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Unalakleet Wind Farm and Chuniixsax Creek Hydroelectric



akenergyauthority.org

RENEWABLE ENERGY FUND

STATUS REPORT AND
ROUND VIII RECOMMENDATIONS

January
2015

updated May 2015



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INTRODUCTION

Renewable Energy Fund appropriations totaling \$247.5 million have been issued since 2008. This funding has been matched with more than \$152 million from other sources. State funding in the early, lower-cost, higher-risk stages of project development creates opportunity to leverage significant private investment to carry projects through to completion.

The Alaska Renewable Energy Fund (REF) 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.

Currently operating REF projects have an overall benefit cost ratio of 2.8 which is calculated using total project cost. Investing in stable priced renewable energy is a wise investment that will save Alaska communities millions of dollars for decades to come.

The REF is managed by the Alaska Energy Authority (AEA) and provides public 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 to benefit Alaskans statewide. As the program matures, the quality of the proposed projects continues to rise as does the knowledge base for designing, constructing, and operating renewable energy in Alaska's diverse climates and terrain.

This 2015 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. 3-8)

An appendix of individual project scopes and statuses for funded projects accompanies this report. It is available in searchable PDF form at <http://www.akenergyauthority.org/Programs/Renewable-Energy-Fund/Rounds>

2. A summary of AEA's recommendations to the Legislature for funding in 2015 (Round VIII). (pg. 9-19)

Additional information on this year's recommendations and all current and past grants are available on AEA's website www.akenergyauthority.org and includes:

- Appendix of project statuses (RI - RVII)
- Economic evaluations
- Technical evaluations
- Maps of project location
- Application summaries

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

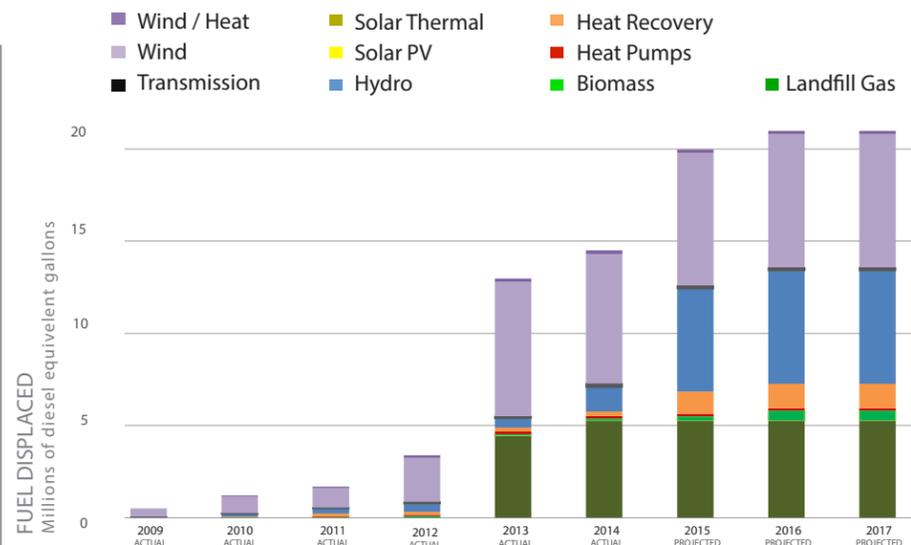


Figure 1 shows continued strong growth in energy generation and fuel displacement. In 2014, REF projects displaced more than 15 million diesel equivalent gallons. 2015 will mark another jump in renewable generation as two significant hydro projects are expected to come online; Whitman Lake and Blue Lake expansion. REF generation in 2015 is projected to be 38 percent higher than 2014.

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. Land use and resource permits and leases required for construction.

CONSTRUCTION: Completion of project construction, commissioning, and beginning of operations. It 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 30 years for

solar PV, 50 years for transmission and hydro and 20 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. high-cost-energy community) to be recommended with a B/C of less than 1.

B/C ratios are calculated using best available data that is appropriate for the project's development phase. Early phase projects use assumptions based on prior similar experience, while 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. This score is the Stage 2 score in the evaluation process.

ENERGY COST BURDEN: Household energy cost / 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 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 to the building owners.

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

Yes, in a number of ways:

In PCE communities statewide 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.

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

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

REF projects create local employment opportunities and local energy independence.

WHAT IS THE GOAL OF THE REF?

To achieve the state of Alaska 50 percent renewable by 2025 goal and to reduce and stabilize the cost of energy to Alaskans.

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

In 2014, an estimated 147,143 metric tons of CO₂.

Since 2009, an estimated 347,575 metric tons of CO₂.

Projected reduction between 2015 and 2017 is 682,360 metric tons of CO₂.

RENEWABLE ENERGY FUND ADVISORY COMMITTEE

The Renewable Energy Fund Advisory Committee (REFAC) is comprised of nine members, five of which 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. Charisse Millett
 - 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 in defining eligibility criteria for grants



REFAC members (in bold) and others at a tour of Kodiak's Terror Lake Hydro project during the May 2014 REFAC meeting. Pictured L-R: Rep. Bryce Edgmon, Sean Skaling (AEA), Darren Scott (Kodiak Electric), Sara Fisher-Goad (AEA), Sen. Anna MacKinnon, Sen. Gary Stevens, Brad Reeve (Kotzebue Electric), Kathie Wasserman (AML), Jason Meyer (ACEP), Sen. Lyman Hoffman. Not pictured: Chris Rose (REAP), Jodi Mitchell (IPEC), Rep. Charisse Millett, Bradley Evans (Chugach Electric)

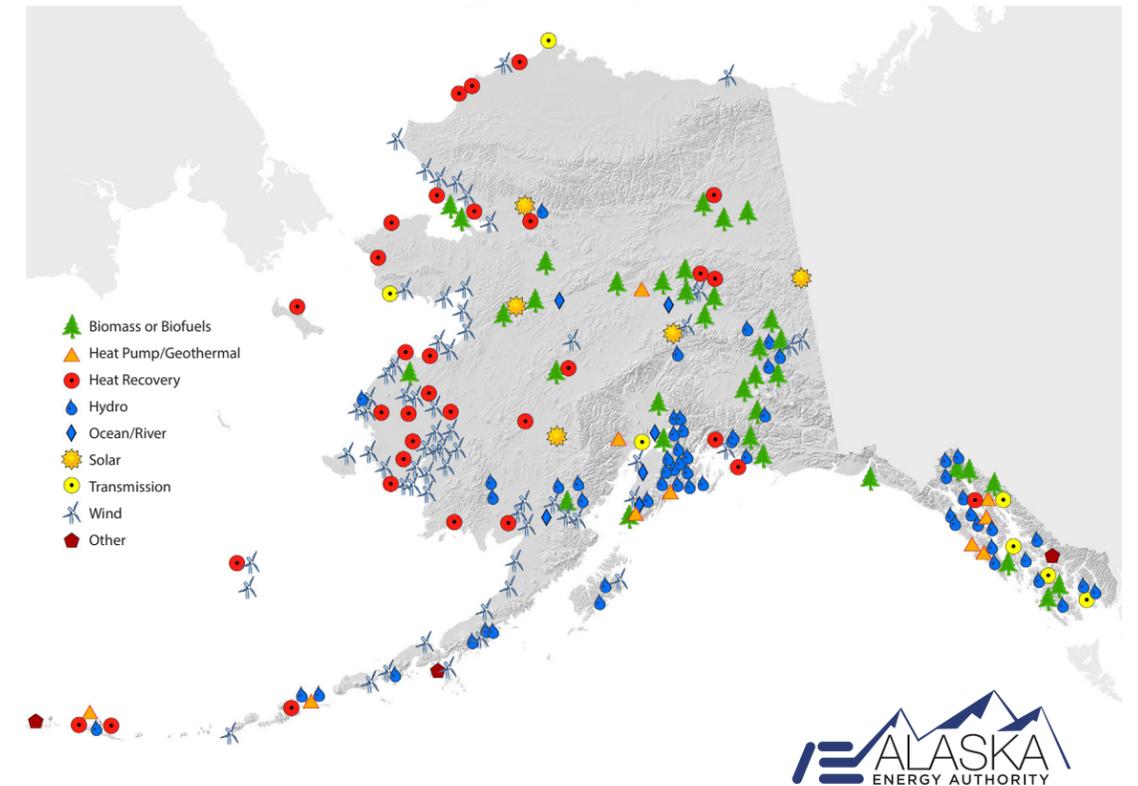
from the Renewable Energy Fund, developing methods for determining the order of projects that may receive grants, and adopting regulations identifying criteria to evaluate the benefit and feasibility of projects seeking legislative support. The REFAC continues to consult with AEA, offering valuable guidance and policy direction regarding the application and evaluation process, and final funding recommendations.

Following is a summary of REFAC involvement with REF Round VIII.

- AEA staff and REFAC members met in May and September, 2014 to discuss issues including the schedule and details of the Round VIII request for applications, progress on funded projects, possible changes to the program evaluation, community assistance efforts and the REF program relationship with regional and community energy planning efforts.
- AEA staff and REFAC members met twice in January, 2015 following AEA evaluation of all applications to review the AEA recommendations for Stage 4 (regional distribution). Based on the feedback provided by the REFAC at this meeting, AEA applied regional distribution rules that increased funding to underserved regions in the state and created greater funding equity across all regions.

