App #202  Ruth Lake Hydro Phase II _PMPL

Resource: Hydro  Proposed Project Phase: Feasibility

Proposer: City of Petersburg, Alaska d/b/a Petersburg Municipal Power & Light

AEA Program Manager: Doug Ott  Applicant Type: Utility
Local Government

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 would include construction of a lake tap, arch dam, unlined tunnel, power penstock, power plant, tailrace, and transmission line segments.

Funding & Cost

| Cost of Power: | $0.12 /kWh |
| Requested Grant Funds: | $2,000,000 |
| Matched Funds Provided: | $520,000 |
| Total Potential Grant Amount: | $2,520,000 |
| Existing RE Fund Grant Offer: |

AEA Funding Recommendation:

AEA Funding Recommendation:  
(Not Constrained by Available Funding)

AEA Recommendation:

Full Funding  
Partial Funding  
Special Provision  
× Not Recommended  
Did Not Pass Stage 1  
Withdrawn
App #202  Ruth Lake Hydro Phase II _PMPL

Resource: Hydro  Proposed Project Phase: Feasibility

Proposer: City of Petersburg, Alaska d/b/a Petersburg Municipal Power & Light

AEA Program Manager: Doug Ott  Applicant Type: Utility
Local Government

Scoring & Location

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Energy Region: Southeast

Election District: 2, Sitka-Wrangell-Petersburg

Rank within Region (out of   )

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<tr>
<td>1) Cost of Energy (Max 30)</td>
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<td>7) Sustainability (Max 5)</td>
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</table>

AEA Review Comments

FERC notice of competing preliminary applications is in process. Preliminary applications have been filed by the Petersburg Municipal Power and Light, C/B Wrangell, Cascade Creek LLC, and City of Angoon.

Funding is not recommended at this time until the earlier funded reconnaissance study has been completed and found acceptable and a FERC ruling on the preliminary application found favorable to City of Petersburg.
App #202  Ruth Lake Hydro Phase II _PMPL

**Resource:** Hydro

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

**AEA Program Manager:** Doug Ott

**Proposed Project Phase:** Feasibility

**Applicant Type:** Utility

Local Government

**Benefit/Cost Ratio**

- (Applicant)

- (AEA)

### Economic Analysis
App #202  Ruth Lake Hydro Phase II _PMPL

Resource: Hydro

Proposer: City of Petersburg, Alaska d/b/a
Petersburg Municipal Power & Light

AEA Program Manager: Doug Ott

Proposed Project Phase: Feasibility

Applicant Type: Utility
Local Government

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #204  Grant Lake Phase III & IV_Nushagak

**Resource:** Hydro  
**Proposer:** Nushagak Electric & Telephone Company, Inc

**AEA Program Manager:** Doug Ott  
**Applicant Type:** Utility

**Proposed Project Phase:** Construction

---

**Project Description**

The Grant Lake site facility would be constructed with a dam at the upper falls and diversion tunnel to maximize the power potential at approximately 3.12 MW (397 feet-net head). However, to minimize the impact on salmon resources in Grant River below the dam site the construction as proposed would consist of a canal from behind the dam to an intake structure located in an adjacent dry channel.

The Nushagak Area Hydropower Project will initially serve the communities of Aleknagik, Dillingham, and Kanakanak in the Nushagak and Wood River areas. This third phase with inter-tie (phase four) is estimated to cost $38 million together and replace 700,000 gallons of diesel fuel annually, for a yearly savings of $2,947,000 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**

- **Cost of Power:** $0.23/kWh
- **Requested Grant Funds:** $20,000,000
- **Matched Funds Provided:** $18,000,000
- **Total Potential Grant Amount:** $38,000,000

**AEA Recommendation**

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

---

**Existing RE Fund Grant Offer:** 5

**AEA Funding Recommendation:** (Not Constrained by Available Funding)
App #204  Grant Lake Phase III & IV_Nushagak

Resource: Hydro  Proposed Project Phase: Construction

Proposer: Nushagak Electric & Telephone Company, Inc

AEA Program Manager: Doug Ott  Applicant Type: Utility

Scoring & Location

Energy Region: Bristol Bay

Election District: 37, Bristol Bay-Aleutians

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

Criterion (Weight)  Score
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

Nushagak Electric proposes final design and construction for Grant Lake hydro project. Feasibility analysis of Lake Elva hydro project was offered in RE Fund round 1 (project #6). Applicant does not provide adequate justification to proceed to final design and construction, at this time. Recommend no funding.
App #204  Grant Lake Phase III & IV_Nushagak

Resource: Hydro

Proposer: Nushagak Electric & Telephone Company, Inc

AEA Program Manager: Doug Ott

Applicant Type: Utility

Proposed Project Phase: Construction

Economic Analysis

Benefit/Cost Ratio (Applicant) 0.64

Benefit/Cost Ratio (AEA) 0.6
App #204  Grant Lake Phase III & IV_Nushagak

Resource: Hydro  Proposed Project Phase: Construction

Proposer: Nushagak Electric & Telephone Company, 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

As stated in Round 1, this project will have significant public scrutiny during the permitting required by Division of Parks. The project is in Wood-Tikchik State Park.
App #205  Banner Wind Construction_Nome

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. Providing for renewable energy projects in villages should help reduce the dependency on oil in those locations where oil must be flown or barged in and ultimately help reduce energy rates in those locations as well.

Funding & Cost

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<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
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<td>Matched Funds Provided:</td>
<td>$1,031,000</td>
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<td>Total Potential Grant Amount:</td>
<td>$5,157,000</td>
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</table>

AEA Recommendation

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

AEA Funding Recommendation: $4,126,000

AEA Funding Recommendation:
App #205  Banner Wind Construction_Nome

Resource: Wind  Proposed Project Phase: Construction
Proposer: Banner Wind, LLC

AEA Program Manager: James Jensen  Applicant Type: IPP

Scoring & Location

Energy Region: Bering Straits
Election District: 39, Bering Straits

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of 5)

Stage 3 Scoring Summary

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

AEA Review Comments

Same as Stage 2 comments from Round 1 application #106.

Stage 3 review update: Following discussions on regional funding allocation, no funding is recommended consistent with policy that not more than one project in a community that uses the same renewable resource be funded for construction in Rounds 1 and 2. In this case round 1 project #52 Nome Newton Peak Wind farm has a higher overall score and is recommended for funding.
App #205  Banner Wind Construction_Nome

Resource: Wind  Proposed Project Phase: Construction
Proposer: Banner Wind, LLC

AEA Program Manager: James Jensen  Applicant Type: IPP

Economic Analysis

Benefit/Cost Ratio (Applicant)  1.88  Benefit/Cost Ratio (AEA)  1.63
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 #206 Whitman Lake Hydro Construction_KPU

Resource: Hydro
Proposer: Ketchikan Public Utilities

AEA Program Manager: Doug Ott
Applicant Type: Utility
Local Government

Proposed Project Phase: Construction

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 Ketchikan Gateway Borough area including Saxman Village, while also enhancing the conversion of oil heat to electric heat and displacing expensive and non-renewable diesel generation. The Project will be interconnected to KPU’s existing distribution system and the grant project will involve KPU.

Funding & Cost

Cost of Power: $0.10 /kWh
Requested Grant Funds: $12,020,000
Matched Funds Provided: $3,000,000
Total Potential Grant Amount: $15,020,000

Existing RE Fund Grant Offer: $12,020,000

AEA Funding Recommendation (Not Constrained by Available Funding): $12,020,000

AEA Recommendation
Full Funding
✗ Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn

AEA Funding Recommendation: $2,000,000
App #206  Whitman Lake Hydro Construction_KPU

Resource: Hydro
Proposer: Ketchikan Public Utilities

Proposed Project Phase: Construction

AEA Program Manager: Doug Ott
Applicant Type: Utility
Local Government

Scoring & Location

Energy Region: Southeast
Election District: 1, Ketchikan

Overall Rank (out of 60) 35
Stage 3 Total Score (out of 100) 58.3

Stage 3 Scoring Summary

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<tr>
<td>7) Sustainability (Max 5)</td>
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</tbody>
</table>

Rank within Region (out of 12 ) 6

AEA Review Comments

This project has been licensed by FERC and is ready to construct. FERC licensing process has demonstrated need for project.

Recommend full funding of $12,020,000.

Stage 3 review update: Following discussions on regional funding allocation, project funding is capped at $2,000,000 per affected community for Railbelt and lower energy cost Southeast communities and $4,000,000 for other communities.
App #206  Whitman Lake Hydro Construction_KPU

**Resource:** Hydro

**Proposer:** Ketchikan Public Utilities

**AEA Program Manager:** Doug Ott

**Proposed Project Phase:** Construction

**Applicant Type:** Utility

Local Government

**Economic Analysis**

- **Benefit/Cost Ratio (Applicant):** 9.15
- **Benefit/Cost Ratio (AEA):** 7.9
App #206  Whitman Lake Hydro Construction_KPU

<table>
<thead>
<tr>
<th>Resource: Hydro</th>
<th>Proposed Project Phase: Construction</th>
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<tbody>
<tr>
<td>Proposer: Ketchikan Public Utilities</td>
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</table>

**AEA Program Manager: Doug Ott**

**Applicant Type: Utility**

**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 #207  PetroStar HR_VFDA

Resource: Heat Recovery          Proposed Project Phase: Construction
Proposer: Valdez Fisheries Development  Design
Association

AEA Program Manager: Lenny Landis  Applicant Type: IPP

Project Description
The project, located in Valdez, Alaska, will take waste heat generated by the Petro Star Refinery. Waste heat will be collected by a shell and tube glycol medium recovery system. The medium will drive two technologies operated in series. Amonia absorption technology will create cooling for a 45 million pound -20 degree F cold storage. An Organic Rankine Cycle Generator will use the medium once it has exited the ammonia absorption system to create 600 Kw's of power which will be used to operate the cold storage facility. The final benefit will be to use the sold cycle on the generator to create a salmon rearing facility.

Funding & Cost

<table>
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<th>Cost of Power: $0.12 /kWh</th>
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<tbody>
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<td>Requested Grant Funds: $6,000,000</td>
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<td>Matched Funds Provided: $350,000</td>
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<td>Total Potential Grant Amount: $6,350,000</td>
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AEA Recommendation

Full Funding  Partial Funding  Special Provision  Not Recommended  Did Not Pass Stage 1  Withdrawn
App #207  PetroStar HR_VFDA

**Resource:** Heat Recovery

**Proposer:** Valdez Fisheries Development Association

**AEA Program Manager:** Lenny Landis

**Proposed Project Phase:** Construction Design

**Applicant Type:** IPP

### Scoring & Location

**Overall Rank** (out of 60)

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

**Energy Region:** Copper River/Chugach

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

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

### Stage 3 Scoring Summary

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</table>

### AEA Review Comments

Valdez Fisheries Development Foundation requests funding for final design and permitting ($3.5 million) and site preparation ($2.5 million) for a $35 million cold storage facility that would include cold and dry heated storage, a secondary seafood processing area, an office and loading docks. The project would also include equipment to recover 22.5 mmBtu/hr of heat from the Petrostar Refinery and convert it into 45 million lb of -20 degree cold storage through a absorption chilling system and 450 kW of power through organic rankine cycle system.

The proposal budget does not separate out design engineering costs for the energy systems from those of the entire cold storage project. The energy system represents only a modest portion of the entire project. Table 4 of appendix 7 estimates the installed cost of the absorption chilling system at $2.8 million, less than the grant request for final design. We were unable to identify installed cost of the ORC units.

Recommend no funding.
App #207 PetroStar HR_VFDA

Resource: Heat Recovery
Proposer: Valdez Fisheries Development Association

AEA Program Manager: Lenny Landis
Applicant Type: IPP

Proposed Project Phase: Construction Design

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
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
Project Description

The wood fired supplemental heating system would be located at the Howard Valentine School Site in the City of Coffman Cove on Prince of Wales Island in Southeast Alaska. The project would also serve the residents of the City of Coffman Cove. The entities involved in this project would be Southeast Island School District, a design engineering firm, local contractors, and the Alaska Energy Authority. We would rely on Alaska Energy Authority for guidance with the project. The use of wood biomass (cordwood) to heat the school will replace 85% of the fuel oil consumption. The project involves placing one thermal storage type wood-fired hydronic heating unit adjacent to the school site and running underground insulated pipes from the woodfired heater to interface with the school’s heating system. Heat energy from biomass will significantly decrease heating costs for the school. Wood is available from waste from local saw mills, USFS small sales, from wood left behind in landings, and from small local firewood cutters.

Funding & Cost

Cost of Power: $0.60/kWh
Requested Grant Funds: $341,056
Matched Funds Provided: $14,000
Total Potential Grant Amount: $355,056

AEA Recommendation

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

AEA Funding Recommendation: (Not Constrained by Available Funding)
App #208  Coffman Cove Wood Boiler_SEISD

Resource: Biomass  Proposed Project Phase: Construction
Proposer: Southeast Island School District  Design
AEA Program Manager: Ron Brown  Feasibility
Applicant Type: Government Entity

Scoring & Location

Energy Region: Southeast
Election District: 1, Ketchikan

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

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</table>

AEA Review Comments

Applicant proposes final design and construction of a stick-fired boiler system that would provide heat to the school in Coffman Cove. Wood would be supplied by local sawmills. A recon assessment report was completed by JEDC in 2008. Contractors would be chosen based on existing school district procurement policies, referenced in the app. School maintenance staff would operate the system. The applicant has requested that AEA manage the project. Project construction would be completed by summer 2010. The application includes a letter of support from the City of Coffman Cove. The app also includes a letter stating interest by a local sawmill manager stating interest in providing slabs for fueling the boiler.

Recommend full funding of $341,056 for final design and construction.

APPLICATION WITHDRAWN BY SCHOOL DISTRICT
Economic Analysis

The applicant estimated wood costs at $175 per cord. This amount was decreased to $160 per cord for the AEA analysis. This estimate is based on a range of potential wood costs for Prince of Wales Island wood provided by Ketchikan-based DNR forester Michael Curran. The application did not contain an estimate of the maintenance cost for the existing oil-fired boilers. An estimated annual cost of $1,000 for each boiler was used, giving a total of $3,000 per year for the three existing boilers. Similar to other wood-fired boilers, this proposed project could help reduce high heating costs due to high fuel oil prices, while providing income for local firewood harvesters. The long term sustainability will depend upon the level and amount of harvest that would be needed to fuel a wood-fired boilers at the School, and the availability of wood within hauling distance of the school.
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #208  Coffman Cove Wood Boiler_SEISD

Resource: Biomass

Proposer: Southeast Island School District

Proposed Project Phase: Construction
Design
Feasibility

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
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #209  Kasaan Wood Boiler_Village of Kasaan

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<tr>
<th>Resource:</th>
<th>Biomass</th>
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<tr>
<td>Proposer:</td>
<td>Organized Village of Kasaan</td>
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<td>AEA Program Manager:</td>
<td>Ron Brown</td>
</tr>
<tr>
<td>Applicant Type:</td>
<td>Government Entity</td>
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</table>

Project Description

This proposed Biomass project will focus on conducting a feasibility analysis and the developing a conceptual design of two wood burners for the community of Kasaan. The project will be located in the village of Kasaan on the Southeast side of Prince of Wales Island in southern Southeast Alaska. The Organized Village of Kasaan (OVK), a federally recognized Tribe is the applicant organization. OVK will work closely with the City of Kasaan in the successful completion of this project.

One wood burner will be designed to heat all of the community buildings in Kasaan (school, city offices, medical clinic, Tribal offices, community library, and community hall). The second wood burner will be constructed on a separate site in Kasaan to heat a cultural- and eco-tourism lodge that is in the design phase and will be owned and operated by the Tribe as the primary economic development focal point for the community.

Funding & Cost

| Cost of Power: | $0.26/kWh |
| Requested Grant Funds: | $30,000 |
| Matched Funds Provided: | $2,000 |
| Total Potential Grant Amount: | $32,000 |

AEA Funding Recommendation: $30,000

× Full Funding
Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
App #209  Kasaan Wood Boiler _ Village of Kasaan

Resource: Biomass  Proposed Project Phase: Feasibility
Proposer: Organized Village of Kasaan

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

Scoring & Location

Energy Region: Southeast
Election District: 1, Ketchikan

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of 12)
54  47.8  10

Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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</table>

AEA Review Comments

Applicant proposes to study feasibility of a two stick-fired wood boiler systems that would serve the school, other community buildings and a lodge. Wood would be supplied by local sawmills in the Thorne Bay and Kasaan area. There would need to be a heat sale agreement between the tribal council and the City and/or other building owners.

Recommend full funding at $30,000.
App #209  Kasaan Wood Boiler_Village of Kasaan

**Resource:** Biomass  
**Proposer:** Organized Village of Kasaan

**AEA Program Manager:** Ron Brown  
**Applicant Type:** Government Entity

### Economic Analysis

The request to evaluate project feasibility, submitted to AEA by the applicant, lacks complete information on the existing system and lacks estimates of costs, benefits, and fuel sources for the proposed wood-fired heating system. The application does not provide sufficient information to conduct a benefit-cost analysis of the project at this time, but results from a feasibility study should provide these answers. OVK has requested $30,000 from AEA to complete the feasibility study. It will provide $2,000 of staff time and office support as an in-kind contribution. Northern Economics recommends AEA approval of the feasibility study since Kasaan is located in a heavily wooded area with industrial operations. Both cord wood and chip wood (especially hog fuel) are available at Thorne Bay and Klawock. The project description provided in the application is in line with other local requests (Thorne Bay, Coffman Cove) and if the application meets other AEA program criteria, we recommend approval of the grant request.
<table>
<thead>
<tr>
<th>Resource: Biomass</th>
<th>Proposed Project Phase: Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposer: Organized Village of Kasaan</td>
<td></td>
</tr>
</tbody>
</table>

| AEA Program Manager: Ron Brown | Applicant Type: Government Entity |

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #210  Kiseralik_Chikuminuk Hydro_AVCP Housing

Resource: Hydro
Proposer: Association of Village Council Presidents
Regional Housing Authority

AEA Program Manager: Doug Ott
Applicant Type: Government Entity

Project Description

This application addresses a first phase in implementing the AVCP Calista Regional Biennial Energy Plan 2008 - 2010 involving a feasibility level analysis to be conducted by the AVCP Regional Housing Authority for Renewable Energy Deployment for the Kuskokwim Region involving Hydroelectric Power, Wind and Solar Energy, Biomass Heating, including Regional Utility Consolidation Plan and Development for Bethel and villages along the Kuskokwim River. As a first effort, engineering, including geophysical and geotechnical analysis is proposed to be undertaken to determine the feasibility and deployment requirements, including environmental permitting required to facilitate development of a Kiseralik River hydroelectric project for the communities in the Kuskokwim River Region. The study will also review the technical merits of the Chikuminuk hydropower project in view of technological advances that may have transpired in the transmission of electricity. This effort also includes the determination of power generation and distribution systems required to interconnect communities of the Kuskokwim region with transmission interties from a regional hydroelectric utility. This project also proposes to outline the planning, organizational and development requirements for consolidating the local utilities into a regional wholesale non-profit utility for the operation and management of a regional hydroelectric generation and transmission system. This project proposes to bring together in a planning and development process the regional non-profit organizations, tribal governments and local utilities proposed to be affected by a regional hydroelectric development project.

Funding & Cost

Cost of Power: $0.60/kWh
Requested Grant Funds: $250,000
Matched Funds Provided: $150,000
Total Potential Grant Amount: $400,000
Existing RE Fund Grant Offer:
AEA Funding Recommendation: $250,000

AEA Recommendation

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

AEA Funding Recommendation: $250,000
App #210  Kiseralik_Chikuminuk Hydro_AVCP Housing

Resource: Hydro
Proposer: Association of Village Council Presidents
Regional Housing Authority

AEA Program Manager: Doug Ott
Applicant Type: Government Entity

Proposed Project Phase: Feasibility
Recon

Scoring & Location

Energy Region: Lower Yukon-Kuskokwim
Election District: 38, Bethel

Overall Rank (out of 60)
Stage 3 Total Score (out of 100)
80.5

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<tr>
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<td>2) Funding Resources (Max 25)</td>
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<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<tr>
<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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</tr>
<tr>
<td>6) Local Support (Max 5)</td>
<td>4</td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td>2</td>
</tr>
</tbody>
</table>

AEA Review Comments

Applicant proposes recon and feasibility assessment of hydro projects that would serve the Bethel area. Although an engineering firm is not selected, selection would follow a formal process. Storage hydro would be complementary with wind energy, under development in Bethel.

There may be significant permitting issues--see DNR comments. Substantial regional is demonstrated.

Recommend full funding of $250,000.
Resource: Hydro

Proposer: Association of Village Council Presidents
Regional Housing Authority

AEA Program Manager: Doug Ott

Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant) 5.37

Benefit/Cost Ratio (AEA) 2.51

The output of the project, if feasible, will be available to offset all diesel electric generation of the region, and supply a considerable portion of the heating fuel requirements. The applicant estimated 6 million gallons of heating fuel could be displaced, but realistically the single hydro plant will reduce a little less than 2 million gallons. The AEA analysis also includes the estimated cost of the regional interties among the villages, which was not included in the estimated $250 million cost of the dam and interconnection to Bethel.

Project includes large land area impacts, and may impact wildlife refuges. Permitting could be a significant issue, and a current assessment of permitting and licensing should be immediately undertaken. Consideration must be taken of the implications for the current utility ownership if the hydroelectric project is pursued under a different organization. Reasonable to assume long-term sustainability, if successfully permitted.
Because the project lies inside a NWR and the ownership of the river bed is disputed between the state and federal agencies, the permitting will be complicated.
App #211  Thorne Bay Wood Boiler_SEISD

**Resource:** Biomass

**Proposer:** Southeast Island School District for Thorne Bay School

**AEA Program Manager:** Ron Brown  
**Applicant Type:** Government Entity

**Proposed Project Phase:** Construction Design

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**Project Description**

This project involves placing supplemental cord wood fired boilers at the school site. The supplemental heating system would be located at the Thorne Bay School in the City of Thorne Bay on Prince of Wales Island in Southeast Alaska. The project would also serve the residents of the City of Thorne Bay. The entities involved in this project would be Southeast Island School District, an engineering firm, local contractors, and the Alaska Energy Authority; We would rely on Alaska Energy Authority for guidance with the project.

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**Funding & Cost**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Power</td>
<td>$0.26/kWh</td>
</tr>
<tr>
<td>Requested Grant Funds</td>
<td>$178,179</td>
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<tr>
<td>Matched Funds Provided</td>
<td>$42,000</td>
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<tr>
<td>Total Potential Grant Amount</td>
<td>$220,179</td>
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<tr>
<td>Existing RE Fund Grant Offer</td>
<td></td>
</tr>
<tr>
<td>AEA Funding Recommendation: (Not Constrained by Available Funding)</td>
<td>$178,179</td>
</tr>
</tbody>
</table>

**AEA Recommendation**

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

**AEA Funding Recommendation:** $178,179
App #211  Thorne Bay Wood Boiler_SEISD

Resource: Biomass
Proposer: Southeast Island School District for Thorne Bay School
AEA Program Manager: Ron Brown
Applicant Type: Government Entity

Proposed Project Phase: Construction Design

Scoring & Location

Energy Region: Southeast
Election District: 1, Ketchikan
Rank within Region (out of 12) 3

Overall Rank (out of 60) 24
Stage 3 Total Score (out of 100) 62.3

Stage 3 Scoring Summary

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

AEA Review Comments
Applicant proposes final design and construction of a stick-fired boiler system that would provide heat to the school in Thorne Bay. Wood would be supplied by sawmills in the industrial park, landings, and small local wood cutters. A feasibility report was completed by TR Miles in 2006, followed by another report by JEDC. Contractors would be chosen based on existing school district procurement policies, referenced in the app. School maintenance staff would operate the system.

Recommend full funding of $178,179 for final design and construction.
App #211  Thorne Bay Wood Boiler_SEISD

Resource: Biomass

Proposer: Southeast Island School District for Thorne Bay School

AEA Program Manager: Ron Brown

Applicant Type: Government Entity

Proposed Project Phase: Construction Design

Economic Analysis

Benefit/Cost Ratio (Applicant)  3.75

Benefit/Cost Ratio (AEA)  3.18

The application assumed a 25-year life of the wood-fired boilers. This has been revised to 20 years based on an assumed project life of 20 years for wood-fired boilers and an estimated construction completion date of July 2010. The application provides four different quantities for wood to be used in the proposed wood-fired system. The analysis uses the highest amount (262 cords annually) to be conservative. Page 13 of the application gives an estimate from T. Miles of 147 cords of wood to replace all of the fuel oil. Page 17 of the application bases the proposed rate of return on 262 cords of wood. Page 2 of the application cost worksheet specifies 222 cords of wood in section 3 and 220 cords of wood in section 4. Given the range of these estimates, the community may not need to burn the entire 262 cords to fuel its wood-fired boiler, which would enhance the benefit-cost ratio of the project. Different wood moisture contents can also affect the number of cords burned and while the City understands this, 262 cords will take into account the high moisture content of Thorne Bay.
App #211  Thorne Bay Wood Boiler_SEISD

**Resource:** Biomass  
**Proposer:** Southeast Island School District for Thorne Bay School  
**AEA Program Manager:** Ron Brown  
**Proposed Project Phase:** Construction Design  
**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 #212  Akiachak Wind_ANCEC

Resource: Wind                                               Proposed Project Phase: Construction
Proposer: Akiachak Native Community Electric Company       Design
                                      Feasibility

AEA Program Manager: James Jensen                             Applicant Type: Utility

Project Description

The Business Operating Plan provides a guideline for the Akiachak Native Community Electric Company ("the Utility") proposing a combination of all three project descriptions, Reconnaissance; Resource Assessment/Feasibility Analysis/Conceptual Design; Final Design and Permitting; and/or Construction for the wind turbine for Akiachak Native Community Electric Company. The ANCEC will be responsible to operate and sustain the newly installed Wind Turbine and associated electric power to save fuel and reduce fuel costs for the generators. The newly Akiachak Electric Wind Turbine project will be located in Akiachak Alaska about 18 air miles east of Bethel, and Alaska Energy Authority will be involved in the grand project. Akiachak Native Community Electric Company needs an alternative energy to determine its best and most sustainable energy here in village of Akiachak, and through this energy development project plan the community feasibility of installing long term energy facility in order to reduce fuel costs and reduce overall cost of energy.

Funding & Cost

<table>
<thead>
<tr>
<th>Cost of Power:</th>
<th>$0.60/kWh</th>
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<tbody>
<tr>
<td>Requested Grant Funds:</td>
<td>$4,500,000</td>
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<td>Matched Funds Provided:</td>
<td>$600,000</td>
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<td>Total Potential Grant Amount:</td>
<td>$5,100,000</td>
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</table>

Existing RE Fund Grant Offer: $15,000

AEA Funding Recommendation (Not Constrained by Available Funding): $15,000

AEA Recommendation

Full Funding
✗ Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
App #212  Akiachak Wind_ANCEC

Resource: Wind  Proposed Project Phase: Construction Design Feasibility
Proposer: Akiachak Native Community Electric Company

AEA Program Manager: James Jensen  Applicant Type: Utility

Scoring & Location

Energy Region: Lower Yukon-Kuskokwim
Election District: 38, Bethel

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of 6)
47  52.3  6

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
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<td>1) Cost of Energy (Max 30)</td>
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<td>2) Funding Resources (Max 25)</td>
<td>16</td>
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<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<tr>
<td>4) Project Readiness (Max 5)</td>
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<tr>
<td>5) Benefits (Max 10)</td>
<td>3</td>
</tr>
<tr>
<td>6) Local Support (Max 5)</td>
<td>0</td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td>2</td>
</tr>
</tbody>
</table>

AEA Review Comments

Applicant proposes feasibility through construction of a wind energy system of unspecified scale and location in Akiakchak. The applicant requests AEA to manage the project.

The application provides only a general description of the project. There is no detailed budget.

AEA recommends funding only onsite wind resource assessment at $15,000. AEA will supply an instrumented met tower.
App #212  Akiachak Wind_ANCEC

Resource: Wind
Proposer: Akiachak Native Community Electric Company

AEA Program Manager: James Jensen
Applicant Type: Utility

Proposed Project Phase: Construction
Design
Feasibility

Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
### App #212  Akiachak Wind_ANCEC

<table>
<thead>
<tr>
<th>Resource: Wind</th>
<th>Proposed Project Phase: Construction, Design, Feasibility</th>
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</thead>
<tbody>
<tr>
<td>Proposer: Akiachak Native Community Electric Company</td>
<td>Applicant Type: Utility</td>
</tr>
<tr>
<td>AEA Program Manager: James Jensen</td>
<td></td>
</tr>
</tbody>
</table>

#### DNR/DGGS Geohazards Comments

#### DNR/DGGS Feasibility Comments

#### DNR/DMLW Feasibility Comments
Jack River Recon_Cantwell

Resource: Hydro
Proposer: Native Village of Cantwell

Proposed Project Phase: Recon

Proposer: Native Village of Cantwell

AEA Program Manager: Doug Ott
Applicant Type: Government Entity

Project Description
The Native Village of Cantwell wishes to improve the reliability and lower the cost of the community of Cantwell's power system. Currently they obtain power from the line between MEA and GVEA (Alaska Inter-tie System). To accomplish this they 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. It 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

| Cost of Power | $0.17 /kWh |
| Requested Grant Funds | $194,540 |
| Matched Funds Provided | $5,460 |
| Total Potential Grant Amount | $200,000 |
| Existing RE Fund Grant Offer | |

AEA Funding Recommendation: $194,540

AEA Recommendation
Full Funding
Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
App #213  Jack River Recon_Cantwell

Resource: Hydro  Proposed Project Phase: Recon

Proposer: Native Village of Cantwell

AEA Program Manager: Doug Ott  Applicant Type: Government Entity

Scoring & Location

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Energy Region: Railbelt

Election District: 8, Denali-University

Rank within Region (out of 7)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
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<td>2) Funding Resources (Max 25)</td>
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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<td>6) Local Support (Max 5)</td>
<td>5</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</tbody>
</table>

AEA Review Comments

This request is for a reconnaissance study for the hydro electric plant for the Jack River located near the Native Village of Cantwell. The village is on the Railbelt Energy Grid served by GVEA.

Recommend full funding of $194,540.
App #213  Jack River Recon_Cantwell

Resource: Hydro  Proposed Project Phase: Recon

Proposer: Native Village of Cantwell

AEA Program Manager: Doug Ott  Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
<table>
<thead>
<tr>
<th>Resource: Hydro</th>
<th>Proposed Project Phase: Recon</th>
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<tbody>
<tr>
<td><strong>Proposer:</strong> Native Village of Cantwell</td>
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</table>

**AEA Program Manager:** Doug Ott
**Applicant Type:** Government Entity

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #214  Air Source Heat Pump_BIHA

Resource: Other  Proposed Project Phase: Recon
Proposer: Baranof Island Housing Authority

AEA Program Manager: David Lockard  Applicant Type: Government Entity

Project Description
Baranof Island Housing Authority (BIHA) proposes to select up to three models of marketed air-source heat pumps and install them in up to 12 BIHA owned residential homes in Sitka, Alaska that are presently heated with fuel oil boiler systems in order to evaluate their effectiveness in reducing household heating water costs. Additionally, heat pump domestic hot water systems will be evaluated for cost effectiveness against conventional electric hot water tanks for determining most cost effective replacement of current fuel oil boiler domestic hot water systems.

Funding & Cost

Cost of Power: $0.10 /kWh
Requested Grant Funds: $121,000
Matched Funds Provided: $21,000
Total Potential Grant Amount: $142,000

Existing RE Fund Grant Offer:

AEA Funding Recommendation: (Not Constrained by Available Funding)

AEA Recommendation:
Full Funding
Partial Funding
Special Provision
Not Recommended
× Did Not Pass Stage 1
Withdrawn
App #214  Air Source Heat Pump_BIHA

Resource: Other
Proposer: Baranof Island Housing Authority

Proposed Project Phase: Recon

AEA Program Manager: David Lockard
Applicant Type: Government Entity

Scoring & Location

Energy Region: Southeast
Election District: 2, Sitka-Wrangell-Petersburg

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

3.9

Rank within Region (out of)

Stage 3 Scoring Summary

Criterion (Weight)  Score
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

Failed Stage 1 review
App #214  Air Source Heat Pump_BIHA

Resource: Other
Proposer: Baranof Island Housing Authority

AEA Program Manager: David Lockard
Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
**App #214  Air Source Heat Pump_BIHA**

<table>
<thead>
<tr>
<th>Resource: Other</th>
<th>Proposed Project Phase: Recon</th>
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</thead>
<tbody>
<tr>
<td>Proposer: Baranof Island Housing Authority</td>
<td>AEA Program Manager: David Lockard</td>
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</tbody>
</table>

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**
App #215 Terror Lake Capacity_KEA

Resource: Hydro  Proposed Project Phase: Feasibility

Proposer: Kodiak Electric Association, Inc. (KEA)

AEA Program Manager: Doug Ott  Applicant Type: Utility

Project Description

Terror Lake is KEA's primary generation source, and is located approximately 25 miles southwest of the City of Kodiak within the Kodiak National Wildlife Refuge. This hydroelectric facility is the cornerstone to KEA's Vision Statement: Endeavor to produce 95% of energy sales with cost effective renewable power solutions by the year 2020, by providing base load capacity to backup other forms of renewable energy. The power output of Terror Lake can be increased or decreased by dispatch to control the amount of total power on the grid. This attribute of hydropower allows KEA to integrate the more variable sources of renewable energy, such as wind and tidal energy, onto its isolated grid. In addition to this stabilizing capability, the Terror Lake reservoir itself acts like a battery for KEA's other renewable energy projects. This synergistic integration of wind and hydro power is an excellent renewable energy solution for other communities in Alaska. The current capacity of Terror Lake has been surpassed by Kodiak's growing load demand. Without the additional hydropower capacity, the synergistic relationship of more renewable variable energy sources and water cannot be fully realized.

Funding & Cost

| Cost of Power: | $0.19 /kWh |
| Requested Grant Funds: | $500,000 |
| Matched Funds Provided: | $500,000 |
| Total Potential Grant Amount: | $1,000,000 |

Existing RE Fund Grant Offer: $500,000

AEA Funding Recommendation: $500,000

AEA Recommendation:

❌ Full Funding
Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
App #215 Terror Lake Capacity KEA

Resource: Hydro
Proposer: Kodiak Electric Association, Inc. (KEA)

Proposed Project Phase: Feasibility

AEA Program Manager: Doug Ott
Applicant Type: Utility

Scoring & Location

Energy Region: Kodiak
Election District: 36, Kodiak

Overall Rank (out of 60) 15
Stage 3 Total Score (out of 100) 69.6

Stage 3 Scoring Summary

<table>
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<tr>
<th>Criterion (Weight)</th>
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<td>5) Benefits (Max 10)</td>
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<td>6) Local Support (Max 5)</td>
<td>2</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
<td>5</td>
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</table>

Rank within Region (out of 1) 1

AEA Review Comments

Kodiak Electric requests funding for a FERC license amendment and final design to add a 3rd turbine at Terror Lake. The turbine will interact with the power generated by the future Pillar Mt. Wind project (under construction) to allow the combined system to meet the current peak load. No additional hydro annual energy will be generated by this additional turbine. It will allow offsetting diesel generation to meet peak demand by providing spinning reserve for wind turbine backup.

Recommend full funding of $500,000.
**Economic Analysis**

Addition of a third, 10 MW turbine to the existing Terror Lake hydro resource. The existing resource is a hydro storage project, and addition of the unit would not increase firm or long-term average energy. Even though the average hydro generation potential is not increased, the third unit will displace some amount of diesel. It is noted that the third unit will decrease diesel generation in the first three benefits above only if spill will occur absent the third unit. If no spill occurs, there will simply be increased hydro generation at other times. Data supplied (albeit very limited) by KEA shows that spill during operations of diesel during peak periods will be a concern from 2009 – 2013 only. After that, loads increase to the point where the “saved” water during diesel operations can be used at other times. The 3rd unit is not expected to be operational until 2013.

No concerns of the project itself. However, data is very limited, and a high-level review such as this does not address a number of issues regarding usability, reduction of diesel usage, spill, and spill prevention. Such issues must be addressed through reservoir and system modeling. Inclusion of additional wind turbine would be a possible enhancement. Reasonable to assume long-term sustainability.
App #215  Terror Lake Capacity  KEA

Resource: Hydro  Proposed Project Phase: Feasibility

Proposer: Kodiak Electric Association, Inc. (KEA)

AEA Program Manager: Doug Ott  Applicant Type: Utility

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments

Complicated landownership. If the footprint varies from existing project, permitting may take more time.
Project Description

The Little Port Walter (LPW) Marine Station is a research unit of Akune Bay Laboratories located 110 miles south of Juneau near the southern tip of Baranof island. LPW is the oldest year-round biological research station in Alaska and has been the host of a wide variety of fisheries research projects since 1934. Electric power is currently provided for the site by a diesel engine generator. Oil is used for building heating. An existing dam on the outlet of Lake Osprey on the north shore of Port Walter inlet could be utilized to provide electric power for LPW through a small hydro turbine generator. Electrical service would require a transmission line under the Port Walter Inlet and across a peninsula to the research center. Ameresco would conduct the project evaluation proposed in this grant application to determine the viability of this hydroelectric project. Current electric consumption for LPW is about 35 kW. The proposed hydroelectric project would include conversion of LPW to all electric energy systems to increase the average electrical consumption rate to 70 kW.

Funding & Cost

<table>
<thead>
<tr>
<th>Cost of Power:</th>
<th>/kWh</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>Total Potential Grant Amount:</td>
<td>$60,000</td>
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</table>

AEA Recommendation

Full Funding
Partial Funding
Special Provision
Not Recommended
× Did Not Pass Stage 1
Withdrawn
App #216  Little Port Walter Hydro_Ameresco

Resource: Hydro

Proposer: Ameresco, Inc

Proposed Project Phase: Feasibility

AEA Program Manager: Doug Ott

Applicant Type: IPP

Scoring & Location

Energy Region: Southeast

Election District: 2, Sitka-Wrangell-Petersburg

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<tr>
<td>1) Cost of Energy (Max 30)</td>
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<td>2) Funding Resources (Max 25)</td>
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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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AEA Review Comments
Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
<table>
<thead>
<tr>
<th>Resource: Hydro</th>
<th>Proposed Project Phase: Feasibility</th>
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<tr>
<td>Proposer: Ameresco, Inc</td>
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<tr>
<td>AEA Program Manager: Doug Ott</td>
<td>Applicant Type: IPP</td>
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</table>

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #217  Camp Hill Wind_NVE

Resource: Wind
Proposer: Native Village of Eyak

Proposed Project Phase: Recon

AEA Program Manager: James Jensen
Applicant Type: Other

Project Description

The project is located at Camp Hill near Wireless Point, approximately seven miles south of Cordova, Alaska. Because of high electricity costs ($0.50/kWh winter and $0.22/kWh summer after PCE credits), Cordova needs to develop other local energy sources to offset running diesel generators - especially in the winter months when hydro power disappears. The wind energy program will 1) complete the Camp Hill wind farm project design and permits, 2) improve wind data maps through a mobile 10-meter anemometer tower project, 3) initiate a wind farm pilot project and a marine-based pilot project, 4) drive community involvement and education, 5) adopt best-known methods from other successful wind projects, 6) determine whether the wind farm will be built and operated by Native Village of Eyak or Cordova Electric Co-Op and 7) set the stage for construction and implementation. The project will provide low-cost electricity for all members of the Cordova Electric Co-Operative power grid.

Funding & Cost

<table>
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<tr>
<th>Cost of Power:</th>
<th>$0.32/kWh</th>
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<td>Matched Funds Provided:</td>
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<td>Total Potential Grant Amount:</td>
<td>$552,073</td>
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</table>

Existing RE Fund Grant Offer: $57

AEA Funding Recommendation: $32,597

AEA Recommendation

Full Funding

X Partial Funding

Special Provision

Not Recommended

Did Not Pass Stage 1

Withdrawn
Scoring & Location

Overall Rank (out of 60) 44
Stage 3 Total Score (out of 100) 53.5
Energy Region: Copper River/Chugach
Election District: 5, Cordova-Southeast Islands
Rank within Region (out of 5)

Stage 3 Scoring Summary

<table>
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<td>7) Sustainability (Max 5)</td>
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</table>

AEA Review Comments

This application proposes a multistage wind energy program for the communities of Cordova and Eyak. The project includes a small scale regional wind resource assessment plan, wind farm design and permitting, pilot scale wind projects, and construction of a community scale wind farm.

The application states that at this time it is unclear as to which entity, Cordova Electric Coop or Native Village of Eyak, would own the wind project. The wind site has not been selected at this point. The pilot scale wind projects do not provide value commensurate with their costs. Recommend partial funding of $32,597 for the mobile anemometer wind assessment.
App #217  Camp Hill Wind_NVE

Resource: Wind

Proposer: Native Village of Eyak

AEA Program Manager: James Jensen

Applicant Type: Other

Economic Analysis

Benefit/Cost Ratio (Applicant) 1.54

Benefit/Cost Ratio (AEA) 1.89

The Native Village of Eyak, in association with the Cordova Electric Cooperative, is requesting $522,633 from AEA to complete the tasks of feasibility analysis and taking the project through full design and permitting for their Camp Hill wind energy project. Funding for construction and implementation would be requested later if the project is found to be feasible. The complete project would develop a wind farm south of Cordova that could provide approximately 3.4 million kWh per year to displace diesel generation. The project is not sufficiently defined to know for certain that the applicant’s proposal would lower the cost of electricity in the community. However, using benchmark data for wind generation indicates that the project could produce electricity at lower cost than current diesel generation.

The aggregate capital costs for the wind turbines and associated electrical equipment appear reasonable and have been increased to account for inflation. Operating costs proposed by the applicant are lower than the benchmarks and benchmark data are used in the AEA analysis worksheet. The proposed project appears sustainable. More data on the wind resources in the area are needed to confirm this finding and the applicant has this activity in their proposed plans. We would recommend funding through the feasibility study for this first phase of activity.
<table>
<thead>
<tr>
<th>Resource: Wind</th>
<th>Proposed Project Phase: Recon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposer: Native Village of Eyak</td>
<td></td>
</tr>
</tbody>
</table>

### AEA Program Manager
James Jensen

### Applicant Type
Other

### DNR/DGGS Geohazards Comments

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments
Project Description

Astronomical heating costs are inspiring new creativity in planning for sustainable and affordable energy sources for our community in Cordova, Alaska. Affordable fuel sources have been identified: waste cardboard that is currently taken to the landfill and wood waste generated at the community burn pile. Historically, the community has squandered these potential energy sources. The burn pile will better serve the community when transitioned from a community dump into local-source heating fuel. The community will also save valuable landfill space by diverting waste cardboard into a fuel source. The purpose of this project is to 1) quantify 2) design and 3) deploy a system that will re-use these valuable resources currently being wasted. The wood and cardboard waste will become fuel for a biomass boiler to heat our community through a district heating network. Potential buildings include the city hall, pool, hospital and schools. We need financial assistance to fully develop this project, which can then become self-sustaining. The feasibility study will quantify the available BTUs that can be generated by our waste stream, and the potential methods of fuel treatment and system equipment.

Funding & Cost

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<td>AEA Funding Recommendation: (Not Constrained by Available Funding)</td>
<td>$50,000</td>
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AEA Recommendation

Full Funding

Partial Funding

Special Provision

Not Recommended

Did Not Pass Stage 1

Withdrawn

AEA Funding Recommendation: $50,000
App #218  Cordova District Heat_NVE

Resource: Biomass
Proposer: Native Village of Eyak

Proposed Project Phase: Construction Design Feasibility

AEA Program Manager: Ron Brown
Applicant Type: Government Entity

Scoring & Location

Energy Region: Copper River/Chugach
Election District: 5, Cordova-Southeast Islands

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

28  60.7

Rank within Region (out of 5)

4

Stage 3 Scoring Summary

Criterion (Weight)  Score
1) Cost of Energy (Max 30)  12
2) Funding Resources (Max 25)  11
3) Project Feasibility from Stage 2 (Max 20)  16
4) Project Readiness (Max 5)  5
5) Benefits (Max 10)  9
6) Local Support (Max 5)  5
7) Sustainability (Max 5)  4

AEA Review Comments

Applicant proposes studying feasibility of using local wood and waste cardboard to heat public buildings including Cordova City Hall, the pool, the hospital, and schools. Applicant estimates roughly 80,000 gallons per year of fuel usage in these buildings. The applicant does not provide a reconnaissance-level assessment, but does provide detailed information on individual building fuel consumption. Project would be managed by the Native Village of Eyak and performed by a consulting engineer yet to be identified. Feasibility study would be complete within 3-4 months of grant funding. There are support letters from the school district and the City. No sites are identified for boiler systems.

Recommend partial funding for phase 1--feasibility analysis at $50,000.
Economic Analysis

The application assumes that 1,460 cords of wood would be used annually. Our analysis suggests only 487 cords would be needed to replace the heat energy currently used in community buildings (displacing 80,000 gallons of diesel), whereas 1,460 cords of wood represents the estimated amount available annually (capable of displacing up to 242,000 gallons). These changes reduce the fuel cost for the wood-fired boiler and the amount of diesel displaced annually. While the proposed system may end up providing heat to more than the six community buildings, no information is available about those other buildings in the application. Northern Economics has used a more conservative approach of just looking at the buildings identified at this stage of the project. NVE can evaluate the addition of other buildings as part of the feasibility study, if funded, and incorporate that information in its benefit-cost analysis.

The application assumes a cost of $50 per cord of wood used in the project. Our analysis uses $150 per cord over the life of the project based on the assumption that $50/cord wood may be available initially but will not be available during the 20-year life of the project. The $150 figure also fits other known and projected costs for firewood in coastal areas. The application did not provide an O&M cost for the existing diesel boiler systems. Our analysis assumes $1,000 of annual maintenance for each of the six boilers to be replaced, or $6K annually. This cost is based on an estimated annual (average) cost for older boilers.
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 #219  High Penetration Wind Diesel Heat_Kipnuk

Resource: Wind  Proposed Project Phase: Construction

Proposer: Kipnuk Light Plant

AEA Program Manager: James Jensen  Applicant Type: Utility

Project Description

$8,588,000 in construction funding is being requested by the Kipnuk Light and Power Utility Board to build a wind-diesel- heat and power system. This system will reduce diesel fuel consumption used for both power generation and heating for 180-residences by 40%. The wind system will generate 4,000,000 kilowatt-hours (kWh) of electricity. The wind energy will displace (save) 200,000 gallons of diesel fuel, 75,000 gallons of which is now being used to generate power, and 125,000 gallons of which will be captured and stored for use as heat.

Funding & Cost

Cost of Power: $0.32/kWh
Requested Grant Funds: $8,588,000
Matched Funds Provided: $1,600,000
Total Potential Grant Amount: $10,188,000

AEA Recommendation

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

Existing RE Fund Grant Offer:

AEA Funding Recommendation:
(Not Constrained by Available Funding)
Scoring & Location

Energy Region: Lower Yukon-Kuskokwim
Election District: 38, Bethel
Rank within Region

Overall Rank (out of 60)
Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<tbody>
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<td>1) Cost of Energy (Max 30)</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</tr>
</tbody>
</table>

AEA Review Comments

Kipnuk proposes design/permitting and construction of a high penetration 1.5 MW wind farm that would include 2 X 750 kW America's Wind Energy turbines, smart grid technology, electric boilers at the school and water plant, and electric heaters at 180 residences to use excess wind generation. This project is a scaleup of similar systems in Kwigillingok and Kongiganek that are being developed by Chaninik wind group. The turbine has not previously been installed in Alaska.

AEA believes that it makes sense to first prove out the system concept at smaller scales (Kwigillingok and Kongiganak) before moving to the scale and expense of this project. Not recommended for funding.
Economic Analysis

The two turbines are estimated to produce 5,934,000 kWh per year, of which 4,394,542 kWh goes to heat, and the remaining 1,539,458 kWh would be used to generate electricity. The analysis assumes that 80 percent of electricity generated is available, and a total of 1,231,566 kWh of electricity will be displaced annually. Likewise, 80% of the heat generated will be available and will displace current diesel fuel usage with 100,000 gallon annually. The O&M costs of the proposed system have been provided by the applicant with a detailed breakdown of costs including an inspection, maintenance and repair schedule. The applicant estimated that high penetration wind system annual O&M would cost $287,000 annually. This is higher than the AEA benchmark O&M cost but the applicant's estimate might better reflect O&M for high penetration systems. The applicant provided an O&M estimate of $0.104 per kWh for the existing system, substantially higher than the AEA benchmark value of $0.022 per kWh. However, AVEC closely tracks and reports the data for their power plants thus the AEA analysis uses the value of $0.191 provided by AVEC.

