

Renewable Energy Fund: Round 13 Application Summaries



Nuyakuk River Hydroelectric Project (Run of River Project)

App #13001

Standard Application

Project Type: Hydro, Other**Energy Region:** Bristol Bay**Applicant:** Nushagak Electric & Telephone Cooperative**Proposed Phase(s):** Feasibility, Design**Applicant Type:** Utility**Recommended Phase(s):** Feasibility

Project Description

The proposed Project is a new 10-12 MW run of river hydropower project consisting of an intake structure, power conduit, powerhouse forebay, powerhouse, and tailrace channel approximately 4 miles downstream of the Tikchik Lake outlet above a natural falls on the Nuyakuk River. Power from the Project would be available to the customers of the Cooperative and potentially other areas in the region. The renewable power provided by the Project would represent a significant improvement in the current distribution system and minimize the reliance of local communities on fossil fuels as their primary source of electricity. Currently, the population that would be served by this Project relies wholly on diesel generation, which is barged upstream through the Nushagak River drainage to requisite locations. The reduction (or elimination) of water transport of fuels will reduce the potential for negative environmental impacts due to spills. The primary industry in the Project service area is related to commercial harvest and processing of salmon. The long-term demand for more reliable, efficient, and cost-effective renewable electric power, dispatchable renewable thermal heat, high-speed broadband, along with the likely limited resource impacts makes this Project a highly viable opportunity. Initially this project will replace up to 1.5 million gallons of diesel fuel annually, eventually up to 2.5 million gallons per year of diesel fuel will be replaced with renewable hydro energy which will provide electric power, heating, or thermal conversion to other useful energy needs. We believe the combination of renewable energy and increased broadband access will provide the basis for economic and social improvement and growth in the region for generations to come.

DNR/DMLW Feasibility Comments

"The Nuyakuk River is considered to be a Navigable Waterway by the State of Alaska and BLM. A plan amendment to the Wood Tikchik State Park Management Plan would need to be completed, Legislative action (SB 91) finalized in 2019 called for a Plan Amendment for this authorization to be consistent with the plan requirements. If DMLWs approach is similar to the Windy Corner project in Chugach State Park, the intake and powerhouse facility would be authorized by DPOR and DMLW would help with process guidance; New transmission lines would need to be authorized with an easement from DMLW if they fall on state land outside of the State Park. No water right application on file yet, please submit application upon completing land exchange from Parks to DMLW. Flow Reservation LAS 28250 issued to ADF&G includes this stretch of river." State Lands. Entire project occurs on mixed ownership lands, including some lands within Wood Tikchik State Park. Project also crosses navigable waters.

DNR/DGGS Feasibility Comments

The closest seismic source to the proposed project is the Quaternary active Holitna segment of the Denali fault. However, this fault is located north of the project and likely should not affect the proposed project. The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affecting mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects. We have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

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App #13001

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis	
1. Cost of Energy (35)	12.43	Stage 2 Tech & Econ Score (100)	53.58
2. Matching Resources (15)	15.00	Benefit/Cost Ratio	0.25
3. Stage 2 Feasibility (20)	13.39		
4. Project Readiness (5)	3.50	Project Rank	
5. Benefits (15)	1.13	Statewide (of 19 Standard applications)	5
6. Local Support (5)	5.00	Regional (of all applications)	1
7. Sustainability (5)	3.00	Stage 3 Ranking Score (100)	56.45
Total Stage 3 Score (100)	56.45		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$152,858,624	\$152,858,624	Cost of Electricity	\$0.46/kWh
REF13 Grant Funds	\$2,000,000	\$1,000,000	Price of Fuel	\$4.71/Gal
Matching Funds	\$10,280,000	\$10,280,000	Household Energy Cost	\$6,323

AEA Review Comments & Recommendation

Partial Funding

The applicant has requested \$2,000,000 in grant monies from the REF program. AEA is recommending funding for the feasibility and conceptual design portion of the project in the amount of \$1,000,000, as indicated by the applicant in their application's budget schedule. Such funding does address the applicant's concern over phase II of their project regarding limited possible and eligible sources of funds for feasibility studies. The applicant is in a position to begin feasibility study work in the project site area owing to their securing of a special use permit from the Alaska Dept. of Natural Resources' Div. of Parks & Outdoor Recreation. AEA understands there are risks relating to the project regarding FERC permitting requirements and potential risks related to significant project cost overages. Owing to this, AEA finds that it is prudent and appropriate at this time to recommend only funding the feasibility and conceptual design portion of the proposed project.

Project Concerns:-Local tribal groups and development organizations have indicated that they are concerned over the potential environmental impacts of the project on the fish population, a primary source of economic activity in the region, and have asked that these issues be resolved between involved parties prior to engaging in construction of the project. The impact of the project on the regional fish habitat will likely be assessed as part of the feasibility study portion of the project. It is expected, and indicated as part of the application, that the applicant will work together with these concerned organizations to alleviate their concerns. The applicant has demonstrated their desire and ability to secure needed permits from all respective local, state, and federal agencies.-Owing to the significant amount of transmission infrastructure which would be required to distribute the energy amongst the six identified communities, it is not unreasonable to assume there is a risk of significant construction cost overages. Issues concerning right-of-way to construction lines over private land is also a risk to the project.-The timeline to construct of 24 months may also be too optimistic when noting issues with road construction and permafrost. It is probable that the proposed project will require a longer development timeframe.-The five identified communities, with the exception of Aleknagik, have not provided any letters of support indicating their desire to purchase hydro power from the proposed system (PSA).-The lack of storage for a run-of-river hydro, like the subject, will likely result in a reduced diesel displacement, especially during periods of low hydro flow. Issues relating to integration of the existing community power systems with the proposed project will likely require some complex engineering.-Agencies may require conditioning of final project that will reduce and/or increase total project costs.

Election District: S-37 Bristol Bay/Aleutians/Upper Kuskokwim

Renewable Energy Fund: Round 13 Application Summaries



Goodnews Bay Wind Energy Feasibility and Conceptual Design Project

App #13002

Standard Application

Project Type: Wind**Energy Region:** Lower Yukon-Kuskokwim**Applicant:** Alaska Village Electric Cooperative**Proposed Phase(s):** Feasibility**Applicant Type:** Utility**Recommended Phase(s):** Feasibility

Project Description

Alaska Village Electric Cooperative, Inc. (AVEC) is requesting \$128,250 and will provide a match of \$6,750 to conduct a wind power feasibility and conceptual design project for the community of Goodnews Bay. AVEC, with the cooperation of the community, proposes to assess the feasibility of wind resources suited to provide power to the community and to prepare a conceptual design of a wind facility.

DNR/DMLW Feasibility Comments

Not on state land No real location. Feasibility Study, project adjacent to navigable waters. We have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affecting mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



Goodnews Bay Wind Energy Feasibility and Conceptual Design Project

App #13002

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis	
1. Cost of Energy (35)	13.43	Stage 2 Tech & Econ Score (100)	66.33
2. Matching Resources (15)	7.00	Benefit/Cost Ratio	0.15
3. Stage 2 Feasibility (20)	16.58		
4. Project Readiness (5)	4.25	Project Rank	
5. Benefits (15)	2.50	Statewide (of 19 Standard applications)	4
6. Local Support (5)	5.00	Regional (of all applications)	2
7. Sustainability (5)	5.00	Stage 3 Ranking Score (100)	58.77
Total Stage 3 Score (100)	58.77		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$3,000,000	\$3,000,000	Cost of Electricity	\$0.56/kWh
REF13 Grant Funds	\$128,250	\$128,250	Price of Fuel	\$4.09/Gal
Matching Funds	\$6,750	\$6,750	Household Energy Cost	\$6,832

AEA Review Comments & Recommendation

Full Funding

The applicant is requesting REF Round 13 grant funding in the amount of \$128,250 for the "feasibility and conceptual design" phase of the proposed wind system project. The applicant is an established rural utility provider with knowledge and experience in the development, and integration of wind-diesel systems in their service area. Prior wind resource study work has been completed prior to this request, indicating the presence and viability of the renewable resource. It is anticipated that the applicant will utilize a portion of the grant monies to determine site control, assess the integration of the proposed wind system with the existing diesel plant, and assess the impact of proposed project on heat recovery due to reduced diesel generation. The applicant, as a revenue generating utility, does have the ability to self-fund reasonable cost overruns. The applicant does indicate that if needed, they would be able to contribute additional matching cash funds; this is a boon to the project. AEA recommends full funding in the amount of \$128,250 for the requested feasibility and conceptual design wind energy project.

Project Concerns: No mention of integration challenges/risks. The applicant indicated high penetration system for this project is considerably higher than that of other wind projects in AVEC portfolio. Likely that these integration challenges will be identified and addressed as part of the feasibility study. No analysis concerning how the project will impact any existing heat recovery systems. This will likely be a part of the feasibility study. Location not yet determined, will be determined by requested feasibility study. Site selection and control to be established post-feasibility.

Election District: S-38 Lower Kuskokwim

Renewable Energy Fund: Round 13 Application Summaries



Kotlik Wind Energy Feasibility and Conceptual Design Project

App #13003

Standard Application

Project Type: Wind**Energy Region:** Lower Yukon-Kuskokwim**Applicant:** Alaska Village Electric Cooperative**Proposed Phase(s):** Feasibility**Applicant Type:** Utility**Recommended Phase(s):** Feasibility

Project Description

Alaska Village Electric Cooperative, Inc. (AVEC) is requesting \$237,500 and will provide a match of \$12,500 to conduct a wind power feasibility and conceptual design project for the community of Kotlik. AVEC, with the cooperation of the community, proposes to assess the feasibility of wind resources suited to provide power to the community and to prepare a conceptual design of a wind facility.