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-VII



FUNDED GRANTS BY ENERGY RESOURCE ROUNDS I-VII

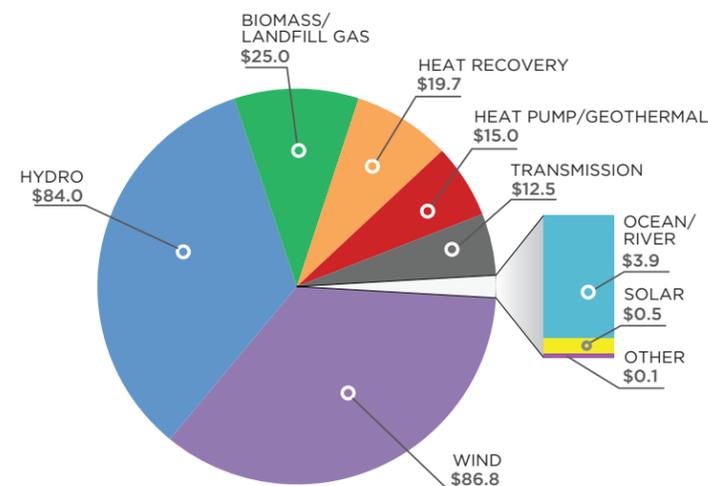


Figure 3 shows funding by energy resource, with wind and hydro grants making up just less than 70 percent of total funding.

FUNDED GRANTS BY ENERGY REGION ROUNDS I-VII

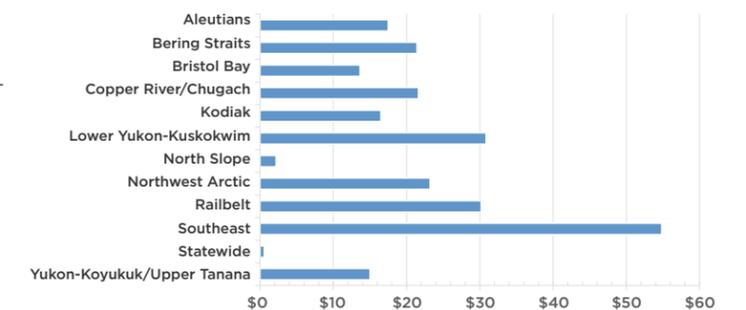


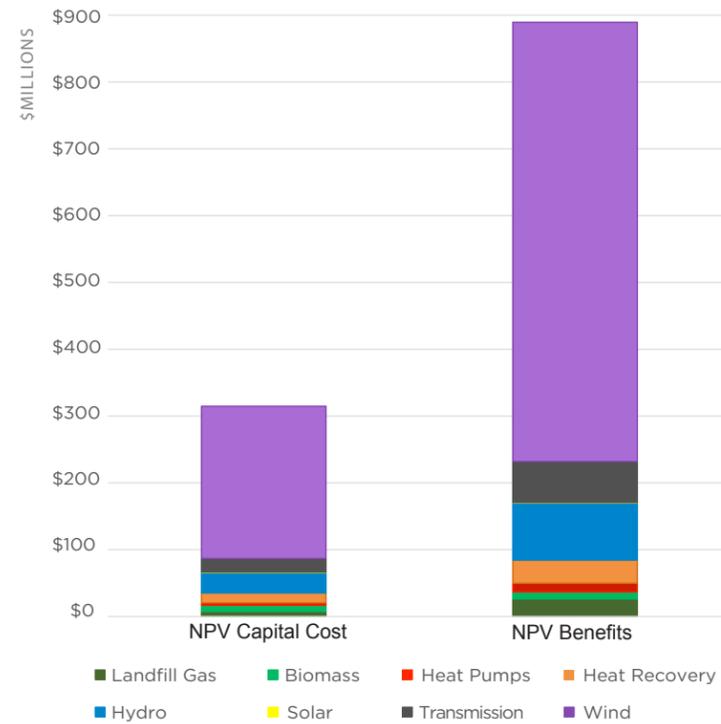
Figure 4 shows cumulative grant funding by AEA energy region totaling to \$247.5 million in rounds I-VII. The three highest recipients to date are Southeast with \$54.8 million, Lower Yukon-Kuskokwim with \$30.8 million, and Railbelt with \$30.2 million.



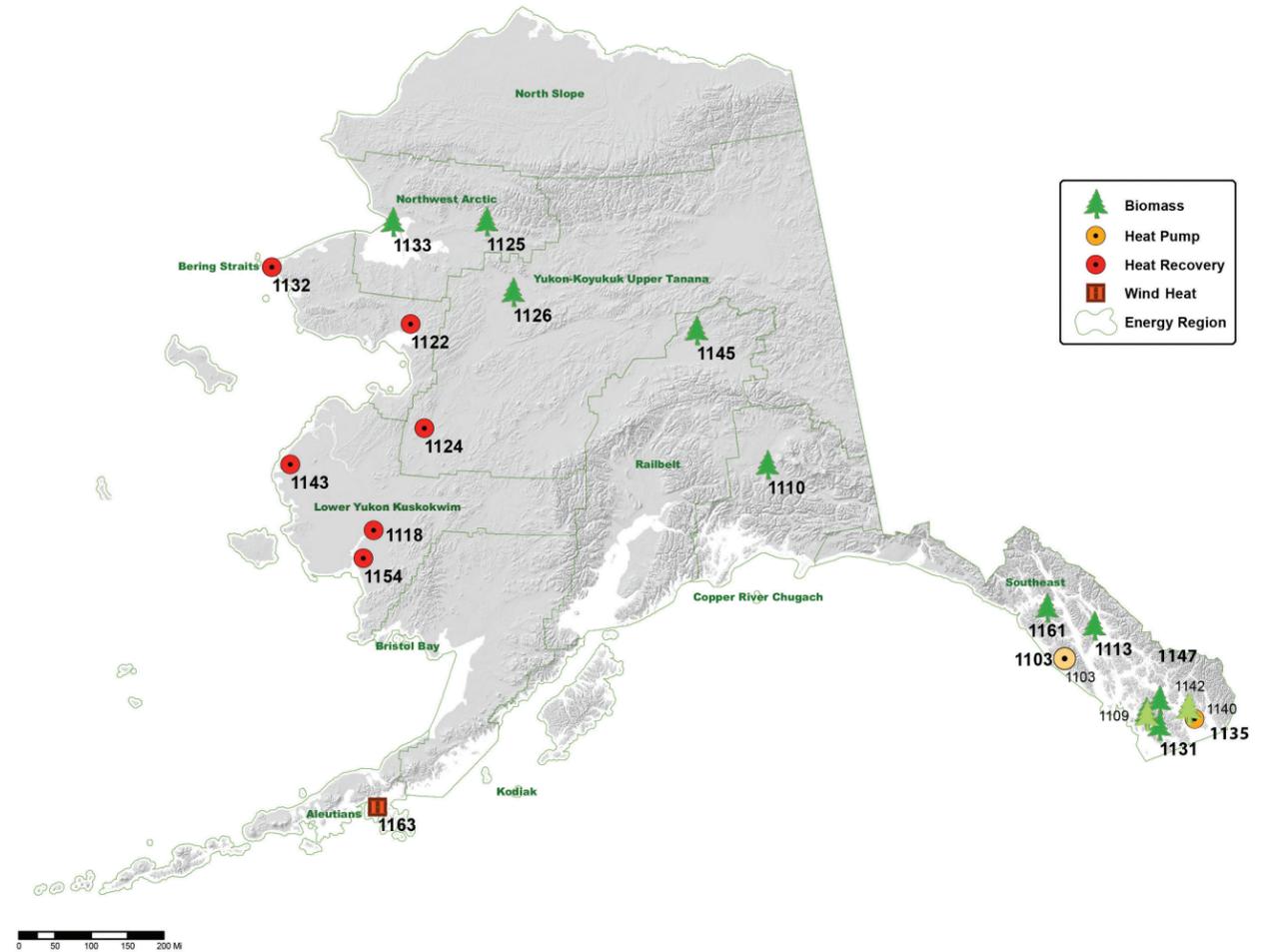
PERFORMANCE & SAVINGS

- Figure 5 shows the net present value (NPV) of those REF projects that have been completed to date. Many of the 44 projects represented received initial funding in the first three rounds of the REF program.
- The net present value of the capital expenditures used to build currently generating projects is \$314.7 million and the net present value of benefits is \$889.5M. These projects have an overall benefit cost ratio of 2.8.
- For every \$1 dollar invested, these projects have an estimated return of \$2.80. It is important to note that the REF only invested a portion of total project cost.
- The largest number of generating projects are wind, at 34 percent. This is a smaller share than last year when 40 percent of projects were wind. Hydro projects increased from 8 percent to 14 percent of total generating projects.
- Given the length of time needed to develop hydro projects, compared to wind which can be developed in roughly half the time, we should expect to see generation from hydro projects continue to grow as projects that have been in development for a number of years come online.
- Though still small as a percentage of total NPV of benefits, the number of heat projects has increased substantially to 41 percent of total projects. This large number of heat projects are smaller in cost and benefits on an individual basis but their overall impact is growing. Heat projects include heat recovery, heat pumps and biomass.
- See pages 6 and 7 for information about where these \$889 million of benefits accrue.

