Renewable Energy Fund: Round 17 Application Summaries

Homer Energy Recovery Project

App #17001 **Standard Application**

Project Type: Hydro
Applicant: City of Homer
Applicant Type: Local Government
Energy Region: Railbelt
Proposed Phase(s): Construction
Recommended Phase(s): Construction

Project Description

In the City of Homer, there exists a pressure control facility located in the City's potable water distribution system. This a mission critical pipeline where the City manages pressure for the potable water supply from the treatment plant to residences and business customers. This pressure control facility is currently venting excess pressure that the City wants to recover and use to produce renewable energy. The proposed project will create a flow bypass around the existing pressure control valve to flow through an energy recovery system. This system shall utilize an integrated solution, a pressure recovery valve that will generate a new source of renewable energy, reduce Homer's carbon footprint, save water and extend the life of its infrastructure. The proposed project shall have a capacity of 10 kW and generate 42,000 kWh that will be used to reduce operating costs for the City's Department of Public Works, Water Utility. Nameplate Capacity: 10kW; Annual Energy: 42,000 kWh; Annual Nat. gas offset: 336 Mcf.

DNR/DMLW Feasibility Comments

No DMLW-managed lands identified in project.Kenai Area Plan but not on State land.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

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 (https://doi.org/10.14509/24956), tsunamis https://doi.org/10.14509/29523), landslides, volcanoes, liquefaction, subsidence, storm surges, ice movement, snow avalanches, erosion, radon (https://maps.dggs.alaska.gov/radon/), and naturally occurring asbestos, and incorporate appropriate measures to mitigate the risks. Projects may be required to perform a geohazards site survey as a condition of receiving construction permits, depending on location of proposed site.Updated tsunami inundation maps for Homer are located at http://doi.org/10.14509/14474. General area is subject to landslides, earthquake hazards (http://dggs.alaska.gov/pubs/id/3883), and volcanic ash accumulation. Known indoor radon values vary from below detection to 18.7 pCi/L."

Renewable Energy Fund: Round 17 Application Summaries

ALASKA ENERGY AUTHORITY

Homer Energy Recovery Project

App #17001 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	16.06
2. Matching Resources (15)	19.50
3. Stage 2 Feasibility (25)	16.50
4. Project Readiness (5)	4.33
5. Benefits (10)	1.67
6. Local Support (5)	2.00
7. Sustainability (10)	8.33
Total Stage 3 Score (100)	68.39

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	66.00
Benefit/Cost Ratio	0.01

Project Rank	
Statewide (of 16 Standard applications)	8
Regional (of all applications)	
Stage 3 Ranking Score (100)	68.39

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$370,000	$370,000
REF Grant Funds	$280,000	$280,000
Matching Funds	$90,000	$90,000

Cost of Electricity	$0.24/kWh
Price of Fuel	$3.73/Gal
Household Energy Cost	$7,120

AEA Review Comments & Recommendation

Full Funding

Election District: 6-C

Renewable Energy Fund: Round 17 Application Summaries

Nuvista Kwethluk Wind and Battery Project Completion

App #17002 **Standard Application**

Project Type: Wind, Transmission, Storage
Applicant: Nuvista Light and Electric Cooperative Incorporated
Applicant Type: IPP
Energy Region: Lower Yukon-Kuskokwim
Proposed Phase(s): Construction
Recommended Phase(s): Construction

Project Description

Kwethluk Incorporated (KI) is working with Nuvista Light & Electric Cooperative (Nuvista) on a Wind and Battery Project in Kwethluk, Alaska. Nuvista hired Intelligent Energy Systems as the contractors for this project in 2019. Kwethluk Inc. and Nuvista hired twenty local construction crew members to work seasonally on this project in 2020-2022. The wind and battery project includes the installation of 4 X 100 KW 24.4 wind turbines, a 500 KW battery energy storage system, 200 KW load regulating boiler, master controller to integrate the renewable energy into the existing diesel system, and 30 electrical thermal stoves. All material and equipment are in place in Kwethluk. The Covid 19 pandemic caused major delays and increased costs for materials (equipment and shipping via air and barge) for the wind and battery project causing increased costs. Kwethluk has had 2 years of very wet summers making the constructions season very difficult when dealing with heavy equipment and wet tundra/roads. The project was put on weather hold multiple times in the last two years due to roads washing out and the work area just too wet to work in. The project had another major setback when it learned of the poor craftsmanship of the supporting safety cables for erecting the towers in September of 2022. The project team attempted to raise one of the towers when two spelter cable connection failed causing major structural damage to the gin pole and damage to the base structure of the tower assembly. This has added a 1 year + delay to the project and many extra work hours to fix the damaged tower. Since then, new cables have been replaced by the manufacturer and is currently at the job site in Kwethluk, Alaska. With these setbacks and overlying costs, Nuvista does not have the extra funds to complete the project at this time. This application to the AEA REF Round 16 is to fund the final steps of the project (installation of the 30 ETS stoves, raise the towers) and commissioning the system. Nameplate Capacity: 400kW Wind + 500kW Battery Storage + 200kW load-regulating boiler & master controller. Annual Energy: 895,570 kWh Annual Diesel offset: 57,739 gal.

DNR/DMLW Feasibility Comments

No DMLW-managed lands identified in project. Not in an area plan or on state land.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. Geologic map https://dggs.alaska.gov/pubs/id/12857 may have useful regional geologic information. General area is subject to erosion and flooding. This region is in the zone of sporadic to isolated permafrost (dominantly lake thermokart terrain), meaning that ~10-50 percent or less of the ground surface is underlain by perennially frozen ground (permafrost) (Jorgenson and others, 2008; Olefeldt and others, 2016). Radon concentrations are modeled to be low.

Renewable Energy Fund: Round 17 Application Summaries

Nuvista Kwethluk Wind and Battery Project Completion

App #17002 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	17.75
2. Matching Resources (15)	21.00
3. Stage 2 Feasibility (25)	15.58
4. Project Readiness (5)	4.33
5. Benefits (10)	1.00
6. Local Support (5)	2.00
7. Sustainability (10)	9.33
Total Stage 3 Score (100)	71.00

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	62.33
Benefit/Cost Ratio	0.67

Project Rank	
Statewide (of 16 Standard applications)	4
Regional (of all applications)	
Stage 3 Ranking Score (100)	71.00

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$	$
REF Grant Funds	$738,979	$738,979
Matching Funds	$00	$00

Cost of Electricity	$0.52/kWh
Price of Fuel	$5.56/Gal
Household Energy Cost	$7,869

AEA Review Comments & Recommendation **Full Funding with Special Provision**

Election District: 38-S

Renewable Energy Fund: Round 17 Application Summaries

Sterling Solar Project

App #17003 **Standard Application**

Project Type: Solar
Applicant: Utopian Power LLC
Applicant Type: IPP
Energy Region: Railbelt
Proposed Phase(s): Design, Construction
Recommended Phase(s): Design, Construction

Project Description

The project is a sustainable energy solution that aims to integrate a local and resilient solar energy model. The project involves the installation of a 4MWdc solar system which will be used to generate electricity. The solar system will be on a landfill which is owned by the Kenai Peninsula Borough and leased to Utopian Power. The energy generated will be used to power the state's communities. This system will also feed electricity back to the grid through the local utility. Nameplate Capacity: 3,200kW; Annual Energy: 3,238,000 kWh; Annual Nat. gas offset: 25,904 Mcf.