DNR/DMLW Feasibility Comments

Insufficient information to review. Request for funding for feasibility study. No location selected for placement of meteorological study tower at this time. DMLW permit required if DNR managed land selected. Native lands with easements. We have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affecting mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

DNR/DGGS Geohazards Comments

The closest seismic source to the proposed project is the Kaltag fault (see Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>). However, this fault is located north of the project and likely should not affect the proposed project. All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



Kotlik Wind Energy Feasibility and Conceptual Design Project

App #13003

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis	
1. Cost of Energy (35)	14.21	Stage 2 Tech & Econ Score (100)	57.42
2. Matching Resources (15)	7.00	Benefit/Cost Ratio	0.25
3. Stage 2 Feasibility (20)	14.36		
4. Project Readiness (5)	1.67	Project Rank	
5. Benefits (15)	2.50	Statewide (of 19 Standard applications)	6
6. Local Support (5)	5.00	Regional (of all applications)	3
7. Sustainability (5)	5.00	Stage 3 Ranking Score (100)	54.73
Total Stage 3 Score (100)	54.73		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$3,100,000	\$3,100,000	Cost of Electricity	\$0.58/kWh
REF13 Grant Funds	\$237,500	\$237,500	Price of Fuel	\$4.60/Gal
Matching Funds	\$12,500	\$12,500	Household Energy Cost	\$7,223

AEA Review Comments & Recommendation

Full Funding

The applicant is requesting REF Round 13 grant funds in the amount of \$237,500 to fund the feasibility and conceptual design phase of the proposed 300-kW wind energy project. The proposed project will utilize the installation of a met tower in the community to assess the feasibility of a future wind energy resource. The applicant is an established and experienced regulated rural utility provider, there does not appear to be any issues with the operations and maintenance of the proposed wind system. The applicant has also indicated its ability to self-fund potential cost-overruns, this is a boon to the proposed project. Additionally, the applicant has indicated its monetary support of future phases, should the wind resource prove feasible, with a proposed 10% cash match for the future design and construction phases. The existing diesel power plant will be continually maintained and operated in conjunction with the proposed wind system to provide backup electrical generation should the wind system fail to meet the required load. AEA recommends full funding for the proposed project in the amount of \$237,500.

Project Concerns: Met tower installation timeframe as indicated in the proposed project schedule seems a bit short. There is a risk that this portion of the project could take longer than anticipated. Met tower site selection has not yet been finalized. Major landholders in the community have expressed support for the project, however, this is a risk to the project if the applicant cannot secure a site for the met tower. The proposed project is contingent on the presence of a sustainable and viable renewable wind resource in the area. The assessment of such is to be the primary aim of the proposed feasibility and conceptual design phase.

Election District: T-39 Bering Straits/Yukon Delta

Renewable Energy Fund: Round 13 Application Summaries



Building Integrated Technologies Potential in Alaska

App #13004

Heat Application

Project Type: HeatSolar, HeatRecovery, HeatPump, HeatOther

Energy Region: Railbelt

Applicant: University of Alaska Anchorage

Proposed Phase(s): Recon, Feasibility

Applicant Type: Governmental Entity

Recommended Phase(s): Feasibility

Project Description

In this project, we will develop numerical models for the assessment of the potential of building integrated technologies (such as solar-thermal, thermal storage, thermal storage coupled with airsource heat pump, solar-thermal coupled with thermal storage) in reducing the energy consumption of residential buildings in Alaska. The models will then be used to assess fossil-based energy use reduction in Utqiagvik, Kaktovik and Kotzebue for existing residential buildings. Through transient modeling, we will investigate the energy contribution of each component in residential buildings. We will use TRNSYS (transient system simulation tool) simulation software to develop the models and simulate different scenarios. The evaluation of different scenarios enables quantification of the contribution of each renewable energy component (and their combinations) to the overall building energy consumption. The work will provide possible improvements that can be made to decrease energy consumption of existing residential buildings by retrofitting them with renewable energy technologies. In the second part of the project, we will investigate the potential of integrating renewable energy technologies to new buildings in Alaska. First, we will investigate the passive design parameters such as building envelope and fenestration for improving energy efficiency. Next, we will incorporate renewable energy technologies and determine the overall energy contributions to the building energy consumption. Such theoretical simulation models allow for easy design changes and forecasting the impact of these design changes which will allow builders to make decisions without physical construction or spending much time to gather data.

Renewable Energy Fund: Round 13 Application Summaries



Building Integrated Technologies Potential in Alaska

App #13004

Heat Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis
1. Cost of Energy (35)		Stage 2 Tech & Econ Score (100)
2. Matching Resources (15)		Benefit/Cost Ratio
3. Stage 2 Feasibility (20)		
4. Project Readiness (5)		Project Rank
5. Benefits (15)		Statewide (of 4 Heat applications)
6. Local Support (5)		Regional (of all applications)
7. Sustainability (5)		Stage 3 Ranking Score (100)
Total Stage 3 Score (100)		
Funding & Cost	Requested	Recommended
Total Cost Through Construction	\$105,872	\$
REF13 Grant Funds	\$69,349	\$0
Matching Funds	\$36,523	\$0
		Cost of Electricity \$/kWh
		Price of Fuel \$/Gal
		Household Energy Cost

AEA Review Comments & Recommendation

Did Not Pass Stage 1

Election District: I-17 University

Renewable Energy Fund: Round 13 Application Summaries



Naknek Service Area Wind and Solar Power Feasibility and Conceptual Design

App #13005

Standard Application

Project Type: Wind, Solar**Applicant:** Naknek Electric Association, Inc.**Applicant Type:** Utility**Energy Region:** Bristol Bay**Proposed Phase(s):** Feasibility**Recommended Phase(s):** Feasibility

Project Description

Naknek Electric Association (NEA) proposes to assess, via a feasibility study and conceptual design process, the technical and economic practicality of constructing a wind farm and expanding its solar PV capacity to create a medium-to-high penetration wind-solar-diesel hybrid power system to meet its approximate mean 2 MW baseload power demand. NEA envisions that the much higher additional summer demand of 10 to 13 MW for seafood processing activities would likely continue to be met with diesel engine generators.

DNR/DMLW Feasibility Comments

State school site, land conveyed to DOT via omnibus Act. DOT has entered into a management agreement with the local school district but title remains with DOT. We have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affect mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



Naknek Service Area Wind and Solar Power Feasibility and Conceptual Design

App #13005

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)		Score	Feasibility Analysis	
1. Cost of Energy (35)		15.37	Stage 2 Tech & Econ Score (100)	50.33
2. Matching Resources (15)		9.00	Benefit/Cost Ratio	0.63
3. Stage 2 Feasibility (20)		12.58		
4. Project Readiness (5)		4.83	Project Rank	
5. Benefits (15)		1.00	Statewide (of 19 Standard applications)	7
6. Local Support (5)		2.00	Regional (of all applications)	2
7. Sustainability (5)		4.33	Stage 3 Ranking Score (100)	53.45
Total Stage 3 Score (100)		53.45		
Funding & Cost		Requested	Recommended	
Total Cost Through Construction	\$12,262,000	\$12,262,000	Cost of Electricity	\$0.49/kWh
REF13 Grant Funds	\$103,500	\$103,500	Price of Fuel	\$3.82/Gal
Matching Funds	\$11,500	\$11,500	Household Energy Cost	\$7,814

AEA Review Comments & Recommendation

Full Funding

The applicant is requesting \$103,500 for feasibility and conceptual design. AEA recommends full funding. The public benefits appear favorable to advancing the integration of renewable energy sources across Alaska and the data relating to the continued research and feasibility studies will be a valued resource for similar future projects in the region. Project Concerns: Vague and/or inaccurate electric and thermal load data poses a risk as to the accuracy of the modeling for the proposed project. Naknek does have a proven wind resource and electric load data, however, thermal load data is lacking. Potential for environmental impact on bird populations near coastal area. Applicant did not indicate risks concerning integration with existing diesel system. Loss of heat sales to Bristol Bay Borough School owing to loss of heat recovery from proposed system is a risk.

Election District: S-37 Bristol Bay/Aleutians/Upper Kuskokwim

Renewable Energy Fund: Round 13 Application Summaries



Walter Northway School Wood Chip Heating System

App #13006

Heat Application

Project Type: HeatBiofuel**Energy Region:** Yukon-Koyuk/Upper Tanana**Applicant:** Alaska Gateway School District**Proposed Phase(s):** Construction**Applicant Type:** Governmental Entity**Recommended Phase(s):** Construction

Project Description

The Northway School Woodchip Heating Project proposes Phase IV Construction funding in the amount of \$650,000 and will construct a biomass wood chip district heating system to service the Northway School and Garage. This project will replace about 23,166 gallons of imported heating fuel which is approximately 90% of the current usage. This system will use approximately 280 tons(25% moisture) per year of locally harvested woodchips. This project will create local wood harvesting employment/small business opportunities, providing a use for wood that is harvested to protect communities from wildfire while decreasing the community's dependence on expensive imported diesel.