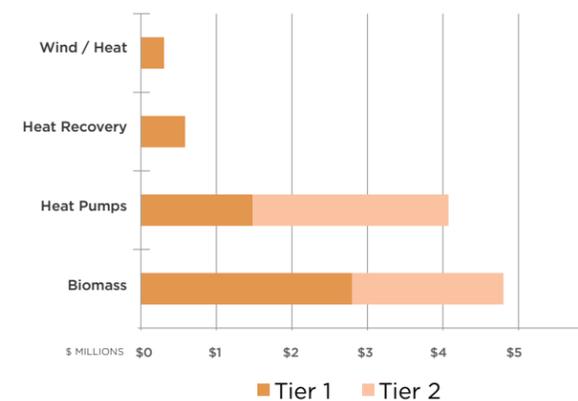
REF CURRENTLY OPERATING PROJECTS



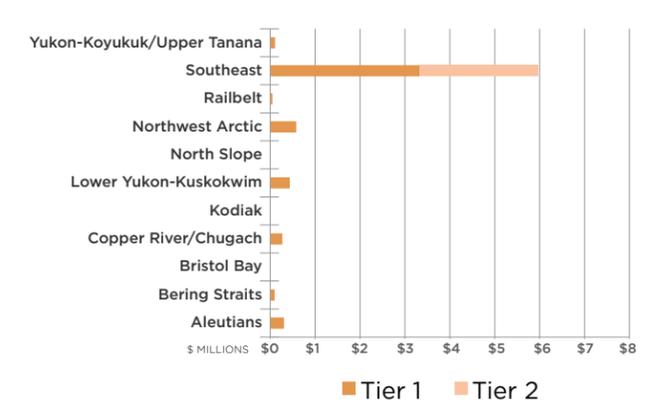
RENEWABLE ENERGY FUND ROUND VIII | RECOMMENDED HEAT PROJECTS



HEAT PROJECTS
BY RESOURCE



HEAT PROJECTS
BY REGION



NOTES:

- Total grant amount requested by all applicants.
- \$26.6 million was appropriated for Round IV, and an additional \$10 million was re-appropriated from Rounds I, II and III for use in Round IV.
- \$20 million was appropriated for Round VII, and an additional \$2.8 million was re-appropriated from previous rounds for use in Round VII.
- Represents only amounts recorded in the grant document and does not capture all other funding.

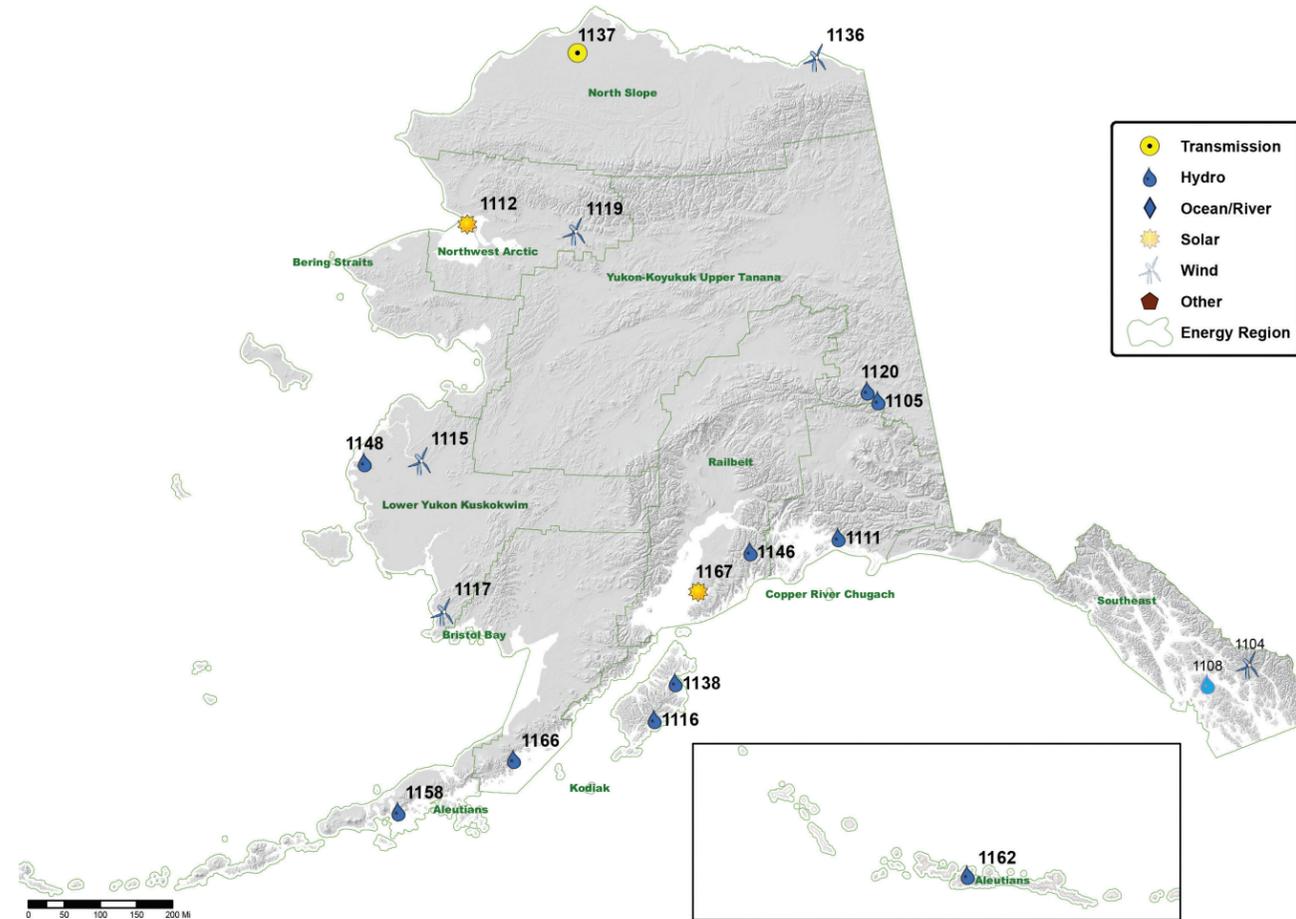
GRANT AND FUNDING SUMMARY

	Round I	Round II	Round III	Round IV	Round V	Round VI	Round VII	Totals
Applications received	115	118	123	108	97	85	86	732
Applications funded	80	30	25	74	19	23	26	277
Grants currently in place	17	7	10	36	17	23	15	125
Amount requested ¹ (\$M)	\$ 453.8	\$ 293.4	\$ 223.5	\$ 123.1	\$ 132.9	\$ 122.6	\$ 93.0	\$ 1,442.3
AEA recommended (\$M)	\$ 100.0	\$ 36.8	\$ 65.8	\$ 36.6	\$ 43.2	\$ 56.8	\$ 59.1	\$ 398.3
Appropriated (\$M)	\$ 100.0	\$ 25.0	\$ 25.0	\$ 26.6 ²	\$ 25.9	\$ 25.0	\$ 20.0 ³	\$ 247.5
Grant match budgeted ⁴ (\$M)	\$ 23.6	\$ 4.5	\$ 11.0	\$ 61.6	\$ 9.0	\$ 5.7	\$ 36.7	\$ 152.1
Cash disbursed (\$M)	\$ 80.2	\$ 20.5	\$ 15.0	\$ 22.3	\$ 15.5	\$ 9.0	\$ 5.4	\$ 167.9

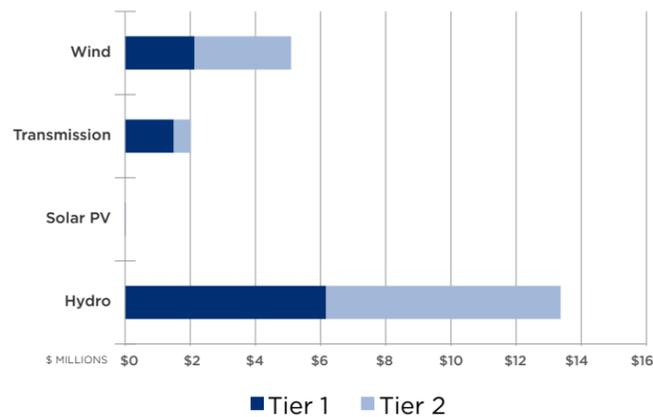
The two bar charts show RVIII recommended funding by energy resource and by region for heat projects. The darker shade (Tier 1) indicates recommended funding within the Governor's \$15 million budget. The lighter shade (Tier 2) indicates recommended funding that falls below the target budget.