DNR/DMLW Feasibility Comments

No DMLW-managed lands identified in project. On KPB lands. In Kenai National Moose Range on Mental Health Trust Land -- cannot dispose of land within an LDA.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. Guidebook and geologic map https://doi.org/10.14509/15941 may have useful regional geologic information. General area is subject to earthquake hazards (http://dggs.alaska.gov/pubs/id/3883) and volcanic ash accumulation. Known indoor radon values vary from below detection to 7.7 pCi/L.

Renewable Energy Fund: Round 17 Application Summaries

ALASKA ENERGY AUTHORITY

Sterling Solar Project

App #17003 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	16.06
2. Matching Resources (15)	0.00
3. Stage 2 Feasibility (25)	10.42
4. Project Readiness (5)	1.50
5. Benefits (10)	1.42
6. Local Support (5)	0.00
7. Sustainability (10)	8.00
Total Stage 3 Score (100)	37.39

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	41.67
Benefit/Cost Ratio	0.70

Project Rank	
Statewide (of 16 Standard applications)	16
Regional (of all applications)	
Stage 3 Ranking Score (100)	37.39

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$5,955,000	$5,955,000
REF Grant Funds	$2,000,000	$12,500
Matching Funds	$2,000,000	$12,500

Cost of Electricity	$0.24/kWh
Price of Fuel	$3.73/Gal
Household Energy Cost	$7,120

AEA Review Comments & Recommendation

Partial Funding with Special Provision

Recommendation:
Funding for final design and permitting recommended prior to recommendation for funding construction phase. Many aspects of the project at this juncture are unclear and need to be revised.

Project Concerns: Cost estimates are quite vague, more detail is requested prior to full funding. Lack of detail on proposed system design, no letters of support included. Not specific in stating required permits. Lack of project presentation including lack of discussion of model results and no technical analysis of proposed system was provided. Project capacity 3.2MW(AC) / 4MW(DC), modeled using AC.

Election District: 8-D

Renewable Energy Fund: Round 17 Application Summaries

Chevak Battery Energy Storage System Project

App #17004 **Standard Application**

Project Type: Storage
Applicant: Alaska Village Electric Cooperative, Inc.
Applicant Type: Utility
Energy Region: Lower Yukon-Kuskokwim
Proposed Phase(s): Construction
Recommended Phase(s): Construction

Project Description

Alaska Village Electric Cooperative, Inc. (AVEC) is requesting $968,644 through an Alaska Energy Authority (AEA) Renewable Energy Fund (REF) grant to construct a Battery Energy Storage System (BESS) to be incorporated into the Chevak power system, which includes four Northwind 100 Turbines and a power plant. Presently, in order to prevent outages during wind fluctuations, AVEC must have a loaded diesel generator constantly running. A BESS would supply a constant spinning reserve providing power during losses of wind resource generation for short periods while replacement diesel generation is started and brought online. Because a generator would not be constantly running, this project would allow the power plant to burn less diesel, thus helping to lower the cost of power in Chevak. The AEA REF grant funds would be used to incorporate a BESS into the existing wind turbine system and power plant in Chevak, and if funded by the AEA, this effort will be supplemented with AVEC contributions. The scope of work under this funding request is for the construction phase of this project and includes the installation of a BESS that will supply a spinning reserve of power allowing AVEC's Chevak power plant to operate diesels off. Battery storage system nameplate capacity: 600kW; Annual diesel offset: 38,664 gal.

DNR/DMLW Feasibility Comments

No DMLW-managed lands identified in project. On TLO lands. Not on state land.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. Geologic map and report https://dggs.alaska.gov/pubs/id/13624 may have useful regional information. General area is subject to erosion and flooding. This region is in the zone of sporadic to isolated permafrost (lake and wetland thermokart terrain), meaning that ~10-50 percent or less of the ground surface is underlain by perennially frozen ground (permafrost) (Jorgenson and others, 2008; Olefeldt and others, 2016). Radon concentrations are modeled to be low.

Renewable Energy Fund: Round 17 Application Summaries

Chevak Battery Energy Storage System Project

App #17004 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	15.57
2. Matching Resources (15)	16.50
3. Stage 2 Feasibility (25)	17.29
4. Project Readiness (5)	4.00
5. Benefits (10)	2.08
6. Local Support (5)	2.50
7. Sustainability (10)	8.00
Total Stage 3 Score (100)	65.94

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	69.17
Benefit/Cost Ratio	0.62

Project Rank	
Statewide (of 16 Standard applications)	10
Regional (of all applications)	
Stage 3 Ranking Score (100)	65.94

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$	$
REF Grant Funds	$968,644	$968,644
Matching Funds	$170,937	$170,937

Cost of Electricity	$0.52/kWh
Price of Fuel	$4.64/Gal
Household Energy Cost	$6,902

AEA Review Comments & Recommendation **Full Funding**

Election District: 38-S

Renewable Energy Fund: Round 17 Application Summaries

Quinhagak Battery Energy Storage System Project

App #17005 **Standard Application**

Project Type: Storage
Applicant: Alaska Village Electric Cooperative, Inc.
Applicant Type: Utility
Energy Region: Lower Yukon-Kuskokwim
Proposed Phase(s): Construction
Recommended Phase(s): Construction

Project Description

Alaska Village Electric Cooperative, Inc. (AVEC) is requesting $443,956 through an Alaska Energy Authority (AEA) Renewable Energy Fund (REF) grant to construct a Battery Energy Storage System (BESS) to be incorporated into the Quinhagak power system, which includes three Northwind 100 wind turbines and a power plant. Presently, in order to prevent outages during wind fluctuations, AVEC must have a diesel generator constantly running. A BESS would supply a constant spinning reserve providing power during losses of wind resource generation for short periods while replacement diesel generation is started and brought online. Because a generator would not be constantly running, this project would allow the power plant to burn less diesel, thus helping to lower the cost of power in Quinhagak. Battery storage system nameplate capacity: 600kW ; Annual diesel fuel offset: 40,660 gal.

DNR/DMLW Feasibility Comments

No DMLW-managed lands identified in project. Bristol Bay Area Plan - not on state land.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. Geologic map and report https://dggs.alaska.gov/pubs/id/13624 may have useful regional information. General area is subject to erosion and flooding. This region is in the zone of sporadic permafrost (lake and wetland thermokart terrain), meaning that 10-50 percent of the ground surface is underlain by perennially frozen ground (permafrost) (Jorgenson and others, 2008; Olefeldt and others, 2016). Radon concentrations are modeled to be low.