The current base system fuel efficiency is 10 gallons per kWh; however by 2010 the applicant is targeting a higher efficiency of 13 gallons per kWh. The analysis assumes fuel efficiency of 13 gallons per kWh. The analysis results in a positive B/C in the AEA model data and analysis. The wind resources in Kipnuk are good and the project has a very good potential for long-term success given proper maintenance and operations of the wind system. The analysis suggests that this project will help reduce high energy prices in the community of Kipnuk.
### App #219  High Penetration Wind Diesel Heat_Kipnuk

<table>
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<tr>
<th>Resource: Wind</th>
<th>Proposed Project Phase: Construction</th>
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<tr>
<td>Proposer: Kipnu Light Plant</td>
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**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 #220  Heat Recovery UMED_MLPUAA

Resource: Heat Recovery
Proposer: University of Alaska Anchorage (UAA) and Municipal Light & Power (ML&P)

AEA Program Manager: Lenny Landis
Applicant Type: Utility Government Entity

Project Description
The project will be co-located with a planned parking garage on University land, adjacent to and west of Providence Hospital. The project will contain two gas turbine generators each with a heat recovery boiler and a thermal distribution system that will connect Providence Hospital and UAA buildings to the plant. It will serve the UMED district with thermal energy and the exclusive service territory of ML&P with electricity. ML&P, UAA and Providence are involved in the grant project. Other institutions may become involved as thermal customers to the project based upon their own schedule and requirements.

Funding & Cost

Cost of Power: $0.09/kWh
Requested Grant Funds: $35,000,000
Matched Funds Provided: $20,000,000
Total Potential Grant Amount: $55,000,000

AEA Recommendation
Full Funding
Partial Funding
Special Provision
Not Recommended
× Did Not Pass Stage 1
Withdrawn

AEA Funding Recommendation:
(Not Constrained by Available Funding)
App #220  Heat Recovery UMED_MLPUAA

Resource: Heat Recovery
Proposer: University of Alaska Anchorage (UAA) and Municipal Light & Power (ML&P)

AEA Program Manager: Lenny Landis
Applicant Type: Utility
Government Entity

Proposed Project Phase: Construction Design

Scoring & Location

Energy Region: Railbelt
Election District: 23, Downtown-Rogers Park

Overall Rank (out of 60)
Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

Criterion (Weight)  Score
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 #220  Heat Recovery UMED_MLPUAA

Resource: Heat Recovery
Proposer: University of Alaska Anchorage (UAA) and Municipal Light & Power (ML&P)

AEA Program Manager: Lenny Landis

Proposed Project Phase: Construction Design
Applicant Type: Utility Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
App #220  Heat Recovery UMED_MLP/UAA

**Resource:** Heat Recovery

**Proposer:** University of Alaska Anchorage (UAA) and Municipal Light & Power (ML&P)

**AEA Program Manager:** Lenny Landis

**Proposed Project Phase:** Construction Design

**Applicant Type:** Utility Government Entity

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**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.

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**DNR/DGGS Feasibility Comments**

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**DNR/DMLW Feasibility Comments**
App #221  Kake Biomass gasifier_ccthita

Resource: Biomass
Proposer: Central Council Tlingit and Haida Indian Tribes of Alaska

AEA Program Manager: Lenny Landis
Applicant Type: Local Government

Proposed Project Phase: Construction Design

Cost of Power: $0.61/kWh
Requested Grant Funds: $4,750,000
Matched Funds Provided: $250,000
Total Potential Grant Amount: $5,000,000

Project Description
The project will be located in the City of Kake, and will serve the entire Kake community. The City of Kake, the Organized Village of Kake and Kake Tribal Corporation have committed to a joint effort, sponsored by the City Council of Tlingit and Haida, the Applicant for this Grant, to implement this project. The project involves the installation of commercially viable, modular technology consisting of a biomass gasifier combustor system (in use for 10+ years) integrated with hot water electrical generating equipment (in use for 20+ years) to provide lower cost electric power generation to remote villages in Alaska that presently rely on high cost diesel fuel to meet their energy needs, for both heating and power. This system is easily replicated in any village or for a particular business operation, the equipment is available within 16 weeks of order, can be installed in less than 12 months and the system can be immediately operational once installed.

Funding & Cost

<table>
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<tr>
<th>Description</th>
<th>Amount</th>
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<td>Total Potential Grant Amount</td>
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AEA Recommendation

Full Funding
Partial Funding
Special Provision
X Not Recommended
Did Not Pass Stage 1
Withdrawn
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #221  Kake Biomass gasifier_ccthita

Resource: Biomass
Proposer: Central Council Tlingit and Haida Indian Tribes of Alaska

Proposed Project Phase: Construction Design

AEA Program Manager: Lenny Landis
Applicant Type: Local Government

Scoring & Location

Energy Region: Southeast
Election District: 5, Cordova-Southeast Islands

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of )

23.0

Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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</tbody>
</table>

AEA Review Comments

Applicant proposes biomass-fired CHP system in Kake which includes a Challenger gasifier in conjunction with a organic rankine cycle turbine-generator system. (Applicant submitted revised information / see file. CCHTI Tribes of Alaska has withdrawn from the project and a letter requests that a new applicant, Agenor Resource TTechnolgies LLC take their place, thus leaving the project with no Alaskan representation.) AIG Tribal Growth would provide project finance and budget reporting. AEA has the following concerns about the proposal:

1. No indication that the local certificated utility IPEC is involved or supportive of the project. Application simply states that the power would be sold local residents, without regard to regulatory requirements.
2. 20-year fuel supply is not documented.
3. Budget includes $660,000 for "project finance advisory, project management, and engineering services for 12 months"
4. There are currently no biomass CHP systems operating in Alaska. AEA would like to see success of the RE Fund-supported Chena system on the road system near Fairbanks before investing additional funds in a project in a more remote location.

Recommend no funding.
App #221  Kake Biomass gasifer_ccthita

**Resource:** Biomass  
**Proposer:** Central Council Tlingit and Haida Indian Tribes of Alaska

**AEA Program Manager:** Lenny Landis  
**Applicant Type:** Local Government

**Proposed Project Phase:** Construction Design

### Economic Analysis

- **Benefit/Cost Ratio (Applicant):** [Diagram]
- **Benefit/Cost Ratio (AEA):** [Diagram]
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 #222  Kenai Winds_Nikiski

Resource: Wind
Proposer: Kenai Winds, LLC

Proposed Project Phase: Construction

AEA Program Manager: James Jensen
Applicant Type: IPP

Project Description
The Kenai Winds project is a 9MW wind energy generation facility located in the Nikiski Industrial Area, in Nikiski, on the Kenai peninsula. The project will consist of 5-6 wind turbines disbursed throughout the site.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Cost of Power:</td>
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AEA Recommendation

- Full Funding
- Partial Funding: X
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn

AEA Funding Recommendation: $2,000,000
App #222  Kenai Winds_Nikiski

**Resource:** Wind  
**Proposer:** Kenai Winds, LLC  
**Proposed Project Phase:** Construction Design  
**AEA Program Manager:** James Jensen  
**Applicant Type:** IPP

**Scoring & Location**

- **Energy Region:** Railbelt  
- **Election District:** 34, Rural Kenai

<table>
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<tr>
<th>Overall Rank (out of 60)</th>
<th>Stage 3 Total Score (out of 100)</th>
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<tbody>
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<td>26</td>
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**Stage 3 Scoring Summary**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
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<td>5</td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
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</tr>
</tbody>
</table>

**AEA Review Comments**

The applicants request funding for final design and permitting and construction funds for a 9 MW wind farm to be located at or near the Tesoro refinery in Nikiski. As noted in the application this project will affect not only HEA but other Railbelt utilities.

Recommend full funding with the following grant conditions: 1) applicant is 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 HEA or other public utility prior to release of construction grant funds.

Stage 3 review update: Following discussions on regional funding allocation, project funding is capped at $2,000,000 per affected community for Railbelt and lower energy cost Southeast communities and $4,000,000 for other communities.
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #222  Kenai Winds_Nikiski

Resource: Wind
Proposer: Kenai Winds, LLC

Proposed Project Phase: Construction Design

AEA Program Manager: James Jensen
Applicant Type: IPP

Economic Analysis

Benefit/Cost Ratio (Applicant) 0.98
Benefit/Cost Ratio (AEA) 1.09

• The applicant’s project capital cost estimate ($21 million) is low compared to the AEA benchmark for a non-rural 9 MW wind farm project ($31.5 million). The AEA analysis uses the applicant’s estimate. The scale of this project and the size of the wind turbines are much larger than the average project applying for funding, and there is no allowance for economies of scale in the benchmark. The applicant has experience in building wind farms around the country and we find it reasonable that the project capital cost could be lower than the AEA benchmark.
• The applicant does not specify whether the cost of interconnection to the HEA system is included in the capital cost. HEA has contracted with Electric Power Systems Inc. (EPS) to perform a study of the HEA’s generation expansion, as well as evaluating the Kenai Winds project and its impact on the HEA transmission system. The results of the study will be used to evaluate the alternative points of interconnection near the Tesoro Alaska Refinery. The study is currently underway. We have not added any costs to HEA to the analysis since we do not have any information on such costs.
• This analysis assumes the applicant’s estimate for O&M costs of non-rural wind projects of $0.023; which is slightly more than AEA benchmark for of $.018 per kWh. The applicant assumes O&M cost will escalate by 3% annually; in the AEA analysis we use the applicant’s O&M costs but do not escalate the O&M cost.
• The analysis results in a B/C ratio of slightly less than one for the review using the applicant’s data (0.98) and a positive B/C ratio with the AEA model data and analysis (1.09). The 1.09:1 benefit-cost ratio is anticipated to be lower once the HEA interconnection costs are added. The ratio could be higher or lower once the final wind resource analysis is complete.

Long Term Sustainability/Concerns/Issues
Construction costs in Alaska are very high compared to elsewhere in the U.S. and the applicant’s capital cost is about 2/3 of the benchmark capital cost for wind projects in the Railbelt. While the applicant’s capital cost may be achievable given the location of the project and existing infrastructure in proximity to the proposed site, a review of a detailed cost schedule by a qualified engineer could alleviate concerns about capital costs for the project.
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 #223  Neck Lake Hydro_APT

Resource: Hydro  Proposed Project Phase: Construction
Proposer: Alaska Power & Telephone Company  Design
  Feasibility

AEA Program Manager: Doug Ott  Applicant Type: Utility

Project Description
AP&T proposes to construct a small run-of-river hydroelectric project at Neck Lake, a 1,000 acre lake located 1.5 miles southwest of the community of Whale Pass on Prince of Wales Island. The Project would supply power to the community of Whale Pass, and would offset diesel generation, which is currently the sole source of electricity. The relatively high and modulated flows from the lake combined with the steep drop at the lower end of the outlet stream provide a good opportunity for a small run-of-river hydroelectric development. Facilities would include an access road, intake structure, 400 feet of penstock, a containerized power plant, a tailrace channel, and upgrade of 4 miles of transmission line. The hydroelectric facilities will be designed to avoid interference with the existing salmon rearing and collection facilities operated at Neck Lake by the Southern Southeast Regional Aquaculture Association (SSRAA). AP&T conducted a reconnaissance study of the site in 2008, and determined that there is sufficient potential to almost always provide enough generation for Whale Pass loads (see Section 7- Appendices for a copy of the reconnaissance report). The Project will provide clean, renewable electricity, as well as rate stabilization and lower rates for AP&T's Whale Pass customers.

Funding & Cost

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Cost of Power</td>
<td>$0.66/kWh</td>
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<tr>
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<td>Total Potential Grant Amount</td>
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<td>AEA Funding Recommendation (Not Constrained by Available Funding)</td>
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AEA Recommendation

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

AEA Funding Recommendation: $108,000
App #223  Neck Lake Hydro_APT

Resource: Hydro  Proposed Project Phase: Construction
Proposer: Alaska Power & Telephone Company  Design
Proposer: Alaska Power & Telephone Company  Feasibility

AEA Program Manager: Doug Ott  Applicant Type: Utility

Scoring & Location

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)
10  74.2

Energy Region: Southeast
Election District: 5, Cordova-Southeast Islands

Rank within Region (out of 12)
1

Stage 3 Scoring Summary

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<td>1) Cost of Energy (Max 30)</td>
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<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<td>7) Sustainability (Max 5)</td>
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</table>

AEA Review Comments

Project may interact with SSRAA smolt rearing and fish taking facility. Question whether AP&T will be able to access resource.

Recommend partial funding of $108,000 for Phase 2 - Feasibility (includes mapping, conceptual design, geotech and environmental surveys) with requirement that AP&T work closely with SSRAA and provide for their involvement as a reviewer of the resulting feasibility study.
Economic Analysis

This project is to evaluate and install a run-of-the-river hydro power plant at Neck Lake near Whale Pass. The site reconnaissance suggests upwards of 750 kW could be provided with 3.2 GWh/yr. Current plans are for evaluation of 124 kW unit at 28% capacity factor, adequate for electrical needs of Whale Pass, but with capability of up to 1.0 GWh/yr. The output of the project, if feasible, will be available to offset all diesel electric generation of the region, and supply a considerable portion of the heating fuel requirements.

The applicant estimated no contribution to offset heating fuel. The AEA analysis assumes a portion of the surplus energy would be available to offset 5,100 gallons of diesel for space and water heating. No concerns. Increase installed size for greater output to provide for further space and water heating opportunities. Reasonable to assume long-term sustainability.
App #223  Neck Lake Hydro_APT

Resource: Hydro  Proposed Project Phase: Construction
Proposer: Alaska Power & Telephone Company  Design
  Feasibility

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 #224  Haines Assistant living GSHP_Apt

**Resource:** Geothermal  
**Proposer:** Alaska Power and Telephone, Inc.  
Haines Assistant Living, Inc.

**AEA Program Manager:** Lenny Landis  
**Applicant Type:** Utility

### 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. The building site is on lots fronting Third St. from Dalton to Union. Residents of Haines and Southeast Alaska will utilize the senior assisted living and senior affordable housing complex being built in 2008—2010. The project is a collaboration seven years in development and funded by the Denali Commission, the Community Development Block Grant Program, the Rasmuson Foundation and the community of Haines. 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.

### Funding & Cost

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### AEA Recommendation

- AEA Funding Recommendation: (Not Constrained by Available Funding)
- AEA Recommendation: Full Funding
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #224  Haines Assistant living GSHP_Apt

**Resource:** Geothermal

**Proposer:** Alaska Power and Telephone, Inc.
Haines Assistant Living, Inc.

**AEA Program Manager:** Lenny Landis

**Proposed Project Phase:** Construction
Design

**Applicant Type:** Utility

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### Scoring & Location

- **Energy Region:** Southeast
- **Rank within Region:** (out of )
- **Election District:** 5, Cordova-Southeast Islands

**Overall Rank** (out of 60)  
**Stage 3 Total Score** (out of 100)  

### Stage 3 Scoring Summary

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<thead>
<tr>
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<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<td>6) Local Support (Max 5)</td>
<td></td>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</tbody>
</table>

### AEA Review Comments

Utility AP&T proposes, on behalf of Haines Assisted Living Inc, to assess temperature of groundwater in a test well ($100,000), prepare a final design and obtain permits ($85,486) and construct a ground source heating system ($2,193,521) to displace 16,600 gallons per year of heating fuel for a assisted living facility under development. The test well would be completed in April 2009. Final design permitting and material order would be completed in June, and construction would be completed in October.

AEA is concerned at the very high cost of the project compared to modest potential fuel displacement. Economics appear marginal and do not support applicants claims of cost savings to residents. Although geothermal resources are generally sustainable, at this scale the project does not produce enough net benefits to be sustainable in the long term without some form of subsidy.

Recommend no funding.
Economic Analysis

Benefit/Cost Ratio (Applicant)  .58
Benefit/Cost Ratio (AEA)  .58

This project will lower heating and hot water costs for residents and users of this facility in the community of Haines by about $30,000 per year. The alternative for this GSHP is a fuel fired boiler, and capital costs for that alternative are included in the analysis. The applicant assumes a life of 25 years, with a water to water pump replacement at year 20. The scale of this project is small, and the cost savings per year are not enough to offset the costs of construction after 25 years. The applicant contracted a life cycle cost analysis that shows a cost savings after a 25 year project life, but that life cycle analysis has different assumptions than the AEA model, so is not comparable. Were the scale of this project larger, it might be able to garner a positive benefit/cost ratio. Indirect benefits from the project that are not considered in the benefit/cost analysis include the fact that the recipients of the lower heating and hot water costs are senior citizens who are generally on a fixed income. In addition, any use of this new technology provides more information towards the success of future projects. Geothermal resources are generally sustainable, however, at this scale the project does not produce enough net benefits to be sustainable in the long term without some form of subsidy.
App #224  Haines Assistant living GSHP_Apt

Resource: Geothermal
Proposer: Alaska Power and Telephone, Inc.
Haines Assistant Living, Inc.

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Proposed Project Phase: Construction Design

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
The proposal does not state the expected temperature of water as it exits the well field, but does make it clear that this system, through heat exchange, is expected to provide domestic hot water – presumably > 100°F – in addition to space heat. Ground temperatures at 125’ should be near the mean annual temperature (~40-45°F). If heat pump technology is capable of doubling the temperature of the water then this proposal could work. If the proposers expect the water exiting the well field to be substantially warmer than 45°F (they use the term “geothermal”) then the feasibility of this proposal is doubtful. DGGS does not have expertise in heat pump technology and restricts comments to ground temperature.

DNR/DMLW Feasibility Comments
**App #225  Triangle Lake_Metlakatla Indian Community**

**Resource:** Hydro  
**Proposer:** Metlakatla Indian Community (MIC)

**Proposed Project Phase:** Feasibility

**AEA Program Manager:** Doug Ott  
**Applicant Type:** Government Entity

---

**Project Description**

The proposed Triangle Lake hydroelectric project will be located on the west side of Annette Island near the route of the proposed Metlakatla – Ketchikan Intertie. The project as presently envisioned will be comprised of a small embankment dam at the outlet of Triangle Lake, a 1.3 mile long penstock and a powerhouse containing a single horizontal Francis turbine generating unit with a capacity of 4.0 MW. The Triangle Lake project will provide additional hydroelectric power to Metlakatla and, with construction of the Metlakatla – Ketchikan Intertie, to the interconnected electric systems of Ketchikan, Wrangell and Petersburg. MIC will develop and own the Triangle Lake project.

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**Funding & Cost**

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**AEA Recommendation**

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

**AEA Funding Recommendation:** $500,000
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #225  Triangle Lake_Metlakatla Indian Community

Resource: Hydro  Proposed Project Phase: Feasibility
Proposer: Metlakatla Indian Community (MIC)  Applicant Type: Government Entity

AEA Program Manager: Doug Ott

Scoring & Location

Energy Region: Southeast
Election District: 5, Cordova-Southeast Islands

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of 12)
58  37.6  12

Stage 3 Scoring Summary

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<tr>
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<td>1) Cost of Energy (Max 30)</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</tbody>
</table>

AEA Review Comments

Improved access to the proposed Triangle Lk hydro site by recent road construction to Walden Point makes hydro development at more reasonable to consider. Project would be located on federal trust land. Major issue is market for power. Will need to be determined in regional IRP.

Recommend full funding for feasibility.
A 4.0 MW (limited or no storage) hydro resource with expected average potential generation of 17,324,000 kWh. Project is to be on Annette Island with power primarily to be sold to Ketchikan Public Utilities. Power would displace the need for diesel generation by KPU. Metlakatla's currently has surplus hydro, and Triangle Lake would be of limited use by Metlakatla.

Assumptions Modified:
1. Benefits based on selling to KPU. Therefore operating and capital costs of Metlakatla – KPU intertie included in both Applicant and AEA analysis.
2. Applicant provided estimate of displaced diesel O&M to be $0.017/kWh. Modified to AEA standard of $0.02/kWh in AEA analysis.

Economics based on use by KPU. Even if Whitman Lake is constructed, it appears (absent usability analysis) that Triangle Lake could be used. However, Tyee-Swan Intertie would preclude the resource from being used. Will KPU desire to purchase output? The Alternative scenario assumes 2 million kWh are sold to Ketchikan during Swan-Tyee outages. This implies that Swan-Tyee is out nearly 12% of the time. Is a 12% failure rate consistent with what was used in the Swan-Tyee feasibility studies? Construction of the SE Intertie, although the resource is of limited size to support other large capital expenditures. Reasonable to assume long-term sustainability if the power can be marketed.
App #225  Triangle Lake_Metlakatla Indian Community

Resource: Hydro  Proposed Project Phase: Feasibility
Proposer: Metlakatla Indian Community (MIC)

AEA Program Manager: Doug Ott  Applicant Type: Government Entity

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #226  Carlson Creek Hydro_APT

Resource: Hydro
Proposer: Alaska Power Company (a subsidiary of Alaska Power & Telephone Company)
AEA Program Manager: Doug Ott
Proposed Project Phase: Design
Feasibility
Recon
 Applicant Type: Utility

Project Description
AP&T proposes to construct the 300 kW Carlson Creek Hydroelectric Project (Project), which will be located approximately 8 miles north of Slana on the Glenn Highway (Tok Cutoff). The Project would offset diesel generation which presently supplies power to the communities of Slana and Chistochina. The Project will consist of two small diversion structures, approximately 13,200 feet of penstock, a powerhouse with a single generating unit, tailrace, small substation, and a very short length of transmission line. For about half the year, the Project operation will be run-of-river, but during the colder months the Project will draw water from Carlson Lake. The potential annual generation is estimated to be approximately 1,200 MWh/yr, which is greater than the current annual requirements of the two communities. Therefore, the Project has the potential to offset 100% of the current diesel generation. 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

<table>
<thead>
<tr>
<th>Cost of Power:</th>
<th>$0.66/kWh</th>
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AEA Recommendation

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

AEA Funding Recommendation: $40,000
App #226  Carlson Creek Hydro_APT

Resource: Hydro
Proposer: Alaska Power Company (a subsidiary of Alaska Power & Telephone Company)
AEA Program Manager: Doug Ott

Proposed Project Phase: Design Feasibility Recon
Applicant Type: Utility

Scoring & Location

Overall Rank (out of 60) 18
Stage 3 Total Score (out of 100) 67.9
Energy Region: Copper River/Chugach
Election District: 6, Interior Villages
Rank within Region (out of 5) 3

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<td>6) Local Support (Max 5)</td>
<td>0</td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
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AEA Review Comments

AEA has concerns about long penstock and the potential for the project to match resource to load. Flashy stream may increase risk to long term success of project.

Recommend $40,000 partial funding for Application’s Phase 1 - Reconnaissance (stream gauging and reconnaissance study).
Economic Analysis

This project is to complete site reconnaissance through final design and permitting of a hydroelectric facility to serve Slana and Chistochina, and potentially provide for energy to Mentasta Lake. The estimated capability of the 300 kW installation will provide 1,200 MWh/yr, fully providing for the electrical needs of the two communities and the possible addition of Mentasta following construction of an intertie. Estimated cost is $6,300,000 with a start date of 2014, if found feasible and eligible for construction permits. The output of the project, if feasible, will be available to offset all diesel electric generation of Slana and Chistochina, and potentially the load of Mentasta Lake (following investment in a distribution line). The applicant estimated no contribution to offset heating fuel. The AEA analysis assumes a portion of the surplus energy would be available to offset 2,500 gallons of diesel fuel equivalent for space and water heating, assuming no loads at Mentasta.

Concerns:
None noted. Reasonable to assume long-term sustainability.
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.
App #227  AK_BC Intertie_Wrangell

Resource: Transmission  Proposed Project Phase: Design
Proposer: City and Borough of Wrangell

AEA Program Manager: Doug Ott  Applicant Type: Local Government

Project Description

The AK-BC Intertie would provide a further opportunity to secure the energy future for Southeast Alaska. The AK-BC Intertie is a 26.5 mile transmission line from the existing Tyee Lake Project to the AK-BC border. A feasibility study was conducted by Hatch Energy in 2005. This phase of the project would continue the project from the feasibility stage into the permitting engineering phase. The purpose of this project is to export surplus power for sale in British Columbia/Pacific Northwest which would encourage development of new projects and provide additional reliability benefits. The ability to export power would encourage early development of new hydro generation, as well as provide revenue from exports, which will help ensure future maintenance of the current overall status of a clean hydro-powered region, offer operating flexibility for the southeast Alaska power system, and provide future benefits to the region under the proposed marketing oversight proposal.

Funding & Cost

<table>
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<th>AEA Funding Recommendation:</th>
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Cost of Power: $0.11 /kWh
Requested Grant Funds: $4,433,414
Matched Funds Provided: $600,000
Total Potential Grant Amount: $5,033,414

Existing RE Fund Grant Offer:

AEA Recommendation:
Full Funding
Partial Funding
Special Provision
× Not Recommended
Did Not Pass Stage 1
Withdrawn
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #227  AK_BC Intertie_Wrangell

Resource: Transmission  Proposed Project Phase: Design
Proposer: City and Borough of Wrangell

AEA Program Manager: Doug Ott  Applicant Type: Local Government

Scoring & Location

Energy Region: Southeast
Election District: 2, Sitka-Wrangell-Petersburg

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
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<tr>
<td>2) Funding Resources (Max 25)</td>
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<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<tr>
<td>4) Project Readiness (Max 5)</td>
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<td>6) Local Support (Max 5)</td>
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</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
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</tr>
</tbody>
</table>

AEA Review Comments

AEA has considered this intertie under the AK-BC Export Intertie Project, and a recent study on the project, and meetings between AEA and the AK-BC Advisory Work Group has led AEA to not pursue the project for the time being. One key determine will be whether BC Transmission Corporation decides to construct an intertie link within BC to extend its network to near the Alaska border. No such intertie exists now.

On this basis funding not recommended.
App #227  AK_BC Intertie_Wrangell

Resource: Transmission
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)
App #227  AK_BC Intertie_Wrangell

Resource: Transmission  Proposed Project Phase: Design

Proposer: City and Borough of Wrangell

AEA Program Manager: Doug Ott  Applicant Type: Local Government

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
Project Description

The City and Borough of Wrangell (City) has a need for an economical alternative power source during the annual maintenance shutdown of the Tyee Lake Hydroelectric facility and as an alternative power source in the event of a catastrophic failure similar to the one experienced in Juneau in the summer of 2008. An additional need is another source of water for the City reservoir, which periodically runs very low on water and has an eminent risk of running out of water for the City’s use. Since there is a pertinent need for the additional water source that Sunrise Lake can provide, it is economical and feasible that the two projects be constructed simultaneously. Hence, by utilizing the outflow from the hydroelectric project turbines, the City will have an additional water source. These two projects are mutually exclusive to each other. In 1997, The Bentley Company performed a reconnaissance study to determine the feasibility of developing hydroelectric power at Sunrise Lake. Sunrise Lake is a 70 acre, 100 foot deep, perched lake on Woronkofski Island, an uninhabited island approximately five miles from the City of Wrangell.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Power:</td>
<td>$0.11/kWh</td>
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<tr>
<td>Requested Grant Funds:</td>
<td>$4,367,616</td>
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<td>Matched Funds Provided:</td>
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<tr>
<td>Total Potential Grant Amount:</td>
<td>$4,367,616</td>
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<tr>
<td>Existing RE Fund Grant Offer:</td>
<td></td>
</tr>
</tbody>
</table>

AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
App #228  Sunrise Lake Hydro_Wrangell

Resource: Hydro
Proposer: City and Borough of Wrangell

Proposed Project Phase: Design Feasibility

AEA Program Manager: Doug Ott
Applicant Type: Local Government

Scoring & Location

Energy Region: Southeast
Election District: 2, Sitka-Wrangell-Petersburg

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</tbody>
</table>

AEA Review Comments

Applicant proposes to study the development of a 5 mile 8” submarine penstock to link Sunrise Lake to Wrangell, primarily to provide a water supply for Wrangell. The penstock would need to convey 11.6 CFS of water to provide 1.7 MW of hydropower capacity. The stated penstock would be adequate to convey significantly less water (less than 1 CFS) thus reducing available energy production by 90%.

The alternative would be to use larger capacity, high pressure penstock that will make the project economically infeasible for energy production. A study completed for the City of Wrangell in 1998 by RW Beck for a larger 4 MW project connecting Sunrise Lake to Wrangell would cost $21M in 2009 dollars.

Recommend no funding.
App #228  Sunrise Lake Hydro_Wrangell

Resource: Hydro
Proposer: City and Borough of Wrangell

AEA Program Manager: Doug Ott

Applicant Type: Local Government

Proposed Project Phase: Design Feasibility

Economic Analysis

Benefit/Cost Ratio (Applicant) 0.74
Benefit/Cost Ratio (AEA) 1.43
### App #228  Sunrise Lake Hydro_Wrangell

**Resource:** Hydro  
**Proposer:** City and Borough of Wrangell

**AEA Program Manager:** Doug Ott  
**Applicant Type:** Local Government

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#### DNR/DGGS Geohazards Comments

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#### DNR/DGGS Feasibility Comments

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#### DNR/DMLW Feasibility Comments
### Resource: Wind  
### Proposer: Alaska Vocational Technical Center (AVTEC)  
### Proposed Project Phase: Construction Design  

### AEA Program Manager: James Jensen  
### Applicant Type: Government Entity

#### Project Description

The AVTEC Renewable Energy Fund Wind Project involves the installation of one (1) 100 kW wind turbine on the AVTEC campus located in Seward, Alaska. The completed project will be owned and operated by AVTEC and connected into the electrical distribution system at the school’s industrial electricity facility located on the northern edge of town. The project will offer benefits to AVTEC/State of Alaska through a reduction of operating costs at the state owned facility (electricity) and will be used primarily to support the creation of a world class winddiesel training program that will provide opportunities for rural power plant operators to gain hands on operational experience with wind energy technology. Essentially, the completed project will support the alternative energy investments the state of Alaska is making through its HB 152 legislation by providing a training center and program for wind-diesel system operators. AVTEC has assembled a project team, headed by STG Incorporated, that is prepared to immediately begin work on an accelerated schedule. The project team includes members from Duane Miller Associates LLC, Hattenburg Dilley & Linnell LLC and BBFM Engineers. All aspects of the Final Design/Permitting and Construction project, detailed in the following pages of this application can be completed by fall of 2009.

#### Cost of Power

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
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<td>Total Potential Grant Amount</td>
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#### AEA Recommendation

- **AEA Funding Recommendation:** (Not Constrained by Available Funding)
- **Existing RE Fund Grant Offer:**
- **AEA Funding Recommendation:** Full Funding

- **Did Not Pass Stage 1**
- **Withdrawn**
- **Not Recommended**
App #229   AVTEC Wind

**Resource:** Wind  
**Proposer:** Alaska Vocational Technical Center (AVTEC)

**AEA Program Manager:** James Jensen  
**Applicant Type:** Government Entity

**Proposed Project Phase:** Construction Design

**Scoring & Location**

- **Energy Region:** Railbelt
- **Election District:** 35, Homer-Seward

**Overall Rank** (out of 60)  
**Stage 3 Total Score** (out of 100)

**Stage 3 Scoring Summary**

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<tr>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</table>

**AEA Review Comments**

The project proposes the installation of one NW100 wind turbine at the AVTEC. The wind turbine would generate very little power due to the poor wind resource at the training facility however, the turbine would provide a significant training benefit for operators of wind-diesel systems.

The poor wind resource prevents this project from producing enough energy to fulfill the intent of the grant program. This project is not recommended for funding.
App #229  AVTEC Wind

Resource: Wind

Proposer: Alaska Vocational Technical Center (AVTEC)

AEA Program Manager: James Jensen

Applicant Type: Government Entity

Proposed Project Phase: Construction Design

Economic Analysis

Benefit/Cost Ratio (Applicant) -0.15

Benefit/Cost Ratio (AEA) -0.16

- The applicant provided a detailed breakdown of project costs from Phase I thru Phase IV. The project costs are based on current information. Cost estimates were completed as part of Phase I of the project. No changes were made to cost assumptions.
- The applicant proposed an accelerated schedule (operations starting in 2010) with a skilled team including STG, Duane Miller Associates, Hattenburg, Dilley and Linell, and BBFM Engineers. No change in project schedule assumptions were made.
- Data indicated that the project site is located within a Class 1 wind resource. Net wind energy production was based on Northwind 100 specifications and wind resource data specific to the area (4.7 m/s average wind speed). AVTEC uses an average of 158,613 kWh of electricity annually at the industrial electricity facility. The project is expected to supply 64 percent of the facility’s annual electricity needs. No changes in annual wind energy output were made for AEA analysis.
- The applicant estimates that annual O&M costs for the wind project would be $2,500 per year. These estimated annual O&M costs have been generated through a review of historic O&M costs of other Northwind 100 turbines installed in Alaska and from information provided by a turbine manufacturer. The anticipation of conducting certain major repairs on the wind farm during certain periods of its operational life (gear box replacement, blade repair, etc.) was factored into this estimated annual O&M expense.
- In the spreadsheet model, project benefits are calculated based on avoided cost of energy in the railbelt. AVTEC’s facilities are connected to the electricity grid maintained by the City of Seward and connected to the larger railbelt power grid. Energy generated by the wind project will offset some of the facility’s energy needs but the AVTEC industrial electricity shop will remain connected to the grid.

Long Term Sustainability/Concerns/Issues
The economic viability of the project can not be evaluated in this case solely on the basis of fuel savings. As indicated, the costs of the wind project greatly outweigh the benefits generated by just the fuel savings. The value of the project lies in other benefits generated besides fuel savings. Including these benefits in the benefit/cost ratio calculation results in a B/C ratio of: 2.37.
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
Project Description

The ultimate goal of this project is to produce electricity and employment both sustainably and locally. Thus the name “Keep It Sustainable, and Keep It Local (KISKIL) Energy project.” The project will be located thirty miles east of Delta Junction. The KISKIL Energy project will serve much of the Interior by providing electricity for Golden Valley Electric Association (GVEA) via the grid. Additionally the project will serve Delta Junction, Healy Lake, Dot Lake, Tanacross, Tok and the surrounding areas by hiring regionally, and purchasing wood for fuel locally. The model will be applicable to all small communities and/or mines or other industrial type operations with significant biomass resources nearby. KISKIL Energy is a subsidiary of Delta Mine Training Center (DMTC) organized specifically for this project. DMTC is a 501 (c) 3 nonprofit corporation. DMTC has policies and procedures in place to comply with ISO 9000 standards. KISKIL will be managed by DMTC. With assistance from the Alaska Energy Authority and the resources and capabilities of DMTC, this project will be a success.

Funding & Cost

Cost of Power: $0.17 /kWh
Requested Grant Funds: $2,034,216.9
Matched Funds Provided: $778,003.8
Total Potential Grant Amount: $2,812,220.7

AEA Recommendation

Full Funding
Partial Funding
Special Provision
Not Recommended
× Did Not Pass Stage 1
Withdrawn
App #230  Wood Gasification_KISKIL

Resource: Biomass
Proposer: Delta Mine Training Center, Inc.

AEA Program Manager: Lenny Landis
Applicant Type: IPP

Proposed Project Phase: Design Feasibility Recon

Scoring & Location

Energy Region: Railbelt
Election District: 12, Richardson-Glenn Highways

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of )

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<td>2) Funding Resources (Max 25)</td>
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<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>6) Local Support (Max 5)</td>
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<td>7) Sustainability (Max 5)</td>
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AEA Review Comments
Failed Stage 1
App #230  Wood Gasification_KISKIL

Resource: Biomass
Proposer: Delta Mine Training Center, Inc.

AEA Program Manager: Lenny Landis
Applicant Type: IPP

Proposed Project Phase: Design
Feasibility
Recon

Economic Analysis

Benefit/Cost Ratio (Applicant)
Benefit/Cost Ratio (AEA)
| Resource: Biomass | Proposed Project Phase: Design
Feasibility
Recon |
<table>
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<tr>
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<tr>
<td><strong>Proposer:</strong> Delta Mine Training Center, Inc.</td>
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**AEA Program Manager:** Lenny Landis  
**Applicant Type:** IPP

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**
Project Description

The project, when it is completed, will include a hydroelectric power plant, and associated infrastructure for access and connection, to serve the community of Elfin Cove. The power plant will be located at the mouth of Crooked Creek, a tributary of Port Althorp in Cross Sound. Upon completion, the hydroelectric facility will include: a diversion structure on Crooked Creek; a 1,000-foot long diversion conduit from Crooked Creek to Jim's Lake; a 1,300-foot long penstock from Jim's Lake to tidewater; a hydro power house with Turgo type turbine and programmable automatic paralleling switchgear at tidewater; an onground transmission line to the newly renovated diesel power plant; fiber optic communication cable between the hydroelectric powerhouse and the town site diesel power plant control room; and access trails to the power house and diversion structure. This project will be carried out by local project administrators, with technical and engineering support subcontracted to a consulting engineering firm. At the end of Phase 3 (proposed here) we should be prepared to begin final construction on the hydroelectric power project.

Funding & Cost

<table>
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<td>Existing RE Fund Grant Offer</td>
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<td>AEA Funding Recommendation (Not Constrained by Available Funding)</td>
<td>$347,200</td>
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AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
App #231  Crooked Creek Hydro_Elfin Cove

Resource: Hydro
Proposer: Community of Elfin Cove Non-Profit Corporation, Elfin Cove Utility Commission
AEA Program Manager: Doug Ott
Proposed Project Phase: Design
Applicant Type: Utility

Scoring & Location

Overall Rank (out of 60) 33
Stage 3 Total Score (out of 100) 60.0
Energy Region: Southeast
Election District: 2, Sitka-Wrangell-Petersburg
Rank within Region (out of 12) 5

Stage 3 Scoring Summary

Criterion (Weight) Score
1) Cost of Energy (Max 30) 16
2) Funding Resources (Max 25) 15
3) Project Feasibility from Stage 2 (Max 20) 13
4) Project Readiness (Max 5) 3
5) Benefits (Max 10) 7
6) Local Support (Max 5) 3
7) Sustainability (Max 5) 3

AEA Review Comments

Applicant proposes final design and permitting of a hydro project at Crooked Creek. Feasibility study was already funded by DC/AEA alternative energy RFP. Project site on USFS land, indicating FERC license will be required. AEA has constructed a power and bulk fuel system under the RUS energy program. Hiring engineering firm underway.

Recommend full funding with requirement that AEA approve the feasibility study now underway before any funds associated with this application are disbursed.
Economic Analysis

An 80 kW hydro resource with the potential of 320,000 kWh/ year located approximately 1 mile from Elfin Cove. The project includes a diversion structure, a 1,000-foot diversion conduit to Jim’s Lake, a 1,300-foot penstock to the powerhouse at tidewater, transmission line to the diesel power house, and automatic paralleling switchgear. Power would offset, but not eliminate, the need for diesel requirements by Elfin Cove.

Assumptions Modified:
1. Applicant did not include an O&M estimate. The AEA analysis includes an estimate of $6,000/year, or $0.021/kWh.
2. Applicant did not include any displaced diesel O&M. AEA analysis includes the AEA standard of $0.02/kWh.

No concerns – data appears to be based on previous AEA work. AEA conducted CDR for Elfin Cove and presumably optimum design has been selected. Still, improvements/enhancements (if any exist) to allow winter loads to be met could be beneficial. High maintenance facility with the long penstocks/pipelines. Limited local operators?
**App #231 Crooked Creek Hydro_Elfin Cove**

<table>
<thead>
<tr>
<th>Resource:</th>
<th>Hydro</th>
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<table>
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<tr>
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<tr>
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<th>Doug Ott</th>
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<table>
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<tr>
<th>Proposed Project Phase:</th>
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<table>
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<tr>
<th>Applicant Type:</th>
<th>Utility</th>
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**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**
Project Description

This study examines 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 serves 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. It is a model plant that, when proven successful, will be recreated throughout the fisheries of the State and the nation, and the world.

This facility serves the ecology and the economy as it provides supplemental clean energy from renewable sources to the locally owned cooperative energy association. This energy counteracts the drain on the power grid during the fish processing season – which is what creates the drain. In short, this model plant and its subsequent generations are usage neutral.

Funding & Cost

Cost of Power: $0.23/kWh
Requested Grant Funds: $75,000
Matched Funds Provided: $25,000
Total Potential Grant Amount: $100,000
Existing RE Fund Grant Offer: $75,000

AEA Recommendation

AEA Funding Recommendation: $75,000

× Full Funding
Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
**App #232  Bristol Bay Fish Waste**

**Resource:** Biofuels  
**Proposer:** Naknek Electric Association  
**Proposed Project Phase:** Feasibility  
**AEA Program Manager:** Lenny Landis  
**Applicant Type:** Utility

### Scoring & Location

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

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<th>Rank within Region (out of 5)</th>
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### Stage 3 Scoring Summary

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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>5) Benefits (Max 10)</td>
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<td>0</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
<td>4</td>
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</table>

### AEA Review Comments

Naknek Electric in partnership with the Bristol Bay Borough proposes to assess feasibility of developing a waste processing that recovering fish oil from salmon waste stream in the Naknek-Kvichak fishery to be used as a fuel blend in the NEA power system. The project team would hire a consultant for $65,000 to quantify the estimated 26,000 ton per year fish waste stream from 13 local processors. The application refers to a recon study that NEA and the Borough have completed at a cost of $5000, however the study was not included with the application.

This application is the same as an earlier application submitted in round 1 (app #7) that did not pass stage 1 review due to an incomplete proposal (no cost and budget worksheet).

Recommend full funding of $75,000 with requirement that NEA submit and AEA review and approve recon study before funds are disbursed.
Resource: Biofuels
Proposer: Naknek Electric Association

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
App #232  Bristol Bay Fish Waste_NEA

Resource: Biofuels  Proposed Project Phase: Feasibility
Proposer: Naknek Electric Association

AEA Program Manager: Lenny Landis  Applicant Type: Utility

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #233  Crooked Creek Hydro Kinetic

Resource: Ocean/River  Proposed Project Phase: Feasibility
Proposer: Crooked Creek Traditional Council

AEA Program Manager: David Lockard  Applicant Type: Government Entity

Project Description

Kuskokwim kinetic energy can be measured in the billions. At present the indication is to use the technology born from recent success in tidal and wave kinetic projects in our state. These were born from the successes of low revolving generators used in wind generating systems. Together they paint a pretty picture wind, oceans producing cheap renewable energy. Unfortunately this isn’t the reality, they are any thing but cheap, the wind farms are plagued by rising maintenance cost, imagine what ours will be out here, with the damn thing under water and ice. The price of a watt to install is staggering, close to 25 dollars a watt. The Prototype under our consideration will reduce the install cost to 1.50 to 3.00 dollars per watt, a 85% reduction. We are able to accomplish this by eliminating the generator from the kinetic hydro turbine and placing it on shore and transferring captured river kinetic energy in the form of slowly revolving torque through a drive line configuration encased in line pipe or drilling casing. By eliminating the marriage of the generator to the turbine allows us to develop torque farms by tying several turbines output to one line, thus eliminating the expensive slow RPM generator and replacing it with a more durable and inexpensive unit. At present none of the Hydro-kinetic being consider are suitable for our shallow river, 20’ deep channels exist but are rare. It is part of our efforts will be to design low profile turbines to accommodate the rivers profile without dredging.

Funding & Cost

| Cost of Power: | $0.77 /kWh |
| Requested Grant Funds: | $368,000 |
| Matched Funds Provided: | |
| Total Potential Grant Amount: | $368,000 |
| Existing RE Fund Grant Offer: | |

AEA Recommendation

Full Funding
Partial Funding
Special Provision
× Not Recommended
Did Not Pass Stage 1
Withdrawn
App #233  Crooked Creek Hydro Kinetic

Resource: Ocean/River  Proposed Project Phase: Feasibility
Proposer: Crooked Creek Traditional Council

AEA Program Manager: David Lockard  Applicant Type: Government Entity

Scoring & Location

Energy Region: Lower Yukon-Kuskokwim
Election District: 6, Interior Villages

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

Criterion (Weight)  Score
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

Crooked Creek Traditional Council proposes feasibility and conceptual design of a hydrokinetic energy device of undetermined capacity on the Kuskokwim River. Unlike river energy projects proposed for funding in Igiugig and Ruby, this proposal does not demonstrate a sufficiently detailed work plan, a strong technical team, or statewide collaboration with others with similar goals.

Recommend no funding.
App #233  Crooked Creek Hydro Kinetic

<table>
<thead>
<tr>
<th>Resource: Ocean/River</th>
<th>Proposed Project Phase: Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposer: Crooked Creek Traditional Council</td>
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</tr>
</tbody>
</table>

AEA Program Manager: David Lockard  Applicant Type: Government Entity

Economic Analysis

<table>
<thead>
<tr>
<th>Benefit/Cost Ratio (Applicant)</th>
<th>Benefit/Cost Ratio (AEA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Diagram]</td>
<td>[Diagram]</td>
</tr>
</tbody>
</table>
App #233  Crooked Creek Hydro Kinetic

Resource: Ocean/River  Proposed Project Phase: Feasibility
Proposer: Crooked Creek Traditional Council

AEA Program Manager: David Lockard  Applicant Type: Government Entity

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #234  Knik Arm CHC_KAPP

Resource: Biomass
Proposer: KAPP, LLC

AEA Program Manager: Ron Brown
Applicant Type: IPP

Project Description
5 MW Biomass Combined Heat & Power Project ("CHP" or "Cogeneration") as the first phase of the repowering of KAPP to provide the thermal energy needs of the ARRC, ADF&G and other commercial customers within economic reach of the Project and provide power to help ML&P and Chugach meet new generation needs.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
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<tbody>
<tr>
<td>Cost of Power</td>
<td>$0.13/kWh</td>
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<tr>
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<td>Matched Funds Provided</td>
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<td>Total Potential Grant Amount</td>
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</table>

Existing RE Fund Grant Offer:

AEA Recommendation:

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

AEA Funding Recommendation:

(Not Constrained by Available Funding)
App #234 Knik Arm CHC_KAPP

Resource: Biomass  Proposed Project Phase: Recon
Proposer: KAPP, LLC

AEA Program Manager: Ron Brown  Applicant Type: IPP

Scoring & Location

Energy Region: Railbelt
Election District: 23, Downtown-Rogers Park

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
</tr>
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<tbody>
<tr>
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<td>2) Funding Resources (Max 25)</td>
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<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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</tr>
<tr>
<td>4) Project Readiness (Max 5)</td>
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<tr>
<td>5) Benefits (Max 10)</td>
<td></td>
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<tr>
<td>6) Local Support (Max 5)</td>
<td></td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td></td>
</tr>
</tbody>
</table>

AEA Review Comments

Applicant proposes feasibility assessment, final design and permitting, and construction to retrofit the existing Knik Arm Power Plant (KAPP) to use local biomass as fuel to supply heat and 5 MW of power to the Railbelt grid. The applicant requests $500,000 for feasibility assessment, $2,000,000 for final design and $12,500,000 for construction.

The applicant states that the facility would require 100,000 tons per year of primarily woody biomass fuel and that the project could receive a disposal fee of $10 per ton for material that it receives. No reconnaissance level assessment was provided that justifies these figures.