MAP NOTES: Recommended projects that fit within the Governor's budget are shown with large/bold labels. Projects that are recommended but do not fit within the proposed budget are shown with small/un-bolded labels

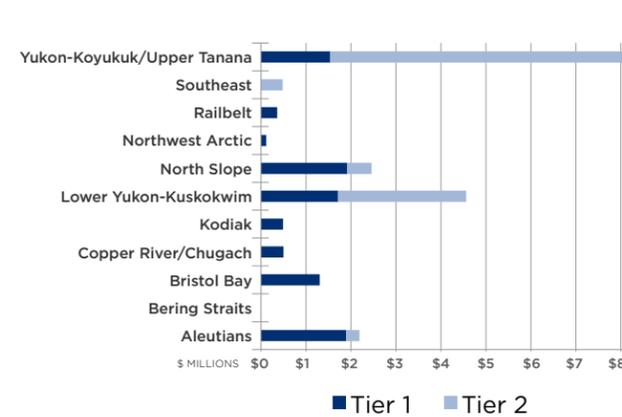
**RENEWABLE ENERGY FUND
ROUND VIII | RECOMMENDED STANDARD PROJECTS**



**STANDARD PROJECTS
BY RESOURCE**



**STANDARD PROJECTS
BY REGION**



The two bar charts show RVIII recommended funding by energy resource and by region for standard projects. The darker shade (Tier 1) indicates recommended funding within the Governor's \$15 million budget. The lighter shade (Tier 2) indicates recommended funding that falls below the target budget.

RENEWABLE ENERGY FUND SUCCESS STORY

THORNE BAY SCHOOL BIOMASS: growing educational opportunities, food, and sustainable economic opportunity in the Southeast Island School District.

REF AWARD | \$478,179
TOTAL PROJECT COST | \$580,179



In Southeast Island School District's Thorne Bay School greenhouse, students are learning the science of growing food, healthy eating, and how to run a successful business. In 2013, the school self-funded and built a hydroponic greenhouse that captures excess heat generated by the school's cordwood boiler.

The boiler was purchased using a Renewable Energy Fund grant made possible through AEA and the efforts of the Alaska Wood Energy Development Task Group's (AWEDTG's) pre-feasibility and feasibility study process.

The AWEDTG is a coalition of federal, state, and non-profit organizations working together to increase the utilization of wood for energy and biofuels production in Alaska. The group is funded half by AEA and half by the U.S. Forest Service and in 2014 received a competitive USDA "State Wood Energy Teams" grant. The AWEDTG's pre-feasibility/feasibility process helps communities explore the potential of heating with high-efficiency, low-emission, wood-fired systems. The group provides

outreach and technical assistance to underserved areas and accepts statements of interest (SOI) for prefeasibility studies. This prefeasibility work can lead to a feasibility assessment, which can then be used in REF grant applications. The group has completed more than 125 prefeasibility studies resulting in over 20 operating wood heating systems, including Thorne Bay School.

At the Thorne Bay School, the biomass boiler is doing more than just displacing diesel. The boiler and greenhouse have been incorporated into the curriculum: science, horticulture, math and business are all taught hands-on. The school's greenhouse grows fresh vegetables for the school cafeteria, improving the quality of school lunch. Excess food is sold to the community as a part of the student-led business and families can deliver wood to the boilers to help fund sports and other extracurricular activities.



Thorne Bay students grow food for their school and community in a greenhouse heated by the REF funded biomass project.



Thorne Bay parents and students raise money for school activities by splitting and stacking wood for the biomass project.

Thorne Bay School is generating cheaper, more sustainable heat while championing a model of hands-on learning and local economic development that can be replicated around the region. This REF success story is an example of the great things that can be accomplished through collaboration and creativity.

AWEDTG TASK GROUP: Alaska Energy Authority | Alaska Village Initiatives | Denali Commission | National Renewable Energy Lab | AK DNR Division of Forestry | AK DCCED Division of Economic Development | USDOC Economic Development Administration | USDA FS AK Region & PNW Research Station | The Nature Conservancy | Tanana Chiefs Conference | USDA Farm Service Agency, Alaska | USDA Natural Resources Conservation Service | USDA Rural Development, Alaska | USDI Bureau of Indian Affairs, Alaska | USDI Bureau of Land Management, Alaska | Southeast Conference | UAF Cooperative Extension Service

PERFORMANCE OF RENEWABLE ENERGY FUND

PROJECTS IN OPERATION DURING THE PERIOD 2009- 2014

Performance of Renewable Energy Fund projects in operation during the period 2009- 2014						2013			
Technology Type	Fuel Displaced	Grantee	Project Name	Start date	Energy Production		Fuel Displaced		
					Electrical (MWh)	Thermal (MMBtu)	Diesel (Gal x 1000)	Value (\$ x 1000)	
1	Heat Recovery	Diesel	City of Unalaska	Unalaska Heat Recovery	09/14				
2	Hydro	Diesel	Gustavus Electric Company	Falls Creek	07/09	1,913	-	147	\$ 612
3	Hydro	Diesel	Cordova Electric Cooperative	Humpback Creek Rehab	07/11	3,509	-	270	\$ 964
4	Hydro	Diesel	City of Atka	Chuniixsax Creek Hydroelectric	12/12	389	-	30	\$ 162
5	Hydro	Diesel	Kodiak Electric Assoc.	Terror Lake Unit 3 Hydroelectric Project	01/14	-	-	-	-
6	Hydro	Diesel	City of Ketchikan	Whitman Lake	10/14	-	-	-	-
7	Hydro	Diesel	City and Borough of Sitka	Blue Lake Expansion	11/14	-	-	-	-
8	Landfill Gas	Natural Gas	Municipality of Anchorage	Anchorage Landfill Gas Electricity	08/12	46,714	-	4,451	\$ 4,050
9	Solar PV	Diesel	AK Village Electric Co-op	Kaltag Solar Construction	10/12	9	-	1	\$ 2
10	Transmission	Diesel	Nome Joint Utility System	Nome Banner Wind Transmission	10/10	1,173	-	72	\$ 234
11	Transmission	Diesel	Alaska Power and Telephone	North Prince of Wales Intertie	09/11	989	-	60	\$ 216
12	Transmission	Diesel	AK Electric Light & Power	Snettisham Transmission	01/14	-	-	-	-
13	Wind	Diesel	AK Village Electric Co-op	Toksook Wind Farm	08/09	122	-	9	\$ 34
14	Wind	Diesel	AK Village Electric Co-op	Quinhagak Wind Farm	11/10	539	-	41	\$ 162
15	Wind	Diesel	AK Village Electric Co-op	Mekoryuk Wind Farm	11/10	198	-	14	\$ 53
16	Wind	Naphtha	Alaska Environmental Power	Delta Area Wind Turbines	09/10	1,563	-	101	\$ 266
17	Wind	Diesel	Kodiak Electric Assoc.	Pillar Mountain Wind Project	09/10	25,438	-	1,791	\$ 6,134
18	Wind	Diesel	AK Village Electric Co-op	Emmonak/Alakanuk Wind	09/11	506	-	36	\$ 139
19	Wind	Diesel	AK Village Electric Co-op	Shaktoolik Wind Construction	04/12	223	-	17	\$ 67
20	Wind	Diesel	Kotzebue Electric Association	Kotz Wind-Battery-Diesel	05/12	2,686	-	183	\$ 649
21	Wind	Naphtha	Golden Valley Electric Assoc.	Eva Creek	10/12	71,619	-	5,044	\$ 13,302
22	Wind	Diesel	Nome Joint Utility System	Banner Peak Wind Farm Expansion	08/13	612	-	37	\$ 122
ELECTRIC PROJECTS SUBTOTAL						158,200	-	12,304	\$ 27,168
23	Biomass	Diesel	Alaska Gateway School District	Tok Wood Heating	10/10	-	3,950	38	\$ 103
24	Hydro	Diesel	City of Pelican	Pelican Hydro Upgrade	03/13	709	-	51	\$ 230
25	Wind/Heat	Diesel	Unalakleet Valley Electric Co	Unalakleet Wind Farm	12/09	955	316	72	\$ 276
26	Wind/Heat	Diesel	Puvurna Power Company	Kong Wind-Diesel Smart Grid	12/10	314	626	30	\$ 140
27	Wind/Heat	Diesel	Aleutian Wind Energy	Sand Point Wind	08/11	772	19	57	\$ 263
28	Wind/Heat	Diesel	Kwigillingok Power Company	Kwig Wind-Diesel Smart Grid	02/12	113	138	10	\$ 46
29	Wind/Heat	Diesel	Tuntutuliak Comm Svcs Assoc	Tunt Wind-Diesel Smart Grid	01/13	193	312	15	\$ 67
ELECTRIC & HEAT PROJECTS SUBTOTAL						3,056	5,361	272	\$ 1,125
30	Biomass	Diesel	Gulkana Village Council	Gulkana Central Wood Heating	10/10	-	1,040	10	\$ 28
31	Biomass	Diesel	Native Village of Eyak	Cordova Wood Processing Plant	12/11	-	720	5	\$ 14
32	Biomass	Diesel	Chilkoot Indian Association	Haines Central Wood Heating	10/11	-	231	2	\$ 6
33	Biomass	Diesel	Delta/Greely School District	Delta Junction Wood Chip Heating	09/11	-	3,048	29	\$ 94
34	Biomass	Diesel	Southeast Island School District	Thorne Bay School Biomass	01/13	-	-	-	\$ -
35	Biomass	Residual Fuel Oil	City of Tanana	City-Tribe Biomass Conservation	01/14	-	-	-	\$ -
36	Heat Pumps	Diesel	City and Borough of Juneau	Aquatic Cntr Ground Source Heat Pump	04/11	-	4,382	37	\$ 104
37	Heat Pumps	Diesel	City and Borough of Juneau	Airport Ground Source Heat Pump	05/11	-	6,400	46	\$ 159
38	Heat Pumps	Diesel	City of Seward	Sealife Center Seawater Heatpump	11/11	-	5,521	53	\$ 143
39	Heat Recovery	Naphtha	Golden Valley Electric Assoc.	North Pole Heat Recovery	11/09	-	3,235	59	\$ 164
40	Heat Recovery	Diesel	McGrath Light & Power	McGrath Heat Recovery	05/10	-	2,500	24	\$ 178
41	Heat Recovery	Diesel	City and Borough of Wrangell	Wrangell Hydro Electric Boilers	02/11	-	7,329	76	\$ 130
42	Heat Recovery	Diesel	Inside Passage Electric Co-op	Hoonah Heat Recovery Project	08/12	-	5,837	56	\$ 230
43	Heat Recovery	Diesel	North Slope Borough	Point Lay Heat Recovery	08/13	-	-	-	\$ -
44	Heat Recovery	Diesel	City of Ambler	Ambler Heat Recovery	10/13	-	90	1	\$ 10
45	Solar Thermal	Propane	Golden Valley Electric Assoc.	McKinley Village Solar Thermal	06/10	-	108	1	\$ 7
HEAT PROJECTS SUBTOTAL						-	40,441	400	\$ 1,266
GRAND TOTAL						161,256	45,802	12,976	\$ 29,559

