negates the economic benefits of the proposed line unless additional hydroelectric resources become available.

For this reason, the North POW intertie proposal is evaluated only in conjunction with the proposed Reynolds Creek hydroelectric project. Given the demand growth forecast, the intertie cannot be cost-effective unless combined with additional hydroelectric resources on the island. When Reynolds Creek and the North POW intertie are evaluated as if they were a single, combined project, the B/C ratio is estimated at 3.08.

## App #23 Coffman Cove-Naukati Intertie Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction

**Proposer:** Alaska Power & Telephone Company

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #24 Yerrick Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Power & Telephone Company

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

Alaska Power and Telephone (AP&T) proposes to construct the 2.0 MW Yerrick Creek Hydroelectric Project (Project) located on Yerrick Creek, approximately 20 miles west of Tok. The Project would off-set diesel generation which presently supplies power to the communities of Tetlin, Tanacross, Dot Lake, and Tok. The Project will consist of a small diversion structure, approximately 15,000 feet of penstock, powerhouse with a single generating unit, tailrace, small substation, and transmission line. The Project operation will be run-of-river; annual generation is expected to be approximately 4,900 MWh/yr (approximately 40% of the interconnected load). The Project will provide clean, renewable electricity, as well as rate stabilization. The cost to maintain a hydro project is also significantly lower than diesel generation.

### Funding & Cost

<b>Cost of Power:</b>	\$0.49/kWh
<b>Requested Grant Funds:</b>	\$11,600,000
<b>Matched Funds Provided:</b>	\$2,900,000
<b>Total Potential Grant Amount:</b>	\$14,500,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

## App #24 Yerrick Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Power & Telephone Company

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



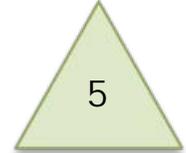
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Yukon-Koyukuk/Upper Tanana

**Election District:** 6, Interior Villages



**Rank within Region**  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	18
2) Funding Resources (Max 25)	20
3) Project Feasibility from Stage 2 (Max 20)	17
4) Project Readiness (Max 5)	2
5) Benefits (Max 10)	9
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	5

### AEA Review Comments

The powerhouse, access road, and a portion of the penstock would be located on Tanacross Inc. land. AEA contact with village corp president Bob Brean indicates potential controversy. Feasibility analysis funded through DC/AEA Alt Energy RFP is pending. AP&T has \$1.675 million from USDA Rural Utilities Service for the project. Recommend no funding at this time. Following completion of design and permitting, including resolution of land use authorizations with Tanacross Inc., AP&T can apply to the RE Fund for construction funding.

## App #24 Yerrick Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Power & Telephone Company

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant states that Yerrick Creek hydro would displace approximately 40% of existing diesel generation for Tok and connected, nearby communities. During high flows in the summer, the project might be able to serve 100% of the connected load. During low flows in the winter, however, the utility would continue to rely mostly on diesel generation. Based on the applicant's estimate of hydro output and project costs, the B/C ratio is estimated at 2.76.

## App #24 Yerrick Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design

**Proposer:** Alaska Power & Telephone Company

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #25 Haines Ground Source Heat Pump Construction

**Resource:** Geothermal

**Proposed Project Phase:** Construction Design

**Proposer:** Haines Assisted Living, Inc

**AEA Program Manager:**

**Applicant Type:** IPP

### Project Description

In July 2008, Haines Assisted Living, Inc. (HAL) began construction on a senior assisted living/ residential complex comprising a total of 26,000 SF. Residents of Haines and Southeast Alaska will utilize the senior assisted living and senior affordable housing being built in 2008–2010. The first phase of the project will be completed in the fall of 2009 at a cost of over \$4 million. Key to the long term sustainability of the facility is the installation of a Ground Source Heat Pump to extract geothermal energy from the earth and circulate it through a radiant in-floor heating system. The initial feasibility and design has been completed as the follow-up to an extensive energy life-cycle cost analysis performed in 2007 and updated in October 2008. The designed system estimate of 210% efficiency will eliminate fossil fuel consumption in favor of renewable geo-thermal heat source and local hydro-electric power and result in significant operational savings for the life of the facility. Haines Assisted Living, Inc., Dan Austin, Project Manager and Jim Rehfeldt, Alaska Energy Engineering LLC are the principals involved in this grant project.

### Funding & Cost

<b>Cost of Power:</b>	\$0.23/kWh
<b>Requested Grant Funds:</b>	\$1,432,906
<b>Matched Funds Provided:</b>	\$946,101
<b>Total Potential Grant Amount:</b>	\$2,379,007
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- ✗ Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$0

**App #25 Haines Ground Source Heat Pump Construction**

**Resource:** Geothermal

**Proposed Project Phase:** Construction Design

**Proposer:** Haines Assisted Living, Inc

**AEA Program Manager:**

**Applicant Type:** IPP

**Scoring & Location**



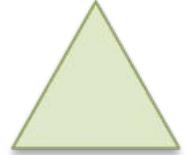
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Southeast

**Election District:**



Rank within Region  
(out of )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	9
2) Funding Resources (Max 25)	
3) Project Feasibility from Stage 2 (Max 20)	
4) Project Readiness (Max 5)	
5) Benefits (Max 10)	
6) Local Support (Max 5)	
7) Sustainability (Max 5)	

**AEA Review Comments**

**App #25 Haines Ground Source Heat Pump Construction**

**Resource:** Geothermal

**Proposed Project Phase:** Construction Design

**Proposer:** Haines Assisted Living, Inc

**AEA Program Manager:**

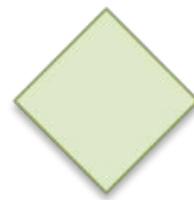
**Applicant Type:** IPP

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



## App #25 Haines Ground Source Heat Pump Construction

**Resource:** Geothermal

**Proposed Project Phase:** Construction  
Design

**Proposer:** Haines Assisted Living, Inc

**AEA Program Manager:**

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #26 Cordova Wood Processing Plant Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction

**Proposer:** Native Village of Eyak

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Project Description

The project is located in Cordova, Alaska. Affordable fuel wood is available to the community, from donated lots at an old sort yard and from an airport clearing project. We are asking for assistance with purchasing a processing mill, yarding the logs, and cutting the logs into split firewood. The Eyak Corporation owns several log sort yards which they have generously donated to the village for firewood use. The State of Alaska has offered down logs from the airport clearing project. To efficiently process this wood, we will purchase a firewood processing mill, set it up and train the operators. The mill will enable us to process firewood in a timely manner to be able to distribute an abundant amount of firewood to the community. We will mill approximately 3,421 cords of firewood. The supply for this will come from existing log decks and the airport clearing project. The firewood will be distributed to our elders at no cost and the rest of the community will be asked to contribute \$50 per cord to sustain the program. The money generated will help pay for labor costs of processing the firewood in future years. This project will provide 37.2 billion BTU's of low cost energy for home heating and will offset 312.6 thousand gallons of fuel oil and save \$1.58 million this winter in home heating costs for Cordova.

### Funding & Cost

<b>Cost of Power:</b>	\$0.32/kWh
<b>Requested Grant Funds:</b>	\$364,225
<b>Matched Funds Provided:</b>	\$264,600
<b>Total Potential Grant Amount:</b>	\$628,825
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$147,720

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$147,720

## App #26 Cordova Wood Processing Plant Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction

**Proposer:** Native Village of Eyak

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Scoring & Location



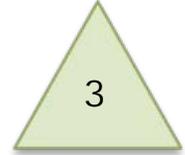
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Copper River/Chugach

**Election District:** 5, Cordova-Southeast Islands



**Rank within Region**  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	12
2) Funding Resources (Max 25)	23
3) Project Feasibility from Stage 2 (Max 20)	16
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	9
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	2

### AEA Review Comments

Project appears to be well-conceived and a practical way to use a local energy resource. We are concerned about efficiency of the current residential woodstoves and possible health impacts from increased smoke. We do not recommend funding for processing and distributing the firewood. Recommend funding for only firewood processor equipment and freight as quoted (\$147,720).

Recommend at lower project cost.

**App #26 Cordova Wood Processing Plant Construction**

**Resource:** Biomass

**Proposed Project Phase:** Construction

**Proposer:** Native Village of Eyak

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposed to construct a wood processing plant. AEA biomass cost calculations were linked to real price increases (forecast by ISER) as they will move upward (or downward) as a substitute for heating oil. This short-term project (five years) will process existing biomass (wood) for Year one and Year two, while supplies for Years three to five are less defined. Estimated B/C ratio is 19.92 by the applicant and the Evaluator's figure is 20.31.

## App #26 Cordova Wood Processing Plant Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction

**Proposer:** Native Village of Eyak

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #27 Allison Lake Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Design  
Feasibility

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

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

The Allison Lake Hydroelectric Project is located adjacent to the Prince William Sound, immediately south of Valdez, Alaska. Copper Valley Electric Association (CVEA) is a member-owned electric cooperative providing central station electrical service to a relatively large geographical area of Eastern Interior and Gulf Coast Alaska. CVEA is a stand-alone (not interconnected to another power system) electric utility. The service territory is divided into two districts, the Valdez district and the Copper River Basin district. The Valdez district is comprised of the organized area of the City of Valdez. The Copper Basin district incorporates many outstretched communities including: Glennallen, Gakona, Gulkana, Tazlina, Copper Center, Kluti-Kaah, Copperville, Kenny Lake, Tolsona, Mendeltna, Nelchina, Eureka, and Sheep Mountain. CVEA's personnel are extensively involved with the Allison Lake Project. CVEA has hired Hatch Acres to assist in coordinating the work and field studies and license application.

### Funding & Cost

<b>Cost of Power:</b>	\$0.17 /kWh
<b>Requested Grant Funds:</b>	\$2,288,000
<b>Matched Funds Provided:</b>	\$572,000
<b>Total Potential Grant Amount:</b>	\$2,860,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$2,288,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$2,288,000

## App #27 Allison Lake Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Design Feasibility

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

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



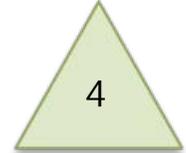
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Copper River/Chugach

**Election District:** 12, Richardson-Glenn Highways



Rank within Region  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	6
2) Funding Resources (Max 25)	19
3) Project Feasibility from Stage 2 (Max 20)	19
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	10
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

Applicant proposes feasibility assessment and final design/permitting for a hydro project at Allison Lake that will result in up to 4 MW added capacity and energy production of 20.5-24.7 GWh/yr. Recon work indicates substantial benefit, and utility Copper Valley Electric has demonstrated track record in hydro development and operation.

Recommend full funding.

## App #27 Allison Lake Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Design  
Feasibility

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

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Copper Valley Electric Assoc. (CVEA) serves Valdez, Glennallen, and several smaller load centers in between. The Solomon Gulch hydroelectric project supplies all of CVEA's requirements during the summer but, due to limited storage capability, contributes much less during the winter. In an average year, Solomon Gulch supplies approximately 60% of CVEA's requirements while oil-based generation supplies the other 40%. The Allison Lake hydro project would address this seasonal issue –during the winter it would supply power to displace oil-fired generation; during the summer its reservoir would be refilled.

The largest share of CVEA's oil-based generation is supplied from a cogeneration plant located at the Petro Star refinery in Valdez. The plant produces electricity for the utility as well as process heat for the refinery. CVEA indicates that most of the oil-fired generation that Allison Lake would displace would come from this cogeneration plant. The evaluation therefore includes as its major benefit the oil fuel that is now consumed at the cogeneration plant but would be displaced by Allison Lake hydro. What the evaluation does not account for is the additional fuel that the refinery would need to consume for its process heat requirements once deprived of the heat produced from the cogeneration plant. This is due to lack of information at this early stage of project consideration.

The price of fuel used in this evaluation is the price supplied by CVEA. For whatever reason(s), it is significantly below the price that would have been used had it been based on AEA's fuel price methodology. So, while accounting for Petro Star's need to use additional fuel would have reduced the B/C ratio, a fuel price consistent with AEA methodology would have increased it. These qualifications having been stated, the B/C ratio for this evaluation came out to 4.81.

## App #27 Allison Lake Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Design  
Feasibility

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

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #28 Hoonah - Hawk Inlet Intertie Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction Design

**Proposer:** Kwaan Electric Transmission Intertie Cooperative, Inc (KWETICO)

**AEA Program Manager:** Jim Strandberg

**Applicant Type:** Utility

### Project Description

Hoonah-Hawk Intertie will begin at the Hawk Inlet submarine cable termination yard on Admiralty Island as a continuation of the 69-kV line from Juneau. The cable termination yard will be located on the eastern shore approximately 2.75 miles up Hawk Inlet just inland from the shoreline and the submarine cable will be buried as it leaves the yard and proceeds offshore. The total length of the submarine cable is approximately 25 miles. Kwaan Electric Intertie Cooperative, Inc. (KWETICO) will own and operate the transmission line however Inside Passage Electric Cooperative (IPEC) will continue as the utility providing electrical service to the Hoonah area. IPEC will purchase power from Alaska Electric Light & Power (AEL&P), KWETICO will charge IPEC a wheeling rate for providing power to Hoonah who will be the primary community served along with the old Whitestone Logging Camp. This project is part of the overall Southeast Intertie plan commissioned and supported by Southeast Conference and regional leaders.

### Funding & Cost

<b>Cost of Power:</b>	\$0.61 /kWh
<b>Requested Grant Funds:</b>	\$36,709,970
<b>Matched Funds Provided:</b>	\$750,000
<b>Total Potential Grant Amount:</b>	\$37,459,970
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$0

## App #28 Hoonah - Hawk Inlet Intertie Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction Design

**Proposer:** Kwaan Electric Transmission Intertie Cooperative, Inc (KWETICO)

**AEA Program Manager:** Jim Strandberg

**Applicant Type:** Utility

### Scoring & Location



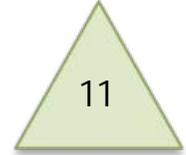
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 5, Cordova-Southeast Islands



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	23
2) Funding Resources (Max 25)	12
3) Project Feasibility from Stage 2 (Max 20)	12
4) Project Readiness (Max 5)	1
5) Benefits (Max 10)	5
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	4

### AEA Review Comments

This project would result in significant savings to the Hoonah ratepayer but the project has a very high capital cost. According to the brief economic analysis completed as part of AEA review, the project has a benefit to cost ratio over 1 if it is assumed that hydropower is available from the Alaska Electric Light and Power system. The estimated capital cost has risen from \$37 million to over \$40 million. Other factors that might influence economics are decreased availability of potentially recoverable heat in Hoonah if diesel generation is curtailed, and the existence of other potentially viable hydro and geothermal projects in the Hoonah area.

If the project receives state funds, AEA will require as a grant condition that Hoonah residents receive rate treatment equal to Juneau residents.

If the intertie connects to Hoonah, the Two-County Rule introduces considerable uncertainty in the tax-exempt status of the Snettisham Hydro project, the main generation source for the Juneau area. AEA understands that, although there have been attempts to resolve the issue, at present there is no resolution. Therefore, the continuing uncertainty of the intertie on the Snettisham project's tax exempt financing is considered in AEA's review of this proposal.

AEA does not recommend that this project be funded because: 1) the high capital cost of the project, 2) continuing uncertainty of the impact of the project on Snettisham financing, and 3) the existence of other potentially viable hydro and geothermal projects in the Hoonah area.

**App #28 Hoonah - Hawk Inlet Intertie Construction**

**Resource:** Transmission

**Proposed Project Phase:** Construction Design

**Proposer:** Kwaan Electric Transmission Intertie Cooperative, Inc (KWETICO)

**AEA Program Manager:** Jim Strandberg

**Applicant Type:** Utility

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant provided the following estimates: construction cost: \$37.4 million, O&M: \$47,180/year - this is offset in part by \$2,866/year savings in air permit fees, displaced diesel generation: 4,878,261 kWh, displaced fuel: 376,451 gallons based on achieved efficiency of 12.96 kWh/gallon for year. Based on this data, AEA fuel cost estimates, and 3 percent (real) discount rate, the B/C ratio for the Applicant was calculated as 1.15 over a 40-year period. It is assumed that all replacement generation is from hydro and any marginal costs of generation are not included in the analysis.

AEA-based B/C ratio was based on the following estimates: construction cost: use same as applicant, displaced diesel O&M: \$0.02/kWh applied to displaced diesel generation = \$97,565, intertie O&M: use same as applicant, and displaced fuel based on displaced diesel generation, PCE generating statistics

The primary reason for the difference is the difference in generating efficiency assumed. Based on the revised data assumptions, a B/C ratio of 1.10 was calculated for a 50-year analysis period.

## App #28 Hoonah - Hawk Inlet Intertie Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction  
Design

**Proposer:** Kwaan Electric Transmission Intertie  
Cooperative, Inc (KWETICO)

**AEA Program Manager:** Jim Strandberg

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #29 Kake-Petersburg Intertie Final Design

**Resource:** Transmission

**Proposed Project Phase:** Design

**Proposer:** Kwaan Electric Transmission Intertie Cooperative, Inc (KWETICO)

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

The applicant, along with the State Department of Transportation (ADOT), proposes to build a road and 69-kV transmission line to connect the community of Kake with Petersburg. The road/intertie will allow the delivery of surplus hydropower available from the Tyeer project to Kake and eliminate its total reliance upon diesel generation. The community of Kake will continue to be served by the Inside Passage Electric Cooperative (IPEC). The transmission line infrastructure will be owned and operated by the Kwaan Electric Intertie Cooperative, Inc. (KWETICO, the applicant), who will charge IPEC for wheeling power to Kake. The road project will allow Kake citizens access to Petersburg's infrastructure including major air transportation, medical facilities, more frequent ferry service, engine repair facilities, and various services and industries not available in Kake. The Intertie will also provide broadband telecommunications to the community of Kake, and savings to the State's Power Cost Equalization Program. The project is part of the overall Southeast Intertie plan commissioned and supported by Southeast Conference and regional leaders. The road/Intertie dual construction will save money for both ADOT and KWETICO, and will facilitate access to the transmission line for repairs and maintenance.

### Funding & Cost

<b>Cost of Power:</b>	\$0.61 /kWh
<b>Requested Grant Funds:</b>	\$2,990,000
<b>Matched Funds Provided:</b>	\$2,500,000
<b>Total Potential Grant Amount:</b>	\$5,490,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$2,990,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$2,990,000

## App #29 Kake-Petersburg Intertie Final Design

**Resource:** Transmission

**Proposed Project Phase:** Design

**Proposer:** Kwaan Electric Transmission Intertie Cooperative, Inc (KWETICO)

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



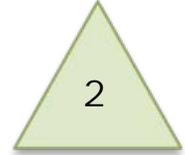
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 5, Cordova-Southeast Islands



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	23
2) Funding Resources (Max 25)	23
3) Project Feasibility from Stage 2 (Max 20)	13
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	4
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	4

### AEA Review Comments

This project is structured as an integrated road-intertie project in a 300' right-of-way through USFS land that was previously granted to DOT/PF through federal congressional action. The project will address both the road and intertie in a cost-effective manner. Savings for intertie construction are calculated to be \$8 million if projects occur together. The intertie would result in lowering Kake power costs significantly. AEA expects DOT/PF to fully participate in the project.

Design documents would be useful in the preparation of a regional integrated resource plan for the southern Southeast network. An integrated resource plan should be prepared before significant construction funding is provided to projects to be interconnected to this network. If the project receives state funds, AEA will require as a grant condition that ratepayers of Kake and its distribution utility IPEC receive generation and transmission rate treatment equal to other distribution utilities on the network.

Recommend.

## App #29 Kake-Petersburg Intertie Final Design

**Resource:** Transmission

**Proposed Project Phase:** Design

**Proposer:** Kwaan Electric Transmission Intertie Cooperative, Inc (KWETICO)

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant states that the intertie project will offset 196,027 gallons of diesel fuel equal to 2,531,000 kWh of generation at 12.9 kWh/gallon. The applicant's B/C calculations, with intertie in operation in 2012, indicate a portion of generation will remain, presumably for line outages and other system requirements, estimated at 3% of full diesel requirements. Applicant estimated displaced variable O&M at \$.08/kWh. Capital costs are provided by the applicant for the Base Case and Renewable Case. An entry of \$4.1 million in capital costs are included in the base case with no explanation, and have been removed pending additional support. Applicant B/C analysis, before adjustment, is 0.92 and after 0.84 after adjustment. Applicant did not include replacement energy for displaced generation, the B/C ratio is only from the installed cost of the intertie and the displaced diesel fuel and O&M.

AEA analysis uses \$40,000,000 capital cost and includes replacement energy at the Applicant expected cost of \$0.068/kWh beginning in 2013, the anticipated first year of intertie operation. Estimated B/C ratio is 0.56.

## App #29 Kake-Petersburg Intertie Final Design

**Resource:** Transmission

**Proposed Project Phase:** Design

**Proposer:** Kwaan Electric Transmission Intertie Cooperative, Inc (KWETICO)

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #30 McGrath Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction Design

**Proposer:** McGrath Power and Light

**AEA Program Manager:** Ron Brown

**Applicant Type:** Utility

### Project Description

This application supports a wood heating project in McGrath, Alaska. A wood energy supply analysis, and a Level 2 Feasibility (in writing phase) and conceptual design analysis has been completed for a district heating loop for downtown McGrath to include in addition to residences, larger consumers; School District Office Building (offices, Museum, Library), Captain Snow Center, (including Water Treatment Plant, Southcentral Foundation offices and current Health Center, Alaska State Troopers, Washeteria & Showers, District Court, city offices and meeting hall), Post Office, new Health Center, (to be built), DNR Forestry & Wildfire Center, new Tribal Center (Village Council offices and Community Hall), and KSKO Public Radio Station. This Level 2 study has not yet been coordinated with an analysis for a heat recovery project being proposed by ML&P and Alaska Energy and Engineering (AE&E). The biomass project will link and integrate with the heat recovery project in future iterations of design and cost analysis in order to capture the synergies from both to create an optimum design. A side by side analysis of both chip boilers (Köb) and stick fired boilers (Garr) with estimated cost analysis and net simple payback for individual buildings was conducted in the feasibility assessment (calculations attached). The chip fired boilers will require approximately 2000 tons of chips annually modeled at 40% moisture content to displace up to 125,000 gallons of fuel or 98% of oil used in these commercial buildings at a cost of between \$28.88 – \$36.10/MMBTUs or between \$4-\$5 on a per gallon equivalent compared to \$50.54/MMBTU for fuel oil (\$7.00/gal). This project is planned to be conducted in concert with the Village Safe Water project to replace the entire water main system in McGrath in 2009-2011. The integration of these two projects has the potential to produce significant cost savings for installation of piping, the most expensive portion of the project. Both projects have been developed through technical support from Alaska Village Initiatives, and McGrath Light & Power and e-Four Engineering. Principle personnel to date include Bill Wall, PhD, Peter Olsen, Ernie Baumgartner, and Greg Koontz, ME, George Wilson, ME of Village Safe Water. Linkages are planned with Steven J. Stassel, P.E., President AE&E.

### Funding & Cost

<b>Cost of Power:</b>	\$0.61 /kWh
<b>Requested Grant Funds:</b>	\$3,052,000
<b>Matched Funds Provided:</b>	\$953,000
<b>Total Potential Grant Amount:</b>	\$4,005,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$322,000

### AEA Recommendation

- Full Funding
- ✗ Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$322,000

## App #30 McGrath Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction Design

**Proposer:** McGrath Power and Light

**AEA Program Manager:** Ron Brown

**Applicant Type:** Utility

### Scoring & Location



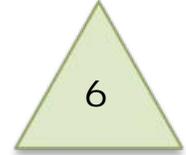
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Yukon-Koyukuk/Upper Tanana

**Election District:** 6, Interior Villages



Rank within Region  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	23
2) Funding Resources (Max 25)	23
3) Project Feasibility from Stage 2 (Max 20)	11
4) Project Readiness (Max 5)	3
5) Benefits (Max 10)	4
6) Local Support (Max 5)	4
7) Sustainability (Max 5)	3

### AEA Review Comments

Application refers to a feasibility study that has not been finalized. This is a community wood heating system that combines wood harvest and transport, combustion, district heating and energy sales. The project will likely interact with proposal number 61-McGrath (diesel) heat recovery, but is expensive and appears uneconomic as proposed. Since this is a large project with considerable risk and uncertainty, it should be developed in a stepwise manner with stakeholder input. AEA and MP&L jointly defined a diesel heat recovery and wood heated district heating system project in 2001 that appeared economically viable. We recommend granting \$225,000 to MP&L for feasibility and final design (milestones 1-8) in conjunction with proposal 61. If the project is favorable, then ML&P can request construction funding from the RE Fund during round 3.

Recommend at lower funding level.

**App #30 McGrath Central Wood Heating Construction**

**Resource:** Biomass

**Proposed Project Phase:** Construction Design

**Proposer:** McGrath Power and Light

**AEA Program Manager:** Ron Brown

**Applicant Type:** Utility

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposed to construct a central wood heating system. This capital intensive project will substitute for 16 older boilers. Initial applicant fuel cost was \$7 per gallon, however, for consistency, ISER prices were used. AEA biomass cost calculations were linked to real price increases (forecast by ISER) as they will move upward (or downward) as a substitute for heating oil. New systems are proposed to come on line in 2011 and no fuel displacement is forecast until then. Estimated B/C ratio is -0.06 by the applicant and the Evaluator's figure is 0.01.

## App #30 McGrath Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design

**Proposer:** McGrath Power and Light

**AEA Program Manager:** Ron Brown

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

The Alaska Wood Energy Task Force completed the feasibility study for this project. Large heat demand makes this a viable project. Lands for biomass harvesting have not yet been identified. Alder is the proposed biomass source. Proposed boilers are both manual feed which will require commitments of personnel.

## App #31 Fort Yukon Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction Design

**Proposer:** Gwitchyaa Zhee Utility Company

**AEA Program Manager:** Ron Brown

**Applicant Type:** Utility

### Project Description

This application supports a wood heating project in Fort Yukon, Alaska. A wood energy supply analysis, and a feasibility and conceptual design analysis has been completed for a district heating loop for downtown Fort Yukon to include the School, Gym, AC Store, School District Office, Water Plant, Post Office and two stand alone boilers; one at the new CATG Clinic and the other heating the Voc Ed Complex. The three chip fired boilers will require approximately 2000-2500 tons of chips depending on moisture content to displace up to 135,347 gallons of fuel or 90% of oil used in these commercial buildings at a cost of approximately \$20/MMBTU (\$200/ton) for chips compared to \$46.93/MMBTU for fuel oil (\$6.50/gal). This project is being conducted in concert but as a separate project with a project funded by Denali Commission, US DOE through an Alaska Village Initiatives earmark, and GZ Corporation to develop a wood harvesting system, wood yard and a wood energy utility to supply and maintain the boilers

### Funding & Cost

<b>Cost of Power:</b>	\$0.45 /kWh
<b>Requested Grant Funds:</b>	\$2,945,991
<b>Matched Funds Provided:</b>	\$1,200,000
<b>Total Potential Grant Amount:</b>	\$4,145,991
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$210,000

**AEA Funding Recommendation:** \$210,000

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #31 Fort Yukon Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction Design

**Proposer:** Gwitchyaa Zhee Utility Company

**AEA Program Manager:** Ron Brown

**Applicant Type:** Utility

### Scoring & Location



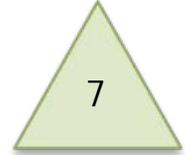
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Yukon-Koyukuk/Upper Tanana

**Election District:** 6, Interior Villages



Rank within Region  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	17
2) Funding Resources (Max 25)	22
3) Project Feasibility from Stage 2 (Max 20)	13
4) Project Readiness (Max 5)	3
5) Benefits (Max 10)	6
6) Local Support (Max 5)	3
7) Sustainability (Max 5)	4

### AEA Review Comments

The proposal is somewhat unclear as to who will manage the project. Sec 3.1 applicant states "A construction manager will be hired through AEA..." We assume that the applicant will manage the project.

This project was configured using stick-fired combustors under the application received by AEA and the Denali Commission. Chip-fired systems proposed are more complex and costly. We question whether they are appropriate for a remote community.

Application refers to a feasibility study that has not been finalized. This is a community wood heating system that combines wood harvest and transport, combustion, district heating and energy sales. Since this is a large project with considerable risk and uncertainty, it should be developed in a stepwise manner. Economics appear favorable, and there has been considerable federal investment in the project (DC and USDOE). Recommend funding to final design and permitting (stages 1-8) only because applicant has not yet established final design concept.

Recommend at lower funding level.

## App #31 Fort Yukon Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction Design

**Proposer:** Gwitchyaa Zhee Utility Company

**AEA Program Manager:** Ron Brown

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposed to construct a central wood heating system. Fuel displacement is estimated to occur at 90 percent overall for eight oil-fired boilers at the School, Gym, AC Store and other locations. The system life was forecast at 15 years with fuel displacement from three boilers fueled with wood chips. ISER fuels costs for Fort Yukon were used for both applicant and AEA calculations; AEA biomass cost calculations were linked to real price increases (forecast by ISER) as they will move upward (or downward) as a substitute for heating oil. In addition, the AEA operational life was extended to 20 years to meet project standards. Estimated B/C ratio is 0.92 by the applicant and the Evaluator's figure is 1.14.

## App #31 Fort Yukon Central Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design

**Proposer:** Gwitchyaa Zhee Utility Company

**AEA Program Manager:** Ron Brown

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

The Alaska Wood Energy Task Force completed the feasibility study for this project; large heat demand makes it a viable project. The DNR Division of Forestry participated in development of a forest stewardship plan for Native lands around Fort Yukon in support of this project.

## App #32 Statewide Biomass Reconnaissance Study

**Resource:** Biofuels

**Proposed Project Phase:** Recon

**Proposer:** University of Alaska, Fairbanks

**AEA Program Manager:**

**Applicant Type:** Government Entity

### Project Description

The project addresses the availability, quality and feasibility of sustainable, economic use of agricultural and forestry biomass in Alaska. The goal of the project is to 1) assimilate all existing information on the total forest and crop biomass available in Alaska into one data base, 2) determine the gaps in the data base and the information needed to fill the gaps, and 3) determine the biological, physical, and economic feasibility of using Alaskan biomass as biofuels. The impetus for the Study is the biomass/coal-to-liquids plant proposed for the Fairbanks area and its need for commercial/industrial-scale volumes of biomass fuel stocks. Work will take place in Fairbanks and Palmer, Alaska.

### Funding & Cost

<b>Cost of Power:</b>	\$0.40/kWh
<b>Requested Grant Funds:</b>	\$286,149
<b>Matched Funds Provided:</b>	\$0
<b>Total Potential Grant Amount:</b>	\$286,149
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- ✗ Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$0

**App #32 Statewide Biomass Reconnaissance Study**

**Resource:** Biofuels

**Proposed Project Phase:** Recon

**Proposer:** University of Alaska, Fairbanks

**AEA Program Manager:**

**Applicant Type:** Government Entity

**Scoring & Location**



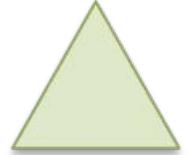
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Statewide

**Election District:**



Rank within Region  
(out of )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	15
2) Funding Resources (Max 25)	
3) Project Feasibility from Stage 2 (Max 20)	
4) Project Readiness (Max 5)	
5) Benefits (Max 10)	
6) Local Support (Max 5)	
7) Sustainability (Max 5)	

**AEA Review Comments**

**App #32 Statewide Biomass Reconnaissance Study**

**Resource:** Biofuels

**Proposed Project Phase:** Recon

**Proposer:** University of Alaska, Fairbanks

**AEA Program Manager:**

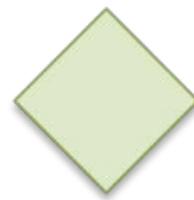
**Applicant Type:** Government Entity

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



**App #32 Statewide Biomass Reconnaissance Study**

**Resource:** Biofuels

**Proposed Project Phase:** Recon

**Proposer:** University of Alaska, Fairbanks

**AEA Program Manager:**

**Applicant Type:** Government Entity

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

**App #33 Haines Central Wood Heating System Construction (Low Income Housing Project)**

**Resource:** Biomass

**Proposed Project Phase:** Construction Design

**Proposer:** Chilkoot Indian Association

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

**Project Description**

The Chilkoot Indian Association is proposing to construct and operate four-plex housing (four buildings with sixteen units) incorporating a cordwood-fired boiler system. The project is initiated by our Housing Department, who will manage the subsidized, low-income housing project. A separate boiler/fuel storage building will be built on one lot and recirculate hot water to be used in each four-plex for building heat and domestic hot water. Architectural, civil, mechanical, and electrical design is complete except for an engineering refit to accommodate the wood boiler system. Our proposal will be for heating system redesign and construction.

**Funding & Cost**

<b>Cost of Power:</b>	\$0.23/kWh
<b>Requested Grant Funds:</b>	\$288,222.3
<b>Matched Funds Provided:</b>	\$28,446.4
<b>Total Potential Grant Amount:</b>	\$316,668.7
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$288,222.3

**AEA Recommendation**

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation: \$288,222**

## App #33 Haines Central Wood Heating System Construction (Low Income Housing Project)

**Resource:** Biomass

**Proposed Project Phase:** Construction Design

**Proposer:** Chilkoot Indian Association

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Scoring & Location



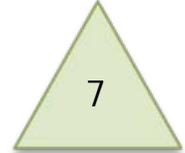
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 5, Cordova-Southeast Islands



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	9
2) Funding Resources (Max 25)	15
3) Project Feasibility from Stage 2 (Max 20)	19
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	9
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

Applicant proposes design and construction of cordwood-fired heating systems for four 4-plex housing units. Project offers good potential savings over heating oil and provides a demonstration project for southeast Alaska. Recommend.

## App #33 Haines Central Wood Heating System Construction (Low Income Housing Project)

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design

**Proposer:** Chilkoot Indian Association

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposed a wood-fired district heating project. Evaluator used Skagway fuel prices and AEA biomass cost calculation, then linked to real price increases (forecast by ISER) as they will move upward (or downward) as a substitute for heating oil. Heating oil displacement was set at 90 percent for AEA analysis, as biomass will be supplement (backed-up) by oil, as needed. Estimated B/C ratio is 4.23 by the applicant and the Evaluator's figure is 3.50.