Recommend no funding.
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #234 Knik Arm CHC_KAPP

Resource: Biomass
Proposer: KAPP, LLC

Proposed Project Phase: Recon

AEA Program Manager: Ron Brown
Applicant Type: IPP

Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
App #234  Knik Arm CHC_KAPP

**Resource:** Biomass  **Proposed Project Phase:** Recon

**Proposer:** KAPP, LLC

**AEA Program Manager:** Ron Brown  **Applicant Type:** IPP

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #235 Kotzebue HR and Ammonia Power Cycle

Resource: Heat Recovery  Proposed Project Phase: Construction Design
Proposer: Kotzebue Electric Association

AEA Program Manager: Lenny Landis  Applicant Type: Utility

Project Description
In order to effectively reduce the amount of diesel consumption in KEA’s power plant, thermal energy must be utilized to the fullest. In order to do so, heat from both the jacket water system and the exhaust heat should be captured. KEA currently utilizes roughly one third of the available thermal energy which originates from the jacket water system. The exhaust will be captured via HRSR stack heat exchangers, manufactured by Cain Industries. Waste heat absorbed into the existing 50/50 glycol loop can generate net 162 kW electricity from an Ammonia Power Cycle, designed by Energy Concepts. The recovered heat will also be utilized in an updated ammonia absorption ice maker and an extended district heating system.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
<tr>
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<tr>
<td>Matched Funds Provided</td>
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<tr>
<td>Total Potential Grant Amount</td>
<td>$1,215,627</td>
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</table>

AEA Recommendation

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

AEA Funding Recommendation: $915,627
App #235  Kotzebue HR and Ammonia Power Cycle

Resource: Heat Recovery
Proposer: Kotzebue Electric Association

Proposed Project Phase: Construction Design

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Scoring & Location

Energy Region: Northwest Arctic
Election District: 40, Arctic

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of 4)

74.2  9  2

Stage 3 Scoring Summary

<table>
<thead>
<tr>
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<th>Score</th>
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<td>5) Benefits (Max 10)</td>
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<td>6) Local Support (Max 5)</td>
<td>2</td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td>5</td>
</tr>
</tbody>
</table>

AEA Review Comments

Applicant proposes to install equipment that will recover unutilized heat from the diesel generator exhaust stacks for district heating and absorption chiller to make ice for the fishing fleet. Utility has track record in heat recovery and high level of management expertise. Stack heat recovery is commercially viable.

Recommend full funding of $915,627.
App #235  Kotzebue HR and Ammonia Power Cycle

Resource: Heat Recovery
Proposer: Kotzebue Electric Association

Proposed Project Phase: Construction Design

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Economic Analysis

| Benefit/Cost Ratio (Applicant) | 9.12 |
| Benefit/Cost Ratio (AEA)       | 7.66 |

The capital costs are modest at $1,215,627 they appear to be complete. The assumption of 24/7 operation 365 days a year was reduced to 90% for more conservative AEA estimates. Project Start-up was assumed 2010 as opposed to applicant’s Nov 2009. The extremely high B/C drew careful inspection of the calculations, which were verified, but still depend on theoretical derivations of the heat recovery system capabilities. Partly the high B/C is due to economies from tying in to the existing heat recovery glycol loop. Both technologies are newer and have risk associated with them. Stack heat systems are prone to failure due to stack corrosion. Ammonia-based thermal conversion to electricity is a new technology. But both are also evolving and there are successful applications (Stack Heat: Red Dog Mine, Kalina Ammonia Power Cycle: Cement plants). Even a high penalty assigned for lower useful life or downtime leaves a high B/C ratio. There is an ice-maker upgrade included in this project at $91,000, but the equipment portion is donated ($65,000) and project costs were therefore left as is. Professional Assessment is high likelihood of success. Sustainable.

It is understood that Kotzebue is applying for other grants. The Assumptions behind this model require 1,500 kW diesel electric production in order to operate at assumed APC efficiency. There is presently no problem with that. A 4.59 MW wind plant will change matters to where the project should be re-evaluated. However, the pay back period for this unit appears to be approximately two years. So if wind came on line after that period, the unit would have paid for itself in increased efficiency.
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 #236  Fivemile Creek_Chitna Electric

**Resource:** Hydro  
**Proposer:** Chitna Electric Inc, (CEI)

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

**AEA Program Manager:** Doug Ott  
**Applicant Type:** Utility

### Project Description

This project is located on the outskirts of Chitina, Alaska, to serve the City of Chitina, the Chitina Airport, and the Chitina community. Generating low cost, sustainable renewable energy and extending the existing power distribution utility to the hydro-electric facility are the two main goals of this project. The existing 25 year old diesel generator plant provides expensive environmentally dirty power of limited reliability. The options for hydro-electric generation facilities have been previously studied for several waterways in the area. (reference appendix) Development of the most affordable, permitable, and sustainable option, Fivemile Creek near the Chitina Airport, with a line extension connection to the existing utility distribution system would provide reliable, low cost, local renewable energy source for a community dependent on high operation cost fossil fuel-powered diesel generators.

### Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Power:</td>
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<td>Matched Funds Provided:</td>
<td>$500,000</td>
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<td>Total Potential Grant Amount:</td>
<td>$4,659,500</td>
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**Existing RE Fund Grant Offer:** $303,000

**AEA Funding Recommendation:** $303,000
App #236  Fivemile Creek_Chitna Electric

Resource: Hydro  Proposed Project Phase: Construction Design Feasibility Recon

Proposer: Chitna Electric Inc, (CEI)  Applicant Type: Utility

AEA Program Manager: Doug Ott

Scoring & Location

Energy Region: Copper River/Chugach

Election District: 6, Interior Villages

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

73.7  11

Rank within Region (out of 5)

Stage 3 Scoring Summary

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

AEA Review Comments

Applicant proposes developing a hydro project at 5-mile Creek near Chitna. Project appears lower risk than previous study of hydro potential of O’Brien Creek. AEA has prepared a conceptual design, final design, and construction for the diesel power plant. Recon work was done in May 2008. Although applicant requests funding for recon, we would characterize it as feasibility level work since it includes stream gauging, an investigation of penstock route and intake structure location. Applicant requests project management assistance from AEA.

Project would result in airport receiving power since it is nearby.

Recomm partial funding for milestones 1-4, 7, 8 totaling $303,000 with requirement that AEA must approve "reconnaissance" feasibility report before additional funding provided.
### Economic Analysis

| Benefit/Cost Ratio (Applicant) | 2.41 |
| Benefit/Cost Ratio (AEA)      | 1.83 |

This project is to complete site reconnaissance through final design, permitting and construction of a 300 kW hydroelectric facility, including a 4 mile distribution line to serve Chitna, the airport and a DOT maintenance facility. An initial reconnaissance study was completed in 2008, indicating the possibility of a start date of operation in 2012. Applicant indicates funding of the distribution line has been pending at the Denali Commission, and “inexplicably” delayed. The output of the project, if feasible, will be available to offset all the diesel electric generation of Chitna and provide surplus energy for to offset heating fuel on an interruptible basis. No estimate of heating offset was provided. The applicant estimated an additional load from the airport of a stable 25,000 kWh/year, and a base load growth of 3.26% per year. The AEA analysis reduced this to 1%/year, but assumed that the Denali Commission funding for the distribution line was available to offset the capital cost of the project. No concerns. Reasonable to assume long-term sustainability.
<table>
<thead>
<tr>
<th>Resource: Hydro</th>
<th>Proposed Project Phase: Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposer: Chitna Electric Inc, (CEI)</td>
<td>Design</td>
</tr>
<tr>
<td></td>
<td>Feasibility</td>
</tr>
<tr>
<td></td>
<td>Recon</td>
</tr>
<tr>
<td>AEA Program Manager: Doug Ott</td>
<td>Applicant Type: Utility</td>
</tr>
</tbody>
</table>

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #237  Kotlik Pellet Stove_KYE

Resource: Biomass

Proposer: Kotlik Yupik Enterprise

AEA Program Manager: Ron Brown

Proposed Project Phase: Construction

Applicant Type: Government Entity

IPP

Project Description

Pellet stoves utilized in homes will alleviate the high costs of heating homes. A self contained pellet plant can process pellets from willows found in all the myriad rivers of the Yukon Delta. The use of biomass pellets will reduce consumption of fossil fuels and create needed jobs for residents. Kotlik has an estimated population of 670 and 130 households. The success of a project as this can be expanded to other vilatges in rural Alaska.

Funding & Cost

Cost of Power: $0.57/kWh

Requested Grant Funds: $626,400

Matched Funds Provided: $50,000

Total Potential Grant Amount: $676,400

Existing RE Fund Grant Offer:

AEA Funding Recommendation: (Not Constrained by Available Funding)

AEA Recommendation

Full Funding
Partial Funding
Special Provision
Not Recommended
✗ Did Not Pass Stage 1
Withdrawn
App #237 Kotlik Pellet Stove_KYE

Resource: Biomass  Proposed Project Phase: Construction

Proposer: Kotlik Yupik Enterprise

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

IPP

Scoring & Location

Energy Region: Lower Yukon-Kuskokwim

Election District: 39, Bering Straits

Overall Rank (out of 60)
Stage 3 Total Score (out of 100)

Rank within Region (out of )

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<tbody>
<tr>
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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>4) Project Readiness (Max 5)</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</table>

AEA Review Comments

Failed Stage 1
App #237  Kotlik Pellet Stove_KYE

**Resource:** Biomass  
**Proposer:** Kotlik Yupik Enterprise

**AEA Program Manager:** Ron Brown  
**Applicant Type:** Government Entity

**Proposed Project Phase:** Construction

**Benefit/Cost Ratio (Applicant)**

**Benefit/Cost Ratio (AEA)**

---

**Economic Analysis**
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
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #238  Pilot Point High Penetration Wind/Diesel/CHP

| Resource: Wind | Proposed Project Phase: Construction Design |
| Proposer: City of Pilot Point |

AEA Program Manager: James Jensen  
Applicant Type: Utility  
Local Government

Project Description

This funding request is for a three phased high penetration wind/diesel power and heating system that will eventually be capable of providing over half of Pilot Point's heating and energy needs without a battery storage system. The project will serve Pilot Point and be located at the designated City owned wind park site which now has two small 10kWh wind turbines and towers with one producing power for over five years and the second ready for installation in November. The site is located away from the coast, residential areas, and avian flight and feeding routes. The project will produce excess power during cold, predominately north wind winter periods and provide heating for residential homes through electric thermal impact stoves as well as a boiler grid interface system to heat centrally located public buildings. Our steadiest winds are from the north tend to occur in the winter, are very cold and are strongest at the time when heating relief is the most needed. The project is also needed to stabilize kWh rates and allow for economic development. Pilot Point is rich in natural renewable resources that cannot be developed without sustainable energy.

Funding & Cost

| Cost of Power: $0.50/kWh |
| Requested Grant Funds: $910,180 |
| Matched Funds Provided: $45,280 |
| Total Potential Grant Amount: $955,460 |

| AEA Funding Recommendation: Not Constrained by Available Funding |

AEA Recommendation

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

AEA Funding Recommendation: $910,180
App #238  Pilot Point High Penetration Wind/Diesel/CHP

Resource: Wind  Proposed Project Phase: Construction Design
Proposer: City of Pilot Point

AEA Program Manager: James Jensen  Applicant Type: Utility Local Government

Scoring & Location

<table>
<thead>
<tr>
<th>Overall Rank (out of 60)</th>
<th>Stage 3 Total Score (out of 100)</th>
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</thead>
<tbody>
<tr>
<td>29</td>
<td>60.4</td>
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</table>

Energy Region: Bristol Bay
Election District: 37, Bristol Bay-Aleutians
Rank within Region (out of 5):

Stage 3 Scoring Summary

<table>
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<tr>
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<td>5) Benefits (Max 10)</td>
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<td>2</td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td>4</td>
</tr>
</tbody>
</table>

AEA Review Comments

The City of Pilot Point requests funding for design and construction of a high penetration wind farm consisting of one Northwind 100 turbines to be site on City land. Pilot Point has operated a 10 kW Bergey turbine for 5 years and were in the process of adding another in November. The City has consulted with USFWS and an archeologist to assess wildlife and historic/archaeological issues. There no indications that permitting will be an issue. Project manager would be Dennis Meiners, who is also involved with projects in Kwig, Kong, and Tuntutulik.

Recommend full funding of $910,180.
Economic Analysis

The applicant’s proposal does not contain sufficient information to be absolutely certain that the proposed wind turbines would lower energy costs, since the HOMER program runs were with a 3 X 65 kW system rather than the proposed 2 X 100 kW turbines. On the surface however, it appears that the system could achieve lower costs for both electricity and heat. However, it appears that the applicant’s cost estimates may not have considered the district heating costs. Also the O&M costs for the renewable heating system have not been identified. The aggregate capital costs for the wind turbines and associated electrical equipment appear reasonable. Operating costs proposed by the applicant, even after allocating the costs between electricity and heat, are higher than the benchmarks and are used in the analysis. We reduced the volume of fuel saved in heating to account for the fact that district heating systems typically lose 10% or more of their energy due to line losses during distribution.

The high penetration CHP system has merit and could be a worthwhile investment. We believe that the applicant should provide information demonstrating that the cost of the district heating system has been incorporated into the cost estimate and provide estimates for O&M and repair of the heating system prior to an award. If a revised cost estimate and O&M still has a positive benefit-cost ratio then we would recommend funding the first phase of the project and then monitoring the initial project to see if the turbine performs as expected before committing to the second turbine.
App #238  Pilot Point High Penetration Wind/Diesel/CHP

Resource: Wind  Proposed Project Phase: Construction
Proposer: City of Pilot Point  Design

AEA Program Manager: James Jensen  Applicant Type: Utility
                     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 #239  Biomassheat Anchorage_Earth Run Energy

Resource: Biomass  Proposed Project Phase: Feasibility

Proposer: EarthRun Energy

AEA Program Manager: Ron Brown  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, Alaska 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

<table>
<thead>
<tr>
<th>Cost of Power:  $0.09/kWh</th>
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<td>Matched Funds Provided:</td>
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<td>Total Potential Grant Amount: $42,000</td>
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</table>

Existing RE Fund Grant Offer:

AEA Funding Recommendation:  (Not Constrained by Available Funding)

AEA Recommendation:
Full Funding
Partial Funding
Special Provision
X Not Recommended
Did Not Pass Stage 1
Withdrawn
App #239  Biomassheat Anchorage_Earth Run Energy

Resource: Biomass
Proposer: EarthRun Energy

Proposed Project Phase: Feasibility

AEA Program Manager: Ron Brown
Applicant Type: IPP

Scoring & Location

Energy Region: Railbelt
Election District: 23, Downtown-Rogers Park

Overall Rank (out of 60)
Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
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<tr>
<td>6) Local Support (Max 5)</td>
<td></td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td></td>
</tr>
</tbody>
</table>

AEA Review Comments

Applicant proposes harvesting beetle-killed spruce and other wood from Anchorage residential lots and public lands, transporting it to Russian Jack park, and burning it to displace natural gas currently heating 1/3rd of the greenhouse.

The concept of thinning and beautifying the Anchorage-area urban forests in order to displace fossil fuel is very appealing. However the relative scale required to economically displace natural gas is much larger than that of the proposal. As proposed the economics of this proposal are not attractive.

Recommend no funding.
Economic Analysis

Benefit/Cost Ratio (Applicant) \(0.20\)  
Benefit/Cost Ratio (AEA) \(0.13\)

Total project cost was increased to $347,500 to reflect a separate boiler building and a simple wood chip storage building (covered, but unheated). Project costs were allocated between 2009 and 2010, with $42,000 in costs for 2009 and the remainder in 2010. No in-kind funds were projected and all costs (such as boiler purchase, connections, etc.) are anticipated to become future funding requests to AEA. Derived savings of $3,000 per year are based on AEA and ISER supplied fuel costs for Anchorage (southern Railbelt). The applicant estimates $9,000 per year. As proposed, this project is not economical. With revisions, especially engineering analysis of the boiler operations, it could become a viable demonstration of how urban forests can be cleaned and at the same provide “green” heat for the Municipality.
### App #239  Biomassheat Anchorage_Earth Run Energy

<table>
<thead>
<tr>
<th>Resource:</th>
<th>Biomass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposer:</td>
<td>EarthRun Energy</td>
</tr>
<tr>
<td>Proposed Project Phase:</td>
<td>Feasibility</td>
</tr>
<tr>
<td>AEA Program Manager:</td>
<td>Ron Brown</td>
</tr>
<tr>
<td>Applicant Type:</td>
<td>IPP</td>
</tr>
</tbody>
</table>

### DNR/DGGS Geohazards Comments

- None provided.

### DNR/DGGS Feasibility Comments

- None provided.

### DNR/DMLW Feasibility Comments

- Similar to the first round. May have substantial challenges obtaining authorizations for gathering wood in Anchorage.
### App #240 Wasteoil for Heat #2 Fuel

**Resource:** Other  
**Proposer:** Daniel A Pryse  

**AEA Program Manager:**  
**Applicant Type:** IPP

### Project Description

Project will be located in the fishing ports of coastal Alaska. From Ketchikan to Dutch Harbor we will be surveying the 20 larger communities involved in the fishing industry to catalog their waste oil production, and where resources are presently used. That information will be shared with state and local authorities to show potential as recyclable fuel and waste disposal. This oil could be utilized as fuel in school buses, generators, garbage trucks, or as any #2 fuel.

### Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Cost of Power</td>
<td>$0.17/kWh</td>
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<tr>
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<tr>
<td>Total Potential Grant Amount</td>
<td>$116,625</td>
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</table>

### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
-did not pass stage 1
- Withdrawn
App #240 Wasteoil for Heat #2 Fuel

Resource: Other
Proposer: Daniel A Pryse

Proposed Project Phase: Feasibility Recon

AEA Program Manager: Applicant Type: IPP

Scoring & Location

Energy Region: Southeast
Election District: 2, Sitka-Wrangell-Petersburg

Overall Rank (out of 60) Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
</tr>
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<tbody>
<tr>
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<td>2) Funding Resources (Max 25)</td>
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<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<tr>
<td>4) Project Readiness (Max 5)</td>
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</tr>
<tr>
<td>5) Benefits (Max 10)</td>
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<tr>
<td>6) Local Support (Max 5)</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</table>

AEA Review Comments
App #240  Wasteoil for Heat_#2 Fuel

Resource: Other
Proposer: Daniel A Pryse

Proposed Project Phase: Feasibility Recon

AEA Program Manager:
Applicant Type: IPP

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
App #240  Wasteoil for Heat #2 Fuel

Resource: Other
Proposer: Daniel A Pryse

Proposed Project Phase: Feasibility Recon

AEA Program Manager:      Applicant Type: IPP

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
### Project Description

The Alaska Gasline Port Authority (AGPA) will prepare a feasibility analysis for a new natural gas distribution system to provide service to the 3300 potential customers of North Pole, Moose Creek, and Salecha, areas. Residents currently heat with home heating oil, coal, and/or wood. Natural gas service from Fairbanks Natural Gas is not available outside of the city of Fairbanks. The feasibility analysis would include but not be limited to preparing a conceptual design of the high pressure and distribution system, preparing a base computer model of the proposed system, preparing various design scenarios using the base model as a foundation, developing and reviewing various design scenarios including location of gate stations, district regulators, and high pressure main routing, preparing conceptual rate schedule, preparing conceptual construction costs estimates, preparing a cost/revenue comparisons between the various scenarios, recommending a most feasible/practical conceptual design, and recommending construction phasing.

### Funding & Cost

**Cost of Power:** $0.17 /kWh

**Requested Grant Funds:** $30,000

**Matched Funds Provided:**

**Total Potential Grant Amount:** $30,000

**Existing RE Fund Grant Offer:**

**AEA Funding Recommendation:**

(Not Constrained by Available Funding)

---

**AEA Recommendation:**

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
App #241  Natural Gas Distribution_AGPA

Resource: Gas  Proposed Project Phase: Feasibility

Proposer: Alaska Gasline Port Authority

AEA Program Manager:  Applicant Type: Government Entity

Scoring & Location

Energy Region: Railbelt

Election District: 11, North Pole

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
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<td>2) Funding Resources (Max 25)</td>
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<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<td>6) Local Support (Max 5)</td>
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AEA Review Comments
App #241 Natural Gas Distribution_AGPA

Resource: Gas
Proposer: Alaska Gasline Port Authority

Proposed Project Phase: Feasibility

AEA Program Manager:
Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)          Benefit/Cost Ratio (AEA)
Resource: Gas
Proposer: Alaska Gasline Port Authority

Applicant Type: Government Entity

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments
This project is a feasibility study to prepare a conceptual design of a new natural gas distribution system in the North Pole area, Interior Alaska. This project does not propose the exploration for or development of natural gas resources. The proposal states: The feasibility study will serve as the first step toward understanding the impact of a gasline to/through Fairbanks and North Pole on local energy resources and the energy infrastructure. Therefore, the Alaska Division of Geological & Geophysical Surveys (DGGS) has no comment on engineering feasibility study for a gas pipeline.

DNR/DMLW Feasibility Comments
App #242  Wainwright Coal Bed Methane Phase III

**Resource:** Other

**Proposer:** North Slope Borough

**AEA Program Manager:**

**Applicant Type:** Local Government

### Project Description

Phase III of the Wainwright Coal Bed Methane is in the vicinity of Wainwright, Alaska. The parties that will be involved in this will be the North Slope Borough, United States Geological Survey and Arctic Slope Regional Corporation. This phase will consist of drilling delineation wells at the landfill and the Wainwright Lagoon.

### Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tr>
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<td>Matched Funds Provided</td>
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<td>Total Potential Grant Amount</td>
<td>$3,612,000</td>
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</table>

**AEA Recommendation:**

- **Existing RE Fund Grant Offer:**

- **AEA Funding Recommendation:**
  (Not Constrained by Available Funding)

- **AEA Recommendation:**
  - Did Not Pass Stage 1
  - Withdrawn

- **Did Not Pass Stage 1**
- **Withdrawn**
App #242  Wainwright Coal Bed Methane Phase III

Resource: Other  Proposed Project Phase: Design
Proposer: North Slope Borough

AEA Program Manager:  Applicant Type: Local Government

Energy Region: North Slope
Election District: 40, Arctic

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of )

17.6

Stage 3 Scoring Summary

<table>
<thead>
<tr>
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<td>6) Local Support (Max 5)</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</tbody>
</table>

AEA Review Comments
App #242  Wainwright Coal Bed Methane Phase III

Resource: Other
Proposer: North Slope Borough

Proposed Project Phase: Design

AEA Program Manager: 
Applicant Type: Local Government

Economic Analysis

Benefit/Cost Ratio (Applicant)  
Benefit/Cost Ratio (AEA)
It was our understanding that HB 152 does not provide funding for CBM projects unless other alternate forms of energy are not available. The proposed AIN Coalbed Methane Project at Wainwright is presented as Phase III of a multi-year project. The authors propose to drill delineation wells in the Wainwright area and conduct pump testing of the wells to determine the quality, quantity and availability of methane. As proposed the AIN Coalbed Methane project does not provide details on the specifics of the pump testing of the wells, whether long term production testing is planned and whether a water disposal method (i.e. downhole reinjection) will be tested as part of this project. This location for coalbed methane has one of the highest likelihoods of success in rural Alaska based on geology, coal rank, coalbed seam abundance and location at favorable depth beneath Wainwright. If not funded through HB152, DGGS strongly encourages additional funding sources be sought to finalize the project. DGGS recommends that a more detailed plan of operations and full explanation of the proposed testing be presented to the AEA.
Project Description

The NSB recently commissioned an update of the Project Analysis Report (feasibility study) entitled “Village Heat Recovery” and dated February 2006. The prior study assessed the previously constructed waste lines and costs associated with waste heat utilization in Arctic and/or permafrost conditions in six NSB villages. The study verified that use of waste heat could reduce or replace dependence on diesel fuel for its heating needs in NSB area wide villages. With rising fuel costs, it is now feasible to install waste heat lines in Wainwright.

This application requests funds to:
• Provide schematic design services
• Identify and mitigate environmental issues
• Provide construction cost estimates
• Finalize land, routing and site control issues
• Complete design and bid documents
• Provide construction costs
• Provide for construction administration services
• Provide NSB employee training in operating and maintaining waste heat systems

The North Slope Borough will be the primary participant and will utilize internal expertise and retain external consultants and contractors that have special expertise in designing waste heat pipe lines, connecting building heating plants to the pipe lines, and recommending operations and maintenance schedules.

Funding & Cost

| Cost of Power: | $0.47/kWh |
| Requested Grant Funds: | $3,300,000 |
| Matched Funds Provided: | $312,000 |
| Total Potential Grant Amount: | $3,612,000 |

AEA Recommendation

Full Funding
\times Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn

AEA Funding Recommendation: $300,000
App #243 Wainwright Heat Recovery

Resource: Heat Recovery
Proposer: North Slope Borough

Proposed Project Phase: Construction Design

AEA Program Manager: Lenny Landis
Applicant Type: Local Government

Scoring & Location

Energy Region: North Slope
Election District: 40, Arctic

Overall Rank (out of 60) 32
Stage 3 Total Score (out of 100) 60.0
Rank within Region (out of 3) 3

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
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<tr>
<td>1) Cost of Energy (Max 30)</td>
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<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<tr>
<td>6) Local Support (Max 5)</td>
<td>2</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
<td>3</td>
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</tbody>
</table>

AEA Review Comments

Applicant proposes to recover heat from jacket water of existing diesel generators and pump hot water to various public buildings. Applicant estimated recoverable heat available but did not correlate availability with specific building heating load. Applicant also did not provide an estimate of amount of arctic pipe that would be required or heat loss from distribution. This is an expensive project that requires a high level of engineering and construction expertise. Due to the project's arctic location there will be a high cost for design, installation, and long-term operation.

Recommend partial funding of $300,000 for final design (task #1).
Economic Analysis

Benefit/Cost Ratio
(Applicant)  1.14

Benefit/Cost Ratio
(AEA)  1.14

Capital costs were based on an RSA engineering report, with about 17% contingency to those numbers, which had no such factor. Engineering data indicated fuel savings of about 61,000 gallons per year. The benefit-cost ratio came in at 1.19, which is low for heat recovery – but is nevertheless indicative of probable success of the project. This B/C ratio is also mitigated in that there is ample additional heat recovery available for either future building heat or additional application of heat recovery for other purposes. Because of the extreme arctic conditions, limited barge access and short construction season, there is some downside risk of project delay.
App #243  Wainwright Heat Recovery

Resource: Heat Recovery
Proposer: North Slope Borough

Proposed Project Phase: Construction Design

AEA Program Manager: Lenny Landis
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 #244  Point Lay Heat Recovery**

**Resource:** Heat Recovery  
**Proposer:** North Slope Borough  

**AEA Program Manager:** Lenny Landis  
**Applicant Type:** Local Government

---

**Project Description**

The NSB recently commissioned an update of the Project Analysis Report (feasibility study) entitled "Village Heat Recovery" dated February 2006. The prior study assessed the previously constructed waste lines and costs associated with waste heat utilization in Arctic and/or permafrost conditions in six NSB villages. The study verified that use of waste heat could reduce or replace dependence on diesel fuel for its heating needs in NSB area wide villages. With rising fuel costs, it is now feasible to install waste heat lines in Point Lay.

This application requests funds to cover the following expenses:
* Design and construction administration services
* Construction cost estimates
* Construction costs
* NSB employee training in operating and maintaining waste heat systems.

The North Slope Borough will be the primary participant and will utilize internal expertise and retain external consultants and contractors that have special expertise in designing waste heat pipe lines, connecting building heating plants to the pipe lines, and recommending operations and maintenance schedules.

---

**Funding & Cost**

<table>
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<tr>
<th>Cost of Power:</th>
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<td>Requested Grant Funds:</td>
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<td>Total Potential Grant Amount:</td>
<td>$4,257,116</td>
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</table>

**AEA Recommendation**

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

**Existing RE Fund Grant Offer:**  

**AEA Funding Recommendation:**  
(Not Constrained by Available Funding)  

$395,912  

---

**AEA Funding Recommendation:**  

$395,912
### App #244 Point Lay Heat Recovery

**Resource:** Heat Recovery  
**Proposer:** North Slope Borough  
**Proposed Project Phase:** Construction Design  
**AEA Program Manager:** Lenny Landis  
**Applicant Type:** Local Government

### Scoring & Location

<table>
<thead>
<tr>
<th>Overall Rank (out of 60)</th>
<th>Stage 3 Total Score (out of 100)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>63.8</td>
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</table>

**Energy Region:** North Slope  
**Election District:** 40, Arctic  
**Rank within Region (out of 3):** 2

### Stage 3 Scoring Summary

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

### AEA Review Comments

Applicant proposes to recover heat from jacket water of existing diesel generators and pump hot water to various public buildings. Applicant estimated recoverable heat available but did not correlate availability with specific building heating load. Applicant also did not provide an estimate of amount of arctic pipe that would be required or heat loss from distribution. Projected O&M costs appear low. This is an expensive project that requires a high level of engineering and construction expertise. Due to the project's arctic location there will be a high cost for design, installation, and long-term operation.

Recommend partial funding of $395,912 for final design (task #1).
Economic Analysis

Benefit/Cost Ratio (Applicant) 1.64  
Benefit/Cost Ratio (AEA) 1.37

Waste heat systems are very efficient alternative energy systems. This project will substantially lower the cost of energy to the community by saving fuel purchases of over 100,000 gallons per year. It was difficult to ascertain the relationship between the 2008 engineering report data and the grant application amounts, although clearly the amount requested considers building heat system modifications to candidate facilities not incorporated in the 2008 estimate. The applicant's indication that "escalation" factors had not been included, in addition to the uncertainty above, resulted in an AEA addition of a 20% cost escalation/contingency to the applicant's numbers. There is also some concern over the timing of barge shipment for renovation equipment, and this would have the effect of adding one year to project completion. Despite the cost escalation/contingency factor, the benefit/cost ratio is 1.37. Because this is part of a renovation to a new facility the long term prospects are excellent. It is a solid project.
App #244  Point Lay Heat Recovery

Resource: Heat Recovery
Proposer: North Slope Borough

Proposed Project Phase: Construction Design

AEA Program Manager: Lenny Landis
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 #245  Barrow_Atqasuk Transmission

Resource: Transmission
Proposer: North Slope Borough

Proposed Project Phase: Design Feasibility

AEA Program Manager: Doug Ott
Applicant Type: Local Government

Project Description
The NSB recently commissioned a preliminary feasibility study entitled "Energy Options for the City of Atqasuk" (Attachment A, disk copy). The recently completed study assessed the alternative energy options that could reduce or replace Atqasuk’s dependence on diesel fuel for its power and heating needs. Natural gas from the Barrow gas fields proved to be the most viable energy source.

This application requests funds to:
* Evaluate and select the power transmission option (HVDC vs. 3 phase AC) via comparative lifecycle cost analysis, technical viability and system reliability.
* Evaluate the use of composite poles in the Arctic. The poles are 1/3 the weight and 4 to 5 times the strength of wood poles. They can also be shipped in 25 foot sections.
* Evaluate the capacity of the Barrow Utilities & Electric Cooperative Inc. power plant for the additional demand.
* Determine business structure, rates and O&M responsibilities
* Evaluate the impact of the added demand on the Barrow natural gas reserves.
* Evaluate land ownership issues.
* Evaluate environmental issues.
* Identify permit requirements
* Determine design parameters for wind and ice loads in arctic conditions.
* Develop the design and cost estimate of a power transmission system that will serve Atqasuk, Walakpa Gas Field and also facilitate a future expansion to Wainwright.

Funding & Cost

Cost of Power: $0.82/kWh
Requested Grant Funds: $400,000
Matched Funds Provided: $100,000
Total Potential Grant Amount: $500,000

Existing RE Fund Grant Offer: $
AEA Funding Recommendation: (Not Constrained by Available Funding) $175,000

AEA Recommendation
Full Funding
X Partial Funding
X Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
App #245  Barrow_Atqasuk Transmission

Resource: Transmission  Proposed Project Phase: Design Feasibility
Proposer: North Slope Borough

AEA Program Manager: Doug Ott  Applicant Type: Local Government

Scoring & Location

Energy Region: North Slope
Election District: 40, Arctic

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)
3  78.8

Stage 3 Scoring Summary

Criterion (Weight)  Score
1) Cost of Energy (Max 30)  30
2) Funding Resources (Max 25)  18
3) Project Feasibility from Stage 2 (Max 20)  14
4) Project Readiness (Max 5)  4
5) Benefits (Max 10)  8
6) Local Support (Max 5)  2
7) Sustainability (Max 5)  3

AEA Review Comments

North Slope Borough proposes feasibility and final design of transmission linking Atqasuk to lower cost natural gas-fired power in Barrow. No discussion of permits required. ABR is on study team to address bird impacts.

Potential demonstration of HVDC.

This transmission line was studied in 1981 by Jack West Assoc along with a secondary line to Wainwright. The 2008 cost equivalent of the Barrow to Atqasuk portion of this line was estimated in that 1981 study to be more than twice the application estimate. Additionally costs to convert Atqasuk residences to electric heat were not included nor the impacts of line losses over 70 miles of transmission nor other potential upgrades needed to Atqasuk distribution system.

Recommend Tasks 1 - 3 in the amount of $175,000 be funded at this time due to the above concerns which provides for concept design, construction cost estimate and economic analysis.
App #245  Barrow_Atqasuk Transmission

**Resource:** Transmission  
**Proposer:** North Slope Borough  
**Proposed Project Phase:** Design Feasibility  

**AEA Program Manager:** Doug Ott  
**Applicant Type:** Local Government

**Economic Analysis**

<table>
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<table>
<thead>
<tr>
<th>Benefit/Cost Ratio</th>
<th>2.55</th>
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<tbody>
<tr>
<td>(AEA)</td>
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</table>

The North Slope Borough examined a number of energy alternatives for the village of Atqasuk that currently is heavily subsidized by the Borough. The preliminary energy alternatives evaluation identified a 70 mile transmission line at 25 kV between the Barrow Utilities and Electric Cooperative natural gas-fired generation and the village as a preferred alternative. The project requested is for engineering evaluation of the feasibility of the line and alternative transmission configurations, providing a conceptual design. Preliminary estimates are $14,350,000 for the cost of the intertie. The transmission line will be evaluated with the expectation of providing adequate power to offset diesel in Atqasuk for both electric generation and heating. Atqasuk requires 239,593 gallons of diesel for generation and 69,494 gallons for space and water heating that can be displaced with electric generation by natural gas from Barrow. The Barrow utility currently had 20 MW of available generation for a load of 8 MW. The equivalent load for meeting the Atqasuk requirement would be around 1 MW, indicating satisfactory surplus available.

Applicant assumed all non-fuel O&M of the utility would be offset with generation from Barrow. The AEA assumption is a reduction of one-half of the O&M cost, as backup facilities will remain, and additional electric support will be required for the expanded use of electricity. No estimate has been provided of distribution system upgrade costs to handle higher current and continuous loads which may reduce benefits. A transmission line will provide access to low cost generation and transmission systems and with appropriate design and installation should be fully sustainable.
App #245  Barrow_Atqasuk Transmission

Resource: Transmission  Proposed Project Phase: Design
Proposer: North Slope Borough  Feasibility

AEA Program Manager: Doug Ott  Applicant Type: Local Government

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #246  Hot Springs Bay Valley_Akutan

Resource: Geothermal  Proposed Project Phase: Feasibility Recon
Proposer: City of Akutan

AEA Program Manager: Lenny Landis  Applicant Type: Local Government

Project Description

The City of Akutan intends to evaluate the feasibility of developing the Hot Springs Bay Valley into an active geothermal resource for power generation and related applications. The purposes and anticipated results of this effort are those set forth in Section 2.3 Phase I – Reconnaissance Requirements of the renewable energy grant application instructions. The project will involve four primary tasks:

1. Prospecting: Analysis of existing data and previous scientific studies. Geological, geophysical and geochemical field work sufficient to support exploratory drilling.
2. Exploratory Drilling and Well Testing: Includes mobilization, drilling of test wells, flow testing and demobilization based on the results of prospecting.
3. Preliminary Feasibility Study: A comprehensive assessment of the proposed geothermal development project, including technical alternatives, land issues, environmental screening, financial and operational viability.
4. Economic Assessment: Examines Akutan’s growing infrastructure, including airport construction, port expansion and growth of Trident Seafoods. Assesses potential for cooperative development among the City, Akutan Corporation, Aleut Corporation, Trident Seafoods and other stakeholders. Identifies public and private financing alternatives. Defines the key elements of the business plan for development and operation of the resulting power system.

Completion of the Phase I Reconnaissance project will allow all potential stakeholders, including the State of Alaska, to determine the potential technical and economic viability of the proposed geothermal development before proceeding with feasibility and conceptual design tasks (Phase II).

Funding & Cost

Cost of Power: $0.32/kWh
Requested Grant Funds: $2,995,000
Matched Funds Provided: 
Total Potential Grant Amount: $2,995,000
Existing RE Fund Grant Offer: 
AEA Funding Recommendation (Not Constrained by Available Funding): $2,995,000

AEA Recommendation

× Full Funding
× Partial Funding
× Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
App #246  Hot Springs Bay Valley_Akutan

Resource: Geothermal
Proposer: City of Akutan

Proposed Project Phase: Feasibility Recon

AEA Program Manager: Lenny Landis
Applicant Type: Local Government

Scoring & Location

Energy Region: Aleutians
Election District: 37, Bristol Bay-Aleutians

Overall Rank (out of 60) 51
Stage 3 Total Score (out of 100) 50.4
Rank within Region (out of 7) 7

Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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AEA Review Comments

Applicant proposes to assess geothermal resources of Hot Springs Bay Valley near Akutan through drilling to confirm temperatures suggested by earlier surface studies. DGGS (see above) indicates there is high likelihood of significant geothermal resource and indicates that the resource is one of four stand-out high temperature resources in the state. The proposed reconnaissance project would be completed within a year.

Although the energy load in the City of Akutan is relatively small, the Trident plant nearby has a 6-7 MW electrical load most of the year. Trident provided a general letter support for the project in the application. Infrastructure projects planned include a $75 million airport and transportation system, a $24 million Corps of Engineers harbor, and an $8 million road connecting the harbor to the city.

Applicant has also submitted two other applications--#249 to repair the existing hydro system, and #248 to investigate feasibility of developing Loud Creek hydro resources. These projects more closely match the City load, while the geothermal resources may assist in regional economic development.

Recommend full funding at $2,995,000 with requirement that prior to any expenditure of funds Trident enter into an agreement that states its intent to participate in the reconnaissance project and make use of energy produced by development of the geothermal resources.
App #246  Hot Springs Bay Valley_Akutan

Resource: Geothermal  Proposed Project Phase: Feasibility Recon
Proposer: City of Akutan

AEA Program Manager: Lenny Landis  Applicant Type: Local Government

Economic Analysis

Benefit/Cost Ratio (Applicant)  3.19

Benefit/Cost Ratio (AEA)  3.19
DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

Hot Springs Bay/Akutan is one of four stand-out high-temperature geothermal systems identified during the statewide geothermal resource inventory of the late 1970’s and early 1980’s. The other three are Makushin/Unalaska, Geyser Bight/central Umnak Island, and Atka. Makushin was chosen for additional study, including drilling, only because of the larger nearby electrical load (Unalaska/Dutch Harbor). Surface studies, including chemical geothermometry of spring waters, have always indicated that the geothermal resource at HSB is substantial.

This proposal seeks to take the next step – drilling (after necessary prospecting) to confirm the temperatures inferred from surface samples and make direct observations of the depth of the system, and, through flow testing, reservoir volume and permeability. The proposed project is very similar in scale to that carried out at Makushin during the 1980’s.

In terms of geologic science and resource exploration DGGS fully supports this proposal. The management team is fully capable and all indications are that a resource exists and is capable of megawatt-scale electrical production. The fact that the City of Akutan is an active participant, rather than a potential customer (as at Makushin) bodes well for successful integration of a geothermal resource into the local economy and infrastructure.

DNR/DMLW Feasibility Comments
Project Description

AEA renewable energy grant guidelines require a multi-phase approach to project development. A feasibility assessment of the Loud Creek resource was previously completed at the direction of AEA. The assessment found Loud Creek to be “an obvious choice” for development. Therefore, the City of Akutan is requesting funds for:

• Phase II Feasibility Analysis, Conceptual Design

The tasks for this project are defined in Section 2.4 of the grant application instructions.

Funding & Cost

- **Cost of Power:** $0.52/kWh
- **Requested Grant Funds:** $237,772
- **Matched Funds Provided:**
- **Total Potential Grant Amount:** $237,772
- **Existing RE Fund Grant Offer:**
- **AEA Funding Recommendation:** $237,772

AEA Recommendation

- **Full Funding**
- **Partial Funding**
- **Special Provision**
- **Not Recommended**
- **Did Not Pass Stage 1**
- **Withdrawn**
App #248 Loud Creek Hydro_Akutan

Resource: Hydro  Proposed Project Phase: Feasibility
Proposer: City of Akutan  Applicant Type: Local Government

AEA Program Manager: Doug Ott

Scoring & Location

Energy Region: Aleutians
Election District: 37, Bristol Bay-Aleutians

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)
39  56.1

Rank within Region (out of 7)
5

Stage 3 Scoring Summary

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<tr>
<td>7) Sustainability (Max 5)</td>
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</table>

AEA Review Comments

Existing reconnaissance study completed in 1989 indicates the proposed site may be a good prospect. Substantial load at Trident and letter of support has been provided by them.

With the existing 105 kW hydro repaired, this project will not be needed unless extra power can be sold to Trident to offset their diesel generation and provide income to City. Trident should agree to purchase excess power before any future grants for construction funds be considered.

Recommend full funding.
Economic Analysis

Benefit/Cost Ratio (Applicant) 5.61  Benefit/Cost Ratio (AEA) 3.78

A 400 kW hydro resource with the potential of 1,800,000 kWh/year to supplement the existing hydro at Akutan. The existing hydro is proposed to be upgraded pursuant to grant request 249. Power is expected to eliminate the residual diesel requirements of the City. Excess generation could be used by Trident Seafoods, which now self generates with diesel power.

Assumptions Modified:
1. AEA study in 1989 recommended a smaller, 200 kW resource with average annual generation of 1,292,000 kWh. This was used in the AEA analysis.
2. Applicant did not include O&M estimates of the hydro. For the AEA analysis, the O&M costs in the 1989 study were used (updated to 2008 $).
3. The Applicant did not include offsets to displaced diesel O&M. AEA standard of $0.02/kWh was included in the AEA analysis.

Limited data, with no estimates for O&M or capital costs. Full usability will depend on usage by Trident Seafoods. Existing hydro was not maintained, and pipeline/penstock ruptured by excavator during other work.
App #248  Loud Creek Hydro_Akutan

Resource: Hydro  Proposed Project Phase: Feasibility
Proposer: City of Akutan

AEA Program Manager: Doug Ott  Applicant Type: Local Government

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
Project Description

This grant request identifies the repairs and upgrades required to bring the system back on line and to improve its long term efficiency and output. Since the Akutan hydroelectric generation system has been in place for nearly 15 years, many requirements such as site assessment, reconnaissance, conceptual design and site control do not apply. Therefore, this grant application is requesting funds for:

• Phase III Final Design and Permitting
• Phase IV Construction, Commissioning, Operation and Reporting

The tasks for this project are defined in Sections 2.5 and 2.6 of the grant application instructions.

Funding & Cost

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AEA Recommendation

Full Funding
× Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
App #249  Akutan Hydrosystem Repair and Upgrade

Resource: Hydro
Proposer: City of Akutan

Proposed Project Phase: Construction Design

AEA Program Manager: Doug Ott
Applicant Type: Local Government

Scoring & Location

Energy Region: Aleutians
Election District: 37, Bristol Bay-Aleutians

Overall Rank (out of 60)  46
Stage 3 Total Score (out of 100)  53.0
Rank within Region (out of 7 )  6

Stage 3 Scoring Summary

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</table>

AEA Review Comments

Application does not provide an adequate basis for Phase IV construction request. AEA is concerned that the project is too expensive. Trident plant may be able to use excess energy, but there is no indication of communication. A refined estimate of the total construction cost and energy capacity of the project is required.

AEA recommends partial funding for milestones 1 - 6 (system evaluation, permitting/environmental review and final design of all repairs and upgrades).
App #249 Akutan Hydrosystem Repair and Upgrade

**Resource:** Hydro  **Proposed Project Phase:** Construction Design

**Proposer:** City of Akutan  **AEA Program Manager:** Doug Ott

**Applicant Type:** Local Government

**Economic Analysis**

Benefit/Cost Ratio (Applicant) **1.84**  
Benefit/Cost Ratio (AEA) **1.61**

Repair to an existing 105 kW hydro resource. Estimated annual generation is 420,000 kWh. The facility was constructed in 1993 and has gone through a series of upgrades. However, the system continued to have problems and has been inoperable since 2007 when the main line was cut during construction of the water treatment plant. Power will offset approximately 60 percent of the diesel requirements.

Assumptions Modified:
1. Applicant did not include O&M estimates of the hydro. For the AEA analysis, the O&M costs were assumed to be 50 percent of that assumed in the 1989 AEA study for Loud Creek (escalated to 2008 $). The resulting amount of $25,448/year equals $0.061/kWh.
2. The Applicant did not include offsets to displaced diesel O&M. AEA standard of $0.02/kWh was included in the AEA analysis.

Limited data, with no estimates for O&M. Although not in the scope of this review, the original design and interface with the diesel system seems to be in question due to the inherent problems during its operating history.
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 #250  Galena Hydrokinetic

Resource: Ocean/River
Proposer: City of Galena

Proposed Project Phase: Feasibility Recon

AEA Program Manager: Lenny Landis
Applicant Type: Local Government

Project Description
This project is for a reconnaissance study to investigate using hydrokinetic power to supply approximately 1.0 MW of renewable electricity to the City of Galena. Hydrokinetic power extracts power from the velocity of water using turbines lowered into a river, and is benign compared to hydropower since no dams are required. Aerial photos suggest that the Yukon River is narrow and straight at Galena, suggesting an ideal location for hydrokinetic power. However, to understand the most advantageous location (where the highest velocity exists) for deploying hydrokinetic turbines to produce power, a thorough scientific study of the site needs to be completed. The project will perform a quality investigation of river bathymetry, ice thickness and current vector (velocity and direction) survey.

Funding & Cost

Cost of Power: $0.40/kWh
Requested Grant Funds: $223,464
Matched Funds Provided: $55,866
Total Potential Grant Amount: $279,330

Existing RE Fund Grant Offer:

AEA Funding Recommendation:
(Not Constrained by Available Funding)

AEA Recommendation
Full Funding
Partial Funding
Special Provision
× Not Recommended
Did Not Pass Stage 1
Withdrawn
Alaska Renewable Energy Fund: Round 2 (Mar-09)

**App #250  Galena Hydrokinetic**

**Resource:** Ocean/River  
**Proposer:** City of Galena

**Proposed Project Phase:** Feasibility Recon

**AEA Program Manager:** Lenny Landis  
**Applicant Type:** Local Government

**Scoring & Location**

- **Energy Region:** Yukon-Koyukuk/Upper Tanana
- **Election District:** 6, Interior Villages

**Overall Rank** (out of 60)  
**Stage 3 Total Score** (out of 100)

**Stage 3 Scoring Summary**

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**AEA Review Comments**

City of Galena requests funding to assess river energy resource within the bounds of IPP Hydro Green Energy's preliminary permit from FERC for development hydrokinetic power in the Galena area.

The Legislature has already approved $565,439 in RE Fund round 1 grant funding to University of Alaska for an extensive assessment of hydrokinetic resources in 24 sites along Alaskan rivers (app #88). The river energy resources of the Yukon River in the Galena area can be addressed at least on a recon level during this effort. Based on these results the City can refine its application for further RE Fund funding.

Recommend no funding.
App #250  Galena Hydrokinetic

**Resource:** Ocean/River

**Proposer:** City of Galena

**Proposed Project Phase:** Feasibility Recon

**AEA Program Manager:** Lenny Landis

**Applicant Type:** Local Government

**Economic Analysis**

 Benefit/Cost Ratio (Applicant)

 Benefit/Cost Ratio (AEA)
App #250  Galena Hydrokinetic

**Resource:** Ocean/River  
**Proposer:** City of Galena  
**Proposed Project Phase:** Feasibility Recon  

**AEA Program Manager:** Lenny Landis  
**Applicant Type:** Local Government

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #251  AEB Geothermal Assessment_AGDAP

Resource: Geothermal  Proposed Project Phase: Feasibility Recon

Proposer: Aleutians East Borough

AEA Program Manager: Lenny Landis  Applicant Type: Local Government

Project Description

AEB proposes a resource assessment/feasibility analysis/conceptual design project of geothermal sites in the targeted service area.