DNR/DMLW Feasibility Comments

Project is likely within a DOT Airport property. Applicant will need to work with DOT or their designee to obtain landowner authorization. If biomass is desired from DNR managed lands, applicant will need to work with Forestry. We have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affecting mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



Walter Northway School Wood Chip Heating System

App #13006

Heat Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis	
1. Cost of Energy (35)	16.22	Stage 2 Tech & Econ Score (100)	84.54
2. Matching Resources (15)	7.00	Benefit/Cost Ratio	1.42
3. Stage 2 Feasibility (20)	21.14		
4. Project Readiness (5)	4.10	Project Rank	
5. Benefits (15)	7.25	Statewide (of 4 Heat applications)	1
6. Local Support (5)	5.00	Regional (of all applications)	1
7. Sustainability (5)	4.50	Stage 3 Ranking Score (100)	69.70
Total Stage 3 Score (100)	69.70		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$793,500	\$793,500	Cost of Electricity	\$0.59/kWh
REF13 Grant Funds	\$650,000	\$650,000	Price of Fuel	\$2.45/Gal
Matching Funds	\$62,375	\$62,375	Household Energy Cost	\$8,246

AEA Review Comments & Recommendation

Full Funding

The applicant is seeking a request for REF grant monies in the amount of \$650,000 for the construction of a biomass boiler to be integrated into the Walter Northway School site with the goal of displacing the use of more costly heating fuel. The applicant is experienced in the development, construction, and operation of biomass boilers. The applicant currently owns and operates a biomass mass boiler at a location within the local district. AEA recommends full funding in the requested amount of \$650,000 for the proposed project.

Project Concerns: The applicant indicated (see section 3.1 of application) procurement and construction schedule appears unrealistically short. The applicant indicates 5 months for procurement and 4 months for construction/installation of boiler. Applicant indicated they were not yet certain as to which type of boiler would be procured (see section 5.4.4 of application). Labor allocation is not specified, it is not clear if any critical positions required for the project development/construction would be over-subscribed. This is not expected to be a major risk to the project. This project is recommended for full funding of \$650,000.

Election District: C-6 Eielson/Denali/Upper Yukon/Border

Renewable Energy Fund: Round 13 Application Summaries



City of Unalaska Wind Power Feasibility and Final Design

App #13007

Standard Application

Project Type: Wind**Energy Region:** Aleutians**Applicant:** City of Unalaska Department of Public Utilities**Proposed Phase(s):** Feasibility, Design**Applicant Type:** Utility**Recommended Phase(s):** Feasibility

Project Description

City of Unalaska (COU) proposes a two-phase project: feasibility/conceptual design to determine best method to integrate wind power with the planned geothermal power project (to be operational in 2024), followed by final design and permitting. COU initiated a self-funded wind study in 2017 to identify prospective wind power sites and collect high quality wind data. Four met towers were installed (two 60-meter at two primary sites of interest, one 34-meter at an auxiliary site, and one 10-meter at a reference site). As of Sept. 2020, the two 60-meter towers remain operational and a wind resource report documenting the project is presently in draft form. COU anticipates installing 2 to 5 MW wind turbine capacity. Construction funding will be explored during the feasibility/conceptual phase. Options include bank financing or grant funding. Wind and geothermal power will enable COU to attain its near-term goal of achieving a 100% renewable energy-powered community with its longer-term goal of becoming a world leader in operating a carbon-free economy.

DNR/DMLW Feasibility Comments

Potential exist for Temporary Water Use Authorizations as a consequence of dewatering activities resulting from excavation operations associated with construction of foundations for wind generators. There are existing water rights for public water supply and power under ADL 47232 and ADL 400616. Native LandsWe have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affecting mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



City of Unalaska Wind Power Feasibility and Final Design

App #13007

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)		Score	Feasibility Analysis		
1. Cost of Energy (35)		9.83	Stage 2 Tech & Econ Score (100)	54.33	
2. Matching Resources (15)		9.00	Benefit/Cost Ratio	0.54	
3. Stage 2 Feasibility (20)		13.58			
4. Project Readiness (5)		5.00	Project Rank		
5. Benefits (15)		2.33	Statewide (of 19 Standard applications)	9	
6. Local Support (5)		1.00	Regional (of all applications)	1	
7. Sustainability (5)		2.83	Stage 3 Ranking Score (100)	46.41	
Total Stage 3 Score (100)		46.41			
Funding & Cost		Requested	Recommended		
Total Cost Through Construction		\$15,866,000	\$14,100,000	Cost of Electricity	\$0.36/kWh
REF13 Grant Funds		\$1,143,900	\$139,000	Price of Fuel	\$3.05/Gal
Matching Funds		\$127,100	\$13,900	Household Energy Cost	\$4,997

AEA Review Comments & Recommendation

Partial Funding

The applicant has indicated a grant fund request in the amount of \$1,143,900 for use as part of the proposed project's "Feasibility and Conceptual Design" and "Final Design and Permitting" phases. AEA recommends partial funding for the proposed project. It is recommended the feasibility and conceptual design (CDR) phase, requested at \$139,000, be funded prior to funding the final design phase. It is expected that the applicant's cash match for the partial feasibility portion will be reduced to \$13,900 (10% of cost). Cash match expected as applicant indicated that they would self-fund a 10% cash match for both the CDR (\$13,900) and the final design phase (\$113,200); with the final design phase not recommended, only the CDR phase match would be available. The integration of the Geothermal plant, expected on-line in 2024, with the proposed wind system, potential ESS, and the existing diesel plant is complex and will likely require some study as part of the initial feasibility phase to gauge the requirements for integration. Additionally, the load which the geothermal plant could meet is to be determined and it is likely that the joint-venture between Ounalashka Corporation and Chena Power (OCCP) will have more accurate estimates as to generational capacity for the Geothermal system as the project progresses. As the feasibility portion of the requested phases is anticipated to finish in April 2022, this allows more time for other components of the project to develop and will refine the scope of the proposed wind system. Successful completion of the feasibility CDR will allow for a determination to be made on the selection of the generational capacity of the proposed wind system. At present, the applicant has provided a range of 2 to 5 MW. Project Concerns: While applying for a feasibility study and final design funding request, the applicant left blank those sections relating to the sustainability (section 7) of the project. Logistical, business, and financial arrangements for operating and maintaining the project throughout its lifetime and selling energy from the completed project was not addressed. There is not anticipated to be a 14th REF funding round. Although specific information isn't available at this time, there should be some consideration and discussion of these topics because they are important in determining the projects long term success. The applicant did not address the size of the wind system, turbine type, and other technical aspects in the application as they have not yet been evaluated. It is expected that items relating to proposed system performance, operations and maintenance costs, fuel costs and basic operation of the system will be addressed as part of the feasibility study. This should have been addressed at least high level for this application. If geothermal power plant fails to materialize, the proposed system integration and project will be all the more critical in transforming current power generation from fossil fuel sources to renewable. Operational cost overruns are a risk to the project and the applicant, subject to their board's approval, to self-fund these overages is a boon to the project. The amount of overage, however, which the applicant could self-fund is unknown and likely limited in scope. While future phase funding sources will be further explored as part of the proposed feasibility and final design portion of the project, this is a risk to the project.

Renewable Energy Fund: Round 13 Application Summaries



Chignik Hydroelectric Dam Project

App #13008

Standard Application

Project Type: Hydro**Energy Region:** Bristol Bay**Applicant:** City of Chignik**Proposed Phase(s):** Design**Applicant Type:** Local Government**Recommended Phase(s):** Design

Project Description

The City of Chignik is seeking funding to complete final design and permitting for a run of the river hydroelectric dam project that will enable the city to eliminate dependency on diesel fuel for electricity generation. The establishment of the project will supply year round electrical generation for the community. The City, Tribal Council, Borough, CE2 Engineers, and the Alaska Native Tribal Health Consortium are in a collaborative venture to manage the project successfully with ANTHC taking the lead on project management. CE2 Engineers will be continually involved to conduct work on the project following the completion of the feasibility study in September 2014. The final feasibility report recommends the installation of a 385 kW generator with an anticipated capacity factor of 63%. The final report of the feasibility study models this system and it was determined that the City would see an annual reduction in diesel fuel use by 63,500 gallons annually. The study indicates that "based on current electric demand...[this] has potential to displace 184,000 gallons of diesel fuel annually." The system is projected to run primarily as a diesel-free system with the exception of two periods in the year where water flow is projected to be too low. During FY15, the city spent about \$250K on diesel fuel to generate electricity. Through this project, the city will see substantial enhancements in the areas of water supply delivery, reduced dependence on fossil fuels, and reduced maintenance of electric generation infrastructure. The City of Chignik is already a FERC license holder for the hydroelectric project which can significantly reduce the permitting timeline.

