ALASKA ENERGY AUTHORITY

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AEA's mission: Reduce the cost of energy in Alaska.

ALASKA ENERGY AUTHORITY

akenergyauthority.org

RENEWABLE ENERGY FUND

STATUS REPORT AND ROUND X RECOMMENDATIONS

January
2017

ALASKA ENERGY AUTHORITY

INTRODUCTION

This status report is provided to the legislature in compliance with the program's legislative reporting requirements. From 2008 to 2015, appropriations totaling $257 million have been issued for Renewable Energy Fund (REF) projects. This funding has been matched with hundreds of millions of dollars in funding from local sources to develop projects that reduce and stabilize the cost of energy in Alaska communities.

In the 2016 legislative session, there were no appropriations made to the REF. In recognition of the State's current fiscal challenges, Alaska Energy Authority (AEA), in consultation with the Renewable Energy Fund Advisory Committee (REFAC), made the decision not to release a solicitation for applications for Round X of the REF and instead to supply the legislature with the list of projects that were recommended for Round IX funding for consideration during the 2017 legislative session.

Alaska's Renewable Energy Fund provides benefits to Alaskans by assisting communities across the state to both reduce and stabilize the cost of energy. The program also creates jobs, uses local energy resources and keeps money in local economies.

Managed by AEA, the REF provides funding for the development of qualifying and competitively selected renewable energy projects in Alaska. The program is designed to produce cost-effective renewable energy for heat and power. As the program matures, the quality of proposed projects continues to grow as does the knowledge base for designing, constructing and operating renewable energy projects in Alaska's diverse climates and terrain.

Operational REF projects have an overall benefit cost ratio of 2.51 based on total known project cost, of which State funding is only a portion. Investing in renewable energy will provide price stability and will save Alaska communities millions of dollars for decades to come.

CONTENTS:
This 2017 status report has two parts and a separate appendix:

1. A summary analysis of projects funded to date, including the performance and savings associated with projects that are currently generating heat and power. (pg. 1 - 8)

2. A summary of AEA's recommendations to the Legislature for funding in 2017. These pages are largley unchanged from those presented to the legislature in 2016. (pg. 9 - 19)

An appendix of individual project scopes and statuses for funded projects accompanies this report. It is available in searchable PDF form at www.akenergyauthority.org

Additional information is available on AEA's website www.akenergyauthority.org and includes:

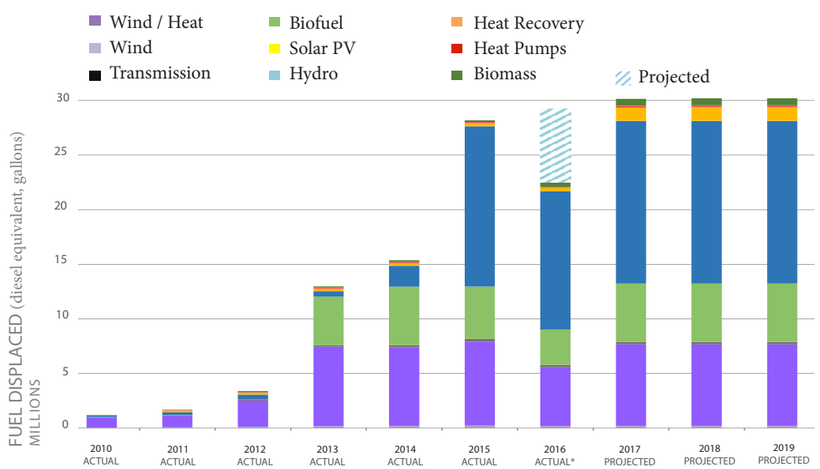
- Appendix of project statuses (Rounds I - VIII)
- Economic evaluations (Round I - IX)
- Application summaries (Round I - IX)

This report only includes performance of REF funded projects and thus is not a complete view of renewable energy production in Alaska.

Figure 1 shows continued strong growth in energy generation and fuel displacement.

Renewable Energy Fund projects saved Alaska communities an estimated 21.2 million gallons of diesel fuel (equivalent) in the first three quarters of 2016, a savings of nearly $44 million dollars.

The majority of projects that became operational in 2016 were heat projects which now comprise 44 percent of all operating.



DEFINITIONS

RECONNAISSANCE: A preliminary feasibility study designed to ascertain whether a feasibility study is warranted.

FEASIBILITY/CONCEPTUAL DESIGN: Detailed evaluation intended to assess technical, economic, financial, and operational viability and to narrow focus of final design and construction. This category also includes resource assessment and monitoring.

FINAL DESIGN AND PERMITTING: Project configuration and specifications that guide construction. Includes land use and resource permits and leases required for construction.

CONSTRUCTION: Completion of project construction, commissioning, and beginning of operations. This category also includes follow-up operations and maintenance reporting requirements.

DIESEL EQUIVALENT GALLON: Most REF communities are displacing diesel fuel (Diesel #2), however some projects displace natural gas, naphtha, propane or Diesel #1. In those instances the displaced fuel is converted to BTUs and then expressed as diesel equivalent gallons for reporting purposes.

B/C: The B/C, or benefit/cost ratio is the total net present value of savings over the life of a project divided by the net present value of a project's total cost. The assumed project life is 50 years for hydro and transmission, 30 years for solar PV and 20-25 years for all others. The B/C is one component of the overall project score; it is possible for a project to score high enough in other areas (e.g. being high cost of energy) to be recommended with a B/C of less than 1.

B/C ratios are calculated using best available data appropriate for the project's development phase. Early phase projects use assumptions based on prior similar experience, late phase projects use refined project models and are much more certain. AEA attempts to be as realistic as possible when using assumptions for early phase projects, while also attempting to avoid rejecting potentially good early-phase projects due to overly conservative assumptions.

TECHNICAL/ECONOMIC SCORE: This score is based on a project's technical and economic viability. The technical score considers resource availability, maturity of the proposed technology, the technical viability of the proposed project, and the qualifications and experience of the project team. The economic score is based on the projected costs and benefits associated with the project including consideration of the future price of fuel, current and future local demand for energy and the ability of the applicant to finance the project to completion.

ENERGY COST BURDEN: Household energy cost divided by household income.

ANSWERS TO COMMONLY ASKED QUESTIONS

WHAT IMPACT DO REF PROJECTS HAVE ON RATES?

It depends. Some electrical projects will lower rates immediately and some may only stabilize rates and keep them from increasing over time due to inflation and changing fuel costs. Heating projects result in immediate and direct fuel savings costs to the building owners.

DO POWER COST EQUALIZATION (PCE) COMMUNITIES BENEFIT FROM THE REF?

Yes, in a number of ways:

1. Statewide, in PCE communities, about 30 percent of total kWhs sold are eligible for the PCE subsidy. That means that any savings from REF projects are passed directly to the other 70 percent of kWhs sold. Schools and privately owned businesses benefit greatly from reduced cost of electricity.

2. REF projects provide stability in the face of uncertain and often volatile fuel prices.

3. 100 percent of the value created by heat projects stays in the community.

4. REF projects create local employment opportunities and local energy independence.

WHICH PROJECTS ARE THE BEST FIT FOR REF FUNDING?

- Technically strong
- Economically viable
- Located in high energy cost communities
- Provides public benefit
- Matching funds provided

HOW MUCH ARE REF PROJECTS REDUCING GREENHOUSE GAS (GHG) EMISSIONS?

2009-2016, an estimated 857,875 metric tons of CO2.

RENEWABLE ENERGY FUND ADVISORY COMMITTEE

The Renewable Energy Fund Advisory Committee is comprised of nine members, five of whom are appointed by the governor to staggered three-year terms, with representation from each of the following groups:

- One member from a small Alaska rural electric utility, Brad Reeve
- One member from a large Alaska urban electric utility, Bradley Evans
- One member from an Alaska Native organization, Jodi Mitchell
- One member from businesses or organizations engaged in the renewable energy sector, Chris Rose
- One member from the Denali Commission, Kathleen Wasserman
- Four remaining members come from the legislature:
  - Two members of the House of Representatives, appointed by the Speaker of the House of Representatives, Rep. Bryce Edgmon and Rep. Jim Colver
  - Two members of the Senate, appointed by the President of the Senate, Sen. Lyman Hoffman and Sen. Anna MacKinnon

In establishing the program, the REFAC worked with AEA to define eligibility criteria for the Renewable Energy Fund grants, to develop methods for ranking projects, and to adopt regulations identifying criteria to evaluate the benefit and feasibility of projects seeking legislative support. The REFAC continues to consult with AEA, offering valuable guidance and policy direction regarding the application and evaluation process, and final funding recommendations.

Following is a summary of REFAC involvement with REF in Round X.

- AEA staff and REFAC members met in June 2016 to update members of operating projects and active grants and to discuss a path forward for Round X of the Renewable Energy Fund.
- In recognition of the State's current fiscal challenges and in an effort to not unduly burden potential applicants the REFAC supported the decision to not issue a request for new applications.
- Instead, the same list of ranked recommended projects that were provided to the legislature for FY16 funding consideration but did not receive funding, will be resubmitted for FY17 funding consideration.