PRODUCTION CATEGORIES

Electrical
Electrical and Heat
Heat

PERFORMANCE TABLE NOTES:

- Due to an exceptional hydro generation year, the Cordova Heat Recovery project did not produce energy in 2014. It remains operational and ready for use.
- Savings are equal to the value of the displaced fossil fuel minus the cost of the renewable energy fuel, where appropriate (e.g. the cost of wood for a biomass project). For projects with no renewable fuel costs (e.g. wind, hydro), savings are equal to the value of the fossil fuel displaced. These savings estimates do not account for changes in operation and maintenance costs or other costs or benefits.

Project Cost							
Energy Source	B/C	Project Cost Through Construction	Applicant Grant Requested	Applicant Match Offered ††	Phase(s) Requested	AEA Recommendation	
Wind	0.87	\$2,100,000	\$185,000	\$15,000	Recon, Feas	Did Not Pass Stage 2	
Wind	0.71	\$4,526,458	\$382,400	\$7,500	Design	Did Not Pass Stage 2	
Hydro	0.99	\$3,380,000	\$102,300	\$56,900	Design	Did Not Pass Stage 2	
Hydro	0.96	\$4,526,280	\$977,000	\$280	Construction	Did Not Pass Stage 2	
Biomass	0.36	\$420,765	\$341,465	\$79,300	Construction	Did Not Pass Stage 2	
Hydro	5.57	\$50,000,000	\$1,250,000	\$1,250,000	Design	Not Recommended	
Hydro	1.28	\$45,320,707	\$800,000	\$100,000	Design	Not Recommended	
Hydro	3.21	\$13,391,869	\$2,797,935	\$6,695,934	Construction	Not Recommended	
Hydro	0.95	\$7,770,000	\$7,620,000	\$500,000	Design, Constr	Not Recommended	
Hydrokinetic	0.09	\$6,870,575	\$428,646	\$62,500	Feasibility	Not Recommended	
Hydrokinetic	0.34	\$2,458,622	\$2,016,509	\$296,500	Design, Constr	Not Recommended	
Biomass	0.71	\$705,893	\$698,904	\$6,989	Design, Constr	Not Recommended	
HeatRecovery	0.50	\$439,453	\$390,449	\$74,009	Design, Constr	Not Recommended	
HeatWind	0.18	\$284,562	\$279,562	\$5,000	Design, Constr	Not Recommended	
HeatRecovery	0.46	\$200,718	\$198,731	\$105,773	Design, Constr	Not Recommended	
Solar	0.42	\$60,000	\$56,000	\$4,000	Construction	Not Recommended	
Hydro	1.66	-	\$75,000	\$75,000	Recon	Not Recommended	
Other	N/A	-	\$85,000	\$17,000	Recon	Not Recommended	
Other	N/A	-	\$202,696	\$50,673	Recon	Not Recommended	
Biomass	1.06	\$309,450	\$247,560	\$61,890	Design, Constr	Not Recommended	
Wind	0.77	-	\$295,775	\$29,650	Recon, Feas	Not Recommended	
Solar	0.69	\$165,000	\$165,000	\$1,000	Design, Constr	Not Recommended	
Wind, Trans	0.40	\$25,000,000	\$230,000	\$0	Feasibility	Not Recommended	
HeatRecovery	0.00	\$13,717,479	\$4,000,000	\$10,497,695	All	Not Recommended	
Hydro	0.82	\$1,750,000	\$1,750,000	\$0	Design, Constr	Not Recommended	
Biomass	N/A	\$3,100,000	\$3,000,000	\$100,000	All	Did Not Pass Stage 1	
Solar	N/A	\$427,600	\$342,600	\$85,000	Construction	Did Not Pass Stage 1	
		\$186,925,431	\$28,918,532	\$20,177,593			

1125: Construction funding will not be released until the final design and business/operating plan is approved.

1136: 65 percent design, including all necessary permits, must be accepted by AEA prior to the release of funds for final design work.

1146: In order to receive design funding, Kenai Hydro will be required to complete the feasibility and concept design report, and meet other provisions listed in AEA's review comments.

1158: Prior to the issuance of a R VIII grant or expenditure of any existing project grant funds, applicant must demonstrate site control, become current on financial and progress reports, amend existing grants to reflect proposed milestone and deliverables, and provide detailed project management plan.

1162: Additional funding be used to expand the scope of the feasibility study.

1166: Must receive a detailed design budget and a list of the proposed consultants prior to grant execution.

Stage 4 Reductions

1103: Reduced recommendation from \$627,000 to \$0 based upon maximum regional allocation.

1104: Reduced recommendation from \$88,742 to \$0 based upon maximum regional allocation.

1108: Reduced recommendation from \$391,200 to \$0 based upon maximum regional allocation.

1109: Reduced recommendation from \$493,100 to \$0 based upon maximum regional allocation.

1115: Reduced recommendation by \$2,848,540 to maximum grant amount of \$1,500,000.

1120: Reduced recommendation by \$6,500,000 to maximum grant amount of \$1,500,000.

1135: Reduced recommendation of \$3,445,040 by \$1,963,513 based upon maximum regional allocation. Funding recommended outside the Governor's \$15 million budget is limited to \$18,473 due to maximum grant amount of \$1,500,000.

1137: Reduced recommendation by \$517,818 to maximum grant amount of \$1,500,000.

1140: Reduced recommendation from \$1,288,018 to \$0 based upon maximum regional allocation.

1142: Reduced recommendation from \$220,000 to \$0 based upon maximum regional allocation.

1158: Reduced recommendation by \$300,000 to max grant amount of \$1,500,000.

APPLICATIONS NOT RECOMMENDED FOR FUNDING

REF Round VIII - Applications Not Recommended for Funding				
Count	Energy Region	ID	Project Name	Applicant
1	Bristol Bay	1101	Manokotak Renewable Energy Feasibility	Manokotak Power Company
2	Lower Yukon-Kuskokwim	1139	Chefornak Wind Heat System	City of Chefornak/Naterkaq Light Plant
3	Southeast	1159	Elfin Cove Hydroelectric Permitting	Elfin Cove Utility Commission
4	Southeast	1160	Indian River Hydroelectric Construction	Tenakee Springs Electric Dept
5	Railbelt	1164	Port Graham Community Building Biomass	Port Graham Village Council
6	Kodiak	1102	Upper Hidden Basin Diversion	Kodiak Electric Association, Inc. (KEA)
7	Southeast	1106	Mahoney Lake Hydropower Project	City of Saxman
8	Southeast	1107	Swan Lake Reservoir Expansion Project	Southeast Alaska Power Agency
9	Copper River/Chugach	1123	Fivemile Creek Hydroelectric Project	Chitina Electric Inc. (CEI)
10	Aleutians	1127	Hydrokinetic Feasibility Study: False Pass	City of False Pass
11	Bristol Bay	1128	Igiugig RivGen® Power System Project	Igiugig Village Council
12	Yukon-Koyukuk/Upper Tanana	1129	Nikolai Community Biomass Heating System	City of Nikolai
13	Yukon-Koyukuk/Upper Tanana	1130	Holy Cross Heat Recovery for Water System	City of Holy Cross
14	Lower Yukon-Kuskokwim	1134	Kwigillingok Wind/Heat Elec. Thermal Storage	Kwig Power Company
15	Northwest Artic	1141	Selawik Water System Heat Recovery	City of Selawik
16	Southeast	1144	Kake Senior Housing Solar PV	Tlingit Haida Regional Housing Authority
17	Railbelt	1149	Southcentral Small Hydro Assessments	Chugach Electric Association, Inc.
18	Aleutians	1150	Adak Community Energy Baseline Study	Adak Generating, LLC., (TDX)
19	Aleutians	1151	St. Paul Community Energy Baseline Study	TDX Power, Inc.
20	Bristol Bay	1152	Lake and Peninsula Borough Wood Boilers	Lake and Peninsula Borough
21	Bering Straits	1153	Unalakleet Wind-Diesel Optimization	Unalakleet Valley Electric Coop
22	Northwest Artic	1155	City of Noorvik Solar-PV	City of Noorvik
23	Northwest Artic	1156	NW AK Wind Assessment & Intertie Study	NW Alaska Tribal Energy Org.
24	North Slope	1157	Deadhorse Waste Heat to Energy Plant	TDX Power, North Slope Generating
25	Copper River/Chugach	1165	Chenega Bay Hydroelectric Construction	Native Village of Chenega
26	Lower Yukon-Kuskokwim	1121	Biomass for Akiachak Native Comm. Electric	Akiachak Native Comm Electric
27	Railbelt	1167	Community Solar Project	Homer Electric Association
Total, Not Recommended Projects				

NOTES FOR TABLES PAGES 10-15

† Total recommended funding for all projects before stage 4 regional distribution sums to \$28,281,857.