DNR/DMLW Feasibility Comments

A DMLW Water Resources authorization is recognized to be required. City of Chignik holds title to most affected uplands, remaining potentially impacted parcel owned by Chignik Lagoon Native Corporation. Consistent with the resource agency meeting notes from October 16, 2013, please work with DMLW's Water Resource section and either file for an amendment to existing water right (LAS 27818) or apply for an additional water right. Bristol Bay Native Corp./City of Chignik We have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affect mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. The coastal area in this region is subject to potential tsunami hazard, see <https://doi.org/10.14509/29675> and <https://earthquake.alaska.edu/sites/all/tsuMap/html/tsunami.html>. All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



Chignik Hydroelectric Dam Project

App #13008

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis
1. Cost of Energy (35)		Stage 2 Tech & Econ Score (100) 24.67
2. Matching Resources (15)		Benefit/Cost Ratio 0.57
3. Stage 2 Feasibility (20)		
4. Project Readiness (5)		Project Rank
5. Benefits (15)		Statewide (of 19 Standard applications)
6. Local Support (5)		Regional (of all applications)
7. Sustainability (5)		Stage 3 Ranking Score (100)
Total Stage 3 Score (100)		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$7,438,000	\$7,438,000	Cost of Electricity	\$0.42/kWh
REF9 Grant Funds	\$1,276,656	\$0	Price of Fuel	\$3.94/Gal
Matching Funds	\$00	\$0	Household Energy Cost	\$5,826

AEA Review Comments & Recommendation

Did Not Pass Stage 2

Application did not meet the minimum score of 40 points in stage 2. The application will not proceed to stage 3 per Section 4 – “Stage 2”, of the REF Process Manual. Project Concerns: The applicant did not address heat loss from the proposed system. The proposed hydro plant is anticipated to displace substantially more power than the city load requires. Some of this load could be used to power electric boilers in community buildings to utilize the excess hydro power for heating purposes. Heat loss from diesel-off time due to the hydro is a risk to the project. Run-of-river hydro with little storage will not allow for diesel-off in periods of low water flow (i.e. winter months). Lack of local knowledge concerning operation and maintenance of hydro systems. Diesel O&M knowledge/experience cannot be readily applied to hydro O&M. There will be added O&M costs for hydro. O&M costs are not clear and many differing values have been stated in the application. Schedule appears too compressed. Dispersal of grant funds would likely not occur until Aug 2021 at the earliest. Final design cost of ~\$1.27M does not align with the ANTHC (2018) stated cost of \$379,829. Applicant does not indicate ability to self-fund cost overruns. Applicant indicates potential PSA with local fish processor, however, no letters of support or MOUs provided.

Election District: S-37 Bristol Bay/Aleutians/Upper Kuskokwim

Renewable Energy Fund: Round 13 Application Summaries



Pilgrim Hot Springs Geothermal Power Plant Conceptual Design

App #13009

Standard Application

Project Type: Geothermal**Energy Region:** Bering Straits**Applicant:** Kawerak, Inc.**Proposed Phase(s):** Feasibility**Applicant Type:** Other**Recommended Phase(s):** Feasibility

Project Description

The "Pilgrim Hot Springs Geothermal Power Plant Conceptual Design" project will allow stakeholders in the Bering Strait Region the chance to design an on-site power and heat production facility for Pilgrim Hot Springs. The property is owned by Unaatuq, LLC, a consortium of seven regional and local entities, including five Alaska Native Corporations, one Tribal Consortium (Kawerak), and a non-profit regional CDQ corporation. Kawerak acts as a co-managing owner of the property, along with Bering Straits Native Corporation, and will manage the Renewable Energy Fund grant and project activities. Kawerak, Inc. will work with the Alaska Center for Energy and Power as their main technical contractor, and hire a full-service engineering firm to provide various tasks as described in the scope of work. By providing sustainable, clean energy to Pilgrim Hot Springs using the existing and abundant geothermal resource on site, business development activities may continue to grow and bring economic benefit to all residents of the Bering Strait Region.

DNR/DMLW Feasibility Comments

New info - Project does not appear to be tied to Rock Creek Mine at this time and appears to be entirely on non-State land. TWUP would likely still be needed. Exempt from water use act if > 120 degrees celsius. Water resources for possible cooling fluids would require water rights. Revise TWUP to TWUA. Power use for proposed Rock Creek Mine and others. Rock Creek Mine is not in operation, and is looking for buyers. Project will require TWUP for drilling and water rights depending on the temperature of the geothermal resource. Unaatuq LLC We have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

Pilgrim Hot Springs has been known to be a major geothermal anomaly, and suspected for decades of hosting a significant moderate-temperature geothermal resource. Earlier exploration (?70s and early ?80s) failed to find the upflow zone which produces the surface springs. Location of and drilling into the upflow zone is essential for an understanding of this resource that is an adequate basis for development decisions. This project suggests a stepwise progression, with drilling following geophysical surveys, which in turn followed geological surveys. The surveys are proceeding under Phase I of this project, although results are not given. This proposal is for Phase II, drilling and results of phase I are needed to fully evaluate. The timeline given in the proposal states that this Phase II drilling will be done between about February and November of 2012. The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affect mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



Pilgrim Hot Springs Geothermal Power Plant Conceptual Design

App #13009

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis
1. Cost of Energy (35)		Stage 2 Tech & Econ Score (100) 42.46
2. Matching Resources (15)		Benefit/Cost Ratio 1.01
3. Stage 2 Feasibility (20)		
4. Project Readiness (5)		Project Rank
5. Benefits (15)		Statewide (of 19 Standard applications)
6. Local Support (5)		Regional (of all applications)
7. Sustainability (5)		Stage 3 Ranking Score (100)
Total Stage 3 Score (100)		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$9,005,721	\$9,005,721	Cost of Electricity	\$/kWh
REF9 Grant Funds	\$368,822	\$0	Price of Fuel	\$/Gal
Matching Funds	\$136,893	\$0	Household Energy Cost	\$7,531

AEA Review Comments & Recommendation

Did Not Pass Stage 2

It is determined that the project is not technically and economically feasible, as per regulation 3 AAC 107.645. As such, this application will not be proceeding to stage 3 of the evaluation process. Project Concerns:-Project is predicated on a future, non-existent tourist community. Tourist demand is not fully developed and is subject to seasonality and volatility owing to issues related to COVID-19 and/or other travel restrictions.-No thermal or electrical loads indicated. Generational capacity is based on resource, not future load demand.-Integration is not adequately addressed. Applicant indicates induction generators, but synchronous generators would be more appropriate.-Diesel generation is not addressed in the application although it would be required, even with geothermal generation. Displaced diesel is assumed at 100% of geothermal production. This is incorrect, as supplemental integrated diesel power would be required at the site for peak load assistance and as backup.-Total project costs are not wholly addressed; the geothermal power plant is a smaller aspect of the overall project. Note items such as road maintenance, improvements construction (e.g. wellness retreat), full and part time labor costs, state approved runway construction (if part of development strategy), and others are all additional costs which would likely be incurred by the applicant as part of the overall project site development. -Native village relocation has not been simple, based on past occurrences within the State. It would be reasonable to assume that the potential relocation of the dispersed community of Mary's Igloo would be a major undertaking, likely adding significant costs to the project.

Election District: T-39 Bering Straits/Yukon Delta

Renewable Energy Fund: Round 13 Application Summaries



Water Supply Creek Hydro Final Design - Hoonah, AK

App #13010

Standard Application

Project Type: Hydro**Energy Region:** Southeast**Applicant:** Inside Passage Electric Cooperative**Proposed Phase(s):** Design**Applicant Type:** Utility**Recommended Phase(s):** Design

Project Description

IPEC is requesting \$461,474 in grant funding to prepare the final design for Water Supply Creek Hydro (WSCH). IPEC plans to hire HDR-Alaska to do this work. IPEC will provide labor, and labor overhead, travel, meals & lodging, and legal expenses in the amount of \$75,000 as in-kind match. IPEC staff regularly provides administrative and technical support for consultants as part of its annual labor budget. HDR prepared a conceptual design report for IPEC in 2011, then in December 2019, a feasibility study specific to WSCH. The December 2019 study is included with this application. The next step is final design and permitting, and once it is complete, the Water Supply Creek Hydro project will be "shovel-ready."

DNR/DMLW Feasibility Comments

Water right application on file (LAS 32100). Recommend completing a Hazard Potential Classification and Jurisdictional Review form for submittal to DNR's Dam Safety Program. Native Lands We have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affect mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. The closest seismic source to the proposed project is the Fairweather fault (see Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>). This fault has been active in the last 150 years. All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



Water Supply Creek Hydro Final Design - Hoonah, AK

App #13010

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis	
1. Cost of Energy (35)	12.38	Stage 2 Tech & Econ Score (100)	85.83
2. Matching Resources (15)	11.00	Benefit/Cost Ratio	1.35
3. Stage 2 Feasibility (20)	21.46		
4. Project Readiness (5)	5.00	Project Rank	
5. Benefits (15)	5.25	Statewide (of 19 Standard applications)	2
6. Local Support (5)	5.00	Regional (of all applications)	1
7. Sustainability (5)	5.00	Stage 3 Ranking Score (100)	70.09
Total Stage 3 Score (100)	70.09		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$5,984,099	\$5,984,099	Cost of Electricity	\$0.59/kWh
REF13 Grant Funds	\$461,474	\$461,474	Price of Fuel	\$2.79/Gal
Matching Funds	\$75,000	\$75,000	Household Energy Cost	\$6,297

AEA Review Comments & Recommendation

Full Funding

The applicant is requesting REF Round 13 grant funds in the amount of \$461,474 for the "final design and permitting" phase of the proposed run-of-river hydro project in Hoonah, AK. The applicant is an experienced and technically knowledgeable rural utility which owns and operates several hydro plants in the region, including Gartina Falls near the project site. Owing to this, the applicant has also demonstrated technical knowledge concerning the integration of hydro generation into their community diesel plants. For this particular request, it is assumed that the integration of the proposed plant will be determined as part of the requested phase. The applicant has demonstrated substantial support for the project. The applicant has already completed the prior reconnaissance and feasibility phases, the latter being recently completed in 2019. The quote for the requested final design and permitting phase, as prepared by the applicant-selected engineering firm, appears detailed and reasonable. The applicant has also demonstrated its ability to utilize multiple funding sources in funding projects like the subject. The completed feasibility portion of the proposed project was partially funded through a \$30k grant via the Alaska Native Tribal Health Consortium. The applicant has also stated that they have, although limited, the ability to self-fund reasonable cost overruns through allocations from their general fund. This is a boon to the project. The proposed project seeks to displace diesel powered electric generation within the community, further incorporating renewable energy generation into the local grid, advancing the goal of the REF. AEA is recommending full funding for the proposed project in the amount of \$461,474.