Rep. Edgmon


Rep. Colver


Senator Hoffman


Senator MacKinnon


Brad Reeve


Bradley Evans

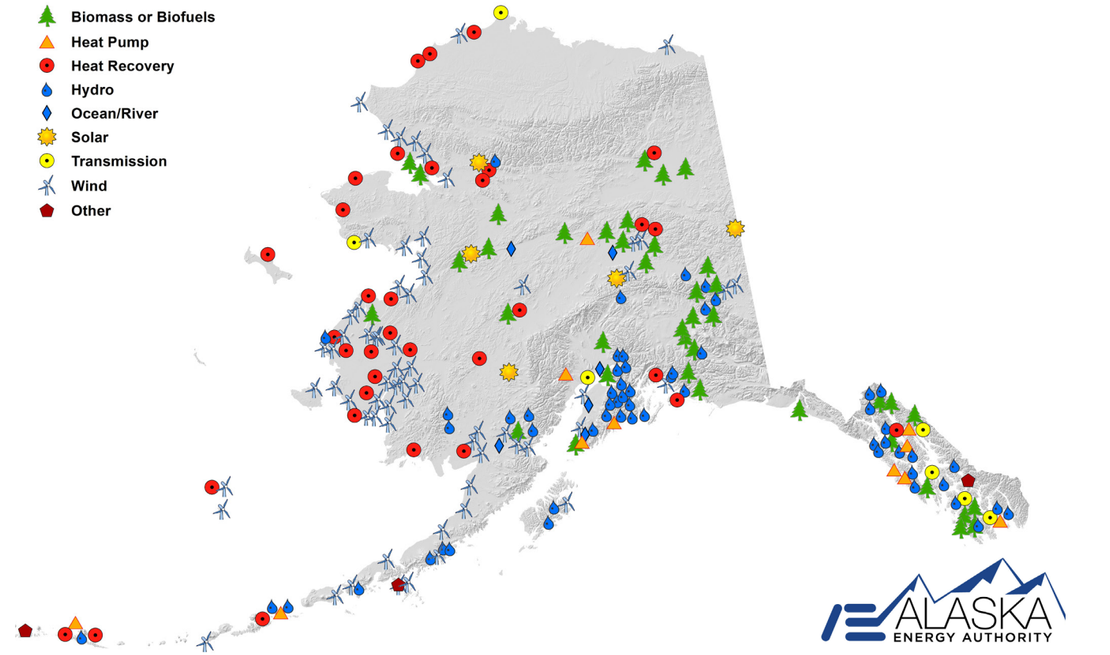

Jodi Mitchell


Chris Rose


Kathy Wasserman

Figure 2 below demonstrates the wide geographic distribution of REF projects across all areas of the state. Most funding is provided to high cost-of-energy communities.

RENEWABLE ENERGY FUND PROJECTS
ROUNDS I-VIII



FUNDED GRANTS BY ENERGY RESOURCE ($ millions)
ROUNDS I-VIII

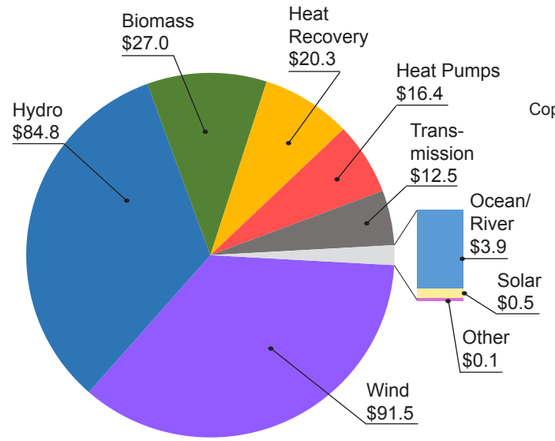


Figure 3 shows funding by energy resource, with wind and hydro grants making up just less than 70 percent of total funding.

FUNDED GRANTS BY ENERGY REGION ($ millions)
ROUNDS I-VIII

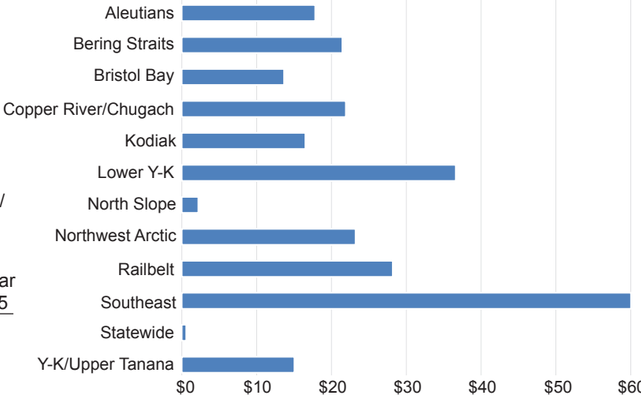


Figure 4 shows cumulative grant funding by AEA energy region totaling to $257 million in rounds I-VIII. The three highest recipients to date are Southeast with $60 million, Lower Yukon-Kuskokwim with $36.6 million, and Railbelt with $28.2 million.

PERFORMANCE & SAVINGS

- The present value of the capital expenditures used to build the 66 projects that were operational by the third quarter of 2016 is $562 million and the present value of benefits is $1,413 million. Based on the present value of capital cost and future estimated benefits, these projects have an overall benefit-cost ratio of 2.51.
- For every dollar invested, these projects have an estimated return of $2.51. It is important to note that the REF invested $158 million of total project costs in these 66 projects. The balance was invested from other sources.
- The technology with the largest number of generating projects continues to be wind, at 27 percent. This share has declined each year since 2013 when wind projects represented 40 percent of all REF projects.
- Biomass projects continue to come online and currently account for 20 percent of all active projects. Heat recovery projects make up an additional 20 percent of operational projects; these projects take heat from diesel powerhouse engines that would otherwise be wasted and put that heat to use in buildings and water systems, displacing thousands of gallons of costly heating fuel.
- The large majority of both capital cost and future benefit are from hydroelectric and wind projects. This is because of a handful of relatively large hydro and wind projects in more populated parts of the state including the Railbelt, Kodiak and Sitka.
- Three additional projects have come online in the fourth quarter of 2016 and will be included in the May 2017 update of this report.
- See pages 6 and 7 for information about where these $1.4 billion of benefits accrue.

REF CURRENTLY OPERATING PROJECTS - 2016 Q3

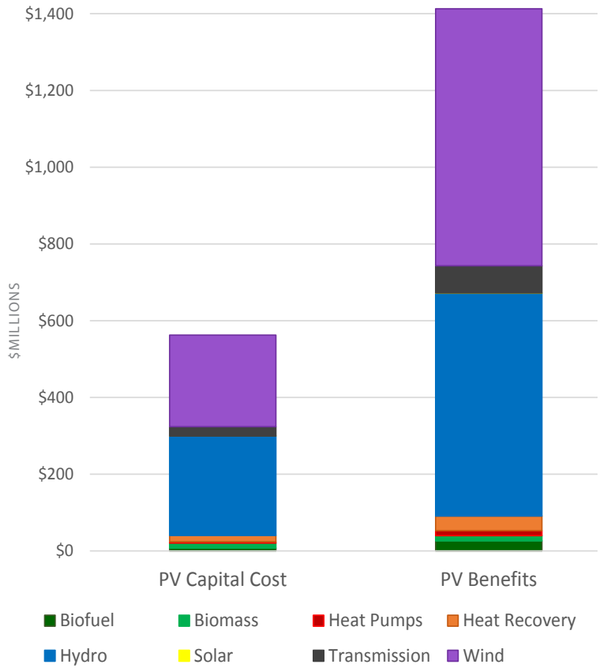


Figure 5 shows the present value (PV) of the 66 projects that are operational at end of Q3 2016.

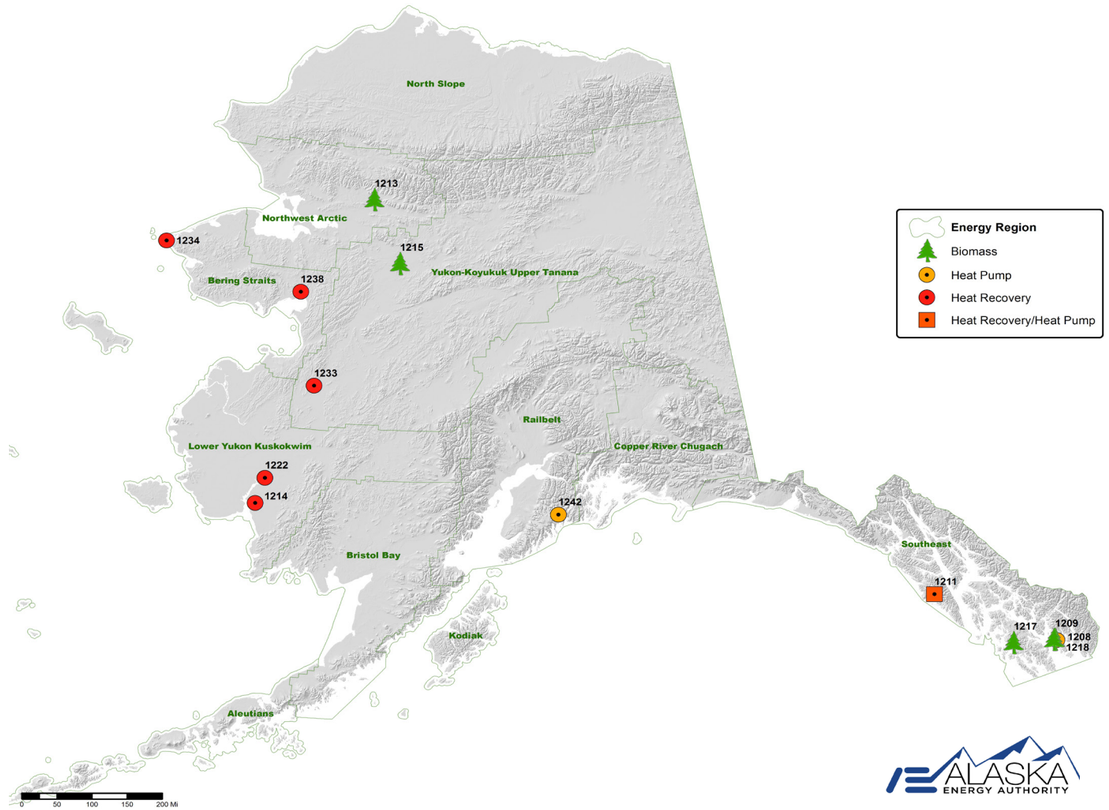
NOTES:

1. Total grant amount requested by all applicants.
2. $26.6 million was appropriated for round IV, and an additional $10 million was re-appropriated from previous rounds for use in round IV.
3. $20 million was appropriated for round VII, and an additional $2.8 million was re-appropriated from previous rounds for use in round VII.
4. $9.5 million was re-appropriated from the Mt. Spurr geothermal project (FSSLA 2011 CH5, P137) for round VIII, and an additional $2.0 million was re-appropriated from previous rounds for use in round VIII.
5. Represents only amounts recorded in active and completed grants, does not capture all funding needed to construct the project.

GRANT AND FUNDING SUMMARY

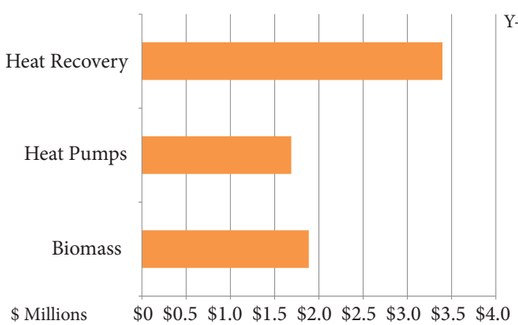
	Round I	Round II	Round III	Round IV	Round V	Round VI	Round VII	Round VIII	Round IX	Totals
Applications Received	115	118	123	108	97	85	86	67	52	851
Applications Funded	80	30	25	74	19	23	26	10	-	287
Grants Currently in Place	9	4	8	19	8	16	21	9	-	94
Amount Requested[1] ($M)	$453.8	$293.4	$223.5	$123.1	$132.9	$122.6	$ 93.0	$ 43.8	$ 50.0	$ 1,536.1
AEA Recommended ($M)	$100.0	$ 36.8	$ 65.8	$ 36.6	$ 43.2	$ 56.8	$ 59.1	$ 20.6	$36.1	$ 455.0
Appropriated ($M)	$100.0	$ 25.0	$ 25.0	$ 26.6[2]	$ 25.9	$ 25.0	$ 20.0[3]	$ 9.5[4]	-	$ 257.1
Match Budgeted ($M)[5]	$ 10.1	$ 7.0	$ 8.6	$ 58.4	$ 5.7	$ 32.8	$ 8.1	$ 0.2	-	$ 130.8

RENEWABLE ENERGY FUND
ROUND X | RECOMMENDED HEAT PROJECTS

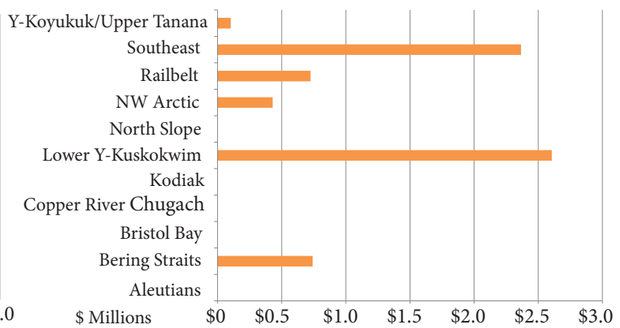


ALASKA ENERGY AUTHORITY

HEAT PROJECTS
BY RESOURCE

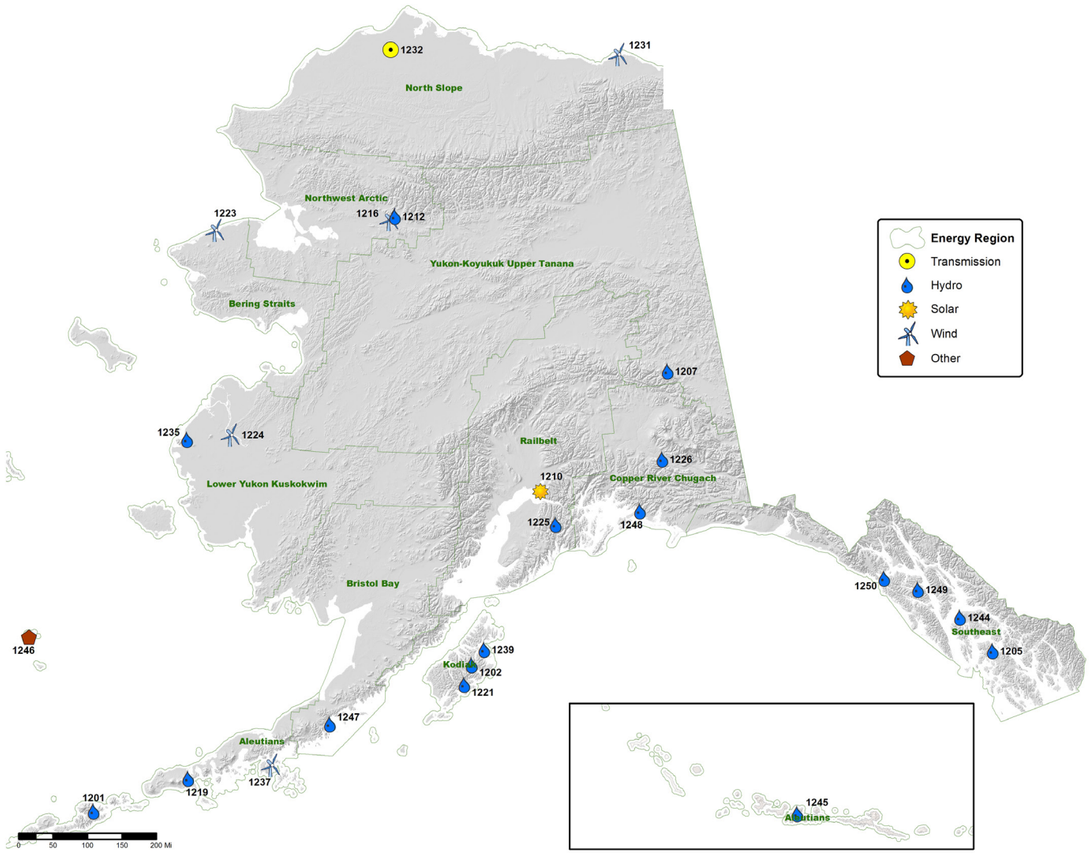


HEAT PROJECTS
BY REGION

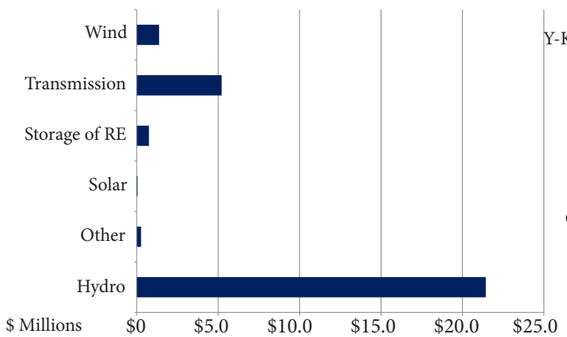


The two bar charts show Round IX recommended projects by energy resource and by region for heat projects. None of these projects received funding for FY16 and are being resubmitted for consideration for FY17 funding. The top three ranked heat projects are heat recovery projects, two in the Bering Straits and one in the Yukon-Koyukuk/Upper Tanana energy regions.