Goal: The AGDAP goal is to ascertain the feasibility of geothermal power generation for regional communities and develop conceptual design documents/reports for geothermal generation on the eastern Alaska Peninsula and associated Aleutian Islands. The AGDAP strategic objectives are as follows:

SO1: Identify potential geothermal sites in the Aleutian Island Service Area.
SO2: Undertake a geological, geochemistry, and geophysical assessment of targeted sites for geothermal power generation potential.
SO3: Undertake a geothermal drilling program to promote regional geothermal interests.
SO4: Develop conceptual design and business plan for follow-on phases of the projects.
SO5: Conduct an optimization phase in the conceptual design to determine how to supply power either from one centrally located geothermal plant or from many smaller geothermal plants, so the communities involved can be evaluated. Included will be evaluating the use of transmission lines for power versus supplying hot water via a pipeline to one or several geothermal power plant(s).

Funding & Cost

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AEA Recommendation

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

AEA Funding Recommendation:
(Not Constrained by Available Funding)
App #251  AEB Geothermal Assessment_AGDAP

Resource: Geothermal  Proposed Project Phase: Feasibility Recon
Proposer: Aleutians East Borough

AEA Program Manager: Lenny Landis  Applicant Type: Local Government

Scoring & Location

Energy Region: Aleutians
Election District: 37, Bristol Bay-Aleutians

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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AEA Review Comments

Applicant proposes assessment of geothermal resources in the eastern Aleutians including Akutan, Cold Bay, False Pass, King Cove, Sand Point, and Nelson Lagoon. DGGS states "In summary, hot spring systems in the general area are small and of only moderate temperature, unlikely to produce megawatt scale electricity. In addition, they are in Wilderness Areas, and unreasonably distant from communities (esp. Sand Point). Coupled with the flawed and vague proposed exploration program this makes for a very weak proposal." AEA concurs.

Recommend no funding.
<table>
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**Economic Analysis**

- Benefit/Cost Ratio (Applicant)
- Benefit/Cost Ratio (AEA)
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #251  AEB Geothermal Assessment_AGDAP

Resource: Geothermal  Proposed Project Phase: Feasibility Recon

Proposer: Aleutians East Borough

AEA Program Manager: Lenny Landis  Applicant Type: Local Government

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

Robust hot spring systems do not exist within the region addressed (except for Akutan, subject of a separate very strong proposal by a different group). Those springs which exist are (with one exception) located on USFWS Wilderness Areas and are up to several tens of miles from the communities whose power needs are considered. The geosciences merits of the proposal are difficult to determine because this proposal and Application Number 304 (Seward Peninsula/AVEC) are, for sections 2 and 3 (workplan description) word-for-word identical for the vast majority of the text, including such details as the number and rate of placement of shallow temperature probes, and the number and depth of proposed drill holes. The budgets vary by an even $35,000.00. Personnel vary only in upper level management and oversight by AEB vs. AVEC. The project timelines for the two are identical for 18 out of 20 items – committing the proposers to, for instance, two 120 day drilling programs, both starting on October 1, 2010 (each with the challenge of a winter drilling program). Thus at least one of these proposals is a cookie-cutter proposal not actually geared toward the particular resources in the areas. Since the AVEC proposal mentions the geothermal sites to be investigated, and this proposal does not, it is likely that this is the carbon copy.

Because this proposal has the same words as AVEC, there are the same geoscience concerns (in order as they appear):

a) The geochemical survey mentions rock, soil (As, Hg), and water sampling on a grid, but not specific detailed sampling of spring waters for standard geothermometry. This may be an oversight. However, no-one on the project has specific expertise in geothermal fluid chemistry. Mention is made of the UU Energy and Geoscience Institute (who specialize in innovative technology, not routine exploration) but specifics are not given. Fluid inclusion studies on bedrock samples that are merely adjacent to the geothermal system will not return information relevant to geothermal resources. 
b) The shallow temperature probe survey presumably will use the same 2m probes that HDL used at Naknek. It seems unlikely that this technique will be useful in permafrost areas, or that it will be useful unless temperatures are collected well below the seasonal freeze/thaw layer. 
c) Several satellite remote sensing platforms are mentioned – there is substantial duplication between many of these platforms, with newer instruments making older data obsolete. Few (perhaps none) of these satellite systems can image the small (magnitude and size) surface anomalies generated by hot springs. 
d) There is no discussion of a way to ascertain that any of these spring systems are capable of delivering the large amounts of hot water necessary (e.g. flow rates similar to the ~1,000 gal/min Chena uses.

In summary, hot spring systems in the general area are small and of only moderate temperature, unlikely to produce megawatt scale electricity. In addition, they are in Wilderness Areas, and unreasonably distant from communities (esp. Sand Point). Coupled with the flawed and vague proposed exploration program this makes for a very weak proposal.

DNR/DMLW Feasibility Comments
Project Description
The Manley Village Council is applying for a Planning, Feasibility, and Coordination grant to develop the geothermal resources available in and around Manley Hot Springs for the purposes of providing economical, stable, reliable, and environmentally friendly power generation and home heating options to its tribal members and other community members. Pending partners include the Bean Ridge Corporation, Doyon, Ltd., the Alaska Energy authority, UAF’s Alaska Center for Energy and Power, Chena Hot Springs, and private landowners in the Manley area.

Funding & Cost

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</table>

AEA Recommendation:

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

AEA Funding Recommendation: (Not Constrained by Available Funding)
App #252  Manley Village Council Geothermal

Resource: Geothermal  Proposed Project Phase: Feasibility
Proposer: Manley Village Council  Recon

AEA Program Manager: Lenny Landis  Applicant Type: Government Entity

Scoring & Location

Energy Region: Yukon-Koyukuk/Upper Tanana
Election District: 6, Interior Villages

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

Criterion (Weight)  Score
1) Cost of Energy (Max 30)  23
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

Applicant proposes to do exploratory drilling and data collection on the Manely Hot Springs area geothermal resource for the purpose of producing heat and power for the community. The Denali Commission has provided $725,000 through the alternative energy RFP and AEA has provided $215,000 in renewable energy fund funding to TDX Power for the Manley Hot Springs Geothermal Plant project. TDX Power is the local certificated electrical utility. In the current proposal there is no mention of any involvement by TDX in the proposed project nor any indication of power sales discussions. This proposal is by an entity other than TDX, which already has been allocated funding for geothermal development in Manley.

Because the application does not demonstrate coordination with the funded TDX work, we recommend no funding.
App #252  Manley Village Council Geothermal

Resource: Geothermal  Proposed Project Phase: Feasibility Recon

Proposer: Manley Village Council  AEA Program Manager: Lenny Landis

Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
**App #252  Manley Village Council Geothermal**

<table>
<thead>
<tr>
<th>Resource:</th>
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<tbody>
<tr>
<td>Proposer:</td>
<td>Manley Village Council</td>
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<table>
<thead>
<tr>
<th>AEA Program Manager:</th>
<th>Lenny Landis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicant Type:</td>
<td>Government Entity</td>
</tr>
</tbody>
</table>

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

Manley is one of few sites in Alaska where a resource (probably) capable of generating electricity for local consumption exists geographically within the community. Hence it is a clear target for investigation of the potential of using that resource for power generation. The scale of the potential development would be very similar to that of Chena. It is logical and appropriate that Bernie Karl (Chena) and Gwen Holdmann (UAF/ACEP) be involved in this project.

Moving forward with understanding the capabilities of the resource at Manley, and evaluating the potential for its exploitation, is a clear priority of the geothermal community in Alaska. This proposal is a clear way forward.

The main issues at Manley involve management, engineering, and development cost. They are not in the geosciences realm.

As noted in the proposal, resolving land use issues is paramount, since much or all of the resource lies on private land. Additionally, Manley Village Council and TDX (current power provider) need to start to work together. These issues are not within the expertise or

**DNR/DMLW Feasibility Comments**
Project Description

Along with many communities in Alaska, Chena Power is not located directly in one of Alaska's larger cities making it heavily reliant on diesel and other fossil fuels. In order to offset the rising cost of fuel, Chena Power has undertaken well known steps to greatly reduce the amount of fuel that it requires by means of renewable energy sources. By taking these steps, Chena Power is providing cost effective solutions for many Alaskan communities (large and small) to become less reliant on non renewable sources of energy. Chena Power is proposing to use excess electricity that is produced by its geothermal power plant towards the production of hydrogen gas at Chena Hot Springs Resort. Chena Power plans to install a 60 kg/day hydrogen generation module, a 6667 psi compression module, a 76.5 kg hydrogen storage module, and a hydrogen dispenser module all of which will be purchased from Hydrogenics. Also in this proposal is a plan to convert three 12 passenger vans to run off of hydrogen. This will allow Chena Power to produce hydrogen to reduce the use of diesel in transportation and to reduce the propane in the operation of appliances on site.

Funding & Cost

<table>
<thead>
<tr>
<th>Cost of Power:</th>
<th>$0.17 /kWh</th>
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<td>Total Potential Grant Amount:</td>
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AEA Recommendation:

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
App #253  Chena Power Hydrogen

Resource: Geothermal  Proposed Project Phase: Construction
Proposer: Chena Power, LLC

AEA Program Manager: Lenny Landis  Applicant Type: Utility

Scoring & Location

Energy Region: Railbelt
Election District: 7, Farmers Loop-Steese Highway

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

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

AEA Review Comments

Applicant proposes using excess geothermal energy to make hydrogen for use as a transportation fuel. The project would involve building a $1.6M hydrogen fueling system and retrofitting four vehicles to use hydrogen at $50,000 each. Applicant estimates fuel displacement savings at approximately $90,000/yr. Although we recognize a technology benefit to demonstrating the use of a stranded renewable energy resource as transportation fuel, there is limited benefit to the public at large.

Recommend no funding.
App #253  Chena Power Hydrogen

Resource: Geothermal  Proposed Project Phase: Construction
Proposer: Chena Power, LLC

AEA Program Manager: Lenny Landis  Applicant Type: Utility

Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
App #253  Chena Power Hydrogen

Resource: Geothermal
Proposer: Chena Power, LLC

Proposed Project Phase: Construction

AEA Program Manager: Lenny Landis
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
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #254  Victor Creek Hydro_Kenai Hydro

Resource: Hydro  Proposed Project Phase: Recon

Proposer: Kenai Hydro, LLC

AEA Program Manager: Doug Ott  Applicant Type: IPP

Project Description

The proposed Victor Creek hydro project could produce up to 5-MW and would be located near Lawing, Alaska just south of Moose Pass, Alaska (see the map below produced by HDR Alaska, Inc.). Kenai Hydro seeks to develop the project in compliance with current low impact hydro guidelines and practices. The scope of this project will look at the Victor Creek project as a stand-alone hydroelectric facility. 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 (KHL) is a partnership among Homer Electric Association, Inc. (HEA), enXco and Cook Inlet Region, Inc. (CIRI) that was formed for the purpose of evaluating and developing low impact hydroelectric facilities.

Funding & Cost

<table>
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<tr>
<th>Description</th>
<th>Amount</th>
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<td>Total Potential Grant Amount</td>
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AEA Recommendation

× Full Funding
Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
The proposed project is a run-of-the-river hydro whose power would feed the Railbelt Grid near Moose Pass.

This project would be located on federal lands of the Chugach National Forest and be subject to licensing by FERC. Discussion of potential fish issues is absent from the application and may pose a risk to ultimate development. Victor Creek drains into Kenai Lake and may provide spawning habitat for anadromous fish.

Work should include determination of the fisheries impacts posed by this project and the likelihood of obstacles to achieving a FERC license to construct.

Recommend full funding.
Economic Analysis

Benefit/Cost Ratio (Applicant) 2.94
Benefit/Cost Ratio (AEA) 2.94

This project is to undertake Phase I Reconnaissance study of a proposed run-of-rive hydroelectric facility on the Kenai Peninsula to provide renewable generation to offset fuel consumed in the Railbelt South of the Alaska Range. The project is a 5 MW unit with anticipated capacity factor of 50%, producing 21.9 GWh/year to offset natural gas generation. The output of the project, if feasible, will directly displace natural gas generation in the Railbelt. Reasonable to assume long-term sustainability.
## App #254  Victor Creek Hydro_Kenai Hydro

<table>
<thead>
<tr>
<th>Resource</th>
<th>Hydro</th>
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<tbody>
<tr>
<td>Proposer</td>
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<td>AEA Program Manager</td>
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<td>Applicant Type</td>
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### DNR/DGGS Geohazards Comments

- [Insert comments]

### DNR/DGGS Feasibility Comments

- [Insert comments]

### DNR/DMLW Feasibility Comments

- [Insert comments]
Chena Hot Springs Reservoir Modeling

**Resource:** Geothermal

**Proposer:** University of Alaska Fairbanks, Institute of Northern Engineering, Alaska Center for Energy and Power

**AEA Program Manager:** Lenny Landis

**Applicant Type:** Government Entity

**Proposed Project Phase:** Feasibility

---

**Project Description**

The geothermal plant at Chena Hot Springs has been in continual operation since 2006 and is the only operating geothermal plant in the State of Alaska. Since startup, there has been a decline in geothermal fluid temperature and pressure. This may be due to either engineering or reservoir issues. In order to operate the plant in a sustainable manner and develop other similar and possibly more marginal projects sustainably, it is critical that we understand the underlying mechanisms driving this production decline. Following this analysis, a suitable production scheme and monitoring schedule should be developed. The proposed project is a cooperative program between the University of Alaska and Chena Hot Springs Resort. A numerical reservoir model of the Chena geothermal system will be created and its performance matched to the historical production data. This model can then be used to assist in the making of development strategy decisions.

The information that will be obtained from drilling this well will prove invaluable for the understanding of geothermal potential in Interior Alaska as well as providing crucial input data for the Chena Hot Springs reservoir model. A resource assessment achieved through the testing of multiple production scenarios will be integrated with a conceptual design of the power plant production system. A generic feasibility analysis will generate recommendations for the final design of the Chena Hot Springs geothermal project. The outcomes of the modeling effort may be transferred to other geothermal systems such as Circle, Manley and Pilgrim Hot Springs and to other sites within the Central Alaska Hot Springs Belt.

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**Funding & Cost**

- **Cost of Power:** $0.17 /kWh
- **Requested Grant Funds:** $198,168
- **Matched Funds Provided:**
  - **Total Potential Grant Amount:** $198,168
- **Existing RE Fund Grant Offer:**
  - **AEA Funding Recommendation:** $198,168

**AEA Recommendation**

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
App #255  Chena Hot Springs Reservoir Modeling_ACEP

**Resource:** Geothermal  
**Proposer:** University of Alaska Fairbanks, Institute of Northern Engineering, Alaska Center for Energy and Power  
**AEA Program Manager:** Lenny Landis  
**Applicant Type:** Government Entity

### Scoring & Location

<table>
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<th>Overall Rank (out of 60)</th>
<th>Stage 3 Total Score (out of 100)</th>
<th>Energy Region</th>
<th>Election District</th>
<th>Rank within Region (out of 7)</th>
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<td><strong>60</strong></td>
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### Stage 3 Scoring Summary

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<tr>
<td>2) Funding Resources (Max 25)</td>
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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<tr>
<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<td>6) Local Support (Max 5)</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
<td>5</td>
</tr>
</tbody>
</table>

### AEA Review Comments

Applicant proposes modeling the existing geothermal resource at Chena Hot Springs to determine why pressures and temperatures of the resource appear to be declining. They will make use of data from a USDOE-funded deep well. DGGS states "the benefit for the State is not the additional information that will be gained about Chena, but the additional information that will be gained about this class of system".

Recommend full funding at $198,168.
Resource: Geothermal
Proposer: University of Alaska Fairbanks, Institute of Northern Engineering, Alaska Center for Energy and Power
AEA Program Manager: Lenny Landis
Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
### App #255  Chena Hot Springs Reservoir Modeling_ACEP

<table>
<thead>
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<th>Proposed Project Phase: Feasibility</th>
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<tr>
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<tr>
<td><strong>AEA Program Manager:</strong> Lenny Landis</td>
<td><strong>Applicant Type:</strong> Government Entity</td>
</tr>
</tbody>
</table>

#### DNR/DGGS Geohazards Comments

#### DNR/DGGS Feasibility Comments

Chena is representative of a class of moderate-temperature geothermal resources capable of producing electricity at the scale of hundreds of kilowatts. These are distinct from high-temperature resources such as Makushin. Such systems are spread throughout southeastern and interior Alaska and are potentially attractive targets for exploitation. However, because of their moderate temperature and often fault-hosted geometry they are substantially different than bigger, better-known systems elsewhere in the world. Understanding reservoir limitations of these systems is paramount if they are to be considered part of the State’s energy portfolio.

This proposal seeks to investigate the reservoir characteristics of one of these systems (Chena) – the only one with drill data and a production history. The benefit for the State is not the additional information that will be gained about Chena, but the additional information that will be gained about this class of system. The PI (Mongrain) is well suited for this because of her previous experience in reservoir modeling in the petroleum industry.

While this proposal is not about producing power at a particular site, it is an essential part of understanding energy alternatives statewide.

#### DNR/DMLW Feasibility Comments
Project Description

This project will assess the practicality of using heat pumps in different regions of Alaska. Several technologies and unique configurations will be examined, including ground-source heat pumps, air-source heat pumps, solar thermal storage, and diurnal thermal storage. In the case of ground-source heat pumps, the ground temperature resource will be assessed by region. Additionally, low-temperature heat applications will be explored. This project will be a joint effort between UAF’s Alaska Center for Energy and Power (ACEP) and the Cold Climate Housing Research Center (CCHRC). The project will culminate with a final published report of the findings.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
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<td>Total Potential Grant Amount</td>
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AEA Recommendation

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

AEA Funding Recommendation:
(Not Constrained by Available Funding)
App #256  Statewide Heat Pump Analysis_ACEP

Resource: Geothermal                     Proposed Project Phase:

Proposer: University of Alaska Fairbanks, Center for Energy and Power

AEA Program Manager: David Lockard       Applicant Type: Government Entity

Scoring & Location

Energy Region: Railbelt

Election District: 9, City of Fairbanks

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
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<tr>
<td>2) Funding Resources (Max 25)</td>
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<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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</tr>
<tr>
<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<td>6) Local Support (Max 5)</td>
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<td>7) Sustainability (Max 5)</td>
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AEA Review Comments

Failed Stage 1
App #256  Statewide Heat Pump Analysis_ACEP

**Resource:** Geothermal

**Proposer:** University of Alaska Fairbanks, Center for Energy and Power

**AEA Program Manager:** David Lockard

**Applicant Type:** Government Entity

**Proposed Project Phase:**

---

### Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
<table>
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<tr>
<th>Resource: Geothermal</th>
<th>Proposed Project Phase:</th>
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<tr>
<td>Proposer: University of Alaska Fairbanks, Center for Energy and Power</td>
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**AEA Program Manager:** David Lockard

**Applicant Type:** Government Entity

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
Project Description

The Mount Spurr area represents one of the best opportunities in Alaska for to develop a utility-scale geothermal power plant. Phase 1 exploration efforts must be performed before moving forward to project development. The target site is located 70 miles west of Anchorage on state land. Field work was performed at the site in 1985. It is likely that the project would serve communities along the Railbelt and the power purchased by one of the Railbelt electric utilities.

The grant request is for initial resource studies and assessment. The plan assumes a timeline of three years with the bulk of the field work done in the summer months. The plan calls for an initial geological scouting, mapping and sampling work, with progression to aerial and ground geophysics work, culminating in a gradient and slim holes drilling program. Field surveys and surface studies during the Summer of 2009, which Ormat would finance 100% from its own funds. The grant would cover additional field surveys and geophysical studies and shallow temperature gradient wells during the summer of 2010. A slim hole drilling program would occur during the Summer of 2011, if justified.

There are about 13 miles between the nearest road and the southeast flank of Crater Peak to our leases. The objective of this field survey aspect of the potential geothermal area should be an early focus as to cost for infrastructure and project development, including access roads and transmission. The primary obstacle for this phase is the short time window (May through September) for exploration to avoid extreme weather.

Funding & Cost

Cost of Power: $0.13 /kWh
Requested Grant Funds: $4,478,345
Matched Funds Provided: $20,178,927
Total Potential Grant Amount: $24,657,272

AEA Recommendation:

Full Funding
Partial Funding
Special Provision
× Not Recommended
Did Not Pass Stage 1
Withdrawn
Ormat Nevada Inc, holds a lease from Alaska DNR for geothermal exploration and development in Mount Spurr (Geothermal Lease Sale No. 3). Ormat proposes to use its own funding to support reconnaissance studies on Mt. Spurr in summer 2009, but requests RE grant funding of $4.5 million to perform geophysical surveys, rig mobilization and demobilization and drilling of four temperature gradient wells in the summer of 2010.

AEA and DGGS believe that assessment of geothermal resources of Mt. Spurr is very valuable. Since the temperature gradient wells will not be funded until summer of 2010, we feel it is reasonable to assess the results of summer 2009 recon work before allocating funds to the drilling program.

Recommend no funding at this time.
App #257  Mt. Spur Resource Assessment_Ormat

Resource: Geothermal
Proposer: Ormat Nevada, Inc

Proposed Project Phase: Design
Feasibility
Recon

AEA Program Manager: Lenny Landis
Applicant Type: IPP

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
Proposer: Ormat Nevada, Inc

Applicant Type: IPP

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

Ormat is among the most highly experienced companies in the world in geothermal exploration and development. This proposal is for appropriate resource assessment work. The proposed work is correctly stepwise, with surface geology leading to targeted geophysics and exploratory drilling, leading to resource confirmation drilling. Ormat is clearly up to speed on previous work which has been done at Spurr, including the largely unpublished (at least in geothermal literature) conclusion that existing petrologic and geochemical data do NOT suggest the existence of a persistent high-level magma chamber/heat source – but note the unequivocal fact that high temperatures must nevertheless exist at shallow depths. They also note that existing exploration data is permissive of the existence of an accessible geothermal resource, yet in many respects is equivocal. Their view of the Spurr system is accurate.

It is in the State’s interest to know if there is a geothermal resource at Spurr, and to move toward development of that resource if feasible. This proposed work is the best way forward. It may be problematic for the State to fund a private for-profit entity, but that issue is outside DGGS’ responsibility.

DNR/DMLW Feasibility Comments
App #258 Pilgrim Hot Springs Assessment_ACEP

Resource: Geothermal
Proposer: University of Alaska Fairbanks, Institute of Northern Engineering, Alaska Center for Energy and Power
AEA Program Manager: Lenny Landis

Proposed Project Phase: Feasibility Recon
Applicant Type: Government Entity

Project Description
The Pilgrim Hot Springs geothermal system was extensively studied in the late 1970s and early 1980s with a variety of geological, geochemical, and geophysical studies. Unfortunately the execution of these surveys and interpretation of the data from these earlier studies did not result in a thorough understanding of the area. By example, 6 very closely spaced holes were drilled ranging from depths of 150 ft to 1001 ft, passing through a very shallow plume of thermal water that may be flowing in a southerly direction. Chemical analyses from this earlier work are incomplete. It is proposed that the existing Pilgrim wellheads will be reconditioned so that static and flowing temperature logs can be rerun in the existing wells and new water samples collected. Additionally, a Controlled Source Audio Magnetotellurics (CSMAT) survey will be combined with new shallow (+ 200’) temperature-gradient holes drilled away from the cluster of existing wells to try to identify the location of the hotter upflow zone supplying thermal fluid to the shallow aquifer.

The goal of this project will ultimately be to drill a deeper hole into the upflow zone to determine its temperature and water chemistry. The deeper hole, and perhaps some of the other holes will also be flowed to obtain water samples for chemical analysis and possibly collect some pressure interference data between the wells. These data, combined with an airborne thermal imaging survey to determine total heat flow to the surface should be adequate to determine total potential output of the system for sustainable long term development.

Funding & Cost

<table>
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AEA Recommendation
× Full Funding
Partial Funding
× Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn

AEA Funding Recommendation: $2,349,751
App #258 Pilgrim Hot Springs Assessment_ACEP

Resource: Geothermal

Proposer: University of Alaska Fairbanks, Institute of Northern Engineering, Alaska Center for Energy and Power

AEA Program Manager: Lenny Landis

Proposed Project Phase: Feasibility Recon

Applicant Type: Government Entity

Scoring & Location

Energy Region: Bering Straits

Election District: 39, Bering Straits

Rank within Region (out of 5)

Overall Rank (out of 60)

Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
</tr>
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<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
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</table>

AEA Review Comments

Applicant proposes to assess geothermal resources at Pilgrim Hot Springs through refurbishing existing shallow wells and drilling deep wells.

The Nome Energy Study identified development of the Pilgrim Hot Springs geothermal resource as the least-cost option for long-term power supply. The applications includes letters of support from Nome Joint Utilities, Mary's Igloo Native Council (the owner of the adjacent land), and the USGS, who indicates that they will make a drill rig available for this project. Project team includes landowner Catholic Chuch Diocese of Fairbanks. DGGS indicates support for the project (see above).

Recommend full funding at $2,349,751 with requirement that AEA and DGGS find that there is adequate likelihood of a viable geothermal resource based on summer 2009 shallow well assessments before funding is provided for drilling deep wells.
Economic Analysis

The communities of Nome, Teller and Brevig Mission currently derive electrical energy from diesel generation. At completion, this project would reduce electric energy costs to residents and businesses in the area of by over $10,000,000 per year. In addition to reducing costs of living for residents, lower costs and greater reliability of electric energy would attract and sustain economic development opportunities in the area. In addition, if this project proves to be successful, transmission lines could be built to include other recipient communities. This project has a high cost, but it replaces a large amount of very high cost electric energy with low cost, renewable energy. The cost savings from the lower cost energy outweighs the capital costs of the project over its 30 year life. In addition, the resource assessment portion of this project will prove economically valuable by providing information for future projects in the state, and therefore, lowering the risk of those projects. Indirect benefits of increased or sustained economic activity in the area, and lowered risk of future projects are not considered in this calculation. The project uses a sustainable resource to produce electric power. The economies of scale are large enough to overcome the high capital costs with the annual savings on lower cost energy. This project appears to be sustainable in the long term.
In terms of temperature, chemistry, and flow rate of fluids coming to the surface, Pilgrim is one of the most attractive of the moderate temperature geothermal systems in the state. Because of this, it was targeted for detailed study, including drilling, in the 1970s to early 1980s. Frustratingly, the drilling only pierced a thin perched layer of hot water, with strong temperature reversal below the layer. Finding the upwelling source which feeds this outflowing layer remains. Understanding the full potential of Pilgrim requires knowing the dimensions of this zone and its temperature and volume at depth.

This proposal is for a clearheaded stepwise exploration program which will gather necessary preliminary data and, ultimately, correctly site a drill hole for direct sampling of the upwelling fluid.
App #259  Mountain Village Wind_City and Tribe

Resource: Wind
Proposer: Asa'carsarmuit Tribal Council

AEA Program Manager: James Jensen
Applicant Type: Government Entity

Project Description
The project will be located in Mountain Village. The tribe with cooperation from the city will be the main entities involved in the project. We request to purchase and utilize small wind turbines for the municipal and tribal government buildings, in all approximately seven buildings.

Cost of Power: $0.47/kWh
Requested Grant Funds: $122,100
Matched Funds Provided: $11,155
Total Potential Grant Amount: $133,255

AEA Recommendation:
Full Funding
Partial Funding
Special Provision
✗ Not Recommended
Did Not Pass Stage 1
Withdrawn
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #259  Mountain Village Wind_City and Tribe

Resource: Wind
Proposer: Asa'carsarmuit Tribal Council

Proposed Project Phase: Construction Design

AEA Program Manager: James Jensen
Applicant Type: Government Entity

Scoring & Location

Energy Region: Lower Yukon-Kuskokwim
Election District: 39, Bering Straits

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of )

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<td></td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
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</tr>
</tbody>
</table>

AEA Review Comments

The Tribal Council proposes installing 8 unspecified residential-sized wind turbines near tribal and municipal buildings. No onsite wind resource has been performed. AVEC proposes locating met towers in the area and assess feasibility of wind development and interties in the St. mary's, Mountain Village, Pitka's Point, and Pilot Station. The current application does not provide sufficient information on O&M measures and costs, turbine type and output, and permitting.

Recommend no funding.
App #259  Mountain Village Wind_City and Tribe

Resource: Wind
Proposer: Asa'carsarmuit Tribal Council

AEA Program Manager: James Jensen
Applicant Type: Government Entity

Proposed Project Phase: Construction Design

Economic Analysis

Benefit/Cost Ratio (Applicant)  

Benefit/Cost Ratio (AEA)
App #259 Mountain Village Wind_City and Tribe

**Resource:** Wind

**Proposer:** Asa'carsarmuit Tribal Council

**Proposed Project Phase:** Construction Design

**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
Project Description
This project is to develop a wood energy project for the Kaltag school and community. The school is the largest consumer of power in the community so that it is appropriate for the District to take the lead role in the development of this project, but for biomass utilization to be sustainable in the community and to possibly expand to other nearby communities a cooperative effort is required. This project will be developed in phases. The first phase will be to identify the energy requirements and to confirm the availability of the resource. A preliminary cost benefit analysis will be conducted to verify that the project and fuel supply has the potential to be sustainable and that the projected cost will justify the development costs. Environmental issues will be identified and community meetings held to confirm support for the project. Potential business partners will be identified. If the first phase of development yields favorable results the project will proceed to Phase II and a more detailed business plan and project concept design will be developed. The District plans to contract with William Wall, PhD. who is developing the Ft. Yukon Biomass project, to perform the reconnaissance, feasibility studies and harvest management plan. To proceed to final design, Phase III the commitment of a wood supplier is required. The existing heating system at the Kaltag School is in very poor condition and the District has designed a replacement system and is waiting for approval of a Department of Education grant for construction. The design of a conventional hydronic heating system for the Kaltag School heating has been completed to the design development level by WH Pacific. The engineer effort to date will be coordinated with wood heat engineering. Kathy Christy, an experienced project manager, will serve as the District’s project manager responsible for coordinating the work of the consultants and the compilation of the reports and recommendations.

Funding & Cost

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<tr>
<th>Description</th>
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<td>AEA Funding Recommendation</td>
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AEA Recommendation

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

AEA Funding Recommendation: $16,550
App #260  Biomass Hydronic Heating_YKSD

Resource: Biomass
Proposer: Yukon-Koyukuk School District

Proposed Project Phase: Design
Feasibility
Recon

AEA Program Manager: Ron Brown
Applicant Type: Government Entity

Scoring & Location

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Election District: 6, Interior Villages

49  51.3  Energy Region: Yukon-Koyukuk/Upper Tanana

Rank within Region (out of 5)

Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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</table>

AEA Review Comments

Applicant requests funding for recon, feasibility, and final design of wood-fired heating system(s) for the community of Kaltag’s school and community buildings. AEA's heat recovery system inventory indicates that AVEC's power system supplies a modest amount of heat to the school. The application does not supply information about fuel usage in buildings in Kaltag, which uses 18000 gallons/year. There was not sufficient information in the application to assess project economics. Project management would be by the YK school district. Bill Wall would perform the proposed recon and feasibility work. AEA is concerned that Wall will have sufficient time to perform this work since he is also involved in similar wood energy projects in Upper Kobuk, Ft. Yukon, and McGrath.

Recommend partial funding for reconnaissance at $16,550.
App #260  Biomass Hydronic Heating_YKSD

**Resource:** Biomass  
**Proposer:** Yukon-Koyukuk School District

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

**AEA Program Manager:** Ron Brown  
**Applicant Type:** Government Entity

### Economic Analysis

- Benefit/Cost Ratio (Applicant)
- Benefit/Cost Ratio (AEA)
App #260  Biomass Hydronic Heating_YKSD

Resource: Biomass
Proposer: Yukon-Koyukuk School District

Proposed Project Phase: Design
Feasibility
Recon

AEA Program Manager: Ron Brown
Applicant Type: Government Entity

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #261  Alternative Energy Recon_YKSD

Resource: Other

Proposer: Yukon-Koyukuk School District

AEA Program Manager: Lenny Landis

Applicant Type: Government Entity

Proposed Project Phase: Feasibility Recon

Project Description

This project is to conduct an assessment of potential sources of alternative energy for the schools and communities served by the Yukon Koyukuk School District. These communities are Alakaket, Hughes, Huslia, Kaltag, Koyukuk, Manley Hot Springs, Minto, Nulato and Ruby. Potential alternative energy sources in the District include hydrokinetic, geothermal, biomass (wood), waste heat and wind. There is a high degree of interest in developing alternative energy in the Interior. The District plans to coordinate with other agencies working in this area. The Gwitchyaa Zhee Corporation in Fort Yukon is developing a much larger wood fuel project than would be required by YKSD communities but they provide a model to follow. The District will contract with the consultants assisting in the development of that project, Dr. William Wall, Ph.D. and Peter Olsen. The biomass potential community of Kaltag will be address in a separate grant application. The Yukon River Inter-Tribal Watershed Council (YRITWC) has an experimental hydrokinetic project in Ruby that might have application to our other river based communities. Dr. Brian Hirsch of the Council will assist in the evaluation of harnessing river power. River conditions in the Region will be reviewed and the two most promising site will be selected for evaluation. Gwen Holdmann of the Alaska Center for Energy and Power at the University of Alaska Fairbanks will complete a basic reconnaissance of the geothermal potential in the District for direct use and power generation applications. The District will review waste heat options with local utilities. Manley may have good waste heat potential. From initial review it appears wind generation opportunities are limited. This will be confirmed with AEA. Kathy Christy will serve as the District’s project manager responsible for coordinating the work of the consultants and the compilation of the Phase I report and recommendations.

Funding & Cost

| Cost of Power: | $0.78/kWh |
| Requested Grant Funds: | $112,000 |
| Matched Funds Provided: | $8,500 |
| Total Potential Grant Amount: | $120,500 |

AEA Recommendation

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

AEA Funding Recommendation:
(Not Constrained by Available Funding)
App #261  Alternative Energy Recon_YKSD

Resource: Other
Proposer: Yukon-Koyukuk School District

Proposed Project Phase: Feasibility Recon

AEA Program Manager: Lenny Landis
Applicant Type: Government Entity

Scoring & Location

Energy Region: Yukon-Koyukuk/Upper Tanana
Election District: 6, Interior Villages

Stage 3 Scoring Summary

<table>
<thead>
<tr>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</table>

AEA Review Comments

Applicant proposes to assess alternative energy resources of communities served the YKSD--Alakaket, Hughes, Huslia, Kaltag, Koyukuk, Manley Hot Springs, Minto, Nulato and Ruby.

The work that the applicant proposes, while potentially valuable to the region, is more effectively accomplished using standard methodology on a statewide and regionwide basis that builds on the work already done in the statewide energy report that was released after this application.

Recommend no funding.
Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
### App #261 Alternative Energy Recon _YKSD_

<table>
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<th><strong>Proposed Project Phase:</strong> Feasibility Recon</th>
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<td><strong>Proposer:</strong> Yukon-Koyukuk School District</td>
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#### AEA Program Manager: Lenny Landis

#### Applicant Type: Government Entity

### DNR/DGGS Geohazards Comments

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments
App #262  West Creek Hydro_Muni Skagway

Resource: Hydro  Proposed Project Phase: Design
Proposer: Borough and Municipality of Skagway  Feasibility

AEA Program Manager: Doug Ott  Applicant Type: Local Government

Project Description

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

Funding & Cost

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<td>AEA Funding Recommendation (Not Constrained by Available Funding)</td>
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AEA Recommendation

Full Funding  
✗ Partial Funding  
Special Provision  
Not Recommended  
Did Not Pass Stage 1  
Withdrawn
App #262  West Creek Hydro_Muni Skagway

Resource: Hydro
Proposer: Borough and Municipality of Skagway

Proposed Project Phase: Design
Feasibility

AEA Program Manager: Doug Ott
Applicant Type: Local Government

Scoring & Location

Overall Rank (out of 60) 37
Stage 3 Total Score (out of 100) 57.7

Energy Region: Southeast
Election District: 5, Cordova-Southwest Islands

Rank within Region (out of 12) 7

Stage 3 Scoring Summary

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<tr>
<td>7) Sustainability (Max 5)</td>
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</table>

AEA Review Comments

Geology of upper West Creek Valley is unstable according to the application. Project access and associated transmission lines would interact with Klondike Gold Rush National Historic Site and cross the Chilkoot Trail. Project has potential impacts on coho rearing habitat. Overall project concept is not clear. Project may be configured as storage or run-of-river. Project capital cost and power generation will vary significantly depending upon scheme selected. Applicant claims that FERC licensing would not be required due to pending land transfer out of federal ownership. Licensing jurisdiction remains with FERC until land patent is issued.

Land status and licensing jurisdiction should be assessed in grant funded study along with other requested scope.

Interaction with other potential hydro projects for which RE Fund applications have been received include Burro Cr and Connelly Lk. Existing hydros include Goat Creek, Dewey Lakes, Lutak, 10-Mile, and Kasidaya. An IRP is desirable for the Skagway, Haines, Klukwan area.

AP&T and the City would jointly manage the project, while AP&T would perform the work.

Recommend partial funding of $236,000 for feasibility (phase 2).
### App #262  West Creek Hydro_Muni Skagway

**Resource:** Hydro  
**Proposer:** Borough and Municipality of Skagway  
**AEA Program Manager:** Doug Ott  
**Applicant Type:** Local Government

#### Proposed Project Phase: Design Feasibility

| Benefit/Cost Ratio (Applicant) | 1.22 |
| Benefit/Cost Ratio (AEA)        | 1.26 |

**Economic Analysis**

Hydro resource on West Creek, approximately 7 miles west of Skagway, used primarily to provide power to cruise ships while in port. Currently, cruise ships self generate and the current APC system cannot accommodate the ships. Any excess power could be sold to APC, the local utility. Power will be sold to cruise ships with revenues going to Municipality of Skagway and possibly to the State of Alaska. Excess power sold to APC would reduce the ratepayer costs if the sales price was less than avoided costs.

It is noted that displaced diesel O&M was not included in the analysis due to the power displacing generation on the cruise ships. Analysis based on 25 MW storage project with the capability of providing power to three cruise ships simultaneously. Possible enhancements would result from the feasibility study being funded. Question of usage if the cruise ship industry contracts from current levels.
App #262  West Creek Hydro_Muni Skagway

Resource: Hydro  Proposed Project Phase: Design

Proposer: Borough and Municipality of Skagway  Feasibility

AEA Program Manager: Doug Ott  Applicant Type: Local Government

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
**Project Description**

This proposal is to conduct a reconnaissance and feasibility study for alternative energy use for the school facilities in the communities of Whittier, Chenega Bay, and Tatitlek operated by Chugach School District. Development of sustainable alternative energy is a School Board objective in Chugach School District where fuel costs consume an escalating proportion of the annual budget, detracting from the primary mission of education. Chugach School District has been an education leader and model for other rural Alaska school districts for over 15 years and now wants to be one of the first to create a solution to a problem plaguing rural Alaska.

**Funding & Cost**

- **Cost of Power:** $0.44/kWh
- **Requested Grant Funds:** $1,380,439
- **Matched Funds Provided:**
  - **Total Potential Grant Amount:** $1,380,439

**AEA Recommendation**

- **Existing RE Fund Grant Offer:**
  - **Not Recommended**
- **Did Not Pass Stage 1**
- **Withdrawn**
App #263 Alternative Energy Feasibility_CSD

Resource: Other
Proposer: Chugach School District

Proposed Project Phase: Feasibility Recon

AEA Program Manager: Lenny Landis
Applicant Type: Government Entity

Scoring & Location

Energy Region: Copper River/Chugach
Election District: 32, Chugach State Park

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

Criterion (Weight)  Score
1) Cost of Energy (Max 30)  16
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

Applicant proposes to assess alternative energy resources of communities served the Chugach SD--Whittier, Chenega Bay, and Tatitlek.

The work that the applicant proposes, while potentially valuable to the region, is more effectively accomplished using standard methodology on a statewide and regionwide basis that builds on the work already done in the statewide energy report that was released after this application.

Recommend no funding.
Proposer: Chugach School District

Resource: Other

Proposed Project Phase: Feasibility Recon

AEA Program Manager: Lenny Landis

Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
### DNR/DGGS Geohazards Comments


### DNR/DGGS Feasibility Comments


### DNR/DMLW Feasibility Comments
### App #264 Yakutat Wave Energy Conversion

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<tr>
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<tr>
<td>AEA Program Manager:</td>
<td>Lenny Landis</td>
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<tr>
<td>Applicant Type:</td>
<td>Utility</td>
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#### Project Description

Yakutat Power is located in Yakutat, Alaska. The City and Borough of Yakutat has a population of 631, and is located at the mouth of Yakutat Bay along the Gulf of Alaska, 225 miles northwest of Juneau and 220 miles southeast of Cordova. Yakutat receives monthly barge service during the winter and more frequent service during summer. Yakutat is equipped with two jet-certified runways and receives jet service daily. The U.S. Forest Service and the National Park Service have offices in Yakutat. This project will investigate the conversion of readily available wave energy with the long term goal of integrating the resource into the Yakutat Power electric grid. Direct beneficiaries of this project include all Yakutat Power electric service customers.

#### Funding & Cost

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#### AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
Alaska Renewable Energy Fund: Round 2 (Mar-09)

**Proposed Project Phase:** Construction Design

**Proposer:** Yakutat Power

**Resource:** Ocean/River

**AEA Program Manager:** Lenny Landis

**Applicant Type:** Utility

**Stocking & Location**

**Energy Region:** Southeast

**Rank within Region (out of 12):** 9

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

**Stage 3 Total Score (out of 100):** 52.2

**Overall Rank (out of 60):** 48

**Stage 3 Scoring Summary**

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**AEA Review Comments**

Yakutat Power proposes to collaborate with Electric Power Research Institute to perform final design / permitting and construction of a 500 kW demonstration wave energy project. EPRI and Yakutat are currently conducting reconnaissance and feasibility work expected to be completed by spring 2009. During the final design and permitting stage Yakutat proposes to develop specifications and a solicitation package to be sent to known wave energy technology companies, perform site assessment and environmental permitting, work with the chosen technology vendor on detailed design, and prepare a bid package for construction. Following construction the device would be operated and independently evaluated for at least 18 months.

AEA is concerned at the high cost and high risk of demonstrating new technology. Estimated design and construction cost for the project is $7 million. However, Yakutat and EPRI are proposing a logical, staged development that would minimize risk. Alaska has substantial potential for wave energy and it is logical for the state to support ocean energy technology development.

Recommend partial funding of $632,500 for phase 3 final design and permitting with requirement that no funds be disbursed until Yakutat and EPRI have completed feasibility report and AEA concludes that further work is warranted.
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #264  Yakutat Wave Energy Conversion

<table>
<thead>
<tr>
<th>Resource: Ocean/River</th>
<th>Proposed Project Phase: Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposer: Yakutat Power</td>
<td>Design</td>
</tr>
</tbody>
</table>

AEA Program Manager: Lenny Landis  
Applicant Type: Utility

**Economic Analysis**

Benefit/Cost Ratio (Applicant): **0.60**  
Benefit/Cost Ratio (AEA): **0.48**

The community of Yakutat currently derives electrical energy from diesel generation. At completion, this project would reduce electric energy costs to residents and businesses in the area of between about $194,000 and $281,000 per year. In addition to reducing costs of living for residents, lower costs and greater reliability of electric energy would attract and sustain economic development through the fish processors, sport hunting and fishing lodges, and possibly other opportunities. The applicant suggested a 20 year project life, while AEA suggests a 15 year project life for this type of technology.

Costs of the entire project are high, and outweigh the direct benefits of lowered energy costs to Yakutat during the expected project life of 15 years. However, most of the costs for this project are for elements that do not relate directly to project construction and operation, yet are valuable for moving forward other such projects in other areas of the state. In general, resource assessments and feasibility analyses will lower risk (and therefore, costs) of future projects in this and other locations because of the information obtained through those studies, and so are economically beneficial. Indirect benefits of increased or sustained economic activity in the area, and lowered risk of future projects are not considered in this calculation. The project uses a sustainable resource to produce electric power. However, the small population in the area reduces the chance for greater economies of scale to further reduce marginal costs.
App #264  Yakutat Wave Energy Conversion

**Resource:** Ocean/River  **Proposer:** Yakutat Power

**Proposed Project Phase:** Construction Design

**AEA Program Manager:** Lenny Landis  **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

New technology, therefore will take a bit longer to permit to address environmental studies.
App #265  Kvichak River_Igiugig

Resource: Ocean/River
Proposer: Igiugig Village Council d/b/a Igiugig Electric Company

Proposed Project Phase: Construction
Design
Feasibility
Recon

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Project Description
The Village of Igiugig is located at the outlet of Lake Iliamna, 240 air miles southwest of Anchorage, on the southern shore of the Kvichak River. Igiugig has a year-round population of 56 (predominantly Yupik, Aleut, and Athabascan) rising in summer to about 75. Igiugig also provides goods and services to six area tourism lodges and their respective clients and workforce of 90 additional persons per week. This lake outlet location provides an ideal site for the study, testing and implementation of river in-stream energy conversion that will also benefit other Alaska communities considering this form of renewable energy. A RISEC plant will convert available river kinetic energy into electric power, and feed into the existing Igiugig electric grid to reduce diesel fuel consumption at the Igiugig power plant. Direct beneficiaries include the Lake and Peninsula School District (LPSD) and Igiugig electric service customers.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Power: $/kWh</td>
<td>$0.60</td>
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<tr>
<td>Requested Grant Funds:</td>
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<td>Matched Funds Provided:</td>
<td>$94,200</td>
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<td>Total Potential Grant Amount:</td>
<td>$2,396,830</td>
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</table>

Existing RE Fund Grant Offer: $718,175

AEA Recommendation
Full Funding
x Partial Funding
x Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn

AEA Funding Recommendation: $718,175
The Igiugig Village Council proposes a multi-stage project to test and develop a river instream energy conversion (RISEC) device. The Village would continue collaboration with the Electric Power Research Institute and AEA on RISEC development. Phase 2 would perform a bathymetric profile of the Kvichak River, permitting and environmental analysis, and install two pilot turbines to test performance (2009-11). Phase 3 would select a technology and complete final design and permitting (2012-13). Phase 4 would complete construction and commissioning (2012-14).

IVC has assembled a strong team of experienced engineering, technology, and geotechnical specialists. The project is the logical follow-up to earlier work by EPRI and AEA, and will provide valuable performance data on RISEC devices that is applicable throughout Alaska.

Recommend funding for Phase 2 at $718,175 with the requirement that grantee must coordinate with other ongoing RISEC projects in Ruby, Nenana, and Eagle.
App #265  Kvichak River_Igiugig

**Resource:** Ocean/River  
**Proposer:** Igiugig Village Council d/b/a Igiugig Electric Company  
**AEA Program Manager:** Lenny Landis  
**Proposed Project Phase:** Construction  
**Benefit/Cost Ratio (Applicant):** 0.39  
**Benefit/Cost Ratio (AEA):** 0.36  
**Applicant Type:** Utility

**Economic Analysis**
App #265 Kvichak River_Igiugig

Resource: Ocean/River
Proposer: Igiugig Village Council d/b/a Igiugig Electric Company

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Proposed Project Phase: Construction
Design
Feasibility
Recon

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

Environmental concerns with new technology expected to be raised during permitting may slow this project.
App #266  Birch Creek Solar

Resource: Solar  Proposed Project Phase: Construction
Proposer: Birch Creek Village Council

AEA Program Manager: Lenny Landis  Applicant Type: Government Entity

Project Description
Birch Creek Village Council is seeking funds to install a solar array in conjunction with a 35kw generator in the community of Birch Creek. The Tribal Council operates the electric utility and like many others, is experiencing the negative affects of the high cost of diesel. With the solar panels, we anticipate we can generate enough electricity six months of the year to utilize a 35kw gen set, thereby replacing the need to run the larger 65kw diesel powered generator for a significant portion of the year. The project and the utility serve the village of Birch Creek. The tribal council and the village corporation (project management/personnel) will be involved in the project.

Funding & Cost

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<tr>
<th>Description</th>
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<td>Cost of Power</td>
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<td>Total Potential Grant Amount</td>
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AEA Recommendation

Full Funding
Partial Funding
Special Provision
× Not Recommended
Did Not Pass Stage 1
Withdrawn
### App #266  Birch Creek Solar

<table>
<thead>
<tr>
<th>Resource:</th>
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<tbody>
<tr>
<td>Proposer:</td>
<td>Birch Creek Village Council</td>
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<tr>
<td>AEA Program Manager:</td>
<td>Lenny Landis</td>
</tr>
<tr>
<td>Applicant Type:</td>
<td>Government Entity</td>
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#### Scoring & Location

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

**Election District:** 6, Interior Villages

**Stage 3 Scoring Summary**

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<tbody>
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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<tr>
<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<tr>
<td>6) Local Support (Max 5)</td>
<td></td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td></td>
</tr>
</tbody>
</table>

**AEA Review Comments**

Birch Creek Village Council proposes to install two 2750 Watt tracking solar arrays and a 35 kW diesel generator in Applicant estimates that the project will displace 11520 gallons of diesel per year. AEA has recommended funding for one 50 kW utility-scale photovoltaic-diesel hybrid demonstration project in Northwest Alaska in round 1 of the RE Fund (ID #75) before investing further. The applicants suggestion that 11,000 gallons of fuel per year will be displaced is not supported. KWh displaced by the solar arrays, according to their estimates would displace only about 1000 gallons of fuel. At a more realistic estimated savings of $5000/yr the economics of the proposed project in Birch Creek are not compelling.