†† The applicant match column includes energy efficiency improvements that are offered as part of the applicant's match, but do not contribute to the Project Cost Through Construction column.

* Funding for these projects was reduced according to the \$1.5 million cap on all individual projects. See Stage 4 reductions.

** Funding for these projects was reduced according to the maximum regional allocation. See Stage 4 Reduction.

B/C = AEA calculation of Benefit/Cost Ratio over the life of the project based upon available information.

Some not recommended projects' B/C ratios may not be listed due to incomplete information provided or other reasons.

Total Stage 2 Score column is the technical and economic evaluation score on a scale of 0 to 100. A minimum score of 40 is required to pass stage 2.

Project Cost Through Construction, Applicant Grant Requested, and Applicant Match Offered are based upon the project scopes recommended by AEA.

Match offered is applicant's offered cash and in-kind match, including supporting energy efficiency work and wood harvest value where applicable.

SP = Special Provisions

If REF VIII funding is limited to \$15M, #1136, Kaktovik Wind Diesel Design would be partially funded. To fully fund, \$15,023,416 must be appropriated.

Special Provisions

1113: AEA must review and accept the final engineering design and the final business/operational plan.

1114: AEA must review and accept the final engineering design and the final business/operational plan.

1115: 95 percent design must be accepted by the Authority prior to allocation of construction funds.

1120: Design must be finalized and approved by AEA prior to issuing a grant for the construction phase.

2014				Cumulative Total (2009-2014)			
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)
80	-	6	\$ 21	80	-	6	\$ 21
1,871	-	144	\$ 557	10,337	-	760	\$ 2,832
2,814	-	217	\$ 762	11,396	-	871	\$ 3,187
287	-	22	\$ 121	676	-	52	\$ 284
12,406	-	827	\$ 3,680	12,406	-	827	\$ 3,680
2,487	-	191	\$ 809	2,487	-	191	\$ 809
9	-	1	\$ 3	9	-	1	\$ 3
56,167	-	5,352	\$ 2,416	102,881	-	9,803	\$ 6,466
9	-	1	\$ 2	18	-	1	\$ 5
986	-	61	\$ 206	5,498	-	326	\$ 1,032
931	-	70	\$ 253	3,171	-	206	\$ 754
1,247	-	96	\$ 150	1,247	-	96	\$ 150
42	-	3	\$ 12	991	-	69	\$ 258
415	-	32	\$ 130	1,935	-	145	\$ 574
173	-	12	\$ 47	761	-	51	\$ 191
2,251	-	145	\$ 392	7,033	-	436	\$ 1,105
23,039	-	1,622	\$ 5,066	95,577	-	6,725	\$ 22,665
485	-	34	\$ 136	1,560	-	111	\$ 435
312	-	24	\$ 97	651	-	50	\$ 200
3,374	-	229	\$ 811	8,237	-	560	\$ 2,009
71,770	-	5,054	\$ 13,074	156,480	-	11,020	\$ 28,349
1,283	-	78	\$ 266	1,895	-	116	\$ 388
182,436	-	14,222	\$ 29,010	425,324	-	32,422	\$ 75,394
269	6,106	59	\$ 146	269	19,286	180	\$ 540
1,004	431	76	\$ 339	1,713	431	127	\$ 569
1,090	236	83	\$ 322	4,670	552	334	\$ 1,195
322	551	30	\$ 111	908	1,177	80	\$ 327
1,105	394	81	\$ 371	2,864	413	210	\$ 965
180	168	14	\$ 58	293	306	24	\$ 102
158	256	12	\$ 47	351	568	27	\$ 115
4,127	8,142	354	\$ 1,395	11,068	22,733	982	\$ 3,813
-	920	9	\$ 25	-	3,800	35	\$ 117
-	540	4	\$ 10	-	4,080	34	\$ 120
-	337	3	\$ 5	-	780	8	\$ 17
-	2,963	29	\$ 97	-	9,988	96	\$ 297
-	1,633	15	\$ 36	-	1,633	15	\$ 36
-	1,972	17	\$ 40	-	1,972	17	\$ 40
-	4,222	36	\$ 95	-	10,344	88	\$ 252
-	6,400	46	\$ 153	-	23,317	174	\$ 602
-	4,809	46	\$ 126	-	10,330	99	\$ 268
-	2,706	50	\$ 193	-	13,622	250	\$ 690
-	2,427	23	\$ 176	-	11,602	108	\$ 653
-	8,162	84	\$ 145	-	30,090	305	\$ 640
-	4,869	47	\$ 210	-	10,706	103	\$ 440
-	2,153	20	\$ 98	-	2,153	20	\$ 98
-	426	4	\$ 48	-	516	5	\$ 59
-	108	1	\$ 10	-	541	6	\$ 33
-	44,647	433	\$ 1,466	-	135,474	1,361	\$ 4,361
186,563	52,789	15,009	\$ 31,871	436,391	158,207	34,765	\$ 83,568

3. The energy production data provided for years 2012 and after is net renewable energy produced by Renewable Energy Fund projects.

4. Savings for the Anchorage Landfill project are the cost of the electricity that would have otherwise been purchased. The project grantee, Solid Waste Services (SWS), sells the landfill gas to Doyon Utilities, LLC.

5. Data for wind turbines in Toksook Bay represent only the portion covered by the REF grant in years 2012 and after. The REF program funded only one of the four wind turbines installed.

6. Tok Wood Heating produces energy used for space heating and electricity production. The REF program funded the space heating system. The electrical system was funding separately by the Alaska Legislature.

8 The Juneau Airport ground source heat pump project does not have metering that can provide exact heat displacement. The values reported are estimates based on information provided by the grantee.

9. Actual reported values for Terror Lake Hydro Unit 3 were not available, the figures reported are estimates.

10. Actual reported values for Snettisham Transmission Line Avalanche Mitigation were not available, the figures reported are estimates.

11. Totals may not equal sum of individual figures as displayed due to independent rounding.

12. Alaska Energy Data Gateway, developed by the Institute of Social and Economic Research, University of Alaska Anchorage, is supported by the U.S. Department of Energy (DOE), Office of Science, Basic Energy Sciences (BES), under EPSCoR Award # DE-SC0004903 (database and web application development), and by Alaska Energy Authority (Renewable Energy Fund data management and reporting). Database and web hosting is provided by Arctic Region Supercomputing Center, University of Alaska Fairbanks.

RENEWABLE ENERGY FUND SUCCESS STORY

UNALAKLEET WIND FARM

REF AWARD | \$4,000,000
 MATCHING FUNDS | \$201,492
 TOTAL PROJECT COST | \$6,000,000



During Round I of the Renewable Energy Fund, Unalakleet Valley Electric Cooperative (UVEC) requested funding for construction of a wind farm to offset expensive and highly variable diesel costs, which fuel their isolated community power system. The project was selected for funding and the system was designed, built and commissioned in November 2011, dovetailing with a power plant upgrade.

Unalakleet's wind system includes six Northern Power Systems 100 kW wind turbines, the most common wind turbine used in Alaska, placed in a windy spot 3 miles from the community. In 2013 the six wind turbines contributed approximately 40 percent of the total electricity produced and saved the community \$276,000 in fuel expenses (72,000 gallons). In 2014, it appears the savings will grow due to continued system operational

improvements. Savings for the first three quarters of 2014 were \$213,000, and typically increase during the fourth quarter's windier conditions and colder, denser air. Some wind energy is used to heat the school, baler building and water plant at times when wind energy production exceeds the community's demand for electricity.

The project has hit some technical challenges along the way, but with the cooperation of the community, AEA's technical experts on wind/diesel system integration, and the wind turbine manufacturer, the system has been integrated with the diesel system and its performance maximized over the years, including recent integration improvements in 2014. The community has maintained the equipment well and operates the system for maximum performance.



A salmon drying rack waits for next year's catch on Unalakleet's coast as the sun sets on Norton Sound.



UVEC crews raise a met tower just east of the Unalakleet Wind Farm - Nov 2014.



Unalakleet wind turbines in winter.