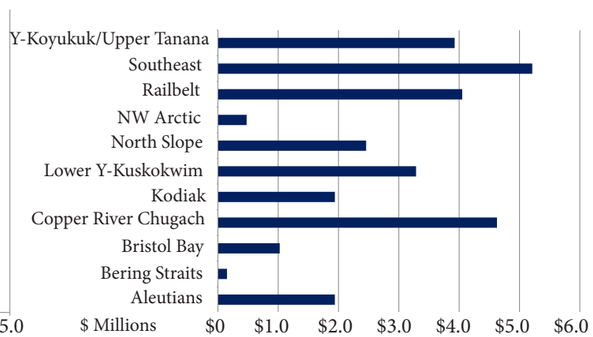
RENEWABLE ENERGY FUND
ROUND X | RECOMMENDED STANDARD PROJECTS



STANDARD PROJECTS
BY RESOURCE



STANDARD PROJECTS
BY REGION

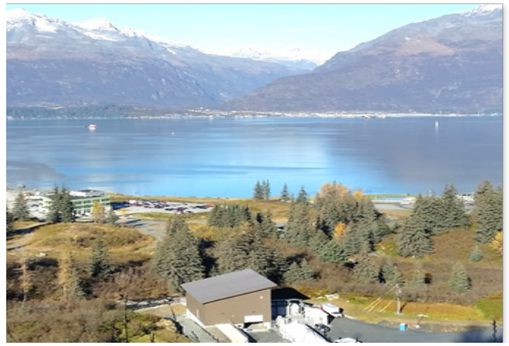


The two bar charts show Round IX recommended funding by energy resource and by region for standard projects. None of these projects received funding for FY16 and all but one are being resubmitted for consideration for FY17 funding. Waterfall Creek, a hydroelectric project in King Cove, was recomended for Round IX funding but has since secured financing through AEA's Power Project Fund loan program and the Alaska Municipal Bond Bank Authority to construct the project.

RENEWABLE ENERGY FUND SUCCESS STORY

ALLISON CREEK HYDROELECTRIC PROJECT
The project has a capacity of 6.5 MW and will displace 15 gigawatt-hours of diesel-generated electricity annually

REF AWARDS | $10.3 million
DIRECT STATE APROPRIATION | $10 million
MATCHING FUNDS | $34.7 million
TOTAL PROJECT COST | $55 million
EXPECTED PROJECT LIFE | 50 years



Developing a hydro project in the Allison Creek drainage was a concept considered for many decades. In 2016, modern equipment, efficient contracting and construction and funding from the REF program. coupled with the dedication of Copper Valley Electric Association (CVEA), converged to make the Allison Creek Hydroelectric Project a reality.

The project serves more than 8,000 members of the CVEA cooperative in 15 communities in Southcentral Alaska. Like most rural areas, the high and variable cost of fuel is a burden. The Allison Creek project reduces dependence on fossil fuels and provides electric cost-stability and certainty in the region.

The Allison Creek project will provide an additional 15 GWh of hydro power on an annual basis. However, should demand in the area grow, the project has the potential to generate about 23 GWh annually. Total estimated fuel savings from the Allison Creek hydro is 725,000 gallons annually at present day demand.

The Allison Creek Project is a run of river (ROR) hydro project that is operated in conjunction with the existing Solomon Gulch storage hydro project to displace diesel generation to meet the demands of the service area.

The Allison Creek hydro project involved construction of a diversion structure at an elevation of 1,300 feet which diverts up to 80 cubic feet per second (cfs) of water from the creek into a 40 inch buried steel penstock to generate 6.5 megawatts of power via a single twin jet Pelton turbine.

Major features of the infrastructure include:

A 16 foot high diversion structure above a glacial moraine foundation spanning approximately 95 feet across Allison Creek.

A 7,900 foot long steel penstock ranging in size from 40 inch diameter at the intake to 36 inch diameter at the powerhouse.

A 700 foot long 16 foot diameter tunnel housing the 36 inch diameter penstock.

A 65 foot x 65 foot powerhouse with a floor slab to peak roof height of 48 feet, pitched to guide snow away from parking and the entrance to the building. The building also supports a large crane for handling the generation equipment.

A single twin jet 6.5 MW Canyon Pelton turbine and a tailrace located above the anadromous salmon reach of lower Allison Creek.

A 3.8 mile long 34.5 kV transmission line to the Copper Valley switching station near the Petro Star facility along Dayville Road.

PERFORMANCE OF RENEWABLE ENERGY FUND PROJECTS

PROJECTS IN OPERATION DURING THE PERIOD 2009- 2016

						2015			
						Energy Production		Fuel Displaced	
	Technology Type	Fuel Displaced	Grantee	Project Name	Start date	Electrical (MWh)	Thermal (MMBtu)	Diesel (Gal x 1000)	Value ($ x 1000)
	ELECTRICAL PROJECTS								
1	Hydro	Natural Gas	Chugach Electric Association, Inc.	Stetson Creek Diversion/Cooper Lake	08/15	2,994	-	401	142
2	Hydro	Diesel	Inside Passage Electric Co-op	Gartina Falls - Hoonah	07/15	568	-	38	144
3	Hydro	Diesel	Chignik Lagoon Power Utility	Packers Creek	03/15	562	-	52	235
4	Hydro	Diesel	City of Akutan	Akutan Hydro	12/14	11	-	1	5
5	Hydro	Diesel	City and Borough of Sitka	Blue Lake Expansion	11/14	59,272	-	4,559	14,594
6	Hydro	Diesel	City of Ketchikan	Whitman Lake	10/14	8,762	-	674	2,851
7	Hydro	Diesel	Kodiak Electric Assoc.	Terror Lake	01/14	118,044	-	8,432	34,233
8	Hydro	Diesel	Cordova Electric Co-op	Humpback Creek	07/11	3,074	-	236	768
9	Hydro	Diesel	Gustavus Electric	Falls Creek	07/09	2,149	-	165	613
10	Hydro	Diesel	City of Atka	Chuniixsax Creek	12/12	381	-	29	150
11	Landfill Gas	Nat Gas	Municipality of Anchorage	Anchorage Landfill Gas	08/12	50,032	-	4,783	1,079
12	Solar PV	Diesel	Alaska Power Company	Eagle Solar Array Project	01/16	-	-	-	-
13	Solar PV	Diesel	AK Village Electric Co-op	Kaltag Solar	10/12	8	-	1	2
14	Transmission	Diesel	AK Electric Light & Power	Snettisham - Juneau	01/14	936	-	72	112
15	Transmission	Diesel	Alaska Power & Telephon	North Prince of Wales Intertie	09/11	1,352	-	104	289
16	Transmission	Diesel	Nome Joint Utility System	Banner Wind Transmission	10/10	1,650	-	102	307
17	Wind	Diesel	Nome Joint Utility System	Banner Peak Wind Expansion	08/13	1,642	-	100	304
18	Wind	Diesel	Northwest Arctic Borough	Buckland, Deering, Noorvik Wind Farm	01/16	-	-	-	-
19	Wind	Naphtha	Golden Valley Electric Assoc.	Eva Creek	10/12	72,639	-	5,115	8,324
20	Wind	Diesel	Kotzebue Electric Association	Kotz Wind-Battery-Diesel	05/12	2,511	-	171	542
21	Wind	Diesel	AK Village Electric Co-op	Shaktoolik Wind	04/12	283	-	22	84
22	Wind	Diesel	AK Village Electric Co-op	Emmonak/Alakanuk Wind	09/11	327	-	23	84
23	Wind	Diesel	AK Village Electric Co-op	Quinhagak Wind Farm	11/10	403	-	31	115
24	Wind	Diesel	AK Village Electric Co-op	Mekoryuk Wind Farm	11/10	180	-	13	48
25	Wind	Naphtha	Alaska Environmental Power	Delta Area Wind Turbines	09/10	2,013	-	130	351
26	Wind	Diesel	Kodiak Electric Assoc.	Pillar Mountain Wind	09/10	29,107	-	2,050	5,417
27	Wind	Diesel	AK Village Electric Co-op	Toksook Wind Farm	08/09	168	-	12	46
	ELECTRICAL PROJECTS SUBTOTAL					359,069	-	27,317	70,838
	ELECTRICAL & HEAT PROJECTS								
28	Hydro	Diesel	City of Pelican	Pelican Hydro Upgrade	03/13	1,298	-	93	415
29	Biomass	Diesel	AK Gateway School District	Tok Wood Heating	10/10	306	6,136	59	124
30	Heat Recovery	Diesel	City of Unalaska	Unalaska Heat Recovery	09/14	470	-	36	114
31	Wind/Heat	Diesel	Tuntutuliak Comm Svs Assoc.	Tunt Wind-Diesel Smart Grid	01/13	215	128	17	64
32	Wind/Heat	Diesel	Kwigillingok Power Company	Kwig Wind-Diesel Smart Grid	02/12	464	238	38	126
33	Wind/Heat	Diesel	Aleutian Wind Energy	Sand Point Wind	08/11	974	360	72	326
34	Wind/Heat	Diesel	Puvurnaq Power Company	Kong Wind-Diesel Smart Grid	12/10	330	435	29	96
35	Wind/Heat	Diesel	Unalakleet Valley Electric Co	Unalakleet Wind Farm	12/09	972	228	72	273
	ELECTRICAL & HEAT PROJECTS SUBTOTAL					5,029	7,525	416	1,537
	HEAT PROJECTS								
36	Wind	Diesel	AK Village Electric Co-op	Chevak Surplus Wind to Heat Water	07/15	-	121	1	6
37	Wind	Diesel	AK Village Electric Co-op	Gambell Surplus Wind to Heat Water	07/15	474	174	2	6
38	Biomass	Diesel	Ketchikan Gateway Borough	Ketchikan Gateway Borough Biomass Heat	08/16	-	-	-	-
39	Biomass	Diesel	Venetie Village Council	Venetie District Heating	02/16	-	-	-	-
40	Biomass	Diesel	City of Kobuk	Upper Kobuk River Biomass	01/16	-	-	-	-
41	Biomass	Diesel	Lake and Peninsula Borough	Lake and Pen Wood Boilers	01/15	-	45	0	2
42	Biomass	Diesel	Interior Regional Housing	Wood Heating Interior Commmunities	01/15	-	272	3	10
43	Biomass	Diesel	Mentasta Traditional Council	Mentasta Community Facility Heat	10/14	-	542	5	22
44	Biomass	Diesel	City of Tanana	Tanana City-Tribe Biomass	01/14	-	1,360	11	57
45	Biomass	Diesel	Southeast Island School District	Thorne Bay School Biomass	01/13	-	2,121	19	64
46	Biomass	Diesel	Native Village of Eyak	Cordova Wood Processing	12/11	-	840	7	28
47	Biomass	Diesel	Chilkoot Indian Association	Haines Central Wood Heating	10/11	-	141	2	2
48	Biomass	Diesel	Delta/Greely School District	Delta Wood Chip Heating	09/11	-	3,339	32	105
49	Biomass	Diesel	Gulkana Village Council	Gulkana Central Wood Heating	10/10	-	198	2	6
50	Heat Pumps	Diesel	Cook Inlet Housing Authority	Seldovia House Ground Source Heat Pump	01/16	-	-	-	-
51	Heat Pumps	Diesel	City of Seward	Sealife Center Seawater Heat Pump	11/11	-	4,179	40	105
52	Heat Pumps	Diesel	City and Borough of Juneau	Airport Ground Source Heat Pump	05/11	-	6,400	46	153
53	Heat Pumps	Diesel	City and Borough of Juneau	Aquatic Cntr Ground Source Heat Pump	04/11	-	4,621	39	68
54	Heat Recovery	Diesel	Native Village of Quinhagak	Heat Recovery Water Plant & Washeteria	12/15	-	-	-	-
55	Heat Recovery	Diesel	City of Marshall	Heat Recovery - Marshall Water Plant & Store	09/15	-	-	-	-
56	Heat Recovery	Diesel	Atmautluak Traditional Council	Atmautluak Washeteria Heat Recovery	08/15	-	-	-	-
57	Heat Recovery	Diesel	City of Saint Paul Electric Utility	Saint Paul Fuel Economy Upgrade	02/15	-	5,680	51	265
58	Heat Recovery	Diesel	Sleetmute Traditional Council	Heat Recovery to Water Plant	11/14	-	176	2	9
59	Heat Recovery	Diesel	City of Savoonga	Savoonga Heat Recovery - Water Plant	10/14	-	-	-	-
60	Heat Recovery	Diesel	City of Ambler	Ambler Heat Recovery	10/13	-	494	5	26
61	Heat Recovery	Diesel	North Slope Borough	Point Lay Heat Recovery	08/13	-	1,555	15	71
62	Heat Recovery	Diesel	Inside Passage Electric Co-op	Hoonah Heat Recovery Project	08/12	-	4,099	39	148
63	Heat Recovery	Diesel	City and Borough of Wrangell	Wrangell Hydro Electric Boilers	02/11	-	7,588	78	25
64	Heat Recovery	Diesel	McGrath Light & Power	McGrath Heat Recovery	05/10	-	2,390	23	95
65	Heat Recovery	Naphtha	Golden Valley Electric Assoc.	North Pole Heat Recovery	11/09	-	2,040	23	93
66	Solar Thermal	Propane	Golden Valley Electric Assoc.	McKinley Village Solar Thermal	06/10	-	120	1	11
	HEAT PROJECTS SUBTOTAL					474	48,495	446	1,378
	GRAND TOTAL					**364,572**	**56,020**	**28,178**	**73,753**