Recommend no funding.
Economic Analysis

Benefit/Cost Ratio (Applicant)  \(0.40\)

Benefit/Cost Ratio (AEA)  \(0.59\)

Attempts to reverse-engineer the assumptions that were made to arrive at the 14,418 gallons per year savings (cost worksheet) or the 11,520 gallons per year savings (pg 11 application) did not make sense given the specifications of the solar array or savings possible with a smaller generator operating more efficiently vs. a larger generator running less efficiently. Entries in the applicant cost worksheet for installed capacity (5,740 kW) and kWh per year total renewable ("40,740 Watts") did not make sense. The only manner of producing these kinds of fuel savings would be if the village had a significant conservation program that was undertaken simultaneously. Attempt to contact Birch Creek Village CEO did not result in a return call. In order to salvage a B/C analysis the $35,000 for the new generator was dropped from the capital cost estimate, resulting in a $77,200 project total. In so doing the B/C ratio improved to \(0.59\). Annual fuel savings were estimated at about 423 gallons per year. With the generator included, the capital cost is $112,200 and B/C ratio \(0.4\).
Birch Creek Solar

Proposer: Birch Creek Village Council

Proposed Project Phase: Construction

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
Project Description

Tlingit Haida Central Council (CCTHIA) will construct two containerized mobile biodiesel processing plants to be operated in tandem to take advantage of available feedstock, while also servicing distinct geographical regions in Alaska. As the relative isolation of the Southeast and Southcentral regions of the state make prices of feedstock and finished biodiesel dependent upon transportation, we expect to use lower-cost local production and local feedstocks, in addition to imported feedstocks, to bring down the overall costs of the final wholesale and retail costs of Bioheat, a blended Home Heating Oil that can be used in virtually any existing fuel oil stove for residential and public space heating. The operations will be conducted by AlaskaSmart Eco-fuels as per a memorandum of agreement.
App #267  Mobile Biodiesel Processing Plant_CCTHIA

Resource: Biofuels
Proposer: Tlingit Haida Central Council

AEA Program Manager: Lenny Landis
Applicant Type: Government Entity

Proposed Project Phase: Construction
Design

Scoring & Location

Energy Region: Southeast
Election District: 3, Juneau-Downtown-Douglas

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
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<tr>
<td>2) Funding Resources (Max 25)</td>
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<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<tr>
<td>4) Project Readiness (Max 5)</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>6) Local Support (Max 5)</td>
<td></td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td></td>
</tr>
</tbody>
</table>

AEA Review Comments

Applicant proposes to construct two containerized biodiesel processing facilities that will convert waste vegetable oil and other feedstocks into biodiesel that will be marketed to displace heating oil. Feedstock would be provided by an Anchorage-based firm and possibly by cruise lines. Potential customers would be one or more petroleum distributors. The applicant requests $1.5 million in grant funds, $901,590 of which would cover the first year of operation.

Although we support the concept of using waste vegetable oil or fish oil from fish processing operations to displace heating fuel, AEA has serious concerns with this application: 1) 60% of the grant would be used for operation during the first year, thus calling into question the sustainability of the operation, 2) assumptions on feedstock supply and savings to consumers have fundamental problems. (See economist notes.)

Recommend no funding.
App #267  Mobile Biodiesel Processing Plant_CCTHIA

- **Resource:** Biofuels
- **Proposer:** Tlingit Haida Central Council
- **AEA Program Manager:** Lenny Landis
- **Applicant Type:** Government Entity

**Proposed Project Phase:** Construction Design

**Economic Analysis**

- **Benefit/Cost Ratio (Applicant):** 19.73
- **Benefit/Cost Ratio (AEA):** -0.72

The WVO in Anchorage is currently being collected by Alaska Mill and Feed and sold to buyers in the Seattle area. Alaska Mill and Feed is selling their WVO collection business to Alaska Waste in June 2009 and leaving that line of business. Alaska Waste is building their own biodiesel plant to provide diesel fuel for their fleet of garbage trucks and the WVO will not be available to other interested parties. As a result, the benefit-cost analysis only evaluates the Juneau plant. Labor costs are shown for the batch production of biodiesel but no costs are shown for management of the company (supervision of staff, accounting, legal, administrative, etc.), land rents, costs for transporting the feedstock, etc.

The application has reasonable capital estimates for the biodiesel processing plant but costs for other capital equipment are not evident in the application. For example, in the winter months the WVO may need to be heated to convert it into a liquid form after it is picked up from local restaurants. Similarly, a heated biodiesel storage tank may be needed so that final testing can be done before the finished product is transferred to the petroleum distributor. A basic laboratory will be needed for conducting such tests and a facility that houses the lab could also provide space for storing supplies and spare equipment. The costs for such facilities are not apparent.
App #267  Mobile Biodiesel Processing Plant _CCTHIA

<table>
<thead>
<tr>
<th>Resource:</th>
<th>Biofuels</th>
<th>Proposed Project Phase:</th>
<th>Construction Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposer:</td>
<td>Tlingit Haida Central Council</td>
<td>AEA Program Manager:</td>
<td>Lenny Landis</td>
</tr>
</tbody>
</table>

**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 #268  UAF Absorption Chiller

Resource: Heat Recovery  Proposed Project Phase: Construction Design
Proposer: University of Alaska, Fairbanks

AEA Program Manager: Lenny Landis  Applicant Type: Government Entity

Project Description
This project will provide a central chilled water system for the West Ridge area of the University of Alaska Fairbanks campus. This central chilled water system will meet the cooling needs of the buildings on the West Ridge and the needs of the computer center. This project will replace the electrically-driven chillers that are in each building with a central absorption chilling facility. This cooling system will utilize steam heat that is currently being wasted as its energy source.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Power:</td>
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<tr>
<td>Requested Grant Funds:</td>
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<td>Total Potential Grant Amount:</td>
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</table>

Existing RE Fund Grant Offer:

AEA Funding Recommendation: (Not Constrained by Available Funding)

AEA Recommendation:
Full Funding  Partial Funding  Special Provision  Not Recommended  Did Not Pass Stage 1  Withdrawn
App #268  UAF Absorption Chiller

Resource: Heat Recovery
Proposer: University of Alaska, Fairbanks

Proposed Project Phase: Construction Design

AEA Program Manager: Lenny Landis
Applicant Type: Government Entity

Scoring & Location

Energy Region: Railbelt
Election District: 9, City of Fairbanks

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
<td>6</td>
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<tr>
<td>2) Funding Resources (Max 25)</td>
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<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<tr>
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<td>6) Local Support (Max 5)</td>
<td></td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
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</tbody>
</table>

AEA Review Comments

Applicant proposes to recover unutilized heat from UAF's coal-fired power plant to operate an absorption chilling system on the University's West Ridge to replace existing electric chillers located in each building. Proposal is based on a detailed feasibility analysis and conceptual design. Final design would begin following grant approval and take approximately one year. Construction would last 24 months.

Although the project would reduce average electrical load substantially and reduce CO2 emissions, the project is expensive and the applicant's economic analysis indicates a payback in approximately 30 years. Despite the applicant's strong design and management team, AEA does not think the demonstration value of the absorption chiller offsets the long payback.

Recommend no funding.
### Economic Analysis

<table>
<thead>
<tr>
<th>Benefit/Cost Ratio (Applicant)</th>
<th>Benefit/Cost Ratio (AEA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.43</td>
<td>-0.43</td>
</tr>
</tbody>
</table>

The project cost of $15 million is large relative to the 2 million kWh per year in electric savings, which produce a net avoided cost of $453,6 thousand beginning in 2013 ($353,612 in avoided electric cost, plus $100,000 in building O&M). The applicant indicated that future capital costs would be substantially reduced because the installation is designed for projected University growth. But these capital cost savings have not quantified and are therefore not in the cost/benefit calculation. Doing so would enhance the benefit/cost ratio.
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

This is not a conventional geothermal project and DGGS does not have specific expertise or comments. (Summertime temperature regulation of west ridge buildings has been a problem for years.)

DNR/DMLW Feasibility Comments
App #269  WCA Hydrokinetic_Tanana River

**Resource:** Ocean/River

**Proposer:** Whitestone Community Association

**Proposed Project Phase:** Construction Design

**AEA Program Manager:**

**Applicant Type:** Government Entity

### Project Description

WCA proposes a hydrokinetic renewable energy project to be implemented on the nearby Tanana River, approximately 2000-3000 feet downriver from the Richardson Highway crossing near Big Delta, Alaska. This proposed project encompasses Phases III and IV of a four-phase program. Reconnaissance and feasibility studies were performed by Electric Power Research Institute, Inc. (EPRI) in 2007 and 2008. The purpose was to assess technical, economic, financial, and operational viability of a project and to narrow the focus of final design and construction. The reconnaissance and feasibility studies have shown that this proposed project is warranted. Electronic copies of the reconnaissance and feasibility reports are available on EPRI’s website at http://oceanenergy.epri.com/risec.html#reports.

Building on information gathered in Phases I and II, WCA shall establish the project configuration and specifications that will be used to guide construction, further refine project cost estimates, finalize business plans, and obtain land use and resource authorizations required for construction. This proposed project encompasses the final design and permitting and construction/operation phases for a pilot RISEC plant and subsequent expanded generating plant serving the Whitestone Community on the Tanana River. The electricity produced by the pilot generating plant will be operated in two modes; first, exclusively connected to the remote Whitestone power distribution grid, and then, when deemed successful, connected to the GVEA power transmission / distribution grid. This project will be managed by WCA, with technical support provided by EPRI; system integration and construction management support from CE2 Engineers, Inc. (CE2); a RISEC technology developer to be selected; and other necessary Renewable Energy Fund Grant Application AEA 09-004 Grant Application Page 4 of 16 9/3/2008 support contractors to be identified and selected. This phased project will be progressively conducted with a gated decision process allowing for data evaluation prior to proceeding with construction.

### Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Power:</td>
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<td>Total Potential Grant Amount:</td>
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**AEA Recommendation:**

<table>
<thead>
<tr>
<th>Recommendation</th>
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<tbody>
<tr>
<td>Full Funding</td>
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<td>Special Provision</td>
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<td>× Did Not Pass Stage 1</td>
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**AEA Funding Recommendation: (Not Constrained by Available Funding)**
App #269  WCA Hydrokinetic_Tanana River

Resource: Ocean/River
Proposer: Whitestone Community Association

Proposed Project Phase: Construction Design

AEA Program Manager:

Applicant Type: Government Entity

Scoring & Location

Energy Region: Southeast
Election District: 5, Cordova-Southeast Islands

Overall Rank (out of 60)
Stage 3 Total Score (out of 100)

Rank within Region (out of )

Stage 3 Scoring Summary

Criterion (Weight)  Score
1) Cost of Energy (Max 30)  6
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

Not eligible applicant
App #269  WCA Hydrokinetic_Tanana River

**Resource:** Ocean/River  
**Proposer:** Whitestone Community Association

**Proposed Project Phase:** Construction Design

**AEA Program Manager:**  
**Applicant Type:** Government Entity

**Economic Analysis**

Benefit/Cost Ratio (Applicant) ![Diagram]

Benefit/Cost Ratio (AEA) ![Diagram]
App #269  WCA Hydrokinetic_Tanana River

<table>
<thead>
<tr>
<th>Resource: Ocean/River</th>
<th>Proposed Project Phase: Construction</th>
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<tbody>
<tr>
<td>Proposer: Whitestone Community Association</td>
<td>Design</td>
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**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

Environmental concerns with new technology expected to be raised during permitting may slow this project.
Project Description
This project will provide a 20-kilowatt solar photovoltaic array on the roof of the Student Recreation Center on the University of Alaska Fairbanks campus. This array will generate electric power to the University of Alaska Fairbanks electric power grid. All power produced by this project will offset power that the University will not have to purchase or generate.

Funding & Cost

- Cost of Power: $0.17/kWh
- Requested Grant Funds: $320,000
- Matched Funds Provided: $50,000
- Total Potential Grant Amount: $370,000

AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- × Did Not Pass Stage 1
- Withdrawn
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #270  UAF Photovoltaic

<table>
<thead>
<tr>
<th>Resource: Solar</th>
<th>Proposed Project Phase: Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposer: Univertity of Alaska, Fairbanks</td>
<td></td>
</tr>
</tbody>
</table>

AEA Program Manager: Lenny Landis

Applicant Type: Government Entity

Scoring & Location

Energy Region: Railbelt

Election District: 9, City of Fairbanks

Rank within Region (out of )

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
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<tr>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</tbody>
</table>

AEA Review Comments

UAF proposes to install a 20 kW solar array on the roof of the Student Recreation Center at a cost of $370,000 and expects to displace $4,000/yr of fuel. Economic benefit of the project is very low to installed cost. AEA judges the demonstration value of a solar array very modest. We note that the Cold Climate Housing Research Center has a larger tracking array in the near vicinity.

Recommend no funding.
Economic Analysis

Benefit/Cost Ratio (Applicant) .19

Benefit/Cost Ratio (AEA) .19

The construction cost estimate of $370,000 was based upon a previous pilot project UAF undertook, and was accepted. In addition the 1,000 hours of effective capacity production was based upon two years of data with this pilot project. (20 kW capacity at 1,000 hours resulting in 20,000 kWh per annum total production). Photovoltaic is an expensive means of reducing electric consumption, and as such the costs are large relative to small savings in electric production from other means (In this case GVEA). Given the UAF experience with the photovoltaic pilot project, there are no flaws or attributes expected to add or detract significantly from expectations regarding this analysis. Long term sustainability is obviously a positive feature for solar projects. But the benefits are very low relative to the capital costs, resulting in a .19 Benefit/Cost ratio. The project would have to be justified not on the basis of economics, but on the basis of research potential.
App #270  UAF Photovoltaic

Resource: Solar  Proposed Project Phase: Construction

Proposer: University of Alaska, Fairbanks

AEA Program Manager: Lenny Landis  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 #271  Unalaska Heat Recovery

Resource: Heat Recovery
Proposer: City of Unalaska, Department of Public Utilities
AEA Program Manager: Lenny Landis

Proposed Project Phase: Construction
Applicant Type: Utility, Local Government

Project Description
Waste Heat Recovery Project: This project will tap off of the excess heat from existing generators at the Dutch Harbor Powerhouse to run a new generator designed to convert the waste heat to electrical energy. When the New Powerhouse is constructed, the waste heat recovery system will be expanded to include excess heat from increased power demands. The Dutch Harbor Powerhouse serves the residents and various industrial processes in the City of Unalaska and the International Port of Dutch Harbor, which is the number one fishing port in the United States.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Power:</td>
<td>$0.54/kWh</td>
</tr>
<tr>
<td>Requested Grant Funds:</td>
<td>$1,300,000</td>
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<tr>
<td>Matched Funds Provided:</td>
<td>$619,807</td>
</tr>
<tr>
<td>Total Potential Grant Amount:</td>
<td>$1,919,807</td>
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<tr>
<td>Existing RE Fund Grant Offer:</td>
<td></td>
</tr>
<tr>
<td>AEA Funding Recommendation:</td>
<td>$1,300,000</td>
</tr>
</tbody>
</table>

AEA Recommendation

Full Funding
Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
App #271  Unalaska Heat Recovery

**Resource:** Heat Recovery

**Proposer:** City of Unalaska, Department of Public Utilities

**AEA Program Manager:** Lenny Landis

**Proposed Project Phase:** Construction Design

**Applicant Type:** Utility

**Local Government

**Applicant proposes to recover heat from diesel generation plant to supply a 200 kW organic rankine cycle generator. Applicant would provide 32% of total project funding. Project would be complete by summer 2010.**

**EA Review Comments**

Recommend full funding of $1,300,000.
App #271  Unalaska Heat Recovery

Resource: Heat Recovery  
Proposer: City of Unalaska, Department of Public Utilities  
AEA Program Manager: Lenny Landis  
Applicant Type: Utility  
Local Government  
Proposed Project Phase: Construction Design

Economic Analysis

Benefit/Cost Ratio (Applicant)  
4.77

Benefit/Cost Ratio (AEA)  
4.62

The engineering estimate was slightly higher than applicant's submission, but on the other hand the $91,605 preliminary design work was considered a sunk cost. The total capital cost estimate is $1,982,243. Displaced fuel in AEA estimation is over 127,000 gallons per year. This yields a high B/C ratio of 4.44. Pg 11 of 17 in engineering report expressed concerns about cooling water flow rate that might affect feasibility of the system. But a 30% contingency was built in to the analysis and alternative systems are available. The project is clearly both feasible and of high economic value. Also sustainable.
App #271 Unalaska Heat Recovery

**Resource:** Heat Recovery

**Proposer:** City of Unalaska, Department of Public Utilities

**Proposed Project Phase:** Construction Design

**AEA Program Manager:** Lenny Landis

**Applicant Type:** Utility 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**
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #272 Akiak Wind

<table>
<thead>
<tr>
<th>Resource: Wind</th>
<th>Proposed Project Phase: Feasibility Recon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposer: Akiak Power Utilities</td>
<td></td>
</tr>
</tbody>
</table>

AEA Program Manager: James Jensen  
Applicant Type: Utility

Project Description

This purpose of this work is to provide a conceptual design and construction cost estimate for to use wind power to displace diesel fuel for power generation and heating. The scope of work will include conducting energy use baseline studies, energy resource monitoring and the development of conceptual designs and cost estimates for construction. This work would also explore the management and financial feasibility of a wind project. This project would be in conjunction with other efforts such as those of the Chaninik Wind Group, which is working in the Bethel region. The average consistent power in the wind across our region is some of the best to be found in Alaska, however, this general data must be supplemented with simultaneous electric load data in each location to better integrate the available wind with the energy needs. Village energy system and wind monitoring stations will be purchased in Fall of 2009 and installed this winter, and monitored for one year. This work is needed in order to move forward with a renewable energy project and obtain future funding.

Funding & Cost

Funding & Cost:  
| Cost of Power: $0.60/kWh |  
| Requested Grant Funds: $200,000 |  
| Matched Funds Provided: |  
| Total Potential Grant Amount: $200,000 |  
| Existing RE Fund Grant Offer: |  
| AEA Funding Recommendation: (Not Constrained by Available Funding) |  

AEA Recommendation:  
Full Funding  
Partial Funding  
Special Provision  
Not Recommended  
✗ Did Not Pass Stage 1  
Withdrawn
App #272  Akiak Wind

Resource: Wind  Proposed Project Phase: Feasibility Recon

Proposer: Akiak Power Utilities

AEA Program Manager: James Jensen  Applicant Type: Utility

Scoring & Location

Energy Region: Lower Yukon-Kuskokwim

Election District: 38, Bethel

Rank within Region (out of )

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<tr>
<td>1) Cost of Energy (Max 30)</td>
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<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<td>6) Local Support (Max 5)</td>
<td></td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td></td>
</tr>
</tbody>
</table>

AEA Review Comments
App #272  Akiak Wind

Resource: Wind  Proposed Project Phase: Feasibility Recon
Proposer: Akiak Power Utilities

AEA Program Manager: James Jensen  Applicant Type: Utility

Economic Analysis
### App #272  Akiak Wind

<table>
<thead>
<tr>
<th><strong>Resource:</strong> Wind</th>
<th><strong>Proposed Project Phase:</strong> Feasibility Recon</th>
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</thead>
<tbody>
<tr>
<td><strong>Proposer:</strong> Akiak Power Utilities</td>
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</tr>
<tr>
<td><strong>AEA Program Manager:</strong> James Jensen</td>
<td><strong>Applicant Type:</strong> Utility</td>
</tr>
</tbody>
</table>

#### DNR/DGGS Geohazards Comments

#### DNR/DGGS Feasibility Comments

#### DNR/DMLW Feasibility Comments
App #273  Tuntutuliak High Penetration Wind Diesel

<table>
<thead>
<tr>
<th>Resource: Wind</th>
<th>Proposed Project Phase: Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposer: Tuntutuliak Community Services Association</td>
<td></td>
</tr>
<tr>
<td>AEA Program Manager: James Jensen</td>
<td>Applicant Type: Utility</td>
</tr>
</tbody>
</table>

**Project Description**

This is a request for funding to construct a high-penetration wind-diesel system for the community of Tuntutuliak. The wind diesel system will displace 30% of the diesel fuel currently being used to generate electricity and used to provide residential home heating. The work plan consists of the installation, control and integration of five major components:

1. Five (5) Windmatic 17-S Wind turbines on 80 feet-tall lattice towers
2. Diesel power system control and integration upgrades
3. Energy recovery boiler at the school
4. Smart metering system
5. 40 Residential electric thermal room heating units

The wind turbines will be installed 250 feet apart on pile foundations on the abandoned runway. Construction will take place during the Summer and Fall of 2009. Each turbine will be connected to the electrical distribution system via a buried armored cable. A fiber optic cable will be buried alongside the power cable to provide a communications link with the powerplant. Three hierarchical methods of integrating the wind into the diesel grid include:

1. Heat recovery with frequency control
2. Adaptations to diesel generators to enable low-load operation
3. An integrated control system that operates both the wind turbines and diesel generators in a coordinated manner with ceramic thermal storage.

**Funding & Cost**

<table>
<thead>
<tr>
<th>Cost of Power: $0.52/kWh</th>
<th>AEA Recommendation: $1,760,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requested Grant Funds: $1,760,000</td>
<td>✗ Full Funding</td>
</tr>
<tr>
<td>Matched Funds Provided: $1,600,000</td>
<td>Partial Funding</td>
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<tr>
<td>Total Potential Grant Amount: $3,360,000</td>
<td>✗ Special Provision</td>
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<tr>
<td>Existing RE Fund Grant Offer:</td>
<td>Not Recommended</td>
</tr>
<tr>
<td>AEA Funding Recommendation (Not Constrained by Available Funding): $1,760,000</td>
<td>Did Not Pass Stage 1</td>
</tr>
<tr>
<td>AEA Funding Recommendation: $1,760,000</td>
<td>Withdrawn</td>
</tr>
</tbody>
</table>

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Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #273  Tuntutuliak High Penetration Wind Diesel

Resource: Wind  Proposed Project Phase: Construction
Proposer: Tuntutuliak Community Services Association
AEA Program Manager: James Jensen  Applicant Type: Utility

Scoring & Location

Energy Region: Lower Yukon-Kuskokwim
Election District: 38, Bethel

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)
12  72.9

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
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<td>1) Cost of Energy (Max 30)</td>
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<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<tr>
<td>6) Local Support (Max 5)</td>
<td>4</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
<td>4</td>
</tr>
</tbody>
</table>

Rank within Region (out of 6)

AEA Review Comments

This application is for installation of 450 kW of wind turbines in Tuntutuliak, upgrades to the existing diesel system, recovered heat at the washeteria and school, and smart meters and thermal stoves in approximately 35 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. Connections to the existing system will be underground. However USFWS has requested further review due to the known or suspected presence of listed species in the area. Rights-of-way through Native allotments may be needed from BIA. Unlike a similar project in Kongiganek, there is no onsite met tower data available.

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 of $1,760,000 with the following conditions that must be met before funds are disbursed: 1) AEA approval of final design and permitting, 2) the grantee establish a five-year operation and maintenance contract with an 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 #273  Tuntutuliak High Penetration Wind Diesel

Resource: Wind  Proposed Project Phase: Construction
Proposer: Tuntutuliak Community Services Association

AEA Program Manager: James Jensen  Applicant Type: Utility

Economic Analysis

| Benefit/Cost Ratio (Applicant) | 1.94 |
| Benefit/Cost Ratio (AEA)       | 1.56 |

The analysis shows the project will generate significant fuel savings from wind power to serve both the heat and power needs of the community. The project could save at least 64,000 gallons of fuel per year. Current fuel usage of the community is about 430,000 gallons for electric and heat per year.

The analysis shows that the project as proposed would be economically viable given the 20-year horizon. The concern with wind is always the availability or variability of the resource. The wind resource data indicate a Class 5 wind regime. Highly variable wind production would need to be addressed to ensure power system stability. Furthermore, sustainability of the project would depend on proper maintenance and operations of the equipment.
App #273  Tuntutuliak High Penetration Wind Diesel

Resource: Wind  Proposed Project Phase: Construction

Proposer: Tuntutuliak Community Services 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 #274  Wind Recon_NPRHA

**Resource:** Wind  
**Proposer:** North Pacific Rim Housing Authority

**AEA Program Manager:** James Jensen  
**Applicant Type:** Government Entity

### Project Description

The Project is a Reconnaissance Project to investigate the possibilities of installing supplemental or replacement renewable energy for the lighting needs for the public docks and harbors operated by NPRHA in Tatitlek and Chenega Bay, Alaska. It will include quantifying the renewable energy resource available by erecting a monitoring tower, completing other items of the reconnaissance phase including consolidating our data into this process, completing environmental screening, reviewing system benefits, proposing a system design, other phase requirements and lastly the analysis and recommendations.

### Funding & Cost

- **Cost of Power:** $0.76 /kWh
- **Requested Grant Funds:** $30,500
- **Matched Funds Provided:** $15,000
- **Total Potential Grant Amount:** $45,500

**Existing RE Fund Grant Offer:**

**AEA Funding Recommendation:** (Not Constrained by Available Funding)

**AEA Recommendation:**

- Full Funding
- Partial Funding
- Special Provision
- X Not Recommended
- Did Not Pass Stage 1
- Withdrawn
App #274  Wind Recon_NPRHA

Resource: Wind  Proposed Project Phase: Recon

Proposer: North Pacific Rim Housing Authority

AEA Program Manager: James Jensen  Applicant Type: Government Entity

Scoring & Location

Energy Region: Copper River/Chugach

Election District: 5, Cordova-Southeast Islands

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

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</table>

AEA Review Comments

Applicant proposes wind resource assessment and feasibility study/conceptual design of residential size 7.5 kW wind systems for lighting in the harbors of Chenega and Tatitlek.

The Denali Commission/AEA have already allocated funds for a hydro study in Chenega under the alternative energy RFP. AEA is recommending funding for proposed feasibility of wind and hydro in Tatitlek in Round 2 of the RE Fund (app # 316). We feel it is more appropriate to focus on development of community-scale energy systems.

AEA recommends no funding.
Total fuel savings related to the proposed wind energy project for the local utilities would be pretty modest; about 2,500 gallons per year. Although the total gallons saved per year is modest, the applicant points out that there are also benefits of reducing the load on the village generator; by removing the applicant's large sporadic load, the local utility could operate their generators more efficiently. The applicant further states that their additional load sometimes is a factor in requiring additional winter fuel delivery to the community which can be expensive.

Cost assumptions, project schedule, base system information are the same in both AEA and applicant analysis. The only difference in the AEA analysis, which is significant, is the amount of fuel displaced. The applicant estimated fuel displacement based on load growth assumptions. Fuel displaced in the AEA analysis is based simply on displacement of electricity generated from diesel by electricity generated by wind (given fuel efficiency of existing diesel generation system). The applicant notes that the average amount of fuel displacement for the communities is expected to grow over the lifetime of the project as dock traffic from tourism and commercial activities continue to grow. The risk of the project lies in whether there is enough wind resource in the location. The intent of the applicant in requesting funding is to evaluate the wind resource and design an optimal wind configuration to make the project economically viable.
<table>
<thead>
<tr>
<th>Resource: Wind</th>
<th>Proposed Project Phase: Recon</th>
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</thead>
<tbody>
<tr>
<td>Proposer: North Pacific Rim Housing Authority</td>
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</tbody>
</table>

**AEA Program Manager:** James Jensen  
**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments
### Project Description

This project involves constructing a powerhouse, diversion structure with penstock, and substation for a new hydroelectric facility located on the Nenana River upstream of the Healy Creek confluence. The new substation would connect the hydroelectric power generation facility to GVEA's existing high voltage transmission infrastructure in Healy. Electricity from the new power generation source would be distributed to GVEA's 33,000 members from Cantwell to Delta Junction.

### Funding & Cost

- **Cost of Power:** $0.17/kWh
- **Requested Grant Funds:** $2,200,000
- **Matched Funds Provided:** $550,000
- **Total Potential Grant Amount:** $2,750,000

### AEA Recommendation

- **Full Funding**
- **Partial Funding**
- **Special Provision**
- **Not Recommended**
- **Did Not Pass Stage 1**
- **Withdrawn**
App #275  Nenana Healy Hydro Phase II_GVEA

**Resource:** Hydro  
**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** Doug Ott  
**Applicant Type:** Utility

### Scoring & Location

- **Energy Region:** Railbelt
- **Election District:** 8, Denali-University
- **Rank within Region**

### Stage 3 Scoring Summary

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</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
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</tbody>
</table>

### AEA Review Comments

Application withdrawn by applicant.
**App #275  Nenana Healy Hydro Phase II_GVEA**

**Resource:** Hydro  
**Proposer:** Golden Valley Electric Association

**AEA Program Manager:** Doug Ott  
**Applicant Type:** Utility

**Economic Analysis**

- **Benefit/Cost Ratio (Applicant)**
- **Benefit/Cost Ratio (AEA)**
App #275  Nenana Healy Hydro Phase II_GVEA

Resource: Hydro  Proposed Project Phase: Feasibility
Proposer: Golden Valley Electric Association

AEA Program Manager: Doug Ott  Applicant Type: Utility

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
**Project Description**

Objectives that have been established by stakeholders of the IRP process. The resource portfolio is a set of supply-side and/or demand-side improvements that eliminate any identified energy or capacity deficits. Supply side improvements would be new generation construction, or modifications to existing generation assets such that energy production or available capacity is increased. Demand side improvements are system efficiency improvements or peak load modification measures. Stakeholders include concerned citizen groups, commercial and industrial customers, utility or city government officials, and representatives of state agencies. The stakeholders and the IRP issuing body (The Four Dam Pool Power Agency, FDPPA) establish the objectives that govern how the resource portfolio is established. Most IRP objectives are governed by the 3 major categories of cost, risk, and environmental impact. The IRP process includes stakeholder input with final content decisions made by the issuing body (FDPPA).

The FDPPA is also undergoing a restructuring whereby two of the Agency’s four projects are being transferred or sold back to the member utilities. The FDPPA is a Joint Action Agency organized under State Statute and will remain the same although the name will be changed to the Southeast Alaska Power Agency (SEAPA). This planned restructuring is scheduled to close in January, 2009. SEAPA will remain the owner of the Swan Lake and Tyee Lake hydroelectric facilities as well as associated transmission lines providing Agency power to Ketchikan, Wrangell and Petersburg including the Swan-Tyee Intertie.

Developing an IRP requires an analysis of the regions generation and transmission system, and an estimation of the regions load growth. Generation and load forecasts are modeled to determine when and to what extent future energy and/or capacity deficits occur. Energy and capacity deficits are resolved by a combination of constructing new generation facilities, and through load growth rate or peak hour value reduction via demand side management. The IRP then documents a short term and long term plan to address the energy and capacity deficits.

**Funding & Cost**

<table>
<thead>
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<th></th>
<th>Cost of Power: $0.12 /kWh</th>
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<tr>
<td>AEA Funding Recommendation: (Not Constrained by Available Funding)</td>
<td>$252,000</td>
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</tbody>
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**AEA Recommendation**

- [x] Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn

**AEA Funding Recommendation:** $252,000
App #276 Integrated Resource Plan_FDPPA

Resource: Other
Proposer: The Four Dam Pool Power Agency

AEA Program Manager: Doug Ott
Applicant Type: Government Entity

Applicant proposes to prepare a detailed integrated energy resource plan (IRP) for southern Southeast. The study will be valuable for addressing cost, output, energy market and other elements of projects under various stages of development in this subregion, a number of them being funded by the RE Fund (e.g. Kake-Petersburg Intertie, Whitman, Triangle, Ruth Lk hydro development, Wrangell electric boiler).

Recommend full funding. AEA will assist in coordinating the IRP with other energy requirements in the Southeast region and may consider providing additional funding to do so. As with other projects AEA will approve scope of work.
App #276  Integrated Resource Plan_FDPPA

Resource: Other  Proposed Project Phase: Recon
Proposer: The Four Dam Pool Power Agency

AEA Program Manager: Doug Ott  Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
<table>
<thead>
<tr>
<th>Resource: Other</th>
<th>Proposed Project Phase: Recon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposer: The Four Dam Pool Power Agency</td>
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</tbody>
</table>

**AEA Program Manager:** Doug Ott

**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments
App #277  Angoon HR_IPEC

Resource: Heat Recovery  Proposed Project Phase: Construction Design
Proposer: Inside Passage Electric Company

AEA Program Manager: Lenny Landis  Applicant Type: Utility

Project Description
The proposed project is located in Angoon, Alaska which is a remote native community with a population of approximately 400 residents. Electricity is generated locally by diesel-electric generation. Most homes and larger buildings, including the schools, use diesel as a heating fuel. The heat recovery project will provide heat to the local schools and reduce their annual heating fuel requirement. IPEC is working closely with the engineering firm, Alaska Energy and Engineering, Inc. to make this project successful.

Funding & Cost

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Cost of Power:</td>
<td>$0.61/kWh</td>
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<tr>
<td>Requested Grant Funds:</td>
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<td>Matched Funds Provided:</td>
<td>$72,000</td>
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<td>Total Potential Grant Amount:</td>
<td>$617,934</td>
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<td>Existing RE Fund Grant Offer:</td>
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<tr>
<td>AEA Funding Recommendation: (Not Constrained by Available Funding)</td>
<td>$545,934</td>
</tr>
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</table>

AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #277 Angoon HR_IPEC

Resource: Heat Recovery
Proposer: Inside Passage Electric Company

Proposed Project Phase: Construction Design

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Scoring & Location

Energy Region: Southeast
Election District: 5, Cordova-Southeast Islands

Overall Rank (out of 60) 13
Stage 3 Total Score (out of 100) 72.2
Rank within Region (out of 12) 2

Stage 3 Scoring Summary

<table>
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<td>5) Benefits (Max 10)</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</tr>
</tbody>
</table>

AEA Review Comments

Applicant proposes final design and construction for recovering heat from the new diesel generating plant and pipe hot water to two school buildings. As part of the powerhouse project, the utility has installed equipment for recovering both jacket water and stack heat. The utility has requested that AEA manage the project. Permitting is complete and project construction would be complete within a year of funding.

Recommend full funding for $545,934.
App #277  Angoon HR_IPEC

Resource: Heat Recovery
Proposer: Inside Passage Electric Company

Proposed Project Phase: Construction
          Design

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Economic Analysis

Benefit/Cost Ratio (Applicant)  3.00
Benefit/Cost Ratio (AEA)  2.26

The back-up documentation disagreed with applicant’s estimate of 26,000 gallons of fuel savings per year. AEA analysis utilized the 17,280 gallon estimate from the heat recovery analytical program estimates included in the application. Applicant estimate of $617,934 was based on professional engineering estimates, but included sunk cost of $72,000 that was excluded from the AEA analysis. A substantial contingency of $71,000 was included in the cost estimate, and was included in the AEA estimate. Project delay in the upgrade that led to this additional funding request is also a possibility here, although less so than by comparison to projects that have not had this level of engineering detail. Heat recovery systems like this provide substantial and sustainable reductions in energy use. It is a solid project with high likelihood of success, with a B/C ratio of 2.26.
App #277  Angoon HR_IPEC

Resource: Heat Recovery  Proposed Project Phase: Construction
Proposer: Inside Passage Electric Company  Design

AEA Program Manager: Lenny Landis  Applicant Type: Utility

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
Project Description

Rising energy prices and demand for renewable systems could create demand for solar for hot water heating throughout the nation—even in the Arctic. Solar is often dismissed as a non-starter in the Arctic—it should not be. Some of the world’s most successful solar projects have been in places where the solar fraction is about 50%. By strategically targeting entities and institutions with solar technology, this could be an effective demand-side management option.

This project focuses on the installation of solar hot water heaters on residential, commercial, and public buildings in the Northwest Arctic Borough. If the technology proves to be economically feasible, the eventual goal would be to install many solar water heaters on buildings and residences throughout the region. Before solar water heaters are installed on many buildings throughout the region, a solar hot water heating demonstration project would be installed as a test case. Presumably, this demonstration solar water heater would be installed on commercial and housing interests where the NIHA has a strategic influence, in Kotzebue or the surrounding communities. Key partners in the project include NANA Pacific/NANA Regional Corporation, the Northwest Arctic Borough School District and additional engineering and building maintenance consultants. It is the team’s desire to develop monitoring and evaluation parameters that can prove/disprove the technology in an Arctic setting.

The strategic objectives of this project are as follows:

• SO1: Develop monitoring and evaluation criteria and test methodology to evaluate the effectiveness of solar thermal hot water heating in the Arctic;

• SO2: Identify up to 5 commercial entities and 25 residential entities that are viable candidates for a solar hot water heating program in the NW Arctic/NANA Region;

• SO3: Design, procure, and install an appropriate solar hot water heating system;

• SO4: Evaluate the effectiveness of solar thermal hot water heating in NW Alaska.

Funding & Cost

<table>
<thead>
<tr>
<th>Cost of Power:</th>
<th>$0.49/kWh</th>
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<td>Existing RE Fund Grant Offer:</td>
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<tr>
<td>AEA Funding Recommendation: (Not Constrained by Available Funding)</td>
<td>$101,000</td>
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</tbody>
</table>

AEA Recommendation

Full Funding

× Partial Funding

Special Provision

Not Recommended

Did Not Pass Stage 1

Withdrawn
The Northwest Inupiat Housing Authority proposes to assess solar thermal resources, construct a model project on the NIHA headquarters or other building in Kotzebue that demonstrates solar thermal systems functioning in an arctic environment, deploy the technology in regional communities, and provide O&M training and evaluation.

The project would have significant value for demonstrating a technology with substantial promise. Good project team including University of Alaska with appropriate technical, public information, and project management expertise. Before proceeding to the relatively expensive deployment stage, AEA feels it is appropriate to complete a demonstration project.

Recommend partial funding of $101,000 for resource assessment and demonstration.
Economic Analysis

There are some fairly well understood economics of application where solar data is known (e.g. Seifert “Solar Design for Alaska 3rd ed. 2005), and the project evaluator/PI is the author of that key report. But it is unusual to propose construction and application funding prior to a resource assessment being conducted. Solar heating potential depends on factors other than latitude, such as cloud cover and precipitation. Fairbanks has nearly 30% more solar heating potential than Anchorage in April, but less than half of Anchorage’s potential in the winter. The economies of solar heating systems are likely to vary substantially between the coastal region of NWAB and the interior. So a region wide resource assessment or feasibility study is appropriate, and must be conducted before a benefit/cost analysis can be constructed.

A significant portion of the resources, and the first objective in the project are dedicated to developing “monitoring and evaluation parameters that can prove/disprove the technology in an Arctic setting”, along with resource assessment. But these aspects of the project are beginning at the same time site selection is proposed for deployment of the 30 systems. The development of monitoring and evaluation parameters and resource assessment continues long afterwards, but only one pyranometer (or more) is proposed for measuring solar radiation intensity. It is therefore recommended that the resource assessment/demonstration portion of the project ($91,000) or wider scope of feasibility/demonstration be considered before deployment of this magnitude.
App #278  Solar Hot Water NWAB NIHA

Resource: Solar  Proposed Project Phase: Construction
Proposer: Northwest Inupiat Housing Authority  Design
                      Feasibility

AEA Program Manager: Lenny Landis  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 #279  Tanalian River Hydro_AGE

Resource: Hydro  Proposed Project Phase: Construction
Proposer: Alaska Green Energy, LLC  Design
AEA Program Manager: Doug Ott  Feasibility
Applicant Type: IPP
Recon

Project Description

The Port Alsworth Improvement Corporation, the Tanalian Electric Cooperative, Tanalian Incorporated, Lake Clark National Park and Preserve, and the Lake and Peninsula Borough support AGE’s proposal to conduct all pre-construction activities related to the construction of a hydroelectric facility on the Tanalian River. The project will reduce the community’s dependence on expensive diesel fuel that must be flown into Port Alsworth to provide heat and power. The Reconnaissance Phase will be multi-faceted and will include initial engineering, environmental and hydrological studies on the Tanalian River to confirm its hydroelectric potential. The reconnaissance phase will include scoping meetings with the community and agencies to identify issues and study needs that will need to be addressed during the feasibility phase.

A selection process, that will include public and agency input, will be developed to recommend the most feasible alternative. A recommendation and analysis report will be developed that will include a preferred alternative for the continuation for the project. This alternative will become the final design option. The Final Design and Permitting Phase will prepare the detailed design and bid documents for the preferred alternative and secure all the remaining permits to allow construction. The final design will include the services of a landscape architect to ensure that construction and visual impacts are minimized and mitigated. The Construction Phase will install the preferred alternative.

Funding & Cost

<table>
<thead>
<tr>
<th>Cost of Power: $0.70/kWh</th>
<th>AEA Recommendation: Full Funding</th>
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<tr>
<td>Requested Grant Funds: $4,097,000</td>
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<tr>
<td>Matched Funds Provided:</td>
<td>Special Provision</td>
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<td>Total Potential Grant Amount: $4,097,000</td>
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<td>Existing RE Fund Grant Offer:</td>
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<td>AEA Funding Recommendation: $92,000</td>
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AEA Funding Recommendation: $92,000
App #279  Tanalian River Hydro_AGE

Resource: Hydro  Proposed Project Phase: Construction
Proposer: Alaska Green Energy, LLC  Design
AEA Program Manager: Doug Ott  Feasibility
Applicant Type: IPP  Recon

Scoring & Location

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Energy Region: Bristol Bay
Election District: 36, Kodiak
Rank within Region (out of 5)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<tr>
<td>1) Cost of Energy (Max 30)</td>
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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<tr>
<td>6) Local Support (Max 5)</td>
<td>5</td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td>2</td>
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</table>

AEA Review Comments

Project concept is vague but there is local support. Overall project site is within the national park, which will result in permitting challenges.

Letters of support for this project from NPS and Borough are for hydrokinetic type of project-- a significant departure from micro-hydro type of project written in the application; this demonstrates some confusion

Recommend partial funding for reconnaissance at $92,000. Special provisions include a requirement that applicant submit detailed project plan for approval by AEA with potential for granting less funding if appropriate. First go - no go will be at $25k study level. Study should also address long term ownership and operation of any facilities and issues identified in Stage 1 comments.
App #279  Tanalian River Hydro_AGE

Resource: Hydro
Proposer: Alaska Green Energy, LLC

AEA Program Manager: Doug Ott
Applicant Type: IPP

Economic Analysis

Benefit/Cost Ratio (Applicant)  1.03

Benefit/Cost Ratio (AEA)  1.03
App #279 Tanalian River Hydro_AGE

**Resource:** Hydro

**Proposer:** Alaska Green Energy, LLC

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

**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**

Within a National Park and Preserve which may take some time to permit.
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #280  Alternative Energy Assessment_Perryville NVOP

Resource: Other  Proposed Project Phase: Feasibility

Proposer: Native Village of Perryville (NVOP)

AEA Program Manager: Lenny Landis  Applicant Type: Government Entity

Project Description

The location of the project is Perryville, Alaska. Perryville is located on the south coast of the Alaska Peninsula, 275 miles southwest of Kodiak and 500 miles southwest of Anchorage. It lies at approximately 55.912780° North Latitude and 159.145560° West Longitude. (Sec. 27, T049S, R064W, Seward Meridian.) Perryville is located in the Aleutian Islands Recording District. The area encompasses 9.2 sq. miles of land and 0.1 sq. miles of water. As can be seen in this image, the village benefits from southern exposure to the sun and longer days due to its southerly latitude.

Community To Be Served

The community was founded in 1912 as a refuge for Alutiiq people driven away from their villages by the eruption of Mt. Katmai.

Many villagers from Douglas and Katmai survived the eruption because they were out fishing at the time. Captain Perry of the ship "Manning" transported people from the Katmai area to Ivanof Bay, and later, to the new village site. The village was originally called "Perry," but the "ville" was added to conform to the post office name, established in 1930. The population is approximately 110. Project management is a collaborative approach. The Native Village of Perryville is the applicant will be responsible for the overall management of AEA funds. George Sikat III of Mat-Su Energy will serve as the Project Manager. Mr. Anthony Caole will be the grants administrator and will be assisted by Ms. Charlene Yagie. Mr. Tom Humphrey, P.E. will serve as the project’s consulting electrical engineer and assist with data analysis and economic/feasibility calculations.

Funding & Cost

Cost of Power: $0.60/kWh

Requested Grant Funds: $95,581

Matched Funds Provided: $95,581

Total Potential Grant Amount: $95,581

Existing RE Fund Grant Offer: $95,581

AEA Funding Recommendation: (Not Constrained by Available Funding)

AEA Recommendation

Full Funding
Partial Funding
Special Provision
X Not Recommended
Did Not Pass Stage 1
Withdrawn
App #280  Alternative Energy Assessment_Perryville NVOP

Resource: Other
Proposer: Native Village of Perryville (NVOP)

AEA Program Manager: Lenny Landis
Applicant Type: Government Entity

Scoring & Location

Energy Region: Bristol Bay
Election District: 37, Bristol Bay-Aleutians

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of  )

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
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</thead>
<tbody>
<tr>
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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</tbody>
</table>

AEA Review Comments

Applicant proposes to assess alternative energy resources of Perryville.

The work that the applicant proposes, while potentially valuable to the region, is more effectively accomplished using standard methodology on a statewide and regionwide basis that builds on the work already done in the statewide energy report that was released after this application.

Recommend no funding.
App #280  Alternative Energy Assessment_Perryville NVOP

Resource: Other
Proposer: Native Village of Perryville (NVOP)

AEA Program Manager: Lenny Landis
Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant) .91
Benefit/Cost Ratio (AEA) .89

A generic 1 kW benefit-cost estimate for solar was prepared with some reliance on applicant’s estimate of 35% efficiency, but somewhat higher installed costs. The solar B/C came in at .89 but is speculative given the lack of data on efficiency in particular. The primary benefit of the work is acquisition of that very data. Solar is the main thrust of this effort, and in reviewing the proposal for by Three Star Enterprises, not much work can be achieved in the analysis for the secondary purposes mentioned. The wind data will be valuable in determining whether that system should be expanded and whether household-module systems will work in small villages. (Installation is much easier with these systems as it does not involve cranes or other large equipment).
App #280  Alternative Energy Assessment_Perryville NVOP

Resource: Other  Proposed Project Phase: Feasibility

Proposer: Native Village of Perryville (NVOP)

AEA Program Manager: Lenny Landis  Applicant Type: Government Entity

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
Project Description

The Tanana area is blessed with a multitude of possible alternative energy resources including:
1) Wind Energy at T. 5 N., R. 21 W. Sec. 10 located approximately 10 miles from downtown Tanana proper. The transmission line would have to cross the Yukon River.
2) Wind Energy at T. 4 N., R. 20 W. This resource was eliminated as a possible because of transmission line costs from the site to Tanana.
3) Wind and Kinetic Hydro at T. 6 N., R 17 W. commonly referred to as “The Rapids”. This has both wind and water energy available however transmission line costs from The Rapids to Tanana, given the terrain, would be very costly.
4) Geothermal at Little Melozitna Hot Springs (65.459, 153.312). There has been cursory analysis done on this resource using chalcedony geo-thermometer methods by Kolker. These results are encouraging. However, the magnitude of the resource needs to be defined better to determine if it would be economically prudent to develop.
5) Traditional Hydro at Jackson Creek located at T. 5 N., R. 21 W. and T. 6 N., R 21 W. The project has been studied before by the APA in the 1980s. Information regarding the study can be found in “Reconnaissance Study of Energy Requirements and Alternatives for Tanana” Report Summary.
6) Kinetic Hydro Energy production using the Yukon River at Tanana using drag turbines. Grant funds would be used to do engineering assessments of resources 4 and 5 with the contributed funds and in kind resources of Tanana Power and the community of Tanana devoted to quantifying the resources 1 and 6.