## App #33 Haines Central Wood Heating System Construction (Low Income Housing Project)

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design

**Proposer:** Chilkoot Indian Association

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #34 Grant Lake/Falls Creek Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Kenai Hydro, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Project Description

The proposed 5 to 7-MW Grant Lake/Falls Creek hydro project is located near Moose Pass, Alaska. Kenai Hydro seeks to develop the project in compliance with current low impact hydro guidelines and practices. The scope of this project will also involve looking at the feasibility of a design that includes diverting flows from Falls Creek into Grant Lake. Kenai Hydro has secured a Preliminary Permit for this project, issued by FERC on October 7, 2008. Power from the project would be available to customers of Homer Electric Association and other areas served by the existing Railbelt transmission grid. Kenai Hydro, LLC is a partnership among Homer Electric Association (HEA), enXco, and Cook Inlet Region, Inc. (CIRI) that was formed for the purpose of evaluating and developing this site as a low impact hydroelectric facility.

### Funding & Cost

<b>Cost of Power:</b>	\$0.14 /kWh
<b>Requested Grant Funds:</b>	\$816,000
<b>Matched Funds Provided:</b>	\$204,000
<b>Total Potential Grant Amount:</b>	\$1,020,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$816,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$816,000

## App #34 Grant Lake/Falls Creek Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Kenai Hydro, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Scoring & Location



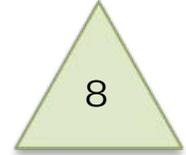
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 35, Homer-Seward



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	5
2) Funding Resources (Max 25)	19
3) Project Feasibility from Stage 2 (Max 20)	17
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	9
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

AEA is providing \$100,000 for reconnaissance assessment under the DC/AEA Alternative Energy RFP. Recommend full funding for feasibility and FERC permit preparation with requirement that AEA approve recon study indicating project viability before any AEA funds are expended.

## App #34 Grant Lake/Falls Creek Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Kenai Hydro, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The evaluation assumes that Grant Lake hydro would displace natural gas-fired generation in the Railbelt and the primary benefit is therefore the estimated avoided cost of natural gas. The applicant's estimate of average annual energy from the project is 29 million kWh, based on a 1984 feasibility study. Based on that assumption combined with the applicant's estimated project costs, the B/C ratio comes to 2.95.

AEA notes that previous consultation with resource agencies raised significant issues with minimum stream flows and the volume of water to be diverted through the project powerhouse. Based on that earlier experience, an alternative B/C ratio was estimated based on annual average production of 25 million kWh – the resulting B/C ratio is 2.51.

## App #34 Grant Lake/Falls Creek Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Kenai Hydro, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #35 Hooper Bay Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** City of Hooper Bay

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Project Description

The project involves the installation of two wind turbines near the water treatment plant (WTP) in Hooper Bay, Alaska. The two Northwind 100B: 100kW wind turbines will provide a dedicated energy source for the WTP's water heating system, providing approximately 539,000 kWh per year dedicated to an electric boiler inside the WTP. Wind-powered energy will offset the use of 15,995 gallons of fuel currently used in the three fuel oil-burning boilers. Northern will provide the wind towers and turbine technology, and STG will perform the installation of the towers and turbines. CE2 Engineers, the firm that designed and built the WTP, will supervise the engineering and wiring of the new boiler system.

### Funding & Cost

<b>Cost of Power:</b>	\$0.48/kWh
<b>Requested Grant Funds:</b>	\$2,220,141
<b>Matched Funds Provided:</b>	\$0
<b>Total Potential Grant Amount:</b>	\$2,220,141
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$80,000

### AEA Recommendation

- Full Funding
- ✗ Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$80,000

## App #35 Hooper Bay Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** City of Hooper Bay

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Scoring & Location



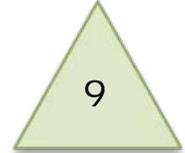
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Lower Yukon-Kuskokwim

**Election District:** 39, Bering Straits



**Rank within Region**  
(out of 10)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	18
2) Funding Resources (Max 25)	0
3) Project Feasibility from Stage 2 (Max 20)	11
4) Project Readiness (Max 5)	2
5) Benefits (Max 10)	4
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant proposes to install 200 kW of wind turbine at \$2.2 million to displace 16,000 gallons per year of heating fuel at the Hooper Bay water treatment plant. Given modest savings in fuel AEA has concerns that the project is not optimized to maximize diesel displacement for community heat and power. For this reason we recommend that applicants consult with the community and power utility to integrate the project into the community energy system. We recommend funding be limited to feasibility analysis that matches heating load profile with resource availability, and develop alternate scenarios. Develop two scenarios--1) interconnected with utility grid, 2) stand alone for water treatment plant only.

Recommend partial funding of \$80,000 under task 6 to prepare feasibility assessment and conceptual design as above.

## App #35 Hooper Bay Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design

**Proposer:** City of Hooper Bay

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant is requesting funds for final design and construction of a 200kW wind farm to supply wind energy to the waste treatment plant (WTP). The requested amount is the total project cost of \$2,220,141.

The economic benefit of the project is primarily driven by the value of displaced fuel estimated to be \$1.57 million over the 20-year period compared to the project cost \$2.22 million. In present value terms, using a 3 percent discount, total benefits are \$931,844 and total costs in present value terms are \$2,092,696. There are no differences in capital costs between the applicant data and AEA information. The AEA evaluation estimates a slightly lesser wind generation estimate and an insignificant lower amount of estimated O&M costs (less than \$200 per year). The calculated B/C ratio is 0.50 based on the applicant provided information and 0.45 using AEA data.

## App #35 Hooper Bay Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design

**Proposer:** City of Hooper Bay

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #36 Statewide Heat Recovery Demonstration Project

**Resource:** Heat Recovery

**Proposed Project Phase:**

**Proposer:** Precision Power, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Project Description

This proposal seeks to design and make commercially available a system that utilizes renewable energy as an option to the basic rural Alaska electrical power generating system. This is multi part concept that utilizes advanced technology to improve the over-all efficiency of prime power diesel generating systems. The elements of the new system are divided into three separate parts each bringing their own value contribution. They include waste heat recovery, conversion of waste heat using the Organic Rankine Cycle in combination with Controlled Environment Agriculture, and biomass incineration.

### Funding & Cost

<b>Cost of Power:</b>	\$0.40/kWh
<b>Requested Grant Funds:</b>	\$300,000
<b>Matched Funds Provided:</b>	\$60,000
<b>Total Potential Grant Amount:</b>	\$360,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

## App #36 Statewide Heat Recovery Demonstration Project

**Resource:** Heat Recovery

**Proposed Project Phase:**

**Proposer:** Precision Power, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Scoring & Location



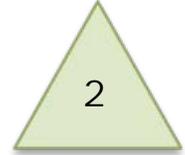
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Statewide

**Election District:** 13, Greater Palmer



**Rank within Region**  
(out of 3 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	15
2) Funding Resources (Max 25)	15
3) Project Feasibility from Stage 2 (Max 20)	5
4) Project Readiness (Max 5)	1
5) Benefits (Max 10)	1
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	1

### AEA Review Comments

Following detailed review by project manager, we conclude that the project is not adequately defined. The proposer would investigate ways to utilize heat recovered from diesel generation or biomass combustion. The stated goal of this project is to prove concepts that have been already been demonstrated.

## App #36 Statewide Heat Recovery Demonstration Project

**Resource:** Heat Recovery

**Proposed Project Phase:**

**Proposer:** Precision Power, LLC

**AEA Program Manager:** James Jensen

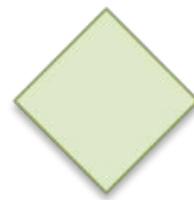
**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant states in the application that benefit is to be determined by the reconnaissance study. Typically, in this situation a rough Benefit/Cost ratio could be calculated without concrete numbers. However, in this case, the project was not defined clearly enough to calculate a B/C ratio of any kind.

**App #36 Statewide Heat Recovery Demonstration Project**

**Resource:** Heat Recovery

**Proposed Project Phase:**

**Proposer:** Precision Power, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #37 Whitman Lake Hydro Construction

**Resource:** Hydro

**Proposed Project Phase:** Design

**Proposer:** Ketchikan Public Utilities- Electric Division

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

The proposed Whitman Lake Hydroelectric Project, FERC No. 11841 (Project) is located near the southeast end of Revillagigedo Island, approximately four miles east of the City of Ketchikan, Alaska. KPU proposes to install 4.6 MW of hydropower generating capacity at KPU's existing Whitman Lake Dam to provide an additional source of clean renewable energy to KPU's customers, in the city of Ketchikan and the Borough area including Saxman Village, while also enhancing the conversion of oil heat to electric heat and displacing expensive and nonrenewable diesel generation. The Project will be interconnected to KPU's existing distribution system and the grant project will involve KPU.

### Funding & Cost

<b>Cost of Power:</b>	\$0.10 /kWh
<b>Requested Grant Funds:</b>	\$1,300,000
<b>Matched Funds Provided:</b>	\$320,000
<b>Total Potential Grant Amount:</b>	\$1,620,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$1,300,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$1,300,000

## App #37 Whitman Lake Hydro Construction

**Resource:** Hydro

**Proposed Project Phase:** Design

**Proposer:** Ketchikan Public Utilities- Electic Division

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



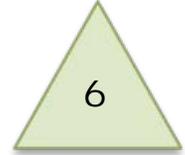
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 1, Ketchikan



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	4
2) Funding Resources (Max 25)	19
3) Project Feasibility from Stage 2 (Max 20)	20
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	10
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

Recommend full funding for design and permitting.

This project would interconnect with an existing power network that serves Ketchikan, Wrangell and Petersburg. There are proposals to expand this network to include Metlakatla and Kake. There are other projects being proposed for this network and potential load increases on the network. There is a need to integrate these projects. On this basis we recommend approval of the proposal to assist the integration process.

Design documents would be useful in the preparation of a regional integrated resource plan for the southern Southeast network. An integrated resource plan should be prepared before significant construction funding is provided to projects to be interconnected to this network. If the project receives state funds, AEA will require as a grant condition that ratepayers of all connected utilities receive equal generation and transmission rate treatment.

## App #37 Whitman Lake Hydro Construction

**Resource:** Hydro

**Proposed Project Phase:** Design

**Proposer:** Ketchikan Public Utilities- Electic Division

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant notes Swan-Tyee intertie is scheduled for completion in 2010, at which time the communities of Petersburg, Wrangell, and Ketchikan will be tied together in a single electrical grid. Energy projects in any of these communities must therefore be evaluated in the context of this interconnected system.

The existing Tyee Lake hydroelectric project currently supplies most of the electricity used in Petersburg and Wrangell, and still has a substantial surplus of energy each year that could be used if there were sufficient demand. Excess energy will still be available from Tyee Lake after Ketchikan is connected to the system in 2010.

The load forecast that has been used for the evaluation of proposed projects in the interconnected system of Wrangell, Petersburg, and Ketchikan is the "reference" forecast used in the 2007 AK-BC Intertie Feasibility Study, shown in the graph below. Also shown is the average annual energy capability of the existing hydro projects serving the interconnected system. According to these projections, the existing hydro surplus is used up by 2014.

The applicant's present schedule anticipates that Whitman Lake will be online in 2013. According to the load forecast, all of Whitman Lake's average annual energy will be used by 2018 and in all subsequent years. The project cost is favorable not only because the project is located close to the City and its electrical system but also because there is an existing dam at Whitman Lake that already creates the project reservoir. As a result of these factors and other assumptions, the B/C ratio is estimated at 8.26.

## App #37 Whitman Lake Hydro Construction

**Resource:** Hydro

**Proposed Project Phase:** Design

**Proposer:** Ketchikan Public Utilities- Electric Division

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

Underway

## App #38 Ruth Lake Hydro Reconnaissance

**Resource:** Hydro

**Proposed Project Phase:** Recon

**Proposer:** City of Petersburg d/b/a Petersburg  
Municipal & Light

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

The proposed project would be located in an unincorporated area, northeast of the City of Petersburg, Alaska. Development of hydroelectric power at the site will include construction of a lake tap, arch dam, unlined tunnel, power penstock, power plant, tailrace, and transmission line segments. The powerhouse would be located within 2,000 ft. of the confluence of Delta Creek and would house three impulse turbines. The rated installed capacity of the powerhouse would be 20 MW and the energy output would be roughly 70 GWh. Power generated by the Project would be transmitted by a new overhead / submarine, 138 kilovolt (KV) transmission segment roughly 20-miles long running generally southwest from the powerhouse to Petersburg. The transmission segment would integrate the project to the Southeast Intertie which currently connects Petersburg to Wrangell to the Tyee Lake Hydroelectric Project on Bradfield Canal. Project would provide the interconnected Southern Southeast Alaska regional utilities with increased system reliability; replace current dependency on diesel generation; and enable regional utilities to meet the increasing demand for electricity as customers convert from oil to electric heat and new construction is designed for electric heat.

### Funding & Cost

<b>Cost of Power:</b>	\$0.12 /kWh
<b>Requested Grant Funds:</b>	\$160,000
<b>Matched Funds Provided:</b>	\$45,000
<b>Total Potential Grant Amount:</b>	\$205,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$160,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$160,000

## App #38 Ruth Lake Hydro Reconnaissance

**Resource:** Hydro

**Proposed Project Phase:** Recon

**Proposer:** City of Petersburg d/b/a Petersburg Municipal & Light

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



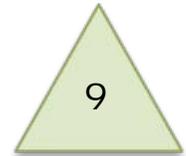
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 5, Cordova-Southeast Islands



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	5
2) Funding Resources (Max 25)	18
3) Project Feasibility from Stage 2 (Max 20)	19
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	9
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

This project would serve the Southeast Alaska Power Authority (SEAPA) area. Note that SEAPA is projected to come into existence in early 2009 in restructuring the Four Dam Pool PA. A private company, Cascade Creek LLC, currently holds a preliminary permit on this project from FERC that expires on 1/31/09. [ref FERC webpage status of preliminary permits]. The applicant proposes to file a preliminary permit on 2/1/09.

This project would interconnect with an existing power network that serves Ketchikan, Wrangell and Petersburg. There are proposals to expand this network to include Metlakatla and Kake. There are other projects being proposed for this network and potential load increases on the network. There is a need to integrate these projects. On this basis we recommend approval of the proposal to assist the integration process.

Design documents would be useful in the preparation of a regional integrated resource plan for the southern Southeast network. An integrated resource plan should be prepared before significant construction funding is provided to projects to be interconnected to this network. If the project receives state funds, AEA will require as a grant condition that ratepayers of all connected utilities receive equal generation and transmission rate treatment.

Recommend.

## App #38 Ruth Lake Hydro Reconnaissance

**Resource:** Hydro

**Proposed Project Phase:** Recon

**Proposer:** City of Petersburg d/b/a Petersburg Municipal & Light

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The Swan-Tyee intertie is scheduled for completion in 2010, at which time the communities of Petersburg, Wrangell, and Ketchikan will be tied together in a single electrical grid. Energy projects in any of these communities must therefore be evaluated in the context of this interconnected system.

The existing Tyee Lake hydroelectric project currently supplies most of the electricity used in Petersburg and Wrangell, and still has a substantial surplus of energy each year that could be used if there were sufficient demand. Excess energy will still be available from Tyee Lake after Ketchikan is connected to the system in 2010. If no demand growth were assumed to occur in the future, there would be no point in considering the Ruth Lake project. Petersburg currently generates about 1 million kWh per year from its diesel generators when Tyee Lake is down for maintenance or when transmission outages occur, but Ruth Lake would be designed to supply 70 million kWh per year. Nearly all of this energy would therefore be wasted.

AEA directed that a demand growth scenario be used to evaluate this project and other projects in the region. A key factor in AEA's decision is that numerous conversions from oil heat to electric heat have recently occurred due to the sharply rising fuel prices combined with the availability of surplus hydroelectricity from Tyee Lake. As a result, the "reference case" load forecast from the September 2007 AK-BC Intertie Feasibility Study was used for this evaluation. That load forecast assumes growth in customers, growth in use per customer, and continued conversions from oil to electric heat.

That forecast for Ketchikan, Wrangell, and Petersburg is shown in the graph below. Also shown is the current annual average energy capability from existing hydroelectric projects now connected to the grid, plus the expected output from the Whitman Lake hydro project starting in 2013. The applicant estimates that Ruth Lake would come online in approximately 2018 and the evaluation extends for 50 years through 2067. The benefit/cost analysis assumes that electricity demand shown in the graph above existing hydro capability would be served either by the Ruth Lake project or by diesel generators. Based on these assumptions, the B/C ratio came out to 3.97.

## App #38 Ruth Lake Hydro Reconnaissance

**Resource:** Hydro

**Proposed Project Phase:** Recon

**Proposer:** City of Petersburg d/b/a Petersburg  
Municipal & Light

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

This is one of 3 projects in same area. Is AEA considering other energy projects that are proposed for same area to evaluate whether it is necessary to do all projects?

## App #39 Delta Junction Barley/Wood Pellet Central Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction Design

**Proposer:** State of AK, Dept. of Natural Resources, Division of Forestry

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Project Description

The Division of Forestry at Milepost 267.5 Richardson Highway, Delta Junction is proposing a pilot project using barley/wood pellets for heating a governmental building. The boiler system will combine two heating systems, a 3840 square foot (sf) main office building, proposed 3000 sf addition, and a 1792 sf warehouse. The boiler will be located in a separate building which will house a heating system and barley/wood pellet storage.

### Funding & Cost

<b>Cost of Power:</b>	\$0.21 /kWh
<b>Requested Grant Funds:</b>	\$831,203
<b>Matched Funds Provided:</b>	\$0
<b>Total Potential Grant Amount:</b>	\$831,203
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #39 Delta Junction Barley/Wood Pellet Central Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction Design

**Proposer:** State of AK, Dept. of Natural Resources, Division of Forestry

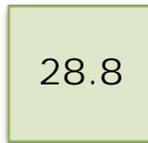
**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Scoring & Location



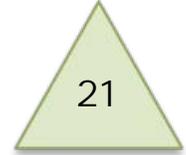
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 12, Richardson-Glenn Highways



Rank within Region  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	8
2) Funding Resources (Max 25)	1
3) Project Feasibility from Stage 2 (Max 20)	10
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	2
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	4

### AEA Review Comments

The project has merit in that it demonstrates the use of a local fuel, for which a local producer is willing to sell at \$100/ton. However, at \$831,203, project is too expensive for relatively small benefit.

## App #39 Delta Junction Barley/Wood Pellet Central Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction Design

**Proposer:** State of AK, Dept. of Natural Resources, Division of Forestry

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant presents that existing boilers are a combined 244,000 BTU system running at about 70% efficiency. The proposed biomass boiler is a 300,000 BTU system operating at 80% efficiency. Present diesel fuel use was estimated at about 2,500 gallons per year, of which 90% is forecasted to be replaced. In the calculation of BTU equivalents, a modification was made to their analysis. The correct biomass equivalent to 2,500 gallons appears to be 18 tons/yr at 8200 BTU/lb of wood chips as opposed to the 15 tons forecasted, and accounts for the difference in the AEA analysis vs. the submitted analysis.

The capital cost of \$831,223 produces a net fuel savings of just over \$7,000 per year based on AEA conversion numbers. Inclusion of heat savings for the new building and the calculation of heating costs on the basis of some combination of barley and wood pellets would improve the benefit/cost ratio, but the capital costs are still quite high for the level of fuel savings. The B/C ratio is 0.08.

## App #39 Delta Junction Barley/Wood Pellet Central Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design

**Proposer:** State of AK, Dept. of Natural Resources,  
Division of Forestry

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

DNR Division of Forestry is involved with this project, and it is a demonstration project for a state office building. The Alaska Wood Energy Task Force recommended this as a demonstration project.

## App #40 Indian Creek Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** City Of Chignik

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### Project Description

The City of Chignik will partner with Trident Seafoods (holder of FERC License 620) to study the engineering, electronics, and economics of restoring the antiquated hydropower system on Indian Creek in Chignik, Alaska. (See attached Project Area maps.) The "Chignik Hydro" project would benefit the residents of Chignik by offsetting the cost of fuel currently used to generate electricity for homes and community buildings such as the Subsistence Building and the school. Electricity generated by the new hydropower system will also benefit the new small boat harbor, the Trident Seafoods fish processing plant, and the Harris Sub-Regional Clinic, which will serve residents of Chignik Lagoon, Chignik Lake, Perryville, and Port Heiden. In addition, by re-building the dam and conveyor pipeline, the project would also be reinforcing the infrastructure that supports the city's water system, as well as the fish plant water supply.

### Funding & Cost

<b>Cost of Power:</b>	\$0.63/kWh
<b>Requested Grant Funds:</b>	\$207,500
<b>Matched Funds Provided:</b>	\$0
<b>Total Potential Grant Amount:</b>	\$207,500
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$207,500

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$207,500

## App #40 Indian Creek Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** City Of Chignik

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### Scoring & Location



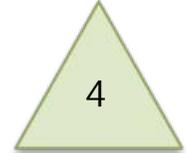
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Bristol Bay

**Election District:** 37, Bristol Bay-Aleutians



**Rank within Region**  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	24
2) Funding Resources (Max 25)	0
3) Project Feasibility from Stage 2 (Max 20)	18
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	10
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	5

### AEA Review Comments

Note that app# 14 Chignik Lagoon hydro, app# 62 Chignik hydro/wind feas, and app#40 Chignik Hydro all address the same subregion. Recommend this proposed feasibility study be funded up to \$207,500 and that the three applicants be required to coordinate on data collection, study and milestones.

We note that Trident Seafoods holds the FERC license for the current project and the applicant proposes to negotiate the use of Trident's license to expand the hydro project and generate electricity for the community at large. Recommend that an agreement that ensures access to the resource be signed by City and Trident before expenditure of any grant funds.

## App #40 Indian Creek Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** City Of Chignik

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant presents that a small, aging hydro project currently exists at Indian Creek, and is owned by Trident Seafoods. It supplies water to the seafood plant, water to the City, and a small amount of power to the seafood plant. The proposal is to upgrade and expand the aging hydro project. Estimates of monthly electricity demand for Trident and for the City were provided by the applicant, as well as monthly estimates of hydroelectric generation. Trident demand is more than sufficient to absorb nearly all of the estimated hydroelectric production. Alternatively, it could be said that the hydro production could supply virtually all of the City demand and still contribute most of its expected output to the Trident operation. For this evaluation, no distinction is made between the two loads. The projected benefit of the proposed project is therefore estimated as the diesel fuel cost that would be incurred by either Trident or the City if all of the hydro production were supplied by diesel generators instead. On this basis, the B/C ratio is estimated at 4.40.

## App #40 Indian Creek Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** City Of Chignik

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

Permitted to Trident Seafoods. May be challenge with second applicant.

## App #41 Haines Central Wood Heating Feasibility Study (Community Buildings)

**Resource:** Biomass

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Haines Borough

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Project Description

The Haines Borough proposes to explore the potential for use of low-emission nontoxic wood biomass as the source for wood-fired boilers to provide heat (through an insulated pipe distribution system) initially to four buildings located within the Borough: the K-12 School, the Voc-Ed Building, the Municipal Administration Building, and the Public Library. The Borough would begin to reduce our dependence on costly fossil fuels, while employing cleaner, renewable, and locally available resources, through the use of locally available wood biomass. The Haines Borough will contract qualified consultants to perform reconnaissance and feasibility studies, and guide us through the 35% concept design.

### Funding & Cost

<b>Cost of Power:</b>	\$0.23/kWh
<b>Requested Grant Funds:</b>	\$120,500
<b>Matched Funds Provided:</b>	\$20,000
<b>Total Potential Grant Amount:</b>	\$140,500
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$120,500

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$120,500

## App #41 Haines Central Wood Heating Feasibility Study (Community Buildings)

**Resource:** Biomass

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Haines Borough

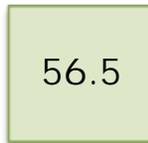
**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Scoring & Location



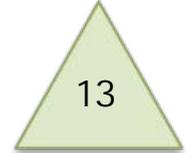
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 5, Cordova-Southeast  
Islands



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	9
2) Funding Resources (Max 25)	15
3) Project Feasibility from Stage 2 (Max 20)	14
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	5
6) Local Support (Max 5)	4
7) Sustainability (Max 5)	5

### AEA Review Comments

The Haines Borough proposes to study feasibility of a wood chip fired system located downtown that would serve the K-12 school, two other school buildings, and the town library. As currently configured the system cost appears rather high compared to expected annual savings in fuel oil. However, alternate configurations to be assessed in the conceptual design will likely improve economics. Recommend for full funding.

## App #41 Haines Central Wood Heating Feasibility Study (Community Buildings)

**Resource:** Biomass

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Haines Borough

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposed a reconnaissance biomass project. Four public buildings would be heated by a wood biomass. Skagway fuel prices were used and AEA biomass cost calculations were linked to real price increases (forecast by ISER) as they will move upward (or downward) as a substitute for heating oil. Heating oil displacement was set at 90 percent for AEA analysis, as biomass will be supplement (backed-up) by oil, as needed. Estimated B/C ratio is 0.59 by the applicant and the Evaluator's figure is also estimated at 0.59.

## App #41 Haines Central Wood Heating Feasibility Study (Community Buildings)

**Resource:** Biomass

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Haines Borough

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #42 Burro Creek Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Burro Creek Holdings, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Project Description

Burro Creek, formerly the Burro Creek Farms Hatchery, is an existing, operational hydro system located on 121 acres of private land approximately one and a half miles south of Skagway on the west side of upper Lynn Canal. A grant is requested to obtain expert analysis of the feasibility of upgrading the existing hydro system in order to wholesale power to Alaska Power and Telephone or the City of Skagway. Existing AP&T hydro projects supply electricity to Haines and Skagway but the communities must still rely on diesel during certain times of the year. Also, existing hydro projects do not generate enough power to supply the cruise lines who have expressed an interest in connecting to shore power as a means of reducing air quality emissions.

### Funding & Cost

<b>Cost of Power:</b>	\$0.23/kWh
<b>Requested Grant Funds:</b>	\$48,000
<b>Matched Funds Provided:</b>	\$12,000
<b>Total Potential Grant Amount:</b>	\$60,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$48,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$48,000

## App #42 Burro Creek Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Burro Creek Holdings, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Scoring & Location



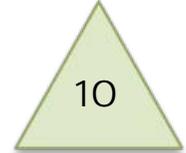
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 5, Cordova-Southeast Islands



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	9
2) Funding Resources (Max 25)	17
3) Project Feasibility from Stage 2 (Max 20)	15
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	8
6) Local Support (Max 5)	4
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant proposes studying feasibility of a potential 500-2000 kW hydro project at Burro Creek on private land near Skagway. Project would supplement other hydro projects that serve AP&T's Haines-Skagway grid. Recommend for full funding.

## App #42 Burro Creek Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Burro Creek Holdings, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant presents a small, private hydro project exists at this site which the applicant proposes to upgrade for sale of power to the utility serving Skagway. Little is known about the costs of such upgrade or the potential project output. Estimates used in this evaluation, including the capital cost, are essentially concept numbers based on knowledge of the existing project and discussion with the local utility, and are intended to provide a rough order of magnitude.

Based on discussion with the local utility, which currently operates both hydro and diesel plants in the Skagway area, applicant estimates that Burro Creek could displace 1-2 million kWh of diesel generation in the April to June time frame. Applicant also suggests that the project might be able to operate at a low level throughout the winter, displacing additional diesel generation. And finally, applicant suggests that some summer energy from Burro Creek might be usable to serve visiting cruise ships if they decide to connect to shore power. As the latter two possibilities seem more speculative than the first, this evaluation assumes the high estimate of diesel displacement for the April-June time frame (i.e. 2 million kWhs) but does not assume additional displacement for winter operation or supplying cruise ships. The B/C ratio estimated on the basis of these assumptions is 2.40.

## App #42 Burro Creek Hydro Feasibility Study

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Burro Creek Holdings, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #43 Palmer Gas CHP Construction

**Resource:** Gas

**Proposed Project Phase:** Construction

**Proposer:** Alpine Energy, LLC

**AEA Program Manager:**

**Applicant Type:** IPP

### Project Description

The proposal is for a 5 MW natural gas fired Combined Heat & Power Project (“CHP” or “Cogeneration”), sited at the Alaska State Fair in Palmer (the “Fair”) as the centerpiece of an Alaska Energy Center, to showcase renewable and alternative energy technologies, provide the energy needs of the Fair and operations sited at the Fair, provide the thermal energy needs of commercial, institutional and agricultural customers within economic reach of the Project, and provide firm power to help Matanuska Electric Association meet new generation needs.

### Funding & Cost

<b>Cost of Power:</b>	\$0.14 /kWh
<b>Requested Grant Funds:</b>	\$7,500,000
<b>Matched Funds Provided:</b>	\$7,500,000
<b>Total Potential Grant Amount:</b>	\$15,000,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- ✗ Did Not Pass Stage 1
- Pending

**App #43 Palmer Gas CHP Construction**

**Resource:** Gas

**Proposed Project Phase:** Construction

**Proposer:** Alpine Energy, LLC

**AEA Program Manager:**

**Applicant Type:** IPP

**Scoring & Location**



Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Railbelt

**Election District:**



Rank within Region  
(out of )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	5
2) Funding Resources (Max 25)	
3) Project Feasibility from Stage 2 (Max 20)	
4) Project Readiness (Max 5)	
5) Benefits (Max 10)	
6) Local Support (Max 5)	
7) Sustainability (Max 5)	

**AEA Review Comments**

**App #43 Palmer Gas CHP Construction**

**Resource:** Gas

**Proposed Project Phase:** Construction

**Proposer:** Alpine Energy, LLC

**AEA Program Manager:**

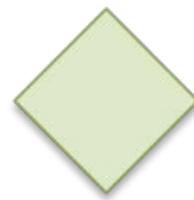
**Applicant Type:** IPP

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



**App #43 Palmer Gas CHP Construction**

**Resource:** Gas

**Proposed Project Phase:** Construction

**Proposer:** Alpine Energy, LLC

**AEA Program Manager:**

**Applicant Type:** IPP

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #44 Whittier Gas CHP Construction

**Resource:** Gas

**Proposed Project Phase:** Construction

**Proposer:** Alpine Energy, LLC

**AEA Program Manager:**

**Applicant Type:** IPP

### Project Description

The proposal is for a 5 MW natural gas fired Combined Heat & Power Project (“CHP” or “Cogeneration”), sited near the Begich Tower, to provide the energy needs of the Begich Tower and thermal energy needs of City of Whittier, Public School and commercial customers within economic reach of the Project, and provide firm power to help Chugach meet new generation needs and improve service reliability to Whittier.

### Funding & Cost

<b>Cost of Power:</b>	\$0.12 /kWh
<b>Requested Grant Funds:</b>	\$7,500,000
<b>Matched Funds Provided:</b>	\$7,500,000
<b>Total Potential Grant Amount:</b>	\$15,000,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- ✗ Did Not Pass Stage 1
- Pending

**App #44 Whittier Gas CHP Construction**

**Resource:** Gas

**Proposed Project Phase:** Construction

**Proposer:** Alpine Energy, LLC

**AEA Program Manager:**

**Applicant Type:** IPP

**Scoring & Location**



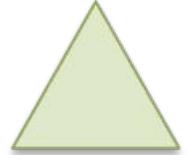
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Railbelt

**Election District:**



Rank within Region  
(out of )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	5
2) Funding Resources (Max 25)	
3) Project Feasibility from Stage 2 (Max 20)	
4) Project Readiness (Max 5)	
5) Benefits (Max 10)	
6) Local Support (Max 5)	
7) Sustainability (Max 5)	

**AEA Review Comments**

**App #44 Whittier Gas CHP Construction**

**Resource:** Gas

**Proposed Project Phase:** Construction

**Proposer:** Alpine Energy, LLC

**AEA Program Manager:**

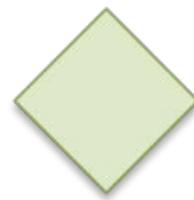
**Applicant Type:** IPP

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



**App #44 Whittier Gas CHP Construction**

**Resource:** Gas

**Proposed Project Phase:** Construction

**Proposer:** Alpine Energy, LLC

**AEA Program Manager:**

**Applicant Type:** IPP

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #45 Anchorage Wood Processing and Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction

**Proposer:** EarthRun Energy

**AEA Program Manager:**

**Applicant Type:** IPP

### Project Description

EarthRun Energy will provide a sustainable source of high grade wood chips for biomass heating in the city of Anchorage while strengthening and beautifying the urban forests. In Anchorage, urban forests are currently overgrown presenting fire and disease problems. It is the right time to make a sick forest a productive and healthy forest. EarthRun has worked hard to come up with the cleanest, quietest and least interruptive way of harvesting the dead and unhealthy trees from our urban forests, chipping them, and heating one municipal building, the Russian Jack greenhouse. EarthRun Energy will work closely with the municipality to return the forests to a healthy state.

### Funding & Cost

<b>Cost of Power:</b>	\$0.11 /kWh
<b>Requested Grant Funds:</b>	\$300,000
<b>Matched Funds Provided:</b>	
<b>Total Potential Grant Amount:</b>	\$300,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- ✗ Did Not Pass Stage 1
- Pending

**App #45 Anchorage Wood Processing and Heating Construction**

**Resource:** Biomass

**Proposed Project Phase:** Construction

**Proposer:** EarthRun Energy

**AEA Program Manager:**

**Applicant Type:** IPP

**Scoring & Location**



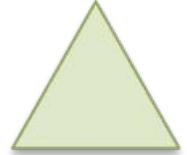
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Railbelt

**Election District:**



Rank within Region  
(out of )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	4
2) Funding Resources (Max 25)	
3) Project Feasibility from Stage 2 (Max 20)	
4) Project Readiness (Max 5)	
5) Benefits (Max 10)	
6) Local Support (Max 5)	
7) Sustainability (Max 5)	

**AEA Review Comments**

**App #45 Anchorage Wood Processing and Heating Construction**

**Resource:** Biomass

**Proposed Project Phase:** Construction

**Proposer:** EarthRun Energy

**AEA Program Manager:**

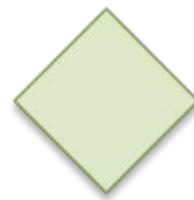
**Applicant Type:** IPP

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



**App #45 Anchorage Wood Processing and Heating Construction**

**Resource:** Biomass

**Proposed Project Phase:** Construction

**Proposer:** EarthRun Energy

**AEA Program Manager:**

**Applicant Type:** IPP

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

Red flag: Should not proceed. Harvesting would be on Municipality of Anchorage land, but proposers have not yet contacted the Muni. Major pitfalls in project. Proposers are high school students, which is impressive -- they deserve encouragement, but not \$300,000.