				Project Cost				Recommendation
B/C Ratio	Household Energy Cost	Tech/ Econ Score	State-wide Rank	Project Cost Through Construction	Applicant Grant Requested	Applicant Match Offered	Requested Phase(s)	AEA Recomnd
0.74	$7,963	37.00	40	$15,400,000	$386,000	$100,000	Feas	DNP Stage 2
0.42	$5,594	31.17	41	$3,000,000	$400,000	$2,600,000	Recon	DNP Stage 2
1.07	$7,351	N/A	42	$386,000	$80,000	$10,000	Feas, Design	Not Recomnd
0.13	$8,145	N/A	43	$6,300,000	$440,319	$62,500	Feas	Not Recomnd
0.54	$9,956	N/A	44	$5,289,000	$5,282,000	$277,000	Constr	Not Recomnd
0.29	$6,260	N/A	45	$448,663	$140,000	$210,000	Recon, Feas, Design, Constr	Not Recomnd
0.43	$11,759	N/A	46	$800,000	$384,730	$64,448	Design, Constr	Not Recomnd
0.47	$7,750	N/A	47	$168,000,000	$320,000	$25,000	Design	Not Recomnd
0.37	$9,471	N/A	48	$86,400	$140,000	$210,000	Recon, Feas, Constr	Not Recomnd
1.15	$11,122	N/A	49	$392,959	$95,733	$61,996	Feas	Not Recomnd
0.44	$9,399	N/A	50	N/A	$75,000	$10,000	Feas	Not Recomnd
0.20	$16,003	N/A	51	$2,131,740	$1,490,077	$641,663	Design, Constr	Not Recomnd
N/A	$11,412	N/A	52	N/A	$255,000	$0	Feas, Design, Constr	DNP Stage 1
				$202,234,762	**$9,488,859**	**$4,272,607**		

Haida Energy began construction of the Hiilangaay hydroelectric project on Prince of Wales Island. The project will increase hydro capacity on the island by 5MW and received early investment from the Renewable Energy Fund as well as a loan through AEA's Power Project Fund loan program.

APPLICATIONS NOT RECOMMENDED FOR FUNDING

Not Recommended Projects					
Count	Energy Region	ID	Project Name	Applicant	Energy Source
40	Y-K/Upper Tanana	1204	Clearwater Creek Hydropower Project: Phase II	Alaska Power Company	Hydro
41	Railbelt	1229	Knik Arm Power Plant Biomass to Power	Central Environmental Inc.	Biofuel
42	Southeast	1203	Craig Water Treatment Plant Micro-Hydro	City of Craig	Hydro
43	Aleutians	1206	False Pass Hydrokinetic Feasibility Study	City of False Pass	Hydrokinetic
44	Southeast	1227	Hoonah Waste-to-Energy Project	City of Hoonah	Biofuel
45	Railbelt	1228	Point McKenzie Correction Farm Solar	SOA Dept. of Corrections	Solar
46	Northwest Arctic	1230	Kotzebue 100 Kilowatt Solar Array	Kotzebue Electric Association, Inc.	Solar
47	Southeast	1236	West Creek Hydroelectric Project	Municipality of Skagway Borough	Hydro
48	Y-K/Upper Tanana	1241	Minto PV Solar Project	Minto Development Corporation	Solar
49	Copper River/Chugach	1243	Maximizing Cordova Hydro with Controlled Systems	Cordova Electric Cooperative, Inc.	Heat Hydro
50	Y-K/Upper Tanana	1251	Circle 100 Kilowatt Solar Array	Circle Utilities, Inc.	Solar
51	Bristol Bay	1252	Igiugig RivGen© Power System	Igiugig Electric Company	Hydrokinetic
52	Southeast	1240	Solar Panels for Kake Community Buildings	City of Kake	Solar
Totals, Not Recommended Projects					

Some not recommended projects' B/C ratios may not be listed due to incomplete information

NOTES FOR TABLES PAGES 10-11

Individual project summaries are available on AEA's website www.akenergyauthority.org

B/C = AEA Benefit/Cost Ratio over the life of the project.

*Refer to page 15 for an explanation of the benefit-cost ratio and recommended projects with a B/C ratio of less than 1.0.

The rows that appear in bold font are those projects in underserved regions. Applications #1238, 1233 and 1223 were moved up the list during stage four regional distribution.

Impacted Population includes the population of a community(s) or utility service area(s) which a project is located in or may impact.

The Household Energy Cost is a measure of the annual heating and electricity costs for a typical household in a given community.

The technical and economic score is the total stage 2 score and is on a scale of 0 to 100. A minimum score of 40 is required to pass stage 2.

Match offered is applicant's offered cash and in-kind match, including supporting efficiency work and wood harvest value where applicable. If the awarded funding amount is reduced from the requested amount, the required match will also be reduced.

The Energy Region Yukon-Koyukuk/Upper Tanana was shortened to Y-K/Upper Tanana for printing purposes.

†The economic benefits of this project (1209) were ineligible for consideration in the REF evaluation because the project displaces renewable hydro generated energy.

#1207, Yerrick Creek Hydro, is in an under-served region but was not elevated because the funding request was $4 million and only $38,401 was available within the FY16 Governor's budget. Instead #1233, a smaller project from the same region was elevated for nearly full funding.

** Sand Point High Penetration Wind (1237) - As a prerequisite for consideration, if funding is appropriated the applicant shall provide documentation that the proposed engine meets all applicable regulatory requirements.