Renewable Energy Fund: Round 17 Application Summaries

Quinhagak Battery Energy Storage System Project

App #17005 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	15.7
2. Matching Resources (15)	21.00
3. Stage 2 Feasibility (25)	17.17
4. Project Readiness (5)	4.00
5. Benefits (10)	2.00
6. Local Support (5)	2.50
7. Sustainability (10)	8.00
Total Stage 3 Score (100)	70.37

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	68.67
Benefit/Cost Ratio	0.88

Project Rank	
Statewide (of 16 Standard applications)	5
Regional (of all applications)	
Stage 3 Ranking Score (100)	70.37

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$1,236,581	$1,236,581
REF Grant Funds	$443,956	$443,956
Matching Funds	$707,625	$707,625

Cost of Electricity	$0.50/kWh
Price of Fuel	$4.65/Gal
Household Energy Cost	$6,962

AEA Review Comments & Recommendation

Full Funding

Election District: 38-S

Renewable Energy Fund: Round 17 Application Summaries

Pelican Hydro Relicensing Project, Restoration, Repair

App #17006 **Standard Application**

Project Type: Hydro
Applicant: City of Pelican, Pelican Utilities
Applicant Type: Utility
Energy Region: Southeast
Proposed Phase(s): Design, Construction
Recommended Phase(s): Design, Construction

Project Description

The City of Pelican is in the process of relicensing its FERC license P-10198 for its 700kW Federal Energy Regulatory Commission (FERC) hydropower project. FERC relicensing requires three significant actions: FERC regulatory relicensing, which includes implementing a fish habitat restoration plan (FHRP), replacing a damaged trash rack, and stabilizing a Gabion Wall at the Powerhouse from stream bank erosion. These relicensing actions are vital to ensure that the Pelican community continues to benefit from dependable and cost-effective hydropower, which supports its residents, businesses, and the local economy. Lat: 57.95819; Long: -136.21535. Nameplate capacity: 700kW; Annual Energy: 977,497 kWh ; Annual Diesel Offset: 78,200 gal.

DNR/DMLW Feasibility Comments

Northern Southeast Area Plan (unit C12) classified Water Resources.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. Geologic map and report https://dggs.alaska.gov/pubs/id/11998 may have some useful regional geologic information. Tsunami inundation maps for Pelican are located at https://doi.org/10.14509/30423. General area is subject to earthquake hazards (https://doi.org/10.14509/2356; https://www.ncei.noaa.gov/maps/hazards). Radon concentrations are modeled to be moderate, averaging 2-4 pCi/L.

Renewable Energy Fund: Round 17 Application Summaries

Pelican Hydro Relicensing Project, Restoration, Repair

App #17006 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	14.38
2. Matching Resources (15)	10.50
3. Stage 2 Feasibility (25)	24.04
4. Project Readiness (5)	5.00
5. Benefits (10)	9.67
6. Local Support (5)	2.50
7. Sustainability (10)	10.00
Total Stage 3 Score (100)	76.09

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	96.17
Benefit/Cost Ratio	1.63

Project Rank	
Statewide (of 16 Standard applications)	1
Regional (of all applications)	
Stage 3 Ranking Score (100)	76.09

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$00	$
REF Grant Funds	$650,474	$650,474
Matching Funds	$50,000	$50,000

Cost of Electricity	$0.26/kWh
Price of Fuel	$4.89/Gal
Household Energy Cost	$6,374

AEA Review Comments & Recommendation

Full Funding

This project has been confirmed as an eligible project under AEA statutes AS 42.45.045(f)(1). Per a legal memo issued by AEA on July 20, 2023, the City of Pelican's (applicant) stated use of funds would be permissible use of program funds because the project is "an addition to an existing project made after August 20, 2008.

Election District: 2-A

Renewable Energy Fund: Round 17 Application Summaries

Railbelt Wind Diversification Alaska Renewables

App #17007 **Standard Application**

Project Type: Wind, Transmission, Storage
Applicant: Alaska Renewables LLC
Applicant Type: IPP
Energy Region: Railbelt
Proposed Phase(s): Feasibility
Recommended Phase(s): Feasibility

Project Description

Following years of reconnaissance, initial field assessments, and land leasing discussions with the State of Alaska and several Alaska Native Regional and Village Corporations, AKR now has several wind development assets which have the potential to dramatically displace expensive fossil fuel consumption for electricity generation in Alaska. Bald Hills Wind is a project suggested by members of the Native Village of Tyonek and would interconnect into Chugach Electric's grid. Chatanika Wind is a project in the Interior that would relieve the flow of power from south to north and would interconnect into GVEA's grid. Walker Dome is a project at the center of Alaska's Intertie that would provide grid stability between south and north, would support the community of Healy through their energy transition with the planned retirement of Healy 2, and would interconnect into GVEA's grid. Now, AKR is advancing into the core Phase II work of site environmental and wind resource data collection. Battery energy storage, long-duration storage, and transmission services are also key technology investments that are relevant to some or all these projects to provide grid stability and part of the mid-term development scope of the projects. Nameplate Capacity: 609,000 kW; Annual Energy: 2,133,936,000 kWh; Annual nat. gas offset: 17,071,488 Mcf.

DNR/DMLW Feasibility Comments

"PAAD - Site 2 appears to be near accepted RS 2477 Right of way. RST Merrill River - Stony River Passes near this location. The project will be subject to the right of way for this trail. Site 3 appears to be at the fork of two accepted RS 2477 Rights-of-way. RST 237 Circle-Fairbanks Trail a codified RS 2477 in AS 19.30.400 and uncodified RST 1908 Chena Hot Springs - Olympia Creek Trail. The project will be subject to the Right-of-way for these two trails and travel on these two trails will not be limited by the project."Site 1: In Yukon-Tanana Area Plan on Mental Health Trust Land; Site 2: in Kenai Area Plan on Mental Health Trust Land; Site 3: in Eastern Tanana Area Plan on state land but unclassified.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. Geologic maps and reports may have useful regional information: https://dggs.alaska.gov/pubs/id/12899 Geologic map (site 1); https://doi.org/10.14509/29471 Geologic map and report (site 2); https://dggs.alaska.gov/pubs/id/12617 Geologic (map site 3).

Renewable Energy Fund: Round 17 Application Summaries

ALASKA ENERGY AUTHORITY

Railbelt Wind Diversification Alaska Renewables

App #17007 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	12.31
2. Matching Resources (15)	19.50
3. Stage 2 Feasibility (25)	17.64
4. Project Readiness (5)	3.67
5. Benefits (10)	5.92
6. Local Support (5)	2.50
7. Sustainability (10)	7.33
Total Stage 3 Score (100)	68.86

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	70.54
Benefit/Cost Ratio	1.22
Project Rank	
Statewide (of 16 Standard applications)	7
Regional (of all applications)	
Stage 3 Ranking Score (100)	68.86

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$	$
REF Grant Funds	$2,000,000	$2,000,000
Matching Funds	$2,187,000	$2,187,000

Cost of Electricity	$0.21/kWh
Price of Fuel	$2.47/Gal
Household Energy Cost	$5,458

AEA Review Comments & Recommendation **Full Funding**

Election District:

Renewable Energy Fund: Round 17 Application Summaries

ALASKA ENERGY AUTHORITY

Chignik Hydroelectric Power System

App #17008 **Standard Application**

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

Project Description

This application is a revised application from Round 15 (15014). There are modifications from the Round 15 application, including the addition of beneficial electrification. The City of Chignik's water source is Indian Lake which is impounded by a timber buttress dam. Water flows from the dam through a 7,260 ft transmission line to the community water treatment plant. Flow from Indian Lake has also historically powered a now decommissioned 60 kW hydroelectric turbine in local cannery, the FERC permit for which is now owned by the city. The dam and portions of the water transmission lines are over 70 years old, near failure, and in urgent need of replacement. As of the date of this application, the Alaska Area Office of the Indian Health Service (IHS) has approved $7,230,830 of funding ($639,987 for engineering- including geotechnical, survey, and design- and $6,590,843 for construction) for the purpose of renovating the aging dam and water transmission lines. This funding is being reviewed by the national level IHS and expected to be available in 2023. The dam and water transmission line renovation project to be funded by IHS is referred to as the "dam renovation" for the remainder of this application. Concurrent with this dam renovation, the city would like to install a hydroelectric power generation system, consisting of a penstock, new powerhouse with a Turgo turbine, tailrace, electrical transmission to the existing diesel powerplant.. This project is referred to the "hydroelectric system" for the remainder of this application. This application seeks funding to complete the final design and permitting phase (Phase III) for the hydroelectric system concurrent with the design of the dam renovation. Phase III of the hydroelectric system project will utilize a 2014 feasibility study performed by the consulting firm Hatch Ltd., and a 2018 Preliminary Engineering Report (PER) performed by the Alaska Native Tribal Health Consortium (both documents are included in Appendix A). Because the dam renovation is expected to be funded in 2023, is presents a unique opportunity to design the dam renovation concurrently with the hydroelectric system in order to achieve cost savings through economies of scale and ensure that electric generation is considered in the sizing, location and layout of the water source project. If the dam renovation is completed without the hydroelectric system, design and construction of the hydroelectric system would be significantly more expensive, and will be limited by a dam that was designed without consideration for future electrical generation. Therefore, it is vital that funding is provided during the current round of the REF in order to fully leverage the dam renovation funding to achieve maximally efficient achievement of project outcomes. AEA has previously recommended this project for design funding under the REF three times, but the State has not yet appropriated funds for it. However, this is the first application where the dam renovation will be separately funded. The 2014 feasibility study found that the proposed hydroelectric system could meet approximately 94.7% of the city's electrical load, saving approximately 50,441 gallons of diesel annually at a current cost of $5.03 per gallon. This project will save an additional 13,571 gallons of heating fuel by utilizing excess hydro-generated electricity for heating the community clinic and school. This project will provide public benefits to both the local electric utility and individual rate payers in the form of fuel savings to the utility and lowered utility bills for community members. This project would make the local utility financially stronger, keep money circulating in the community that would have otherwise gone to the fuel provider, and reduce fuel use and the associated emissions. Nameplate capacity: 320 kW; Annual Energy: 558,847 kWh; Annual diesel offset: 58,279 gal.

DNR/DMLW Feasibility Comments

Bristol Bay Area Plan - not on state land.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. Geologic map and report https://doi.org/10.3133/b1969B. may have useful regional geologic information. The coastal area in this region is subject to potential tsunami hazard, see https://doi.org/10.14509/29675 and

https://www.ncei.noaa.gov/maps/hazards. General area is subject to volcanic ash accumulation and earthquake hazards. Radon concentrations are modeled to be moderate averaging 2.74 pCi/L

Renewable Energy Fund: Round 17 Application Summaries

ALASKA ENERGY AUTHORITY

Chignik Hydroelectric Power System

App #17008 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	17.37
2. Matching Resources (15)	10.50
3. Stage 2 Feasibility (25)	14.38
4. Project Readiness (5)	3.17
5. Benefits (10)	3.00
6. Local Support (5)	2.50
7. Sustainability (10)	6.00
Total Stage 3 Score (100)	56.91

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	57.50
Benefit/Cost Ratio	1.06

Project Rank	
Statewide (of 16 Standard applications)	15
Regional (of all applications)	
Stage 3 Ranking Score (100)	56.91

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$7,228,206	$7,228,206
REF Grant Funds	$883,012	$883,012
Matching Funds	$44,346	$44,346

Cost of Electricity	$0.58/kWh
Price of Fuel	$5.03/Gal
Household Energy Cost	$7,701

AEA Review Comments & Recommendation

Full Funding

Election District: 37-S

Renewable Energy Fund: Round 17 Application Summaries

Hunter Creek Hydroelectric Feasibility Study Project

App #17009 **Standard Application**

Project Type: Hydro, Transmission, Storage
Applicant: Matanuska Electric Association
Applicant Type: Utility
Energy Region: Railbelt
Proposed Phase(s): Feasibility
Recommended Phase(s): Feasibility

Project Description

This project will conduct a feasibility study of the east fork Hunter Creek hydropower resource by expanding on the findings of the reconnaissance study completed by Eklutna, Inc. in 2013 with partial grant funding award in REF Round 4. The proposed study will include new field studies updated and more detailed technical, regulatory, and economic analysis to determine whether the project is feasible and a preferred project configuration. The prior reconnaissance study identified a viable 7.7 MW run-of-river hydro project on the east fork of Hunter Creek with an estimated 27,100 MWh of annual energy output. East fork project configurations considered by the 2013 study ranged from 5.3 to 23 MW installed capacity and 21,000 to 80,900 MWh annual output. This study will also assess storage potential at the east fork diversion site and the potential added value to the project that can be realized with reservoir and/or battery energy storage system (BESS) to enable the project to form a Knik River microgrid. Nameplate capacity: 7,700 kW; Annual Energy: 27,100,000 kWh; Annual nat. gas offset: 216,800 Mcf.

DNR/DMLW Feasibility Comments

Proposed site (based on a single GPS coordinate and not a project footprint) is located within S016N004E31, which is state selected lands at this point with ANILCA top-filing. It is unlikely that this location is under DNR management. However, if it is determined that this is under DNR management, projects such as this often need development plan details such as placement of infrastructure, transmission lines and access to be clearly defined in the application. Permits may be required for feasibility studies and for access if access development is not within GAUs. If access involves material, a material sales contract may be needed.Knik Public Use Area- LDA (41.23.180) -- No disposals of land within an LDA. Leases may be okay if they follow the management guidelines in the Knick River Public Use Area Management Plan.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. Geologic map and report https://dggs.alaska.gov/pubs/id/24604 may have useful geologic information. General area is subject to snow avalanche and landslide hazards. Radon concentrations are modeled to be moderate, averaging 2-4 pCi/L.

Renewable Energy Fund: Round 17 Application Summaries

Hunter Creek Hydroelectric Feasibility Study Project

App #17009 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	13.35
2. Matching Resources (15)	19.50
3. Stage 2 Feasibility (25)	13.75
4. Project Readiness (5)	3.50
5. Benefits (10)	1.50
6. Local Support (5)	1.00
7. Sustainability (10)	5.00
Total Stage 3 Score (100)	57.60

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	55.00
Benefit/Cost Ratio	0.67

Project Rank	
Statewide (of 16 Standard applications)	14
Regional (of all applications)	
Stage 3 Ranking Score (100)	57.60

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$67,765,000	$67,765,000
REF Grant Funds	$1,280,500	$1,280,500
Matching Funds	$384,500	$384,500

Cost of Electricity	$0.20/kWh
Price of Fuel	$3.30/Gal
Household Energy Cost	$5,920

AEA Review Comments & Recommendation

Full Funding

Election District: Various

Renewable Energy Fund: Round 17 Application Summaries

Goat Lake Hydro Storage Expansion Study

App #17010 **Standard Application**

Project Type: Hydro
Applicant: Goat Lake Hydro, Inc.
Applicant Type: Utility
Energy Region: Southeast
Proposed Phase(s): Recon
Recommended Phase(s): Recon

Project Description

Alaska Power & Telephone (AP&T) subsidiary Goat Lake Hydro, Inc. requests $121,250 in AEA REF Round 16 funding for Phase I Reconnaissance analysis examining an increase to the reservoir at Goat Lake Hydro (GLH), a currently operational hydropower project. GLH will supply $52,250 of in-kind funding as a match. The project currently provides power to the communities of Skagway, Haines, and Dyea, as well as to Inside Passage Electrical Cooperative (IPEC), which resells energy in the community of Klukwan. Nameplate capacity: 4,000 kW (Existing hydro turbine); Annual Energy (increased hydro-storage): 900,000 kWh; Annual diesel offset: 65,597 gal.