## App #46 Kenny Lake Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Copper River School District

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Project Description

The final design work will build upon the feasibility study and preliminary design work completed as of October, 2008. A bulk fuel wood boiler will be built at the Kenny Lake K-12 school to displace 18,035 gallons of fuel oil. The current boilers will be used for backup and low load periods. This project will involve school district personnel, local contractors, design engineers and Alaska Energy Authority. This project will employ local residents in project management, construction and chip material delivery.

### Funding & Cost

<b>Cost of Power:</b>	\$0.17 /kWh
<b>Requested Grant Funds:</b>	\$1,200,000
<b>Matched Funds Provided:</b>	
<b>Total Potential Grant Amount:</b>	\$1,200,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$120,000

**AEA Funding Recommendation:** \$120,000

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #46 Kenny Lake Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Copper River School District

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Scoring & Location



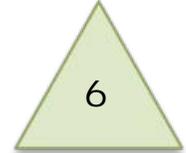
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Copper River/Chugach

**Election District:** 6, Interior Villages



**Rank within Region**  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	6
2) Funding Resources (Max 25)	10
3) Project Feasibility from Stage 2 (Max 20)	14
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	5
6) Local Support (Max 5)	3
7) Sustainability (Max 5)	5

### AEA Review Comments

AEA will manage project. Given relatively small fuel displacement chip-fired system is too expensive. Recommend partial funding for feasibility assessment and final design (tasks 2 and 3) to consider options with higher B/C ratio.

## App #46 Kenny Lake Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Copper River School District

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposed to construct a central wood heating system for the Kenny Lake School. Chistochina fuel prices were used for analysis while quoted wood chip prices from a local provider were used for biomass costing. AEA biomass cost calculations were linked to real price increases (forecast by ISER) as they will move upward (or downward) as a substitute for heating oil. Estimated B/C ratio is 0.67 by the applicant and the Evaluator's figure is also 0.67.

## App #46 Kenny Lake Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Copper River School District

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

The Alaska Wood Energy Task Force completed the feasibility study for this project; it is a viable medium heat-demand project.

## App #47 Nome Banner Peak Wind Farm Transmission Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction Design

**Proposer:** City of Nome d/b/a Nome Joint Utilities System

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

Located in Nome, this project will install a 2-mile transmission line and a 8-mile fiber control cable to connect a 1MW wind farm to be operated by Banner Wind LLC, an independent power producer, to the City of Nome/Nome Joint Utility System (NJUS) power distribution grid. The project will place an underground 25kv distribution line adjacent to a new road, and include a fiber control cable run from the wind generators to the utility power plant. Banner Wind LLC is an IPP formed in partnership between Bering Straits Native Corporation & Sitnasuak Native Corporation. NJUS will be primarily responsible for the project construction activities, as well as the reporting and financial control of the intertie project.

### Funding & Cost

<b>Cost of Power:</b>	\$0.32/kWh
<b>Requested Grant Funds:</b>	\$801,000
<b>Matched Funds Provided:</b>	\$89,000
<b>Total Potential Grant Amount:</b>	\$890,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$801,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$801,000

## App #47 Nome Banner Peak Wind Farm Transmission Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction Design

**Proposer:** City of Nome d/b/a Nome Joint Utilities System

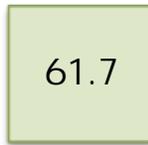
**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



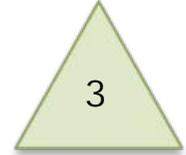
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Bering Straits

**Election District:** 39, Bering Straits



Rank within Region  
(out of 4 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	12
2) Funding Resources (Max 25)	15
3) Project Feasibility from Stage 2 (Max 20)	15
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	8
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

This project, scheduled for completion in December 08, provides transmission from Banner Wind (proposal #106) to the Nome electrical system. We note there is a separate proposal for larger turbines on Newton Peak #52, consistent with the USDOE/AEA-supported Nome Region Energy Assessment. The three proposals do not indicate coordination between wind projects, and AEA is concerned that this may result in unnecessarily high development, integration, and operation costs.

NJUS is preparing a feasibility assessment for the Newton Peak project that will address the quality of the wind energy resource, wind system design and integration into the existing power system, operation and maintenance, land ownership and other development issues. This study should provide valuable information for integrating the Newton Peak and Banner Peak wind farms into the NJUS system.

Recommend full funding for expenses incurred after August 20 with the following conditions: 1) before any funds are disbursed NJUS provide to AEA, and AEA approves, a feasibility assessment and conceptual design that addresses integration of the Newton Peak and Banner Peak wind farms and other development issues, 2) Banner Wind LLC has petitioned RCA for a certificate of public convenience and necessity and economic rate regulation prior to release of construction funds, 3) a power purchase agreement for the Banner Peak project is in place with NJUS prior to release of construction grant funds.

## App #47 Nome Banner Peak Wind Farm Transmission Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction Design

**Proposer:** City of Nome d/b/a Nome Joint Utilities System

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Nome's utility, Nome Joint Utility System, is requesting funding for design and construction of transmission and control fiber control cable to link the 1 MW Banner Peak wind farm to the utility's power distribution grid. The total project cost is estimated to be \$890,000; the applicant is requesting \$801,000.

In present value terms, the estimated stream of benefits of the proposed project amount to \$1.82 million using applicant's data and \$1.56 million using AEA information. The present value of project costs amount to about \$838,910 (for both applicant and AEA calculations). The applicant estimated the amount of displaced fuel to be 200,000 gallons per year; however, using the utility's diesel generation efficiency of 15.81 kWh/gal, the AEA calculation for displaced fuel amounted to only 187,413 gallons per year (assuming the same amount of wind generation as the applicant). The economic benefits in this analysis reflect the transmission line portion of the project only and not the benefits of the Banner wind farm. The calculated B/C ratios are: 2.17 using the applicant's data and 1.86 using AEA information.

## App #47 Nome Banner Peak Wind Farm Transmission Construction

**Resource:** Transmission

**Proposed Project Phase:** Construction  
Design

**Proposer:** City of Nome d/b/a Nome Joint Utilities  
System

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #48 Whittier Creek Hydroelectric Reconnaissance

**Resource:** Hydro

**Proposed Project Phase:** Recon

**Proposer:** City of Whittier

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### Project Description

The City of Whittier proposes conducting a renewable energy project consisting of a reconnaissance level effort to examine the viability of hydropower on Whittier Creek in Whittier, Alaska. The work will include engineering analysis, an economic study, and two years of stream gauge data gathering. The final product will include an estimated generation capacity, a preliminary cost estimate for a hydropower facility, and a preliminary analysis of the potential benefits (i.e. power cost savings over time). This effort will be performed by the Alaska District Corps of Engineers with assistance from the Corps of Engineers Hydroelectric Design Center based out of Portland, Oregon, with stream gauging to be performed by the USGS.

### Funding & Cost

<b>Cost of Power:</b>	\$0.12 /kWh
<b>Requested Grant Funds:</b>	\$85,000
<b>Matched Funds Provided:</b>	\$115,000
<b>Total Potential Grant Amount:</b>	\$200,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$85,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$85,000

## App #48 Whittier Creek Hydroelectric Reconnaissance

**Resource:** Hydro

**Proposed Project Phase:** Recon

**Proposer:** City of Whittier

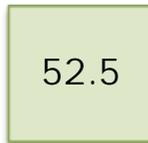
**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### Scoring & Location



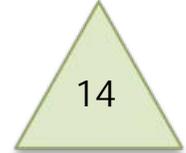
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 32, Chugach State Park



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	5
2) Funding Resources (Max 25)	23
3) Project Feasibility from Stage 2 (Max 20)	11
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	5
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	3

### AEA Review Comments

For economic viability this project will likely need to be interconnected to the Railbelt grid. Recommend project team evaluate technical and regulatory issues associated with interconnection.

Recommend.

## App #48 Whittier Creek Hydroelectric Reconnaissance

**Resource:** Hydro

**Proposed Project Phase:** Recon

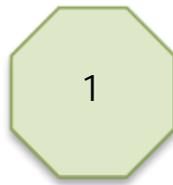
**Proposer:** City of Whittier

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



This evaluation assumes that Whittier Creek hydro would displace natural gas-fired generation in the Railbelt and the primary benefit is therefore the estimated avoided cost of natural gas. Whittier is connected to the Railbelt grid and receives power from Chugach Electric Association. Estimated annual output from the project is very preliminary, as is the capital cost estimate. As for annual output, the applicant states only that “dependable capacity” is estimated at 175 kW for 9 months per year. For this evaluation, annual output was simply assumed to be 175 kW, 24 hours per day for 9 months, with no production during the remaining 3 months. Based on that assumption combined with the applicant’s estimated project costs, the B/C ratio comes to 1.00.

## App #48 Whittier Creek Hydroelectric Reconnaissance

**Resource:** Hydro

**Proposed Project Phase:** Recon

**Proposer:** City of Whittier

**AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #49 Tok Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Alaska Gateway School District

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Project Description

The proposed biomass heating system will take place at Tok School, in Tok, Alaska, and will serve to initiate the beginnings of a systemic regional conversion from fossil heating fuel to clean, renewable biomass heating systems. An outbuilding to house the boilers will be constructed behind the school, in a central location where access to the outbuildings can also be had. The building will have 3 bays for fiber wagons that will feed into the feeder bin inside the boiler room. The boiler will be able to be fed from the inside or the outside of the building, to accommodate for downtime on the biomass feed systems. The biomass boiler will feed into the current boiler infrastructure, which will serve as a back-up system, and will heat the outbuildings. The project has the advantage of being designed by firms having extensive experience with biomass systems, and is heavily supported by the community. It was written in partnership with the Tok Area Forestry, CTA Engineering, and by Alaska Gateway School District staff.

### Funding & Cost

<b>Cost of Power:</b>	\$0.49/kWh
<b>Requested Grant Funds:</b>	\$3,245,349
<b>Matched Funds Provided:</b>	\$560,000
<b>Total Potential Grant Amount:</b>	\$3,805,349
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$3,245,349

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$3,245,349

## App #49 Tok Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Alaska Gateway School District

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Scoring & Location



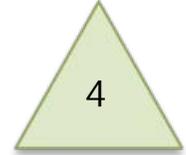
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Yukon-Koyukuk/Upper Tanana

**Election District:** 6, Interior Villages



Rank within Region  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	18
2) Funding Resources (Max 25)	19
3) Project Feasibility from Stage 2 (Max 20)	16
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	6
6) Local Support (Max 5)	4
7) Sustainability (Max 5)	5

### AEA Review Comments

There is substantial accessible biomass wood supply in the upper Tanana from sawmills, two pellet mills in development, and state-owned forest land. Tok Umbrella Corp received a grant for a whole tree chipper which can potentially be used to supply fuel for this project.

Recommend.

## App #49 Tok Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Alaska Gateway School District

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposed a reconnaissance to construction biomass project. Several capital cost estimates were referenced in the submittal and the selected version was reduced by \$500,000 for the AEA analysis. This amount reflects sunk costs in the form of existing wood biomass. Also, wood costs estimated at \$60 per ton by local State employees were adjusted upward for AEA analysis (to \$65 per ton) based on quoted prices in the Glennallen area. AEA biomass cost calculations were linked to real price increases (forecast by ISER) as they will move upward (or downward) as a substitute for heating oil. Estimated B/C ratio is 0.82 by the applicant and the Evaluator's figure is 0.94.

## App #49 Tok Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Alaska Gateway School District

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

The Alaska Wood Energy Task Force completed the feasibility study for this project. Large heat demand makes this a viable project. The DNR Division of Forestry is involved with this project, which has particularly strong community support.

## App #50 Unalakleet Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Unalakleet Valley Electric Cooperative, Inc. (UVEC)

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

The Unalakleet Renewable Energy Fund Wind Project involves the installation of two 600 kW wind turbines on a project site located approximately one and a half miles northeast of Unalakleet. The completed project, with a total size of 1.2 MW, will be owned and operated by Unalakleet Valley Electric Cooperative (UVEC). The wind turbines will be connected into UVEC's electrical distribution system through a constructed transmission line. The project will offer benefits to the village of Unalakleet and its electric customers through a system-wide reduction and stabilization of energy prices. UVEC has assembled a project team, headed by STG Incorporated which is prepared to immediately begin work on an accelerated schedule. The project team includes members from Intelligent Energy Systems LLC, DNV Global Energy Concepts Inc., Electrical Power Systems, Duane Miller Associates LLC, Hattenburg Dilley & Linnell LLC, BBFM Engineers and Aurora Consulting. All aspects of the Final Design/Permitting and Construction project, can be completed by fall 2010.

### Funding & Cost

<b>Cost of Power:</b>	\$0.34 /kWh
<b>Requested Grant Funds:</b>	\$8,774,080
<b>Matched Funds Provided:</b>	\$222,752
<b>Total Potential Grant Amount:</b>	\$8,996,832
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$8,774,080

**AEA Funding Recommendation:** \$4,000,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #50 Unalakleet Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Unalakleet Valley Electric Cooperative, Inc. (UVEC)

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



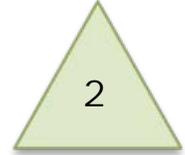
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Bering Straits

**Election District:** 39, Bering Straits



**Rank within Region**  
(out of 4 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	13
2) Funding Resources (Max 25)	12
3) Project Feasibility from Stage 2 (Max 20)	16
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	7
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	5

### AEA Review Comments

This project represents substantial additional wind generation capacity that directly integrates into the utility. It is part of a joint effort to coordinate a bulk purchase of large turbines within the region. Recommend monitor current power system upgrade and coordinate final integration design. Recommend up to full funding \$8,770,080.

## App #50 Unalakleet Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Unalakleet Valley Electric Cooperative, Inc. (UVEC)

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The electric utility in Unalakleet, the Unalakleet Valley Electric Cooperative, is requesting funds for design and construction of a 1.2 MW wind farm. Total project cost is \$8,996,832; amount requested is \$8,774,080.

The B/C ratio using applicant provided data is 1.13 and 2.06 based on AEA assumptions. The difference is due to a lower benchmark O&M cost of \$.022 per kWh or \$51,584 per year compared to the applicant's stated annual O&M costs of \$292,160. AEA evaluation also assumed a higher amount of wind generation potential than the applicant provided study. In present value terms, the estimated stream of benefits amount to \$9.38 million using the applicant's data and \$17.17 million using AEA information. The present value of project costs amount to \$8.32 million (for both applicant and AEA calculations)

## App #50 Unalakleet Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Unalakleet Valley Electric Cooperative, Inc. (UVEC)

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #51 Mt. Alice Harbor Renewable Energy Construction

**Resource:** Other

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Mt. Alice Development, Inc.

**AEA Program Manager:**

**Applicant Type:** Local Government

### Project Description

Mt. Alice Harbor Development project is in and around Seward at mile 2 Nash Rd. the service road to the NE side of Resurrection bay 1.5 miles across from the municipal boat harbor on the NW side, serving the needs of the local population as a community and destination resort, boating access and public access to the Fishing resources of the area. Local Engineers, Surveyors, Municipal department heads etc. have expressed positive input and eagerness to work on the project. The Architects, Project managers are ready to proceed.

### Funding & Cost

<b>Cost of Power:</b>	\$0.09/kWh
<b>Requested Grant Funds:</b>	\$14,673,250
<b>Matched Funds Provided:</b>	
<b>Total Potential Grant Amount:</b>	\$14,673,250
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- ✗ Did Not Pass Stage 1
- Pending

**App #51 Mt. Alice Harbor Renewable Energy Construction**

**Resource:** Other

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Mt. Alice Development, Inc.

**AEA Program Manager:**

**Applicant Type:** Local Government

**Scoring & Location**



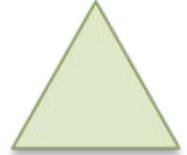
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Railbelt

**Election District:**



Rank within Region  
(out of )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	3
2) Funding Resources (Max 25)	
3) Project Feasibility from Stage 2 (Max 20)	
4) Project Readiness (Max 5)	
5) Benefits (Max 10)	
6) Local Support (Max 5)	
7) Sustainability (Max 5)	

**AEA Review Comments**

**App #51 Mt. Alice Harbor Renewable Energy Construction**

**Resource:** Other

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Mt. Alice Development, Inc.

**AEA Program Manager:**

**Applicant Type:** Local Government

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



**App #51 Mt. Alice Harbor Renewable Energy Construction**

**Resource:** Other

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Mt. Alice Development, Inc.

**AEA Program Manager:**

**Applicant Type:** Local Government

**DNR/DGGS Geohazards Comments**

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

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #52 Nome/Newton Peak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** City of Nome d/b/a Nome Joint Utility System (NJUS)

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

The Nome Joint Utilities System (NJUS) Renewable Energy Fund Wind Project involves the installation of five 600 kW wind turbines on Newton Peak located approximately one mile north of Nome. The completed project, with a total size of three MW, will be owned and operated by NJUS. The wind turbines will be connected into NJUS's electrical distribution system through a constructed transmission line. The project will offer benefits to the community of Nome and its electric customers through a system-wide reduction and stabilization of energy prices. NJUS has assembled a project team, headed by STG Incorporated which is prepared to immediately begin work on an accelerated schedule. The project team includes members from Intelligent Energy Systems LLC, DNV Global Energy Concepts Inc, Electrical Power Systems, Duane Miller Associates LLC, Hattenburg Dilley & Linnell LLC, BBFM Engineers and Aurora Consulting. All aspects of the Final Design/Permitting and Construction project, detailed in the following pages of this application, can be completed by fall 2010.

### Funding & Cost

<b>Cost of Power:</b>	\$0.32/kWh
<b>Requested Grant Funds:</b>	\$13,951,326
<b>Matched Funds Provided:</b>	\$1,582,983
<b>Total Potential Grant Amount:</b>	\$15,534,309
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$13,951,326

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$4,000,000

## App #52 Nome/Newton Peak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** City of Nome d/b/a Nome Joint Utility System (NJUS)

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



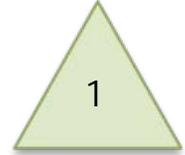
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Bering Straits

**Election District:** 39, Bering Straits



**Rank within Region**  
(out of 4 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	12
2) Funding Resources (Max 25)	17
3) Project Feasibility from Stage 2 (Max 20)	16
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	7
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	5

### AEA Review Comments

The 3 MW Newton Peak wind project proposed by local utility Nome Joint Utilities Systems (NJUS) represents substantial additional wind generation capacity for the Nome system. It is consistent with the Nome Regional Energy Assessment findings. It is part of a joint effort to coordinate a bulk purchase of large turbines within the region. The separate 1,170 kW Banner Peak Wind project (proposal #106) has recently been constructed in a different area. NJUS has requested funding for the intertie that connects the Banner Peak project to the Nome system (proposal #47). The three proposals do not indicate coordination between wind projects, and AEA is concerned that this may result in unnecessarily high development, integration, and operation costs.

The application states NJUS is preparing a feasibility assessment for the Newton Peak project that will address the quality of the wind energy resource, wind system design and integration into the existing power system, operation and maintenance, land ownership and other development issues. This study should provide valuable information for integrating the Newton Peak and Banner Peak wind farms into the NJUS system.

Recommend full funding with the condition that before any funds are disbursed NJUS provide to AEA, and AEA approves, a feasibility assessment and conceptual design that addresses integration of the Newton Peak and Banner Peak wind farms and other development issues.

## App #52 Nome/Newton Peak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** City of Nome d/b/a Nome Joint Utility System (NJUS)

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Nome's utility, the Nome Joint Utility System, is requesting funding for design and construction of a 3 MW wind farm. The total project cost is \$15,534,309; amount requested is \$13,952,326.

In present value terms, the estimated stream of benefits of the proposed project amount to \$18.5 million using applicant's data and \$34.3 million using AEA information. The present value of project costs amount to \$14.4 million (for both applicant and AEA calculations). The calculated B/C ratios are: 1.28 using the applicant's data and 2.38 using AEA information. The difference is due to lower AEA benchmark O&M cost of \$.022 per kWh or about \$150,000 per year compared to the applicant's stated annual O&M costs of \$523,786. The applicant also projected a lower wind energy output than the AEA evaluation.

## App #52 Nome/Newton Peak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design

**Proposer:** City of Nome d/b/a Nome Joint Utility  
System (NJUS)

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #53 North Pole Biomass Electricity/Heat Construction

**Resource:** Biofuels

**Proposed Project Phase:** Construction Design

**Proposer:** Chena Power Utility, LLC

**AEA Program Manager:** Brown

**Applicant Type:** Utility

### Project Description

This project is designed to demonstrate power generation using combusted biomass as a heat source to drive an Organic Rankine Cycle (ORC) power plant module designed and developed by United Technologies Corporation. The module is based on the award-winning geothermal power plant installed at Chena Hot Springs Resort; however the biomass version will operate at significantly higher efficiency. These efficiency improvements are necessary because unlike the geothermal fluid, biomass material is not a 'free' fuel. In addition to being designed for maximum thermal efficiency, the power plant includes load following capability, and independent, simple, remotely monitored operation at low pressures that do not require special training to operate. This is important because while the project will be located in North Pole, Alaska, the power plant is specifically designed for rural Alaskan applications. The project will be constructed and managed by Chena Power, LLC and will be located at the K&K Recycling Facility located at Mile 9 on the Richardson Highway. Design work and assembly of the power plant will be completed by United Technologies Corporation through their Research Center (UTRC).

### Funding & Cost

<b>Cost of Power:</b>	\$0.21 /kWh
<b>Requested Grant Funds:</b>	\$2,000,000
<b>Matched Funds Provided:</b>	\$2,007,900
<b>Total Potential Grant Amount:</b>	\$4,007,900
<b>Existing RE Fund Grant Offer:</b>	1000000.00
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$1,000,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$2,000,000

## App #53 North Pole Biomass Electricity/Heat Construction

**Resource:** Biofuels

**Proposed Project Phase:** Construction Design

**Proposer:** Chena Power Utility, LLC

**AEA Program Manager:** Brown

**Applicant Type:** Utility

### Scoring & Location



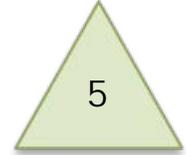
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 11, North Pole



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	8
2) Funding Resources (Max 25)	24
3) Project Feasibility from Stage 2 (Max 20)	15
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	9
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant proposes construction of a 400 kW (net) biomass (wood and paper)-fired combined heat and power plant in the North Pole area. The project would include two 250 UTC Pure Cycle ORC units; a biomass boiler; fuel processing, storage, and handling equipment; cooling pond; controls and grid tie-in. As a small biomass-fired CHP system the project holds considerable value as a demonstration project for rural heat and power production. Note that \$1 million of the requested \$2 million has been approved for RE Fund funding already.

Recommend with the following grant conditions: 1) applicant required to petition RCA for a certificate of public convenience and necessity and economic rate regulation prior to release of construction funds, 2) establish a power purchase agreement with GVEA prior to release of construction grant funds. The recommended funding amount equals total amount requested from the state (\$2,000,000) minus amount already offered (\$1,000,000).

**App #53 North Pole Biomass Electricity/Heat Construction**

**Resource:** Biofuels

**Proposed Project Phase:** Construction Design

**Proposer:** Chena Power Utility, LLC

**AEA Program Manager:** Brown

**Applicant Type:** Utility

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposed to construct a combined heat and power system. The project estimated displaced diesel fuel at 7,500 gallons, based on the applicant's submission and experience. Displaced fuel for power generation followed AEA guidance and spreadsheet figures. The full cost of biomass tipping fees, at \$61 per ton, was used as a proxy for redirected values and community benefit. Estimated B/C ratio is 2.45 by the applicant and the Evaluator's figure is 1.64.

## App #53 North Pole Biomass Electricity/Heat Construction

**Resource:** Biofuels

**Proposed Project Phase:** Construction  
Design

**Proposer:** Chena Power Utility, LLC

**AEA Program Manager:** Brown

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #54 Galena Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction

**Proposer:** Interior Regional Housing Authority (IRHA)

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Project Description

Interior Regional Housing Authority (IRHA) proposes to install a biomass heat source for the Yukon-Koyukuk Assisted Living Center, a NAHSDA, Denali Commission, ICDBG, FHLB, and AHFC funded project that will provide a 9 unit housing complex for the elderly of the Yukon Koyukuk Region. The design includes a multi-purpose area, office space, and dormitory-type housing for transient village health care workers.

### Funding & Cost

<b>Cost of Power:</b>	\$0.40/kWh
<b>Requested Grant Funds:</b>	\$382,779
<b>Matched Funds Provided:</b>	\$4,659,760
<b>Total Potential Grant Amount:</b>	\$5,042,539
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$382,779

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$382,779

## App #54 Galena Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction

**Proposer:** Interior Regional Housing Authority (IRHA)

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Scoring & Location



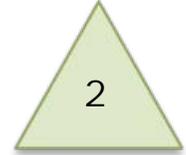
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Yukon-Koyukuk/Upper Tanana

**Election District:** 6, Interior Villages



**Rank within Region**  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	15
2) Funding Resources (Max 25)	24
3) Project Feasibility from Stage 2 (Max 20)	20
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	10
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	5

### AEA Review Comments

Applicant proposes a high-efficiency cordwood-fired boiler to supply heat to a community building in Galena. Project appears well-conceived and economic. Project management and development team is strong.

Recommend full funding.

## App #54 Galena Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction

**Proposer:** Interior Regional Housing Authority (IRHA)

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposed a combination (construction) biomass and solar project. Fuel costs for Galena were adjusted upward by \$0.50 per gallon for both applicant and AEA analysis. AEA biomass cost calculations were linked to real price increases (forecast by ISER) as they will move upward (or downward) as a substitute for heating oil. Solar power impacts were used as presented and appear to be based on experienced results from Tanana and its biomass and solar powered washeteria. Estimated B/C ratio is 2.90 by the applicant and the Evaluator's figure is 2.62.

## App #54 Galena Wood Heating Construction

**Resource:** Biomass

**Proposed Project Phase:** Construction

**Proposer:** Interior Regional Housing Authority  
(IRHA)

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #55 Snake Mountain Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Bristol Bay Area Health Corporation

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

### Project Description

This project focuses on the development of 1 megawatt of wind power located in an area AEA suspects to be have a Class 7 resource. The location is approximately 14 miles Northwest of the City of Dillingham, less than 5 miles Northeast of Manakotak, and approximately 8 miles South of Aleknagik near Snake Mountain. Due to the specific need of the development of this resource for the Healthcare organization, this project will benefit all the communities that rely on the Bristol Bay Area Health Corporation to remain 'the only' critical access medical facility in the Bristol Bay Region. Although the project is being proposed by a Tribal Organization, it has the support of the local electrical cooperative [Nushagak] as well as many of the residents of Dillingham. Our project development team has tapped into the resources of TDX, Power Corp., MAP Consulting, STG Inc, and Bristol Bay Area Health Corporation.

### Funding & Cost

<b>Cost of Power:</b>	\$0.23/kWh
<b>Requested Grant Funds:</b>	\$10,100,000
<b>Matched Funds Provided:</b>	\$2,800,000
<b>Total Potential Grant Amount:</b>	\$12,900,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**App #55 Snake Mountain Wind Farm Construction**

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Bristol Bay Area Health Corporation

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

**Scoring & Location**



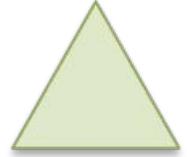
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Bristol Bay

**Election District:** 37, Bristol Bay-Aleutians



Rank within Region  
(out of )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	9
2) Funding Resources (Max 25)	20
3) Project Feasibility from Stage 2 (Max 20)	
4) Project Readiness (Max 5)	
5) Benefits (Max 10)	
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	

**AEA Review Comments**

Applicant requested proposal be withdrawn.

## App #55 Snake Mountain Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Bristol Bay Area Health Corporation

**AEA Program Manager:** James Jensen

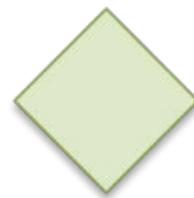
**Applicant Type:** Government Entity

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The Bristol Bay Area Health Corporation (BBAHC) is requesting for funding for the development of a 1 MW wind farm in Snake Mountain near Dillingham. The total project cost is \$13.1 million; amount requested is \$10.1 million.

In present value terms, the estimated stream of benefits of the proposed project amount to \$10.54 million using applicant's data and \$11.14 million using AEA information. The present value of project costs amount to \$12.38 million (for both applicant and AEA calculations). The economic benefit of the project is primarily driven by the value of displaced fuel estimated to be on average about \$920,000 per year over the 20-year period; not enough to offset capital costs of the project. The calculated B/C ratios are: 0.85 using the applicant's data and 0.90 using AEA information.

## App #55 Snake Mountain Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Bristol Bay Area Health Corporation

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

state land

## App #56 Buckland/Deering/Noorvik Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** Northwest Arctic Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

### Project Description

Rural Alaskans in the Northwest Arctic Borough (NWAB) are facing some of the highest costs anywhere in the nation. This project proposes to: develop the wind energy potential in the communities of Buckland, Deering, and Noorvik; develop appropriate wind generation engineering plans and designs, and; construct the necessary wind generation facilities (fully integrated with diesel power systems). This is a two year project. Year one involves performing both pre-construction and construction tasks in Deering and Noorvik as well as pre-construction tasks in Buckland. Year two involves construction tasks in Buckland.

### Funding & Cost

<b>Cost of Power:</b>	\$0.52 /kWh
<b>Requested Grant Funds:</b>	\$10,758,928
<b>Matched Funds Provided:</b>	\$162,500
<b>Total Potential Grant Amount:</b>	\$10,921,428
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$10,758,928

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$10,758,928

**App #56 Buckland/Deering/Noorvik Wind Farm Construction**

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** Northwest Arctic Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

**Scoring & Location**



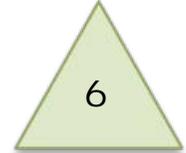
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Northwest Arctic

**Election District:** 40, Arctic



**Rank within Region**  
(out of 9 )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	19
2) Funding Resources (Max 25)	12
3) Project Feasibility from Stage 2 (Max 20)	14
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	6
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	4

**AEA Review Comments**

It is likely that viable projects with proposed energy savings can be completed. Recommend full funding with requirement that prior to disbursement of construction funding applicant submit feasibility and final design documents acceptable to AEA that indicate viable project.

## App #56 Buckland/Deering/Noorvik Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** Northwest Arctic Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The Northwest Arctic Borough (NWAB) is jointly applying for three wind projects in Buckland, Deering, and Noorvik. The NWAB is requesting funding for construction of a total installed wind capacity of 700 kw that will be allocated as follows: 3 wind turbines at 100 kw each in Buckland; 2 wind turbines at 100kW each in Deering; and 3 wind turbines at 100 kW each in Noorvik. The total project cost is \$10,921,428 (Buckland: \$5,279,369; Deering: \$2,690,191; Noorvik: \$2,951,869) amount requested is \$10,758,928.

**Buckland:** In present value terms, the estimated benefits of the proposed project amount to \$3.0 million using applicant's data and \$3.7 million using AEA information. The present value of project costs amount to \$4.9 million (for both applicant and AEA calculations). The calculated B/C ratios are: 0.62 using the applicant's data and 0.77 using AEA information. The difference is due to lower AEA benchmark O&M cost of \$.022 per kWh or about \$14,388 per year compared to the applicant's stated annual O&M costs of \$22,000 and the amount of displaced diesel fuel. The projected amount of displaced diesel fuel is 49,420 gal/year based on applicant data and 54,545 gal/year based on AEA assumptions. The difference is due to a discrepancy of reported diesel generator efficiency vs. applicant stated powerhouse efficiency.

**Deering:** In present value terms, the estimated benefits of the proposed project amount to \$2.3 million using applicant's data and \$3.1 million using AEA information. The present value of project costs amount to \$2.5 million (for both applicant and AEA calculations). The calculated B/C ratios are: 0.94 using the applicant's data and 1.25 using AEA information. The difference is due to lower AEA benchmark O&M cost of \$.022 per kWh or about \$10,736 per year compared to the applicant's stated annual O&M costs of \$22,000 and the amount of displaced diesel fuel. The projected amount of displaced diesel fuel is 37,778 gal/year based on applicant data and 43,262 gal/year based on AEA assumptions. The difference is due to a discrepancy of reported diesel generator efficiency vs. applicant stated powerhouse efficiency.

**Noorvik:** In present value terms, the estimated benefits of the proposed project amount to \$2.6 million using applicant's data and \$2.2 million using AEA information. The present value of project costs amount to \$2.7 million (for both applicant and AEA calculations). The calculated B/C ratios are: 0.98 using the applicant's data and 0.83 using AEA information. The difference is due the amount of displaced diesel fuel. The projected amount of displaced diesel fuel is 36,329 gal/year based on applicant data and 27,273 gal/year based on AEA assumptions, based on wind generation projections: applicant states 473,000 kWh/year; AEA calculates 363,000 kWh/year.

## App #56 Buckland/Deering/Noorvik Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design

**Proposer:** Northwest Arctic Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #57 South Fork Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** South Fork Hydro, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Project Description

The South Fork hydroelectric project is a low-impact run-of-river project located in Eagle River, Alaska. The project will be located on a private homestead off Hiland Road in Eagle River. Energy from the project would be provided into the Matanuska Electric Association (MEA) grid. South Fork Hydro, LLC (SFH) is the project proponent, and would contribute funding, own, and operate the project. SFH has already completed reconnaissance, feasibility, and permitting efforts. Final design is currently in progress, and construction is planned for 2009. Final design would be completed by members of South Fork Hydro, LLC. Construction would be completed by South Fork Construction, Inc., with some construction tasks subcontracted as appropriate.

### Funding & Cost

<b>Cost of Power:</b>	\$0.14 /kWh
<b>Requested Grant Funds:</b>	\$1,000,000
<b>Matched Funds Provided:</b>	\$2,087,000
<b>Total Potential Grant Amount:</b>	\$3,087,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$1,000,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$1,000,000

## App #57 South Fork Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** South Fork Hydro, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Scoring & Location



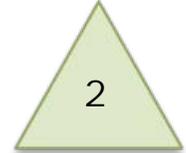
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 17, Eagle River



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	5
2) Funding Resources (Max 25)	24
3) Project Feasibility from Stage 2 (Max 20)	19
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	9
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	5

### AEA Review Comments

This appears to be a viable hydro resource that will benefit the Railbelt network. At 1 MW, the project's relatively small capacity and energy output will likely not impact regional planning.