SP = Special Provisions

2016 - January through September only				Cumulative Total (2009 - 2016)			
Energy Production		Fuel Displaced		Energy Production		Fuel Displaced	
Electrical (MWh)	Thermal (MMBtu)	Diesel (Gal x 1000)	Value ($ x 1000)	Electrical (MWh)	Thermal (MMBtu)	Diesel (Gal x 1000)	Value ($ x 1000)
4,002	-	536	190	6,995	-	936	332
867	-	59	184	1,435	-	97	328
546	-	51	177	1,108	-	103	412
47	-	5	14	58	-	7	19
44,729	-	3,441	8,361	112,756	-	8,674	25,110
6,231	-	479	1,256	17,480	-	1,345	4,916
93,272	-	6,662	19,987	220,621	-	15,714	56,980
3,331	-	256	743	17,801	-	1,364	4,698
1,682	-	129	424	13,734	-	1,022	3,740
226	-	17	119	1,283	-	99	553
33,772	-	3,229	586	186,685	-	17,815	8,131
17	-	1	6	17	-	1	6
8	-	1	3	34	-	2	10
936	-	72	157	2,807	-	216	381
1,222	-	94	264	5,745	-	406	1,312
982	-	60	151	8,130	-	488	1,490
753	-	46	115	4,290	-	262	807
95	-	7	40	95	-	7	40
49,428	-	3,481	4,355	278,547	-	19,616	41,029
2,001	-	136	369	11,909	-	810	2,718
354	-	27	114	1,287	-	99	398
563	-	40	206	2,450	-	174	725
495	-	38	189	2,833	-	213	877
115	-	8	50	1,056	-	72	289
938	-	61	159	9,983	-	626	1,615
21,620	-	1,523	2,750	146,304	-	10,297	30,831
563	-	41	248	1,722	-	123	552
268,794	-	20,500	41,215	1,057,164	-	80,588	188,296
869	-	62	191	3,880	431	282	1,174
71	3,794	37	106	646	29,216	276	769
406	-	31	54	956	-	74	188
181	-	14	67	747	696	57	246
271	153	22	104	994	696	82	321
742	-	55	248	4,580	773	336	1,539
364	420	32	145	1,602	2,033	141	568
925	-	67	305	6,561	779	471	1,747
3,828	4,367	319	1,218	19,966	34,624	1,718	6,552
-	73	1	4	-	195	2	10
-	85	1	4	-	294	3	11
-	190	2	1	-	190	2	1
-	307	3	27	-	307	3	27
-	247	3	13	-	247	3	13
-	35	0	2	-	81	1	4
-	911	8	42	-	1,183	11	52
-	705	6	11	-	1,247	11	33
-	554	5	23	-	3,886	35	131
-	487	4	6	-	4,241	38	106
-	1,066	8	22	-	5,986	48	170
-	-	-	-	-	852	8	18
-	1,370	13	24	-	16,407	158	495
-	379	4	8	-	4,377	40	132
-	205	2	1	-	205	2	1
-	2,090	20	18	-	16,599	160	391
-	6,400	46	145	-	36,117	266	899
-	2,955	25	30	-	17,920	152	350
-	625	6	28	-	625	6	28
-	1,703	15	80	-	1,703	15	80
-	64	1	4	-	64	1	4
-	3,414	31	114	-	9,094	82	379
-	175	2	8	-	351	3	17
-	1,214	9	46	-	1,214	9	46
-	315	3	18	-	1,325	14	103
-	827	8	14	-	4,535	43	182
-	14,606	140	441	-	29,411	283	1,029
-	2,385	25	69	-	40,063	408	734
-	1,731	17	124	-	15,723	147	872
-	2,016	23	59	-	17,229	287	810
-	101	1	3	-	762	7	47
-	47,235	430	1,390	-	232,433	2,245	7,177
272,621	**51,602**	**21,249**	**43,823**	**1,077,130**	**267,057**	**84,550**	**202,025**

The power and heat generation presented is this table is the annual amount produced by projects that have received REF investment. In certain cases the interactions between REF-funded and previously existing or subsequently built projects are not separable. These cases are noted and total renewable generation is provided.

Project specific notes:

Row 1 - Stetson Creek Diversion: Values based on grantee reported performance for period and modeled value of diversion project.

Row 5 - Blue Lake Expansion: The production numbers shown are for the whole system.

Row 7 - Terror Lake Hydro: REF funded the installation of turbine three at Terror Lake. The production numbers shown are for the whole hydro system. Years prior to 2015 reported modeled estimates of turbine three contributions. The cumulative total is the sum of all years as reported.

Row 14 - Snettisham Transmission Line Avalanche Mitigation: actual production values are not available, the figures reported are based on initial economic valuation.

Rows 25 and 27 - Delta and Toksook performance values are only for REF funded turbines, not the whole wind farm. Delta performance is estimated, grantee is no longer required to report.

Row 29 - Tok Wood: 2016 values are lower b/c the system shut down to install new steam engine and replace turbine.

Row 31 - Tuntutuliak Wind: Electric values are reported through PCE reporting.

Row 32 - Kwigillingok Wind: Electric values are reported through PCE reporting. Heat values are based on prior years reported values.

Row 34 - Kong Wind: Heat values are based on prior years reported values.

Row 40 - Cordova Wood Processing: Estimates based on prior year production is presented.

Row 44 - Tanana Biomass: value reported based on prior years reported.

Row 45 - Juneau Airport Ground Source Heat Pump: the project does not have metering. The values reported are estimates based on grantee information.

Row 47 - Haines Wood Heating: the project did not operate in 2016 due to low diesel prices.

Row 58 - Sleetmute Heat Recovery: value reported based on prior year.

Row 59 - Savoonga Heat Recovery: value reported based on application.

Row 65 - North Pole Heat Recovery: value reported based on prior years. Grantee no longer required to report.

RENEWABLE ENERGY FUND SUCCESS STORY

KOBUK BIOMASS

REF AWARD | $356,424
MATCHING FUNDS | $45,449
TOTAL PROJECT COST | $401,873
EXPECTED LIFE | 20 YEARS

In 2013, the City of Kobuk received funding through the Renewable Energy Fund to incorporate a biomass boiler system in their water treatment plant.

The intent of the project was to increase the use of locally available biomass energy for thermal heating. The biomass boiler relies on locally harvested wood, creating new jobs and keeping dollars spent on energy in the community.

In addition to creating local harvest jobs, the biomass boiler also increased the number of work hours available for the water treatment plant operators who now regularly stoke the boiler.

The diesel displaced by this project is approximately 3,550 gallons per year. Over its useful life, the project is estimated to save over $500,000 resulting in a benefit-cost ratio of 1.25

Kobuk's log splitter improves the efficiency of processing their local fuel source

This project was bolstered by the purchase of a 34 ton log splitter, allowing local wood cutters to more easily process timber they have harvested.

The community is very pleased with the biomass boiler; its success has spurred the Northwest Arctic Borough to pursue biomass heating feasibility studies in other communities in the region.

Firewood is harvested and stored near the water treatment plant in Kobuk for up to one year to give the wood time to dry.

REF ROUND X RECOMMENDED PROJECTS WITH LOW B/C RATIOS

The benefit-cost (B/C) ratio is an estimate of a project's life cycle present value (benefits) divided by present costs. A ratio of 1.0 is generally considered the break-even point where the benefits equal the costs, however, this economic metric is only an estimate. Benefits counted in the REF economic evaluation mostly take the form of displaced diesel fuel but this value will fluctuate as it follows the global price of oil. The B/C ratios become more reliable as projects move to later phases of development because more comprehensive cost and benefit information is available and there is less time for circumstances to change before construction. By design in statute and regulations, the B/C ratio is only one portion of the overall project score.

The REF evaluation considers other measures such the local cost of energy, the statewide distribution of grant funds, the amount of matching funds provided, the project's technical feasibility, project readiness, other economic development impacts, and other criteria. This mix of weighted factors allows projects with B/C ratios of less than 1.0 to be recommended if other project merits are high. See Round IX Project Summaries for more information. Early phase projects such as reconnaissance or feasibility studies are designed to determine economic and technical feasibility based on the renewable energy resource available. If there is a reasonable chance of improving economics, projects with moderately low B/C ratios often can advance through the REF evaluation process. Projects receive no points in the scoring criteria if the B/C ratio is below 0.9, and only 1 out of 10 points for 0.9 to 1.0.

Below is more project-specific information about projects with B/C ratios of less than 1.0.

1223 Shishmaref wind: The applicant requested funding for the feasibility stage. The B/C ratio could potentially increase based on site specific meteorological data once it is available for analysis. The state-wide wind model often under-predicts the wind resource on the west coast of Alaska. Wind measurement at the specific targeted site through the requested feasibility study will increase the confidence of the project economics.

1233 Grayling water heat recover: The applicant requested design and construction funding. AEA recommends funding only the final design. AEA believes that cost saving measures can be identified during the final design phase that can significantly improve the project economics.

1249 Indian River hydro: The grant request is to augment existing funding to reduce the new debt applicant requires to complete the project. The project recently completed the first phase of construction and is expected to resume construction in the first half of 2016. The additional funding request would cover project costs that are above the original estimates. As the overall project cost has increased and the benefit has remained constant the B/C ratio has declined to slightly less than 1.0. If grant funded the applicant anticipates that the grant will reduce energy costs to residents by $0.13 per kWh.

1215 Huslia water and clinic biomass: The applicant requested design and construction funding. AEA recommends funding final design only with an emphasis on improving the project economics before committing to construction. If constructed, the project will save the community an estimated 8,474 gallons of fuel per year and would provide local wood fuel jobs. Many of the costs in the B/C ratio would remain in the local economy for wood harvest and biomass plant operator jobs.