DNR/DMLW Feasibility Comments

Northern Southeast Area Plan but not on state land.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. The coastal area in this region is subject to potential tsunami hazard, see https://dggs.alaska.gov/pubs/id/30029 and https://www.ncei.noaa.gov/maps/hazards. General area is subject to earthquake, volcanic ash accumulation, snow avalanche, and landslide hazards. Radon concentrations are modeled to be high, averaging 4 pCi/L or greater.

Renewable Energy Fund: Round 17 Application Summaries

ALASKA ENERGY AUTHORITY

Goat Lake Hydro Storage Expansion Study

App #17010 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	14.37
2. Matching Resources (15)	19.50
3. Stage 2 Feasibility (25)	17.63
4. Project Readiness (5)	5.00
5. Benefits (10)	2.08
6. Local Support (5)	2.50
7. Sustainability (10)	10.00
Total Stage 3 Score (100)	71.08

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	70.50
Benefit/Cost Ratio	0.00

Project Rank	
Statewide (of 16 Standard applications)	3
Regional (of all applications)	
Stage 3 Ranking Score (100)	71.08

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$	$
REF Grant Funds	$121,250	$121,250
Matching Funds	$52,250	$52,250

Cost of Electricity	$0.32/kWh
Price of Fuel	$3.60/Gal
Household Energy Cost	$6,371

AEA Review Comments & Recommendation **Full Funding**

Election District: 3-B

Renewable Energy Fund: Round 17 Application Summaries

Akiachak Native Community 200 kW Solar Energy Project

App #17011 **Standard Application**

Project Type: Solar
Applicant: Akiachak, Ltd
Applicant Type: Government Entity
Energy Region: Lower Yukon-Kuskokwim
Proposed Phase(s): Design, Construction
Recommended Phase(s): Design, Construction

Project Description

The project proposes to install, integrate, and commission a 200-kW solar/PV array energy for the islanded hybrid wind-diesel-battery-heat system for Akiachak Native Community village corporation, Akiachak, Ltd. (ANC), a tribally owned community utility in Akiachak, AK, which is designated as a High Energy Cost Area with a residential retail electric rate of $0.60 per kWh. Our utility was recently awarded a grant through the USDA High Energy Cost (HEC) grant program in the amount of $2,265,809 for the installation of 200 kW solar PV and a battery energy storage system (500 kW/677 kVA lithium ion). While this represents a major upgrade and will be of tremendous benefit to our community, to really be able to optimize the system it needs to be upgraded to include a total of 400 kW PV, as that will boost our displacement of fuel from 17,000 to more than 42,000 gallons annually and more than double the kWh of solar produced annually (from 226,215 to 452,431 kWh). Due to limited availability of funds, we were not able to apply for the full capacity required to optimize our renewable system through the USDA HEC grant; instead, we now seek to leverage that funding as match toward the current proposal, which will allow us to gain cost efficiencies through the combining of these two projects. Other benefits to be gained by adding to our solar array include:- Increased system reliability- Reduced diesel maintenance and operations cost due to increased hours of diesel off operations- Improved community resilience through additional source of energy- The additional displacement of 24,514 gallons of diesel (@$3.90/gallon = $95,605) annually, as well as an additional 900 hours of diesel off operations ($9.25/hour = $8,325) resulting in an estimated annual reduction in operating costs in excess of $103,930 from this 200 kW addition to the overall project.- Reduced fuel purchases, resulting in a deferral of investments in bulk fuel storage capacity as well as a reduction in harmful greenhouse gas emissions- Support for local workforce, both during the period of construction and long-term, through on-going cost savings to our tribal utility- Advancement of knowledge and understanding of integration and operation of diesel-renewable hybrid systems in the region. Nameplate capacity: 400 kW (200 + 200) + 667 kW battery energy storage system; Annual energy: 452,431 kWh; Annual diesel offset: 36,194 gal.

DNR/DMLW Feasibility Comments

No DMLW-managed lands identified in project. Not on state land.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. Geologic map https://dggs.alaska.gov/pubs/id/12857 may have useful information. General area is subject to erosion and flooding. This region is in the zone of sporadic to isolated permafrost (dominantly lake thermokart terrain), meaning that ~10-50 percent or less of the ground surface is underlain by perennially frozen ground (permafrost) (Jorgenson and others, 2008; Olefeldt and others, 2016). Radon concentrations are modeled to be low.

Renewable Energy Fund: Round 17 Application Summaries

ALASKA ENERGY AUTHORITY

Akiachak Native Community 200 kW Solar Energy Project

App #17011 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	20.01
2. Matching Resources (15)	21.00
3. Stage 2 Feasibility (25)	11.11
4. Project Readiness (5)	0.83
5. Benefits (10)	1.38
6. Local Support (5)	1.00
7. Sustainability (10)	8.33
Total Stage 3 Score (100)	63.65

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	44.42
Benefit/Cost Ratio	0.33
Project Rank	
Statewide (of 16 Standard applications)	12
Regional (of all applications)	
Stage 3 Ranking Score (100)	63.65

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$1,443,257	$1,443,257
REF Grant Funds	$1,443,257	$67,833
Matching Funds	$2,265,809	$113,291

Cost of Electricity	$0.60/kWh
Price of Fuel	$6.17/Gal
Household Energy Cost	$8,870

AEA Review Comments & Recommendation

Partial Funding with Special Provision

Recommendation:
The USDA funded solar & battery project is currently in construction and fully funded. This project is to add additional solar capacity. It is unclear how the USDA-funded solar panels will integrate with the four new diesel gensets in the existing diesel powerhouse. There is concern over loss of heat recovery with integration of renewables. Technical feasibility remains in question.

AEA requested a copy of the USDA award, solar resource study, and updated HOMER model from the applicant. Applicant provided the USDA grant agreement, but neither the solar resource study, or the updated HOMER model.

It is recommended that this project be funded for final design, which will better inform the additional solar capacity integration.

Funding for grant administration is not allowable under the REF program. The $8,150 for the line item entitled "AEA award and NTP" under the final design budget is thus removed from the funding recommendation, for a total recommendation of $67,833 for final design.