Energy Source	B/C	Tech / Econ Score	State-wide Rank	Project Cost Through Construction	Applicant Grant Requested	Applicant Match Offered++	Recommended Phase(s)	AEA Recomnd	Recommend Funding	Cumulative Funding
Hydro, Storage	2.3	71.7	8	\$10,000,000	\$500,000	\$350,000	Feas, Design	Full SP	\$500,000	\$500,000
Hydro	1.36	61.0	10	\$9,200,000	\$1,092,500	\$20,000	Design	Partial	\$400,000	\$900,000
Hydro	1.52	61.5	11	\$1,400,000	\$85,000	\$0	Feasibility	Full SP	\$390,000	\$1,290,000
Wind	1.17	59.3	18	\$1,634,500	\$123,500	\$6,500	Feasibility	Full	\$123,500	\$1,413,500
Wind	1	56.0	20	\$4,886,000	\$4,348,540	\$537,460	Construction	Full SP/Cap*	\$1,500,000	\$2,913,500
Hydro	1.03	63.0	22	\$6,610,000	\$1,305,000	\$70,000	Design	Full SP	\$1,305,000	\$4,218,500
Hydro	1.21	47.0	25	\$24,000,000	\$8,000,000	\$16,000,000	Construction	Full SP/Cap*	\$1,500,000	\$5,718,500
Transmission	2.19	79.2	28	\$26,272,407	\$2,017,818	\$201,782	Design	Full/Capped*	\$1,500,000	\$7,218,500
Hydro	1.71	40.8	29	\$4,283,056	\$305,000	\$3,050	Recon	Partial	\$90,000	\$7,308,500
Wind	0.69	40.0	33	\$6,000,000	\$525,000	\$27,036	Feasibility	Partial	\$95,000	\$7,403,500
Hydro	1.25	40.0	34	\$5,461,000	\$1,800,000	\$1,061,000	Construction	Full SP/Cap*	\$1,500,000	\$8,903,500
Hydro	1.23	42.8	35	\$15,922,000	\$413,600	\$103,400	Feasibility	Partial	\$40,000	\$8,943,500
Solar	1.3	42.0	36	\$449,178	\$384,730	\$64,448	Feasibility	Partial	\$20,000	\$8,963,500
Hydro	0.62	42.8	37	\$5,541,549	\$2,516,385	\$8,840	Feasibility	Partial	\$88,400	\$9,051,900
Hydro	1.28	45.7	38	\$59,067,808	\$4,000,000	\$36,000	Design	Partial SP	\$358,000	\$9,409,900
Wind	1.02	48.8	40	\$4,565,200	\$440,000	\$44,000	Design	Full SP	\$416,584	\$9,826,484
				\$185,292,698	\$27,857,073	\$18,533,516			\$9,826,484	
Wind	1.02	48.8	40	\$4,565,200	\$440,000	\$44,000	Design	Full SP	\$23,416	\$9,849,900
udget as a result of REFAC recommendations regarding Stage 4 regional distribution.										
Hydro	0.94	63.5	13	\$3,011,475	\$391,200	\$97,800	Feas, Design	Full**	\$391,200	\$10,241,100
Wind	1.79	81.8	21	\$170,583	\$88,742	\$81,842	Recon, Feas	Full**	\$88,742	\$10,329,842
				\$188,474,756	\$28,337,015	\$18,713,158			\$10,329,842 †	
Biomass	1.79	75.8	1	\$292,184	\$240,592	\$266,592	Design/Const	Full SP	\$240,592	\$240,592
Biomass	2.33	89.3	2	\$872,635	\$832,635	\$124,708	Construction	Full	\$832,635	\$1,073,227
Biomass	1.67	78.0	4	\$0	\$45,000	\$30,000	Feasibility	Full	\$45,000	\$1,118,227
HeatRecovery	3.63	71.2	5	\$9,000,000	\$645,613	\$33,980	Feasibility	Partial	\$325,000	\$1,443,227
HeatWind	2.94	75.7	6	\$383,900	\$307,120	\$76,780	Design/Const	Full	\$307,120	\$1,750,347
Biomass	1.95	86.5	9	\$660,977	\$620,977	\$40,000	Design/Const	Full	\$620,977	\$2,371,324
HeatPump	1.8	77.0	12	\$3,479,490	\$3,445,040	\$34,450	Design/Const	Full**	\$1,481,527	\$3,852,851
Biomass	1.14	64.3	14	\$2,692,700	\$2,495,189	\$250,000	Design	Partial	\$200,000	\$4,052,851
Biomass	1.12	47.7	15	\$433,379	\$379,583	\$13,796	Design	Full SP	\$379,583	\$4,432,434
HeatRecovery	1.26	62.7	16	\$763,898	\$756,335	\$7,563	Design	Partial	\$60,000	\$4,492,434
Biomass	1.09	59.0	19	\$102,275	\$102,275	\$314,381	Design/Const	Full SP	\$102,275	\$4,594,709
Biomass	0.67	40.7	23	\$503,990	\$499,000	\$89,990	Design	Partial	\$58,000	\$4,652,709
Biomass	1.06	68.7	26	\$324,807	\$270,807	\$54,000	Design/Const	Full	\$270,807	\$4,923,516
HeatRecovery	0.7	49.3	27	\$729,600	\$729,600	\$92,296	Design	Partial	\$50,000	\$4,973,516
HeatRecovery	0.58	49.3	30	\$706,701	\$699,163	\$7,538	Design	Partial	\$50,000	\$5,023,516
HeatRecovery	0.59	48.0	31	\$299,754	\$296,786	\$107,968	Design	Partial	\$50,000	\$5,073,516
HeatRecovery	0.75	50.0	32	\$458,716	\$454,277	\$26,439	Design	Partial	\$50,000	\$5,123,516
Biomass	0.97	56.0	39	\$50,000	\$50,000	\$19,338	Feasibility	Full	\$50,000	\$5,173,516
				\$21,755,006	\$12,869,992	\$1,589,819			\$5,173,516	
udget as a result of REFAC recommendations regarding Stage 4 regional distribution.										
HeatPump	1.8	77.0	12	\$3,479,490	\$3,445,040	\$34,450	Design/Const	Full**	\$18,473	\$5,191,989
Biomass	1.98	82.5	3	\$679,950	\$493,100	\$186,850	Design/Const	Full**	\$493,100	\$5,685,089
HeatPump	1.41	83.5	7	\$740,000	\$627,000	\$168,278	Design/Const	Full**	\$627,000	\$6,312,089
Biomass	1.97	89.3	17	\$2,200,000	\$220,000	\$0	Feas, Design	Full**	\$220,000	\$6,532,089
Biomass	1.46	83.2	24	\$1,408,908	\$1,288,018	\$0	Construction	Full**	\$1,288,018	\$7,820,107
				\$26,783,864	\$15,498,110	\$1,944,947			\$7,820,107 †	