The ultimate goal being to determine “the best” resource to develop of the community to meet the community of Tanana’s long term energy needs most cost effectively.

Funding & Cost

Cost of Power: $0.57/kWh
Requested Grant Funds: $303,060
Matched Funds Provided: $90,238.5
Total Potential Grant Amount: $393,298.5

Existing RE Fund Grant Offer:

AEA Funding Recommendation:
(Not Constrained by Available Funding)

AEA Recommendation:
Full Funding
Partial Funding
Special Provision
× Not Recommended
Did Not Pass Stage 1
Withdrawn
App #281  Tanana Alternative Energy Assessment _Tanana Power

Resource: Other  Proposed Project Phase: Feasibility Recon
Proposer: Tanana Power Company

AEA Program Manager: Lenny Landis  Applicant Type: Utility

Scoring & Location

Energy Region: Yukon-Koyukuk/Upper Tanana
Election District: 6, Interior Villages

Stage 3 Scoring Summary

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AEA Review Comments

Applicant proposes to assess alternative energy resources of Tanana.

The work that the applicant proposes, while potentially valuable to Tanana, is more effectively accomplished using standard methodology on a statewide and regionwide basis that builds on the work already done in the statewide energy report that was released after this application.

Recommend no funding.
App #281  Tanana Alternative Energy Assessment _Tanana Power

Resource: Other
Proposer: Tanana Power Company

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Proposed Project Phase: Feasibility Recon

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
App #281  Tanana Alternative Energy Assessment  _Tanana Power

<table>
<thead>
<tr>
<th>Resource: Other</th>
<th>Proposed Project Phase: Feasibility Recon</th>
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<tbody>
<tr>
<td>Proposer: Tanana Power Company</td>
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</table>

AEA Program Manager: Lenny Landis  

Applicant Type: Utility

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #282  Tidal Feasibility_City of Homer

Resource: Ocean/River  Proposed Project Phase: Feasibility Recon
Proposer: City of Homer

AEA Program Manager: Lenny Landis  Applicant Type: Local Government

Project Description

The City of Homer, with participation from Seldovia Village Tribe and the Port Graham Village Council, proposes to assess the tidal energy potential and development feasibility of four sites within Kachemak Bay. The National Oceanic and Atmospheric Administration (NOAA) will be the lead technology provider through the Center for Operational Oceanographic Products and Services (CO-OPS) and the Kasitsna Bay Laboratory, which is the Coastal Marine Ecosystem Research Laboratory for NOAA in Kachemak Bay. NOAA will deploy both stationary and roving Acoustic Doppler Current Profiling (ADCP) devices, conduct bathymetric mapping, and integrate other existing and new data to construct a comprehensive tidal, energetic, and circulation flow model of the entire Kachemak Bay region. This model will be focused on providing the necessary outputs to determine power densities and to conduct detailed and site specific tidal energy feasibility studies, but it will also have multiple public benefits beyond assessing tidal energy, such as improved spill response, mariculture siting, and impact assessment of local development projects. Terrasond, an industry leading terrestrial and marine floor mapping consultancy firm, will provide additional technical assistance on data collection and spatial data analysis to contribute to the circulation model and generate power density values. An assumed project start date of July 1, 2009 will result in project completion in 12 months, i.e., July 1, 2010. The total project budget is $1,154,341, of which $482,387 is requested via this proposal, and the remainder, $671,954, is provided as matching contributions, for a 58% cost-share. Of the $482,287 requested from AEA, Phase 1 (reconnaissance) would require $79,910 of AEA funds and phase 2 (feasibility and conceptual design) would require $402,387 of AEA funds.

Funding & Cost

Cost of Power: $0.14 /kWh
Requested Grant Funds: $482,387
Matched Funds Provided: $672,125
Total Potential Grant Amount: $1,154,512
Existing RE Fund Grant Offer: $313

AEA Recommendation

✗ Full Funding
✓ Partial Funding
✗ Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn

AEA Funding Recommendation: $482,387
The City of Homer proposes reconnaissance assessment and feasibility analysis/conceptual design of a 250 kW hydrokinetic device in Kachemak Bay. Homer has assembled a strong project team that includes a number of entities with experience in assessing tidal energy feasibility and resources—NOAA’s Center for Operational Oceanographic Products and Services, Terrasond, and Re vision. There are letters of support from the Native Village of Port Graham and the Seldovia Village Tribe who are also interested in the project. The application appropriately addresses potential wildlife impacts and includes the involvement of ADFG. NOAA commits to $650,000 in in-kind project support.

We are concerned that Homer Electric Association, the likely power purchaser or owner of a potential project, is not included in the plan for implementing the feasibility stage in a more concrete way. We are also concerned that the scope of work for reconnaissance phase of the project is inadequate. Instead of serving as a stand-alone, less in-depth study that provides a go/no-go or focus for further work, the recon phase appears to be structured as the early phases of coordination of the feasibility stage.

Recommend full funding of $482,387 with condition that before any grant funds are disbursed Homer prepare a more detailed recon plan of work that is approved by AEA. Standard grant conditions will require that AEA approve recon report findings before proceeding to feasibility study.
App #282  Tidal Feasibility _City of Homer

**Resource:** Ocean/River  
**Proposer:** City of Homer

**AEA Program Manager:** Lenny Landis  
**Applicant Type:** Local Government

### Economic Analysis

<table>
<thead>
<tr>
<th>Benefit/Cost Ratio</th>
<th>.24</th>
<th>Benefit/Cost Ratio</th>
<th>.10</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Applicant)</td>
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<td>(AEA)</td>
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</table>

Railbelt area energy costs are currently quite low, but this project would reduce energy costs ranging from about $15,000 to $33,000 per year. In addition to reducing costs of living for residents, lower costs and greater reliability of electric energy would attract and sustain economic development in the area. The applicant suggested a 20 year project life, while AEA suggests a 15 year project life for this type of technology. In addition, AEA suggests O&M costs for this technology in the railbelt at 1.5 percent of capital costs per year, which is higher than the applicant suggested.

The benefit/cost ratio of this project is below one, however, some of the costs for this project are for elements that do not relate directly to project construction and operation, yet are valuable for moving forward other such projects in other areas of the state. In general, resource assessments and feasibility analyses will lower risk (and therefore, costs) of future projects in this and other locations because of the information obtained through those studies, and so are economically beneficial. Indirect benefits of increased or sustained economic activity in the area, and lowered risk of future projects are not considered in this calculation. Additional unquantified benefits could include improved oil spill response, mariculture siting, and impact assessment of local development projects. The project uses a sustainable resource to produce electric power, however, the short project life and high construction costs of this technology make it currently unsustainable. Expanding production and distribution would improve the sustainability of this project.
App #282  Tidal Feasibility _City of Homer

Resource: Ocean/River
Proposer: City of Homer

Proposed Project Phase: Feasibility Recon

AEA Program Manager: Lenny Landis
Applicant Type: Local Government

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments

New technology - environmental concerns and not sure of ramification of the Beluga Whale listing on this project.
App #283 Statewide Biomass Assessment_UAF

Resource: Biomass
Proposer: University of Alaska, Fairbanks

AEA Program Manager: Ron Brown
Applicant Type: Government Entity

Project Description

The project addresses the availability, quality and feasibility of sustainable, economic use of agricultural and forestry biomass for bioenergy in Alaska. This must be considered before the myriad of biofuel projects proposed & envisioned can move forward, and before existing, commercially available technologies that use biomass to produce energy for heat, fuel, & power can be most effectively, and most successfully, deployed. The goal of the project is to 1) assimilate existing information on standing forest and agricultural biomass in Alaska, 2) conduct research and demonstration projects addressing agricultural bioenergy crop varities and crop management and addressing harvest methods in preparation for natural and managed regeneration in mixed, single-aged forest stands, and, 3) determine the biological, physical, and economic feasibility of using Alaska agricultural energy crops and existing forest stands for biomass as biofuels. The impetus for the study is the biomass/coal-to-liquids plant proposed for the Fairbanks area of interior Alaska, and its need for commercial/industrial-scale volumes of biomass fuel stocks. However, the study will have major statewide application as it will serve as the basis for all agricultural and forestry biomass-based energy projects; the greatest number of which are being proposed for rural and village communities. Work will take place in Fairbanks and Palmer, Alaska. Project cooperators are the School of Natural Resources and Agricultural Sciences (SNRAS) and the Agricultural and Forestry Experiment Station (AFES) at the University of Alaska Fairbanks (UAF) (project primary/agricultural energy crops and forest biomass), Fairbanks Economic Development Corporation (FEDC) (logistics, data support, and information dissemination) and the Alaska Division of Forestry (forest biomass, and harvest, transport, and storage technologies).

Funding & Cost

<table>
<thead>
<tr>
<th>Cost of Power: $0.17 /kWh</th>
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</thead>
<tbody>
<tr>
<td>Requested Grant Funds: $454,828</td>
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<td>Matched Funds Provided:</td>
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<tr>
<td>Total Potential Grant Amount: $454,828</td>
</tr>
<tr>
<td>Existing RE Fund Grant Offer:</td>
</tr>
</tbody>
</table>

AEA Recommendation

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

AEA Funding Recommendation:
(Not Constrained by Available Funding)
App #283  Statewide Biomass Assessment_UAF

<table>
<thead>
<tr>
<th>Resource: Biomass</th>
<th>Proposed Project Phase: Feasibility Recon</th>
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<tbody>
<tr>
<td>Proposer: University of Alaska, Fairbanks</td>
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**AEA Program Manager:** Ron Brown  **Applicant Type:** Government Entity

### Scoring & Location

<table>
<thead>
<tr>
<th>Overall Rank (out of 60)</th>
<th>Stage 3 Total Score (out of 100)</th>
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<tbody>
<tr>
<td>6.4</td>
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</table>

**Energy Region:** Railbelt  **Election District:** 9, City of Fairbanks  **Rank within Region (out of):**

### Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<tr>
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<td>2) Funding Resources (Max 25)</td>
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<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
<td></td>
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<td>6) Local Support (Max 5)</td>
<td></td>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</tr>
</tbody>
</table>

### AEA Review Comments

Failed Stage 1
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #283  Statewide Biomass Assessment_UAF

Resource: Biomass
Proposer: University of Alaska, Fairbanks

Proposed Project Phase: Feasibility Recon

AEA Program Manager: Ron Brown
Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
App #283  Statewide Biomass Assessment_UAF

**Resource:** Biomass  
**Proposer:** University of Alaska, Fairbanks

**Proposed Project Phase:** Feasibility Recon

**AEA Program Manager:** Ron Brown  
**Applicant Type:** Government Entity

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #284  Kotzebue Solid Waste_City of Kotzebue

<table>
<thead>
<tr>
<th>Resource: Biofuels</th>
<th>Proposed Project Phase: Design Feasibility Recon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposer: Municipal Government</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>AEA Program Manager: Lenny Landis</th>
<th>Applicant Type: Local Government</th>
</tr>
</thead>
</table>

**Project Description**

Using the existing seven (7) ton per day municipal solid waste stream, renewable resource biomass and digester gas, we will evaluate the Tactical Garbage-to-Energy (TGER) self-contained bio-refinery technology and other viable low-volume alternatives. The waste-to-energy project will be co-located with the existing baler source separation facility located on municipally-owned land known as the Public Works Compound in Kotzebue. The City of Kotzebue will work with Decision Sciences and Maniilaq Services to perform the reconnaissance study to determine the feasibility of deploying the TGER technology to produce fuel for heating and electricity at the Public Works Compound. The fuel from the TGER can produce enough energy to power 60 Kwh for every ton of municipal solid waste. The heat and power savings, if reconnaissance proves feasible, is $2,900,000 over cost today for ten years not including the substantial landfill costs found in the project benefit.

**Funding & Cost**

<table>
<thead>
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<th>Cost of Power: $0.36/kWh</th>
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<td>Matched Funds Provided: $5,000</td>
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<td>Total Potential Grant Amount: $20,000</td>
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<table>
<thead>
<tr>
<th>Existing RE Fund Grant Offer:</th>
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<table>
<thead>
<tr>
<th>AEA Funding Recommendation: (Not Constrained by Available Funding)</th>
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<tr>
<th>AEA Funding Recommendation:</th>
<th>$15,000</th>
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<table>
<thead>
<tr>
<th>AEA Recommendation</th>
<th></th>
</tr>
</thead>
</table>

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #284  Kotzebue Solid Waste_City of Kotzebue

Resource: Biofuels  Proposed Project Phase: Design
Proposer: Municipal Government  Feasibility

AEA Program Manager: Lenny Landis  Applicant Type: Local Government

Scoring & Location

Energy Region: Northwest Arctic

Election District: 40, Arctic

Rank within Region (out of 4 )

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

55.5

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
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<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<td>6) Local Support (Max 5)</td>
<td>0</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
<td>2</td>
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</tbody>
</table>

AEA Review Comments

The City of Kotzebue proposes a recon study of using TGER (Tactical Garbage to Energy Refinery) technology under development by the U.S. Army. The unit is packaged in a shipping container, shreds garbage, soaks it in water, pumps sludge into a bioreactor, converts a portion of the waste stream into ethanol, and pelletizes the remaining solids. Pellets are in turn gasified. Gas is fed into a recip diesel generator and converted into power.

This system is complex, and AEA questions whether there are more suitable, simpler systems that would achieve the same aims of waste reduction and energy (such as a modular incinerator with stack heat recovery). This is prototype technology with little operating history in an arctic environment.

Recommend full funding of $15,000 for recon assessment with condition that University of Alaska Center for Energy and Power be included in the review team.
App #284  Kotzebue Solid Waste_City of Kotzebue

Resource: Biofuels
Proposer: Municipal Government

Proposed Project Phase: Design
Feasibility
Recon

AEA Program Manager: Lenny Landis
Applicant Type: Local Government

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
<table>
<thead>
<tr>
<th>Resource: Biofuels</th>
<th>Proposed Project Phase: Design Feasibility Recon</th>
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<tr>
<td>Proposer: Municipal Government</td>
<td></td>
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</tbody>
</table>

**AEA Program Manager:** Lenny Landis  
**Applicant Type:** Local Government

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #285  Delta Wind Construction_AWP

Resource: Wind  Proposed Project Phase: Construction
Proposer: Alaska Wind Power, LLC  Design

AEA Program Manager: James Jensen  Applicant Type: IPP

Project Description

The Delta Wind Project is located approximately 25 miles south of Delta Junction near the end of Coal Mine Road and is designed to contribute 50 MW of clean, renewable wind power to the Golden Valley Electric Association (GVEA) railbelt energy grid. The communities served will include all communities within the GVEA’s service area including Delta Junction, North Pole, Fairbanks, Fox, College, Nenana, and Healy. In addition to local communities, a number of large facilities are currently served by GVEA's transmission system including, Alyeska Trans Alaska Pipeline Pump Station 9, Fort Knox Gold Mine, and Pogo Gold Mine. More distant utilities could also benefit through the railbelt electric grid. An Interconnection Study with GVEA is currently being conducted by Power Engineers, Inc. to identify costs associated with integrating Delta Project wind power and GVEA’s existing transmission system. The results of the interconnection study will be used to help formulate a power purchase agreement between GVEA and the project sponsors.

The project will include construction of a 20 mile-long transmission line, and a ten mile-long construction access road across state-owned land from the Richardson Highway south to the proposed wind power generation facility. The power generation facility will include thirty 1.65 MW AAER wind turbines or equivalent, mounted on 65 meter high towers (subject to final design and site suitability) set on buried concrete foundations. Underground power collection cables and control wiring will lead from each turbine to the transformer substation. A five-acre lay down yard with a control building/service facility/warehouse will be installed within the wind farm area. Overhead transmission lines from the transformer substation will follow the access road and Richardson Highway approximately 20 miles to the existing GVEA power transmission grid near Alyeska Pump Station #9.

Funding & Cost

Cost of Power: $0.17 /kWh
Requested Grant Funds: $13,000,000
Matched Funds Provided: $700,000
Total Potential Grant Amount: $13,700,000
Existing RE Fund Grant Offer: $325,000

AEA Recommendation

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

AEA Funding Recommendation:
(Not Constrained by Available Funding)
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #285  Delta Wind Construction_AWP

Resource: Wind  Proposed Project Phase: Construction Design
Proposer: Alaska Wind Power, LLC
AEA Program Manager: James Jensen  Applicant Type: IPP

Scoring & Location

Energy Region: Railbelt
Election District: 12, Richardson-Glenn Highways

Overall Rank
(out of 60)
Stage 3 Total Score
(out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
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<tr>
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<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>4) Project Readiness (Max 5)</td>
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<td>7) Sustainability (Max 5)</td>
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</table>

AEA Review Comments

The applicant proposes a 50MW wind farm near Delta Junction. The project will require a 20 mile tie line and 10 mile access road.

The applicant did not provide information that they had contacted GVEA and jointly determined that a 50MW wind farm could be integrated into the Railbelt System and the power could be effectively used. The applicant has not secured the land rights needed to access, construct and operate the project. The project should be considered in a regional integrated resource plan prior to commitment of state funds. Further the financing package through the Power Project Fund will require legislative review and approval.

Recommend no funding.
App #285  Delta Wind Construction_AWP

Resource: Wind

Proposer: Alaska Wind Power, LLC

Proposed Project Phase: Construction Design

AEA Program Manager: James Jensen

Applicant Type: IPP

Economic Analysis

Benefit/Cost Ratio (Applicant)  2.30

Benefit/Cost Ratio (AEA)  1.92

Differences between the applicant’s analysis and AEA’s analysis include:

• The applicant’s project cost estimate ($135.3 million) is low compared to AEA benchmark for non-rural 50 MW wind farm project ($175 million).
• While the applicant’s stated project start date appear to be optimistic; this analysis assumes the same project start date as noted in the application; the application states certain milestones for permitting, land acquisition, design, and construction. Even with a 1 year delay; the B/C analysis would still result in a BC ratio greater than 1.
• The applicant’s stated annual wind energy output may be low. Based on a previous assessment by AEA of the same site for a 40 MW wind farm, the annual energy output was estimated as 139,778,000 kWh. In contrast this project proposes a 50 MW wind farm. AEA needs to review wind output. This analysis uses a higher number of 140,000,000 but may need to be changed. The applicant states however, that wind resources have been evaluated with 2 50-meter met tower, one for 22 months, and the other for 10 months.
• This analysis assumes the AEA benchmark for O&M costs of non-rural wind projects; which is slightly less than applicant’s estimate of $.02 per kWh.
• The construction costs for 2010 were escalated using a 4% factor.
• Base system data for the analysis is based on the existing GVEA system which is not purely diesel-based. The AEA analysis uses an approximation of the avoided cost of generation of GVEA, based on data provided GVEA to AEA and ISER.
• The calculated value for displaced petroleum fuel is lower than the applicant’s estimated displaced fuel (9,500,000 versus 8,187,500 gallons).

At this stage, there are still uncertainties surrounding project success—including a successful power purchase agreement between the applicant and the utility, and permitting and land acquisition issues. A system integration study would have to be undertaken to determine the impact of this load on the existing system. As noted in the application, the Delta Wind Project carries commercial risk in the short term because there is no power purchase agreement negotiated with the utility. Furthermore, the limiting factor for wind energy capture in the region would be the amount of wind power that can be integrated into the GVEA electrical grid; not the wind resource. The applicant noted that the 50 MW wind farm would provide approximately 6 percent of the railbelt’s 800 MW peak load (GVEA's peak system load recorded in December of 2007 was 223 MW).
App #285  Delta Wind Construction_AWP

Resource: Wind
Proposer: Alaska Wind Power, LLC

Proposed Project Phase: Construction Design

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

This has land issues in the Supreme Court. May affect capability to get this permitted until decision is made.
Project Description

The Slana Wind Project is located approximately seven miles west of Slana near the 4,000 foot level at VABM Cobb, and will contribute up to 2 MW of clean, renewable wind power to the Alaska Power Company Slana distribution system. The communities served will include all communities within the Alaska Power Company (APC, an Alaska Power & Telephone Company public utility subsidiary) service area including Slana (2007 population 108), Chistochena (93) and when it is connected, Mentasta (1,404). The total population of the served area will be 1,605. The project will include construction of a 1.5 mile long transmission line and construction access road across Ahtna Corporation and state-owned land from the Tok Cutoff to the proposed wind power generation facility on the ridgetop. The power generation facility will include approximately two MW of wind turbines, the size and type subject to final design. These turbines will be founded in shallow bedrock prevalent on the ridge crest. Power collection cables and control wiring will lead from each turbine to the transformer substation. Overhead transmission lines (distribution voltage) from the transformer substation will follow the access road 1.5 miles to the existing APC distribution line on the Tok Cutoff. The grant participant is Village Wind Power LLC who have three Alaska wind projects under development (Tok, Slana, and Bethel). There will be a number of contractors involved in completing the project. In addition to our own in-house efforts, other experienced contractors will be chosen to carry out selected components of the project.

Funding & Cost

Cost of Power: $0.75/kWh
Requested Grant Funds: $6,940,000
Matched Funds Provided:
Total Potential Grant Amount: $6,940,000
Existing RE Fund Grant Offer:
AEA Funding Recommendation: (Not Constrained by Available Funding)

AEA Recommendation:
Full Funding
Partial Funding
Special Provision
× Not Recommended
Did Not Pass Stage 1 Withdrawn
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #286  Slana Wind Construction_AWP

Resource: Wind  Proposed Project Phase: Construction Design
Proposer: Village Wind Power, LLC

AEA Program Manager: James Jensen  Applicant Type: IPP

Scoring & Location

Energy Region: Copper River/Chugach
Election District: 6, Interior Villages

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
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<td>Cost of Energy (Max 30)</td>
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<tr>
<td>Funding Resources (Max 25)</td>
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<td>Project Feasibility from Stage 2 (Max 20)</td>
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<td>Project Readiness (Max 5)</td>
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<tr>
<td>Sustainability (Max 5)</td>
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</table>

AEA Review Comments

The proposed project is a 2MW wind farm near Slana. The turbines would be tied into the Slana and Chistochina grid and potentially could be tied to Mentasta as well. The project would be very high penetration. The application is for resource assessment through construction.

The application lacks detail on reasoning for site selection, integration issues, plans for using excess wind energy, or current energy usage. Without having an onsite wind resource assessment it is impossible to evaluate the viability of the project. APC can request a meteorological tower from AEA’s met tower loan program to complete the resource assessment.

Recommend no funding.
App #286  Slana Wind Construction_AWP

<table>
<thead>
<tr>
<th>Resource: Wind</th>
<th>Proposed Project Phase: Construction Design</th>
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<tbody>
<tr>
<td>Proposer: Village Wind Power, LLC</td>
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<td>AEA Program Manager: James Jensen</td>
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<tr>
<td>Applicant Type: IPP</td>
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</tbody>
</table>

### Economic Analysis

- Benefit/Cost Ratio (Applicant): \(4.83\)
- Benefit/Cost Ratio (AEA): \(-0.63\)

- The applicant provided a detailed breakdown of all required project components including road, transmission, and hook-up with local power distribution. No changes in cost assumptions were made.
- The AEA analysis assumes a much different amount of displaced electricity—equal to the total energy demand (total kWh sold) in the two communities that are anticipated to benefit from this wind project—Slana and Chistochina. According to the 2007 PCE report, the utilities in the two communities sold 622,557 kWh that year. The AEA analysis shows that even if all power requirements in the two communities could be provided by this wind project; thereby eliminating almost all fuel costs for diesel generation, the costs of the wind project would still outweigh the benefits. The wind project should be scaled down significantly to fit the current load unless the project can tie into a larger distribution system, excess energy can be used for heating, or an industrial demand could be served.
- This analysis uses AEA benchmarks for O&M costs for rural wind projects in Alaska, as stated in the model assumptions.
- The applicant did not provide information regarding the base system (diesel generation system). The analysis used PCE data for the APC facility in Slana and Chistochina.
- Construction costs scheduled for 2010 were escalated using a 4% p.a. escalation factor.

At this stage, there are still uncertainties surrounding project success—including a successful power purchase agreement between the applicant and the utility, and permitting and land acquisition issues. The optimum wind project size needs to be engineered to fit power requirements of the communities served. As proposed, the costs outweigh the benefits of the project.
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
Project Description

The Tok Wind Project is located approximately 12 miles south of Tok near the 5,000 foot level of Seven Mile Ridge and will contribute 2 MW of clean, renewable wind power to the Alaska Power Company Tok distribution system.

The communities served will include all communities within the Alaska Power Company (APC, an Alaska Power & Telephone Company public utility subsidiary) service area including Tok (2007 population 1,353), Tanacross (173), Tetlin (165), and Dot Lake (15). The total population of the served area is 1,706.

The project will include construction of a 12 mile long transmission line, and a five mile-long construction access road across state-owned land from the old Eagle Trail west to the proposed wind power generation facility. The power generation facility will include approximately two MW of wind turbines, the size and type subject to final design. These turbines will be founded in shallow bedrock prevalent on the ridge crest. Power collection cables and control wiring will lead from each turbine to the transformer substation. Overhead transmission lines (distribution voltage) from the transformer substation will follow the access road and Eagle Trail approximately 12 miles to the existing APC distribution line on the Tok Cutoff.

The grant participants are Village Wind Power LLC who have three Alaska wind projects under development (Slana, Tok, and Bethel). There will be a number of contractors involved in completing the project. In addition to our own in-house efforts, other experienced contractors will be chosen to carry out selected components of the project.

Funding & Cost

Cost of Power: $0.49/kWh
Requested Grant Funds: $8,100,000
Matched Funds Provided: NA
Total Potential Grant Amount: $8,100,000
Existing RE Fund Grant Offer: NA
AEA Funding Recommendation (Not Constrained by Available Funding): $130,000

AEA Recommendation

Full Funding
× Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
### Scoring & Location

- Overall Rank (out of 60): 53
- Stage 3 Total Score (out of 100): 48.1
- Election District: 6, Interior Villages
- Rank within Region (out of 5): 5

### Stage 3 Scoring Summary

<table>
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<tr>
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<tbody>
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</tbody>
</table>

### AEA Review Comments

The proposed project is a 2MW wind farm near Tok. The turbines would be tied into the Tok, Tanacross, Dot Lake and Tetlin grids. The application is for resource assessment through construction.

The application lacks detail on reasoning for site selection, integration issues, interconnection of villages, plans for using excess wind energy, or current energy usage. Without having an onsite wind resource assessment it is impossible to evaluate the viability of the project.

Recommend partial funding for wind resource assessment only.
Economic Analysis

Changes to the applicant’s assumptions and cost estimates include:
- The applicant’s estimated project cost of $8.1 million is lower than the AEA estimate of $10 million using the benchmark cost estimate of $5,000 per installed kW for rural wind projects.
- While the applicant’s stated project start date provided in the application appears to be optimistic, the AEA analysis assumes the same project start date based on evaluation of start dates on B/C ratios. The application provided certain milestones for permitting, land acquisition, design, and construction. Even with a 1 year delay, the B/C ratio would still be greater than 1.
- The AEA analysis uses an annual wind energy output of 6,189,000 kWh’s which is higher than stated in the application output of 5,256,000 kWh’s. Wind resource assessment is part of the pre-construction costs being applied for in this grant so the applicant’s estimate of energy output may change. The information used in the AEA analysis is based on a previous assessment by the AEA wind program manager for the same project.
- The renewable generation O&M stated in the application ($0.03 per kWh) is slightly higher than the AEA benchmark for rural wind projects ($0.022).
- The applicant did not provide information on the utility’s O&M costs. The information used in both applicant and AEA analyses is based on PCE data for the APC Tok facility.
- Diesel generation fuel efficiency is based on PCE data for APC Tok facility.
- Construction costs for 2010 were escalated using 4% factor.

At this stage, there are still uncertainties surrounding project success—including a successful power purchase agreement between the applicant and the utility, and permitting and land acquisition issues. The estimated annual wind energy output would account for about half of the electricity generated by the APC facility in Tok, and certainly more than half of the annual energy sold (based on PCE data for the facility). A system integration study would have to be undertaken to determine the impact of this load on the existing system.
### App #287 Tok Wind Construction_VWP

<table>
<thead>
<tr>
<th>Resource: Wind</th>
<th>Proposed Project Phase: Construction Design</th>
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</thead>
<tbody>
<tr>
<td>Proposer: Village Wind Power, LLC</td>
<td>AEA Program Manager: James Jensen</td>
</tr>
<tr>
<td>Applicant Type: IPP</td>
<td></td>
</tr>
</tbody>
</table>

### 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 #288  St Paul Wind Construction_City of St. Paul

**Resource:** Wind  
**Proposer:** City of St. Paul

**AEA Program Manager:** James Jensen  
**Applicant Type:** Utility  
  Local Government

### Project Description

The project would be constructed at the City landfill in Ataqan Subdivision on Saint Paul Island, the existing utility power plant, and within existing utility easements. The new turbines would be tied into the existing City electric utility grid and control cables installed to tie into the existing power plant switchgear. A new low fuel consumption diesel 4,160v generator would be installed in the existing power plant to replace an older unused 480v generator. Wind generated electricity would benefit all existing electric customers through lower power generation costs. The City would administer the project and contract out to qualified consultants for the final design, and contract with a qualified contractor to supply, install and maintain the wind turbines for the first 5 years and train local wind turbine maintenance personnel.

### Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tr>
<td><strong>Cost of Power:</strong></td>
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<tr>
<td><strong>Requested Grant Funds:</strong></td>
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<tr>
<td><strong>Matched Funds Provided:</strong></td>
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</tr>
<tr>
<td><strong>Total Potential Grant Amount:</strong></td>
<td>$1,760,000</td>
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</table>

**Existing RE Fund Grant Offer:**

**AEA Funding Recommendation:**

(Not Constrained by Available Funding)

**AEA Recommendation:**

Full Funding  
Partial Funding  
Special Provision  
× Not Recommended  
Did Not Pass Stage 1  
Withdrawn
App #288  St Paul Wind Construction_City of St. Paul

Resource: Wind  Proposed Project Phase: Construction Design
Proposer: City of St. Paul

AEA Program Manager: James Jensen  Applicant Type: Utility Local Government

Scoring & Location

Energy Region: Aleutians
Election District: 37, Bristol Bay-Aleutians

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

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AEA Review Comments

Applicant proposes final design/permitting and construction of a 300 kW wind energy system to be connected to the existing St. Paul City grid.

The application makes no mention of the option of connecting to TDX Power’s existing 675 kW wind farm. The City and TDX have so far been unable to reach an agreement to integrate the existing turbines into the City system. AEA has allocated $174,500 in state funds to match $349,000 in USDOE funds to assist with the integration. AEA has requested that USDOE redirect these funds from an earlier earmark for this purpose.

AEA recommends no funding. The City and TDX should reach an agreement on using existing energy assets in St. Paul before further funds are made available.
Economic Analysis

The proposed project can potentially save the utility about 75,000 to 80,000 gallons of fuel annually. This will result in at least a 17 percent reduction in the cost of electricity generation.

- The applicant provided reasonable project cost estimates with a breakdown of all the development and capital costs. The estimates on labor requirements and costs are based on prior projects completed by the City of St. Paul and the estimates on materials costs are based on previous vendor quotes.
- The AEA analysis used applicant’s estimate for project costs instead of the benchmark figure of $5,000 per kW of installed capacity. As for the O&M costs, the applicant provided an estimate of $30,000 per year. This includes a local training component. The AEA analysis assumes the benchmark O&M figure of $0.022 per kWh, which results in a slightly lower annual O&M of $24,363 compared to the applicant’s estimate.
- The plan for integrating the wind system into the existing system appears to be well laid out. The project’s technical team includes Polarconsult Alaska, Inc. and Vector Engineering.
- Wind generation was estimated based on Homer modeling using historic actual wind recordings from the National Weather Service (adjacent to the project site) and AEA. Wind data was also based on information provided by an adjacent wind power project since 1999. Homer wind generation modeling uses Northwind 100 turbine parameters.

The analysis shows that the project would be economically viable. St. Paul has good wind resources and the community has experience with wind energy projects.
Proposer: City of St. Paul

Proposer: City of St. Paul

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 #289  Glacier Fork Hydro

Resource: Hydro
Proposer: Glacier Fork Hydropower, LLC

AEA Program Manager: Doug Ott
Applicant Type: IPP

Proposed Project Phase: Design
Feasibility
Recon

Project Description

The Glacier Fork Hydroelectric Project is an approximately 75 MW storage project proposed for the Glacier Fork of the Knik River near the mouth of Metal Creek, located approximately 20 miles east of the Eklutna Hydroelectric Project powerhouse and 25 miles southeast of Palmer, Alaska. Electricity from the project would be delivered into the railbelt transmission grid via a new approximately 20-mile transmission line to existing transmission infrastructure in the vicinity of the Old Glenn Highway bridge over the Knik River. A map of the project is included at the end of the application before Attachment A. Glacier Fork Hydropower, LLC (GFH) would be the project owner, and would contribute funding, develop, own, and operate the project. GFH is currently owned by the five engineers of Polarconsult Alaska, Inc., an engineering consulting firm based in Anchorage, Alaska that specializes in hydroelectric project development throughout Alaska. GFH is currently in discussions with Chugach Electric Association (CEA) regarding the project. GFH, jointly with CEA, intends to work with other Railbelt utilities and the State to develop the project.

Funding & Cost

Cost of Power: $0.13 /kWh
Requested Grant Funds: $5,000,000
Matched Funds Provided:
Total Potential Grant Amount: $5,000,000
Existing RE Fund Grant Offer:
AEA Funding Recommendation: $500,000

AEA Recommendation

Full Funding
× Partial Funding
× Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
App #289  Glacier Fork Hydro

Resource: Hydro
Proposer: Glacier Fork Hydropower, LLC

Proposed Project Phase: Design
Feasibility
Recon

AEA Program Manager: Doug Ott
Applicant Type: IPP

Scoring & Location

Energy Region: Railbelt

Overall Rank (out of 60) 69
Stage 3 Total Score (out of 100) 33.0

Election District: 16, Chugiak-South Mat-Su

Rank within Region (out of 7 )

Stage 3 Scoring Summary

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</table>

AEA Review Comments

Applicant requests $5.0 million for project reconnaissance, feasibility, permitting and design. AEA recommends funding limited to reconnaissance study and has concerns with the large size of the funding amount being requested for that purpose.

Given the large scale of this project and complexity involved in management and financing, a business plan will need to be prepared as a part of the reconnaissance study which details involvement of railbelt utilities and private developers. Also to be included in study will be a determination of licensing barriers specific to this project.

FERC accepted the preliminary permit application filed by Glacier Fork Hydro LLC on November 10, 2008.

Recommend partial funding of $500,000 with requirement that before grant is finalized grantee prepares a detailed project budget with go/no go milestones for inclusion into grant document.
App #289  Glacier Fork Hydro

**Resource:** Hydro

**Proposer:** Glacier Fork Hydropower, LLC

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

**AEA Program Manager:** Doug Ott

**Applicant Type:** IPP

---

**Economic Analysis**

<table>
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<tr>
<th>Benefit/Cost Ratio</th>
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<tbody>
<tr>
<td>Benefit/Cost Ratio</td>
<td>(AEA)</td>
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</table>

A 70 MW run of river hydro on the Knik River, approximately 20 miles east of the Eklutna Project. Average annual energy expected to be 330 million kWh. Power would be sold into the Railbelt grid. Power would offset the use of natural gas generation in the Railbelt.

Assumptions Modified:
1. Development time increased by one year for both Applicant and AEA analysis. Even that is aggressive.
2. Applicant includes as a benefit $1,271,970 in property taxes to the Mat-Su Borough, but this amount is not included in O&M. O&M increased by this amount and excluded from benefits on both Applicant and AEA analysis.
3. Applicant assumes $0.019/kWh for O&M and $0.02/kWh Green Tags revenues. It is not certain that project would qualify for Green Tags, and assuming they continue for 50 years is aggressive. For AEA analysis, the same O&M costs are assumed, but Green Tags included for initial 10 years only.
4. Applicant includes benefit of reduced losses since generation is closer to load center. At the same time, applicant includes another benefit of displacing part of new CEA/MLP generation. Since this new generation is currently envisioned to be closer to the load center than Beluga, this benefit of reduced losses is not included in the AEA analysis.

Applicant states that the business plan is based on selling at avoided cost, and then in another place stating that it would be financed similar to Bradley Lake. The two approaches are incompatible. Furthermore, developing or selling a 70 MW/$330 million resource is problematic in a limited market such as the Railbelt (as opposed to large grids in the lower 48). Silt in the river?
### App #289  Glacier Fork Hydro

<table>
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**Proposed Project Phase:**
- Design
- Feasibility
- Recon

**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

Most components of this project sit wholly or partially in the Knik River Public Use Area and the National Natural Landmark areas. Recent management plan for the public use area did not address this use, therefore there will be challenges to permit this because of the necessity to revise the management plan.
App #290  Packers Creek Hydro_CLPU

Resource: Hydro  Proposed Project Phase: Construction
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

Cost of Power: $0.52/kWh
Requested Grant Funds: $1,750,000
Matched Funds Provided:
Total Potential Grant Amount: $1,750,000

AEA Recommendation
Full Funding
Partial Funding
Special Provision
× Not Recommended
Did Not Pass Stage 1
Withdrawn

AEA Funding Recommendation:
(Not Constrained by Available Funding)
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #290  Packers Creek Hydro_CLPU

Resource: Hydro  Proposed Project Phase: Construction
Proposer: Chignik Lagoon Power Utility (CLPU)

AEA Program Manager: Doug Ott  Applicant Type: Utility

Scoring & Location

Energy Region: Bristol Bay
Election District: 37, Bristol Bay-Aleutians

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

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AEA Review Comments

Chignik Lagoon was funded at $150,000 in round 1 of the RE fund for final design and permitting (app#14).

Recommend no funding this round. Lagoon can reapply pending successful outcome of the final design/permitting work.
App #290  Packers Creek Hydro_CLPU

Resource: Hydro  Proposed Project Phase: Construction

Proposer: Chignik Lagoon Power Utility (CLPU)

AEA Program Manager: Doug Ott  Applicant Type: Utility

Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
## App #290  Packers Creek Hydro_CLPU

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<td>Chignik Lagoon Power Utility (CLPU)</td>
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<td>AEA Program Manager:</td>
<td>Doug Ott</td>
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<td>Applicant Type:</td>
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<td>Proposed Project Phase:</td>
<td>Construction</td>
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### DNR/DGGS Geohazards Comments

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments
App #291  McGrath District Heat_MPL

Resource: Biomass  Proposed Project Phase: Construction Design
Proposer: McGrath Power and Light

AEA Program Manager: Ron Brown  Applicant Type: Utility IPP

Project Description
This application specifically develops the capacity to harvest and deliver 2000+ tons of wood annually to the Village of McGrath, Alaska and to process the wood into usable form and store the wood for later use. 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 (Garn) with estimated cost analysis and net simple payback for individual buildings was conducted in the feasibility assessment (calculations attached). This application supports a district wood heating project already in development in a previous application. The funding will be used to purchase harvest and processing equipment and develop a wood processing, storage and delivery system and storage yard. Matching funding will be used for development of a forest harvest plan, training and technical support.

Funding & Cost

| Cost of Power | $0.61 /kWh |
| Requested Grant Funds | $822,950 |
| Matched Funds Provided | $767,142 |
| Total Potential Grant Amount | $1,590,092 |

Existing RE Fund Grant Offer:

AEA Funding Recommendation:
(Not Constrained by Available Funding)

AEA Recommendation:
- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
App #291  McGrath District Heat_MPL

**Resource:** Biomass  
**Proposer:** McGrath Power and Light

**Proposed Project Phase:** Construction Design

**AEA Program Manager:** Ron Brown  
**Applicant Type:** Utility IPP

### Scoring & Location

- **Energy Region:** Yukon-Koyukuk/Upper Tanana
- **Election District:** 6, Interior Villages

### Stage 3 Scoring Summary

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</table>

### AEA Review Comments

Applicant proposes funding for a wood harvest, processing, storage, and delivery system in conjunction with a proposed biomass energy system (RE Fund Round 1 app #30).

AEA comments from Round 1 app are as follows: "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."

Since ML&P has not yet completed the work funded in Round 1, AEA recommends no funding at this time for the harvest equipment proposed in this application.
App #291  McGrath District Heat_MPL

Resource: Biomass
Proposer: McGrath Power and Light

AEA Program Manager: Ron Brown

Proposed Project Phase: Construction Design
Applicant Type: Utility

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #291  McGrath District Heat_MPL

**Resource:** Biomass

**Proposer:** McGrath Power and Light

**Proposed Project Phase:** Construction Design

**AEA Program Manager:** Ron Brown

**Applicant Type:** Utility 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 #292 Chalkyitsik District Heat_Village Council

Resource: Biomass  Proposed Project Phase: Design Feasibility

Proposer: Chalkyitsik Village Council  Applicant Type: Local Government

AEA Program Manager: Ron Brown

Project Description

The project is a wood energy district heating project located in Chalkyitsik for two groups of buildings: District Heat 1: the school, school housing and water system; District Heat 2: the washeteria/water plant and Village/Tribal Office. The applicant is the Chalkyitsik Village Council. The project will be a two year project with completion of project development Phases 2-3 to occur in 2009 and construction Phase 4 to occur in 2010. A level one feasibility boilers and a reconnaissance of forest wood resources has been performed in the summer of 2008 under a DOE Tribal energy grant for Yukon Flats through CATG. A table comparing round wood boiler and chip fed boilers is attached to demonstrate initial analysis and initial potential designs. It is anticipated that round wood fired boilers will be used for simplicity of the harvest system. This will require installation of 2 district heating systems one at the school with 3 stickfired boilers and the second at the Chalkyitsik Village Council office which will require 2 boilers.

Funding & Cost

Cost of Power: $0.95/kWh
Requested Grant Funds: $88,500
Matched Funds Provided: $20,000
Total Potential Grant Amount: $108,500
Existing RE Fund Grant Offer: $32,500

AEA Recommendation

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

AEA Funding Recommendation: $32,500
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #292 Chalkyitsik District Heat_Village Council

Resource: Biomass
Proposer: Chalkyitsik Village Council

Proposed Project Phase: Design
Feasibility

AEA Program Manager: Ron Brown
Applicant Type: Local Government

Scoring & Location

Energy Region: Yukon-Koyukuk/Upper Tanana
Election District: 6, Interior Villages

Overall Rank (out of 60) 76.3
Stage 3 Total Score (out of 100) 1

Rank within Region (out of 5)

Stage 3 Scoring Summary

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</table>

AEA Review Comments

Chalkyitsik proposes feasibility and final design for stick-fired wood boiler and district heating systems to supply heat to school, school housing, water system, and the village tribal office. The estimated project cost at $1.54 M is expensive. Recon assessment was done for this project by CATG in the summer of 2008. Bill Wall would perform the proposed feasibility work. AEA is concerned that Wall will have sufficient time to perform this work since he is also involved in similar wood energy projects in Upper Kobuk, Ft. Yukon, and McGrath.

Recommend partial funding for feasibility (task 1,2) at $32,500.
App #292  Chalkyitsik District Heat_Village Council

Resource: Biomass

Proposer: Chalkyitsik Village Council

Proposed Project Phase: Design

Feasibility

AEA Program Manager: Ron Brown

Applicant Type: Local Government

Economic Analysis

Benefit/Cost Ratio (Applicant)  .78

Benefit/Cost Ratio (AEA)  .92

Two changes were made: first, the project life was extended from 15 years to 20 years, and second, five Garn boilers were assumed as the selected boilers due to their ease of operation and operating history elsewhere in Alaska. These five boilers are included with additional firebrick replacement costs, at an estimated cost of $500 = $2,500. Firebrick replacements begin in 2015, five years after the boilers are first fired. The proposed boiler system appears sized to the Venetie situation and both have progressed through a sound series of inventory, analysis, and conceptual system development. Wood suppliers could help support each of the two villages with fuel wood if needed. Both are members of a five-village survey completed by CATG (Council of Athabascan Tribal Governments). Harvest levels appear reasonable and the use of an existing firewood firm will enhance the project’s long-term sustainability.
App #292  Chalkyitsik District Heat_Village Council

Resource: Biomass  Proposed Project Phase: Design Feasibility

Proposer: Chalkyitsik Village Council

AEA Program Manager: Ron Brown  Applicant Type: Local Government

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #293 Venetie District Heat_Village Council

Resource: Biomass
Proposer: Venetie Village Council

Proposed Project Phase: Design
Feasibility

AEA Program Manager: Ron Brown
Applicant Type: Local Government

Project Description
The project is a wood energy district heating project located in Venetie for three buildings: the school, school housing and washeteria/water system. The applicant is the Venetie Village Council. The project will be a two year project with completion of project development Phases 2-3 to occur in 2009 and construction Phase 4 to occur in 2010. A level one feasibility boilers and a reconnaissance of forest wood resources has been performed in the summer of 2008 under a DOE Tribal energy grant for Yukon Flats. A table comparing round wood boiler and chip fed boilers is attached to demonstrate initial analysis and initial potential designs. It is anticipated that round wood fired boilers will be used for simplicity of the harvest system. This will require installation of 3 stick-fired boilers which will require firing up to 4 times per day on peak heat days and will require approximately 300-350 cords of wood annually to displace 33,390 gallons of fuel oil for heat.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
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<td>Matched Funds Provided:</td>
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<td>Total Potential Grant Amount:</td>
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</table>

Existing RE Fund Grant Offer: $32,500

AEA Funding Recommendation: $32,500

AEA Recommendation
Full Funding
× Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
App #293 Venetie District Heat_Village Council

Resource: Biomass
Proposer: Venetie Village Council

Proposed Project Phase: Design Feasibility

AEA Program Manager: Ron Brown
Applicant Type: Local Government

Scoring & Location

Energy Region: Yukon-Koyukuk/Upper Tanana
Election District: 6, Interior Villages

Overall Rank (out of 60) 7
Stage 3 Total Score (out of 100) 75.6

Stage 3 Scoring Summary

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<thead>
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<th>Criterion (Weight)</th>
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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>6) Local Support (Max 5)</td>
<td>3</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
<td>3</td>
</tr>
</tbody>
</table>

AEA Review Comments

Applicant proposes feasibility and final design for stick-fired wood boiler systems to supply heat to school, school housing, and washeteria/water system. Fuel savings over the 20-year life of the project appear to offset high potential project cost. Recon assessments were done for this project by CATG in the summer of 2008 by JEDC and TR Miles in 2006.

Two important outstanding issues are supply of wood and reliable operation of the boilers. The feasibility assessment would address these issues before design commences. A local woodcutter is currently providing residential supply. Sites are available for the boiler systems near the buildings. Feasibility and final design would be completed by the end of 2009. Since proposed project manager Bill Wall is involved in numerous wood projects (Ft. Yukon, Upper Kobuk, McGrath, Chalkyitsik) we are concerned about staff resources.

Recommend partial funding for feasibility (task 1,2) at $32,500.
App #293 Venetie District Heat_Village Council

Resource: Biomass
Proposer: Venetie Village Council

Proposed Project Phase: Design
Feasibility

AEA Program Manager: Ron Brown
Applicant Type: Local Government

Economic Analysis

Benefit/Cost Ratio (Applicant) .80
Benefit/Cost Ratio (AEA) 1.00

Two changes were made: first, the project life was extended from 15 years to 20 years, and second, six Garn boilers were assumed as the selected boilers due to their ease of operation and operating history elsewhere in Alaska. These six boilers are included with additional firebrick replacement cost, at an estimated an estimated cost of $3,000. This proposed boiler system appears sized to the Venetie situation and has progressed through a sound series of inventory, analysis, and conceptual system development. Harvest levels (at 12-15 tons per acre) appear reasonable and the use of an existing firewood firm will enhance the project’s long-term sustainability.
App #293  Venetie District Heat_Village Council

Resource: Biomass

Proposer: Venetie Village Council

Proposed Project Phase: Design
Feasibility

AEA Program Manager: Ron Brown

Applicant Type: Local Government

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #294  Sitka CHP _City and Borough

Resource: Biomass  Proposed Project Phase: Feasibility Recon
Proposer: City and Borough of Sitka (CBS) Alaska

AEA Program Manager: Ron Brown  Applicant Type: Local Government

Project Description
This application seeks funding to conduct a feasibility study on using high efficiency, low emissions (HELE) biomass heat and power systems for the Sitka Community Hospital and the proposed adjacent Sitka Community Greenhouse. Specifically, we are following the example of the system being used in the city of Craig, which is a wood chip fired gasifier burner that transfers heat via a low pressure hydronic system. This study will be accomplished by contracting with mechanical engineers who will determine the specific equipment necessary, the fuel requirements and availability, and the costs and payback period of the project. If this project is selected by the AEA and approved by the Alaska Legislature, the award recipient will be the City and Borough of Sitka. The City will contract with the engineers to do the study. Sitka Community Hospital will provide the engineers with all the data and access to their facilities necessary for the study. Direct technical assistance regarding the community greenhouse requirements will be provided by the Sitka Community Greenhouse Committee and other members of the Sitka Health Summit. The City will be responsible for reporting to the Authority and providing AEA with the final report.