Election District: 38-S

Renewable Energy Fund: Round 17 Application Summaries

Nenana Biomass District Heat System, Final Phase

App #17012 **Heat Application**

Project Type: Biomass
Applicant: City of Nenana
Applicant Type: Local Government
Energy Region: Yukon-Koyukuk/Upper Tanana
Proposed Phase(s): Construction
Recommended Phase(s): Construction

Project Description

The City of Nenana is a rural community located in the interior of Alaska with a population of 412 residents; 41% of which are Alaskan Native. This is a biomass wood-chip boiler system project that will provide heat to several public buildings, provide services to the community for needs which have never been met before, and help to dramatically reduce heating expenses. The problems this project will address include high utility costs, local poverty rates, climate change impacts and increasing wildfire risk in our region. Nenana is not only identified as an underserved population, but is also an area of persistent poverty with 62.75% LMI. Utilizing woody debris from local sources and forest management projects to supply the biomass boiler mitigates wildfire risk and reduces the use of fossil fuels while providing low-cost heat with a renewable energy source. The biomass facility will support local employment, improve community sanitation, potentially revitalize the local milling industry, and be a major source of marketable biochar – a soil amendment that helps to increase soil fertility for agriculture. The intended outcomes of this project are to provide ongoing employment opportunities and affordable heat, sequester carbon, reduce use of fossil fuels and create healthy tree stands to mitigate wildfire risk in the region. The City's limited budget restricts its ability to provide adequate support to reduce poverty, address unemployment, or bolster the local economy. The grant funding we have received to date has been utilized to design and progress into the final stages of building a biomass wood-chip heating facility. The project began in 2019 and upon completion, will provide heat to the local K-12 school, fitness center, water treatment plant, fire station, school recreation hall and a hookup to heat a future community greenhouse. These amenities which will be available within the community upon the completion of this project will allow for those who live in dry cabins year-round to have local access to safe drinking water, showers, and laundry facilities. The City will have a sustainable energy heat source to provide renewable energy for years to come. Improved forest management practices will reduce wildfire risk in our region. The jobs created by this project will help to improve the poverty rate and increase the resilience of our community, as energy costs are mitigated, and the City budget can facilitate employment opportunities for year-round positions at the Biomass Heat Plant. This is the final phase of the project which is intended to complete all remaining portions of the project and make it fully operational. Nameplate capacity: 2.2 MMBtu/hr (biomass boiler); Annual diesel fuel offset: 44,698 gal.

DNR/DMLW Feasibility Comments

Not on state land.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. Geologic maps and reports https://dggs.alaska.gov/pubs/id/1321 and https://dggs.alaska.gov/pubs/id/1321 may have useful information about the general geology. Location is within the Minto Flats seismic zone, active within the past 150 years, and this region is in the zone of discontinuous to isolated permafrost (wetland thermokart terrain), meaning that ~50-90 percent of the ground surface is underlain by perennially frozen ground (permafrost) (Jorgenson and others, 2008; Olefeldt and others, 2016). Radon concentrations are modeled to be moderate, averaging 2-4 pCi/L.

Renewable Energy Fund: Round 17 Application Summaries

Nenana Biomass District Heat System, Final Phase

App #17012 **Heat Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	15.48
2. Matching Resources (15)	13.50
3. Stage 2 Feasibility (25)	19.64
4. Project Readiness (5)	4.33
5. Benefits (10)	5.33
6. Local Support (5)	2.50
7. Sustainability (10)	8.67
Total Stage 3 Score (100)	69.46

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	78.58
Benefit/Cost Ratio	1.14

Project Rank	
Statewide (of 2 Heat applications)	1
Regional (of all applications)	
Stage 3 Ranking Score (100)	69.46

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$1,223,000	$1,223,000
REF Grant Funds	$1,223,000	$1,223,000
Matching Funds	$168,322	$168,322

Cost of Electricity	$0.25/kWh
Price of Fuel	$4.31/Gal
Household Energy Cost	$6,864

AEA Review Comments & Recommendation **Full Funding**

Election District: 36-R

Renewable Energy Fund: Round 17 Application Summaries

NJUS Solar Nome Banner Ridge Solar Farm

App #17013 **Standard Application**

Project Type: Solar
Applicant: Nome Joint Utility System
Applicant Type: Utility
Energy Region: Bering Straits
Proposed Phase(s): Construction
Recommended Phase(s): Construction

Project Description

Nome Joint Utility Service (NJUS) proposes construction of a 1 MW capacity solar PV farm on the south slope of Banner Ridge near its existing wind farm of two EWT wind turbines. Solar power, combined with the 2 MWh/2 MW battery energy storage system (BESS) project (awarded to NJUS in REF Round 14) will supply Nome with renewable energy during the summer months when winds are light. Given lower load demand during summer, this will enable NJUS to operate its lower capacity/lower minimum load Caterpillar generators in its old powerplant instead of the high capacity/high minimum load Wartsila generators in the new plant. NJUS envisions eventual growth of solar capacity to perhaps 5 MW to serve anticipated load growth from new mining and national security infrastructure. Nameplate capacity: 1,000 kW; Annual energy: 1,050,805 kWh; Annual diesel offset: 67,519 gal.

DNR/DMLW Feasibility Comments

Northwest Area Plan but not on state land.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. The geologic maps and report https://doi.org/10.14509/1665 may have some useful information about the general geology. This region is in the zone of discontinuous permafrost, meaning that 50-90 percent of the ground surface is underlain by perennially frozen ground (permafrost) (Jorgenson and others, 2008). Radon concentrations are modeled to be low to moderate, averaging below detection to 4 pCi/L.

Renewable Energy Fund: Round 17 Application Summaries

NJUS Solar Nome Banner Ridge Solar Farm

App #17013 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	20.61
2. Matching Resources (15)	9.00
3. Stage 2 Feasibility (25)	15.29
4. Project Readiness (5)	4.50
5. Benefits (10)	1.58
6. Local Support (5)	1.00
7. Sustainability (10)	8.00
Total Stage 3 Score (100)	59.99

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	61.17
Benefit/Cost Ratio	0.57

Project Rank	
Statewide (of 16 Standard applications)	13
Regional (of all applications)	
Stage 3 Ranking Score (100)	59.99

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$4,050,000	$4,050,000
REF Grant Funds	$4,000,000	$4,000,000
Matching Funds	$50,000	$50,000

Cost of Electricity	$0.36/kWh
Price of Fuel	$6.85/Gal
Household Energy Cost	$9,139

AEA Review Comments & Recommendation

Full Funding

Election District: 39-T

Renewable Energy Fund: Round 17 Application Summaries

Naknek Solar PV on Cape Suwarof

App #17014 **Standard Application**

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

Project Description

Naknek Electric Association (NEA) proposes the construction of a 1 MW capacity solar PV system on Bristol Bay Borough property at Cape Suwarof. This will expand NEA's existing 80 kW solar system on the Cape which has been operational for several years. Solar power, combined with the 1.5 MWh/1.5 MW battery energy storage system (BESS) project awarded to NEA in REF Round 15, will supply the Naknek Service Area (Naknek, South Naknek, and King Salmon) with renewable energy during the high electric demand summer months when fish processing activities dramatically increase load demand. NEA envisions eventual growth of solar system capacity to perhaps 4 or 5 MW, plus 2 to 3 MW of wind power, to serve fish processing needs and Naknek's approximately 2 MW base load. Nameplate capacity: 1,000 kW; Annual Energy: 1,037,966; Annual diesel offset: 71,584.