Project Concerns: Run-of-river hydro and absence of storage reduces diesel displacement during the winter months when water flow is low. Ability for the applicant to self-fund cost overruns is limited, as substantial debt service obligations may affect its financial position. Loss of heat recovery is not specifically addressed as part of the application, and this could be a risk to the subject as additional fuel may be required to replace the loss of heat recovery from the diesel gensets. The local native tribe, Hoonah Indian Association, is in the process of installing a biomass heat loop within the community to assist in the offset of heat loss from displaced diesel generation. Loss of heat recovery is not anticipated to be significant as diesel generation will still be required to meet the community load.

Election District: R-35 Sitka/Petersburg

Renewable Energy Fund: Round 13 Application Summaries



Shungnak Heat Recovery Expansion

App #13011

Heat Application

Project Type: HeatRecovery**Energy Region:** Northwest Artic**Applicant:** City of Shungnak**Proposed Phase(s):** Design, Construction**Applicant Type:** Local Government**Recommended Phase(s):** Design, Construction

Project Description

The proposed project will expand the heat recovery system in Shungnak, AK to provide heat for the health clinic, cookhouse community center, VPSO housing, and community store, displacing an estimated 14,036 gallons of fuel oil being used annually in these community facilities, for an estimated cost savings of \$115,797 per year at the current fuel price of \$8.25 per gallon. The heat recovery system currently serves the collective heating needs of the water treatment plant and city office. This proposed expansion is possible due to AVEC replacing all of its diesel generators with models that include marine manifolds, which will significantly increase the amount of recovered heat available.

DNR/DMLW Feasibility Comments

No NRO involvementNative Town/Shungnak/NANA/IsingnakmuntWe have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affecting mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



Shungnak Heat Recovery Expansion

App #13011

Heat Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis	
1. Cost of Energy (35)	22.81	Stage 2 Tech & Econ Score (100)	73.50
2. Matching Resources (15)	0.00	Benefit/Cost Ratio	1.03
3. Stage 2 Feasibility (20)	18.38		
4. Project Readiness (5)	5.00	Project Rank	
5. Benefits (15)	3.25	Statewide (of 4 Heat applications)	2
6. Local Support (5)	5.00	Regional (of all applications)	1
7. Sustainability (5)	5.00	Stage 3 Ranking Score (100)	64.44
Total Stage 3 Score (100)	64.44		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$1,303,607	\$1,303,607	Cost of Electricity	\$0.73/kWh
REF13 Grant Funds	\$1,303,607	\$1,303,607	Price of Fuel	\$8.25/Gal
Matching Funds	\$00	\$00	Household Energy Cost	\$11,601

AEA Review Comments & Recommendation

Full Funding

The applicant is requesting REF Round 13 grant funds in the amount of \$1,303,607 to fund the final design and permitting, and construction of the proposed heat recovery system upgrade. The applicant has not indicated any matching funds, although ANTHC has self-funded the feasibility portion of the proposed project. Heat distribution infrastructure within the village and the existing diesel power plant are the target improvements for the heat recovery upgrades and additions. The applicant is proposing these heat recovery system upgrades in an effort to maximize the benefit which would be provided by the local utility as it replaces its existing diesel gensets with new gensets equipped with marine manifolds. A heat sales agreement exists between the applicant and the local utility. A revised heat sales agreement will be developed to continue to provide monetary incentive to the local utility to provide ongoing support in maintaining and operating the heat recovery system. The local utility currently maintains 30 local heat recovery system in those communities in which it operates. With the exception of these revenues earned by the utility to provide ongoing maintenance and support, there are no anticipated additional funds required for the proposed project. The proposed project is estimated to significantly reduce the cost incurred by the applicant for heating village improvements. AEA is recommending full funding for this project in the amount of \$1,303,607.

Project concerns: There is a risk to the project concerning potential cost overruns. The applicant's proposed project development and operations partner, ANTHC, is experienced in the pursuit of grant and loan sources. While several funding sources are identified, the inability of the applicant to self-fund any potential cost overruns is a risk to the project. The applicant indicated revised heat sales agreement with the local utility is paramount to the success of this project. If an agreement fails to materialize there will be little to no benefit realized by the local community. The applicant indicates that the community is anticipated to construct a PV solar and battery storage system. There is a risk that such renewable energy offset of diesel production could impact heat recovery of the proposed project. Applicant indicated preliminary analysis indicates that high levels of solar production would occur during those months where heating is not required, thus limiting the impact on the proposed project. Further analysis with the solar system in production would be required to measure the impact of heat recovery loss.

Election District: T-40 Arctic

Renewable Energy Fund: Round 13 Application Summaries



Engineering Alaska's Geothermal Energy- HSBV, Akutan

App #13012**Standard Application****Project Type:** Geothermal**Energy Region:** Aleutians**Applicant:** University of Alaska Fairbanks, Alaska Division
of Geological & Geophysical Surveys**Proposed Phase(s):** Recon, Feasibility**Applicant Type:** Other**Recommended Phase(s):** 0

Project Description

Although previous studies have been conducted to evaluate and characterize geothermal resources in the State of Alaska, there still exist extensive disagreements on the commercial potential of Alaska geothermal energy. The objective of this collaborative study is to establish a systematic engineering solution/workflow to develop Alaska geothermal resources. This project integrates laboratory experiments, field characterizations, and numerical modeling for advancing the physical understanding of Alaska geothermal resources and guiding future geothermal research and development in the state. Hot Springs Bay Valley (located adjacent to the City of Akutan), a geothermal area with high temperature gradients will be used as a case study to execute and validate the workflow proposed in this project. Eventually, the engineering workflow developed and validated in this project will be applied to the other geothermal sites across the state, thus making contributions to the renewable energy inventory of Alaska.

Renewable Energy Fund: Round 13 Application Summaries



Engineering Alaska's Geothermal Energy- HSBV, Akutan

App #13012

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis
1. Cost of Energy (35)		Stage 2 Tech & Econ Score (100)
2. Matching Resources (15)		Benefit/Cost Ratio
3. Stage 2 Feasibility (20)		
4. Project Readiness (5)		Project Rank
5. Benefits (15)		Statewide (of 19 Standard applications)
6. Local Support (5)		Regional (of all applications)
7. Sustainability (5)		Stage 3 Ranking Score (100)
Total Stage 3 Score (100)		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$947,156	\$	Cost of Electricity	\$/kWh
REF13 Grant Funds	\$851,263	\$0	Price of Fuel	\$/Gal
Matching Funds	\$95,893	\$0	Household Energy Cost	

AEA Review Comments & Recommendation

Did Not Pass Stage 1

Election District: S-37 Bristol Bay/Aleutians/Upper Kuskokwim

Renewable Energy Fund: Round 13 Application Summaries



Cordova Hydro Storage Assessment Project

App #13013

Standard Application

Project Type: Hydro, Storage**Energy Region:** Copper River/Chugach**Applicant:** Cordova Electric Cooperative, Inc.**Proposed Phase(s):** Recon, Feasibility**Applicant Type:** Utility**Recommended Phase(s):** Recon, Feasibility

Project Description

Cordova Electric Cooperative (CEC) is requesting \$295,000 to conduct an analysis of the hydroelectric resources in the area, per AEA recommendation in attached letter AEA Regional Hydro Resource Assessment dated April 13, 2017. CEC intends to collect LIDAR imagery and develop feasibility assessments on at least four potential storage locations. The results of this analysis will inform the strategic direction of CEC in the short and long term. The priority assessment is for storage capacity upstream of the existing Humpback Creek Hydroelectric Project. The potential storage location is on private lands with low permitting and regulatory overheads and is a low-cost, high value supplement to the existing infrastructure. The next priority is at the Raging Creek hydroelectric site, for which CEC has already conducted a desktop feasibility assessment. Raging Creek would be a long-term hydro prospect that faces moderate permitting and regulatory barriers that has the potential to bring CEC to 100% renewable. A more comprehensive feasibility assessment would be conducted as part of this application. The last two locations and reports includes an updated feasibility report on Snyder Falls and a pre-feasibility on storage potential at Power Creek would. To maximize the LIDAR equipment, McMillen-Jacobs professional staff mobilization, and helicopter support, CEC proposes to conduct aerial reconnaissance of Boy Scout Lake, No Name Lake #1, and No Name Lake #2, per AEA recommendation.