Funding & Cost

<table>
<thead>
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<th>Description</th>
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<td>Total Potential Grant Amount:</td>
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<tr>
<td>Existing RE Fund Grant Offer:</td>
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AEA Recommendation

$30,000  $30,000

AEA Funding Recommendation: $30,000

AEA Recommendation: Full Funding
App #294  Sitka CHP _City and Borough

Resource: Biomass
Proposer: City and Borough of Sitka (CBS) Alaska

Proposed Project Phase: Feasibility Recon

AEA Program Manager: Ron Brown
Applicant Type: Local Government

Scoring & Location

Energy Region: Southeast

Election District: 2, Sitka-Wrangell-Petersburg

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of 12)
56  44.2  11

Stage 3 Scoring Summary

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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>5) Benefits (Max 10)</td>
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<tr>
<td>6) Local Support (Max 5)</td>
<td>2</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
<td>4</td>
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</tbody>
</table>

AEA Review Comments

The City proposes feasibility study and conceptual design of a wood chip fired system that would provide heat to the Sitka hospital and a planned greenhouse and power to the Sitka grid. Fuel would originate from USFS thinnings of forest plantations or sawmills in the region. Work would be contracted to an engineering firm by the City and be complete by October 2009.

AEA has concerns about availability and delivered cost of second growth thinnings. We expect, however, that this information will be a critical output of the study.

Recommend full funding of $30,000.
**App #294  Sitka CHP_City and Borough**

**Resource:** Biomass  
**Proposer:** City and Borough of Sitka (CBS) Alaska

**AEA Program Manager:** Ron Brown  
**Applicant Type:** Local Government

**Proposed Project Phase:** Feasibility Recon

### Economic Analysis

- Benefit/Cost Ratio (Applicant)
- Benefit/Cost Ratio (AEA)
App #294  Sitka CHP _City and Borough

Resource: Biomass  Proposed Project Phase: Feasibility Recon

Proposer: City and Borough of Sitka (CBS) Alaska

AEA Program Manager: Ron Brown  Applicant Type: Local Government

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
**Project Description**

The Applicant owns and operates Motherlode Lodge located near Delia Creek. 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 Motherlode Lodge currently utilizes 2 diesel fuel generators, 1 boiler and 2 wood stoves to power the facility and accounts for a significant percentage of annual operating expenses. The company plans to construct a 50 kWh run of river project with a flow of 3.5 cfs through a 10” pipeline from Delia Creek to the Powerhouse. Peak production is estimated to be 140 kWh with a minimum of 16 kWh. The proposed project, The Delia Creek Alternative Energy Project (DCAEP), will utilize water flow from the Delia Creek to power electricity to the Motherlode Lodge. The project will include an intake site, underground penstock and powerhouse. The hydroelectric system will be integrated with the new MEA power line extension. The existing energy system will be removed immediately and a 2.75 mile MEA power line extension developed to displace all fuel costs. The first phase of development was estimated by MEA to cost $150,000. All three phases of development are estimated at $750,000 by MEA. DCAEP will be headed by Project Manager, Jill Reese, Owner and sole member of HPML LLC and Polarconsult Engineering Firm. HPML LLC will match funds of $50,000 to the total cost of development. This does not include HPML's initial investment in the lodge (paid, free and clear) plus an additional $850,000 in upgrades, permits and licensing.

**Funding & Cost**

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<thead>
<tr>
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<td>Total Potential Grant Amount:</td>
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**AEA Recommendation**

Full Funding
Partial Funding
Special Provision
**X Not Recommended**
Did Not Pass Stage 1
Withdrawn
App #295  Delia Creek Hydro_HPML

<table>
<thead>
<tr>
<th>Resource: Hydro</th>
<th>Proposed Project Phase: Construction Design</th>
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<tbody>
<tr>
<td>Proposer: HPML LLC</td>
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</table>

AEA Program Manager: Doug Ott  Applicant Type: IPP

Scoring & Location

Energy Region: Railbelt
Election District: 12, Richardson-Glenn Highways

Overall Rank (out of 60)    Stage 3 Total Score (out of 100)    Rank within Region (out of )
4.8

Stage 3 Scoring Summary

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<tr>
<th>Criterion (Weight)</th>
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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<td>6) Local Support (Max 5)</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</tr>
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</table>

AEA Review Comments

AEA staff requested further information on January 22, 2009 but received no response from the applicant. Applicant was also contacted by phone in February where the applicant acknowledged receipt of the request for information but no answers were ever provided.

Because no follow up by the applicant was received by AEA, this application cannot be scored.

Recommend no funding.
Delia Creek Hydro_HPML

Resource: Hydro
Proposer: HPML LLC

Proposed Project Phase: Construction
Design

AEA Program Manager: Doug Ott
Applicant Type: IPP

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
### 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 #296  Archangel Creek Hydro_AGP

**Resource:** Hydro  **Proposed Project Phase:** Feasibility

**Proposer:** Archangel Green Power, LLC

**AEA Program Manager:** Doug Ott  **Applicant Type:** Utility IPP

Project Description

The Archangel Creek hydroelectric project is a low-impact run-of-river project located in Hatcher Pass, Alaska. The project will be located on state land in the Archangel Valley. Energy from the project would be provided into the Matanuska Electric Association (MEA) grid.

Archangel Green Power, LLC (AGP) is the project proponent, and would contribute funding, own, and operate the project. AGP has already completed reconnaissance studies of the Archangel Creek resource, and finds that the project warrants further study. Construction would be completed by qualified contractors and subcontractors selected through a competitive bidding process.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Cost of Power</td>
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<td>Total Potential Grant Amount</td>
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**Existing RE Fund Grant Offer:**

**AEA Funding Recommendation:**

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

**AEA Funding Recommendation:** (Not Constrained by Available Funding)
Resource: Hydro
Proposer: Archangel Green Power, LLC

Proposed Project Phase: Feasibility
Applicant Type: Utility

AEA Program Manager: Doug Ott

App #296 Archangel Creek Hydro_AGP

Applicant Type: Utility

AEA Review Comments
AEA Staff sent request for further information on January 26 2009 but received no response from the applicant. Applicant was also contacted by phone in February where the applicant acknowledged receipt of the request for information but no responses were ever received.

Because no followup by the applicant was received by AEA, this application cannot be scored

Recommend no funding.

Scoring & Location

Energy Region: Railbelt
Election District: 15, Rural Mat-Su

Overall Rank (out of 60)
Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
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<tr>
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</table>

Rank within Region (out of )
App #296  Archangel Creek Hydro_AGP

Resource: Hydro  Proposed Project Phase: Feasibility
Proposer: Archangel Green Power, LLC

AEA Program Manager: Doug Ott  Applicant Type: Utility
IPP

Economic Analysis

Benefit/Cost Ratio (Applicant)  3.45
Benefit/Cost Ratio (AEA)  2.92
### App #296  Archangel Creek Hydro_AGP

<table>
<thead>
<tr>
<th>Resource: Hydro</th>
<th>Proposed Project Phase: Feasibility</th>
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<tr>
<td>Proposer: Archangel Green Power, LLC</td>
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</table>

| AEA Program Manager: Doug Ott | Applicant Type: Utility IPP |

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**
App #297  Teller Wind Analysis_AVEC

Resource: Wind  Proposed Project Phase: Feasibility

Proposer: Alaska Village Electric Cooperative (AVEC)

AEA Program Manager: James Jensen  Applicant Type: Utility

Project Description

AVEC proposes to install a wind meteorological (met) tower and complete geotechnical work to determine the possibility of installing wind towers in Teller. The work will involve obtaining a letter of non-objection for placement of the wind tower and geotechnical fieldwork, permitting, purchasing, transporting, and installing a met tower, studying the wind resource for 1 year, and conducting a geotechnical investigation to determine the soil conditions and needed engineering at the site. A conceptual design will be created based on the outcome of the met tower recordings and geotechnical investigation.

Funding & Cost

Cost of Power: $0.56/kWh
Requested Grant Funds: $117,610
Matched Funds Provided: $6,190
Total Potential Grant Amount: $123,800

Existing RE Fund Grant Offer:

AEA Funding Recommendation: $117,610

AEA Recommendation

× Full Funding
Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
App #297  Teller Wind Analysis_AVEC

**Resource:** Wind  
**Proposer:** Alaska Village Electric Cooperative (AVEC)

**AEA Program Manager:** James Jensen  
**Applicant Type:** Utility

### Scoring & Location

- **Overall Rank** (out of 60): 20
- **Stage 3 Total Score** (out of 100): 65.0
- **Energy Region:** Bering Straits
- **Election District:** 39, Bering Straits

- **Rank within Region** (out of 5): 2

### Stage 3 Scoring Summary

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<th>Criterion (Weight)</th>
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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>4) Project Readiness (Max 5)</td>
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<td>5) Benefits (Max 10)</td>
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<td>6) Local Support (Max 5)</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
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</table>

### AEA Review Comments

Applicant proposes onsite wind resource assessment, geotech analysis, feasibility, and conceptual design of a wind system in the Teller and Brevig Mission area. The proposal is reasonable and the project team has substantial experience in this area.

Recommend full funding of $117,610.
## Economic Analysis

<table>
<thead>
<tr>
<th>Benefit/Cost Ratio (Applicant)</th>
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</thead>
<tbody>
<tr>
<td>Benefit/Cost Ratio (AEA)</td>
<td>1.56</td>
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</table>

Diesel and heating oil are currently the primary energy sources in the communities of Teller and Brevig Mission. The combined electric consumption in Teller and Brevig Mission in 2007 was 1,775,932 kW. If this study finds the wind resources suitable, the amount of diesel fuel used for power generation would decrease. Based on the initial assessment, it appears the proposed project will lower heating costs for the communities of Teller and Brevig Mission. In the application two different numbers for gallons of displaced fuel are mentioned; 53,000 gallons in Section 5 page 11 of the Application, and 72,654 on page 2 of the Cost Worksheet. Based on the amount of electricity that would be generated with the proposed system and the efficiency of the existing diesel generator the result is 72,654 gallons, therefore the AEA analysis utilizes this number.

The applicant provided reasonable project cost estimates with a detail breakdown for the feasibility and conceptual design phase. AVEC has prior experience with wind energy projects in rural Alaska and has knowledge of the communities where they have facilities. Thus the AEA analysis uses the cost estimates provided by the applicant, even though they are higher than the AEA benchmark value of $5,000 per kW of installed capacity. The applicant provided an O&M estimated of $0.191 per kWh for the existing system, substantially higher than the AEA benchmark value of $0.022 per kWh. However, AVEC closely tracks and reports the data for their power plants thus the AEA analysis uses the value of $0.191 provided by AVEC. The analysis results in a positive B/C ratio of 1.44 for both the applicant data and analysis, and AEA data and analysis. The analysis suggests that this project could help lower energy prices in the communities of Teller and Brevig Mission. A feasibility analysis and resource assessment would help the applicant better understand the availability of conditions needed to generate wind energy, and the amount of energy that could be generated. These details will help the applicant determine if the costs of the project are worth the benefits of wind energy generation.
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #297  Teller Wind Analysis_AVEC

<table>
<thead>
<tr>
<th>Resource: Wind</th>
<th>Proposed Project Phase: Feasibility</th>
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<tbody>
<tr>
<td>Proposer: Alaska Village Electric Cooperative (AVEC)</td>
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</table>

AEA Program Manager: James Jensen  Applicant Type: Utility

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
Project Description

A meteorological (met) tower installed near Pitka’s Point (Saint Mary’s and Pitka’s Point are connected by a road and an electrical intertie) in October 2007 has revealed an outstanding Class 6 wind resource with highly directional winds. A second met tower was installed in August 2008 at lower elevation and closer to Saint Mary’s. This second site was chosen to evaluate possible tradeoffs of wind resource and rime icing risk. The Pitka’s Point met tower data has indicated that rime icing conditions appear to possibly be a significant issue at that location. While rime icing is presumed to also occur at the lower elevation Saint Mary’s met tower site, the desire is to contrast and compare the two sites with respect to wind power and predicted power loss due to rime icing. A third met tower is presently stored in Saint Mary’s and available for installation at a third site should early winter data collection at the Saint Mary’s (the second site) indicate significant rime icing. AVEC proposes to continue the wind resource assessment for an additional one to two years to include evaluation and comparison of the two existing met towers and possible installation of the third met tower at a site further from back from the Yukon River. The primary focus of continuation of the wind study will be to further evaluate the icing problem at the met tower sites and to estimate as accurately as possible turbine downtime during icing conditions.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Cost of Power</td>
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<td>AEA Funding Recommendation (Not Constrained by Available Funding)</td>
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</table>
App #298  St. Mary's Wind Analysis_AVEC

Resource: Wind  Proposed Project Phase: Feasibility
Proposer: Alaska Village Electric Cooperative (AVEC)
AEA Program Manager: James Jensen  Applicant Type: Utility

Scoring & Location

Energy Region: Lower Yukon-Kuskokwim
Election District: 39, Bering Straits

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)
31  60.0

Rank within Region (out of 5)
5

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
</tr>
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<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
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<tr>
<td>2) Funding Resources (Max 25)</td>
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<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
<td>15</td>
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<tr>
<td>4) Project Readiness (Max 5)</td>
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<tr>
<td>5) Benefits (Max 10)</td>
<td>7</td>
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<td>2</td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td>4</td>
</tr>
</tbody>
</table>

AEA Review Comments

Applicant proposes onsite wind resource assessment, geotech analysis, feasibility, and conceptual design of a wind system and possible transmission in the St. Mary's, Mountaina Village, Pilot Station and Pitka's Point area. There are already two met towers near Pitka's Point that indicate class 6 wind resource. But there is also significant rime icing. AVEC feels that further analysis is required to optimize wind resource against rime icing loss. The proposal is reasonable and the project team has substantial experience in this area.

Recommend full funding of $110,000.
App #298  St. Mary's Wind Analysis_AVEC

**Resource:** Wind  
**Proposer:** Alaska Village Electric Cooperative (AVEC)  
**AEA Program Manager:** James Jensen  
**Proposed Project Phase:** Feasibility  
**Applicant Type:** Utility

**Economic Analysis**

**Benefit/Cost Ratio** (Applicant)  
1.44

**Benefit/Cost Ratio** (AEA)  
1.44

Diesel and heating oil are currently the primary energy resources in the three communities St. Mary, Mt. Village and Pilot Station. The diesel power systems in the three communities, generated 7,182,539 kWh in 2007. If this study finds the wind resources suitable, the amount of diesel fuel used for power generation could be decreased by 132,112 gallons for St. Mary's. Given the area's wind resources, a target goal for the proposed wind turbines is offset of 40 percent or more of diesel fuel usage. The proposed 4-5 turbines are expected to produce an average of 1,839,600 kWh annually. The estimated fuel displacement for this project is 132,112 gallons at savings of over $563,449 annually for all three communities (based on St.Mary's 2008 fuel costs of $4.26 per gallon).

The applicant provided project cost estimates with a detailed breakdown for the feasibility and conceptual design phase. These appear reasonable as AVEC has prior experience with wind energy projects in rural Alaska and also has extensive knowledge of their communities. Thus, the AEA analysis uses cost estimates provided by the applicant, even though they are higher than the AEA benchmark cost estimate of $5,000 per installed kW for rural wind projects. The applicant does not suggest an O&M cost for the existing system or the proposed system. The analysis used a benchmark set by AEA for O&M cost for the existing and the proposed systems. The applicant suggests a higher efficiency for the existing diesel system than the AEA benchmark: the applicant suggests 13.92 kWh per gallon while the benchmark proposed by AEA is 13.00. However, as AVEC closely tracks and reports the generation data for their diesel generator efficiencies the AEA analysis uses AVEC's figure. The analysis results in a positive B/C ratio of 1.33 for both the applicant data and analysis, and also the AEA model data and analysis. The analysis suggests that this project could help lower energy prices in the communities of St. Mary, Mt. Village and Pilot Station. A feasibility analysis and resource assessment would help the applicant better understand the availability of conditions needed to generate wind energy, and the amount of energy that could be generated. These details will help the applicant determine if the costs of the project are worth the benefits of wind energy generation.
App #298  St. Mary's Wind Analysis_AVEC

Resource: Wind
Proposer: Alaska Village Electric Cooperative (AVEC)
AEA Program Manager: James Jensen
Applicant Type: Utility

Proposed Project Phase: Feasibility

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #299 Scammon Bay Wind Analysis_AVEC

Resource: Wind
Proposer: Alaska Village Electric Cooperative (AVEC)

AEA Program Manager: James Jensen
Applicant Type: Utility

Proposed Project Phase: Feasibility

Project Description

AVEC proposes to install a wind meteorological (met) tower and complete geotechnical work to determine the possibility of installing wind towers in Scammon Bay. The work will involve obtaining a letter of nonobjection for placement of the wind tower and geotechnical fieldwork, permitting, purchasing, transporting, and installing a met tower, studying the wind resource for one year, and conducting a geotechnical investigation to determine the soil conditions and needed engineering at the site. A conceptual design will be created based on the outcome of the met tower recordings and geotechnical investigation.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Power:</td>
<td>$0.54/kWh</td>
</tr>
<tr>
<td>Requested Grant Funds:</td>
<td>$117,610</td>
</tr>
<tr>
<td>Matched Funds Provided:</td>
<td>$6,190</td>
</tr>
<tr>
<td>Total Potential Grant Amount:</td>
<td>$123,800</td>
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<tr>
<td>Existing RE Fund Grant Offer:</td>
<td></td>
</tr>
<tr>
<td>AEA Funding Recommendation:</td>
<td>$117,610</td>
</tr>
</tbody>
</table>

AEA Recommendation

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

AEA Funding Recommendation: $117,610
App #299 Scammon Bay Wind Analysis_AVEC

Resource: Wind
Proposer: Alaska Village Electric Cooperative (AVEC)
AEA Program Manager: James Jensen
Applicant Type: Utility

Proposed Project Phase: Feasibility

Scoring & Location

Energy Region: Lower Yukon-Kuskokwim
Election District: 39, Bering Straits

Overall Rank (out of 60)
Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
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<td>7) Sustainability (Max 5)</td>
<td>4</td>
</tr>
</tbody>
</table>

AEA Review Comments

Applicant proposes onsite wind resource assessment, geotech analysis, feasibility, and conceptual design of a wind system in Scammon Bay. The proposal is reasonable and the project team has substantial experience in this area. The City of Scammon Bay has contacted AEA in 2007 to request a met tower for the City to develop a wind project independent of AVEC.

Recommend full funding of $117,610.
Economic Analysis

Diesel and heating oil are currently the primary energy sources in Scammon Bay. In 2007, 127,463 gallons of diesel fuel was used for power generation in Scammon Bay. If suitable wind resources are identified by the Phase II study, the amount of diesel fuel used for power generation would decrease. According to the AEA Alaska high resolution wind resource map, Scammon Bay is rated as a class 6 wind regime. Compared to other similar areas, the annual wind resource is expected to be 35% of installed wind turbine capacity. Thus the three proposed 100 kW turbines can be expected to generate an average of 919,800 kWh annually, displacing 69,200 gallons of fuel annually. Estimated cost savings from fuel displacement would be approximately $305,680 annually (based on applicant’s 2008 fuel prices of $4.43). Based on the initial assessment, the proposed project could potential lower energy costs for the community of Scammon Bay depending upon prices negotiated for wind energy.

The applicant provided project cost estimates with a detailed breakdown of the feasibility and conceptual design phase. The cost estimates appear reasonable as AVEC has prior experience with wind energy projects in rural Alaska and also has extensive knowledge of their communities. Thus the AEA analysis uses cost estimates provided by the applicant, even though they are higher than the AEA benchmark cost estimate of $5,000 per installed kW for rural wind projects. The applicant provided an O&M estimated of $0.103 per kWh for the existing system, substantially higher than the AEA benchmark value of $0.022 per kWh. However, AVEC closely tracks and reports the data for their power plants thus the AEA analysis uses the value of $0.191 provided by AVEC. The applicant suggests a higher efficiency for the existing diesel system than the AEA benchmark: the applicant suggests 13.33 kWh per gallon while the benchmark proposed by AEA is 13.00. As mentioned above AVEC tracks their generation data therefore the AEA analysis uses AVEC’s figure. The analysis results in a positive B/C ratio of 1.20 for both the applicant data and analysis and the AEA model data and analysis.

The analysis suggests that this project could help reduce high energy prices in the community of Scammon Bay. A feasibility analysis and resource assessment would help the applicant better understand the availability of conditions needed to generate wind energy, and the amount of energy that could be generated. These details will help the applicant determine if the costs of the project are worth the benefits of wind energy generation.
App #299 Scammon Bay Wind Analysis_AVEC

Resource: Wind

Proposer: Alaska Village Electric Cooperative (AVEC)

AEA Program Manager: James Jensen

Applicant Type: Utility

Proposed Project Phase: Feasibility

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
Project Description
A meterological (met) tower installed in New Stuyahok between 2003 and 2005 found that winds were class 3 (fair to good); however, placement of the met tower was hindered by the active runway at the time (location new airport has now been constructed out of town), and it is expected that the wind resource could be better. Before going forward with the final design and construction of wind turbines, AVEC would like to better determine the wind potential in the community. The work would involve obtaining a letter of non-objection for placement of the wind tower and geotechnical fieldwork, permitting, purchasing, transporting, and installing a met tower, studying the wind resource for one year, and conducting a geotechnical investigation to determine the soil conditions and needed engineering at the site. A conceptual design will be created based on the outcome of the met tower recordings and geotechnical investigation. Wind generators placed at the old airport could reduce the annual fuel consumption of the diesel generators, thus reducing the cost of electricity within New Stuyahok, as well as reducing the overall volume of fuel that is handled within the community and risks associated with handling fuel.

Funding & Cost

<table>
<thead>
<tr>
<th></th>
<th>ramento Fund Grant Offer:</th>
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<tbody>
<tr>
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<tr>
<td>Requested Grant Funds</td>
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<td>Matched Funds Provided</td>
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<tr>
<td>Total Potential Grant Amount</td>
<td>$123,800</td>
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<tr>
<td>AEA Funding Recommendation: (Not Constrained by Available Funding)</td>
<td>$117,610</td>
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Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #300 New Stuyahok Wind Analysis_AVEC

<table>
<thead>
<tr>
<th>Resource: Wind</th>
<th>Proposed Project Phase: Feasibility</th>
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<tbody>
<tr>
<td>Proposer: Alaska Village Cooperative (AVEC)</td>
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AEA Program Manager: James Jensen

Applicant Type: Utility

Scoring & Location

Energy Region: Bristol Bay

Election District: 37, Bristol Bay-Aleutians

Overall Rank (out of 60)

Stage 3 Total Score (out of 100)

Rank within Region (out of 5)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
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<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
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</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td>5</td>
</tr>
</tbody>
</table>

AEA Review Comments

Applicant proposes onsite wind resource assessment, geotech analysis, feasibility, and conceptual design of a wind system in New Stuyahok. The proposal is reasonable and the project team has substantial experience in this area. The existing met tower erected by AEA and AVEC in 2003 indicates a class 3 wind resource. Due to relocation of the airport, however, AVEC believes there is a location with a more promising wind resource.

Recommend full funding of $117,610.
### Economic Analysis

<table>
<thead>
<tr>
<th>Benefit/Cost Ratio (Applicant)</th>
<th>0.59</th>
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</thead>
<tbody>
<tr>
<td>Benefit/Cost Ratio (AEA)</td>
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</table>

Diesel and heating oil are currently the primary energy sources in New Stuyahok. The consumption of diesel fuel for power generation in New Stuyahok in 2007 was 87,967 gallons. If this study finds the wind resources suitable, the amount of diesel fuel used for power generation would decrease. The three proposed turbines can be expected to produce an average of 473,040 kWh annually, displacing 34,604 gallons of fuel annually. Estimated cost savings from fuel displacement would be approximately $164,716 annually (based on applicant 2008 fuel costs of $4.76 per gallon).

The applicant provided project cost estimates with a detailed breakdown for the feasibility and conceptual design phase. These appear reasonable as AVEC has prior experience with wind energy projects in rural Alaska and also has extensive knowledge of their communities. Thus the AEA analysis uses cost estimates provided by the applicant, even though they are higher than the AEA benchmark cost estimate of $5,000 per installed kW for rural wind projects. The applicant suggests a higher efficiency for the existing diesel system than the AEA benchmark: the applicant suggests 13.67 kWh per gallon while the benchmark proposed by AEA is 13.00. However, as AVEC closely tracks and reports the generation data for their diesel generator efficiencies the AEA analysis uses AVEC’s figure. The analysis shows that the benefits do not outweigh the costs for this project. The wind resources are rated as class 3 and do not seem to produce enough power to outweigh the costs. A feasibility analysis and resource assessment would help the applicant better understand the availability of conditions needed to generate wind energy, and the amount of energy that could be generated. These details will help the applicant determine if the costs of the project are worth the benefits of wind energy generation.
App #300  New Stuyahok Wind Analysis_AVEC

Resource: Wind  Proposed Project Phase: Feasibility

Proposer: Alaska Village Cooperative (AVEC)

AEA Program Manager: James Jensen  Applicant Type: Utility

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #301 Stebbins Wind Analysis_AVEC

Resource: Wind

Proposer: Akaska Village Electric Cooperative (AVEC)

AEA Program Manager: James Jensen

Proposed Project Phase: Feasibility

Applicant Type: Utility

Cost of Power: $0.50/kWh

Requested Grant Funds: $103,256

Matched Funds Provided: $5,435

Total Potential Grant Amount: $108,691

Existing RE Fund Grant Offer: $389

AEA Funding Recommendation:

AEA Recommendation:

Full Funding
Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn

Project Description

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

Funding & Cost

Cost of Power: $0.50/kWh

Requested Grant Funds: $103,256

Matched Funds Provided: $5,435

Total Potential Grant Amount: $108,691

AEA Funding Recommendation: $103,256

AEA Funding Recommendation: $103,256

AEA Recommendation:

Full Funding
Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
App #301  Stebbins Wind Analysis_AVEC

Resource: Wind  Proposed Project Phase: Feasibility

Proposer: Akaska Village Electric Cooperative (AVEC)

AEA Program Manager: James Jensen  Applicant Type: Utility

Scoring & Location

Energy Region: Bering Straits

Election District: 39, Bering Straits

Rank within Region (out of 5)

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

59.3  34

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
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<td>1) Cost of Energy (Max 30)</td>
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<tr>
<td>6) Local Support (Max 5)</td>
<td>2</td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td>5</td>
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</tbody>
</table>

AEA Review Comments

Applicant proposes onsite wind resource assessment, geotech analysis, feasibility, and conceptual design of a wind system in Stebbins. The proposal is reasonable and the project team has substantial experience in this area.

Recommend full funding of $103,256.
Economic Analysis

The applicant provided a detailed breakdown of their project cost estimates. The cost estimates appear reasonable as AVEC has prior experience with wind energy projects in rural Alaska and also has extensive knowledge of their communities. Thus, the AEA analysis uses cost estimates provided by the applicant, even though they are higher than the AEA benchmark cost estimate of $5,000 per installed kW for rural wind projects. The applicant estimates their new system energy production would range between 1,000,000 and 1,500,000 kWh produced annually. Coincidentally, the applicant estimated energy production would displace between 71,839 to 107,759 gallons of fuel. Due to this range, two separate benefit/cost analyses are completed using the applicant’s displacement estimates. This differed from what the model shows, in this analysis, the applicant’s numbers have been used.

The applicant provided an O&M estimated of $0.059 per kWh for the existing system, higher than the AEA benchmark value of $0.022 per kWh. However, AVEC closely tracks and reports the data for their power plants, thus the AEA analysis uses the value of $0.059 provided by AVEC. The applicant suggests a higher efficiency for the existing diesel system than the AEA benchmark: the applicant suggests 13.76 kWh per gallon while the benchmark proposed by AEA is 13.00. As mentioned above, AVEC tracks their generation data, thus the AEA analysis uses AVEC’s figure. The AEA analysis used the range of estimated kWh produced and produced a B/C ratio ranging from 0.86 to 2.26. The analysis suggests a feasibility analysis and resource assessment could help the applicant better understand the availability of conditions needed to generate wind energy, and the amount of energy that could be generated. These details will help the applicant determine if the costs of the project are worth the benefits of wind energy generation.
### App #301  Stebbins Wind Analysis_AVEC

<table>
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<tr>
<th>Resource:</th>
<th>Wind</th>
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<th>Feasibility</th>
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<tr>
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<td>Applicant Type:</td>
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<tr>
<td>AEA Program Manager:</td>
<td>James Jensen</td>
<td></td>
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</tbody>
</table>

#### DNR/DGGS Geohazards Comments

#### DNR/DGGS Feasibility Comments

#### DNR/DMLW Feasibility Comments
App #302  Emmonak Wind and Transmission_AVEC

Resource: Wind
Proposer: Alaska Village Electric Cooperative (AVEC)
AEA Program Manager: James Jensen
Applicant Type: Utility

Proposed Project Phase: Construction Design

Project Description

The project involves the final design, permitting, and construction of an electrical distribution tie line between the villages of Emmonak and Alakanuk and the final design, permitting, construction, erection, startup, and commissioning of eight wind turbines to supplement a new power generation system for the communities of Emmonak and Alakanuk. 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, installation of the electrical distribution lines, 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 is under final review and is expected within a week of submission of this application. Permitting was completed for the met tower currently at the site of the wind turbines; we expect no unusual permitting requirements for the site.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Cost of Power</td>
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<td>Requested Grant Funds</td>
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<td>Matched Funds Provided</td>
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<td>Total Potential Grant Amount</td>
<td>$10,733,179</td>
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AEA Recommendation

Full Funding
-crossed out Partial Funding
-crossed out Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn

AEA Funding Recommendation: $9,670,361

AEA Funding Recommendation: $8,000,000
App #302 Emmonak Wind and Transmission_AVEC

Resource: Wind
Proposer: Alaska Village Electric Cooperative (AVEC)
AEA Program Manager: James Jensen

Proposed Project Phase: Construction Design
Applicant Type: Utility

Scoring & Location

Energy Region: Lower Yukon-Kuskokwim
Election District: 39, Bering Straits

Overall Rank (out of 60) 63.4
Stage 3 Total Score (out of 100) 3
Rank within Region (out of 6)

Stage 3 Scoring Summary

<table>
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<tr>
<th>Criterion (Weight)</th>
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</tr>
</tbody>
</table>

AEA Review Comments

Applicant proposes final design/permitting and construction of a 800 kW wind farm and intertie to serve the communities of Emmonak and Alakanuk. The project team has substantial experience in wind-diesel development. AEA provided a met tower for Emmonak in 2007. However, the proposal does not give detailed results of wind resource assessment, a general route of the transmission line, or turbine production estimates, nor a detailed assessment of economic feasibility. The app does not address land ownership implications on transmission and wind farm development. The project would be completed by 2010.

Recommend full funding of $9,670,361 with requirement that grantee provide feasibility assessment and conceptual design of the wind farm and transmission line for AEA review and approval before any grant funds are made available.

Stage 3 review update: Following discussions on regional funding allocation, project funding is capped at $2,000,000 per affected community for Railbelt and lower energy cost Southeast communities and $4,000,000 for other communities. Since this project impacts both Emmonak and Alakanuk, funding recommendation is $8,000,000.
Economic Analysis

The applicant provided reasonable project cost estimates with a detailed breakdown of construction costs. These appear reasonable as AVEC has extensive prior experience with wind energy projects in rural Alaska and also significant local knowledge. Because of this, the AEA analysis uses cost estimates provided by the applicant, even though they are higher than the AEA benchmark cost estimate of $5,000 per installed kW for rural wind projects. The applicant estimates a fuel displacement of 110,000 gallons of diesel fuel for electricity. This is lower than the AEA benchmark analysis estimates, based on the assumed efficiency of 13.0 kWh per gallon for the diesel generators and the estimated electricity generated with the proposed wind system. The AEA model estimates the displacement of 142,774 gallons of diesel fuel annually for electricity.

The applicant provided an O&M costs estimate of $0.072 per kWh for the existing system, substantially higher than the AEA benchmark value of $0.022 per kWh. However, AVEC closely tracks and reports periodic data for their power plants so the AEA analysis uses AVEC’s value of $0.072 per kWh. The applicant suggests a higher efficiency for the existing diesel system than the AEA benchmark: the applicant suggests 13.76 kWh per gallon while the benchmark proposed by AEA is 13.00. As mentioned, AVEC tracks their generation data and the AEA analysis uses AVEC’s figure. The analysis results in B/C ratios of slightly less than one (0.99) for the AEA review and 0.91 for the review using applicant data. The wind resources in Emmonak are considered good. The project has good potential for long-term success given proper maintenance and operations of the wind system. The analysis suggests that this project could help reduce high-energy prices in the communities of Emmonak and Alakanuk. Factors that are important to consider are the construction costs and the amount of diesel fuel that can be displaced annually. While the benefit-cost ratio is slightly less than one under the AEA analysis, we believe that the assumptions on capital and operating costs put forth by the applicant are conservative and that with greater operating experience with the wind turbines additional benefits could be identified and realized.
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.
App #303  Shaktoolik Wind_AVEC

Resource: Wind  Proposed Project Phase: Construction Design

Proposer: Alaska Village Cooperative (AVEC)

AEA Program Manager: James Jensen  Applicant Type: Utility

Project Description

Our 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 Shaktoolik. 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.

Funding & Cost

| Cost of Power: | $0.47/kWh |
| Requested Grant Funds: | $2,465,664 |
| Matched Funds Provided: | $262,296 |
| Total Potential Grant Amount: | $2,727,960 |

AEA Recommendation

$2,465,664

× Full Funding
Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #303  Shaktoolik Wind_AVEC

- **Resource:** Wind
- **Proposer:** Alaska Village Cooperative (AVEC)
- **Proposed Project Phase:** Construction
  - Design
- **AEA Program Manager:** James Jensen
- **Applicant Type:** Utility

### Scoring & Location

**Energy Region:** Bering Straits

**Election District:** 39, Bering Straits

- **Overall Rank (out of 60):** 19
- **Stage 3 Total Score (out of 100):** 65.6
- **Rank within Region (out of 5):** 1

### Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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</thead>
<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>5) Benefits (Max 10)</td>
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<td>6) Local Support (Max 5)</td>
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<tr>
<td>7) Sustainability (Max 5)</td>
<td>5</td>
</tr>
</tbody>
</table>

### AEA Review Comments

AVEC proposes a 200 kW medium penetration wind project consisting of 2 Northwind 100 turbines and electric boilers that would displace approximately 50% of the fuel used for diesel generation. AVEC states that they have site control for the wind farm. USFWS and USACE would be consulted. USFWS states that Shaktool is close to spectacled eider molting areas but eiders are not known to migrate through or around Shaktoolik. Onsite wind assessment indicates a class 4 resource.

Recommend for full funding of $2,465,664.
Economic Analysis

The applicant provided detailed project cost estimates for the feasibility and conceptual design phase. These appear reasonable as AVEC has prior experience with wind energy projects in rural Alaska and also has extensive knowledge of their communities. Thus the AEA analysis uses cost estimates provided by the applicant, even though they are higher than the AEA benchmark cost estimate of $5,000 per installed kW for rural wind projects. The applicant estimates a fuel displacement of 22,000 gallons of diesel fuel annually for electricity. This is lower than the AEA analysis shows based on efficiency of 13.8 kWh per gallon. The model estimates the displacement of 39,151 gallons of diesel fuel annually for electricity.

The applicant provided a small cost for O&M for the proposed system, $0.006 per kWh, which is used for the applicant’s BC analysis. The AEA benchmark is substantially larger, and for the AEA analysis we use the benchmark cost of $0.022 per kWh. The applicant provided an O&M estimated of $0.420 per kWh for the existing system, substantially higher than the AEA benchmark value of $0.022 per kWh. However, AVEC closely tracks and reports the data for their power plants thus the AEA analysis uses the value of $0.420 provided by AVEC. The applicant suggests a higher efficiency for the existing diesel system than the AEA benchmark: the applicant suggests 13.80 kWh per gallon while the benchmark proposed by AEA is 13.00. As mentioned above AVEC tracks their generation data and the AEA analysis uses AVEC’s figure. The analysis results in a positive B/C for both the applicant data and analysis, and also the AEA model data and analysis. The wind resources in Shakttoolik are good. The project has a very good potential for long-term success given proper maintenance and operations of the wind system. The analysis suggests that this project will help reduce high energy prices in the community of Shaktoolik.
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #303  Shaktoolik Wind_AVEC

<table>
<thead>
<tr>
<th>Resource: Wind</th>
<th>Proposed Project Phase: Construction Design</th>
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</thead>
<tbody>
<tr>
<td>Proposer: Alaska Village Cooperative (AVEC)</td>
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</table>

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 #304  Geothermal Resource Assessment Seward Pen_AVEC

**Resource:** Geothermal

**Proposer:** Alaska Village Electric Cooperative (AVEC)

**AEA Program Manager:** Lenny Landis

**Proposed Project Phase:** Feasibility Recon

**Applicant Type:** Utility

**Cost of Power:** $0.09/kWh

**Requested Grant Funds:** $4,301,950

**Matched Funds Provided:** $145,000

**Total Potential Grant Amount:** $4,446,950

**Existing RE Fund Grant Offer:**

**AEA Funding Recommendation:** (Not Constrained by Available Funding)

**AEA Recommendation:**

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

---

**Project Description**

AVEC proposes a resource assessment/feasibility analysis/conceptual design project of geothermal sites on the Seward Peninsula region, simultaneously involving the NANA/NW Arctic Borough Regions and the Kawerak/Bering Straights Native Corporation Regions.

Goal: The SGAP goal is to ascertain the feasibility of geothermal power generation for regional communities and develop conceptual design documents/reports for geothermal generation on the Seward Peninsula. The SGAP strategic objectives are as follows:

SO 1: Identify potential geothermal sites in the Seward Peninsula Region.

SO 2: Undertake a geological, geochemistry, and geophysical assessment of targeted sites for geothermal power generation potential.

SO 3: Undertake a geothermal drilling program to promote regional geothermal interests

SO 4: Develop conceptual design and business plan for follow-on phases of the projects.

SO 5: Conduct an optimization phase in the conceptual design wherein how to supply power either from one centrally located geothermal plant or from many smaller geothermal plants, to the communities involved can be evaluated. Included will be evaluating the use of transmission lines for power versus supplying hot water via a pipeline to one or several geothermal power plant(s).
App #304  Geothermal Resource Assessment Seward Pen_AVEC

Resource: Geothermal
Proposer: Alaska Village Electric Cooperative (AVEC)

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Proposed Project Phase: Feasibility Recon

Scoring & Location

Energy Region: Railbelt
Election District: 35, Homer-Seward

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

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

AEA Review Comments

Applicant proposes assessment of geothermal resources in the Seward Peninsula. Although DGGS finds the work plan generally reasonable, they note weaknesses in the methodology. DGGS indicates hot spring systems in the general area are small and of only moderate temperature, unlikely to produce megawatt scale electricity. In addition, they are in remote from communities and would require long transmission lines.

Recommend no funding.
App #304  Geothermal Resource Assessment Seward Pen_AVEC

Resource: Geothermal
Proposer: Alaska Village Electric Cooperative (AVEC)

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Proposed Project Phase: Feasibility Recon

Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

The applicants correctly state that:
a) these springs are poorly known,
b) the springs are likely to be moderate temperature, with potential for production of hundreds of kilowatts (as opposed to tens of megawatts),
c) current understanding of the tectonics is that there may be some rifting in the area. [Note: rifting may be associated with movement of the Bering microplate, which is moving independently of both the Pacific and North America plates. It is unlikely that there has been enough crustal thinning associated with such rifting to result in the kind of mantle upwelling and elevated heat flow associated with rifting in places like Iceland, the Salton Sea, or Nevada. The rifting may instead result in deep faults along which geothermal fluids can rise.]

The proposed work includes ground-based mapping and sampling, satellite and airborne mapping, including imaging capable of returning quantitative ground temperatures (FLIR). Based on this reconnaissance, sites most likely to contain resources will be selected and imaged by ground-based EM, which will in turn be used to site drilling sites. This work plan is generally reasonable, and is a stepwise way to gather information on these geothermal sites. There is nothing in here which is totally fabricated, offbase, or outlandish.

DNR/DMLW Feasibility Comments
App #305  Connelly Lake Hydro_APT

Resource: Hydro  Proposed Project Phase: Design
Proposer: Alaska Power and Telephone Co  Feasibility

AEA Program Manager: Doug Ott  Applicant Type: Utility

Project Description

The Connelly Lake Hydroelectric Project (Project) will be located in Southeast Alaska, approximately 14 miles northeast of the City of Haines and 10 miles southwest of the City of Skagway. Connelly Lake (formerly known as Upper Chilkoot Lake) is an 85 acre alpine lake, and drains into the Chilkoot River. The project will be on state and private land, including the Haines State Forest and Chilkat Bald Eagle Preserve. The project facilities will include a dam at the lake outlet, a penstock about 6,200 feet long, a 12.0 MW powerhouse with two generating units, a 14-mile-long 34.5 kV transmission line and a 14-mile long access road. Final dimensions and capacities of these facilities will be determined by optimization studies to be conducted during Phase II. The Project will be developed by AP&T to provide additional generation to its interconnected Haines and Skagway electrical systems.

Funding & Cost

Cost of Power: $0.23/kWh
Requested Grant Funds: $988,000
Matched Funds Provided: $247,000
Total Potential Grant Amount: $1,235,000

AEA Funding Recommendation: $428,000

AEA Recommendation

Full Funding
× Partial Funding
× Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
**Alaska Renewable Energy Fund: Round 2 (Mar-09)**

**App #305  Connelly Lake Hydro_APT**

**Resource:** Hydro  
**Proposer:** Alaska Power and Telephone Co  
**Proposed Project Phase:** Design Feasibility

**AEA Program Manager:** Doug Ott  
**Applicant Type:** Utility

### Scoring & Location

**Energy Region:** Southeast  
**Election District:** 5, Cordova-Southeast Islands  
**Overall Rank (out of 60):** 30  
**Stage 3 Total Score (out of 100):** 60.2  
**Rank within Region (out of 12):** 4

### Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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</table>

### AEA Review Comments

Applicant proposes feasibility study and final design/permitting for a 12 MW storage hydro project.

Interaction with other potential projects, including Burro Cr and West Cr. An IRP is desirable for the Skagway, Haines, Klukwan area before proceeding to final design and construction for these projects.

Existing recon study proposes a substantially smaller 6 MW project which impounds less water than the current proposal. Project may require intertie and road access across the Chilkat Bald Eagle Reserve if it is not feasible to route through the Haines State Forest.

Power sales/benefits limited to offset of diesel costs and air pollution during summer cruise ship landings in Haines and Skagway. Seasonal power production would limit year-round availability.

Recommend $428,000 partial funding for Phase 2 feasibility study with scope per application. Special provision that land issues and licensing jurisdiction question be resolved with go-no go points established.
## Economic Analysis

<table>
<thead>
<tr>
<th>Benefit/Cost Ratio (Applicant)</th>
<th>1.94</th>
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<tr>
<td>Benefit/Cost Ratio (AEA)</td>
<td>1.88</td>
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**Resource:** Hydro  
**Proposer:** Alaska Power and Telephone Co  
**AEA Program Manager:** Doug Ott  
**Applicant Type:** Utility
App #305  Connelly Lake Hydro_APT

Resource: Hydro
Proposer: Alaska Power and Telephone Co

Proposed Project Phase: Design
Feasibility

AEA Program Manager: Doug Ott
Applicant Type: Utility

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #306  Aleutian Peninsula Broadcasting Wind

Resource: Wind
Proposer: Aleutian Peninsula Broadcasting, Inc.

Proposer: Aleutian Peninsula Broadcasting, Inc.

AEA Program Manager: James Jensen
Applicant Type: IPP

Project Description
The proposed project will benefit every electric utility ratepayer in Sand Point and also the public radio station in Sand Point. As such, one hundred (100) percent of the electricity generated by the wind turbine will benefit the public. KSDP Radio / Aleutian Peninsula Broadcasting, Inc. is an AM public radio station licensed to Sand Point, Alaska. The station’s listening audience consists of approximately 3,000 year-round residents and an additional 2,000 seasonal residents in Sand Point, Chignik, Perryville, Port Moller, Nelson Lagoon, King Cove, Cold Bay and False Pass. Aleutian Peninsula Broadcasting, Inc.’s General Manager Kells Hetherington will oversee the project with his five member Board of Directors. Members of the radio station’s Board are elected from within the station’s listening area. The wind turbine and associated equipment will be installed at the station’s transmitter site. The work will be done by ABS Alaska, an alternative energy contractor with offices in Fairbanks, Anchorage and Washington State.

Funding & Cost

Cost of Power: $0.61 /kWh
Requested Grant Funds: $126,750
Matched Funds Provided: $20,000
Total Potential Grant Amount: $146,750

Existing RE Fund Grant Offer: $126,750

AEA Recommendation:
Full Funding
Partial Funding
Special Provision
× Not Recommended
Did Not Pass Stage 1
 Withdrawn

AEA Funding Recommendation:
$126,750
App #306  Aleutian Peninsula Broadcasting Wind

Resource: Wind  Proposed Project Phase: Construction
Proposer: Aleutian Peninsula Broadcasting, Inc.
AEA Program Manager: James Jensen  Applicant Type: IPP

Scoring & Location

Energy Region: Aleutians
Election District: 37, Bristol Bay-Aleutians
Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of 7 )
17  68.0

Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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</table>

AEA Review Comments

Applicant proposes to install a 20 kW wind turbine and battery system that will serve the local public radio station in Sand Point. Station staff would operate the system. The system is very small compared to the 1000 kW system that is currently under development and funded by State and federal funds.

AEA has a number of concerns with the application. No final design/permitting (phase 3) documentation was submitted or referred to in the app. The app does not specify the manufacturer of the turbine system nor supply any backup to the claimed 50%+ of energy that the station will provide to the Sand Point grid at no cost. Since the wind system is small in relation to the grid load, the system will operate as a low-penetration project and likely not need the battery system for integration. Applicants do not appear to have consulted with USFWS on impacts of the guyed tower. There is no mention of a business arrangement with local utility TDX Power. Given the long-term nature of the project we are concerned that the radio station can ensure consistent, long-term O&M of the turbine and battery systems.

Recommend full funding of $126,750 with requirement that 1) applicant provide final design and permitting documentation before funds are made available, 2) applicant demonstrates acceptable business arrangement with local utility.

Stage 3 review update: Following discussions on regional funding allocation, no funding is recommended consistent with policy that not more than one project in a community that uses the same renewable resource be funded for construction. In this case project #317 Sand Point Wind has a higher overall score.
Economic Analysis

Benefit/Cost Ratio (Applicant) 1.72  
Benefit/Cost Ratio (AEA) 1.66

- The applicant provided reasonable and detailed cost estimates of all system components. The applicant’s project cost is higher than AEA benchmark cost for rural wind projects of this scale. The AEA analysis used the applicant’s project cost estimate given the level of detail provided.
- The wind resource analysis by V3 Energy indicated outstanding wind resource of Class 5 to 6; very promising for wind power development. No turbine data is provided; AEA needs to verify wind energy output.
- The applicant’s estimated O&M for the wind project ($2,374) is higher than the AEA benchmark O&M for rural wind projects ($800).
- The applicant estimates that fuel savings would be 3,600 gallons per year; it is unclear how this was estimated. However, applicant’s estimate approximates TDX’s (the operator of the utility) data on diesel generation fuel efficiency (2,600 gallons).
- Applicant did not provide data on base system diesel generation fuel efficiency and base system diesel generation O&M; this analysis uses TDX utility information.