DNR/DMLW Feasibility Comments

Bristol Bay Area Plan - but not on state land.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. The geologic maps and report https://dggs.alaska.gov/pubs/id/12155 may have some useful information just east of the study area. General area is subject to flooding and erosion, volcanic ash accumulation, and earthquake hazards (https://www.ncei.noaa.gov/maps/hazards). The region is in the zone of isolated permafrost (dominantly lake thermokart terrain), meaning that >0-10 percent of the ground surface is underlain by perennially frozen ground (permafrost) (Jorgenson and others, 2008; Olefeldt and others, 2016). Radon concentrations are modeled to be low to moderate, averaging below detection to 4 pCi/L.

Renewable Energy Fund: Round 17 Application Summaries

ALASKA ENERGY AUTHORITY

Naknek Solar PV on Cape Suwarof

App #17014 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	21.54
2. Matching Resources (15)	16.50
3. Stage 2 Feasibility (25)	17.17
4. Project Readiness (5)	5.00
5. Benefits (10)	1.50
6. Local Support (5)	2.50
7. Sustainability (10)	9.33
Total Stage 3 Score (100)	73.54

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	68.67
Benefit/Cost Ratio	0.57

Project Rank	
Statewide (of 16 Standard applications)	2
Regional (of all applications)	
Stage 3 Ranking Score (100)	73.54

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$4,110,000	$4,110,000
REF Grant Funds	$3,210,000	$3,137,848
Matching Funds	$900,000	$900,000

Cost of Electricity	$0.58/kWh
Price of Fuel	$4.78/Gal
Household Energy Cost	$9,551

AEA Review Comments & Recommendation

Partial Funding

Partial Funding adjustment is owing to exclusion of funding for final design cost of $71,152 which is currently ongoing and already funded. Only costs incurred after July 1, 2024, and which are within the scope of the grant agreement are eligible for funding under the REF program.

Revised funding recommendation: $3,137,848

Election District: 37-S

Renewable Energy Fund: Round 17 Application Summaries

Southeast Alaska Grid Resiliency (SEAGR)

App #17015 **Standard Application**

Project Type: Hydro
Applicant: Southeast Alaska Power Agency (SEAPA)
Applicant Type: Government Entity
Energy Region: Southeast
Proposed Phase(s): Design, Construction
Recommended Phase(s): Design, Construction

Project Description

The SEAPA Southeast Alaska Grid Resiliency Project (SEAGR) will increase generating capacity at the Tyee Lake hydroelectric facility and increase resiliency of the SEAPA electrical grid for: Metlakatla and potentially Kake electrical interconnections; Petersburg, Wrangell, and Ketchikan beneficial electrification (load growth); Voltage and Frequency stabilization due to grid expansion and load increases; Reliability with additional spinning reserves, increased inertia, and voltage support; Resiliency during extreme weather conditions. The project would include installation of a third turbine and generator at Tyee. The third “unit” would have synchronous condensing capabilities, allowing it to be synchronized to the electric grid providing voltage support and frequency security through additional spinning inertia. Peak generation capabilities would increase 25% on the SEAPA system. Voltage support would increase while the third generator is operated in synchronous condensing mode, allowing for efficiency gains on existing units due to power factor corrections. Ancillary systems would be installed to support the third turbine to include 480V and 15kV switchgear upgrades/modifications. Nameplate capacity: 12,000 kW; Annual energy: 30,000,000 kWh.

DNR/DMLW Feasibility Comments

Central/Southern Southeast Area Plan, Unit W-21. Designated General Use.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. The report and maps https://dggs.alaska.gov/pubs/id/2970 may have some useful information about the general geology. General area is subject to snow avalanche and landslide hazards. Radon concentrations are modeled to be moderate to high averaging 2 to >4 pCi/L.

Renewable Energy Fund: Round 17 Application Summaries

Southeast Alaska Grid Resiliency (SEAGR)

App #17015 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	15.18
2. Matching Resources (15)	21.00
3. Stage 2 Feasibility (25)	15.58
4. Project Readiness (5)	4.50
5. Benefits (10)	1.67
6. Local Support (5)	1.00
7. Sustainability (10)	9.00
Total Stage 3 Score (100)	67.93

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	62.33
Benefit/Cost Ratio	0.00

Project Rank	
Statewide (of 16 Standard applications)	9
Regional (of all applications)	
Stage 3 Ranking Score (100)	67.93

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$22,592,510	$22,592,510
REF Grant Funds	$4,000,000	$4,000,000
Matching Funds	$18,592,510	$18,592,510

Cost of Electricity	$0.13/kWh
Price of Fuel	$4.79/Gal
Household Energy Cost	$6,730

AEA Review Comments & Recommendation **Full Funding**

Election District: 1-A, 2-A

Renewable Energy Fund: Round 17 Application Summaries

Knutson Creek Hydro Project Construction

App #17016 **Standard Application**

Project Type: Hydro
Applicant: Pedro Bay Village Council
Applicant Type: Utility
Energy Region: Bristol Bay
Proposed Phase(s): Construction
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. Nameplate capacity: 150 kW; Annual Energy: 183,000 kWh; Annual diesel offset: 22,340 gal.

DNR/DMLW Feasibility Comments

Bristol Bay Area Plan - not on state land.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. The report and maps https://dggs.alaska.gov/pubs/id/3681 and https://dggs.alaska.gov/pubs/id/2949 may have some useful information about the general geology. General area is subject to earthquake hazards, volcanic ash accumulation, and potential flooding from disturbances to Iliamna Lake. This region is in the zone of sporadic permafrost, meaning that 10-50 percent of the ground surface is underlain by perennially frozen ground (permafrost) (Jorgenson and others, 2008). Radon concentrations are modeled to be moderate, averaging 2-4 pCi/L.

Renewable Energy Fund: Round 17 Application Summaries

ALASKA ENERGY AUTHORITY

Knutson Creek Hydro Project Construction

App #17016 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	21.18
2. Matching Resources (15)	21.00
3. Stage 2 Feasibility (25)	11.88
4. Project Readiness (5)	2.67
5. Benefits (10)	0.50
6. Local Support (5)	1.00
7. Sustainability (10)	6.33
Total Stage 3 Score (100)	64.56

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	47.50
Benefit/Cost Ratio	0.08
Project Rank	
Statewide (of 16 Standard applications)	11
Regional (of all applications)	
Stage 3 Ranking Score (100)	64.56

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$8,551,470	$8,551,470
REF Grant Funds	$400,000	$400,000
Matching Funds	$7,200,000	$7,200,000

Cost of Electricity	$0.82/kWh
Price of Fuel	$5.29/Gal
Household Energy Cost	$9,390

AEA Review Comments & Recommendation

Full Funding with Special Provision

Special Provisions:-Subsurface geotech needs to be conducted first prior to issuance to grants to confirm site viability. -Fish water rights and habitat permit still pending review. Need permit secured prior to issuance of REF grant. -Ensure DOE grants is awarded prior to issuance of grant funds. If Federal Grant is not awarded, REF grant is to be released and be eligible for reallocation to other projects. DOE Grants must be secured by June 30, 2025, with a tentative construction schedule for 2026. If DOE Grants not secured by June 30, 2025, REF funds will automatically be released back to REF Funds effective July 1, 2025 for reallocation to other viable REF Projects.-REF grant funds not to be expended prior but concurrent with federal grant funds.-Site Control needs to be secured with confirmed documents verified by AEA before moving forward with issuing grants to the grantee. Evidence of sufficient site securement to the satisfaction of AEA necessary prior to issuance of grant funds.-Grantee must provide contingency plan for construction overruns. If costs go above budget, grantee must provide own funds or arrange for additional financing to finish on time.