DNR/DMLW Feasibility Comments

No water use permits or authorizations are required for the feasibility study. Multiple Sites, Native Lands and Forest Service Lands. Waters within the project area may be navigable. We have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affecting mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. The coastal area in this region is subject to potential tsunami hazard, see <https://doi.org/10.14509/27241> and <https://earthquake.alaska.edu/sites/all/tsuMap/html/tsunami.html>. All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



Cordova Hydro Storage Assessment Project

App #13013

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis	
1. Cost of Energy (35)	13.25	Stage 2 Tech & Econ Score (100)	78.17
2. Matching Resources (15)	15.00	Benefit/Cost Ratio	0.99
3. Stage 2 Feasibility (20)	19.54		
4. Project Readiness (5)	5.00	Project Rank	
5. Benefits (15)	3.33	Statewide (of 19 Standard applications)	1
6. Local Support (5)	4.00	Regional (of all applications)	1
7. Sustainability (5)	5.00	Stage 3 Ranking Score (100)	70.13
Total Stage 3 Score (100)	70.13		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$52,961,078	\$70,000,000	Cost of Electricity	\$0.39/kWh
REF13 Grant Funds	\$294,642	\$294,642	Price of Fuel	\$2.80/Gal
Matching Funds	\$150,000	\$150,000	Household Energy Cost	\$6,740

AEA Review Comments & Recommendation

Full Funding

The applicant, CEC, is requesting REF Round 13 grant funds in the amount of \$294,642 for "reconnaissance" and "feasibility and conceptual design" phases of the proposed project. CEC is looking to assess the feasibility of four potential hydro storage sites. The primary assessment is to secure storage capacity upstream of the existing hydro site at Humpback Creek. Supplemental feasibility analysis for potential hydro generation at two sites (Raging Creek & Snyder Falls) with an additional three sites anticipated for aerial reconnaissance including geotechnical and other field observations is also part of the planned project. The project schedule and budget is reasonable and detailed. CEC has sufficient technical and operational knowledge to maintain and operate the future hydro plants that may result from this grant request. CEC, in tandem with the contracted engineering company, McMillen Jacobs has sufficient experience and knowledge in reconnaissance and feasibility work to begin work on the requested phases. CEC has already expended a significant amount of its own funds on feasibility and reconnaissance work of approximately \$444,000. Owing to CEC's current hydro-diesel-battery system, CEC is dedicated to exploring further integration of renewable energy generation into its grid, supporting the goal of the REF program. CEC has indicated its support of future phases through a combination of proprietary, native, and federal funds. CEC's ability to self-fund cost overruns, for this phase or future phases, is a boon to the proposed project. CEC has demonstrated satisfactory grant reporting performance in prior REF rounds. AEA recommends full funding for the proposed project in the amount of \$294,642.

Project Concerns: Land access issues for Raging Creek may prove to result in a long lead time to development if the site is selected for hydro development. LIDAR based reconnaissance may prove to require more time than scheduled due to issues with LIDAR surveying during precipitation.

Election District: P-32 Kodiak/Cordova/Seldovia

Renewable Energy Fund: Round 13 Application Summaries



Improved airfoil for wind turbines in Kongiganak

App #13014

Standard Application

Project Type: Wind**Energy Region:** Lower Yukon-Kuskokwim**Applicant:** Puvurnaq Power Company**Proposed Phase(s):** Construction**Applicant Type:** Utility**Recommended Phase(s):** Construction

Project Description

The Puvurnaq Power Company has been operating five Windmatic 17S wind turbine for the last eight years. These wind turbines that were originally designed and manufactured in Denmark in the 1980's. They previously operated in California, and refurbished to their original specification and reinstalled in the village of Kongiganak. The turbines nacelles have received a number of improvements, however the turbine blades are of the original turbine blade design of the mid-1980's. In the 1990's, the U.S. Solar Energy Research Institute (SERI), which subsequently became the National Renewable Energy Laboratory (NREL), commenced a program to design and test and improved airfoil specifically for these types of Danish wind turbines, of which there were some 7000 installed in California. The SERI airfoils were developed to provide aerodynamic performance improvements over original equipment blades supplied with the Windmatic, Vestas and other fixed pitch, stall regulated turbines. The outcome of the NREL/SERI program was the development and testing of new family of airfoils with improved performance in three primary areas. These are:

- Restrained peak power for greater drive train life
- Reduced sensitivity to turbulence
- Significantly improved annual energy production

In each test instance of stall regulated machines the annual energy output was increasing by 20 to 30%, while not causing increased loading on the tower, gearbox and drive train. Over 80 sets of these blades were installed on various wind farms in California. Puvurnaq is requesting \$98,000 from the REF program to purchase and install two sets of the advanced SERI Thin Airfoils. The Puvurnaq Power Company (PPC) staff will retrofit two of their five 95 kW windmatic turbines with these blades. It is estimated that PPC will provide an in-kind match of \$9,000 which represents the labor and equipment to install and test the blade sets. The blades were manufactured by one of the largest blade manufacturer in China, AVIC Huiteng Windpower, under the design supervision of James Tangler the NREL design engineer. The turbine blades utilize a tip break design for emergency overspeed protection, which should improve overspeed protection compared to the air brake design on the current wind turbine blades. Puvurnaq Power Company proposes to acquire these blade sets and install them on two of its wind turbine in Kongiganak. The Puvurnaq Power maintenance crew has access to an up-tower service crane, which will enable local perform the retrofit using local personnel. Puvurnaq will undertake a program to evaluate the performance of these new airfoils, comparing performance to the non-retrofitted turbines, and comparing the previous four year average production, in order to validate the anticipated improved performance in the Alaskan environment and wind conditions. The following measurements and data will be recorded: Cut in speed, Maximum kW output, Power curve, Average kW, Total kWh

DNR/DMLW Feasibility Comments

Native Lands We have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affecting mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



Improved airfoil for wind turbines in Kongiganak

App #13014

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis	
1. Cost of Energy (35)	15.95	Stage 2 Tech & Econ Score (100)	89.50
2. Matching Resources (15)	7.00	Benefit/Cost Ratio	2.02
3. Stage 2 Feasibility (20)	22.38		
4. Project Readiness (5)	4.33	Project Rank	
5. Benefits (15)	10.00	Statewide (of 19 Standard applications)	3
6. Local Support (5)	1.00	Regional (of all applications)	1
7. Sustainability (5)	4.50	Stage 3 Ranking Score (100)	69.66
Total Stage 3 Score (100)	69.66		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$117,000	\$117,000	Cost of Electricity	\$0.65/kWh
REF13 Grant Funds	\$108,000	\$108,000	Price of Fuel	\$4.93/Gal
Matching Funds	\$9,000	\$9,000	Household Energy Cost	\$8,111

AEA Review Comments & Recommendation

Full Funding

The applicant is requesting \$108,000 in REF Round 13 grant funds to retrofit two sets of new airfoils, to increase wind generational capacity, on two of its existing wind turbines. The proposed project budget and schedule appear reasonable and are adequately supported. The applicant has a proven track record of providing needed maintenance on its existing wind system as well as providing system data to AEA, regarding previously funded projects. AEA recommends full funding in the amount of \$108,000 for the proposed project. **Note on Funding Request** On Dec 3, 2020 the applicant was contacted to clarify a matter concerning the funding amounts. The applicant did clarify, through correspondence with the AEA grant manager, that the correct value is \$117,000 (\$98k for 2 foils + \$24k for shipping + \$9k for installation). The applicant is offering installation as an in-kind match. The total revised grant request for this application is \$108,000. Full funding in the revised requested amount of \$108,000 recommended. Project concerns: Applicant schedule appears too condensed, grant receipt, procurement, shipping, and installation are likely to require more than nine months. Any disruptions resulting from shipping, a more common occurrence owing to growing demand for delivery services logistics companies from COVID-19, will likely result in project being delayed from stated schedule. Largest risk is the new blades would not produce as much additional marginal power as was anticipated. This would impact project economics across all aspects. Another risk is potential issues with maintaining and/or repairing the new technology airfoils. No backup data regarding the proposed airfoil types has been provided, there is limited support which indicates efficiency and/or capacity gains from applying this new airfoil technology. The applicant should take precautions in the installation phase so as to not void the limited manufacturer warranty, if applicable.

Election District: S-38 Lower Kuskokwim

Renewable Energy Fund: Round 13 Application Summaries



Burro Creek Hydro Project

App #13015

Standard Application

Project Type: Hydro

Energy Region: Southeast

Applicant: Burro Creek Holdings, LLC

Proposed Phase(s): Feasibility, Design

Applicant Type: IPP

Recommended Phase(s): Feasibility, Design

Project Description

Develop a 2 MW run-of-river hydro project on private property at Burro Creek, south of Skagway. Transmit electricity to markets in Skagway (and possibly Haines) via a submarine cable.