Recommend with the following grant conditions: 1) applicant required to petition RCA for a certificate of public convenience and necessity and economic rate regulation prior to release of construction funds, 2) establish a power purchase agreement with MEA prior to release of construction grant funds.

Recommend with conditions.

## App #57 South Fork Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** South Fork Hydro, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The evaluation assumes that South Fork hydro would displace natural gas-fired generation in the Railbelt and the primary benefit is therefore the estimated avoided cost of natural gas. The applicant intends to sell the output to a Railbelt utility at the utility's avoided cost. This suggests that rates for Railbelt consumers could be unaffected by the project – to the extent natural gas costs escalate, so would the utility's avoided cost along with the associated price of energy from the hydro project. The applicant does refer to a number of other benefits that could result from the project, and these are not included in this evaluation. Based on these assumptions combined with the applicant's estimated project costs, the B/C ratio comes to 5.41.

## App #57 South Fork Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** South Fork Hydro, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #58 Chuniisax Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** City of Atka

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

The project proposed is a small, 271-kW, cross-flow turbine, generation system with a darn and power which utilizes hydro-electric stored kinetic energy in a reservoir dam on Chuniisax Creek approximately 3/4-mile southwest of the old Atka village site and replacement electrical distribution system. The project will displace use of high cost fossil fuels with a renewable energy resource using proven technology. Energy costs to all users in Atka will be significantly reduced while providing the current and future energy requirements. The village has secured additional funding from EDA to complete the most of the remaining 55%. (45% was previously completed using RUS, AEA, and city funding.) This grant plus our cash and in-kind contribution will complete the balance.

### Funding & Cost

<b>Cost of Power:</b>	\$0.55 /kWh
<b>Requested Grant Funds:</b>	\$996,000
<b>Matched Funds Provided:</b>	\$1,344,000
<b>Total Potential Grant Amount:</b>	\$2,340,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$996,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$996,000

## App #58 Chuniisax Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** City of Atka

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



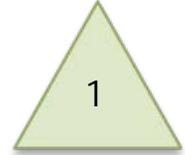
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Aleutians

**Election District:** 37, Bristol Bay-Aleutians



**Rank within Region**  
(out of 5 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	21
2) Funding Resources (Max 25)	23
3) Project Feasibility from Stage 2 (Max 20)	18
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	10
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

This project is approximately 45% complete and has received funding support from Deanli Commission through AEA's rural power system upgrade program. Currently the project is halted due to insufficient construction funding. There are no other major barriers to development.

While the project did not indicate a particular team, the application describes a process underway with EDA for selection of a design and construction team.

AEA recommends full funding with the following conditions before funding is made available: 1) City of Atka provide a revised and detailed project schedule, including outstanding permits, and budget, 2) submit management team resumes for approval by AEA, 3) submit revised final design and cost estimate for AEA approval.

## App #58 Chuniisax Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** City of Atka

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



5.89

Benefit/Cost Ratio  
(AEA)



4.09

Applicant states that approximately \$2 million was spent in 2005 to build an access road and a powerhouse structure, plus purchase of a turbine-generator. The City of Atka has a \$1.3 million federal grant to apply towards the remaining cost plus an approved loan from the Power Project Fund. If approved, this renewable energy grant would substitute for the PPF loan.

All of the electricity demand for the City utility is now supplied by the City's diesel generators, and all of the electricity demand for the local seafood processor is now supplied by the processor's diesel generators. Applicant states that all of that energy – utility and processor -- would be supplied by the hydro project instead. Based on the remaining cost to complete the project combined with the City's assumption on serving 100% of existing demand, the B/C ratio is estimated at 5.89.

The project was also evaluated under somewhat more conservative assumptions on the amount of diesel generation that would be displaced by hydro. Based on earlier indications, the alternative evaluation assumed that the hydro project would supply the City for 10.5 months per year due to water constraints in late winter and early spring, and that it would serve half – not all – of the processor's requirements. This, in turn, was based on the idea that the project would supply the processor's "house loads" such as lights but would not be relied upon to run the processing lines. The B/C ratio under these alternative assumptions still came out at 4.09.

## App #58 Chuniisax Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** City of Atka

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

Underway

## App #59 Kobuk River Valley Woody Biomass Feasibility Study

**Resource:** Biomass

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Northwest Inupiat Housing Authority

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Project Description

This project will be located in the upper Kobuk River Valley and will serve the villages of Kobuk, Shungnak, and Ambler. The applicant is Northwest Inupiat Housing Authority; other cooperating organizations include NANA Regional Corporation, Maniilaq Association, NANAPacific, WHPacific Inc., and Kobuk, Shungnak and Ambler Village Councils. An initial woody biomass site assessment was sponsored by NANAPacific in August, 2008 under a Department of Energy Tribal Energy Grant. Bill Wall, PhD conducted an initial reconnaissance study to determine the viability of a wood energy project. The study determined that a wood energy program is viable and that all three of the villages are very interested in proceeding. The proposed project will develop following analysis and fully complete a reconnaissance and feasibility study.

### Funding & Cost

<b>Cost of Power:</b>	\$0.64/kWh
<b>Requested Grant Funds:</b>	\$249,500
<b>Matched Funds Provided:</b>	\$248,980
<b>Total Potential Grant Amount:</b>	\$498,480
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$249,500

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$249,500

## App #59 Kobuk River Valley Woody Biomass Feasibility Study

**Resource:** Biomass

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Northwest Inupiat Housing Authority

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Scoring & Location



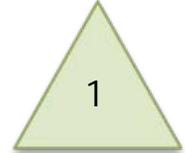
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Northwest Arctic

**Election District:** 40, Arctic



**Rank within Region**  
(out of 9 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	24
2) Funding Resources (Max 25)	23
3) Project Feasibility from Stage 2 (Max 20)	13
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	4
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	3

### AEA Review Comments

Applicant proposes reconnaissance and feasibility assessment of stick- or chip-fired community wood heating stems in Kobuk, Shungnak and Ambler that would displace around 130,000 gallons of fuel oil. While economics of the project remain in question, feasibility study will result in the development of valuable biomass resource and utilization information for three communities with high fuel costs and limited options.

Recommend full funding.

## App #59 Kobuk River Valley Woody Biomass Feasibility Study

**Resource:** Biomass

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Northwest Inupiat Housing Authority

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposes a reconnaissance study to look at supplement or replacement for using heating oil. The capital cost estimate is the high end estimate from a pre-feasibility analysis. AEA analysis considered wood fuel as a cost where as the applicant treated the value of the wood fuel as income to the local woody biomass industry. The AEA B/C ratio is 0.57.

**App #59 Kobuk River Valley Woody Biomass Feasibility Study**

**Resource:** Biomass

**Proposed Project Phase:** Feasibility  
Recon

**Proposer:** Northwest Inupiat Housing Authority

**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #60 Yakutat Biomass Gasification Construction

**Resource:** Biofuels

**Proposed Project Phase:** Construction Design

**Proposer:** Yakutat Power

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

This project will convert readily available biomass to a producer gas (wood gasification) that will be used to reduce diesel fuel consumption at the Yakutat Power plant. The Biomax 75 is based on proven technology with recent additional improvements for use in cold weather climates. Direct beneficiaries of this project include all Yakutat Power electric service customers. Participants in the project include Yakutat Power, the City and Borough of Yakutat, the U.S. Forestry Service, National Park Service, and Community Power Corp - the Biomax 75 developer.

### Funding & Cost

<b>Cost of Power:</b>	\$0.53 /kWh
<b>Requested Grant Funds:</b>	\$3,393,600
<b>Matched Funds Provided:</b>	\$240,000
<b>Total Potential Grant Amount:</b>	\$3,633,600
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$249,600

### AEA Recommendation

- Full Funding
- ✗ Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$249,600

## App #60 Yakutat Biomass Gasification Construction

**Resource:** Biofuels

**Proposed Project Phase:** Construction Design

**Proposer:** Yakutat Power

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



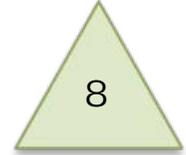
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 5, Cordova-Southeast Islands



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	20
2) Funding Resources (Max 25)	14
3) Project Feasibility from Stage 2 (Max 20)	13
4) Project Readiness (Max 5)	2
5) Benefits (Max 10)	8
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	2

### AEA Review Comments

Technology demonstration appears valuable, however the demonstration project is not defined well enough to assure that the construction project will be successful. Reconnaissance and feasibility work is not finalized and incomplete. There is no evidence of a technology review and selection process. There is no detailed assessment of delivered biomass fuel cost and long-term availability. There is no detailed budget for equipment and contractual.

Because the concept appears promising, recommend partial funding for design, NEPA permitting, and resource selection. Prior to granting any funds, the applicants will be required to submit a detailed budget for these activities.

## App #60 Yakutat Biomass Gasification Construction

**Resource:** Biofuels

**Proposed Project Phase:** Construction Design

**Proposer:** Yakutat Power

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



AEA reviewed the capital costs submitted by Yakutat Power and an additional \$300,000 was added to equipment/capital for chipping and drying/processing. It appears that applicant made an error in the calculation of wood biomass requirements after the system boosts from 75% to 95% availability. Nevertheless, fuel savings quickly rise from \$300,000 to over \$1.4 million per year with the biomass system. Assuming all stages of the project are successfully completed and a 20 year horizon is used the estimated B/C ratio is 1.94.

**App #60 Yakutat Biomass Gasification Construction**

**Resource:** Biofuels

**Proposed Project Phase:** Construction  
Design

**Proposer:** Yakutat Power

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #61 McGrath Heat Recovery Construction

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction Design

**Proposer:** McGrath Light & Power, Co.

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

McGrath Light and Power (ML &P) is proposing a heat recovery project. Direct beneficiaries of this project include the Iditarod Area School District (IASD) McGrath complex, and three commercial facilities adjacent to the ML&P power plant. Indirect beneficiaries include all ML&P electric customers, as the project will provide increased revenues from the sale of recovered heat, as well as improved electric generating efficiency and reduced operations and maintenance costs. ML&P will be the Grantee under the Renewable Energy Fund. ML&P has teamed up with the engineering firm of Alaska Energy and Engineering, Inc. (AE&E). AE&E has a long history of successful energy related projects throughout Alaska, and has worked with both ML&P and IASD on numerous projects dating back to 1995.

### Funding & Cost

<b>Cost of Power:</b>	\$0.61 /kWh
<b>Requested Grant Funds:</b>	\$824,815
<b>Matched Funds Provided:</b>	\$167,000
<b>Total Potential Grant Amount:</b>	\$991,815
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$712,415

### AEA Recommendation

- Full Funding
- ✗ Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$712,415

## App #61 McGrath Heat Recovery Construction

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction Design

**Proposer:** McGrath Light & Power, Co.

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



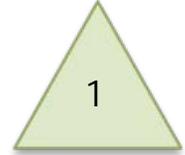
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Yukon-Koyukuk/Upper Tanana

**Election District:** 6, Interior Villages



**Rank within Region**  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	23
2) Funding Resources (Max 25)	19
3) Project Feasibility from Stage 2 (Max 20)	19
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	9
6) Local Support (Max 5)	3
7) Sustainability (Max 5)	5

### AEA Review Comments

Proposal includes a new 456 kW genset in addition to the exhaust and jacket water heat recovery system. Recommend partial funding for the complete heat recovery system development, but excluding the genset and associated freight. The genset is not considered an element of the "waste heat recovery" system eligible for funding under the RE Fund legislation.

Proposal number 30 requests funding for development of a community wood heating system that would likely interact with this proposal. Proposal 30 refers to integration with a water project with Village Safe Water and refers to future coordination with this project. We note there are different engineering teams supporting the two projects. On this basis we require coordination of design of both projects.

## App #61 McGrath Heat Recovery Construction

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction Design

**Proposer:** McGrath Light & Power, Co.

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant capital cost figures were reviewed and accepted, totaling \$991,815 for installation of the new heat recovery system. The benefit-cost analysis excludes the cost of the new generator and calculates benefits strictly stemming from the heat recovery system. The estimated cost of construction for the system without including the new generator and its associated cost is \$855,961, and the amount of fuel savings is 32,000 gal per year. Construction is expected to be completed in 2009 and heat recovery operational in fall of 2009.

The aggregate benefits of this project accrue to the recipients of waste heat at rates less than half that of fuel heat, and to ML&P customers through lower operating costs and power sales. The value of displaced fuel was based on a weighted average of fuel oil savings in the buildings tying in to the waste heat recovery system and ML&P customers buying power. Estimated B/C ratio is 2.13 as evaluated.

**App #61 McGrath Heat Recovery Construction**

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction  
Design

**Proposer:** McGrath Light & Power, Co.

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #62 Chignik Lake Area Wind-Hydro Final Design

**Resource:** Wind

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Lake and Peninsula Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Project Description

The proposed project is a wind/hydro hybrid intertie feasibility study for Chignik Bay, Chignik Lagoon and Chignik Lake (hereafter "Chigniks".) There is existing wind data confirming class 5 wind in the area, strong enough to be a good energy source. Part of the feasibility study will involve determining the most advantageous site for wind turbines by collecting supplemental met data. The Chignik Alaska Draft Small Hydropower Feasibility Report and EIS, by the Army Corps of Engineers, July 1984, evaluated hydro resources at Packers Creek, Mud Bay Lake and Indian Creek. The study found that Indian Creek had the best potential for economical development. The Lake and Peninsula Borough will provide management for the project, overseeing the work of HDR Alaska who will act as the owner representative in developing the feasibility study for a wind/hydro intertie project.

### Funding & Cost

<b>Cost of Power:</b>	\$0.63/kWh
<b>Requested Grant Funds:</b>	\$375,000
<b>Matched Funds Provided:</b>	\$96,000
<b>Total Potential Grant Amount:</b>	\$471,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$225,000

**AEA Funding Recommendation:** \$375,000

### AEA Recommendation

- Full Funding
- ✗ Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #62 Chignik Lake Area Wind-Hydro Final Design

**Resource:** Wind

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Lake and Peninsula Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Scoring & Location



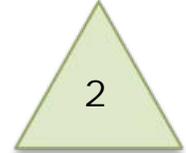
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Bristol Bay

**Election District:** 37, Bristol Bay-Aleutians



**Rank within Region**  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	24
2) Funding Resources (Max 25)	18
3) Project Feasibility from Stage 2 (Max 20)	13
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	8
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	4

### AEA Review Comments

Note that app# 14 Chignik Lagoon hydro, app# 62 Chignik hydro/wind feas, and app#40 Chignik Hydro all address the same subregion. Because all three proposals request feasibility assistance, the proposed wind/hydro integration/transmission budget is too large. Milestones 7 to 13 are final design and permitting activities that should only be undertaken if a decision is made to interconnect the three communities. Recommend that feasibility milestones 1, 3-6 be funded at this time and that the three applicants be required to coordinate on data collection, study and milestones.

## App #62 Chignik Lake Area Wind-Hydro Final Design

**Resource:** Wind

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Lake and Peninsula Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Lake and Peninsula Borough is requesting funds for a wind/hydro hybrid intertie feasibility study for the communities of Chignik, Chignik Lagoon, and Chignik Lake. The total project cost is estimated to be \$8,150,000 including development and construction costs. The amount requested is \$375,000. The proposed installed capacity is 500kW for the hydro project and 100kW for the wind project.

In present value terms, the estimated stream of benefits of the proposed project amount to \$7.86 million using applicant's data and \$11.64 million using AEA information. The present value of project costs amount to \$7.34 million (Both for applicant's data and AEA assumptions). The main difference in the calculation is the addition of R&R costs in the AEA B/C calculation. Since there is a hydro component, the analysis was done over 50 years. The R&R costs for the wind component are based on AEA benchmark costs of \$5,000 per kW capacity with replacement occurring every 20 years. The R&R costs for the hydro component are based on data from Attachment E showing \$50,000 of R&R costs every 5 years. The calculated B/C ratios are: 1.07 using the applicant's data and 1.58 using AEA information. The difference is due to a present value benefit of \$7.86 million based on applicant information, and \$11.64 million based on AEA assumptions. In the AEA evaluation it is assumed that fuel oil based heating will be converted to electric heat, utilizing excess renewable energy generation. The total amount of projected displaced fossil fuel (both for heating and electricity) is 110,000 gal/year based on applicant information and 141,700 gal/year (98,912 from electricity and 42,788 from heat).

## App #62 Chignik Lake Area Wind-Hydro Final Design

**Resource:** Wind

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Lake and Peninsula Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #63 Lake Pen Borough Wood Heating Final Design

**Resource:** Biomass

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Lake and Peninsula Borough

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Project Description

The Lake and Peninsula Borough seeks funding for design and permitting to install High Efficiency Low Emissions (HELE) wood boilers in five communities in the Lake and Peninsula Borough providing heat to the local school and adjacent teacher housing. The communities to be considered are Pedro Bay, Newhalen/Iliamna, Nondalton, Kokhanok and Port Alsworth. The schools in these communities served 225 children in the 07-08 school year.

### Funding & Cost

<b>Cost of Power:</b>	\$0.63/kWh
<b>Requested Grant Funds:</b>	\$77,000
<b>Matched Funds Provided:</b>	\$18,000
<b>Total Potential Grant Amount:</b>	\$95,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$77,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$77,000

## App #63 Lake Pen Borough Wood Heating Final Design

**Resource:** Biomass

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Lake and Peninsula Borough

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Scoring & Location



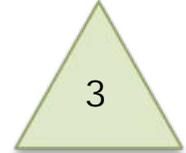
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Bristol Bay

**Election District:** 36, Kodiak



Rank within Region  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	24
2) Funding Resources (Max 25)	18
3) Project Feasibility from Stage 2 (Max 20)	13
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	4
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant proposes final design of small, efficient wood-fired boilers that would use local beetle-killed wood to heat school buildings in Pedro Bay, Newhalen/Iliamna, Nondalton, Kokhanok and Port Alsworth displacing approximately 40,000 gallons of heating fuel per year.

Recommend full funding.

## App #63 Lake Pen Borough Wood Heating Final Design

**Resource:** Biomass

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Lake and Peninsula Borough

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The applicant proposes to install high efficiency wood boilers at the schools of five communities in the Lake and Peninsula Borough. Fuel oil costs were estimated by adding \$0.50 to the PCE fuel price in the community. The Levelock PCE fuel price was used for Nondalton and Newhalen since their PCE fuel price appeared to be too low. The applicant provided an estimate for the wood fuel at a cost of \$20/MMBTU. The amount of wood fuel required was assumed to be the BTU value of the fuel that the applicant said would be displaced. Capital cost (\$1,265,000) and O&M estimates (\$35,000/yr) were taken from the applicant. With a 20 year project life the B/C ratio is 0.65.

**App #63 Lake Pen Borough Wood Heating Final Design**

**Resource:** Biomass

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Lake and Peninsula Borough

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

Project appears viable. The area has a wood supply, including a lot of beetle-killed spruce.

## App #64 Lake Pen Borough Wind Feasibility Study

**Resource:** Wind

**Proposed Project Phase:** Feasibility

**Proposer:** Lake and Peninsula Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Project Description

This project is a regional Resource Assessment/Feasibility Analysis/Conceptual design of Wind Power opportunities around the Lake & Peninsula Borough. It is designed to build upon existing wind resource assessment efforts, including wind met tower data in some communities, as well as data from existing micro-scale (10kW) wind turbines that are in operation.

### Funding & Cost

<b>Cost of Power:</b>	\$0.68/kWh
<b>Requested Grant Funds:</b>	\$184,000
<b>Matched Funds Provided:</b>	\$40,000
<b>Total Potential Grant Amount:</b>	\$224,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$184,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$184,000

## App #64 Lake Pen Borough Wind Feasibility Study

**Resource:** Wind

**Proposed Project Phase:** Feasibility

**Proposer:** Lake and Peninsula Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Scoring & Location



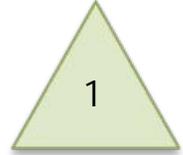
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Bristol Bay

**Election District:** 36, Kodiak



**Rank within Region**  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	26
2) Funding Resources (Max 25)	18
3) Project Feasibility from Stage 2 (Max 20)	16
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	8
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant proposes to assess feasibility of and prepare conceptual designs for potential wind systems in Pedro Bay, Port Alsworth, Egegik, Iliamna-Newhalen-Nondalton, Port Heiden and Pilot Point. The major outcome of the work would be a set of bid documents for a regional design-build package for wind systems in suitable locations. Recommend specialized experts to consult in wind-diesel integration work.

Recommend full funding.

## App #64 Lake Pen Borough Wind Feasibility Study

**Resource:** Wind

**Proposed Project Phase:** Feasibility

**Proposer:** Lake and Peninsula Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Lake and Peninsula Borough is requesting for funds for a regional wind energy assessment for 6 communities. The total project cost is estimated to amount to \$8 million; amount requested for the study is \$184,000.

The B/C ratio based on applicant information is 1.45, and 1.71 based on AEA assumptions. Total project cost in present value terms are \$7.33 million (both from applicant data and AEA). The present value benefits are calculated as \$10.64 million from applicant data and \$12.53 million from AEA calculations. The difference is due to a higher projected amount of diesel displacement based on AEA assumptions.

The amount of displaced fossil fuel is 152,654 gal/year based on applicant data and 164,238 gal/year based on AEA assumptions.

## App #64 Lake Pen Borough Wind Feasibility Study

**Resource:** Wind

**Proposed Project Phase:** Feasibility

**Proposer:** Lake and Peninsula Borough

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #65 Indian River Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** City of Tenakee Springs

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

Replace diesel generation of electricity for the community of Tenakee Springs with renewable hydroelectric power. The City of Tenakee Springs proposes to construct a hydroelectric project on Indian River. This will be a low head, run-of-river plant displacing the use of at least 33,000 gallons of diesel fuel. Design, engineering, and construction will involve the City of Tenakee Springs, multiple state and federal agencies, private contractors, and the Alaska Energy Authority.

### Funding & Cost

<b>Cost of Power:</b>	\$0.54 /kWh
<b>Requested Grant Funds:</b>	\$2,400,000
<b>Matched Funds Provided:</b>	\$100,000
<b>Total Potential Grant Amount:</b>	\$2,500,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

## App #65 Indian River Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** City of Tenakee Springs

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



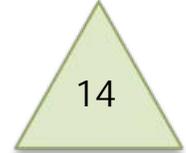
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 5, Cordova-Southeast Islands



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	20
2) Funding Resources (Max 25)	11
3) Project Feasibility from Stage 2 (Max 20)	12
4) Project Readiness (Max 5)	2
5) Benefits (Max 10)	5
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	4

### AEA Review Comments

The City of Tenakee has received funding for assessing feasibility of this project under the DC/AEA alternative energy grant program.

Recently AEA has learned there is potential for a regional power solution that would interconnect Tenakee, Hoonah, and Pelican. It would allow hydro (and possibly geothermal) resources to be shared. This proposal, while well-conceived from the standpoint of serving only Tenakee, may not be optimal for a regional solution.

AEA does not recommend funding for this proposal. AEA will work with Southeast Conference and other stakeholders to move toward a regional power solution.

## App #65 Indian River Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** City of Tenakee Springs

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant recently obtained funds to conduct a feasibility study of the project but that study has not yet been done. At this stage, however, the applicant estimates that the Indian River project would displace all diesel generation for the local utility and would also produce surplus energy to displace an additional 20,000 gallons of heating fuel in the community. Based on these projections and the City's capital cost estimate, the B/C ratio for the project is estimated at 3.99.

AEA notes that the U.S. Army Corps of Engineers developed a \$3.0 million cost estimate for the same project in 1984. This translates into approximately \$6.1 million in 2008 dollars, compared with the \$2.4 million estimate put forward by the applicant. AEA also considers the projected displacement of heating fuel to be speculative at this stage of project definition. As a result, an alternative B/C ratio was calculated to incorporate these two changes: (1) a capital cost estimate of approximately \$6.1 million, and (2) exclusion of the projected displacement of heating fuel using surplus project energy. The B/C ratio under these revised assumptions came to 0.98.

## App #65 Indian River Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** City of Tenakee Springs

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #66 Coal Mine Road Wind Farm Final Design

**Resource:** Wind

**Proposed Project Phase:** Design

**Proposer:** Alaska Wind Power, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Project Description

The Delta Wind Project is designed to contribute clean, renewable wind power to the railbelt energy grid. The project area is about 25 miles south of Delta Junction on Coal Mine Road. We are currently funding an Interconnection Study with Golden Valley Electric Association (GVEA) to identify costs associated with putting wind power on their transmission system near Delta Junction. The results of the interconnection study will be used to formulate a power tariff for sale of our power to GVEA. The size of our project is dependent on our ability to sell power, not on the wind resource, but we expect that a 40 to 50 MW project could be achievable. The communities served will include all communities within the GVEA's service area that purchase power from GVEA, including Delta Junction, North Pole, Fairbanks, Fox, College, Nenana, and Healy, as well as two major gold mines, Fort Knox and Pogo.

### Funding & Cost

<b>Cost of Power:</b>	\$0.21 /kWh
<b>Requested Grant Funds:</b>	\$105,000
<b>Matched Funds Provided:</b>	\$26,250
<b>Total Potential Grant Amount:</b>	\$131,250
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$105,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$105,000

## App #66 Coal Mine Road Wind Farm Final Design

**Resource:** Wind

**Proposed Project Phase:** Design

**Proposer:** Alaska Wind Power, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Scoring & Location



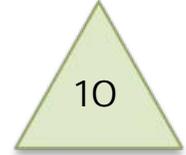
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 12, Richardson-Glenn Highways



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	8
2) Funding Resources (Max 25)	18
3) Project Feasibility from Stage 2 (Max 20)	16
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	9
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant proposes to study impacts on raptors and migratory birds of a potential 40-50 MW wind farm near Delta that would tie into the GVEA grid. Proposal follows onsite wind measurement at two sites, for 9 and 21 months that estimates a 30% capacity factor. Applicant is an IPP that includes AP&T as a partner.

Recommend full funding with the requirement that applicant will be required to cooperate and share data, including interconnection study analysis and outputs, on a non-confidential basis with the ongoing AEA-sponsored Railbelt Regional Integrated Resource Plan project.

## App #66 Coal Mine Road Wind Farm Final Design

**Resource:** Wind

**Proposed Project Phase:** Design

**Proposer:** Alaska Wind Power, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Alaska Wind Power, LLC, an independent power producer is requesting for funds for avian studies amounting to \$105,000 for a 40-50MW wind farm project under development. The total wind farm project cost, including the wind infrastructure is estimated to be \$96 million.

In present value terms, the estimated stream of benefits of the proposed project amount to \$248 million using applicant's data and \$315 million using AEA information. The present value of project costs amount to \$87.9 million (for both applicant and AEA calculations). The calculated B/C ratios are: 2.82 using the applicant's data and 3.58 using AEA information. The more favorable B/C ratio using AEA information is primarily due to higher annual wind generation output assumption; which is based on information used in the previous analysis for the Delta Wind Project.

## App #66 Coal Mine Road Wind Farm Final Design

**Resource:** Wind

**Proposed Project Phase:** Design

**Proposer:** Alaska Wind Power, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

Although this is moving forward and possible, there is a risk that an associated lawsuit about land ownership being given to the University could effect this project.

## App #67 Bethel Wind Farm Construction (BNC land)

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Village Wind Power, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Project Description

The Bethel Wind Project is designed to contribute clean, renewable wind power to the Bethel energy grid. The project area is about 1.5 miles northwest of the Bethel Airport on hilltop land owned by Bethel Native Corporation. Our power will be sold wholesale to BUC for distribution to its customers as normal. The size of our project is dependent on our ability to sell power, not on the wind resource, but we expect that a two MW project will be viable. The communities served could include Napakiak and Bethel.

### Funding & Cost

<b>Cost of Power:</b>	\$0.60/kWh
<b>Requested Grant Funds:</b>	\$6,960,000
<b>Matched Funds Provided:</b>	\$1,750,000
<b>Total Potential Grant Amount:</b>	\$8,710,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

## App #67 Bethel Wind Farm Construction (BNC land)

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Village Wind Power, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Scoring & Location



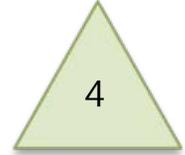
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Lower Yukon-Kuskokwim

**Election District:** 38, Bethel



**Rank within Region**  
(out of 10)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	22
2) Funding Resources (Max 25)	20
3) Project Feasibility from Stage 2 (Max 20)	13
4) Project Readiness (Max 5)	2
5) Benefits (Max 10)	8
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	3

### AEA Review Comments

There are two entities planning wind energy projects in Bethel: 1) the City of Bethel (# 122) is proposing a 400 kW construction project in addition to a 100 kW project that was approved by the AEA and the Denali Commission in the alternative energy RFP, and 2) Village Wind Power is proposing construction of up to 2 MW (# 67). Additionally AVCP Regional Housing Authority is proposing study of hydro at the Kiseralik and Chikuminuk Rivers in Round 2 of the RE Fund. Therefore, there is a need for a regional integrated resource energy plan in the Bethel area to coordinate when and where energy projects should be developed. This proposal should be considered in the context of an integrated plan to assure proper sizing, timing, and integration of multiple energy projects.

A 2 MW wind project will likely impact system reliability and stability of the existing diesel power system. However there is no allowance in the proposed work plan and budget to integrate the project into the existing network to ensure continued reliability. Without the integration work the viability of the project cannot be assured.

On the basis of our integration concerns, AEA recommends not awarding funding for construction.

## App #67 Bethel Wind Farm Construction (BNC land)

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Village Wind Power, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The applicant, Village Wind Power, LLC, is an independent power producer that intends to sell wind energy to the local utility, Bethel Utilities Corporation. The project is a 2 MW wind farm with an estimated cost of \$8.71 million and a grant request of \$6.96 million. The calculated B/C ratios are: 4.25 using the applicant's data and 3.86 using AEA information. AEA information has slightly lower wind energy generation projections and therefore a lower amount of fuel displaced compared to the applicant's data given the same diesel generation efficiency. Based on applicant information the amount of displaced diesel fuel is 400,000 gal/year, AEA's projections are 357,687 gal/year. The O&M costs stated by the applicant are slightly higher (at \$.03/kWh) than the AEA benchmark O&M costs for rural energy projects (at \$.022 per kWh).

## App #67 Bethel Wind Farm Construction (BNC land)

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Village Wind Power, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #68 Anchorage Landfill Gas Electricity Construction

**Resource:** Biofuels

**Proposed Project Phase:** Construction

**Proposer:** Municipality of Anchorage, Solid Waste Services Dept

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Project Description

The Municipality of Anchorage (MOA) Solid Waste Services Department (SWS) intends to develop an electric power generating plant to be located at the Anchorage Regional Landfill (ARL). The plant will use landfill gas (LFG), a byproduct of anaerobic waste decomposition, as its primary fuel. Electricity generated by the project will be sold and delivered to the Matanuska Electric Association (MEA) distribution system to provide power to Eagle River and Southcentral Alaska. SWS will negotiate a power sales agreement with the end power user, likely MEA, and select of a development partner to design, build and operate the plant.

### Funding & Cost

<b>Cost of Power:</b>	\$0.14 /kWh
<b>Requested Grant Funds:</b>	\$3,700,000
<b>Matched Funds Provided:</b>	\$3,700,000
<b>Total Potential Grant Amount:</b>	\$7,400,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$3,700,000

**AEA Funding Recommendation:** \$2,000,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #68 Anchorage Landfill Gas Electricity Construction

**Resource:** Biofuels

**Proposed Project Phase:** Construction

**Proposer:** Municipality of Anchorage, Solid Waste Services Dept

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Scoring & Location



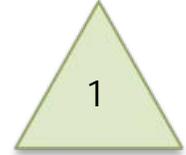
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 23, Downtown-Rogers Park



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	5
2) Funding Resources (Max 25)	24
3) Project Feasibility from Stage 2 (Max 20)	19
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	10
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

Given overall Muni of Anchorage support and extent of matching funds we expect successful power sales agreement negotiations. Note proposal 93 - Anchorage Landfill Gas Electricity requests funding for Alaska Wind Energy LLC to do similar work. While both have technical and economic merit, the application by the owner of the landfill may simplify the project. Under this project the Muni can work with an Alaska Wind or another IPP to develop and operate the project. Additionally the Muni proposes 50% match.

We recommend that either proposal 68 or proposal 93 be funded, but not both.

## App #68 Anchorage Landfill Gas Electricity Construction

**Resource:** Biofuels

**Proposed Project Phase:** Construction

**Proposer:** Municipality of Anchorage, Solid Waste Services Dept

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant capital cost figures were supplied by SCS Energy. They were reviewed and accepted, totaling \$7.4 million for the project. It is a conservative approach with a 15 year horizon -20 years is assumed in this analysis. The capital infrastructure placed will allow increases in generation capacity with moderate cost. Present transmission capacity would need to be enlarged in order to do so, but nevertheless the present approach is conservative. The avoided kWh cost is based on ISER figures.

The technology is well known, so there is very little project risk. The \$5 million municipal gas handling system required for environmental compliance has resulted somewhat higher construction costs. Avoided costs begin at \$1.6 million per year and increase thereafter, making for a B/C ratio of 3.54.

**App #68 Anchorage Landfill Gas Electricity Construction**

**Resource:** Biofuels

**Proposed Project Phase:** Construction

**Proposer:** Municipality of Anchorage, Solid Waste Services Dept

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #70 Quinhagak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

The Alaska Village Electric Cooperative is proposing to complete design, permitting and installation of three Northern 100B Wind Turbines, and new control modules, to provide wind power to the community of Quinhagak, which is located on the coast of the Bering Sea, west of Bethel in the Yukon-Kuskokwim Delta area.

### Funding & Cost

<b>Cost of Power:</b>	\$0.50/kWh
<b>Requested Grant Funds:</b>	\$3,882,243
<b>Matched Funds Provided:</b>	\$431,360
<b>Total Potential Grant Amount:</b>	\$4,313,603
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$3,882,243

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$3,882,243

## App #70 Quinhagak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



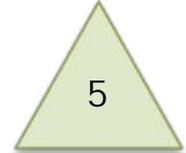
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Lower Yukon-Kuskokwim

**Election District:** 38, Bethel



Rank within Region  
(out of 10)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	19
2) Funding Resources (Max 25)	16
3) Project Feasibility from Stage 2 (Max 20)	13
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	4
6) Local Support (Max 5)	3
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant proposes design and construction of a 300 kW wind farm in Quinhagak. Proposal is well thought out and permitting risks appear low because of previous USFWS consultation. Construction budget is detailed and realistic. The project appears to result in high wind penetration, but the proposal does not provide detailed information regarding integration of wind into the existing system. Given an annual fuel displacement estimated at 46,223 gallons and a project cost of \$4.3 million, present value of net monetary benefits over the life of the project appear to be less than the project cost.