1218 Saxman heat pump: The applicant requested funding for final design and construction of an air source heat pump to replace existing oil-fired boilers that are nearing the end of life. The project would replace 100 percent of their heating oil by efficiently using hydro-powered electricity through an air source heat pump to heat the low-income multi-family complex. The economics are challenged by the high renovation costs to allow for lower temperature emitters in the building.

1248 Crater lake hydro: The applicant requested funding for final design. The B/C ratio is based upon initial findings from a draft feasibility study that had not yet been finalized at the time of evaluation, nor accepted by the applicant or AEA. Once the final feasibility study is finalized, the B/C ratio may change up or down. AEA's issuance of the final design grant is contingent upon acceptance of the feasibility study that demonstrates a technically and economically feasible project.

1210 Chugach community solar: The project is recommended for partial funding as AEA believes the feasibility can be completed at half of the applicant's estimated total phase cost. The feasibility study will help determine the project economics, including possible use of federal incentives.

1239 Ouzinkie hydro: The applicant has recently reconstructed a failed dam which provides drinking water for the community. That project was funded through water project funding sources. The REF application seeks design and construction funding to rebuild the end-of-life penstock and hydro turbine to provide electricity. AEA's economic evaluations capture the full cost of each project. In this case the full cost of the dam is counted as a cost, and the full benefits of all hydro power displacing diesel generation is counted as the benefit. This method, while fair and consistent to all applicants, may be a conservative approach due to the dam construction having been completed with other funding. If only the turbine costs and the full hydro benefit are used in the model, the economics are very good. The AEA B/C ratio of 0.73 provides information about the net value of the overall project (drinking water and energy) over its lifetime.

1231 Kaktovik wind: The applicant requests funds for final design for wind project. The budget is high due to arctic conditions but the application scored well elsewhere in the evaluation and wind may be the community's only renewable energy option.

PARTIAL FUNDING ROUND IX/X RECOMMENDED PROJECTS

In the table on pages 10 and 11 there are a number of projects with a recommendation for partial funding. The table below provides the rationale behind each of these recommendations.

1245 Adak hydro: Application requested funding for feasibility, design and construction. AEA recommends partial funding to complete only the feasibility study.

1238 Koyuk water heat recovery: Application was for funding final design and construction. AEA recommends limiting funding to final design to evaluate the potential to improve project economics and better assess value.

1233 Grayling water heat recovery: Application was for funding final design and construction. AEA recommends funding only the design phase to allow for more refined construction cost estimates prior to making a determination about funding the construction phase. Additionally, the funds requested for design were higher than expected. AEA recommends partial funding for final design phase only.

1221 Old Harbor hydro: Applicant requested funding for final design, including extensive geotechnical work. AEA recommends fully funding the design and partially funding geotech work with the recommendation that ground penetrating radar and/or seismic surveys be done prior to investing in costly helicopter supported drilling.

1214 Eek water heat recover: Application was for final design and construction. AEA recommends funding only the design phase to allow for more refined construction cost estimates prior to making a determination about funding the construction phase. Additionally, funds requested for design are higher than expected. AEA recommends partial funding for final design phase only.

1235 Scammon Bay hydro: Application requested funding for stream gauging and preliminary design. AEA recommends the project for partial funding to complete stream gauging to better understand the hydroelectric resource potential of Hillside Creek.

1215 Huslia water and clinic biomass: Application was for funding final design and construction. Recommend partial funding of $53,116 to complete the design phase only and to better evaluate the potential for an economic project.

1201 Unlaska inline micro-turbines: Application was for funding feasibility, final design and construction. AEA recommends partially funding the feasibility and final design phases of this project to better understand operation of power recovery turbine and pressure reduction valve under varying flow conditions and events such as load rejection.

1217 Klawock school biomass: Application requested funding for final design and construction. While the economics of this project are good, the engineering will be challenging due to the site constraints. Recommend partial funding for the development of final design and a business/operating plan.

1210 Chugach community solar: The application for a 500 kW solar garden project is recommended for funding at 50% of the requested level. AEA estimates that the applicant should be able to complete the proposed feasibility study, conceptual design and cost estimate within this reduced budget.

1209 Ketchikan schools central heating: Application requested feasibility and design funding. AEA recommends partial funding of for a feasibility study phase only to better assess the potential economic benefit.

ROUND X RECOMMENDED APPLICATIONS

The recommendations for Round X are identical to last year's Round IX recommendations with the exception of Waterfall Creek in King Cove which has withdrawn their application. There was no new request for Round X applications due to lack of funding for projects that were evaluated and recommended for funding in the 2016 legislative session.

The 38 projects recommended for Round X funding collectively requested $40.3 million in grants and offered $27.7 million in matching funds. AEA recommends funding of $35.4 million for these 38 projects.

REVIEW PROCESS

The recommendation process involves three stages of review and scoring and a fourth stage where regional distribution is applied. The first three stages evaluate and score: eligibility, technical and economic feasibility, cost of energy, experience and qualifications, and ranking based on criteria established in statute and regulation.

The technical and economic evaluation is a thorough vetting process conducted by AEA technical reviewers, independent economists, and the Department of Natural Resources. Following the third stage of evaluation, AEA presents a ranked list of recommended projects, a list of not recommended projects, and a regional distribution recommendation to the REFAC to ensure that there is regional equity in the cumulative rounds I through IX funding.

ADVISORY COMMITTEE/REGIONAL DISTRIBUTION

Below is the approach to regional distribution.

Calculating a regional funding target: Use a regional population weighted "burden of energy cost" metric to establish regional funding bands. The burden of energy cost for a household is calculated based on regionally appropriate average annual residential heating fuel equivalent consumption, 6,000 kWh per year electric consumption and household income.

Burden of energy cost = (HH cost of electric + heat energy) / HH income

A regional population weighted burden of energy cost is calculated for each energy region in the state. The burden number is then used to calculate a target funding level for each region, such that regions with high energy cost burden are eligible to receive more funding cumulatively across all years of the REF.

Underserved: In order for a region to be classified as underserved they must have received less than 50 percent of the calculated target. Projects in underserved regions will be moved up on the list (if the project they are replacing is in an adequately or overserved region).

- Based on Round I-VIII funding both Yukon-Koyukuk/Upper Tanana and Bering Straits are considered underserved. In Round IX three projects were moved up for this reason.

Overserved: For a region to be considered overserved they must have received more than two times their calculated target. To achieve a better balance of funding across the state, regions that are determined to be overserved will be capped so their share of the overall fund cannot grow.

- Based on Round I-VIII funding both Southeast and the Railbelt are considered overserved; neither region had a project that ranked within the Governor's budget so this rule did not affect any region this round.

AEA'S RECOMMENDATIONS

The REFAC met in June 2016 and accepted AEA's recommendation to not solicit additional applications for Round X of the REF.

Instead, with the support of the committee, AEA presents the legislature with the following tables of recommended projects for funding consideration. The ranked list of recommended projects for Round X is identical to the Round IX list presented last year with the exception of Waterfall Creek Hydro which has secured funding and is nearly through construction.

Pages 10 and 11 identify all projects that are recommended for funding by AEA in ranked order. Standard electric projects are blue and heat projects are orange. Notes for both recommended and not recommended project tables appear after the not recommended list on page 14.