DNR/DMLW Feasibility Comments

A water use application is on file (LAS 29573). Please be sure final design water use requirements are consistent with filed application. Burro Creek Holdings LLC, Lands have been selected by the State under GS-5450. We have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affect mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. The closest seismic source to the proposed project is the Dalton section of the Denali fault (see Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>). This fault has been active in the last 15,000 years. The coastal area in this region is subject to potential tsunami hazard, see <https://doi.org/10.14509/30029> and <https://earthquake.alaska.edu/sites/all/tsuMap/html/tsunami.html>. All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



Burro Creek Hydro Project

App #13015

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis	
1. Cost of Energy (35)		Stage 2 Tech & Econ Score (100)	53.17
2. Matching Resources (15)		Benefit/Cost Ratio	1.56
3. Stage 2 Feasibility (20)			
4. Project Readiness (5)		Project Rank	
5. Benefits (15)		Statewide (of 19 Standard applications)	
6. Local Support (5)		Regional (of all applications)	
7. Sustainability (5)		Stage 3 Ranking Score (100)	
Total Stage 3 Score (100)			
Funding & Cost	Requested	Recommended	
Total Cost Through Construction	\$19,172,000	\$19,172,000	Cost of Electricity \$/kWh
REF9 Grant Funds	\$586,000	\$0	Price of Fuel \$/Gal
Matching Funds	\$26,000	\$0	Household Energy Cost \$4,885

AEA Review Comments & Recommendation

Did Not Pass Stage 2

Items of concern: A similar 5MW project in Southeast Alaska (Hiilangaay), being developed by a utility (AP&T), has a final project cost of \$31M. Given the high fixed costs for hydro projects, project components being sized for a 7M hydro site, and the submersible transmission cable the total project costs for the proposed are likely to be \$25-30M at a minimum. The demand factors for this project are uncertain. Local power demand appears stable and AP&T, the local utility, has not pursued the development of other studied hydro sites due to lack of demand, such as Schubee and Connolly lakes. Applicant project would have to be significantly below the cost to develop these alternate sites, if it were to be a viable economic option. Additionally, West Creek, with road access to the north was studied for a 25MW hydro project. Owing to lack of power demand, however, this project has also not been pursued. Electrification of the municipal dock is unlikely due to the load required by the cruise ships. The load which the cruise ships would require is greater than that existing community as a whole (10-25MW per ship). There are also significant technical problems concerning the receipt of the shore power by the cruise ships, such as placement of power hook-ups and issues concerning load ramping to prevent local grid blackouts. Cruise ship diesel generation would not be able to be 100% offset due to high load requirements. Hydro power via AP&T assets provides the majority (99%) of power generation within the Skagway area. It is unlikely this project would displace any existing diesel generation if at all. Displacement of diesel consumption by cruise ships, if possible, would only occur in the summer months and is temporal in nature. Inability of project to store energy would not allow it to assist in the small diesel generation by the local utility. AP&T only fires their diesel plant during limited periods of high demand during the winter months when the run-of-river hydro sites are experiencing low flow rates.

Election District: Q-33 Downtown Juneau/Douglas/Haines/Skagway

Renewable Energy Fund: Round 13 Application Summaries



Elfin Cove Hydro Final Permitting and Design

App #13016

Standard Application

Project Type: Hydro, Storage**Energy Region:** Southeast**Applicant:** Community of Elfin Cove Non-Profit Corporation, **Proposed Phase(s):** Design

Elfin Cove Utility Commission

Applicant Type: Utility**Recommended Phase(s):** Design

Project Description

The project will include a run-of-river hydroelectric plant between Crooked Creek and Jim's Lake (upper system) and a storage hydroelectric project between Jim's Lake and tidewater (lower system). Our FERC License Application considers two development options: The Full Development Option would feature a 35-kW upper system and 105 kW lower system for 140 kW of generating capacity, supplying 90% of the utility's annual energy demand. The Phased Development Option would defer installation of power recovery equipment on the upper system to the future (only the water diversion would be initially built), providing 105 kW of generating capacity and supplying 82% of the utility's annual energy demand. At this time we expect to proceed with the phased development option, as it is the more economic of the two. Accordingly, this application describes the phased development option.

DNR/DMLW Feasibility Comments

The Elfin Cove Utility Commission (Community of Elfin Cove) has submitted two Applications for Water Rights (LAS 29817 and LAS 29818). The Elfin Cove Utility Commission may need to apply for a Temporary Water Use Authorization prior to the construction phase of the project. The DMLW Water Resources Section recommends the applicant consult with our Southeast Office to determine specific water use authorization requirements. May need a shoreland public easement. Withdrawn for Power Project We have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affecting mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. The closest seismic source to the proposed project is the Fairweather fault (see Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>). This fault has been active in the last 150 years. All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



Elfin Cove Hydro Final Permitting and Design

App #13016

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis	
1. Cost of Energy (35)		Stage 2 Tech & Econ Score (100)	40.33
2. Matching Resources (15)		Benefit/Cost Ratio	0.73
3. Stage 2 Feasibility (20)			
4. Project Readiness (5)		Project Rank	
5. Benefits (15)		Statewide (of 19 Standard applications)	
6. Local Support (5)		Regional (of all applications)	
7. Sustainability (5)		Stage 3 Ranking Score (100)	
Total Stage 3 Score (100)			
Funding & Cost	Requested	Recommended	
Total Cost Through Construction	\$5,909,500	\$5,909,500	Cost of Electricity \$0.65/kWh
REF9 Grant Funds	\$130,000	\$0	Price of Fuel \$4.15/Gal
Matching Funds	\$32,500	\$0	Household Energy Cost \$8,007

AEA Review Comments & Recommendation

Did Not Pass Stage 2

The application did meet the minimum score of 40 points in stage 2, by a margin of 0.33 points. It is the determination of AEA that the application does not reflect a prudent allocation of limited grant monies. The proposed project does not yield sufficient benefits to substantiate its costs. The application will not proceed to stage 3 per Section 4 – “Stage 2”, of the REF Process Manual. Project concerns: -Future funding sources are noted but not specific in identifying clear loan/grant programs or private options. Applicant does state that cost savings are a priority and has demonstrated their ability to service debt (e.g. ongoing bulk diesel fuel facility surcharge). - Contingency of 18% for construction cost is not sufficient. Capital and operational costs are frequently greater than estimated and are likely underestimated for this project. -Small drainage area at project site poses a risk owing to possible low rainfall. Low rainfall years would not be offset by high rainfall years as the load is limited. -Grantee has been a recipient of AEA funds in the past, and has experienced some long grant close-out timeframes.

Election District: R-35 Sitka/Petersburg

Renewable Energy Fund: Round 13 Application Summaries



KNUTSON CREEK HYDRO PROJECT CONSTRUCTION

App #13017**Standard Application****Project Type:** Hydro**Energy Region:** Bristol Bay**Applicant:** Pedro Bay Village Council**Proposed Phase(s):** Construction**Applicant Type:** Utility**Recommended Phase(s):** Construction

Project Description

The proposed project is an approximately 150 kW run-of-river hydroelectric project on Knutson Creek near Pedro Bay. The hydro project will provide nearly all (~98%) of the electricity needs of the village, as well as providing a significant amount of interruptible energy to heat the tribal council building and other community buildings in the village.

DNR/DMLW Feasibility Comments

Water permit. No additional authorizations needed. Knutson Creek within the area that the project lies is not considered navigable for title purposes. An application for a water use is on file (LAS 33115). No additional authorizations are required. Native/Pedro Bay Association. Knutson Creek May be navigable waters We have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affecting mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

DNR/DGGS Geohazards Comments

See general DGGS comments on hazards. The closest seismic source to the proposed project is the Lake Clark fault (see Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>). The relative activity of this structure is unknown. All projects proposing the development of permanent structures should conduct a geotechnical site survey to determine the potential detrimental effects from natural hazards such as flooding, earthquakes, active faults, tsunamis, landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, and erosion, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



KNUTSON CREEK HYDRO PROJECT CONSTRUCTION

App #13017

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis	
1. Cost of Energy (35)		Stage 2 Tech & Econ Score (100)	28.33
2. Matching Resources (15)		Benefit/Cost Ratio	0.34
3. Stage 2 Feasibility (20)			
4. Project Readiness (5)		Project Rank	
5. Benefits (15)		Statewide (of 19 Standard applications)	
6. Local Support (5)		Regional (of all applications)	
7. Sustainability (5)		Stage 3 Ranking Score (100)	
Total Stage 3 Score (100)			
Funding & Cost	Requested	Recommended	
Total Cost Through Construction	\$6,927,870	\$6,927,870	Cost of Electricity \$0.82/kWh
REF9 Grant Funds	\$1,710,000	\$0	Price of Fuel \$2.60/Gal
Matching Funds	\$5,000	\$0	Household Energy Cost \$7,117

AEA Review Comments & Recommendation

Did Not Pass Stage 2

Application did not meet the minimum score of 40 points in stage 2. The application will not proceed to stage 3 per Section 4 – “Stage 2”, of the REF Process Manual. Project concerns: Cost estimate likely significantly low for whole project. Breaking project up over many years with multiple mobilization and longer project management have much higher costs. Funding to complete project not identified so break of many years before construction can resume if ever. Most recent cost estimate not provided, no supporting documentation outlining cost estimate. \$15k for annual O&M on hydro and diesel appears low. Applicant has not yet provided AEA with final deliverables for Design and Permitting funding from 2013 AEA REF Round 6. Grant period of performance is being extended to end of March 2021. This may be an indication to AEA that the proposed schedule is likely too condensed. As evidenced by the school closure in 2011, due to low enrollment, market demand in the local area appears to be trending downward. Comments concerning funding of future phases of construction are non-descript. Applicant states they have ability to service debt through own revenue, however, the amount of debt service which could be taken on is unknown and insufficient to fund entire project.