Recommend full funding with provision that prior to release of construction funding AEA requires the applicant to produce detailed integration documentation and dispatch strategy for the wind-diesel system.

## App #70 Quinhagak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Alaska Village Electric Cooperative (AVEC) is requesting funding for the design and construction of a 300 kW wind farm ( 3x 100 kW wind turbines). The total project cost is \$4,313,603, AVEC is requesting \$3,882,243 in grant funds.

The B/C ratio based on applicant information is 0.71, and 0.83 based on AEA assumptions. Total project cost in present value terms are \$4.01 million (both from applicant data and AEA). The present value benefits are calculated as \$2.87 million from applicant data and \$3.34 million from AEA calculations. The difference is due to a lower cost for O&M from applicant information.

The amount of displaced fossil fuel is 43,222 gal/year (41,260 gal/year electricity and 1,962 gal/year heat) based on applicant data and 50,236 gal/year (48,303 gal/year electricity and 1,933 heat) based on AEA assumptions.

## App #70 Quinhagak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #71 Toksook Bay Wind Farm Expansion Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

This project involves the final design, permitting, construction, erection, startup, and commissioning of one additional wind turbine to supplement the existing power generation and distribution system for the community of Toksook Bay. Participants in the project include AVEC, STG, and Northern Power. AVEC will provide overall project management and electrical system engineering for the project. STG will be the general contractor, responsible for the design and installation of all civil works, erection of the wind turbine, and installation of all ancillary electrical systems. Northern Power will provide the Northwind 100 wind turbine and startup & commissioning services. The site is already under control and already contains three Northwind 100 wind turbines. Existing permits are in place and can be extended to cover the additional turbines.

### Funding & Cost

<b>Cost of Power:</b>	\$0.39/kWh
<b>Requested Grant Funds:</b>	\$1,037,750
<b>Matched Funds Provided:</b>	\$115,306
<b>Total Potential Grant Amount:</b>	\$1,153,056
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$1,037,750

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$1,037,750

## App #71 Toksook Bay Wind Farm Expansion Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Alaska Village Electric Cooperative

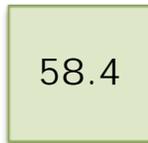
**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



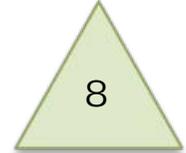
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Lower Yukon-Kuskokwim

**Election District:** 38, Bethel



**Rank within Region**  
(out of 10)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	15
2) Funding Resources (Max 25)	16
3) Project Feasibility from Stage 2 (Max 20)	14
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	4
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	5

### AEA Review Comments

Proposal is well thought out, and given existing turbines in Toksook, permitting risks are low. Construction budget is detailed and realistic. The project appears to result in high wind penetration, but the proposal does not provide detailed information regarding integration of wind into the existing system. Given a fuel displacement of 11,000 gallons and a project cost of over \$1 million, net monetary benefits over the life of the project appear to be less than project cost.

As a part of final design AEA requires the applicant to produce detailed integration documentation and dispatch strategy for the wind-diesel system.

## App #71 Toksook Bay Wind Farm Expansion Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Alaska Village Electric Cooperative (AVEC) is requesting funding for the design and construction for the expansion of their wind farm in Toksook Bay. The additional 100kW wind turbine would bring the installed capacity of Toksook Bay wind to a 400 kW wind farm ( from 3x 100 kW existing wind turbines). The total project cost is \$1,153,056; AVEC is requesting \$1,037,750 in grant funds.

The B/C ratio based on applicant information is 0.65, and 1.00 based on AEA assumptions. Total project cost in present value terms are \$1.01 million (both from applicant data and AEA). The present value benefits are calculated as \$710,398 from applicant data and \$1,091,266 from AEA calculations. The difference is due to a higher projected amount of wind energy generation based on AEA assumptions.

The amount of displaced fossil fuel is 11,000 gal/year (7,600 gal/year electricity and 3,400 gal/year heat) based on applicant data and 16,512 gal/year (11,904 gal/year electricity and 4,608 heat) based on AEA assumptions.

## App #71 Toksook Bay Wind Farm Expansion Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #72 Mekoryuk Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

This project involves the final design, permitting, construction, erection, startup, and commissioning of two wind turbines to supplement the existing power generation and distribution system for the community of Mekoryuk. Participants in the project include AVEC, STG, and Northern Power. AVEC will provide overall project management and electrical system engineering for the project. STG will be the general contractor, responsible for the design and installation of all civil works, erection of the wind turbines, and installation of all ancillary electrical systems. Northern Power will provide Northwind 100 wind turbines and startup and commissioning services. Site control has already been completed. The foundation design is completed. Permitting is underway, having already relocated the turbines in response to input from Fish & Wildlife.

### Funding & Cost

<b>Cost of Power:</b>	\$0.48/kWh
<b>Requested Grant Funds:</b>	\$3,155,765
<b>Matched Funds Provided:</b>	\$350,641
<b>Total Potential Grant Amount:</b>	\$3,506,406
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$3,155,765

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$3,155,765

## App #72 Mekoryuk Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



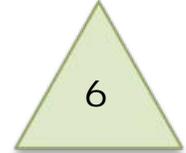
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Lower Yukon-Kuskokwim

**Election District:** 38, Bethel



**Rank within Region**  
(out of 10)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	18
2) Funding Resources (Max 25)	16
3) Project Feasibility from Stage 2 (Max 20)	14
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	4
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	5

### AEA Review Comments

Proposal is well thought out and permitting risks appear low because of previous USFWS consultation. Construction budget is detailed and realistic. The project appears to result in high wind penetration, but the proposal does not provide detailed information regarding integration of wind into the existing system. Given a fuel displacement of 29,000 gallons and a project cost of \$ 3.5 million, net monetary benefits over the life of the project appear to be less than project cost.

Prior to release of construction funding AEA requires the applicant to produce detailed integration documentation and dispatch strategy for the wind-diesel system.

## App #72 Mekoryuk Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Alaska Village Electric Cooperative (AVEC) is requesting funding for the design and construction of a 200 kW (2x 100 kW turbines) wind farm in Mekoryuk. The total project cost is \$3,506,406; AVEC is requesting \$3,155,765 in grant funds.

The B/C ratio based on applicant information is 0.71, and 0.66 based on AEA assumptions. Total project cost in present value terms are \$3.03 million (both from applicant data and AEA). The present value benefits are calculated as \$2.35 million from applicant data and \$2.17 million from AEA calculations. The difference is due to a slightly lower projected amount of diesel fuel displacement based on AEA assumptions, resulting from a discrepancy of reported vs. applicant stated system efficiency.

The amount of displaced fossil fuel is 34,216 gal/year based on applicant data and 31,307 gal/year based on AEA assumptions.

## App #72 Mekoryuk Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #73 Old Harbor Hydroelectric Final Design

**Resource:** Hydro

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

The Alaska Village Electric Cooperative (AVEC) proposes a 300 kW run of the river hydroelectric plant with a diversion structure, pipeline, powerhouse, and electric line in Old Harbor. The project involves collecting up to 7 cfs of water year round from a tributary (Mountain Creek) of Barling Bay Creek and transporting it across a basin boundary to Big Creek. This project will provide for most of the electrical needs of Old Harbor. AVEC will employ consultants and contractors as needed to complete the Project. AVEC may utilize local or other personnel for project maintenance.

### Funding & Cost

<b>Cost of Power:</b>	\$0.46/kWh
<b>Requested Grant Funds:</b>	\$225,000
<b>Matched Funds Provided:</b>	\$25,000
<b>Total Potential Grant Amount:</b>	\$250,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$225,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$225,000

## App #73 Old Harbor Hydroelectric Final Design

**Resource:** Hydro

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



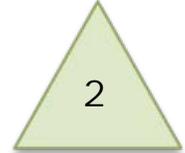
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Kodiak

**Election District:** 36, Kodiak



**Rank within Region**  
(out of 2 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	17
2) Funding Resources (Max 25)	15
3) Project Feasibility from Stage 2 (Max 20)	15
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	6
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant proposes feasibility and design of a 300 kW hydro system in Old Harbor. Proposal will follow up earlier federally-sponsored project development work in 2001-03 that concluded in shelving the project due to high costs compared to displaced fuel. New configuration will assess adding flow from a nearby creek. Recommend full funding.

## App #73 Old Harbor Hydroelectric Final Design

**Resource:** Hydro

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant states that 95% of existing diesel generation at Old Harbor would be displaced by the proposed hydro project. The B/C ratio estimated for this project is based entirely on this estimated benefit, and comes to 1.59.

Applicant also states that the project could generate substantial surplus energy during high flow months and that this surplus could be used to displace heating fuel in the community. However, this potential benefit is not accounted for in this evaluation as no specifics are available at this time in the application.

## App #73 Old Harbor Hydroelectric Final Design

**Resource:** Hydro

**Proposed Project Phase:** Design  
Feasibility

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #74 Upper Kobuk Region Hydroelectric Feasibility

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

Alaska Village Electric Cooperative (AVEC) proposes a resource assessment/feasibility analysis/conceptual design project of hydropower sites in the Upper Kobuk region. We will evaluate at least twelve sites regarding their hydroelectric potential and will create conceptual designs for the most promising sites. The project will potentially serve the communities Kobuk, Ambler, Shungnak, and Kiana, as well as possible future industrial developments, which for the purposes of this application, will be referred to collectively as the Upper Kobuk region. Key partners in the project will include NANA Pacific/NANA Regional Corporation, NovaGold/Mantra Mining and additional engineering consultants.

### Funding & Cost

<b>Cost of Power:</b>	\$0.62/kWh
<b>Requested Grant Funds:</b>	\$1,025,000
<b>Matched Funds Provided:</b>	\$50,625
<b>Total Potential Grant Amount:</b>	\$1,075,625
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$1,025,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$1,025,000

## App #74 Upper Kobuk Region Hydroelectric Feasibility

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



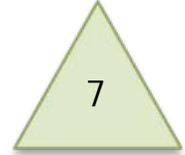
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Northwest Arctic

**Election District:** 40, Arctic



**Rank within Region**  
(out of 9 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	23
2) Funding Resources (Max 25)	13
3) Project Feasibility from Stage 2 (Max 20)	10
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	4
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	3

### AEA Review Comments

NANA has prepared a regional plan for this area, that recommends further work in hydro development for this subregion. The applicants propose detailed hydro assessment work in the area near Ambler, Kobuk, Shungnak, and Kiana.

There are no far north utility hydroelectric projects currently in operation in Alaska. Because of this there are risks with hydro development in this region.

The economic analysis shows little savings compared to project cost assuming the hydro development serves only local communities. If the project were to serve a large load, such as a mine, project economics would likely improve.

Recommend.

## App #74 Upper Kobuk Region Hydroelectric Feasibility

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant requests funds to examine the feasibility of various hydroelectric prospects in the Upper Kobuk region, to serve the communities of Ambler, Shungnak, Kobuk, and/or Kiana. These include both reservoir projects and run-of-river projects.

Of the possible reservoir projects, the least costly is a \$62 million project on the Shungnak River that would produce an estimated 42.7 million kWh per year -- almost all during the May through October time frame. By comparison, the total annual electricity demand in the 4 named villages in 2007 was 4.4 million kWh, most of which was consumed during the winter months. It is clear from these basic numbers that the reservoir projects cannot proceed without a much larger demand to justify their size and expense -- presumably one or more mines. Further consideration of the reservoir projects would require more information about the proposed mine(s), and would seem to be premature until such a mine is approaching actual development.

AEA finds that feasibility review of run-of-river hydro prospects near the Upper Kobuk villages of Ambler, Shungnak, and Kobuk, is a more practical concept in the near term. As representative of these prospects, this evaluation considers Cosmos Creek using data from a 1981 reconnaissance study by the U.S. Army Corps of Engineers. That study considered a 144 kW run-of-river project with average annual energy production of 331,000 kWh during a period of 5 months per year. AEA updated the capital cost estimate to \$9,060,750 in 2008 dollars, and the annual O&M estimate to \$135,000. Given these assumptions the B/C ratio for the project came to only 0.01.

## App #74 Upper Kobuk Region Hydroelectric Feasibility

**Resource:** Hydro

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #75 Ambler Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Project Description

Ambler is a village that can benefit from solar energy. It is proposed that a grid tied, battery-less 50.4 kW photovoltaic system be installed on property adjacent to the AVEC power plant and tank farm in Ambler. It consists of 225 ea 224-watt panels on adjustable 6300 ft<sup>2</sup> racking mounted directly on a Triodetic Multipoint foundation system. Each adjustable array utilizes one 7000 watt inverter providing 277 VAC power.

### Funding & Cost

<b>Cost of Power:</b>	\$0.83/kWh
<b>Requested Grant Funds:</b>	\$550,000
<b>Matched Funds Provided:</b>	\$55,000
<b>Total Potential Grant Amount:</b>	\$605,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$550,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$550,000

## App #75 Ambler Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Scoring & Location



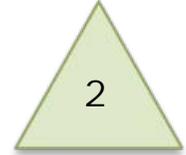
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Northwest Arctic

**Election District:** 40, Arctic



**Rank within Region**  
(out of 9)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	30
2) Funding Resources (Max 25)	15
3) Project Feasibility from Stage 2 (Max 20)	12
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	2
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant proposes to install 50 kW of photovoltaic in the existing Ambler power system. Resulting project would be the largest hybrid PV-diesel system in the state. PV system would generate an average of 5 kW. AVEC submitted virtually identical proposals for Ambler, Noatak, and Shungnak (#75, 76, and 77). The project would be the largest utility scale photovoltaic-diesel hybrid project in Alaska.

O&M costs, which were assumed to be zero in the application, may include panel cleaning, rreplacement of broken panels, electrical component replacement (inverters, controls, relays), snow removal from panels and twice annual panel angle adjustment. During rare periods of peak PV output and minimum electrical loads AEA questions whether there will there be system stability issues and whether the diesel genset efficiency and reliability of the smallest genset will be adversely affected.

Installed cost of the project is high relative to the estimated savings. As an arctic utility PV-diesel hybrid application, however, the project has demonstration value above its modest economic return. For this reason we feel it is reasonable to support funding one of the three PV-diesel proposals as a demonstration.

Recommend full funding for either project #75, 76, or 77 at the choice of applicant.

## App #75 Ambler Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant assumes a 30-year project life. AEA estimates a 20-year project life for rural solar photovoltaic arrays. The applicant assumes annual O&M costs at the current plant of \$146,480, and annual O&M costs at the new plant of \$0. For this analysis, the annual O&M cost estimate used for the current plant was \$27,486, based on AEA benchmark O&M cost estimates for rural areas. AEA estimates for the proposed solar PV system is \$6,050, based on 1% of capital costs annually. These differences compounded for a 30-year life assumption by the applicant, and a 20-year life assumption by AEA results a wide difference in net present value of benefits estimate from O&M savings through installation of the PV system.

## App #75 Ambler Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction  
Design

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #76 Noatak Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Project Description

Noatak is a village that can benefit from solar energy. It is proposed that a grid tied, battery-less 50.4 kW photovoltaic system be installed on property adjacent to the AVEC power plant and tank farm in Noatak . It consists of 225ea 224-watt panels on adjustable 6,300 ft2 racking mounted on a Triodetic Multipoint foundation. Each adjustable array utilizes one 7000 watt inverter providing 277 VAC power.

### Funding & Cost

<b>Cost of Power:</b>	\$0.76 /kWh
<b>Requested Grant Funds:</b>	\$550,000
<b>Matched Funds Provided:</b>	\$55,000
<b>Total Potential Grant Amount:</b>	\$605,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$550,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:**

## App #76 Noatak Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Scoring & Location



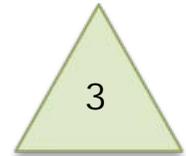
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Northwest Arctic

**Election District:** 40, Arctic



**Rank within Region**  
(out of 9 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	28
2) Funding Resources (Max 25)	15
3) Project Feasibility from Stage 2 (Max 20)	12
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	2
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant proposes to install 50 kW of photovoltaic in the existing Noatak power system. Resulting project would be the largest hybrid PV-diesel system in the state. PV system would generate an average of 5 kW. AVEC submitted virtually identical proposals for Ambler, Noatak, and Shungnak (#75, 76, and 77). The project would be the largest utility scale photovoltaic-diesel hybrid project in Alaska.

O&M costs, which were assumed to be zero in the application, may include panel cleaning, rreplacement of broken panels, electrical component replacement (inverters, controls, relays), snow removal from panels and twice annual panel angle adjustment. During rare periods of peak PV output and minimum electrical loads AEA questions whether there will there be system stability issues and whether the diesel genset efficiency and reliability of the smallest genset will be adversely affected.

Installed cost of the project is high relative to the estimated savings. As an arctic utility PV-diesel hybrid application, however, the project has demonstration value above its modest economic return. For this reason we feel it is reasonable to support funding one of the three PV-diesel proposals as a demonstration.

Recommend full funding for either project #75, 76, or 77 at the choice of applicant.

## App #76 Noatak Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant assumes a 30-year project life. AEA estimates a 20-year project life for rural solar photovoltaic arrays. The applicant assumes annual O&M costs at the current plant of \$146,480, and annual O&M costs at the new plant of \$0. For this analysis, the annual O&M cost estimate used for the current plant was \$27,486, based on AEA benchmark O&M cost estimates for rural areas. AEA estimates for the proposed solar PV system is \$6,050, based on 1% of capital costs annually. These differences compounded for a 30-year life assumption by the applicant, and a 20-year life assumption by AEA results a wide difference in net present value of benefits estimate from O&M savings through installation of the PV system.

**App #76 Noatak Solar PV Construction**

**Resource:** Solar

**Proposed Project Phase:** Construction

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #77 Shungnak Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Project Description

Noatak is a village that can benefit from solar energy. It is proposed that a grid tied, battery-less 50.4 kW photovoltaic system be installed on property adjacent to the AVEC power plant and tank farm in Noatak . It consists of 225ea 224-watt panels on adjustable 6,300 ft2 racking mounted on a Triodetic Multipoint foundation. Each adjustable array utilizes one 7000 watt inverter providing 277 VAC power.

Shungnak is a village that can benefit from solar energy. It is proposed that a grid tied, battery-less 50.4 kW photovoltaic system be installed on property adjacent to the AVEC power plant and tank farm. It consists of 225ea 224-watt solar panels on an adjustable 6300 ft2 rack that is supported on a Triodetic Multipoint foundation. Multiple 7000 watt inverters provide 277 VAC power.

### Funding & Cost

<b>Cost of Power:</b>	\$0.74 /kWh
<b>Requested Grant Funds:</b>	\$550,000
<b>Matched Funds Provided:</b>	\$55,000
<b>Total Potential Grant Amount:</b>	\$605,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$550,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:**

## App #77 Shungnak Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Scoring & Location



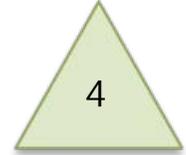
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Northwest Arctic

**Election District:** 40, Arctic



**Rank within Region**  
(out of 9 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	28
2) Funding Resources (Max 25)	15
3) Project Feasibility from Stage 2 (Max 20)	12
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	2
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant proposes to install 50 kW of photovoltaic in the existing Shungnak power system. Resulting project would be the largest hybrid PV-diesel system in the state. PV system would generate an average of 5 kW. AVEC submitted virtually identical proposals for Ambler, Noatak, and Shungnak (#75, 76, and 77). The project would be the largest utility scale photovoltaic-diesel hybrid project in Alaska.

O&M costs, which were assumed to be zero in the application, may include panel cleaning, rreplacement of broken panels, electrical component replacement (inverters, controls, relays), snow removal from panels and twice annual panel angle adjustment. During rare periods of peak PV output and minimum electrical loads AEA questions whether there will there be system stability issues and whether the diesel genset efficiency and reliability of the smallest genset will be adversely affected.

Installed cost of the project is high relative to the estimated savings. As an arctic utility PV-diesel hybrid application, however, the project has demonstration value above its modest economic return. For this reason we feel it is reasonable to support funding one of the three PV-diesel proposals as a demonstration.

Recommend full funding for either project #75, 76, or 77 at the choice of applicant.

## App #77 Shungnak Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant assumes a 30-year project life. AEA estimates a 20-year project life for rural solar photovoltaic arrays. The applicant assumes annual O&M costs at the current plant of \$146,480, and annual O&M costs at the new plant of \$0. For this analysis, the annual O&M cost estimate used for the current plant was \$27,486, based on AEA benchmark O&M cost estimates for rural areas. AEA estimates for the proposed solar PV system is \$6,050, based on 1% of capital costs annually. These differences compounded for a 30-year life assumption by the applicant, and a 20-year life assumption by AEA results a wide difference in net present value of benefits estimate from O&M savings through installation of the PV system.

## App #77 Shungnak Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction

**Proposer:** Alaska Village Electric Cooperative

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #78 Girdwood Gas CHP/Hydro/Wind Solar Construction

**Resource:** Other

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Green Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Project Description

This project is located in Girdwood. AGE proposes to install a natural gas powered CHP plant with its efficiency enhanced by the TEG unit that will provide heat and power to Girdwood Elementary and the Girdwood public by feeding power into the local electrical grid. Thermal energy will be provided to Girdwood Elementary for space heating, snow melt, and heated pedestrian walkways as well as the research center itself. Two micro-hydro projects located at California and Virgin Creeks will provide hydro power generation to supplement the CHP/TPG plant during periods of sufficient flow estimated at 8 months per year. This Construction Project is based on reconnaissance level findings.

### Funding & Cost

<b>Cost of Power:</b>	\$0.12 /kWh
<b>Requested Grant Funds:</b>	\$5,231,750
<b>Matched Funds Provided:</b>	\$7,000,000
<b>Total Potential Grant Amount:</b>	\$12,231,750
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$47,625

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$47,625

## App #78 Girdwood Gas CHP/Hydro/Wind Solar Construction

**Resource:** Other

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Green Energy, LLC

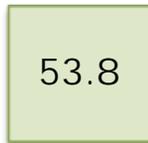
**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Scoring & Location



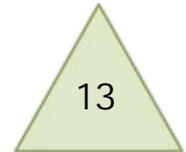
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 32, Chugach State Park



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	5
2) Funding Resources (Max 25)	25
3) Project Feasibility from Stage 2 (Max 20)	11
4) Project Readiness (Max 5)	3
5) Benefits (Max 10)	6
6) Local Support (Max 5)	3
7) Sustainability (Max 5)	2

### AEA Review Comments

This proposal includes four components: 1) Final design and construction of a natural gas-fired combined heat and power (CHP) plant, 2) final design and construction of a thermoelectric generator (TEG) using heat from the CHP plant, 3) final design and construction of a 125 kW microhydro plant at California Cr. and feasibility through construction of microhydro at Virgin Cr., and 4) reconnaissance through construction of wind and solar power generation.

We exclude from consideration the combined CHP /TEG facility, since it is fueled by natural gas in an area that has viable renewable energy resources. We exclude the wind and solar plants because the application did provide enough information to evaluate the component of the project. We limit consideration to California Creek microhydro, since this is the only component of the application that is defined in sufficient detail for meaningful evaluation.

California Cr. hydro appears to be a valid stand-alone project. However, the feasibility analysis does not adequately address interconnection with Chugach Electric, permitting, land use agreements, and resource availability. Recommend partial funding for reconnaissance.

## App #78 Girdwood Gas CHP/Hydro/Wind Solar Construction

**Resource:** Other

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Green Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant provided an estimated capital cost for construction through commissioning of \$890,000. This appears reasonable approximation given data from elsewhere although a contingency is added in the AEA calculations due to several uncertainties covered in the existing pre-feasibility study. Some uncertainties are construction issues (e.g. tying in to Chugach Electric Association transmission lines and certain logistics for the penstock) whereas others are operating or capacity issues (e.g. net generation 10% or more seasonally from minimum flow requirements or ice conditions). A construction contingency of 10% was added for AEA calculation.

Generation at a capacity factor of 68% is reasonably conservative given experience with a similar sized facility near Palmer. Estimated operating and maintenance costs for the mini hydro were not provided in the application. A figure of \$8,250 per year was used for the B/C calculation.

When producing 750,000kWh/year evaluated at the avoided cost of power the annual fuel savings start at nearly \$60,000. These assumptions yield a B/C of 1.47.

## App #78 Girdwood Gas CHP/Hydro/Wind Solar Construction

**Resource:** Other

**Proposed Project Phase:** Feasibility

**Proposer:** Alaska Green Energy, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #79 Palmer Coal Bed Methane CHP Construction

**Resource:** Other

**Proposed Project Phase:** Construction

**Proposer:** Alaska Green Energy, LLC

**AEA Program Manager:**

**Applicant Type:** Other

### Project Description

AGE's management and engineering team in collaboration with the UAA School of Engineering is proposing this PROJECT that when proven will provide rural communities with Coal Bed Methane (CBM) resources an inexpensive energy source that will provide sustainable heat and power 24/7 365 days a year. This PROJECT will develop an Arctic Ready Combined Heat and Power Unit powered by CBM gas that will have direct application to rural communities with viable CBM resources. The PROJECT has three parallel components with appropriate milestones.

### Funding & Cost

<b>Cost of Power:</b>	\$0.40/kWh
<b>Requested Grant Funds:</b>	\$19,401,411
<b>Matched Funds Provided:</b>	\$1,422,600
<b>Total Potential Grant Amount:</b>	\$20,824,011
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- ✗ Did Not Pass Stage 1
- Pending

**App #79 Palmer Coal Bed Methane CHP Construction**

**Resource:** Other

**Proposed Project Phase:** Construction

**Proposer:** Alaska Green Energy, LLC

**AEA Program Manager:**

**Applicant Type:** Other

**Scoring & Location**



Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Railbelt

**Election District:**



Rank within Region  
(out of )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	15
2) Funding Resources (Max 25)	
3) Project Feasibility from Stage 2 (Max 20)	
4) Project Readiness (Max 5)	
5) Benefits (Max 10)	
6) Local Support (Max 5)	
7) Sustainability (Max 5)	

**AEA Review Comments**

**App #79 Palmer Coal Bed Methane CHP Construction**

**Resource:** Other

**Proposed Project Phase:** Construction

**Proposer:** Alaska Green Energy, LLC

**AEA Program Manager:**

**Applicant Type:** Other

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



## App #79 Palmer Coal Bed Methane CHP Construction

**Resource:** Other

**Proposed Project Phase:** Construction

**Proposer:** Alaska Green Energy, LLC

**AEA Program Manager:**

**Applicant Type:** Other

### DNR/DGGS Geohazards Comments

### DNR/DGGS Feasibility Comments

It was our understanding that HB 152 does not provide funding for CBM projects unless other alternate forms of energy are not available. Nevertheless, CBM potential at the proposed test site in Palmer is unknown at this time. There is a reasonable chance that methane will be produced, but ultimate permeability and saturation are unknown, and close monitoring with long-term tests will be required to substantiate the existence of a sustainable resource. Component 2 should not be funded until that resource has been identified and proven sustainable. Component 3 of the project description sites that 38 communities were identified by State and Federal agencies as having CBM potential. This list was generated by DGGS, USGS, and BLM in the early 1990s and very general. The authors of this proposal were told in a meeting in Fairbanks with DGGS personnel (October 2008) that the potential in many of these 38 communities has been discounted or significantly reduced. Only very few communities are now thought to maintain reasonable CBM potential and the State is in the process of better quantifying that potential across the state. Based on work already being performed by the state, and the fact the data justifying component 3 of the proposal is outdated and in the process of being replaced, DGGS recommends that component 3 of this proposal not be funded.

### DNR/DMLW Feasibility Comments

Palmer project will require a number of drilling permits and produced fluids permits from AOGCC, DEC and possibly the Div. of Oil & Gas.

## App #81 Statewide Heat Recovery/Electric Demonstration Construction

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction

**Proposer:** Ormat Nevada Inc.

**AEA Program Manager:**

**Applicant Type:** IPP

### Project Description

The project will be located at a site yet to be determined within the Alaska state boundaries. Once the exact site location is determined, then an evaluation of the communities to be served can be provided. Also involved in this project will be contractors and subcontractors to be hired for various engineering, design, construction and supply aspects related to the project activities. Specifically, Ormat will be working with Precision Power LLC who will be the construction contractor for this project to perform the construction of the project on site.

### Funding & Cost

<b>Cost of Power:</b>	\$0.40/kWh
<b>Requested Grant Funds:</b>	\$495,000
<b>Matched Funds Provided:</b>	\$0
<b>Total Potential Grant Amount:</b>	\$495,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- ✗ Did Not Pass Stage 1
- Pending

**App #81 Statewide Heat Recovery/Electric Demonstration Construction**

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction

**Proposer:** Ormat Nevada Inc.

**AEA Program Manager:**

**Applicant Type:** IPP

**Scoring & Location**



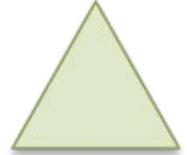
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Statewide

**Election District:**



Rank within Region  
(out of )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	15
2) Funding Resources (Max 25)	
3) Project Feasibility from Stage 2 (Max 20)	
4) Project Readiness (Max 5)	
5) Benefits (Max 10)	
6) Local Support (Max 5)	
7) Sustainability (Max 5)	

**AEA Review Comments**

**App #81 Statewide Heat Recovery/Electric Demonstration Construction**

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction

**Proposer:** Ormat Nevada Inc.

**AEA Program Manager:**

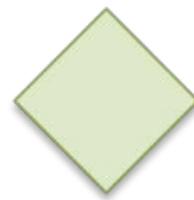
**Applicant Type:** IPP

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



**App #81 Statewide Heat Recovery/Electric Demonstration Construction**

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction

**Proposer:** Ormat Nevada Inc.

**AEA Program Manager:**

**Applicant Type:** IPP

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #82 Juneau Based Statewide Hydro/Ammonia Electricity Construction

**Resource:** Other

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Electric Light & Power

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Project Description

High-efficiency solid state ammonia synthesis (SSAS) will be advanced from laboratory to proof of- concept and pre-commercialization pilot-plant stage. An SSAS module will be built, capable of synthesizing anhydrous ammonia (NH3) at ~10 kWe input from renewable-source electric energy, fresh water, and atmospheric nitrogen. The NH3 will be stored in a pressurized steel tank, and will fuel an internal-combustion-engine (ICE) generating set delivering to the utility electricity grid or isolated load. A complete system will be located in Juneau at the Alaska Electric Light & Power (AEL&P) site. The proposed system will model a village-scale system that could store enough surplus renewable-source energy, as liquid NH3 in surface tanks, to supply the village's total year-round energy needs as firm energy, assuming enough local renewable energy production capacity is in place to generate this total energy. The goal is village and other "energy island" energy independence via renewable-source energy and annual-scale firming storage, replacing all diesel electricity generation and oil heating. Deploying the project initially at AEL&P allows hydro energy input and lower project technical risk via Juneau's benign climate and favorable transportation access; the project may later be relocated to a smaller community for further evaluation and test.

### Funding & Cost

<b>Cost of Power:</b>	\$0.11 /kWh
<b>Requested Grant Funds:</b>	\$800,000
<b>Matched Funds Provided:</b>	\$0
<b>Total Potential Grant Amount:</b>	\$800,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$800,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:**

## App #82 Juneau Based Statewide Hydro/Ammonia Electricity Construction

**Resource:** Other

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Electric Light & Power

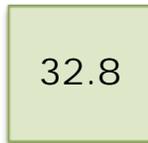
**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Scoring & Location



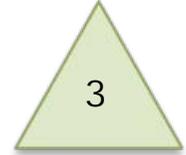
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Statewide

**Election District:** 3, Juneau-Downtown-Douglas



**Rank within Region**  
(out of 3 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	4
2) Funding Resources (Max 25)	0
3) Project Feasibility from Stage 2 (Max 20)	14
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	5
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

Applicant proposes demonstrating an energy storage technology that has potential to increase the value and use of intermittent and stranded renewable energy resources such as excess hydro, wind, tidal, and wave. Project participants are credible. Introducing the uncertainty and risk of a pre-commercial ammonia production process (SSAS) does not benefit the primary goal of this proposal, which is to demonstrate ammonia production and storage from a renewable energy resource in Alaska.

Recommend full funding with the requirement that prior to funding, project participants prepare a technical and economic assessment acceptable to AEA that confirms viability of approach.

**App #82 Juneau Based Statewide Hydro/Ammonia Electricity Construction**

**Resource:** Other

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Electric Light & Power

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposes a demonstration in Juneau due to the availability of hydroelectric power. The resulting ammonia fuel can be stored and transported to other areas of the state. About 40% efficiency of energy is lost converting to ammonia, and about 35% efficiency is lost converting ammonia fuel back to clean energy.

## App #82 Juneau Based Statewide Hydro/Ammonia Electricity Construction

**Resource:** Other

**Proposed Project Phase:** Construction  
Design

**Proposer:** Alaska Electric Light & Power

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #83 Kotzebue Wind Farm Red-Ox Flow Battery Storage Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kotzebue Electric Association

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

Kotzebue Electric Association's Cost of Energy Reduction Program will achieve a 25% reduction in diesel based power by installing, in part, a Vanadium Red-Ox Flow Battery Energy Storage System (VRFB) which will be able to provide 600 kW of power for three hours. This battery bank will increase voltage stability, increase the efficiencies of operating diesel generators, and capture excess wind energy during off-peak hours. While this installation will serve Kotzebue, the demonstrated technology could offer significant benefits to other villages as more wind energy is harnessed. The VRFB will benefit the KEA existing system in three specific ways. Diesel turbines run most efficiently when operating to the fullest capacity. Charging the battery, when the generator would otherwise operate below ideal conditions, will increase overall system efficiency. Secondly, KEA runs one EMD year round and supplements this with a second CAT generator when the load demands it. Instead of starting the second generator, the VRFB will supply the electricity. Normally, the CAT gen set is run approximately 3,200 hrs per year. This will be reduced less than 350 hrs per year with the VRFB online. This results to a direct reduction in diesel consumption. Thirdly, in order to realize the benefits of increasing the level of wind penetration in Kotzebue, energy storage MUST be utilized. The simple payback for the VRFB is under three years.