Election District: 37-S

Renewable Energy Fund: Round 17 Application Summaries

Kongiganak 100 kW Solar Energy Project

App #17017 **Standard Application**

Project Type: Solar
Applicant: Puvurnaq Power Company
Applicant Type:
Energy Region: Lower Yukon-Kuskokwim
Proposed Phase(s): Design, Construction
Recommended Phase(s): Design, Construction

Project Description

The project proposes to install, integrate, and commission a 100-kW solar/PV array energy for the islanded hybrid wind-diesel-battery-heat system for the tribally owned community utility in Kongiganak (Kong), Puvurnaq Power Company (PPC). Kong is designated as a High Energy Cost Area with a residential retail electric rate of $0.67 per kWh. Our utility was recently awarded a grant through the Department of Energy Office of Indian Energy (Award No. DE-IE0000161) in the amount of $674,330 for the installation of 100 kW solar PV. We now seek to leverage that funding as match toward the current proposal, which will allow us to add a total of 200 kW to our islanded system while gaining cost efficiencies through the combining of these two projects. Other benefits to be gained by adding to our solar array include:- Increased system reliability- Reduced diesel maintenance and operations cost due to increased hours of diesel off operations- Improved community resilience through additional source of energy- A total displacement of 54,082 gallons of diesel (@ $4.01/gallon = $216,868) annually, as well as 900 hours of diesel off operations (@ $9.25/hour = $8,325), resulting in an estimated total annual reduction in operating costs for the utility in excess of $225,193, even before accounting for reduced O&M costs as a result of reduced wear on our diesel generators.- Reduced fuel purchases, resulting in a deferral of investments in bulk fuel storage capacity as well as a reduction in harmful greenhouse gas emissions- Support for local workforce, both during the period of construction and long-term, through ongoing cost savings to our tribal utility- Advancement of knowledge and understanding of integration and operation of diesel-renewable hybrid systems in the region. Nameplate capacity: 200 kW (incl. 100 kW existing); Annual energy: 210,262 kWh; annual diesel offset: 16,821 gal. (200kW solar only)

DNR/DMLW Feasibility Comments

Not in an area plan or on state land, but near OSL surf/subsurf.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. The map and report https://dggs.alaska.gov/pubs/id/26722 may have some useful information about general geology, Coastal area is subject to erosion and flooding. This region is in the zone of sporadic to isolated permafrost (lake and wetland thermokart terrain), meaning that ~10-50 percent or less of the ground surface is underlain by perennially frozen ground (permafrost) (Jorgenson and others, 2008; Olefeldt and others, 2016). Radon concentrations are modeled to be low.

Renewable Energy Fund: Round 17 Application Summaries

Kongiganak 100 kW Solar Energy Project

App #17017 **Standard Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	21.26
2. Matching Resources (15)	21.00
3. Stage 2 Feasibility (25)	13.67
4. Project Readiness (5)	3.67
5. Benefits (10)	1.00
6. Local Support (5)	0.00
7. Sustainability (10)	8.67
Total Stage 3 Score (100)	69.26

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	54.67
Benefit/Cost Ratio	0.60

Project Rank	
Statewide (of 16 Standard applications)	6
Regional (of all applications)	
Stage 3 Ranking Score (100)	69.26

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$1,402,933	$1,402,933
REF Grant Funds	$728,603	$720,453
Matching Funds	$674,330	$674,330

Cost of Electricity	$0.67/kWh
Price of Fuel	$6.33/Gal
Household Energy Cost	$9,427

AEA Review Comments & Recommendation

Partial Funding

Recommendation:

Costs the applicant's administration of the REF grant are not eligible uses of REF funds. The line item for "AEA Grant and NTP" for $8,150 is therefore removed from the funding recommendation, yielding a revised funding recommendation of $720,453.

Election District: 38-S

Renewable Energy Fund: Round 17 Application Summaries

Atmautluak ETS Installation, Integration and Commissioning

App #17018 **Heat Application**

Project Type: Wind, Other
Applicant: Atmautluak Tribal Utilities
Applicant Type: Utility
Energy Region: Lower Yukon-Kuskokwim
Proposed Phase(s): Construction
Recommended Phase(s): Construction

Project Description

ATU is requesting funds to install, integrate and commission 30 electric thermal stove (ETS) units, which will be in 30 low income and elders' homes. On-going support will be provided by ATU. Cost increases have created the need for ATU to request $286,227 from the AEA-REF to complete our hybrid project, which requires installing, integrating, and commissioning each of the 30 ETS units, into 30 homes. This will allow us to increase our wind-to-heat storage and reduce the cost of diesel fuel to 30 families by about 50%, from the heat provided by the ETS units. The ETS technology has been proven in nearby communities and can be expected to reliably produce and deliver storage and heat and substantially reduce diesel fuel use and costs to each of these 30 households. We are currently paying $6.54 per gallon and anticipate another $1.00 increase during 2023. For each ETS unit, we estimate each taking 2-4 days to install and integrate. This requires an electrician to be on-site for those days. In addition, the distribution lines need to be upgraded to these homes requiring other certified expertise. Local labor from ATU will also be provided. Nameplate capacity: 30 units (ETS); Annual excess available wind energy for ETS: 47,026 kWh; Annual diesel offset: 1,541 gal.

DNR/DMLW Feasibility Comments

Not in an area plan or on state land.

DNR/DOF Feasibility Comments

N/A

DNR/DGGS Feasibility Comments

N/A

DNR/DGGS Geohazards Comments

See general DGGS comment on hazards. The map and report https://dggs.alaska.gov/pubs/id/26722 may have some useful information about general geology,General area is subject to erosion and flooding. This region is in the zone of sporadic permafrost (lake and wetland thermokart terrain), meaning that 10-50 percent of the ground surface is underlain by perennially frozen ground (permafrost) (Jorgenson and others, 2008; Olefeldt and others, 2016). Radon concentrations are modeled to be low.

Renewable Energy Fund: Round 17 Application Summaries

Atmautluak ETS Installation, Integration and Commissioning

App #17018 **Heat Application**

Stage 3 Scoring Summary

Criterion (Max Score)	Score
1. Cost of Energy (30)	19.26
2. Matching Resources (15)	21.00
3. Stage 2 Feasibility (25)	14.21
4. Project Readiness (5)	5.00
5. Benefits (10)	0.50
6. Local Support (5)	1.50
7. Sustainability (10)	6.67
Total Stage 3 Score (100)	68.13

Feasibility Analysis	
Stage 2 Tech & Econ Score (100)	56.83
Benefit/Cost Ratio	0.29

Project Rank	
Statewide (of 2 Heat applications)	2
Regional (of all applications)	
Stage 3 Ranking Score (100)	68.13

Funding & Cost	Requested	Recommended
Total Cost Through Construction	$474,387	$474,387
REF Grant Funds	$286,227	$286,227
Matching Funds	$188,160	$188,160

Cost of Electricity	$0.66/kWh
Price of Fuel	$5.36/Gal
Household Energy Cost	$8,538

AEA Review Comments & Recommendation

Full Funding

Election District: 38-S