Wind resources in the area are very good. Potential fuel savings are modest but the economic analysis shows a B/C ratio greater than 1.0 for both analyses—using applicant’s data and AEA’s independent analysis of the project. The project has a very good potential for long-term success given proper maintenance and operations of the wind system.
App #306  Aleutian Peninsula Broadcasting Wind

Resource: Wind  Proposed Project Phase: Construction

Proposer: Aleutian Peninsula Broadcasting, Inc.

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 #307  Ambler HR_City of Ambler

Resource: Heat Recovery  Proposed Project Phase: Construction Design
Proposer: City of Ambler

AEA Program Manager: Lenny Landis  Applicant Type: Local Government

Project Description
This project will construct buried piping, pumps, heat exchangers, and other system components required to recover waste heat from the existing AVEC power plant and confer this energy to the new City water plant and washeteria in Ambler. This project will involve coordination between the City of Ambler, Alaska Village Electric Cooperative, Inc. (AVEC), the Northwest Arctic Borough, and the Alaska Native Tribal Health Consortium (ANTHC).

Funding & Cost

<table>
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<tr>
<th>Description</th>
<th>Amount</th>
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<tr>
<td>Cost of Power:</td>
<td>$0.83/kWh</td>
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<tr>
<td>Requested Grant Funds:</td>
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<td>Matched Funds Provided:</td>
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<tr>
<td>Total Potential Grant Amount:</td>
<td>$500,000</td>
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Existing RE Fund Grant Offer: $435,000

AEA Funding Recommendation: $435,000

AEA Recommendation:
- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
App #307  Ambler HR_City of Ambler

Resource: Heat Recovery
Proposer: City of Ambler

AEA Program Manager: Lenny Landis
Applicant Type: Local Government

Proposed Project Phase: Construction
Design

Scoring & Location

Energy Region: Northwest Arctic
Election District: 40, Arctic

Overall Rank (out of 60) 74.5
Stage 3 Total Score (out of 100) 8

Stage 3 Scoring Summary

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AEV Review Comments

Applicant proposes to recover heat from AVEC diesel generators and supply heat to the city water plant and washeteria. ANTHC would design and manage the project as part of the water system improvements. Project completion would be in April 2010. The application does not include a letter of support from AVEC, however the app does refer to initial discussions with AVEC that indicate general agreement price. The application provides a detailed preliminary design.

Recommend full funding of $435,000 with requirement that City and AVEC provide a heat purchase agreement to AEA before disbursement of funds.
App #307  Ambler HR_City of Ambler

**Resource:** Heat Recovery  
**Proposer:** City of Ambler

**Proposed Project Phase:** Construction  
**Design**

**AEA Program Manager:** Lenny Landis  
**Applicant Type:** Local Government

**Economic Analysis**

| Benefit/Cost Ratio (Applicant) | 1.57 |
| Benefit/Cost Ratio (AEA) | 1.34 |

The original AEA commissioned study was very thorough in terms of energy utilization and system components. Although the 2005 report was conducted without a site visit and it is unclear what contingency was incorporated for that, the cost escalation seems more than ample to ameliorate. AEA recommendation on cost escalation is only 4% per annum whereas the applicant allowed more than twice that. The 25 year project life was adjusted to 20 years for the AEA analysis. Other than that, the project applicant data was accepted. The combined reduction in heating fuel requirements were estimated at 8,864 gallons per year – about half the total needs. Although heat exchanger economics are typically quite high, the buildings are over 500 feet from the source heat, resulting in higher construction costs for buried piping. The B/C is still more than acceptable at 1.34. A potentially significant concern is the construction phase planned for August ’09 through April ’10 – the winter season of course presents serious challenges in interior Alaska. Trenching and installation of underground piping would have to be completed before freeze-up in ’09.
## App #307  Ambler HR_City of Ambler

<table>
<thead>
<tr>
<th>Resource:</th>
<th>Heat Recovery</th>
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<tr>
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<td>AEA Program Manager:</td>
<td>Lenny Landis</td>
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### 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 #308  Plasma Gasification_Solena Group

Resource: Biofuels
Proposer: Solena Group

AEA Program Manager: 
Applicant Type: IPP

Project Description
This project will convert Biomass waste (municipal wastes, and sawmill/wood wastes) to renewable electric power. Possible site locations include Eielson Air Force base near Fairbanks and landfill locations near Anchorage, Kodiak and Juneau. Our plant will provide electricity to local communities (local/military schools, residential, Air Force base and civilian airports). The project will involve Solena Group and its partners (GE, MPR Associates, Ford Bacon & Davis and Deutsche Bank).

Funding & Cost

Cost of Power: $0.17 /kWh
Requested Grant Funds: $300,000
Matched Funds Provided: $300,000
Total Potential Grant Amount: $600,000

AEA Recommendation
Full Funding
Partial Funding
Special Provision
Not Recommended
× Did Not Pass Stage 1
Withdrawn
App #308  Plasma Gasification_Solena Group

Resource: Biofuels  Proposed Project Phase: Feasibility
Proposer: Solena Group

AEA Program Manager:
Applicant Type: IPP

Scoring & Location

Energy Region: Railbelt
Election District: 12, Richardson-Glenn Highways

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

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AEA Review Comments
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #308  Plasma Gasification_Solena Group

Resource: Biofuels
Proposer: Solena Group

Proposed Project Phase: Feasibility

AEA Program Manager: 
Applicant Type: IPP

Economic Analysis

Benefit/Cost Ratio (Applicant) Benefit/Cost Ratio (AEA)
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<tr>
<th>Resource</th>
<th>Proposed Project Phase</th>
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<tbody>
<tr>
<td>Biofuels</td>
<td>Feasibility</td>
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</table>

**Proposer:** Solena Group

**DNR/DGGS Geohazards Comments**

**DNR/DGGS Feasibility Comments**

**DNR/DMLW Feasibility Comments**
App #309  Orutsaramiut Native Council

Resource: Gas  Proposed Project Phase: Feasibility Recon
Proposer: Orutsaramiut Native Council Incorporated

AEA Program Manager:  Applicant Type: Local Government

Project Description

Phase I of the project will involve assessment of the current diesel and fuel oil users within the ONC controlled assets in Bethel; to estimate the volume of CNG to be supplied, the extent of modification required to accommodate the switch over to natural gas, and of course the willingness of the village residents to be involved. Phase II will build on the inventory data from the first stage, and will entail development of conceptual design elements sufficient to support the economic analysis noted above, in 2.3. The second stage will also emphasize a firm supply of pipeline quality natural gas or LNG, as well as identifying critical path schedule constraints such as environmental or transport permits.

Funding & Cost

| Cost of Power: | $0.60/kWh |
| Requested Grant Funds: |  |
| Matched Funds Provided: |  |
| Total Potential Grant Amount: |  |
| Existing RE Fund Grant Offer: |  |

AEA Funding Recommendation:

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
App #309  Orutsaramiut Native Council

Resource: Gas  Proposed Project Phase: Feasibility
Proposer: Orutsaramiut Native Council Incorporated

AEA Program Manager:  Applicant Type: Local Government

Scoring & Location

Energy Region: Lower Yukon-Kuskokwim
Election District: 38, Bethel

Stage 3 Scoring Summary

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

AEA Review Comments
App #309  Orutsaramiut Native Council

Resource: Gas
Proposer: Orutsaramiut Native Council Incorporated

Proposed Project Phase: Feasibility Recon

AEA Program Manager: 
Applicant Type: Local Government

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
This proposed project focuses on design study and engineering phases (I and II) for a LCNG system for the City of Bethel, Alaska. As such, this proposal has no direct component that would involve the use of local energy resources through exploration or development. If the proposed project later proceeds to construction issues involving geologic hazards and the use of wetlands (addressed on page 34, 4.8.3 Wetlands/Protected Areas) would potentially involve a geologic component. If funded, we suggest that the applicant include an assessment of potential geologic hazards as part of their feasibility study.
App #310 ORPC Cook Inlet Tidal

Resource: Ocean/River
Proposer: ORPC Alaska LLC ("ORPC")

Proposed Project Phase: Feasibility Recon

AEA Program Manager: Lenny Landis
Applicant Type: IPP

Project Description

ORPC has obtained a FERC Preliminary Permit for a tidal energy site in a portion of Cook Inlet and Knik Arm adjacent to the waterfront of Anchorage for the purpose of deploying a commercial scale tidal energy project. The project will involve the deployment of ORPC's proprietary ocean current generation (OCGen™) modules consisting of four turbine-generator units (TGUs). Each TGU consists of a proprietary underwater permanent magnet generator with four (2 per side) advanced design cross flow (ADCF) turbines attached to and rotating on a common shaft. OCGen™ technology is deployed well below the water surface and held in place with a deep sea mooring system so as to be operable beneath the winter ice and avoid any conflicts with marine navigation. It will be licensed under the FERC hydrokinetic Pilot Project License program and initially installed at a capacity of 1MW (a single OCGen™ module) for testing and monitoring of its operation, including any potential environmental impacts. After the initial OCGen™ module has been operated for a year, additional OCGen™ modules will be installed to bring the generating capacity of the project up to the limit of 5 MW allowed under the Pilot Project License. Full build out of the project will occur after a long term FERC Operating License has been obtained, estimated to be in 2012 or 2013. The project will be interconnected to the railbelt power grid through either Chugach Electric or ML&P and the electricity generated will be sold to the railbelt utilities.

Funding & Cost

Cost of Power: $0.09/kWh
Requested Grant Funds: $1,787,476
Matched Funds Provided: $640,825
Total Potential Grant Amount: $2,428,301
Existing RE Fund Grant Offer: $425

AEA Funding Recommendation:
AEA Funding Recommendation: $1,787,476

Full Funding
Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
Alaska Renewable Energy Fund: Round 2 (Mar-09)

App #310 ORPC Cook Inlet Tidal

Resource: Ocean/River
Proposer: ORPC Alaska LLC ("ORPC")

Proposed Project Phase: Feasibility Recon

AEA Program Manager: Lenny Landis
Applicant Type: IPP

Scoring & Location

Energy Region: Railbelt
Election District: 23, Downtown-Rogers Park

Overall Rank (out of 60)
Stage 3 Total Score (out of 100)

54.5

Rank within Region (out of 7)

3

Stage 3 Scoring Summary

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<thead>
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<td>5) Benefits (Max 10)</td>
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<td>6) Local Support (Max 5)</td>
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</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
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</tbody>
</table>

AEA Review Comments

Ocean Renewable Power Corporation proposes to complete recon work currently underway and assess feasibility / prepare conceptual design of a 1 MW array of proprietary cross-flow tidal instream electric conversion units for potential scale-up to 20+ MW. The units would be moored above the bottom of Cook Inlet near Pt. McKenzie but below ice. Currently the technology is under development in Maine. The proposer states that the most substantial challenges will be impacts on beluga, migrating fish, and sediment flow. Undersea cable would bring power to shore. ORPC has obtained a preliminary FERC permit and will submit a draft request to FERC for pilot project license in 3/09. Other permits will include ADFG fish habitat, DNR water and subsurface use, Army Corps title 10, Coastal Zone, and Coast Guard navigational assessment. ORPC has developed a team of specialists that they state will address technical and habitat issues.

AEA is concerned at the high cost and high risk of developing new technology. Estimated total cost of developing a 1 MW project is $7.9 million. Cost of the feasibility study is $2.4 million—75% of which is proposed to be borne by the renewable energy fund. However, the Alaska-based developers have assembled a credible engineering project team and claim to have invested over $4 million in technology development to date. Alaska has most of the nation’s potential for tidal energy and it is logical for the state to support ocean energy technology development. If state funding is approved for the project, substantial oversight will be required to continually assess for fatal flaws that will require curtailment of funding.

Recommend full funding of $1,787,476 with requirement that ORPC submit for AEA approval detailed project plan with go/no-go points during biological and physical site characterizations before funds are disbursed. AEA will then incorporate the plan into milestones in the grant agreement.
**App #310  ORPC Cook Inlet Tidal**

<table>
<thead>
<tr>
<th>Resource:</th>
<th>Ocean/River</th>
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<tbody>
<tr>
<td>Proposer:</td>
<td>ORPC Alaska LLC (&quot;ORPC&quot;)</td>
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<tr>
<td>Proposed Project Phase:</td>
<td>Feasibility Recon</td>
</tr>
<tr>
<td>AEA Program Manager:</td>
<td>Lenny Landis</td>
</tr>
<tr>
<td>Applicant Type:</td>
<td>IPP</td>
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</table>

### Economic Analysis

- **Benefit/Cost Ratio (Applicant): 0.32**
- **Benefit/Cost Ratio (AEA): 0.18**

Railbelt area energy costs are currently quite low, but this 1 MW pilot project would reduce energy costs ranging from about $90,000 to $160,000 per year. In addition to reducing costs of living for residents, lower costs and greater reliability of electric energy would attract and sustain economic development in the area. The applicant suggested a 20 year project life, while AEA suggests a 15 year project life for this type of technology. In addition, AEA suggests O&M costs for this technology in the railbelt at 1.5 percent of capital costs per year. The applicant discusses future expansion to 5 KW of generation power, but does not supply cost or benefit information for that alternative.

Because of the small scale of the project, the annual cost savings cannot outweigh the construction costs over the life of the project. However, some of the costs for this project are for elements that do not relate directly to project construction and operation, yet are valuable for moving forward other such projects in other areas of the state. In general, resource assessments and feasibility analyses will lower risk (and therefore, costs) of future projects in this and other locations because of the information obtained through those studies, and so are economically beneficial. Indirect benefits of increased or sustained economic activity in the area, and lowered risk of future projects are not considered in this calculation. The project uses a sustainable resource to produce electric power. This pilot project is small, but the larger project would obtain better economies of scale and provide more benefits in the long term.
### App #310  ORPC Cook Inlet Tidal

<table>
<thead>
<tr>
<th>Resource</th>
<th>Ocean/River</th>
<th>Proposed Project Phase:</th>
<th>Feasibility Recon</th>
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<tr>
<td>Proposer</td>
<td>ORPC Alaska LLC (&quot;ORPC&quot;)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**AEA Program Manager:** Lenny Landis  
**Applicant Type:** IPP

### DNR/DGGS Geohazards Comments

### DNR/DGGS Feasibility Comments

New technology - environmental concerns and not sure of ramification of the Beluga Whale listing on this project. This project is progressing with FERC permit requirements.

### DNR/DMLW Feasibility Comments
Project Description

The proposed project will develop a process and a model for community-based biomass resource assessment and analysis at the community of Tanana, Alaska. The model would compile the best available information for land cover, ownership, growth, management concerns and restrictions, and costs to produce a tool that could be used to evaluate biomass demands and proposed energy projects for feasibility and sustainability. It is envisioned that the model produced by the project will be capable of answering basic questions that arise when considering biomass energy projects, such as:

• How large a project could be supported with local biomass resources?
• How many acres would need to be harvested per year to support a project of a specific size?
• How many acres on the surrounding landscape would be required to be managed for biomass production on a sustainable basis in the long term?
• Who owns the available resource and land, and what is the amount and location of the resource by owner?
• How much of the resource is actually available for harvesting and management, and where is it?
• How much does the resource cost as it exists on the landscape (stumpage)
• How much does it cost to get the resource from any available area to a proposed biomass energy facility?
• What harvesting and transportation systems need to be analyzed or addressed?

It is proposed to conduct this assessment over all land ownerships in a 5-mile radius of Tanana, although the geographic extent could be expanded in the future to accommodate local conditions. While producing a viable biomass assessment tool for Tanana, the model produced by this project can also be applied to other communities in Alaska by serving as a template, or framework, for data processing and compilation.

Funding & Cost

Cost of Power: $0.57 /kWh
Requested Grant Funds: $30,669
Matched Funds Provided: $9,200
Total Potential Grant Amount: $39,869

AEA Recommendation

Full Funding
Partial Funding
Special Provision
× Not Recommended
Did Not Pass Stage 1
Withdrawn
App #311  Tanana Biomass Feasibility

Resource: Biomass  Proposed Project Phase: Feasibility

Proposer: Tanana Tribal Council

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

Scoring & Location

Energy Region: Yukon-Koyukuk/Upper Tanana

Election District: 6, Interior Villages

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
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<tr>
<td>2) Funding Resources (Max 25)</td>
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</tr>
<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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</tr>
<tr>
<td>4) Project Readiness (Max 5)</td>
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<tr>
<td>6) Local Support (Max 5)</td>
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</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
<td></td>
</tr>
</tbody>
</table>

AEA Review Comments

Applicant proposes assessing kind, quantity, and delivered cost of biomass near four communities--apps #311 Tanana, #312 Tanacross, #313 Nenana, #314 McGrath. Methodology and objectives are identical for the four applications. The proposed site-specific assessments are an important component of feasibility analysis for wood energy development in these communities. However, of these communities, only McGrath is proposing significant utilization of local wood for energy. Fuel prices are highest in McGrath. While Tanana has recently developed a wood boiler for the washeteria, wood supply has not been identified as a major issue. While a larger scale chip boiler system is under development in Tok, wood supply is less of an issue since it is on the road system. Funding only one of the four projects will be sufficient to show that the method is useful for biomass supply assessment.

Recommend full funding of $34,740 for the McGrath biomass supply assessment (app #314) with requirement that the project team coordinates with McGrath Light and Power and other project participants in assessing harvest supply requirements and system.

Recommend no funding for apps #311 Tanana, #312 Tanacross, #313 Nenana at this time.
App #311  Tanana Biomass Feasibility

Resource: Biomass  Proposed Project Phase: Feasibility

Proposer: Tanana Tribal Council

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
<table>
<thead>
<tr>
<th>Resource: Biomass</th>
<th>Proposed Project Phase: Feasibility</th>
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</thead>
<tbody>
<tr>
<td>Proposer: Tanana Tribal Council</td>
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**AEA Program Manager:** Ron Brown

**Applicant Type:** Government Entity

### DNR/DGGS Geohazards Comments

### DNR/DGGS Feasibility Comments

### DNR/DMLW Feasibility Comments
App #312  Tanacross Biomass Feasibility

Resource: Biomass  Proposed Project Phase: Feasibility

Proposer: Tanacross Tribal Council

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

Project Description

The proposed project will develop a process and a model for community-based biomass resource assessment and analysis at the community of Tanacross, Alaska. The model would compile the best available information for land cover, ownership, growth, management concerns and restrictions, and costs to produce a tool that could be used to evaluate biomass demands and proposed energy projects for feasibility and sustainability. It is envisioned that the model produced by the project will be capable of answering basic questions that arise when considering biomass energy projects, such as:

• How large a project could be supported with local biomass resources?
• How many acres would need to be harvested per year to support a project of a specific size?
• How many acres on the surrounding landscape would be required to be managed for biomass production on a sustainable basis in the long term?
• Who owns the available resource and land, and what is the amount and location of the resource by owner?
• How much of the resource is actually available for harvesting and management, and where is it?  • How much does the resource cost as it exists on the landscape (stumpage)
• How much does it cost to get the resource from any available area to a proposed biomass energy facility?
• What harvesting and transportation systems need to be analyzed or addressed?

It is proposed to conduct this assessment over all land ownerships in a 5-mile radius of Tanacross, although the geographic extent could be expanded in the future to accommodate local conditions. While producing a viable biomass assessment tool for Tanacross, the model produced by this project can also be applied to other communities in Alaska by serving as a template, or framework, for data processing and compilation.

Funding & Cost

<table>
<thead>
<tr>
<th>Cost of Power:</th>
<th>$0.49/kWh</th>
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<tr>
<td>Requested Grant Funds:</td>
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<td>Matched Funds Provided:</td>
<td>$9,200</td>
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<td>Total Potential Grant Amount:</td>
<td>$38,843.58</td>
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AEA Recommendation:

Full Funding
Partial Funding
Special Provision
× Not Recommended
Did Not Pass Stage 1
Withdrawn
App #312  Tanacross Biomass Feasibility

Resource: Biomass
Proposer: Tanacross Tribal Council

AEA Program Manager: Ron Brown
Applicant Type: Government Entity

Scoring & Location

Energy Region: Yukon-Koyukuk/Upper Tanana
Election District: 6, Interior Villages

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of )

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
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<tr>
<td>1) Cost of Energy (Max 30)</td>
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<td>3) Project Feasibility from Stage 2 (Max 20)</td>
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<td>4) Project Readiness (Max 5)</td>
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AEA Review Comments

Applicant proposes assessing kind, quantity, and delivered cost of biomass near four communities--apps #311 Tanana, #312 Tanacross, #313 Nenana, #314 McGrath. Methodology and objectives are identical for the four applications. The proposed site-specific assessments are an important component of feasibility analysis for wood energy development in these communities. However, of these communities, only McGrath is proposing significant utilization of local wood for energy. Fuel prices are highest in McGrath. While Tanana has recently developed a wood boiler for the washeteria, wood supply has not been identified as a major issue. While a larger scale chip boiler system is under development in Tok, wood supply is less of an issue since it is on the road system. Funding only one of the four projects will be sufficient to show that the method is useful for biomass supply assessment.

Recommend full funding of $34,740 for the McGrath biomass supply assessment (app #314) with requirement that the project team coordinates with McGrath Light and Power and other project participants in assessing harvest supply requirements and system.

Recommend no funding for apps #311 Tanana, #312 Tanacross, #313 Nenana at this time.
App #312  Tanacross Biomass Feasibility

- **Resource:** Biomass
- **Proposer:** Tanacross Tribal Council
- **Proposed Project Phase:** Feasibility
- **AEA Program Manager:** Ron Brown
- **Applicant Type:** Government Entity

Economic Analysis

<table>
<thead>
<tr>
<th>Benefit/Cost Ratio (Applicant)</th>
<th>Benefit/Cost Ratio (AEA)</th>
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<td>Octagon</td>
<td>Diamond</td>
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Page 435 of 472
App #312  Tanacross Biomass Feasibility

Resource: Biomass  Proposed Project Phase: Feasibility
Proposer: Tanacross Tribal Council

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
**App #313  Nenana Biomass Feasibility**

**Resource:** Biomass  
**Proposer:** Nanana Native Council  
**Proposed Project Phase:** Feasibility

**AEA Program Manager:** Ron Brown  
**Applicant Type:** Government Entity

### Project Description

The proposed project will develop a process and a model for community-based biomass resource assessment and analysis at the community of Nenana, Alaska. The model would compile the best available information for land cover, ownership, growth, management concerns and restrictions, and costs to produce a tool that could be used to evaluate biomass demands and proposed energy projects for feasibility and sustainability. It is envisioned that the model produced by the project will be capable of answering basic questions that arise when considering biomass energy projects, such as:

- How large a project could be supported with local biomass resources?
- How many acres would need to be harvested per year to support a project of a specific size?
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- How much of the resource is actually available for harvesting and management, and where is it? • How much does the resource cost as it exists on the landscape (stumpage)
- How much does it cost to get the resource from any available area to a proposed biomass energy facility?
- What harvesting and transportation systems need to be analyzed or addressed?

It is proposed to conduct this assessment over all land ownerships in a 5-mile radius of Nenana, although the geographic extent could be expanded in the future to accommodate local conditions. While producing a viable biomass assessment tool for Nenana, the model produced by this project can also be applied to other communities in Alaska by serving as a template, or framework, for data processing and compilation.

### Funding & Cost

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**AEA Funding Recommendation:**  
(Not Constrained by Available Funding)

**AEA Recommendation:**

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
App #313 Nenana Biomass Feasibility

Resource: Biomass
Proposer: Nanana Native Council

Proposed Project Phase: Feasibility

AEA Program Manager: Ron Brown
Applicant Type: Government Entity

Energy Region: Yukon-Koyukuk/Upper Tanana

Election District: 6, Interior Villages

Stage 3 Scoring Summary

Criterion (Weight) | Score
--- | ---
Cost of Energy (Max 30) | 6
Funding Resources (Max 25) |
Project Feasibility from Stage 2 (Max 20) |
Project Readiness (Max 5) |
Benefits (Max 10) |
Local Support (Max 5) |
Sustainability (Max 5) |

Stage 3 Total Score (out of 100)

Overall Rank (out of 60)

Recommend full funding of $34,740 for the McGrath biomass supply assessment (app #314) with requirement that the project team coordinates with McGrath Light and Power and other project participants in assessing harvest supply requirements and system.

Recommend no funding for apps #311 Tanana, #312 Tanacross, #313 Nenana at this time.
App #313  Nenana Biomass Feasibility

Resource: Biomass
Proposer: Nanana Native Council

Proposed Project Phase: Feasibility

AEA Program Manager: Ron Brown
Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)
Benefit/Cost Ratio (AEA)
App #313  Nenana Biomass Feasibility

Resource: Biomass
Proposer: Nanana Native Council

Proposed Project Phase: Feasibility

AEA Program Manager: Ron Brown
Applicant Type: Government Entity

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
Project Description

The proposed project will develop a process and a model for community-based biomass resource assessment and analysis at the community of McGrath, Alaska. The model would compile the best available information for land cover, ownership, growth, management concerns and restrictions, and costs to produce a tool that could be used to evaluate biomass demands and proposed energy projects for feasibility and sustainability. It is envisioned that the model produced by the project will be capable of answering basic questions that arise when considering biomass energy projects, such as:

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- What harvesting and transportation systems need to be analyzed or addressed?

It is proposed to conduct this assessment over all land ownerships in a 5-mile radius of McGrath, although the geographic extent could be expanded in the future to accommodate local conditions. While producing a viable biomass assessment tool for McGrath, the model produced by this project can also be applied to other communities in Alaska by serving as a template, or framework, for data processing and compilation.

Funding & Cost

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<td>AEA Funding Recommendation:</td>
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AEA Recommendation

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
App #314  McGrath Biomass Feasibility

Resource: Biomass  Proposed Project Phase: Feasibility

Proposer: McGrath Traditional Council

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

Scoring & Location

Energy Region: Yukon-Koyukuk/Upper Tanana

Election District: 6, Interior Villages

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)  Rank within Region (out of 5)

14  70.5  3

Stage 3 Scoring Summary

Criterion (Weight)  Score
1) Cost of Energy (Max 30)  23
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)  4
6) Local Support (Max 5)  3
7) Sustainability (Max 5)  4

AEA Review Comments

Applicant proposes assessing kind, quantity, and delivered cost of biomass near four communities--apps #311 Tanana, #312 Tanacross, #313 Nenana, #314 McGrath. Methodology and objectives are identical for the four applications. The proposed site-specific assessments are an important component of feasibility analysis for wood energy development in these communities. However, of these communities, only McGrath is proposing significant utilization of local wood for energy. Fuel prices are highest in McGrath. While Tanana has recently developed a wood boiler for the washeteria, wood supply has not been identified as a major issue. While a larger scale chip boiler system is under development in Tok, wood supply is less of an issue since it is on the road system. Funding only one of the four projects will be sufficient to show that the method is useful for biomass supply assessment.

Recommend full funding of $34,740 for the McGrath biomass supply assessment (app #314) with requirement that the project team coordinates with McGrath Light and Power and other project participants in assessing harvest supply requirements and system.

Recommend no funding for apps #311 Tanana, #312 Tanacross, #313 Nenana at this time.
App #314  McGrath Biomass Feasibility

Resource: Biomass  Proposed Project Phase: Feasibility

Proposer: McGrath Traditional Council

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
App #314  McGrath Biomass Feasibility

Resource: Biomass  Proposed Project Phase: Feasibility

Proposer: McGrath Traditional Council

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #315  Adak Diesel Hybrid_TDX Power

Resource: Other
Proposer: TDX Adak Generating, LLC

Proposed Project Phase: Construction
Design
Feasibility
Recon

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Project Description

Adak is a former military base now owned by the Aleut Corporation (TAC). It is located on Adak Island near the end of Alaska Aleutian Island Chain. Presently there are approximately 75 residents at a base where a population of 6,000 military personnel and their families were once housed. The site was turned over to TAC by the US Navy in 1999. TAC aspires to re-populate the island with shareholders and employees of the fishing industry. The location is in good fishing grounds and has an established processing plant. The US Navy houses and Missile Defense Agency house an enormous radar facility in the harbor there for part of the year. This expensive piece of equipment requires reliable shore-based power.

The RCA recently ruled that the City of Adak was not capable of managing nor operating the utility electric utility. TDX Power agreed to take over the utility while the people of Adak were under emergency conditions. TDX Adak Generating, LLC will complete the project using personnel from its parent company, TDX Power.

Funding & Cost

Cost of Power: $0.77 /kWh
Requested Grant Funds: $800,000
Matched Funds Provided: $100,000
Total Potential Grant Amount: $900,000

Existing RE Fund Grant Offer:
AEA Funding Recommendation: $85,835

AEA Recommendation

Full Funding
X Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn
App #315  Adak Diesel Hybrid_TDX Power

Resource: Other
Proposer: TDX Adak Generating, LLC

Proposed Project Phase: Construction
Design
Feasibility
Recon

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Scoring & Location

Energy Region: Aleutians
Election District: 37, Bristol Bay-Aleutians
Rank within Region (out of 7)

Overall Rank (out of 60) 76.3
Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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AEA Review Comments

Applicant proposes to reconaissance study, feasibility, and design of a hydro-wind-diesel system. The project would develop valuable information on available renewable resources, and establish feasibility and conceptual design for a new community power system.

Recommend partial funding of $85,835 through feasibility and conceptual design.
App #315  Adak Diesel Hybrid_TDX Power

Resource: Other
Proposer: TDX Adak Generating, LLC

AEA Program Manager: Lenny Landis
Applicant Type: Utility

Proposed Project Phase: Construction  
Design  
Feasibility  
Recon

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
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 #316  Tatitlek High Penetration Wind

Resource: Wind
Proposer: Tatitlek IRA Council/ Tatitlek Electric Utility
AEA Program Manager: James Jensen
Applicant Type: Government Entity

Proposed Project Phase: Feasibility Recon

Project Description
Tatitlek, located in northeastern Prince William Sound, is about 30 miles south of Valdez on the eastern side of the Tatitlek Narrows. The community of Tatitlek will be served by this project. With the "upwardly mobile" price of diesel these days, we can afford to leave no stone unturned in our quest to exploit an alternative energy resource. We are aware that a good hydro resource exists nearby. But, is it too far from our community to be economically developed? Local anecdotal information, the Renewable Energy Atlas of Alaska, and AEA’s Draft Regional Wind Study suspect that Tatitlek has an excellent wind resource. But we also have a mountain directly behind the village. Will the winds be too turbulent? Site specific monitoring and feasibility studies can answer these questions and provide direction for further design, permitting, and construction. TDX Power has a Teaming Agreement with Tatitlek Corporation and the Tatitlek Village IRA council to manage this project with active participation from the IRA Council, Corporation, and Tatitlek School.

Funding & Cost

Cost of Power: $0.76 /kWh
Requested Grant Funds: $164,358
Matched Funds Provided: $8,030
Total Potential Grant Amount: $172,388

AEAC Recommendation:
Full Funding
X Partial Funding
Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn

AEAC Funding Recommendation: $138,210
Alaska Renewable Energy Fund: Round 2 (Mar-09)

**App #316 Tatitlek High Penetration Wind**

**Resource:** Wind  
**Proposer:** Tatitlek IRA Council/ Tatitlek Electric Utility  
**AEA Program Manager:** James Jensen  
**Applicant Type:** Government Entity

### Scoring & Location

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<td>16</td>
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**Election District:** 5, Cordova-Southeast Islands  
**Rank within Region (out of 5):** 2

### Stage 3 Scoring Summary

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<td>7) Sustainability (Max 5)</td>
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### AEA Review Comments

Applicant proposes studying feasibility and assessing resources for hydro and wind development in Tatitlek. TDX Power will manage the project. Work would commence summer 2009 and be completed by Nov 2010.

Recommend partial funding for reconnaissance and feasibility study (phase 1 and 2, tasks 1-6) of $138,210 (total cost of tasks 1-6 minus $10,000, since AEA will provide an instrumented 30 m met tower to the project.)
The applicant provided cost estimates of the final project to be $1,672,388, including $1,500,000 in construction costs. The construction costs are lower than the AEA benchmark cost estimate of $5,000 per installed kW for rural wind projects. The project plans to install wind turbines with a combined capacity of 500 kW. The analysis uses the AEA benchmark costs of $2,500,000 for construction of the new system. The current annual electricity production in Tatitlek is 477,978 kWh. The applicant estimates that 438,000 kW of this could be replaced annually with the proposed system. AEA’s wind program manager finds this estimate to be low for a wind farm with 500 kW installed capacity, assuming a class 4-7 wind regime, and estimates that 1,000,000 kWh could be produced annually. The estimated remaining production of the proposed system could then be used to produce heat. Currently the community uses approximately 20,000 gallons annual of heating fuel. This analysis does not estimate how many gallons of heating fuel could be displaced but find it reasonable that at least 50 percent could be replaced. A displacement of 10,000 gallons of heating (diesel) fuel was used.

The applicant provided an O&M estimated of $0.056 per kWh for the existing system, higher than the AEA benchmark value of $0.022 per kWh. However, this analysis assumes the applicant owns and operates their power plants thus the AEA analysis uses the applicant’s value of $0.056 per kWh. The applicant suggests a lower efficiency for the existing diesel system than the AEA benchmark: the applicant suggests 11.89 kWh per gallon while the benchmark proposed by AEA is 13.00. This analysis uses the applicant’s number. The analysis results in a positive B/C in the AEA model data and analysis.
App #316  Tatitlek High Penetration Wind

**Resource:** Wind  
**Proposer:** Tatitlek IRA Council/ Tatitlek Electric Utility

**Proposed Project Phase:** Feasibility Recon  
**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 #317  Sand Point Wind_AWE

Resource: Wind  Proposed Project Phase: Construction

Proposer: Aleutian Wind Energy / AWE

AEA Program Manager: James Jensen  Applicant Type: IPP

Project Description

AWE is requesting additional funds for Phase 1 to add two Vestas V39 turbines to the existing power generation system to dramatically decrease the total consumption of diesel fuel and stove oil in Sand Point, Alaska. The harbor community of Sand Point is located several hundred miles southwest of Anchorage on the Shumagin Islands, just south of the Aleutian chain. This commercial fishing village of nearly 1,000 residents serves as a regional hub for crab and salmon fisheries, as well as other fisheries, and has generally enjoyed a healthy economy over the past ten years. TDX Sand Point Generating (TSPG), a wholly owned subsidiary of TDX Power, owns and operates the Sand Point electric utility. AWE will design, construct, operate, and maintain the entire project.

Funding & Cost

Cost of Power: $0.61 /kWh
Requested Grant Funds: $639,806
Matched Funds Provided: $437,900
Total Potential Grant Amount: $1,077,706
Existing RE Fund Grant Offer: $453

AEA Funding Recommendation:
Not Constrained by Available Funding

AEA Recommendation:
× Full Funding
× Partial Funding
× Special Provision
Not Recommended
Did Not Pass Stage 1
Withdrawn

AEA Funding Recommendation: $639,806
App #317  Sand Point Wind_AWE

Resource: Wind
Proposer: Aleutian Wind Energy / AWE

AEA Program Manager: James Jensen
Applicant Type: IPP

Proposed Project Phase: Construction

Scoring & Location

Energy Region: Aleutians
Election District: 37, Bristol Bay-Aleutians

Overall Rank (out of 60) 83.0
Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

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AEA Review Comments

Applicant proposes supplementary funding for a 1 MW wind energy project in Sand Point. Currently AEA has a grant to TDX for this project--$945,136 in USDOE funds, $528,864 in State funds, and $437,900 in local cash $552,738 in local in-kind match for a total of $2,464,638. The project has been delayed for over two years due to federal NEPA review.

Additional funds are requested to cover across-the-board increases, mostly in the areas of freight and wind integration with the existing system. Applicant indicates that the revised project will also include a dumpload in the high school that will provide facility heating.

Discussions with USDOE indicate that NEPA review is almost complete. No further permitting delays are anticipated.

Recommend full funding of $639,805 with the requirement that before grant funds are made available, AWE revise the existing draft power purchase agreement to address additional grant funding being made available to the project as well as project cost increases.
Economic Analysis

- The applicant’s estimated project costs are low compared to AEA’s benchmark for rural wind projects. However, as noted in the application, excavation equipment, including a bulldozer with backhoe, bucket truck, ditch-witch, light boom truck, dump truck with trailer, and an excavator are available on the island. Furthermore, a 70-ton crane with a 100 foot boom is located at the harbor and is sufficient for unloading barges. A larger crane will be needed to erect the wind turbine tower and nacelles. TDX personnel and local labor will be used. The applicant provided detailed cost estimates and a reasonable project schedule. AWE estimated the project costs using vendor quotes and budgets. In the AEA analysis therefore, the applicant’s estimated project cost was used instead of the benchmark cost figure.
- Wind resource data were collected for 18 months starting in 2004 using a 20-meter anemometer tower. At that height, the wind resource was rated as Class 5 (excellent). Wind energy output was modeled for 2 Vestas turbines. The AEA analysis used the same wind energy output as stated in the application.
- Fuel displacement was estimated using a software model developed by Bill Scott.
- An economic analysis was completed by the applicant using a wind resource report prepared for the site. The software developed by Bill Scott, was used to calculate fuel savings from waste heat recovery and the thermal nodes. As per the applicant, the estimated number of gallons displaced was conservative, but was used in the analysis and still resulted in significant project benefits.
- The applicant’s stated O&M in the cost worksheet is the same as the base system O&M; suggesting that there are no O&M costs of the wind component. The analysis assumes AEA benchmark O&M for rural wind projects at $022 per kWh.
- The applicant used the average fuel efficiency of all their diesel generators; as reported in their PCE statements. The AEA analysis used the same fuel efficiency estimate.
App #317  Sand Point Wind_AWE

Resource: Wind  Proposed Project Phase: Construction
Proposer: Aleutian Wind Energy / AWE

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
Project Description

The Lake and Peninsula Borough, the Lake and Peninsula School District and the Bristol Bay Native Corporation have indicated written or verbal support for this project (see attached letters of support). The Lake and Peninsula School District supplies power to the school and Chignik Lake community with their diesel generators. They used over 65,000 gallons of diesel in the 2007/2008 school year which must transported 5000 gallons at time in a tanker truck from Chignik via a small vessel that can navigate the Chignik River. Diesel cost $3.87 a gallon delivered to Chignik plus a $1.10 per gallon surcharge to transport it from Chignik to Chignik Lake for a total of $323,050 for the 2007/2008 school year. The State of Alaska Department of Natural Resources February 2000 report titled Coalbed Methane and Exploration Targets for Rural Alaska Communities identifies the Chignik Bay Basin within the Alaska Peninsula Province as having potential CBM resources. The Chignik Basin is underlain by bituminous coal. This project will confirm this potential resource by drilling, coring and testing CBM resources in the Chignik Lake area. A specific drilling plan will be prepared during the Reconnaissance Phase. Once the final location is determined, the drilling, coring and testing will take place during the Resource Assessment/Feasibility phases.

Funding & Cost

| Cost of Power:              | $0.63/kWh       |
| Requested Grant Funds:     | $1,995,000     |
| Matched Funds Provided:    |                 |
| Total Potential Grant Amount: | $1,995,000 |

AEA Recommendation:

Full Funding
Partial Funding
Special Provision
Not Recommended
X Did Not Pass Stage 1
Withdrawn

Existing RE Fund Grant Offer:

AEA Funding Recommendation:

(Area Not Constrained by Available Funding)
App #318  Chignik Lake CBM_AGE

Resource: Biofuels
Proposer: Alaska Green Energy, LLC (AGE)

Proposed Project Phase: Feasibility Recon

AEA Program Manager:
Applicant Type: IPP

Scoring & Location

Energy Region: Bristol Bay
Election District: 37, Bristol Bay-Aleutians

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

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AEA Review Comments
Failed Stage 1 review
App #318  Chignik Lake CBM_AGE

**Resource:** Biofuels

**Proposer:** Alaska Green Energy, LLC (AGE)

**Proposed Project Phase:** Feasibility Recon

**AEA Program Manager:**

**Applicant Type:** IPP

**Economic Analysis**

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
It was our understanding that HB 152 does not provide funding for CBM projects unless other alternate forms of energy are not available. CBM potential in the Chignik region is unknown at this time. The proposed Chignik CBM Assessment provides for two phases: Phase 1 – Reconnaissance and Phase 2 – Feasibility Analysis, Resource Assessment. The proposal does not designate a specific site for CBM resource assessment, but rather alludes to the site selection taking place during the Geologic Survey portion (2.2) of Phase 2. The actual methodology of conducting this geologic survey is not specified in the proposal. The basis for the proposed project is a preliminary study (presented in Reports A and B in the proposal) that lists a number of communities that have may have CBM potential. This list was generated by DGGS, BEG, USGS, and BLM in the late 1990s and very general in nature. The authors of the Chignik Lake CBM 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, including the Chignik region. Prior to selecting a drill site in the Chignik area, a detailed structural study, including field mapping is necessary to locate a specific site for test drilling. This is because of local block faulting in the Chignik region. Project proposers should contact DGGS for details on best approach. Prior to selecting a drill site in the
**App #319  Wood Pellet Plant_AHTNA**

**Resource:** Biomass  
**Proposer:** Ahtna, Incorporated

**AEA Program Manager:** Ron Brown  
**Applicant Type:** IPP

### Project Description

Wood biomass for the production of bulk commercial wood pellets and briquettes, bulk and/or bagged residential wood pellets, wood chips for commercial use and cordwood. Facility will be located at milepost 112 Richardson Highway, 190 miles from Anchorage and 250 miles from Fairbanks. Communities served will include all villages and cities in Alaska. The grant project will incorporate varying degrees of assistance from Ahtna, Incorporated and its subsidiaries, State agencies, Federal agencies, local borough, city and village government bodies and various contractors and consulting firms.

### Funding & Cost

- **Cost of Power:** $0.12 /kWh
- **Requested Grant Funds:** $8,630,000
- **Matched Funds Provided:** $7,130,000
- **Total Potential Grant Amount:** $15,760,000

**AEA Funding Recommendation:** (Not Constrained by Available Funding)

- **Existing RE Fund Grant Offer:**

**AEA Funding Recommendation:**

- Full Funding
- Partial Funding
- Special Provision
- **Not Recommended**
- Did Not Pass Stage 1
- Withdrawn
App #319  Wood Pellet Plant_AHTNA

Resource: Biomass  Proposed Project Phase: Design
Proposer: Ahtna, Incorporated

AEA Program Manager: Ron Brown  Applicant Type: IPP

Scoring & Location

Energy Region: Copper River/Chugach
Election District: 6, Interior Villages

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

Criterion (Weight)  Score
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

AHTNA proposes grant funding for constructing a 35,000 ton per year wood pellet plant. AHTNA would harvest wood on public and private lands in the area for feedstock. The project also includes a wood-fired power plant that would sell 250 kW of power to local utility Copper Valley Electric Association. The for-profit start-up company would sell bagged and bulk pellets and briquettes within Alaska.

Although we support the concept of using a local, underutilized resource for creating jobs and displacing fossil fuels, AEA has the following concerns about the application: 1) the application did not include or reference a detailed feasibility analysis that addresses feedstock supply, product market, power sales, construction cost, ramp-up time, or cash flow and pro forma. The business plan that was submitted with the application was incomplete; 2) the application did not include a complete final design and preliminary power purchase agreement, nor adequately address permitting; 3) We question whether or not it is the intent for the Renewable Energy Fund to publicly finance facility construction for private businesses that will manufacture and market a fuel. We can only recommend providing grant assistance for preconstruction activities, i.e. feasibility assessment. However, in this case, the applicant’s funding request did not break out feasibility assessment/conceptual design costs.

Recommend no funding at this time.
App #319  Wood Pellet Plant_AHTNA

Resource: Biomass
Proposer: Ahtna, Incorporated

AEA Program Manager: Ron Brown
Applicant Type: IPP

Economic Analysis

Benefit/Cost Ratio (Applicant)

Benefit/Cost Ratio (AEA)
App #319  Wood Pellet Plant_AHTNA

Resource: Biomass
Proposer: Ahtna, Incorporated

Proposed Project Phase: Design

AEA Program Manager: Ron Brown
Applicant Type: IPP

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments
App #320 Marshall Wood Fired Boiler_Ohogamiut Traditional Council

Resource: Biofuels
Proposer: Ohogamiut Traditional Council

AEA Program Manager: Ron Brown
Proposed Project Phase: Construction Feasibility
Applicant Type: Government Entity

Project Description

There are many types of wood-fired boiler systems available on the market but they are very costly and the freight to bring them to the villages would likely triple the cost of the boiler system. We are proposing to build a wood stove from local scrap metal, e.g., old fuel tanks that are no longer used, but the water containers must be shipped to the village because we do not have the capabilities or the resources to manufacture them. The project will be located in the village of Marshall and the Ohogamiut Traditional Council EPA Department will oversee the project.

Funding & Cost

Cost of Power: $0.48/kWh
Requested Grant Funds: $339,452
Matched Funds Provided: $17,700
Total Potential Grant Amount: $357,152

AEA Recommendation

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

AEA Funding Recommendation:
(Not Constrained by Available Funding)
App #320  Marshall Wood Fired Boiler_Ohogamiut Traditional Council

Resource: Biofuels  Proposed Project Phase: Construction Feasibility
Proposer: Ohogamiut Traditional Council

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

Scoring & Location

Energy Region: Lower Yukon-Kuskokwim
Election District: 6, Interior Villages

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

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AEA Review Comments

Failed Stage 1
App #320  Marshall Wood Fired Boiler_Ohogamiut Traditional Council

Resource: Biofuels  Proposed Project Phase: Construction Feasibility

Proposer: Ohogamiut Traditional Council

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
App #320  Marshall Wood Fired Boiler_Ohogamiut Traditional Council

Resource: Biofuels  Proposed Project Phase: Construction
Proposer: Ohogamiut Traditional Council  Feasibility

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 #321  Noatak Biomass_Native Village of Noatak

Resource: Biomass  Proposed Project Phase: Recon

Proposer: Native Village of Noatak

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

Project Description
This new department will be responsible for 1. energy assessment 2. seek and secure funds related to energy 3. assist tribal members with: a. weatherization application and b. heating assistant applications (to help with the high cost of fuel we pay in Noatak) 4. long term goals will be to look into alternative energy for Noatak.

Funding & Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Power</td>
<td>$0.76/kWh</td>
</tr>
<tr>
<td>Requested Grant Funds</td>
<td>$50,000</td>
</tr>
<tr>
<td>Matched Funds Provided</td>
<td></td>
</tr>
<tr>
<td>Total Potential Grant Amount</td>
<td>$50,000</td>
</tr>
</tbody>
</table>

AEA Recommendation:

- Full Funding
- Partial Funding
- Special Provision
- Not Recommended
- Did Not Pass Stage 1
- Withdrawn
App #321  Noatak Biomass_Native Village of Noatak

Resource: Biomass  Proposed Project Phase: Recon
Proposer: Native Village of Noatak

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

Scoring & Location

Energy Region: Northwest Arctic
Election District: 40, Arctic

Overall Rank (out of 60)  Stage 3 Total Score (out of 100)

Stage 3 Scoring Summary

<table>
<thead>
<tr>
<th>Criterion (Weight)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Cost of Energy (Max 30)</td>
<td>28</td>
</tr>
<tr>
<td>2) Funding Resources (Max 25)</td>
<td></td>
</tr>
<tr>
<td>3) Project Feasibility from Stage 2 (Max 20)</td>
<td></td>
</tr>
<tr>
<td>4) Project Readiness (Max 5)</td>
<td></td>
</tr>
<tr>
<td>5) Benefits (Max 10)</td>
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</tr>
<tr>
<td>6) Local Support (Max 5)</td>
<td></td>
</tr>
<tr>
<td>7) Sustainability (Max 5)</td>
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</tr>
</tbody>
</table>

AEA Review Comments

Failed Stage 1
App #321  Noatak Biomass_Native Village of Noatak

Resource: Biomass  Proposed Project Phase: Recon
Proposer: Native Village of Noatak

AEA Program Manager: Ron Brown  Applicant Type: Government Entity

Economic Analysis

Benefit/Cost Ratio (Applicant)  Benefit/Cost Ratio (AEA)
App #321 Noatak Biomass_Native Village of Noatak

Resource: Biomass
Proposer: Native Village of Noatak

Proposed Project Phase: Recon

AEA Program Manager: Ron Brown
Applicant Type: Government Entity

DNR/DGGS Geohazards Comments

DNR/DGGS Feasibility Comments

DNR/DMLW Feasibility Comments