### Funding & Cost

<b>Cost of Power:</b>	\$0.36/kWh
<b>Requested Grant Funds:</b>	\$3,144,399
<b>Matched Funds Provided:</b>	\$786,000
<b>Total Potential Grant Amount:</b>	\$3,930,399
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

## App #83 Kotzebue Wind Farm Red-Ox Flow Battery Storage Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kotzebue Electric Association

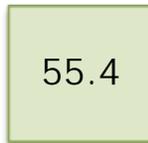
**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



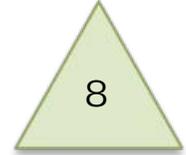
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Northwest Arctic

**Election District:** 40, Arctic



**Rank within Region**  
(out of 9 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	14
2) Funding Resources (Max 25)	19
3) Project Feasibility from Stage 2 (Max 20)	9
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	3
6) Local Support (Max 5)	3
7) Sustainability (Max 5)	4

### AEA Review Comments

NOTE: On Jan 9, 2009 scoring was adjusted in light of information from a November 18, 2008 press release on VRB Power Systems' website. The press release revealed that the company was unsuccessful in seeking offers for the merger, sale, refinance or other strategic alternatives for the company. As a result VRB Power Systems has laid-off or given notice terminating most of its employees, and has ceased accepting new orders. AEA was unsuccessful in contacting VRB Power Systems by phone. After reconsidering the project AEA is no longer recommending funding for this project for funding.

The following text shows AEA's original comments:

[The applicant states that there will be a 15% reduction in diesel peak power which will directly lower the cost of electrical generation while allowing for a higher level of wind penetration. AEA's review suggests limited economic benefits without installing more wind capacity, but there will be significant field demonstration benefits that could facilitate field deployment of the flow battery technology.

The applicant's modeling effort, which was based on HOMER, focused on economic dispatch and did not address critical power quality and stability considerations. Both economics and power quality/stability should be addressed under this project.

This project is attractive because it demonstrates a promising mass energy storage technology. The application is related to a separate proposal (85) for an identical energy storage system that includes 3MW of wind capacity.

NREL prepared a technical review of proposal 85 for AEA. They conclude that the system is technically viable, although "...still in its deployment infancy."

We recommend full funding for either this proposal 83 (flow battery only) or proposal 85 (battery and additional wind generation), but not both.]

## App #83 Kotzebue Wind Farm Red-Ox Flow Battery Storage Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kotzebue Electric Association

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Kotzebue Electric Cooperative (KEA) is requesting funding for the construction of an energy storage project utilizing red-ox flow battery technology (600kW storage/1,800 kWh capacity). The total project cost is \$3,930,399; KEA is requesting \$3,144,399 in grant funds.

The B/C ratio based on applicant information is 1.78, and 0.70 based on AEA assumptions. Total project cost in present value terms are \$3.9 million (both from applicant data and AEA). The present value benefits are calculated as \$7.0 million from applicant data and \$2.7 million from AEA calculations. The difference is due to a lower generation projection based on AEA assumptions.

The amount of displaced fossil fuel is 124,695 gal/year based on applicant data and 52,838 gal/year based on AEA assumptions.

## App #83 Kotzebue Wind Farm Red-Ox Flow Battery Storage Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kotzebue Electric Association

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #84 Ruby Hydrokinetic Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Yukon River Inter-Tribal Watershed Council

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

### Project Description

This proposal is to enhance and expand the first in-stream hydrokinetic energy conversion device successfully deployed in the United States in Ruby, Alaska. In the summer of 2008, the Yukon River Inter-Tribal Watershed Council (YRITWC), along with the Tribe and City of Ruby, the local electric utility (owned and operated by the City of Ruby), and ABS Alaskan, deployed, tested, and removed a 5 kW Encurrent vertical axis hydrokinetic turbine in the Yukon River at Ruby, Alaska, before winter ice formation. Based on the performance of the 5 kW turbine, and modeling feasibility for a larger system with a turbine re-designed to optimally perform at a lower current speed, in 2010 we will install a 25 kW version of the hydrokinetic turbine. All project partners will remain in place, along with Terrasond and re vision LLC, who will assist with resource assessment and feasibility analysis.

### Funding & Cost

<b>Cost of Power:</b>	\$0.98/kWh
<b>Requested Grant Funds:</b>	\$446,950
<b>Matched Funds Provided:</b>	\$10,555
<b>Total Potential Grant Amount:</b>	\$457,505
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$446,950

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$446,950

## App #84 Ruby Hydrokinetic Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Yukon River Inter-Tribal Watershed Council

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

### Scoring & Location



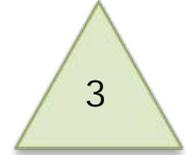
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Yukon-Koyukuk/Upper Tanana

**Election District:** 6, Interior Villages



Rank within Region  
(out of 7 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	30
2) Funding Resources (Max 25)	10
3) Project Feasibility from Stage 2 (Max 20)	14
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	5
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	5

### AEA Review Comments

The short-term economics of this project are moderately beneficial, however its primary value is as a pilot project to prove the technical feasibility of this technology.

The technology is just recently migrating into the commercial realm and has significant potential in rural Alaska.

The applicant team has proven its competence in the 2008 season.

Recommend full funding.

## App #84 Ruby Hydrokinetic Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Yukon River Inter-Tribal Watershed Council

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant used 9.8 kWh/gallon for the current plant efficiency ratio. Upgrades to the current diesel generator are being undertaken soon, resulting in increased efficiency. The applicant made a calculation error in project funding in their budget summary. To correct this error, \$10,000 was added to the cost of deployment of the 25 kWh generator to \$290,200. The applicant assumes annual O&M costs at the current plant of \$41,182, and annual O&M costs at the new plant of \$9,600. For this analysis, the annual O&M cost estimate used for the current plant was \$9,917, based on AEA benchmark O&M cost estimates for rural areas. AEA's O&M estimates for the proposed hydrokinetic generators are \$13,859, based on 3% of capital costs annually. These differences compounded for a 20-year life assumption by the applicant, and a 15-year life assumption by AEA results a wide difference in net present value of benefits estimate from O&M savings through installation of the new generators. Net present value of the project benefit based on the applicant's assumptions is \$895,228, while net present value of the project benefit based on AEA's assumptions is \$163,999. The estimated B/C ratio using AEA assumptions is 0.33.

**App #84 Ruby Hydrokinetic Construction**

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Yukon River Inter-Tribal Watershed  
Council

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

FERC permitted area to another company. This project was completed without permits and is now in process to get permits.

## App #85 Kotzebue Wind Farm Expansion Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kotzebue Electric Association

**AEA Program Manager:** Jensen

**Applicant Type:** Utility

### Project Description

Rural residents in NW Alaska are facing some of the highest costs anywhere in the nation. In order to proactively address the region's energy crisis, Kotzebue Electric Association (KEA) is working to implement long term energy options. While there are a variety of alternative energy options available to the Kotzebue region, such as wind, solar, and geothermal; wind energy has a proven track record of success in this community. The goals of the proposed project are: To increase the wind capacity of KEA from 1.14 MW to 4.39 MW using 5 Fuhrlander 650KWs; To integrate the increased wind capacity with a 600 kW / 1800 kWh Vanadium Red- Ox Flow Battery; To utilize the excess electricity in a distributed heating system. This is a two year project. Year one involves performing all pre-construction and foundation construction tasks. Year two involves the wind turbine erection and commissioning.

### Funding & Cost

<b>Cost of Power:</b>	\$0.36/kWh
<b>Requested Grant Funds:</b>	\$12,075,535
<b>Matched Funds Provided:</b>	\$2,800,000
<b>Total Potential Grant Amount:</b>	\$14,875,535
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$12,075,535

**AEA Funding Recommendation:** \$4,000,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #85 Kotzebue Wind Farm Expansion Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kotzebue Electric Association

**AEA Program Manager:** Jensen

**Applicant Type:** Utility

### Scoring & Location



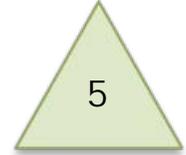
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Northwest Arctic

**Election District:** 40, Arctic



**Rank within Region**  
(out of 9 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	14
2) Funding Resources (Max 25)	19
3) Project Feasibility from Stage 2 (Max 20)	14
4) Project Readiness (Max 5)	3
5) Benefits (Max 10)	7
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

NOTE: On Jan 9, 2009 scoring was adjusted in light of information from a November 18, 2008 press release on VRB Power Systems' website. The press release revealed that the company was unsuccessful in seeking offers for the merger, sale, refinance or other strategic alternatives for the company. As a result VRB Power Systems has laid-off or given notice terminating most of its employees, and has ceased accepting new orders. AEA was unsuccessful in contacting VRB Power Systems by phone. Based on this information a VRB flow battery will likely not be part of the Kotzebue Wind Farm Expansion Project. Alternate storage and/or integration options will need to be considered.

This project is attractive because it will result in a high penetration wind farm in Alaska's first large-scale wind farm. There are two other proposals for wind development in the Nome (52) and Unalakleet (50) utilities that are proposed be developed jointly--e.g. potentially sharing turbine purchase and cranes.

Due to the issues with the proposed energy storage system (VRB Flow Battery) and its role in maintaining power quality under increased wind penetration, more assessment and modeling will be required to define system architecture and potential performance.

Because of the importance of the project and its relationship to the projects in Unalakleet and Nome, we recommend full funding with the condition that prior to the release of construction funds the applicant must provide for AEA's review and approval detailed final design, detailed construction budget, and detailed integration plans based on empirical load and wind resource data.

## App #85 Kotzebue Wind Farm Expansion Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kotzebue Electric Association

**AEA Program Manager:** Jensen

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Kotzebue Electric Association (KEA) is requesting design and construction funding for the expansion of the existing wind farm from 1.17 MW to slightly over 4 MW ( adding 5x 600 kW wind turbines) including a red-ox flow battery for energy storage. The total project cost is \$14,807,535; KEA is requesting \$12,075,535 in grant funds.

The B/C ratio based is 1.57. Total project cost in present value terms are \$13.84 million (both from applicant data and AEA assumptions). The present value benefits are calculated as \$21.7 million.  
The amount of displaced fossil fuel is 412,424 gal/year based on applicant data and 538,710 gal/year based on AEA assumptions.

## App #85 Kotzebue Wind Farm Expansion Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kotzebue Electric Association

**AEA Program Manager:** Jensen

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #86 Fourth of July Creek Hydroelectric Reconnaissance

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Independence Power, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Project Description

The Fourth of July Creek hydroelectric project is a low-impact run-of-river project located near Seward, Alaska. The project would be located east of the Spring Creek Correctional Facility, across Resurrection Bay from the city of Seward. Energy from the project would be provided into the Seward Electric System grid. Independence Power, LLC (IP) is the project developer, and would contribute funding and own and operate the project. IP would manage the pre-construction study process, completing some efforts internally, and contracting out other activities to qualified consultants as appropriate. Construction would be completed by qualified contractors selected through a competitive bidding process.

### Funding & Cost

<b>Cost of Power:</b>	\$0.09/kWh
<b>Requested Grant Funds:</b>	\$7,837,500
<b>Matched Funds Provided:</b>	\$7,837,500
<b>Total Potential Grant Amount:</b>	\$15,675,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$20,000

### AEA Recommendation

- Full Funding
- ✗ Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$20,000

## App #86 Fourth of July Creek Hydroelectric Reconnaissance

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Independence Power, LLC

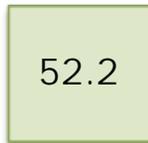
**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Scoring & Location



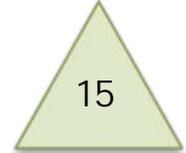
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 35, Homer-Seward



Rank within Region  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	3
2) Funding Resources (Max 25)	25
3) Project Feasibility from Stage 2 (Max 20)	14
4) Project Readiness (Max 5)	1
5) Benefits (Max 10)	8
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	2

### AEA Review Comments

This proposal seeks complete development funding for a hydro resource that, while promising, is currently undefined. The proposal does not include reconnaissance-level analysis that would justify further stages of development. However the rough assessment provided is sufficient to justify funding reconnaissance level assessment.

Recommend partial funding for reconnaissance study (task 1).

## App #86 Fourth of July Creek Hydroelectric Reconnaissance

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Independence Power, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant states that Seward relies on local diesel generators when the transmission line to the Railbelt is out of service. However, this evaluation does not include any displacement of diesel fuel because transmission outages are most likely to occur during the winter, a time when the run-of-river hydro project is unlikely to generate much power.

The evaluation assumes that Fourth of July Creek hydro would displace natural gas-fired generation in the Railbelt and the primary benefit is therefore the estimated avoided cost of natural gas. Based on that assumption combined with the applicant's estimated project costs, the B/C ratio comes to 3.29.

## App #86 Fourth of July Creek Hydroelectric Reconnaissance

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Independence Power, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #87 Fishhook Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction Design

**Proposer:** Fishhook Renewable Energy, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Project Description

The Fishhook Creek hydroelectric project is a low-impact run-of-river project located in Hatcher Pass, Alaska. The project will be located on a combination of mostly state land and some borough land off Hatcher Pass Road. Energy from the project would be provided into the Matanuska Electric Association (MEA) grid. Fishhook Renewable Energy, LLC (FRE) is the project proponent, and would contribute funding, own, and operate the project. FRE has already completed reconnaissance, feasibility, and conceptual design efforts, and is currently in the permitting and contract negotiation processes for the project. With timely completion of permitting, contract negotiations, and financing, construction will occur in 2009. Final design would be completed by members of FRE. Construction would be completed by qualified contractors and subcontractors selected through a competitive bidding process.

### Funding & Cost

<b>Cost of Power:</b>	\$0.14 /kWh
<b>Requested Grant Funds:</b>	\$2,142,961
<b>Matched Funds Provided:</b>	\$2,412,961
<b>Total Potential Grant Amount:</b>	\$4,555,922
<b>Existing RE Fund Grant Offer:</b>	453071.00
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$1,689,890

### AEA Recommendation

- × Full Funding
- Partial Funding
- × Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$2,000,000

## App #87 Fishhook Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction Design

**Proposer:** Fishhook Renewable Energy, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Scoring & Location



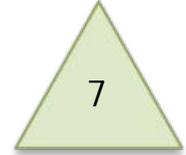
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 13, Greater Palmer



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	5
2) Funding Resources (Max 25)	24
3) Project Feasibility from Stage 2 (Max 20)	18
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	8
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	5

### AEA Review Comments

AEA considered this project in the Denali Commission / AEA alternative energy RFP, and has offered \$553,071 in state grant funds to the projects. This appears to be a viable hydro resource that will benefit the Railbelt network. At 2 MW, the project's relatively small capacity and energy output will likely not impact regional planning.

Recommend with the following grant conditions: 1) applicant required to petition RCA for a certificate of public convenience and necessity and economic rate regulation prior to release of construction funds, 2) establish a power purchase agreement with MEA prior to release of construction grant funds. The recommended funding amount equals total amount requested from the state (\$2,242,961) minus amount already offered (\$553,071).

## App #87 Fishhook Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design

**Proposer:** Fishhook Renewable Energy, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The evaluation assumes that Fishhook Creek hydro would displace natural gas-fired generation in the Railbelt and the primary benefit is therefore the estimated avoided cost of natural gas. The applicant intends to sell the output to a Railbelt utility at the utility's avoided cost. This suggests that rates for Railbelt consumers could be unaffected by the project – to the extent natural gas costs escalate, so would the utility's avoided cost along with the associated price of energy from the hydro project. The applicant does refer to a number of other benefits that could result from the project, and these are not included in this evaluation. Based on these assumptions combined with the applicant's estimated project costs, the B/C ratio comes to 4.13.

## App #87 Fishhook Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design

**Proposer:** Fishhook Renewable Energy, LLC

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #88 Statewide Hydrokinetic Feasibility Study

**Resource:** Ocean/River

**Proposed Project Phase:** Feasibility

**Proposer:** Thomas Ravens, Ph.D. and Myree McDonald, Ph.D.

**AEA Program Manager:** David Lockard

**Applicant Type:** Government Entity

### Project Description

We propose a 2 year project to estimate in-line (hydrokinetic) renewable energy potential for rural Alaska. We will begin creating a list of about 24 sites/communities which appear to have the greatest potential. We plan to study 8 sites in year 1 and 16 sites in year 2. At this point, Alaska's larger rivers (i.e., the Yukon, Koyukuk, Kuskokwim and Susitna Rivers) are obvious places to look for in-stream energy. We will examine available data, and work with project partners (including Re vision, AEA and ANSEP) to come up with a list of river stretches and community partners. The UAA-SOE Alaska Native Science and Engineering Program (ANSEP) has well established relationships with many communities throughout Alaska and has agreed to assist the faculty in establishing working relationships with the communities. Following site selection, we will select student research assistants (3 in year 1 and 5 in year 2) who will be trained in hydrographic surveying and velocity measurement. Then, working in cooperation with the communities, we will survey the selected river stretches during the summer of 2009 and 2010 to obtain bathymetric and current distribution data. Next, using data from United States Geological Survey (USGS) gauging stations, we will estimate the long term hydrologic (i.e, elocity/depth) conditions at the selected rural sites. The USGS provides discharge rates at nearly 400 sites around the state, covering most river systems. The long-term velocity/depth distribution data obtained will be used to determine the hydrokinetic energy available for power generation.

### Funding & Cost

<b>Cost of Power:</b>	\$0.40/kWh
<b>Requested Grant Funds:</b>	\$565,439
<b>Matched Funds Provided:</b>	\$0
<b>Total Potential Grant Amount:</b>	\$565,439
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$565,439

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$565,439

## App #88 Statewide Hydrokinetic Feasibility Study

**Resource:** Ocean/River

**Proposed Project Phase:** Feasibility

**Proposer:** Thomas Ravens, Ph.D. and Myree McDonald, Ph.D.

**AEA Program Manager:** David Lockard

**Applicant Type:** Government Entity

### Scoring & Location



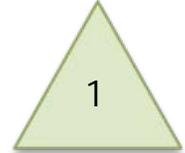
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Statewide

**Election District:** 23, Downtown-Rogers Park



**Rank within Region**  
(out of 3 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	15
2) Funding Resources (Max 25)	1
3) Project Feasibility from Stage 2 (Max 20)	14
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	5
6) Local Support (Max 5)	4
7) Sustainability (Max 5)	5

### AEA Review Comments

Applicant proposes to assess hydrokinetic resource in 24 Alaskan locations. Proposal includes an excellent use of university resources and good training for Alaskan students in alternative energy technologies that may be deployed in Alaska.

The proposal is not clear on how will sites will be chosen. AEA project manager will assist the project team.

Recommend full funding.

**App #88 Statewide Hydrokinetic Feasibility Study**

**Resource:** Ocean/River

**Proposed Project Phase:** Feasibility

**Proposer:** Thomas Ravens, Ph.D. and Myree McDonald, Ph.D.

**AEA Program Manager:** David Lockard

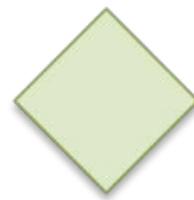
**Applicant Type:** Government Entity

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposed a project that would determine the potential for in-stream sources of renewable energy. There is not enough information available to perform a full B/C analysis on this project. AEA did analyze potential benefits and costs of a possible in-stream hydrokinetic project at Eagle, and found a B/C ratio of approximately 1.66. However, the economics of individual projects will vary by location and circumstances. The project to assess the resource potential has merit on its own, and individual projects should be examined separately for economics. B/C ratio could not be determined based on the information included in the application.

**App #88 Statewide Hydrokinetic Feasibility Study**

**Resource:** Ocean/River

**Proposed Project Phase:** Feasibility

**Proposer:** Thomas Ravens, Ph.D. and Myree McDonald, Ph.D.

**AEA Program Manager:** David Lockard

**Applicant Type:** Government Entity

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #89 Nikolski Wind Integration Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Umnak Power / Nikolski IRA Council

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

### Project Description

This medium penetration wind-diesel and jacket heat recovery project is located on Umnak Island, approximately 100 miles west of Unalaska/Dutch Harbor. The community of Nikolski will be directly served by this project. In addition, the community of pilots and passengers who make international flights over this area will benefit greatly. A communications gap, long a problem for international flights, was recently remedied by the installation of communications equipment in Nikolski by the FAA. The Nikolski IRA Council, Chaluka Corporation, the management of Umnak Power, TDX Power and the Aleutian Pribilof Island Community Development Association/APICDA will be involved in ensuring this project succeeds.

### Funding & Cost

<b>Cost of Power:</b>	\$0.60/kWh
<b>Requested Grant Funds:</b>	\$409,430
<b>Matched Funds Provided:</b>	\$41,600
<b>Total Potential Grant Amount:</b>	\$451,030
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$409,430

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$409,430

## App #89 Nikolski Wind Integration Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Umnak Power / Nikolski IRA Council

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

### Scoring & Location



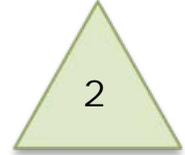
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Aleutians

**Election District:** 37, Bristol Bay-Aleutians



**Rank within Region**  
(out of 5 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	23
2) Funding Resources (Max 25)	15
3) Project Feasibility from Stage 2 (Max 20)	15
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	8
6) Local Support (Max 5)	4
7) Sustainability (Max 5)	3

### AEA Review Comments

This project would result in a medium penetration wind project in a community with very high diesel prices. AEA completed a new power plant in 2006. TDX Power installed a 65 kW wind turbine on behalf of the utility in 2007 using USDA RUS grant and APICDA funding, Currently the turbine is wired to the power plant but not connected. This proposal would provide funding to integrate the turbine into the power system and develop a heat recovery system in the existing power plant and provide for electric boilers in the lodge and school to use excess wind energy.

Nikolski is very remote and difficult to access at times due to weather, has a harsh environment, and the proposed wind-diesel system is technically complex.

Recommend with condition that prior to AEA providing grant funds, the grantee establish a five-year operation and maintenance contract with an contractor acceptable to AEA that has expertise in this area.

## App #89 Nikolski Wind Integration Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Umnak Power / Nikolski IRA Council

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Umnak Power, Nikolski's utility on Umnak Island, is requesting funding for the design and construction of the integration a 65 kW wind turbines into the city grid. The total project cost is \$451,030; Umnak Power is requesting \$409,430 in grant funds.

The B/C ratio based on applicant information is 2.81, and 1.19 based on AEA assumptions. Total project cost in present value terms are \$425,139 (both from applicant data and AEA). The present value benefits are calculated as \$1.2 million from applicant data and \$0.87 million from AEA calculations. The difference is due to a lower projected amount of wind generation based on AEA assumptions.

The amount of displaced fossil fuel is 15,012 gal/year (9,760 gal/year electricity and 5,252 gal/year heat) based on applicant data and 11,181 gal/year (7,393 gal/year electricity and 3,789 heat) based on AEA assumptions.

## App #89 Nikolski Wind Integration Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Umnak Power / Nikolski IRA Council

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #90 St. George Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** City of St. George - St. George Municipal Electric Utility

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

### Project Description

The City of St. George operates a traditional diesel power plant which currently uses multiple diesel fueled engine generators to supply all required electric power to the community of St. George Island. With fuel and fuel handling cost now at historically high levels, the community, through their partner APICDA, seeks technology alternatives to provide long term fuel-savings impact. As wind/diesel technology has been proven viable in a variety of remote applications in Alaska and internationally, APICDA has allocated resources to determine if a wind retrofit at St. George can provide a meaningful, cost effective benefit. The City of St. George, APICDA and TDX Power are all involved in delivering a high penetration wind diesel hybrid project for the community.

### Funding & Cost

<b>Cost of Power:</b>	\$0.37 /kWh
<b>Requested Grant Funds:</b>	\$1,500,000
<b>Matched Funds Provided:</b>	\$1,500,000
<b>Total Potential Grant Amount:</b>	\$3,000,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$1,500,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$1,500,000

## App #90 St. George Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** City of St. George - St. George Municipal Electric Utility

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

### Scoring & Location



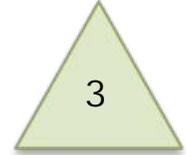
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Aleutians

**Election District:** 37, Bristol Bay-Aleutians



**Rank within Region**  
(out of 5 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	14
2) Funding Resources (Max 25)	24
3) Project Feasibility from Stage 2 (Max 20)	16
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	8
6) Local Support (Max 5)	3
7) Sustainability (Max 5)	3

### AEA Review Comments

This application proposes a 225 kW high penetration wind system that would serve the St. George power system, including a new lodge and fish processing facility to be developed by APICDA. The project would be located on St. George Tanaq Native Corporation land. The City and Corporation have not yet come to formal agreement on using the land, but the application states that there are no problems with site ownership, and the Corporation submitted a support letter for the project.

The introduction of a high penetration system into a moderate-sized community that includes remotely controlled dumploads brings along a significant level of complexity. Successful performance will require commitment to providing skilled and timely operation and maintenance.

Recommend full funding with the following conditions that must be met before funds are disbursed: 1) AEA approval of final design, 2) the grantee establish a five-year operation and maintenance contract with a contractor acceptable to AEA that has expertise in this area.

## App #90 St. George Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** City of St. George - St. George Municipal Electric Utility

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The City of St. George Municipal Electric Utility is requesting funding for the design and construction of a 250 kW high penetration wind system (1x 250 kW wind turbine). The total project cost is \$3,000,000; the City of St. George is requesting \$1,500,000 in grant funds.

The B/C ratio based on applicant information is 1.93, and 1.73 based on AEA assumptions. Total project cost in present value terms are \$2.8 million (both from applicant data and AEA). The present value benefits are calculated as \$5.47 million from applicant data and \$4.91 million from AEA calculations. The difference is due to lower projected wind generation based on AEA assumptions.

The amount of displaced fossil fuel is 70,961 gal/year based on applicant data and 64,435 gal/year based on AEA assumptions.

## App #90 St. George Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design

**Proposer:** City of St. George - St. George  
Municipal Electric Utility

**AEA Program Manager:** James Jensen

**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #91 Napaimute Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction Design

**Proposer:** Native Village of Napaimute

**AEA Program Manager:** David Lockard

**Applicant Type:** Government Entity

### Project Description

Since Napaimute received its land base through unusual means, it was through Administration for Native American funding that survey of its community lands was completed. This enabled the tribe to open a Home Site Program; people are resettling, the village growing. Napaimute Enterprises sells fuel; operates a small package store; rents cabins and the community center; operates a sawmill; has a coin-op washer and dryer; and offer showers. Commerce and our economic base are slowly growing, in accordance to our Community Plan. The cost of providing linked energy to rural Alaskan villages is staggering; individual energy systems must smartly utilize energy by reducing use of petroleum products. Our village, located on the Kuskokwim River, about 30 miles from Aniak works to be a model village where refuse is contained, development is planned and residents demonstrate their care and respect for the environment by minimizing their dependence on diesel; this is also a demonstration of the harsh economic environment. Our proposal will serve current and future members of the community (25 or so residential homes) along with a couple of families that live across the river and the countless river commuters who come to wash clothes and take a shower. NVN's Director Development & Operations Mark Leary and Environmental Coordinator Mitchell Dammeyer will be directly involved in the management of this project. Both men are highly respected in the Kuskokwim and Mr. Leary has overseen most of Napaimute's development, literally from the brush up.

### Funding & Cost

<b>Cost of Power:</b>	\$0.77 /kWh
<b>Requested Grant Funds:</b>	\$109,471.29
<b>Matched Funds Provided:</b>	\$14,023
<b>Total Potential Grant Amount:</b>	\$123,494.29
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

## App #91 Napaimute Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction Design

**Proposer:** Native Village of Napaimute

**AEA Program Manager:** David Lockard

**Applicant Type:** Government Entity

### Scoring & Location



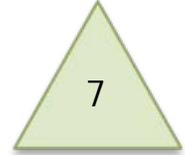
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Lower Yukon-Kuskokwim

**Election District:** 6, Interior Villages



Rank within Region  
(out of 10)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	29
2) Funding Resources (Max 25)	14
3) Project Feasibility from Stage 2 (Max 20)	8
4) Project Readiness (Max 5)	3
5) Benefits (Max 10)	1
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	2

### AEA Review Comments

Applicant proposes a 2.7 kW photovoltaic / battery system that would cost approximately \$123,000. Assuming a capacity factor of 15% the project would displace approximately 350 gallons per year, thus saving about \$2,100 per year.

This proposal does not account for inverter losses or roundtrip battery storage efficiency. An efficient diesel generator and heat recovery system would provide more economic benefit.

AEA recommends that the applicant pursue a powerhouse project, which appears to be more applicable to the applicant's goal of re-establishing the village of Napaimute. Depending on available resources, AEA can provide assistance identifying potential funding sources and preparing grant application materials.

Not recommended for funding.

## App #91 Napaimute Solar PV Construction

**Resource:** Solar

**Proposed Project Phase:** Construction  
Design

**Proposer:** Native Village of Napaimute

**AEA Program Manager:** David Lockard

**Applicant Type:** Government Entity

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The community of Napaimute serves as a seasonal location for subsistence fishing and gathering, and is not occupied year around. The applicant estimates that the location is occupied to some extent for 10.5 months per year. The applicant runs a private generator, and is not part of the Power Cost Equalization program. Consequently, no diesel fuel costs are gathered for Napaimute.

**App #91 Napaimute Solar PV Construction**

**Resource:** Solar

**Proposed Project Phase:** Construction  
Design

**Proposer:** Native Village of Napaimute

**AEA Program Manager:** David Lockard

**Applicant Type:** Government Entity

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #92 Delia Creek Hydro Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction Design

**Proposer:** HPML, LLC

**AEA Program Manager:**

**Applicant Type:** IPP

### Project Description

The Applicant owns and operates Motherload Lodge located near the Little Susitna River. The 4.9 acre plot of land is privately owned but segments of the proposed project will be located on land owned by the State of Alaska Park Service. The Motherload Lodge currently utilizes 3 diesel fuel generators to power the facility and accounts for a significant percentage of annual operating expenses. The company plans to construct a 50kW run of river project on Delia Creek. The proposed project, The Delia Creek Alternative Energy Project (DCAEP), will utilize water flow from the Delia Creek to power electricity to the Motherload Lodge. The project will include an intake site, underground penstock and powerhouse. The hydroelectric system will be integrated with the current fuel generator system. Out of the 3 gensets, 2 gensets will be removed immediately and the third genset, replaced with a smaller genset. DCAEP will be headed by Project Manager, Jill Reese, Owner and sole member of HPML LLC.

### Funding & Cost

<b>Cost of Power:</b>	/kWh
<b>Requested Grant Funds:</b>	\$50,000
<b>Matched Funds Provided:</b>	\$0
<b>Total Potential Grant Amount:</b>	\$50,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- ✗ Did Not Pass Stage 1
- Pending

**App #92 Delia Creek Hydro Construction**

**Resource:** Hydro

**Proposed Project Phase:** Construction Design

**Proposer:** HPML, LLC

**AEA Program Manager:**

**Applicant Type:** IPP

**Scoring & Location**



Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Railbelt

**Election District:**



Rank within Region  
(out of )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	0
2) Funding Resources (Max 25)	
3) Project Feasibility from Stage 2 (Max 20)	
4) Project Readiness (Max 5)	
5) Benefits (Max 10)	
6) Local Support (Max 5)	
7) Sustainability (Max 5)	

**AEA Review Comments**

**App #92 Delia Creek Hydro Construction**

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design

**Proposer:** HPML, LLC

**AEA Program Manager:**

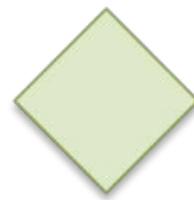
**Applicant Type:** IPP

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



## App #92 Delia Creek Hydro Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction  
Design

**Proposer:** HPML, LLC

**AEA Program Manager:**

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #93 Anchorage Landfill Gas Electricity Final Design

**Resource:** Biofuels

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Wind Energy, LLC, d/b/a Wind Energy Alaska (WEA)

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Project Description

Wind Energy Alaska (WEA) wishes to construct a 3.2 megawatt (MW) Landfill Gas (LFG) to Energy Generation Facility at the Anchorage Regional Landfill, located east of the Glenn Highway near Eagle River, Alaska. The Anchorage Regional Landfill is owned and operated by the Municipality of Anchorage (MOA), Solid Waste Service (SWS). With an in-service date of April, 2010, this project is designed for incremental growth beginning with 3.2 MW and up to 6.4 MW within the next 15 years with additional capacity as needed. Landfill gas flow records and projected fill rates at the landfill over the next 20 years support the potential for this level of electric power production. MOA would receive royalty payments to compensate for use of land and LFG for the project. This revenue could be used to offset tipping fees at the landfill to benefit the public. In addition to power generation, the proposed project will include a heat recovery system that will recover waste heat from the LFG engines to be used in nearby office and storage building presently heated with a natural gas. The natural gas fuel cost savings will reduce landfill operating costs. The landfill is located near the existing power lines that feed into the electric system and the Railbelt grid. The U.S. Army Fort Richardson, Elmendorf Air Force Base, ML&P, Chugach Electric Association (CEA), Matanuska Electric Association (MEA), MOA's Anchorage Regional Landfill and SWS are potential power customers. WEA has contracted HDR Alaska, Inc. to provide design engineering, permitting, and construction management of the project. HDR has LFG design experience and has assisted in the development of cost estimates for this project.

### Funding & Cost

<b>Cost of Power:</b>	\$0.10 /kWh
<b>Requested Grant Funds:</b>	\$2,100,000
<b>Matched Funds Provided:</b>	\$6,157,850
<b>Total Potential Grant Amount:</b>	\$8,257,850
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:**

## App #93 Anchorage Landfill Gas Electricity Final Design

**Resource:** Biofuels

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Wind Energy, LLC, d/b/a Wind Energy Alaska (WEA)

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Scoring & Location



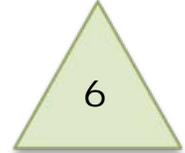
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 17, Eagle River



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	4
2) Funding Resources (Max 25)	25
3) Project Feasibility from Stage 2 (Max 20)	17
4) Project Readiness (Max 5)	3
5) Benefits (Max 10)	10
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	5

### AEA Review Comments

The proposer offers a significant match and claims monetary benefits to the Muni of Anchorage; however there is no discussion of power purchase agreement in section 4.4.3 (Power Purchase/Sale) although a 6 cents/kWh is indicated in Section 2.5.5. Primary hurdles for the applicant are the lack of gas purchase agreement, land for project site, and power purchase agreement.

Proposal 68-Anchorage Landfill Gas Electricity Construction submitted by the Muni requests funding to do similar work. While both proposals have technical and economic merit, the application by the Muni may simplify the project. Under project 68 the Muni could work with Alaska Wind Energy LLC or another IPP to develop and operate the project.