REF ROUND X RECOMMENDED PROJECTS RANK LIST

Blue cells indicate a standard electric generation application

Orange cells indicate a heat project application

Recommended Projects										Project Cost			Recommendation			
Count	Energy Region	ID	Project Name	Applicant	Energy Source	B/C Ratio	Impacted Pop.	Household Energy Cost	Tech/ Econ Score	State-wide Rank	Project Cost Through Construction	Applicant Grant Requested	Applicant Match Offered	Recommended Phase(s)	AEA Recomnd	Recommended Funding	Cumulative Funding
1	Copper River/Chugach	1226	Fivemile Creek Hydroelectric Project	Chitina Electric Inc. (CEI)	Hydro	1.71	116	$12,269	75.67	1	$6,589,090	$3,400,000	$2,600,000	Constr	Full	$3,400,000	$3,400,000
2	Aleutians	1237	Sand Point High Penetration Wind System	Sand Point Generating, TDX	Wind	2.19**	946	$10,793	83.33	2	$1,067,309	$649,030	$423,275	Design, Constr	Full	$649,030	$4,049,030
3	**Bering Straits**	**1234**	**Wales Water System Heat Recovery**	**City of Wales**	**Heat Recovery**	**1.44**	**146**	**$17,269**	**72.50**	**3**	**$653,277**	**$650,047**	**$6,566**	**Design, Const**	**Full**	**$650,047**	**$4,699,077**
4	Aleutians	1245	Adak Hydro Power Generator	TDX Adak Generating, TDX	Hydro	1.75	247	$14,961	59.50	4	$1,750,000	$294,102	$126,044	Feas	Partial	$19,600	$4,718,677
5	**Bering Straits**	**1238**	**Koyuk Water System Heat Recovery**	**City of Koyuk**	**Heat Recovery**	**1.06**	**321**	**$18,742**	**61.50**	**8**	**$695,269**	**$688,386**	**$6,884**	**Design**	**Partial**	**$90,922**	**$4,809,599**
6	**Bering Straits**	**1223**	**Shishmaref Wind Feasibility & Conceptual Design**	**Alaska Village Electric Coop**	**Wind**	**0.93***	**607**	**$15,812**	**52.50**	**18**	**$2,529,400**	**$152,000**	**$8,000**	**Feas**	**Full SP**	**$152,000**	**$4,961,599**
7	***Y-K/Upper Tanana***	***1233***	***Grayling Water System Heat Recovery***	***City of Grayling***	***Heat Recovery***	***0.98****	***191***	***$12,652***	***54.50***	***21***	***$431,982***	***$427,705***	***$4,277***	***Design***	***Partial***	***$38,401***	***$5,000,000***
7	***Y-K/Upper Tanana***	***1233***	***Grayling Water System Heat Recovery***	***City of Grayling***	***Heat Recovery***	***0.98****	***191***	***$12,652***	***54.50***	***21***	***$431,982***	***$427,705***	***$4,277***	***Design***	***Partial***	***$11,599***	***$5,011,599***
8	Railbelt	1242	Heat Pump System for City of Seward	City of Seward	Heat Pump	1.97	2,768	$9,005	83.17	5	$955,458	$725,000	$125,000	Design, Constr	Full	$725,000	*$5,736,599*
9	Southeast	1244	IPEC Gunnuk Creek Hydro Rehab in Kake	Inside Passage Electric Coop	Hydro	2.23	1,913	$10,561	73.00	6	$5,715,000	$3,920,000	$1,545,000	Constr	Full SP	$3,920,000	$9,656,599
10	Lower Yukon-Kuskokwim	1224	Mountain Village-St. Mary's Wind Intertie	Alaska Village Electric Coop	Trans, Wind	1.00	1,524	$12,362	66.00	7	$6,196,000	$3,196,000	$3,000,000	Design, Constr	Full SP	$3,196,000	$12,852,599
11	Southeast	1250	Elfin Cove Hydroelectric Permitting	Elfin Cove Utility Commission	Hydro	1.22	16	$12,008	67.33	9	$3,705,000	$88,000	$22,000	Design	Full	$88,000	$12,940,599
12	Northwest Arctic	1216	Shungnak Wind-Diesel Conceptual Design	Native Village of Shungnak	Wind	1.04	460	$17,752	50.00	10	$5,598,500	$135,000	$39,000	Feas	Full SP	$135,000	$13,075,599
13	Lower Yukon-Kuskokwim	1222	Bethel Power Plant Heat Recovery Module	Alaska Village Electric Coop	Heat Recovery	2.16	6,241	$10,766	71.67	11	$8,233,369	$2,555,489	$283,943	Constr	Full SP	$2,555,489	$15,631,088
14	Bristol Bay	1247	Chignik Hydroelectric Dam Project	City of Chignik	Hydro	1.86	96	$8,746	73.67	12	$7,783,428	$1,025,175	$60,251	Design	Full	$1,025,175	$16,656,263
15	Kodiak	1221	Old Harbor Hydro Geotech & Final Design	Alaska Village Electric Coop	Hydro	1.38	213	$12,095	68.50	13	$9,317,500	$1,092,500	$57,500	Design	Partial	$792,500	$17,448,763
16	Kodiak	1202	Upper Hidden Basin Geotech Investigation	Kodiak Electric Association	Hydro, Storage	4.24	8,465	$7,047	79.00	14	$79,247,000	$750,000	$750,000	Feas	Full	$750,000	$18,198,763
17	Southeast	1249	Indian River Hydroelectric Project - Construction	Tenakee Springs Electric	Hydro	0.94*	128	$11,498	56.33	15	$5,473,280	$809,000	$1,115,280	Constr	Full	$809,000	$19,007,763
18	Northwest Arctic	1212	Cosmos Hills Hydro Design & Permitting	NANA Regional Corporation	Hydro	1.08	734	$15,410	40.50	16	$50,797,871	$341,335	$37,200	Design	Full	$341,335	$19,349,098
19	Lower Yukon-Kuskokwim	1214	Eek Water System Heat Recovery	City of Eek	Heat Recovery	1.01	349	$12,572	59.50	17	$311,394	$308,311	$3,083	Design	Partial	$50,000	$19,399,098
20	Southeast	1211	Sitka Wastewater Plant Effluent Heat Pump	City and Borough of Sitka	Heat Pump	1.13	9,061	$6,991	72.50	19	$826,067	$667,000	$113,000	Design, Constr	Full	$667,000	$20,066,098
21	**Y-K/Upper Tanana**	**1207**	**Yerrick Creek Hydro Construction**	**Upper Tanana Energy**	**Hydro**	**1.23**	**1,539**	**$7,963**	**57.17**	**20**	**$20,744,264**	**$4,000,000**	**$15,000,000**	**Constr**	**Full SP**	**$3,925,000**	**$23,991,098**
22	Southeast	1205	Neck Lake Hydropower Project: Phases II-III	Alaska Power Company	Hydro	1.21	39	$9,630	63.17	22	$3,016,475	$395,200	$98,800	Feas, Design	Full	$395,200	$24,386,298
23	Lower Yukon-Kuskokwim	1235	Scammon Bay Hydroelectric Project	City of Scammon Bay	Hydro	1.25	528	$12,698	49.67	23	$4,283,056	$305,000	$3,050	Feas	Partial	$90,000	$24,476,298
24	**Y-K/Upper Tanana**	**1215**	**Huslia Water & Clinic Biomass Boiler**	**City of Huslia**	**Biomass**	**0.72***	**338**	**$13,795**	**44.67**	**24**	**$496,526**	**$491,610**	**$4,916**	**Design**	**Partial**	**$53,116**	**$24,529,414**
25	Aleutians	1219	False Pass Hydro Feasibility & Conceptual Design	City of False Pass	Hydro	1.87	34	$8,145	73.67	25	$4,380,000	$187,000	$33,000	Feas	Full	$187,000	$24,716,414
26	Aleutians	1246	St. Paul Island 80% Renewable Energy Feasibility	TDX Power, Inc.	Other, Wind	1.66	436	$8,560	48.83	26	$5,731,500	$265,200	$66,300	Recon, Feas	Full	$265,200	$24,981,614
27	Northwest Arctic	1213	Ambler Washeteria and City Office Biomass Heating	City of Ambler	Biomass	1.06	274	$11,345	49.17	27	$484,691	$429,892	$54,799	Design, Constr	Full SP	$429,892	$25,411,506
28	North Slope	1232	Atqasuk Transmission Line Design and Permitting	North Slope Borough	Trans, Other	2.02	4,698	$3,417	78.00	28	$32,840,509	$2,017,818	$201,782	Design	Full	$2,017,818	$27,429,324
29	Southeast	1218	Saxman Low-Rent Multifamily Air Source Heat Pump	Tlingit-Haida RHA	Heat Pump	0.93*	8,314	$6,194	60.83	29	$438,341	$296,038	$213,193	Design, Constr	Full	$296,038	$27,725,362
30	Aleutians	1201	Unalaska Water Treatment Inline Micro Turbines	City of Unalaska	Hydro	1.24	4,689	$7,677	58.00	30	$1,340,000	$1,100,000	$240,000	Feas, Design	Partial	$144,000	$27,869,362
31	Southeast	1208	Ketchikan High School Biomass Boiler	Ketchikan Gateway Borough	Biomass	1.33	8,314	$6,194	82.67	31	$1,365,890	$1,251,000	$0	Constr	Full	$1,251,000	$29,120,362
32	Southeast	1217	Klawock School Biomass Fuel Boiler Project	Klawock City School District	Biomass	1.38	802	$7,488	59.67	32	$858,556	$833,556	$25,000	Design	Partial	$111,986	$29,232,348
33	Copper River/Chugach	1248	Crater Lake Power and Water Project	Cordova Electric Cooperative	Hydro, Storage	0.91*	2,286	$11,122	45.17	33	$17,306,696	$1,227,000	$420,680	Design	Full SP	$1,227,000	$30,459,348
34	Railbelt	1210	Chugach Electric Solar Project	Chugach Electric Association	Solar	0.36*	172,380	$3,751	59.67	34	$1,814,049	$100,000	$100,000	Feas	Partial	$50,000	$30,509,348
35	Railbelt	1225	Grant Lake Hydroelectric Project	Kenai Hydro LLC	Hydro	1.10	49,918	$6,643	56.67	35	$58,936,366	$4,000,000	$875,528	Design	Full	$4,000,000	$34,509,348
36	Kodiak	1239	Ouzinkie Hydroelectric Power Project	City of Ouzinkie	Hydro	0.73*	171	$7,460	40.67	36	$4,603,385	$397,427	$4,014	Design, Constr	Full SP	$397,427	$34,906,775
37	North Slope	1231	Kaktovik Wind Diesel Design	North Slope Borough	Wind	0.79*	251	$6,293	58.17	38	$7,606,795	$440,000	$44,000	Design	Full	$440,000	$35,346,775
38	Southeast	1209	Ketchikan Schools Recreation Heating Plant	Ketchikan Gateway Borough	Biomass	N/A†	8,314	$6,194	62.00	39	$2,600,000	$220,000	$0	Feas	Partial	$40,000	$35,386,775
	Sub Totals, All Recommended Projects										**$367,155,275**	**$40,258,526**	**$27,715,642**			**$35,386,775**	

See page 14 for table notes

Individual project summaries are available on AEA's website