Election District: S-37 Bristol Bay/Aleutians/Upper Kuskokwim

Renewable Energy Fund: Round 13 Application Summaries



Kotzebue Community-Scale Energy Storage System

App #13018

Standard Application

Project Type: Storage**Energy Region:** Northwest Arctic**Applicant:** Kotzebue Electric Association, Inc.**Proposed Phase(s):** Design**Applicant Type:** Utility**Recommended Phase(s):** Design

Project Description

It is the Kotzebue Electric Association (KEA) Board of Director's goal to achieve 50% renewable energy generation by 2025. To achieve this goal, a community-scale Battery Energy Storage System (BESS) is necessary to manage variable generation from wind and solar power. KEA installed and began operating a small lithium-ion BESS in 2015 that has been successful in allowing KEA to capture more renewable energy, improve system reliability (outage mitigation) and reduce diesel importation. To reduce diesel importation by 50%, maintain system reliability and capture more renewable energy, KEA proposes to construct a community scale BESS. The proposed BESS will allow for 100+% renewable power generation from renewable resources (diesel-free power generation) and maximum use of KEA's wind and solar assets.

DNR/DMLW Feasibility Comments

No NRO involvementPrivate/Municipal/Power PlantWe have no objection to any feasibility analysis proposed and would need more information (likely derived from the feasibility and other planning analysis) to determine how public access afforded by RS 2477 ROWs and 17(b) easements could be affected by such projects as they move towards maturity. DNR - PAAD Unit

DNR/DGGS Feasibility Comments

The DMLW Mining section reviewed the AEA projects from a mining stand point and did not note any issues that would affecting mining, since the majority of the projects are not on state owned land and did not note any mining locations in the vicinity of the projects.

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. Additional information on active faults is available in the Quaternary fault & fold digital database: <http://maps.dggs.alaska.gov/qff/>, <http://doi.org/10.14509/qff>, and <https://doi.org/10.14509/24956>.

Renewable Energy Fund: Round 13 Application Summaries



Kotzebue Community-Scale Energy Storage System

App #13018

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis	
1. Cost of Energy (35)	14.29	Stage 2 Tech & Econ Score (100)	48.54
2. Matching Resources (15)	13.00	Benefit/Cost Ratio	0.85
3. Stage 2 Feasibility (20)	12.13		
4. Project Readiness (5)	3.07	Project Rank	
5. Benefits (15)	1.50	Statewide (of 19 Standard applications)	8
6. Local Support (5)	0.00	Regional (of all applications)	2
7. Sustainability (5)	3.77	Stage 3 Ranking Score (100)	51.52
Total Stage 3 Score (100)	51.52		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$3,675,000	\$3,675,000	Cost of Electricity	\$0.41/kWh
REF13 Grant Funds	\$325,000	\$325,000	Price of Fuel	\$5.49/Gal
Matching Funds	\$100,000	\$100,000	Household Energy Cost	\$7,264

AEA Review Comments & Recommendation

Full Funding with Special Provision

KEA is requesting grant monies in the amount of \$325,000 for the final design and permitting phase of the integration of a BESS into their local wind-solar-diesel power system. The scope of work relating to the use of grant monies as stated in the application is concerning a system power flow study and a techno-economic study. These studies will be utilized in selecting the appropriate BESS requirements for achieving 100% renewable energy penetration. KEA is an established utility with experience in developing and operating a grid with multiple generation sources. KEA has demonstrated a commitment to integrating renewable energy system in their grid through the development of both wind and solar systems at project site. KEA has also demonstrated experience in procurement and operation of a small-scale BESS through their 2015 BESS implementation. AEA recommendation is full funding of \$325,000 with special provisions for the proposed project.

Project Concerns: KEA did not adequately provide a sufficient amount of data relating to the performance of their existing solar, wind, and BESS systems. This is a risk to the project as it does not provide sufficient evidence as to the potential performance of the proposed system. A study assessing potential performance prior to the implementation of the 2015 BESS was provided, however, current performance data would be more helpful in this application. KEA's provided schedule seems a bit tight considering that both the technical and economic studies are proposed to be conducted simultaneously. There is a risk that the labor required to conduct these studies may become over-encumbered. KEA's stated O&M appears on the low end of the spectrum, with \$5,000 estimated yielding less than 100 man-hours per year. Anticipated diesel savings are likely under-estimated. Final design should consider the integration of indicated those future wind turbines replacing the aging existing turbines. It is an assumption that the final design will lend itself to the selection of the appropriate model BESS for KEA's existing grid. Significant cost overruns, while unlikely, are a risk to the project as to extent of the overrun could affect the future financial position of the applicant.

Election District: T-40 Arctic

Renewable Energy Fund: Round 13 Application Summaries**NENANA BIOMASS AND WASHETERIA****App #13019****Heat Application****Project Type:** Biomass**Energy Region:** Railbelt**Applicant:** City of Nenana**Proposed Phase(s):** Construction**Applicant Type:** Local Government**Recommended Phase(s):** 0**Project Description**

The city of Nenana is making remarkable strides towards the construction of a multi-purpose biomass facility. When completed, the project will meet multiple needs within the city. For instance, it will supplement the heating requirements of municipal buildings and house a washeteria (public showers, laundry, water filling station). The facility and operation will support local employment, support and improve community sanitation, potentially revitalize local milling industry and the biproducts of the wood combustion will be a major source of marketable biochar – a soil amendment that helps to increase soil fertility for agriculture

Renewable Energy Fund: Round 13 Application Summaries



NENANA BIOMASS AND WASHETERIA

App #13019

Heat Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis
1. Cost of Energy (35)		Stage 2 Tech & Econ Score (100)
2. Matching Resources (15)		Benefit/Cost Ratio
3. Stage 2 Feasibility (20)		
4. Project Readiness (5)		Project Rank
5. Benefits (15)		Statewide (of 4 Heat applications)
6. Local Support (5)		Regional (of all applications)
7. Sustainability (5)		Stage 3 Ranking Score (100)
Total Stage 3 Score (100)		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$1,048,000	\$	Cost of Electricity	\$/kWh
REF13 Grant Funds	\$894,000	\$0	Price of Fuel	\$/Gal
Matching Funds	\$00	\$0	Household Energy Cost	

AEA Review Comments & Recommendation

Did Not Pass Stage 1

Election District: C-6 Eielson/Denali/Upper Yukon/Border

Renewable Energy Fund: Round 13 Application Summaries



Akiachak Reconnaissance Study

App #13020**Standard Application****Project Type:** Wind, Solar, Storage**Energy Region:** Lower Yukon-Kuskokwim**Applicant:** Akiachak Ltd.**Proposed Phase(s):** Recon**Applicant Type:** Utility**Recommended Phase(s):** Recon

Project Description

Reconnaissance Study will focus on collecting and analyzing Akiachak's current diesel system and its wind and solar resources along with its electric and thermal load data. This baseline data will then be used to create a conceptual design for an energy system that incorporates wind/solar/battery with the current diesel system. A proposed costs and financing will also be included in the final Reconnaissance Study Report.

Renewable Energy Fund: Round 13 Application Summaries



Akiachak Reconnaissance Study

App #13020

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis
1. Cost of Energy (35)		Stage 2 Tech & Econ Score (100)
2. Matching Resources (15)		Benefit/Cost Ratio
3. Stage 2 Feasibility (20)		
4. Project Readiness (5)		Project Rank
5. Benefits (15)		Statewide (of 19 Standard applications)
6. Local Support (5)		Regional (of all applications)
7. Sustainability (5)		Stage 3 Ranking Score (100)
Total Stage 3 Score (100)		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$91,000	\$	Cost of Electricity	\$/kWh
REF13 Grant Funds	\$91,000	\$0	Price of Fuel	\$/Gal
Matching Funds	\$00	\$0	Household Energy Cost	

AEA Review Comments & Recommendation

Did Not Pass Stage 1

Election District: S-38 Lower Kuskokwim

Renewable Energy Fund: Round 13 Application Summaries



Port Heiden Reconnaissance study

App #13021**Standard Application****Project Type:** Wind, Solar, Storage**Energy Region:** Bristol Bay**Applicant:** City of Port Heiden**Proposed Phase(s):** Recon**Applicant Type:** Utility**Recommended Phase(s):** Recon

Project Description

Reconnaissance Study will focus on collecting and analyzing Port Heiden's current diesel system and its wind and solar resources along with its electric and thermal load data. This baseline data will then be used to create a conceptual design for an energy system that incorporates wind/solar/battery with the current diesel system. A proposed costs and financing will also be included in the final Reconnaissance Study Report.

Renewable Energy Fund: Round 13 Application Summaries



Port Heiden Reconnaissance study

App #13021

Standard Application

Stage 3 Scoring Summary

Criterion (Max Score)	Score	Feasibility Analysis
1. Cost of Energy (35)		Stage 2 Tech & Econ Score (100)
2. Matching Resources (15)		Benefit/Cost Ratio
3. Stage 2 Feasibility (20)		
4. Project Readiness (5)		Project Rank
5. Benefits (15)		Statewide (of 19 Standard applications)
6. Local Support (5)		Regional (of all applications)
7. Sustainability (5)		Stage 3 Ranking Score (100)
Total Stage 3 Score (100)		

Funding & Cost	Requested	Recommended		
Total Cost Through Construction	\$91,000	\$	Cost of Electricity	\$/kWh
REF13 Grant Funds	\$91,000	\$0	Price of Fuel	\$/Gal
Matching Funds	\$00	\$0	Household Energy Cost	

AEA Review Comments & Recommendation

Did Not Pass Stage 1

Election District: S-37 Bristol Bay/Aleutians/Upper Kuskokwim