We recommend that either proposal 68 or proposal 93 be funded, but not both. For the purposes of funding allocation we are recommending funding for project 68.

## App #93 Anchorage Landfill Gas Electricity Final Design

**Resource:** Biofuels

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Wind Energy, LLC, d/b/a Wind Energy Alaska (WEA)

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



AEA determined that the \$60,000 towards the heat exchanger system in the application is nominal and insignificant insofar as the B/C calculation is concerned. Mechanical, electrical, and other components of the inter-building heating system are not accounted for and it is unclear what the heating requirements are for the buildings targeted. The proposal is therefore evaluated strictly on the electrical output and capital costs net of \$60,000. This facility will displace around \$2 million per year in fossil fuel-based power and provide a B/C ratio of 3.38.

## App #93 Anchorage Landfill Gas Electricity Final Design

**Resource:** Biofuels

**Proposed Project Phase:** Construction Design

**Proposer:** Alaska Wind Energy, LLC, d/b/a Wind Energy Alaska (WEA)

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #94 Nikolaevsk Wind Farm Final Design

**Resource:** Wind

**Proposed Project Phase:** Design

**Proposer:** Alaska Wind Energy, LLC, d/b/a Wind Energy Alaska (WEA)

**AEA Program Manager:** Jensen

**Applicant Type:** IPP

### Project Description

Wind Energy Alaska (WEA), plans to construct a 6 megawatt (MW) wind generation facility on CIRI-owned land near the village of Nikolaevsk, located on the southern Kenai Peninsula. The electricity generated by the project will be interconnected to the Anchor Point Substation, which is owned and operated by the Homer Electric Association (HEA). The project includes the construction of the wind generation plant, with four 1.5 MW GE wind turbines, a new 1.9 mile access road, and a distribution line approximately 10 miles in length from the plant to the Anchor Point Substation in Nikolaevsk. HEA is one of the six prime electric cooperatives, or utilities, that serves the Alaska Railbelt transmission grid. HEA is a member owned electric cooperative that serves most of Alaska's Kenai Peninsula. HEA serves approximately 20,153 members at 28,547 metered locations, 2,200 miles of energized line, within a service area of 3,166 square miles. WEA, CIRI, and enXco are project proponents.

### Funding & Cost

<b>Cost of Power:</b>	\$0.14 /kWh
<b>Requested Grant Funds:</b>	\$4,334,600
<b>Matched Funds Provided:</b>	\$17,588,400
<b>Total Potential Grant Amount:</b>	\$21,923,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$180,600

### AEA Recommendation

- Full Funding
- ✗ Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$180,600

## App #94 Nikolaevsk Wind Farm Final Design

**Resource:** Wind

**Proposed Project Phase:** Design

**Proposer:** Alaska Wind Energy, LLC, d/b/a Wind Energy Alaska (WEA)

**AEA Program Manager:** Jensen

**Applicant Type:** IPP

### Scoring & Location



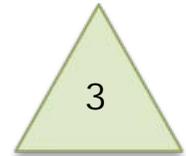
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 34, Rural Kenai



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	5
2) Funding Resources (Max 25)	25
3) Project Feasibility from Stage 2 (Max 20)	16
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	7
6) Local Support (Max 5)	3
7) Sustainability (Max 5)	5

### AEA Review Comments

This wind energy project would supply most of its output during the winter months, when load is greatest. Applicant Alaska Wind Energy is a partnership of Cook Inlet Region Inc. and renewable energy developer EnXco Development Corp. The project would be located on CIRI land. The project would tie into the HEA system at the Anchor Point substation. A 10-mile 24.9 kV line would connect the wind turbines to the substation. The final location of the line is not yet established. The line may cross CIRI, Native Village of Ninilchik, Kenai Borough, and State land.

The applicant references a number of existing project feasibility analyses, but does not provide the analyses or their content in detail. The application includes a letter of support from local utility Homer Electric. Project risks indicated in the application are the ability to obtain a power purchase agreement with HEA and powerline right-of-way with land owners. By December 2009 the applicant proposes to obtain all permits and rights-of-way, complete all necessary field studies, complete a design-build package, finalize design, and substantially complete construction.

Given the uncertainty of obtaining necessary permits and rights-of-way, allocation of construction funding for the project appears premature. Recommend partial funding for Final Design and Permitting with requirements that before the disbursement of grant funds that AEA review and approve feasibility studies.

In the application there is no indication that the plan has the approval of RCA. As noted in the application this project will affect not only HEA but other Railbelt utilities.

Recommend partial funding for final and design and permitting (phase 3 tasks 1-10 excluding task 11 the downpayment on wind turbines) with the following conditions: 1) Prior to the release of funds applicant is required to submit, and AEA must approve, a detailed plan to obtain RCA regulatory approval of power purchase agreements and certification 2) Because this project involves public funds AEA will require that all power produced by this project be sold to a public utility.

## App #94 Nikolaevsk Wind Farm Final Design

**Resource:** Wind

**Proposed Project Phase:** Design

**Proposer:** Alaska Wind Energy, LLC, d/b/a Wind Energy Alaska (WEA)

**AEA Program Manager:** Jensen

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Alaska Wind Energy Alaska, LLC, is requesting funding for the design and construction of a 6 MW wind farm (4 x 1.5MW wind turbines) in Nikolaevsk. The total project cost is \$21,923,000; Alaska Wind Energy is requesting \$4,334,600 in grant funds.

The B/C ratio based on applicant information is 1.13, and 1.34 based on AEA assumptions. Total project cost in present value terms are \$20.45 million (both from applicant data and AEA). The present value benefits are calculated as \$23.2 million from applicant data and \$27.4 million from AEA calculations. The difference is due to a higher wind generation projection based on AEA assumptions.

## App #94 Nikolaevsk Wind Farm Final Design

**Resource:** Wind

**Proposed Project Phase:** Design

**Proposer:** Alaska Wind Energy, LLC, d/b/a Wind Energy Alaska (WEA)

**AEA Program Manager:** Jensen

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #95 Makushin Geothermal Feasibility Study

**Resource:** Geothermal

**Proposed Project Phase:** Feasibility

**Proposer:** Kiiguusi Suuluta Land Company, LLC

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

### Project Description

The Makushin project's primary goal is to produce a minimum of 40 MW of power from the geothermal resource and supply that power to the City of Unalaska, independent power producers and other energy users in the vicinity. The current generating capacity within Unalaska consists of UniSea (Fairbanks- Morris (12± MW)), Westward Seafood (9± MW Wartsila), Alyeska Seafood (5.5± MW), and the City of Unalaska (currently 7.5 MW; in addition the City has purchased, but not installed, 10 MW capacity Wartsila diesel gensets (and perhaps an additional 10 MW of diesel generation) for the potential of 44+ MW, in the future which is contemplated to be utilized as emergency back-up generation. The base load of all Unalaska to be supplied by the Geothermal-electric Project is estimated near 10 mW/hr. The combined base and peak loads are estimated to be near 32 mW/hr. The project could supply more than 50 percent of the electrical load for the City and other power producers in Unalaska.

### Funding & Cost

<b>Cost of Power:</b>	\$0.54 /kWh
<b>Requested Grant Funds:</b>	\$3,225,500
<b>Matched Funds Provided:</b>	
<b>Total Potential Grant Amount:</b>	\$3,225,500
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #95 Makushin Geothermal Feasibility Study

**Resource:** Geothermal

**Proposed Project Phase:** Feasibility

**Proposer:** Kiiguusi Suuluta Land Company, LLC

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

### Scoring & Location



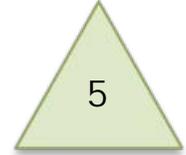
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Aleutians

**Election District:** 37, Bristol Bay-Aleutians



**Rank within Region**  
(out of 5 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	20
2) Funding Resources (Max 25)	1
3) Project Feasibility from Stage 2 (Max 20)	12
4) Project Readiness (Max 5)	1
5) Benefits (Max 10)	8
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	1

### AEA Review Comments

The project file contains correspondence indicating lack of agreement and poor communication between the two critical stakeholders: the City of Unalaska as the certificated utility, and KSLC LLC, the resource owner.

See DGGs comment above under DMLW.

The fish processors are not partners to this proposal, nor have they endorsed the concept which depends almost completely on their participation.

The project budget is too high.

Project appears to be championed by outside interests and has not adequately included the local community, government, or power utility. Project not recommended for funding because of lack of communication, support, and coordination among stakeholders. Recommend prior to any state funding that critical stakeholders determine project development approach and leadership in order to ensure state funds benefit residents of the State of Alaska.

## App #95 Makushin Geothermal Feasibility Study

**Resource:** Geothermal

**Proposed Project Phase:** Feasibility

**Proposer:** Kiiguusi Suuluta Land Company, LLC

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant requests funding for a feasibility study for a geothermal project to serve Unalaska/Dutch Harbor. This community is home to several large fish processing plants, which each use a large amount of power. Several of these processors have their own diesel generating plants. The completed project would supply enough geothermal power to replace all diesel generation in the community, with room for growth.

## App #95 Makushin Geothermal Feasibility Study

**Resource:** Geothermal

**Proposed Project Phase:** Feasibility

**Proposer:** Kiiguusi Suuluta Land Company, LLC

**AEA Program Manager:** David Lockard

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

The Geothermal resource identified in this proposal is well understood from prior scientific, drilling and geophysical evaluations. It is clearly a viable resource that should be developed if proper commercial terms can be reached between all interested parties. It would not be prudent for the State to spend Public funds on further scientific evaluation of this resource, and such funds would be better utilized in drilling and development. DGGS recommends this project is not funded in its current form.

## App #96 Crooked Creek Renewable Energy Reconnaissance Study

**Resource:** Other

**Proposed Project Phase:** Recon

**Proposer:** Crooked Creek Traditional Council

**AEA Program Manager:**

**Applicant Type:** Government Entity

### Project Description

The community of Crooked Creek along the Kuskokwim River, have long been interested in renewable power and have already researched a variety of possibilities, this year's project initially will be to develop a finale list of potentially feasible methods, to explore feasibility studies and cost evaluation. We'll collect the necessary data by testing the feasibility of these considerations; by building prototypes that will supply us with the solid data to base our decisions on, to aid us in reduce our dependency on Fossil Fuels. This may require the combination of available technologies, some we're considering are Thermopile technology, Hydro power (four sources available here), Solar power, Wind, Residential producers, Wood gas and heat power production, We'll be verifying permitting requirements, Land right of ways and environmental, permitting obstacles identified. A Full study of Village Creek flow, explore methods to increase and extend its annual usage. As much as this is a fact finding mission, it is also a call to arms by the population of Crooked Creek. Our IGAP program will, with this grant, will ready us for all consideration.

### Funding & Cost

<b>Cost of Power:</b>	\$0.77 /kWh
<b>Requested Grant Funds:</b>	\$137,543
<b>Matched Funds Provided:</b>	\$58,000
<b>Total Potential Grant Amount:</b>	\$195,543
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- ✗ Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$0

**App #96 Crooked Creek Renewable Energy Reconnaissance Study**

**Resource:** Other

**Proposed Project Phase:** Recon

**Proposer:** Crooked Creek Traditional Council

**AEA Program Manager:**

**Applicant Type:** Government Entity

**Scoring & Location**



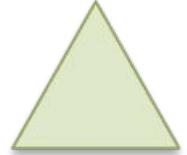
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Lower Yukon-Kuskokwim

**Election District:**



Rank within Region  
(out of )

**Stage 3 Scoring Summary**

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	29
2) Funding Resources (Max 25)	
3) Project Feasibility from Stage 2 (Max 20)	
4) Project Readiness (Max 5)	
5) Benefits (Max 10)	
6) Local Support (Max 5)	
7) Sustainability (Max 5)	

**AEA Review Comments**

**App #96 Crooked Creek Renewable Energy Reconnaissance Study**

**Resource:** Other

**Proposed Project Phase:** Recon

**Proposer:** Crooked Creek Traditional Council

**AEA Program Manager:**

**Applicant Type:** Government Entity

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



**App #96 Crooked Creek Renewable Energy Reconnaissance Study**

**Resource:** Other

**Proposed Project Phase:** Recon

**Proposer:** Crooked Creek Traditional Council

**AEA Program Manager:**

**Applicant Type:** Government Entity

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #97 Nenana Hydrokinetic Construction

**Resource:** Ocean/River

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** University of Alaska Fairbanks, Office of Sponsored Programs

**AEA Program Manager:** David Lockard

**Applicant Type:** Government Entity

### Project Description

The proposed project will take place on the Tanana River adjacent to the community of Nenana. Nenana was chosen due to a combination of strong local support for the project, available technical assistance and infrastructure, and location on the road system within close proximity to the University of Alaska Fairbanks. This project will be administered by the Alaska Center for Energy and Power (ACEP) at the University of Alaska, Fairbanks, with significant contributions from the University of Maine, Yukon River Intertribal Watershed Council, the Tribal and City Councils of Nenana, and Ocean Renewable Power Corporation (ORPC). The primary purpose of the project is to successfully address the numerous challenges associated with installing hydrokinetic devices in Alaska's riverine environments. This will be accomplished through a comprehensive resource assessment (biological and physical), followed by the installation of a 'dummy' open architecture turbine to assess operations in challenging environments (including interactions with ice and debris) without damaging expensive real turbine equipment. Finally, this project will involve the design, construction, deployment and initial testing of a first commercial hydrokinetic device at the site.

### Funding & Cost

<b>Cost of Power:</b>	\$0.21 /kWh
<b>Requested Grant Funds:</b>	\$1,854,026
<b>Matched Funds Provided:</b>	\$83,046
<b>Total Potential Grant Amount:</b>	\$1,937,072
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$450,000

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$450,000

## App #97 Nenana Hydrokinetic Construction

**Resource:** Ocean/River

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** University of Alaska Fairbanks, Office of Sponsored Programs

**AEA Program Manager:** David Lockard

**Applicant Type:** Government Entity

### Scoring & Location



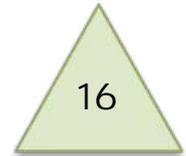
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 6, Interior Villages



Rank within Region  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	8
2) Funding Resources (Max 25)	7
3) Project Feasibility from Stage 2 (Max 20)	14
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	5
6) Local Support (Max 5)	3
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant proposes resource assessment and feasibility analysis and permitting/deployment of a hydrokinetic device at Nenana. The project team appears well-qualified.

The primary benefit of this project to the State of Alaska is the demonstration and testing of a technology with significant potential in rural Alaska. However, project costs appear excessive. At \$975,000, (p13) cost of development and construction of the 30 kW ORPC generating unit is of concern, especially in regard to the potential for eventual technology commercialization.

Recommend partial funding for resource assessment (tasks 1-3).

## App #97 Nenana Hydrokinetic Construction

**Resource:** Ocean/River

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** University of Alaska Fairbanks, Office of Sponsored Programs

**AEA Program Manager:** David Lockard

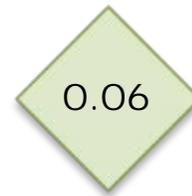
**Applicant Type:** Government Entity

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant is proposed a project for Nenana due to its close proximity and easy access to the applicant's home offices. While this project is worthwhile as a pilot or demonstration project, because it is located within the Railbelt electrical grid where energy costs are low, the energy cost savings over the life of the project do not outweigh the construction costs. B/C ratio is 0.06.

**App #97 Nenana Hydrokinetic Construction**

**Resource:** Ocean/River

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** University of Alaska Fairbanks, Office of  
Sponsored Programs

**AEA Program Manager:** David Lockard

**Applicant Type:** Government Entity

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

No state permits yet.

## App #98 Nikiski Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kenai Winds, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Project Description

The Kenai Winds project is a 15-18MW wind energy generation facility located in the Nikiski Industrial Area, in Nikiski, on the Kenai Peninsula. The project will consist of 10 wind turbines disbursed throughout the site, electrically interconnected to the Tesoro Alaska Refinery. At times when the Kenai Winds generation exceeds the needs of the refinery, power will be sold to others. Electric energy will be delivered and sold to the oil refinery, providing low-cost power, and helping ensure the economic viability of the refinery.

### Funding & Cost

<b>Cost of Power:</b>	\$0.14 /kWh
<b>Requested Grant Funds:</b>	\$11,700,000
<b>Matched Funds Provided:</b>	\$35,100,000
<b>Total Potential Grant Amount:</b>	\$46,800,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$80,000

### AEA Recommendation

- Full Funding
- ✗ Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$80,000

## App #98 Nikiski Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kenai Winds, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Scoring & Location



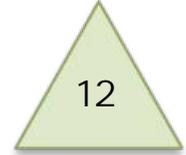
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 34, Rural Kenai



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	5
2) Funding Resources (Max 25)	25
3) Project Feasibility from Stage 2 (Max 20)	13
4) Project Readiness (Max 5)	3
5) Benefits (Max 10)	6
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	5

### AEA Review Comments

The applicants request funding for final design and permitting and construction funds for a 15-18 MW wind farm to be located at or near the Tesoro refinery in Nikiski. Because Tesoro is a customer of HEA and, under this proposal, would purchase power from BQ Energy, the only member of applicant Kenai Winds, there appears to be regulatory implications. In the application there is no indication that the plan has the approval of RCA. As noted in the application this project will affect not only HEA but other Railbelt utilities.

Recommend partial funding for final and design and permitting (phase 3 tasks 1-10 excluding task 11 the downpayment on wind turbines) with the following conditions: 1) Prior to the release of funds applicant is required to submit, and AEA must approve, a detailed plan to obtain RCA regulatory approval of power purchase agreements and certification 2) Because this project involves public funds AEA will require that all power produced by this project be sold to a public utility.

## App #98 Nikiski Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kenai Winds, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Kenai Winds, LLC, an independent power producer, is requesting funding for the design and construction of a 15-18 MW wind farm (10 wind turbines) in Nikiski. The total project cost is \$46,800,000; Kenai Winds, LLC, is requesting \$11,700,000 in grant funds.

The B/C ratio based on applicant information is 1.25, and 1.43 based on AEA assumptions. Total project cost in present value terms are \$44.25 million (both from applicant data and AEA). The present value benefits are calculated as \$55.5 million from applicant data and \$63.2 million from AEA calculations. The difference is due to a higher wind generation projection and slightly lower O&M cost based on AEA assumptions.

## App #98 Nikiski Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kenai Winds, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #101 Ketchikan Biomass Gasification Construction

**Resource:** Biofuels

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Diesel Brewing Company, LLC dba  
Diesel Brewing of Ketchikan

**AEA Program Manager:** Jensen

**Applicant Type:** IPP

### Project Description

The proposed project is to convert biomass (forest products residuals) to liquid fuels, specifically heating fuels and diesel, and electricity through gasification of the biomass and converting the resulting synthesis gas (SynGas) to #1 heating fuel and diesel for transportation applications. Electricity is a by-product of the proposed process and will be produced to meet facility electrical needs with any excess electricity made available to the local utilities. The gasses produced will be converted to liquids fuel using a catalytic conversion process called Fischer-Tropsch, and the electricity will be produced and generated by capturing the waste heat and making steam through heat exchangers and standard turbines and generators.

### Funding & Cost

<b>Cost of Power:</b>	\$0.10 /kWh
<b>Requested Grant Funds:</b>	\$20,500,000
<b>Matched Funds Provided:</b>	\$5,125,000
<b>Total Potential Grant Amount:</b>	\$25,625,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$0

## App #101 Ketchikan Biomass Gasification Construction

**Resource:** Biofuels

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Diesel Brewing Company, LLC dba  
Diesel Brewing of Ketchikan

**AEA Program Manager:** Jensen

**Applicant Type:** IPP

### Scoring & Location



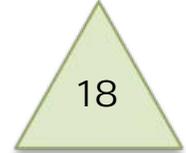
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 1, Ketchikan



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	4
2) Funding Resources (Max 25)	20
3) Project Feasibility from Stage 2 (Max 20)	7
4) Project Readiness (Max 5)	2
5) Benefits (Max 10)	4
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	1

### AEA Review Comments

This proposal requests \$20.5 million for construction of a plant that would convert 33,000 dry tons/yr of sawmill waste into 1.63 million gallons/yr of liquid fuel and 33,600 MWh/yr of power. Although the proposal references recon, feasibility, and final design as development stages, it lumps the development stages together and does not provide individual timelines or budgets for development stages. Thus it is not possible to recommend funding for any intermediate stages.

We have the following concerns regarding the application: 1) No evidence of experience in projects similar to the one proposed, 2) No demonstration of local support or interest in the developing the project or purchasing fuel and power from the project, 3) Little documentation of feedstock availability and delivered cost, 4) Overly optimistic timeline for preconstruction activities, 5) No examples of facilities that the team has developed that use the proprietary fuel and power production processes.

Recommend no funding.

**App #101 Ketchikan Biomass Gasification Construction**

**Resource:** Biofuels

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Diesel Brewing Company, LLC dba  
Diesel Brewing of Ketchikan

**AEA Program Manager:** Jensen

**Applicant Type:** IPP

**Economic Analysis**

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Basic assumptions on moisture content of feedstock, type of processing used at each stage, and efficiency must be determined along with location-specific construction costs, shipping, etc. before a benefit-cost analysis can in good faith be prepared exercising due diligence.

Applicant proposes doing a feasibility study after a construction grant has already been made. Capital cost data is unclear regarding "gasifier" cost vs. pre-treatment, gas cleaning, compressor, turbines, etc. It is impossible to establish what component parts are included or even the basic type of gasifier to be constructed.

Applicant submitted a "project cost" figure of \$25.6 million, where "project costs" include operating costs in years after construction is completed. Reviewed capital cost data supplied by the applicant and determined that the proposed capital costs of the facility were \$19.2 million. This seems unrealistically low in view of other facilities under construction with reported capital costs. Facility construction was scheduled to be completed in the first year. Total operating plus capital costs in year one were approximately \$21.1 million. The requested amount of \$20.5 million is essentially full funding of a turnkey operation. If the grant fully pays for a turnkey operation then it is unclear what is meant by Diesel Brewing co's "match". B/C ratio calculated at 0.79.

**App #101 Ketchikan Biomass Gasification Construction**

**Resource:** Biofuels

**Proposed Project Phase:** Construction  
Design  
Feasibility  
Recon

**Proposer:** Diesel Brewing Company, LLC dba  
Diesel Brewing of Ketchikan

**AEA Program Manager:** Jensen

**Applicant Type:** IPP

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #102 Delta Junction Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Alaska Environmental Power LLC

**AEA Program Manager:** Jensen

**Applicant Type:** IPP

### Project Description

This project will consist of twenty (20) wind turbines to make a collective 2MW "wind farm" in Delta Junction and will be the first project of its kind to integrate into the Railbelt Grid using an "experimental" program by Golden Valley Electric Association (GVEA), by using "proven" cold-weather technology (Northwind 100 turbines with direct-drive motors) which have already been successfully used in Alaska's cold weather, as well as a proven "test" turbine (the first of twenty 100kW turbines) at the same location just erected and successfully tested by GVEA. This will serve all the communities that are on the Railbelt Grid and can produce enough electricity to power 600 homes each year without any emissions or environmental harm of any kind. Mike Craft, Managing Partner for Alaska Environmental Power, LLC (AEP) will be spearheading this project as its P.M. (Project Manager), in conjunction with Golden Valley Electric Association (GVEA), and a team of well qualified individuals and businesses necessary for the construction and erection of the wind turbines for final connection to GVEA's power source connecting it to the Railbelt Grid and all those consumers who receive power from the Grid.

### Funding & Cost

<b>Cost of Power:</b>	\$0.21 /kWh
<b>Requested Grant Funds:</b>	\$6,269,750
<b>Matched Funds Provided:</b>	\$2,094,136
<b>Total Potential Grant Amount:</b>	\$8,363,886
<b>Existing RE Fund Grant Offer:</b>	801500.00
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$5,468,250

**AEA Funding Recommendation:** \$2,000,000

### AEA Recommendation

- Full Funding
- ✗ Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #102 Delta Junction Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Alaska Environmental Power LLC

**AEA Program Manager:** Jensen

**Applicant Type:** IPP

### Scoring & Location



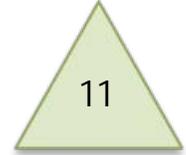
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 12, Richardson-Glenn  
Highways



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	8
2) Funding Resources (Max 25)	24
3) Project Feasibility from Stage 2 (Max 20)	13
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	5
6) Local Support (Max 5)	4
7) Sustainability (Max 5)	4

### AEA Review Comments

Applicant seeks funding for a 2 MW wind energy project in the Delta area. The project, as submitted, would install 20 Northwind 100 kW turbines. In a letter dated November 13, after the submittal deadline, the applicant requested an amendment to the project that would result in substituting 2 Americas Wind Energy 900 kW turbines for eighteen of the Northwind 100 turbines, yielding a reduced cost. Since AEA received the requested amendment after the deadline, the evaluation here is based on the original submittal. AEA will evaluate the amended proposal in Round 2 of the RFA.

The applicant has already received \$801,500 in RE Fund funding from AEA for installation of NorthWind 100 wind turbines on the proposed site. The applicant's current proposal would bring the total number of NorthWind 100 turbines up to twenty.

Based on AEA's high resolution wind map, the wind resource at the proposed location is Class 1 (poor). However the applicant provided 10 months of wind data that indicates a better wind resource. For the purpose of this evaluation, AEA has assumed a Class 3 resource (fair).

Recommend partial funding with the following grant conditions: 1) AEA will require confirmation of an acceptable wind resource prior to dispersing funds to the project. 2) applicant required to petition RCA for a certificate of public convenience and necessity and economic rate regulation prior to release of construction funds, 2) establish a power purchase agreement with GVEA prior to release of construction grant funds. The recommended funding amount equals total amount requested from the state (\$6,269,750) minus amount already offered (\$801,500).

## App #102 Delta Junction Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Alaska Environmental Power LLC

**AEA Program Manager:** Jensen

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Alaska Environmental Power, LLC, is requesting funding for the construction of a 2 MW wind farm (20 x 100 kW wind turbines) near Delta. The total project cost is \$8,363,886; Alaska Environmental Power is requesting \$6,269,750 in grant funds.

The B/C ratio based on applicant information is 1.17, and 0.92 based on AEA assumptions. Total project cost in present value terms are \$7.89 million (both from applicant data and AEA). The present value benefits are calculated as \$9.2 million from applicant data and \$7.2 million from AEA calculations. The difference is due to a lower wind generation projection based on AEA assumptions.

## App #102 Delta Junction Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Alaska Environmental Power LLC

**AEA Program Manager:** Jensen

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #103 Pillar Mountain Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kodiak Electric Association, Inc.

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

The Pillar Mountain Wind project is KEA's next step to achieve its Vision Statement "Endeavor to produce 95% of energy sales with cost effective renewable power solutions by the year 2020. This renewable energy project will consist of three 1.5 MW General Electric (GE) SLE wind turbines. It is estimated that this project will produce 15.6 million kWh's annually and thereby eliminate over 1.2 million gallons of diesel each year. The wind project will utilize the 20MW Terror Lake Hydroelectric facility as an energy storage system to mitigate the fluctuations of wind power. Wind and water will work in concert together to produce an estimated 91% of our current power generation needs. This renewable energy project will benefit the City of Kodiak; United States Coast Guard Integrated Support Command Kodiak, Bells Flats and Russian Creek areas, as well as the villages of Chiniak, Pasagshak and Port Lions.

### Funding & Cost

<b>Cost of Power:</b>	\$0.19 /kWh
<b>Requested Grant Funds:</b>	\$9,650,000
<b>Matched Funds Provided:</b>	\$2,000,000
<b>Total Potential Grant Amount:</b>	\$11,650,000
<b>Existing RE Fund Grant Offer:</b>	1000000.00
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$8,650,000

**AEA Funding Recommendation:** \$4,000,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #103 Pillar Mountain Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kodiak Electric Association, Inc.

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



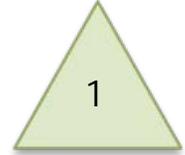
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Kodiak

**Election District:** 36, Kodiak



**Rank within Region**  
(out of 2 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	7
2) Funding Resources (Max 25)	20
3) Project Feasibility from Stage 2 (Max 20)	19
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	9
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

This application proposes to expand the planned Pillar Mt. windfarm from 1.5 MW to 4.5 MW, thus boosting renewable energy production from the current 80% to 91%, and displacing 1.2 million gallons of diesel per year. The project development team is experienced, and project economics are favorable.

Recommend full funding. AEA has already allocated funding of \$1 million of RE Fund dollars. Therefore, recommended additional funding is the proposed \$9.65 million minus \$1 million = \$8.65 million.

## App #103 Pillar Mountain Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kodiak Electric Association, Inc.

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Kodiak Electric Association (KEA) is requesting funding for the design and construction of a 4.5 MW (3x 1.5 MW turbines) wind farm in Kodiak. The total project cost is \$23,319,539; KEA is requesting \$9,650,000 in grant funds.

The B/C ratio based on applicant information is 4.59, and 3.89 based on AEA assumptions. Total project cost in present value terms are \$15.48 million from applicant data and \$14.7 million from AEA assumptions. The present value benefits are calculated as \$71.14 million from applicant data and \$57.28 million from AEA calculations. The difference is due to a lower projected amount wind generation based on AEA assumptions.

The amount of displaced fossil fuel is 1,203,32 gal/year based on applicant data and 982,309 gal/year based on AEA assumptions.

## App #103 Pillar Mountain Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Kodiak Electric Association, Inc.

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

Being permitted.

## App #104 Reynolds Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** Haida Power, Inc.

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Project Description

The Reynolds Creek Hydroelectric Project ("Reynolds Creek" or the "Project") is a 5.0 MW hydroelectric resource to be constructed on Prince of Wales Island approximately ten miles east of Hydaburg. The Project will interconnect with the existing transmission grid on the island and will be used by the residents and businesses of Craig, Klawock, Hollis, Hydaburg, Thorne Bay, and Kasaan. In addition, once the interconnected grid is expanded to Coffman Cove and Naukati, those two communities will also directly benefit from Reynolds Creek. The Project will be constructed and owned by the Haida Power, Inc., a joint venture between the Haida Corporation and Alaska Power & Telephone.

### Funding & Cost

<b>Cost of Power:</b>	\$0.26/kWh
<b>Requested Grant Funds:</b>	\$10,500,000
<b>Matched Funds Provided:</b>	\$6,645,000
<b>Total Potential Grant Amount:</b>	\$17,145,000
<b>Existing RE Fund Grant Offer:</b>	1000000.00
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$10,500,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$2,000,000

## App #104 Reynolds Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** Haida Power, Inc.

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Scoring & Location



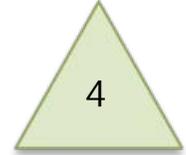
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Southeast

**Election District:** 5, Cordova-Southeast Islands



**Rank within Region**  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	10
2) Funding Resources (Max 25)	21
3) Project Feasibility from Stage 2 (Max 20)	18
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	8
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	4

### AEA Review Comments

AEA considered this project in the Denali Commission / AEA alternative energy RFP, and has offered \$1.1 million in state and Denali Commission grant funds to the project. In addition the Southeast Conference has received \$2 million from the state legislature for this project. This appears to be a viable hydro resource that will benefit the Prince of Wales network especially given recent funding allocated to an extension of the network to the northern portion of the island and load growth in the existing. This hydropower project will apparently be dispatched in conjunction with AP&T's Black Bear Lk and South Fork hydros. The applicants state that the proposed project will only be used after the existing projects are fully dispatched.

Recommend with the following grant conditions: 1) applicant joint venture will be required to petition RCA for a certificate of public convenience and necessity and economic rate regulation prior to release of construction funds, 2) establish a power purchase agreement with AP&T prior to release of construction grant funds. The recommended funding amount equals total amount appropriated, offered, and requested from the state and Denali Commission (\$13,600,000) minus amount already offered and appropriated (\$3,100,000).

## App #104 Reynolds Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** Haida Power, Inc.

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



For evaluation of the Reynolds Creek hydro project, an electricity demand forecast was used that shows significant growth for all communities on Prince of Wales (POW) Island. This forecast is the "reference case" developed for the 2007 AK-BC Intertie Feasibility Study, adjusted upwards for expected demand from a new cold storage facility in Craig and for significant oil to electric heat starting in 2012 rather than 2020. The potential load from the proposed North POW intertie to connect Coffman Cove and Naukati Bay is not considered for this evaluation. Applicant has spent \$2M on preconstruction costs. The \$15M capital cost used for this evaluation excludes these sunk costs. Cash flow estimate assumes construction begins in 2009. The B/C ratio is calculated at 3.29.

## App #104 Reynolds Creek Hydroelectric Construction

**Resource:** Hydro

**Proposed Project Phase:** Construction

**Proposer:** Haida Power, Inc.

**AEA Program Manager:** Doug Ott

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

Underway

## App #105 North Pole Heat Recovery Construction

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction

**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

The NPEP Waste Heat Recovery Project consists of installing 520' of underground supply and return piping, a glycol distribution piping system inside NPPP, installing 12 glycol unit heaters with VFDs, and VAC controls. GVEA will manage and administrate the project, perform the electrical/control installation, commissioning, and startup of the system. The mechanical portion of the work will be performed by a mechanical contractor. Electric power conservation/fuel savings will benefit all of GVEA's 33,000 members from Cantwell to Delta Junction.

### Funding & Cost

<b>Cost of Power:</b>	\$0.21 /kWh
<b>Requested Grant Funds:</b>	\$840,000
<b>Matched Funds Provided:</b>	\$210,000
<b>Total Potential Grant Amount:</b>	\$1,050,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$840,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$840,000

## App #105 North Pole Heat Recovery Construction

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction

**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



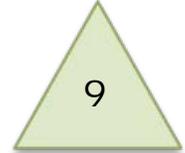
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 11, North Pole



Rank within Region  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	8
2) Funding Resources (Max 25)	19
3) Project Feasibility from Stage 2 (Max 20)	14
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	6
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

This project is ready to go. Mechanical work to be awarded via bid process. Recommend.

## App #105 North Pole Heat Recovery Construction

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction

**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant capital cost figures were reviewed and accepted, totaling \$1,050,000 for installation of the new waste heat recovery system. Construction is expected to be completed in 2009 and heat recovery operational in fall of 2009. Operation and maintenance expenditures were forecasted to be the same as current O&M. The B/C calculation relies on the capital cost vs. future fuel savings. The avoided fuel cost is based on per kWh AEA assumptions. Annually 1,476,000 kWh are avoided based on net electrical savings for a total of \$234,860 in avoided costs per year. This produces a B/C ratio of 3.44.

**App #105 North Pole Heat Recovery Construction**

**Resource:** Heat Recovery

**Proposed Project Phase:** Construction

**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #106 Nome/ Banner Peak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Banner Wind, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Project Description

The installation of this wind power project will provide a maximum output of 1,170 kW to the Nome Joint Utility electric grid in Nome, Alaska over a 20 year extendable project timeframe. The owners of the project are committed to sell the energy at a price below the avoided cost calculations, even without any grant funding. Grant funding will allow further reduction in the price of approximately \$0.03 per kWh for every one million in grant funds. Selling the energy at a rate below avoided costs will provide savings to the utility to help to lower the energy costs in the Nome area and provide some energy produced locally that is not dependent on imported oil. Furthermore, this project helps enable future village installations in the region by helping with a base of operations, spare parts location, local training facility and regional hub. Overall, this project provides a cash and tax credit based revenue stream, provides jobs and keeps money working in the community while increasing overall power generation reliability by producing it locally. Banner Wind LLC (jointly owned by Bering Straits Native Corporation and Sitnasuak Native Corporation) owns the wind farm while the construction and initial operations are managed by Western Community Energy LLC. The profits from the project which are ultimately distributed to the shareholders of BSNC and SNC will help provide income to an area where many have very limited incomes.

### Funding & Cost

<b>Cost of Power:</b>	\$0.32/kWh
<b>Requested Grant Funds:</b>	\$4,126,000
<b>Matched Funds Provided:</b>	\$1,031,000
<b>Total Potential Grant Amount:</b>	\$5,157,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$4,126,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:**

## App #106 Nome/ Banner Peak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Banner Wind, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Scoring & Location



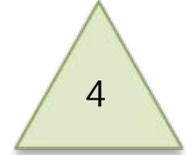
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Bering Straits

**Election District:** 39, Bering Straits



**Rank within Region**  
(out of 4 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	12
2) Funding Resources (Max 25)	20
3) Project Feasibility from Stage 2 (Max 20)	13
4) Project Readiness (Max 5)	2
5) Benefits (Max 10)	7
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	2

### AEA Review Comments

Independent power producer Banner Wind LLC has erected 18 Entegriy EW15 turbines providing installed capacity of 1,170 kW. Banner Wind LLC is owned by Bering Straits Native Corporation and Sitnasuak Native Corporation. Nome Joint Utilities System has requested funding for the 2-mile intertie between Banner Wind farm and the Nome power system, completed in December 2008, through a separate proposal (Nome Banner Peak transmission #47). We also note there is a separate proposal for larger turbines on Newton Peak #52, consistent with the USDOE/AEA-supported Nome Region Energy Assessment. The three proposals do not indicate coordination between wind projects, and AEA is concerned that this may result in unnecessarily high development, integration, and operation costs.

NJUS is preparing a feasibility assessment for the Newton Peak project that will address the quality of the wind energy resource, wind system design and integration into the existing power system, operation and maintenance, land ownership and other development issues. This study should provide valuable information for integrating the Newton Peak and Banner Peak wind farms into the NJUS system.

Recommend full funding for expenses incurred after August 20, 2008 with the following conditions: 1) before any funds are disbursed NJUS provide to AEA, and AEA approves, a feasibility assessment and conceptual design for the Newton Peak project that addresses integration of the Newton Peak and Banner Peak wind farms and other development issues, 2) applicant required to petition RCA for a certificate of public convenience and necessity and economic rate regulation prior to release of construction funds, 2) establish a power purchase agreement with NJUS prior to release of construction grant funds.

## App #106 Nome/ Banner Peak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Banner Wind, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Banner Wind, LLC, is requesting funding for the construction of a 1.17 MW wind farm (18 x 50 kW wind turbines) on Banner Peak in Nome, with the intent to sell the electricity to Nome's utility, Nome Joint Utility System (NJUS). The total project cost is \$5.157 million; Banner Wind, LLC, is requesting \$4.126 million in grant funds.

The B/C ratio based on applicant information is 1.88, and 1.63 based on AEA assumptions. Total project cost in present value terms are \$5.0 million (both from applicant data and AEA). The present value benefits are calculated as \$9.43 million from applicant data and \$8.17 million from AEA calculations. The difference is due to a lower projected amount of wind generation based on AEA assumptions.

The amount of displaced fossil fuel is 175,753 gal/year based on applicant data and 144,988 gal/year based on AEA assumptions.

## App #106 Nome/ Banner Peak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Banner Wind, LLC

**AEA Program Manager:** James Jensen

**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #107 Kwigillingok Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Puvurnaq Power Company

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

The Smart Grid consists of a network of advanced meters, which receive information about the availability of green, or excess wind energy and make this energy available to the community at reduced rates, and enable devices to capture this energy. The meters communicate wirelessly, provide a user interface for customers and account for energy sold at different rates. The meters can be programmed for prepayment. The Smart Grid enables 20 thermal storage devices that are located in the homes of 20 village elders and these stoves capture and store excess wind energy for later use. The Smart Metering and the stoves create a system that allows wind energy to be sold as heat for 1/2 the cost of diesel heating.

### Funding & Cost

<b>Cost of Power:</b>	\$0.50/kWh
<b>Requested Grant Funds:</b>	\$1,600,000
<b>Matched Funds Provided:</b>	\$1,600,000
<b>Total Potential Grant Amount:</b>	\$3,200,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$1,600,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$1,600,000

## App #107 Kwigillingok Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Puvurnaq Power Company

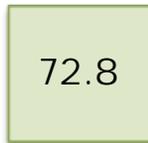
**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



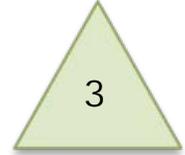
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Lower Yukon-Kuskokwim

**Election District:** 38, Bethel



**Rank within Region**  
(out of 10)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	19
2) Funding Resources (Max 25)	22
3) Project Feasibility from Stage 2 (Max 20)	15
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	7
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	4

### AEA Review Comments

This application is for installation of 475 kW of wind turbines in Kwigillingok, upgrades to the existing diesel system, recovered heat at the washeteria, and smart meters and thermal stoves in 20 residences to displace fuel oil with excess wind energy. The project would be located on village corporation land, and the applicant states that, based on discussions with USFWS, FAA, and Corps of Engineers, no further authorizations are needed.

The introduction of a high penetration system into a moderate-sized community that includes remotely controlled dumploads at the washeteria and 20 residences as well as a low load diesel component brings along a significant level of complexity.

Recommend full funding with the following conditions that must be met before funds are disbursed: 1) AEA approval of final design, 2) the grantee establish a five-year operation and maintenance contract with a contractor acceptable to AEA that has expertise in this area.

Given the substantial demonstration value of this project AEA will require close monitoring of system performance.

## App #107 Kwigillingok Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Puvurnaq Power Company

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Kwig Power, Kwigillingok's utility, is requesting funding for the design and construction of a 450 kW wind farm (5x 90 kW wind turbines) including smart grid and residential electric heating. The total project cost is \$3,200,000; Kwig Power is requesting \$1,600,000 in grant funds.

The B/C ratio based on applicant information is 1.35, and 1.63 based on AEA assumptions. Total project cost in present value terms are \$2.72 million (both from applicant data and AEA). The present value benefits are calculated as \$3.67 million from applicant data and \$4.42 million from AEA calculations. The difference is due to a higher projected amount of wind generation based on AEA assumptions.

The amount of displaced fossil fuel is 62,762 gal/year (51,282 gal/year electricity and 11,480 gal/year heat) based on applicant data and 70,058 gal/year (57,878 gal/year electricity and 12,179 gal/year heat) based on AEA assumptions.

## App #107 Kwigillingok Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Puvurnaq Power Company

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #108 McKinley Village Solar Thermal Construction

**Resource:** Solar

**Proposed Project Phase:** Construction

**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Project Description

Golden Valley Electric Association proposes the construction of a solar water heating system to be used by the Denali Education Center (DEC). This proposed solar water heating system would be used to displace fossil fuel energy (specifically, electricity) that is currently used to heat water and space for these end-users. DEC is a non-profit research, education and communication organization with cooperative interaction to Denali National Park and all its summer-time visitors. The DEC's campus serves people who visit and stay there during the summer tourist season. There are 13 cabins on the campus, a campus center and other outbuildings. Currently, the peak number who lodge and work at the Center during the summer is about 75 people, with an anticipated near-future growth up to 100 people. GVEA also plans to work ABS Alaskan and Jim Norman, principal and owner.

### Funding & Cost

<b>Cost of Power:</b>	\$0.21 /kWh
<b>Requested Grant Funds:</b>	\$190,000
<b>Matched Funds Provided:</b>	\$3,600
<b>Total Potential Grant Amount:</b>	\$193,600
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$190,000

### AEA Recommendation

- × Full Funding
- Partial Funding
- × Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:**

## App #108 McKinley Village Solar Thermal Construction

**Resource:** Solar

**Proposed Project Phase:** Construction

**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Scoring & Location



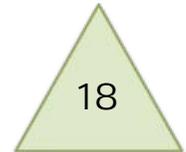
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 8, Denali-University



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	8
2) Funding Resources (Max 25)	10
3) Project Feasibility from Stage 2 (Max 20)	10
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	3
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	4

### AEA Review Comments

Golden Valley Electric Association proposes to develop a solar thermal system for the Denali Education Center owned by Denali Education Foundation. The project would save an estimated 32-36 MWh/yr and cost \$190,000. At an educational center the project would demonstrate technology potentially applicable to other areas of Alaska.

In order to minimize risk of scalding and provide adequate energy storage this project will have to include significant O&M and controls costs.

Currently GVEA is working on a feasibility analysis, not yet complete. Recommend full funding with requirement that AEA approve feasibility analysis and conceptual design in progress.

## App #108 McKinley Village Solar Thermal Construction

**Resource:** Solar

**Proposed Project Phase:** Construction

**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



While this project is worthwhile as a pilot or demonstration project, it's location within the Railbelt electrical grid where energy costs are low; the energy cost savings over the life of the project do not outweigh the construction costs. If this project were constructed in a rural area with high cost diesel generation, it could create positive net benefits from foregone costs of fuel and high O&M costs. B/C ratio is 0.44.

## App #108 McKinley Village Solar Thermal Construction

**Resource:** Solar

**Proposed Project Phase:** Construction

**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** David Lockard

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #109 Eva Creek Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

## Project Description

GVEA has been monitoring the wind resource at the Eva Creek Site since 2003 or five years and has found a resource with approximately a 33% to 36% capacity factor. The Eva Creek Wind Project's proximity to the Northern Intertie is key to its value, making the interconnection viable. The site is located on the east side of the Nenana River near Ferry, Alaska, in the GVEA service territory in the Interior. The area could support up to 150 MW of wind generation but GVEA would like to start by installing a 24 MW wind project.

## Funding & Cost

<b>Cost of Power:</b>	\$0.21 /kWh
<b>Requested Grant Funds:</b>	\$79,340,322
<b>Matched Funds Provided:</b>	\$14,001,233
<b>Total Potential Grant Amount:</b>	\$93,341,555
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$2,526,200

**AEA Funding Recommendation:** \$2,000,000

## AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #109 Eva Creek Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



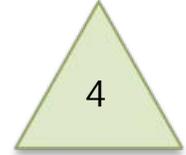
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 8, Denali-University



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	8
2) Funding Resources (Max 25)	21
3) Project Feasibility from Stage 2 (Max 20)	17
4) Project Readiness (Max 5)	4
5) Benefits (Max 10)	8
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

Applicant requests feasibility assessment, final design and permitting, and construction funding for a 24 MW wind energy project near Healy. Feasibility work would begin in 2009 and be completed by March 2010. Final design and permitting would be complete by October 2011. Construction would complete by the end of 2012.

GVEA has performed substantial onsite wind assessment since 2003 and confidently estimates a capacity factor of 33-36%, indicating a good to excellent resource.

Since the project is not fully defined at this point, the proposal does not indicate who owns the land that the project would occupy, but lists a number of public and private landowners in the project vicinity. Permit requirements include USACE wetland and river crossing, FAA, Alaska Railroad, and State DNR easements and historical/archaeological approvals. GVEA has studied avian impacts in the area as part of the Northern Intertie. The project area has been identified as a major sandhill crane migration route and will require further study for potential mitigation activities.

The proposal is for a major Railbelt energy project that would require substantial study for proper integration and operation. Development should be coordinated with the Railbelt Integrated Resource Plan.

Recommend funding for Task 2--Detailed Feasibility, minus the initial wind turbine payment. Recommended amount is \$6,770,260 - \$3,770,260 (initial wind turbine payment) - \$28,000 (grant from Denali Commission/AEA alternative energy RFP for wind interconnection study) = \$2,972,000. Since GVEA has committed to a 15% match in Task 2, we recommend 85% of \$2,972,000, or \$2,526,200.

## App #109 Eva Creek Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Golden Valley Electric Cooperative (GVEC) is requesting funding for the design and construction of a 24MW wind farm (16x 1.5MW wind turbines). The total project cost is \$93,341,555, GVEC is requesting \$79,340,322 in grant funds.

The B/C ratio based on applicant information is 1.87, and 2.68 based on AEA assumptions. Total project cost in present value terms are \$83.2 million (both from applicant data and AEA). The present value benefits are calculated as \$156 million from applicant data and \$223 million from AEA calculations. The difference is due to a higher wind generation projection based on AEA assumptions.

## App #109 Eva Creek Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

Possible competitive interest which may make for more challenging permitting.

## App #110 Kongiganak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Puvurnaq Power Company

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

The Smart Grid consists of a network of advanced meters, which receive information about the availability of green, or excess wind energy and make this energy available to the community at reduced rates, and enable devices to capture this energy. The meters communicate wirelessly, provide a user interface for customers, and account for energy sold at different rates. The devices that are located in the homes of 20 village elders, and these stoves capture and store excess wind energy for later use. The Smart Metering and the stoves create a system that allows wind energy to be sold as heat for 1/2 the cost of diesel heating.

### Funding & Cost

<b>Cost of Power:</b>	\$0.55 /kWh
<b>Requested Grant Funds:</b>	\$1,700,000
<b>Matched Funds Provided:</b>	\$1,500,000
<b>Total Potential Grant Amount:</b>	\$3,200,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$1,700,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$1,700,000

## App #110 Kongiganak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Puvurnaq Power Company

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



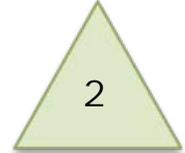
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Lower Yukon-Kuskokwim

**Election District:** 38, Bethel



**Rank within Region**  
(out of 10)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	21
2) Funding Resources (Max 25)	22
3) Project Feasibility from Stage 2 (Max 20)	15
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	8
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	4

### AEA Review Comments

This application is for installation of 475 kW of wind turbines in Kwigillingok, upgrades to the existing diesel system, recovered heat at the washeteria, and smart meters and thermal stoves in 20 residences to displace fuel oil with excess wind energy. The project would be located on village corporation land, and the applicant states that, based on discussions with USFWS, FAA, and Corps of Engineers, no further authorizations are needed.

The introduction of a high penetration system into a moderate-sized community that includes remotely controlled dumploads at the washeteria and 20 residences as well as a low load diesel component brings along a significant level of complexity.

Recommend full funding with the following conditions that must be met before funds are disbursed: 1) AEA approval of final design, 2) the grantee establish a five-year operation and maintenance contract with a contractor acceptable to AEA that has expertise in this area.

Given the substantial demonstration value of this project AEA will require close monitoring of system performance.

## App #110 Kongiganak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Puvurnaq Power Company

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Puvurnaq Power, Kongiganak's utility, is requesting funding for the design and construction of a 450 kW wind farm (5x 90 kW wind turbines) including smart grid and residential electric heating. The total project cost is \$3,200,000; Puvurnaq Power is requesting \$1,700,000 in grant funds.

The B/C ratio based on applicant information is 1.35, and 1.63 based on AEA assumptions. Total project cost in present value terms are \$2.72 million (both from applicant data and AEA). The present value benefits are calculated as \$3.67 million from applicant data and \$4.42 million from AEA calculations. The difference is due to a higher projected amount of wind generation based on AEA assumptions.

The amount of displaced fossil fuel is 49,230 gal/year (37,750 gal/year electricity and 11,480 gal/year heat) based on AEA assumptions.

## App #110 Kongiganak Wind Farm Construction

**Resource:** Wind

**Proposed Project Phase:** Construction

**Proposer:** Puvurnaq Power Company

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #111 Juneau Ground Source Heat Pump Construction (Aquatic Center)

**Resource:** Geothermal

**Proposed Project Phase:** Construction Design

**Proposer:** City & Borough of Juneau

**AEA Program Manager:** David Lockard

**Applicant Type:** Local Government

### Project Description

The proposed hybrid ground source heat pump system at the new Dimond Park Aquatic Center is to be located in Juneau's Mendenhall Valley, adjacent the new Thunder Mountain High School and Riverbend Elementary on the Dimond Park site. The facility will primarily serve Juneau residents, but will also serve visitors from nearby southeast Alaska communities and other visitors to Juneau. The City & Borough of Juneau Engineering and Parks and Recreation Departments are directly involved with the design and construction of the facility, as is the Juneau School District. A professional design team led by local architectural firm Jensen Yorba Lott, Inc. is responsible for the project design and construction administration. The City & Borough of Juneau Engineering Department is responsible for design and construction management and progress reports to grant agencies as required. The City & Borough of Juneau Finance Department is responsible for project funding and financial reporting to grant agencies as required.

### Funding & Cost

<b>Cost of Power:</b>	\$0.11 /kWh
<b>Requested Grant Funds:</b>	\$1,450,000
<b>Matched Funds Provided:</b>	\$500,000
<b>Total Potential Grant Amount:</b>	\$1,950,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$1,450,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$1,450,000

## App #111 Juneau Ground Source Heat Pump Construction (Aquatic Center)

**Resource:** Geothermal

**Proposed Project Phase:** Construction Design

**Proposer:** City & Borough of Juneau

**AEA Program Manager:** David Lockard

**Applicant Type:** Local Government

### Scoring & Location



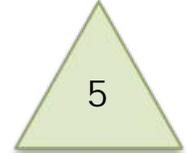
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Southeast

**Election District:** 3, Juneau-Downtown-Douglas



Rank within Region  
(out of 20)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	4
2) Funding Resources (Max 25)	21
3) Project Feasibility from Stage 2 (Max 20)	18
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	9
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	5

### AEA Review Comments

Applicant proposes final design and construction of a ground source heat pump system at the Juneau Aquatic center. Project appears well-conceived and organized with relatively low risk. Excellent technical analysis and detailed cost info.

Recommend for full funding.

## App #111 Juneau Ground Source Heat Pump Construction (Aquatic Center)

**Resource:** Geothermal

**Proposed Project Phase:** Construction Design

**Proposer:** City & Borough of Juneau

**AEA Program Manager:** David Lockard

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant proposes installing a ground source heat pump hybrid heating system with electrical heating as a back up for a new pool facility in place of a purely electrical heating system. As neither system is currently built, we used the additional costs for building the hybrid system over the purely electrical system as estimated by the applicant for capital cost of the system. The applicant provided life cycle cost analysis for four alternative systems with the application, however, they used different assumptions than AEA uses. We used the applicant's estimates of O&M costs and energy costs for the electrical and hybrid systems from their cost worksheet for our analysis. It is assumed that electrical generation offset would be from diesel generation. Based on these assumptions, B/C ratio is 5.12.

**App #111 Juneau Ground Source Heat Pump Construction (Aquatic Center)**

**Resource:** Geothermal

**Proposed Project Phase:** Construction  
Design

**Proposer:** City & Borough of Juneau

**AEA Program Manager:** David Lockard

**Applicant Type:** Local Government

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #112 Delta Junction Wood Chip Heating Feasibility Study

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Delta/Greely School District

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Project Description

The Delta/Greely School District proposes a Wood Chip Boiler Heating System to heat 77,000 sq. ft. of educational space in the sub-arctic. The building would be located 50 feet away from the Delta High School new mechanical room. This Wood Chip Boiler Heating System constructs and installs the following: Cement building to house wood chip boiler, chip storage room, 4 chip storage trailers, and a chip feeding and chip drying process. The direct impact of this Wood Chip Boiler Heating System will be the Delta High School complex staff and students as well as the community groups that use this facility on a weekly basis. The following communities are served by this facility: Delta Junction, Fort Greely Garrison and its contractors, Gerstle River, and the greater Deltana area. The businesses, non-profit agencies, Farm Forum, Relay for Life, Fish and Game, Department of Motor Vehicles, Delta Chamber of Commerce, Boy Scouts and Girl Scouts to name a few groups. All use the Delta High School complex during the year. Finally, the following groups will be involved in this project: Delta/Greely School District (DGSD), the Delta/Greely School Board, DGSD Facilities Committee, Alaska Department of Natural Resources Forestry, CTA, CE2 Engineers, T.R. Miles Technical Consultants, Delta Logging and Milling Associates, and USKH (an architecture, engineering, land surveying and planning company).

### Funding & Cost

<b>Cost of Power:</b>	\$0.21 /kWh
<b>Requested Grant Funds:</b>	\$2,868,000
<b>Matched Funds Provided:</b>	\$0
<b>Total Potential Grant Amount:</b>	\$2,868,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$2,868,000

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$2,704,684

## App #112 Delta Junction Wood Chip Heating Feasibility Study

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Delta/Greely School District

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Scoring & Location



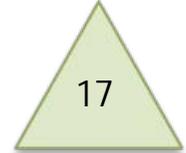
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Railbelt

**Election District:** 12, Richardson-Glenn  
Highways



**Rank within Region**  
(out of 24)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	8
2) Funding Resources (Max 25)	0
3) Project Feasibility from Stage 2 (Max 20)	16
4) Project Readiness (Max 5)	5
5) Benefits (Max 10)	6
6) Local Support (Max 5)	5
7) Sustainability (Max 5)	5

### AEA Review Comments

This project is linked to a previously funded renovation and energy upgrade of the Delta HS that includes the heating system and the external thermal envelop. Together the projects will result in the development of a fully functional, energy efficient facility that uses local sources of renewable energy. There is substantial accessible biomass wood supply in the upper Tanana from sawmills, two pellet mills in development, and state-owned forest land. Tok Umbrella Corp received a grant for a whole tree chipper which can potentially be used to supply fuel for this project. Recommend.

## App #112 Delta Junction Wood Chip Heating Feasibility Study

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Delta/Greely School District

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Applicant supplied project costs on the basis of previous technical reports. They were reviewed and accepted by AEA at approximately \$2,868,000. Ample factors included for remote construction, escalation, and contingency. The analysis is likely conservative in this respect. Delivered chip costs of \$80 per ton were verified by the supplier, and it appears the additional O&M costs of \$3200 per year in labor and 55,000 kWh of electricity were adequate. (It is not known what applicant means by \$195,000 per year on the cost application and the reference on p 16 of the application. Spreadsheet back-up clearly shows otherwise).

The analysis follows applicant's proposal with 2009 being the final design and construction through 2010. The first two years have slightly higher operating costs, and by the third year net fuel savings are around \$170,000. The B/C ratio for a 20 year project life is 0.77.

**App #112 Delta Junction Wood Chip Heating Feasibility Study**

**Resource:** Biomass

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** Delta/Greely School District

**AEA Program Manager:** Ron Brown

**Applicant Type:** Local Government

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

DNR Division of Forestry is involved with this project. The Alaska Wood Energy Task Force completed the feasibility study for this project and recommended it for construction. Large heat demand makes this a viable project.

## App #113 Napaskiak Wind Farm Feasibility Study

**Resource:** Wind

**Proposed Project Phase:** Feasibility

**Proposer:** Napaskiak Utility (electric) - City of Napaskiak

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Project Description

Wind Energy! Wind turbine system at vicinity community location Napaskiak, AK about 7 miles below Bethel, Alaska which service over 100 customers to commercial to residence. Wasteheat from generators to heat nearby facility-church, garage.

### Funding & Cost

<b>Cost of Power:</b>	\$0.60/kWh
<b>Requested Grant Funds:</b>	
<b>Matched Funds Provided:</b>	
<b>Total Potential Grant Amount:</b>	
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation:</b> (Not Constrained by Available Funding)	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- ✗ Not Recommended
- Did Not Pass Stage 1
- Pending

## App #113 Napaskiak Wind Farm Feasibility Study

**Resource:** Wind

**Proposed Project Phase:** Feasibility

**Proposer:** Napaskiak Utility (electric) - City of Napaskiak

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### Scoring & Location



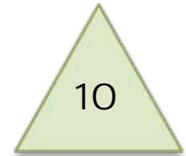
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Lower Yukon-Kuskokwim

**Election District:** 38, Bethel



**Rank within Region**  
(out of 10)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	23
2) Funding Resources (Max 25)	0
3) Project Feasibility from Stage 2 (Max 20)	8
4) Project Readiness (Max 5)	1
5) Benefits (Max 10)	6
6) Local Support (Max 5)	0
7) Sustainability (Max 5)	2

### AEA Review Comments

The City of Napaskiak requested that AEA develop and manage a wind energy project. The application did not include cost estimate and budget, a schedule, or a project description sufficient for evaluation.

AEA has proposed to the Denali Commission a conceptual design to be prepared as part of the Rural Power System Upgrade program. A meteorological tower should be installed as soon as possible to provide data on which to base assessment of wind energy feasibility as part of the power system design.

Recommend no funding for this project through the RE fund because the project application does not provide sufficient information to allow AEA to evaluate the application.

However, we recognize that the applicant contacted AEA staff repeatedly requesting technical assistance in assessing wind feasibility and support for filling out the RE Fund RFA application. AEA did not have available staff time to assist the City. AEA will assess staffing priorities in March 2009 for providing met tower and wind energy planning assistance for Napaskiak and other communities in similar situations.

## App #113 Napaskiak Wind Farm Feasibility Study

**Resource:** Wind

**Proposed Project Phase:** Feasibility

**Proposer:** Napaskiak Utility (electric) - City of Napaskiak

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



Napaskiak Electric Utility is requesting funding for the feasibility study of a wind farm. Since the applicant did not provide generation projections or project cost estimates, all following data are based on AEA assumptions. The total project cost is \$2,500,000. The B/C ratio is 1.36. Total project cost in present value terms are \$2.36 million. The present value benefits are calculated as \$3.2 million. The amount of displaced fossil fuel is 38,699 gal/year.

## App #113 Napaskiak Wind Farm Feasibility Study

**Resource:** Wind

**Proposed Project Phase:** Feasibility

**Proposer:** Napaskiak Utility (electric) - City of  
Napaskiak

**AEA Program Manager:** James Jensen

**Applicant Type:** Utility

### DNR/DGGS Geohazards Comments

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

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments

## App #121 Ambler Solar and Wind Power Construction

**Resource:** Other

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** City of Ambler

**AEA Program Manager:** Jensen

**Applicant Type:** Local Government

### Project Description

Project consists of a combination of Solar and Wind power to offset the high cost of electricity to run City Hall, the washeteria and the Water Plant. The equipment providing this power would be adjacent and/or attached to the City Hall. The project manager and other needed project employees would be hired from the community. This project would serve the community of Ambler by way of a more efficiently run City Government. To lower the cost of running our City government and Water-sewer-plant is the most important work we have in front of us. Without this to offset the cost, the plant may have to be closed down. Current cost for water and sewer in Ambler is \$ 120.00/household and actual cost to balance the budget would be about 400.00/household.

### Funding & Cost

<b>Cost of Power:</b>	\$0.83/kWh
<b>Requested Grant Funds:</b>	\$150,000
<b>Matched Funds Provided:</b>	
<b>Total Potential Grant Amount:</b>	\$150,000
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$0

**AEA Funding Recommendation:** \$0

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

## App #121 Ambler Solar and Wind Power Construction

**Resource:** Other

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** City of Ambler

**AEA Program Manager:** Jensen

**Applicant Type:** Local Government

### Scoring & Location



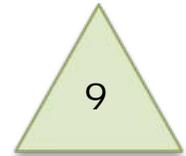
**Overall Rank**  
(out of 99)



**Stage 3 Total Score**  
(out of 100)

**Energy Region:** Northwest Arctic

**Election District:** 40, Arctic



**Rank within Region**  
(out of 9 )

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	30
2) Funding Resources (Max 25)	0
3) Project Feasibility from Stage 2 (Max 20)	8
4) Project Readiness (Max 5)	3
5) Benefits (Max 10)	2
6) Local Support (Max 5)	3
7) Sustainability (Max 5)	3

### AEA Review Comments

This application proposes a residential-sized system (4.9 kW photovoltaic and 1.8 kW wind) to serve the Ambler City Hall, washeteria, and the water plant. AEA requested, but did not receive, information to support the claimed generation estimate of 25,000 kWh/yr (average 2.9 kW output).

Therefore AEA modeled system performance based on AEA's high resolution wind map (wind class 1--"Poor") and a federal solar database via National Renewable Energy Lab's HOMER model. Results indicate a yearly output of 900 kWh for photovoltaic and 1700 kWh from wind based on HOMER modeling--a small fraction of Ambler's 1.3 million kWh/yr electrical load.

Given minimum impact on the community energy system and an installed cost that is high relative to the savings and displaced diesel, AEA does not recommend this project for funding.

## App #121 Ambler Solar and Wind Power Construction

**Resource:** Other

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** City of Ambler

**AEA Program Manager:** Jensen

**Applicant Type:** Local Government

## Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



City of Ambler provided the following estimates: Construction cost: \$145,551, O&M: \$800/year, generation: 25,000 kWh of displaced diesel generation (no back-up to estimates, represents 42 percent capacity factor), and displaced fuel: 1,834 gallons based on PCE stats for AVEC – Ambler. Based on the above data with no load growth, AEA fuel cost estimates, and 3 percent (real) discount rate, the B/C ratio for the Applicant was calculated as 0.88 over a 20-year period.

The AEA-based B/C ratio was based on the following: Construction cost: \$5,000/kW x 1.5 kW (wind) + \$100,000 (solar) = 107,500. Solar amount represents approximate amount included by Applicant, displaced diesel O&M: \$0.02/kWh = \$48, turbine O&M: \$0.022/kWh = \$53. Assumes same amount (\$/kWh) for wind and solar, displaced fuel based on displaced diesel generation and PCE generating statistics, and generation (AEA provided): 2,421 kWh/year. The low energy production assumed by AEA. Based on the revised data assumptions, a B/C ratio of 0.13 was calculated for a 20-year analysis period.

**App #121 Ambler Solar and Wind Power Construction**

**Resource:** Other

**Proposed Project Phase:** Construction  
Design  
Feasibility

**Proposer:** City of Ambler

**AEA Program Manager:** Jensen

**Applicant Type:** Local Government

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**

## App #122 Bethel Wind Power Project Times 4

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design

**Proposer:** City of Bethel

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Project Description

Bethel Wind Power Project Times 4 calls for the purchase and installation of four 100kW wind turbines, tubular towers, foundations, and related appurtenances on land owned by the city of Bethel. The City of Bethel will own, operate, and maintain all four wind turbines and act as an independent power producer by selling 100% of the electricity generated to the privately owned utility in Bethel. The regulated electric utility is Bethel Utilities Corporation.

### Funding & Cost

<b>Cost of Power:</b>	\$0.60/kWh
<b>Requested Grant Funds:</b>	\$2,598,320
<b>Matched Funds Provided:</b>	\$599,666
<b>Total Potential Grant Amount:</b>	\$3,197,986
<b>Existing RE Fund Grant Offer:</b>	
<b>AEA Funding Recommendation: (Not Constrained by Available Funding)</b>	\$2,598,320

### AEA Recommendation

- ✗ Full Funding
- Partial Funding
- ✗ Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Pending

**AEA Funding Recommendation:** \$2,598,320

## App #122 Bethel Wind Power Project Times 4

**Resource:** Wind

**Proposed Project Phase:** Construction Design

**Proposer:** City of Bethel

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Scoring & Location



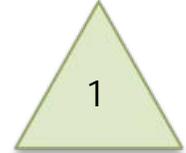
Overall Rank  
(out of 99)



Stage 3 Total Score  
(out of 100)

**Energy Region:** Lower Yukon-Kuskokwim

**Election District:** 38, Bethel



Rank within Region  
(out of 10)

### Stage 3 Scoring Summary

<u>Criterion (Weight)</u>	<u>Score</u>
1) Cost of Energy (Max 30)	22
2) Funding Resources (Max 25)	19
3) Project Feasibility from Stage 2 (Max 20)	16
4) Project Readiness (Max 5)	3
5) Benefits (Max 10)	8
6) Local Support (Max 5)	2
7) Sustainability (Max 5)	4

### AEA Review Comments

There are two entities planning wind energy projects in Bethel: 1) the City of Bethel (# 122) is proposing a 400 kW construction project in addition to a 100 kW project that was approved by the AEA and the Denali Commission in the alternative energy RFP, and 2) Village Wind Power is proposing construction of up to 2 MW (# 67). Additionally AVCP Regional Housing Authority is proposing study of hydro at the Kiseralik and Chikuminuk Rivers in Round 2 of the RE Fund. Therefore, there is a need for a regional integrated resource energy plan in the Bethel area to coordinate when and where energy projects should be developed. This proposal should be considered in the context of an integrated plan to assure proper sizing, timing, and integration of multiple energy projects.

Recommend full funding but require interconnection study and power purchase agreement to be finalized prior to releasing funds.

## App #122 Bethel Wind Power Project Times 4

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design

**Proposer:** City of Bethel

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

### Economic Analysis

Benefit/Cost Ratio  
(Applicant)



Benefit/Cost Ratio  
(AEA)



The City of Bethel is requesting funding for the design and construction of a 400 kW wind farm (4 x 100 kW wind turbines), with the intent to sell the electricity to Bethel's utility. The total project cost is \$3,197,986; the City of Bethel is requesting \$2,598,320 in grant funds.

The B/C ratio based on applicant information is 1.78, and 1.83 based on AEA assumptions. Total project cost in present value terms are \$3.0 million (both from applicant data and AEA). The present value benefits are calculated as \$5.36 million from applicant data and \$5.53 million from AEA calculations. The difference is due to a lower projected cost for O&M based on AEA assumptions.

The amount of displaced fossil fuel is 78,672 gal/year based on applicant data and 56,962 gal/year based on AEA assumptions.

**App #122 Bethel Wind Power Project Times 4**

**Resource:** Wind

**Proposed Project Phase:** Construction  
Design

**Proposer:** City of Bethel

**AEA Program Manager:** James Jensen

**Applicant Type:** Local Government

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**