RECOMMENDED HEAT AND STANDARD

REF Recommended Projects Round VIII				
Count	Energy Region	ID	Project Name	Applicant
1	Copper River/Chugach	1111	Crater Lake Power and Water Project	Cordova Electric Cooperative, Inc.
2	Kodiak	1116	Old Harbor Hydro – Geotechnical Study & Design	Alaska Village Electric Cooperative, Inc.
3	Aleutians	1162	Adak Hydro Feasibility Phase II	TDX Power, Inc.
4	Lower Yukon-Kuskokwim	1117	Goodnews Bay Wind	Alaska Village Electric Cooperative, Inc.
5	Lower Yukon-Kuskokwim	1115	St. Mary’s-Pitka’s Point Wind	Alaska Village Electric Cooperative, Inc.
6	Bristol Bay	1166	Chignik Hydro Design & Permitting	City of Chignik
7	Yukon-Koyukuk/Upper Tanana	1120	Yerrick Creek Hydropower Project	Upper Tanana Energy, LLC (UTE)
8	North Slope	1137	Atkasuk Transmission Line Design & Permitting	North Slope Borough
9	Lower Yukon-Kuskokwim	1148	Scammon Bay Hydroelectric Project	City of Scammon Bay
10	Northwest Arctic	1119	Shungnak Wind-Diesel Design	Native Village of Shungnak
11	Aleutians	1158	Waterfall Creek Hydroelectric Construction Project	City of King Cove
12	Yukon-Koyukuk/Upper Tanana	1105	Clearwater Creek Hydropower Project	Alaska Power Company
13	Northwest Arctic	1112	100 Kilowatt Solar Array for Kotzebue	Kotzebue Electric Association Inc.
14	Kodiak	1138	Ouzinkie Hydroelectric Power Project	City of Ouzinkie
15	Railbelt	1146	Grant Lake Hydroelectric Project	Kenai Hydro LLC
16	North Slope	1136	Kaktovik Wind Diesel Design	North Slope Borough
Sub Total, Recommended Standard Projects within \$15 million budget				
16	North Slope	1136	Kaktovik Wind Diesel Design	North Slope Borough
<i>The remainder of the list of recommended projects (below) are those that were not recommended for funding within the \$15 million b</i>				
17	Southeast	1108	Neck Lake Hydropower Project	Alaska Power Company
18	Southeast	1104	SEAPA Wind Resource Assessment	The Southeast Alaska Power Agency
Total, All Recommended Standard Projects				
1	Southeast	1113	Angoon Low-Income Housing Pellet District Heat	Tlingit Haida Regional Housing Authority
2	Southeast	1147	Southeast Island School District Wood Boilers	Southeast Island School District
3	Southeast	1161	Hoonah Biomass District Heating Loop	Hoonah Indian Association
4	Lower Yukon-Kuskokwim	1118	Bethel Heat Recovery Assessment & Conceptual Design	Alaska Village Electric Cooperative, Inc.
5	Aleutians	1163	Sand Point Excess Wind Utilization	TDX Power, Sand Point Generating
6	Southeast	1131	Hydaburg Schools Wood Fired Boiler Project	Hydaburg City School District
7	Southeast	1135	Lepquinum Center Ground Source Heat Pump	Metlakatla Indian Community
8	Northwest Arctic	1133	Kotzebue Paper & Wood Waste to Energy	City of Kotzebue
9	Northwest Arctic	1125	Ambler Washeteria & City Office Biomass	City of Ambler
10	Lower Yukon-Kuskokwim	1143	Scammon Bay Community Facilities Heat Recovery	City of Scammon Bay
11	Southeast	1114	Klawock Low-Income Housing Pellet	Tlingit Haida Regional Housing Authority
12	Yukon-Koyukuk/Upper Tanana	1126	Huslia Water System & Clinic Biomass Boiler	City of Huslia
13	Copper River/Chugach	1110	Wood Boiler for the Native Village of Tazlina	Native Village of Tazlina
14	Bering Straits	1122	Koyuk Water System Heat Recovery	City of Koyuk
15	Bering Straits	1132	Wales Water System Heat Recovery	City of Wales
16	Lower Yukon-Kuskokwim	1154	Eek Water System Heat Recovery	City of Eek
17	Yukon-Koyukuk/Upper Tanana	1124	Grayling Water System Heat Recovery	City of Grayling
18	Railbelt	1145	IRHA Facility Biomass Feasibility Study	Interior Regional Housing Authority
Sub Total, Recommended Heat Projects within \$15 million budget				
<i>The remainder of the list of recommended projects (below) are those that were not recommended for funding within the \$15 million b</i>				
7	Southeast	1135	Lepquinum Center Ground Source Heat Pump	Metlakatla Indian Community
19	Southeast	1109	Craig High School Wood Heat Conversion	Craig City School District
20	Southeast	1103	Sitka: Wastewater Treatment Plant Effluent Heat Pump	City & Borough of Sitka Public Works Dept.
21	Southeast	1142	Gateway Borough Rec & Schools Central Heating	Ketchikan Gateway Borough
22	Southeast	1140	Ketchikan High School Biomass Boiler	Ketchikan Gateway Borough
Total, All Recommended Heat Projects				

Please see notes for all tables on pages 14 & 15. Individual project summaries are available on AEA's website (see page 2).

ROUND VIII RECOMMENDED APPLICATIONS

AEA recommended 40 out of 67 applications reviewed for Round VIII funding. These 40 projects requested \$43.8 million in funding. Following AEA's technical and economic reviews and scoring, AEA recommends funding of \$28.3 million for these 40 projects. To meet the Governor's budget target of \$15 million, and following consultation with the Renewable Energy Fund Advisory Committee (REFAC) on regional distribution, AEA recommends 34 top-tier projects that are listed in the following pages. Some of the projects are capped at \$1.5 million and one project in an over-served region is partially funded within the top tier.

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, and ranking based on criteria established in statute. The technical and economic evaluation is a thorough vetting process conducted by AEA technical reviewers, economists, and by 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 REFAC to ensure that there is regional equity in the cumulative rounds I through VIII funding.

ADVISORY COMMITTEE/REGIONAL SPREADING

During the January 9, 2015 REFAC meeting, the committee advised AEA to consider a new approach to the regional distribution of REF project funding. Below is the three-step approach developed by AEA to respond to the committee's guidance.

1. 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 household consumption and local

costs for residential electric and heating fuel and household income. Burden of energy cost = (HH cost of electric + heat energy) / HH income. Using this methodology, Yukon-Koyukuk/Upper Tanana is identified as "underserved" based on the amount of funding received to date from the REF.

2. Cap all individual projects at \$1.5 million (10 percent of Governor's budget).
3. Regions that exceed the target funding band by more than 2X will be capped so their share of the overall fund cannot grow beyond current levels. This rule affects the Southeast region in this round. Southeast projects in the top funding tier are limited to recommended projects in communities with the highest burden of energy cost. Once the region's funding equals 22.15 percent (RI through RVIII percentage share of funds) of recommended funding, the remaining projects will be identified as recommended projects, but in a group below the top tier of \$15 million of Round VIII projects.

AEA'S RECOMMENDATIONS

The REFAC re-convened on January 28, 2015 to review the outcome of the recommendations made at the January 9 meeting. The committee recommended the list provided and the new regional distribution methodology. AEA has accepted the committee's recommendations and presents the legislature with the following tables of recommended projects for a funding determination. Pages 10 and 11 identify all projects that are recommended for funding by AEA in ranked order. The first \$15 million of projects that fit within the Governor's budget are colored a darker shade of blue (standard electric projects) and orange (heat projects). The lighter shades represent recommended projects outside the current \$15 million Governor's budget.

RECOMMENDED FULL RANK LIST

REF Recommended Projects Round VIII															
Count	Energy Region	ID	Project Name	Applicant	Energy Source	B/C	Tech / Econ Score	State-wide Rank	Project Cost Through Construction	Applicant Grant Requested	Applicant Match Offered**	Recommended Phase(s)	AEA Recomnd	Recommend Funding	Cumulative Funding
1	Southeast	1113	Angoon Low-Income Housing Pellet District Heat	Tlingit Haida Regional Housing Authority	Biomass	1.79	75.8	1	\$292,184	\$240,592	\$266,592	Design/Const	Full SP	\$240,592	\$240,592
2	Southeast	1147	Southeast Island School District Wood Boilers	Southeast Island School District	Biomass	2.33	89.3	2	\$872,635	\$832,635	\$124,708	Construction	Full	\$832,635	\$1,073,227
3	Southeast	1161	Hoonah Biomass District Heating Loop	Hoonah Indian Association	Biomass	1.67	78.0	4	\$0	\$45,000	\$30,000	Feasibility	Full	\$45,000	\$1,118,227
4	Lower Yukon-Kuskokwim	1118	Bethel Heat Recovery Assessment & Conceptual Design	Alaska Village Electric Cooperative, Inc.	HeatRecovery	3.63	71.2	5	\$9,000,000	\$645,613	\$33,980	Feasibility	Partial	\$325,000	\$1,443,227
5	Aleutians	1163	Sand Point Excess Wind Utilization	TDX Power, Sand Point Generating	HeatWind	2.94	75.7	6	\$383,900	\$307,120	\$76,780	Design/Const	Full	\$307,120	\$1,750,347
6	Copper River/Chugach	1111	Crater Lake Power and Water Project	Cordova Electric Cooperative, Inc.	Hydro, Storage	2.3	71.7	8	\$10,000,000	\$500,000	\$350,000	Feas, Design	Full SP	\$500,000	\$2,250,347
7	Southeast	1131	Hydaburg Schools Wood Fired Boiler Project	Hydaburg City School District	Biomass	1.95	86.5	9	\$660,977	\$620,977	\$40,000	Design/Const	Full	\$620,977	\$2,871,324
8	Kodiak	1116	Old Harbor Hydro – Geotechnical Study & Design	Alaska Village Electric Cooperative, Inc.	Hydro	1.36	61.0	10	\$9,200,000	\$1,092,500	\$20,000	Design	Partial	\$400,000	\$3,271,324
9	Aleutians	1162	Adak Hydro Feasibility Phase II	TDX Power, Inc.	Hydro	1.52	61.5	11	\$1,400,000	\$85,000	\$0	Feasibility	Full SP	\$390,000	\$3,661,324
10	Southeast	1135	Lepquinum Center Ground Source Heat Pump	Metlakatla Indian Community	HeatPump	1.8	77.0	12	\$3,479,490	\$3,445,040	\$34,450	Design/Const	Full**	\$1,481,527	\$5,142,851
11	Northwest Arctic	1133	Kotzebue Paper & Wood Waste to Energy	City of Kotzebue	Biomass	1.14	64.3	14	\$2,692,700	\$2,495,189	\$250,000	Design	Partial	\$200,000	\$5,342,851
12	Northwest Arctic	1125	Ambler Washeteria & City Office Biomass	City of Ambler	Biomass	1.12	47.7	15	\$433,379	\$379,583	\$13,796	Design	Full SP	\$379,583	\$5,722,434
13	Lower Yukon-Kuskokwim	1143	Scammon Bay Community Facilities Heat Recovery	City of Scammon Bay	HeatRecovery	1.26	62.7	16	\$763,898	\$756,335	\$7,563	Design	Partial	\$60,000	\$5,782,434
14	Lower Yukon-Kuskokwim	1117	Goodnews Bay Wind	Alaska Village Electric Cooperative, Inc.	Wind	1.17	59.3	18	\$1,634,500	\$123,500	\$6,500	Feasibility	Full	\$123,500	\$5,905,934
15	Southeast	1114	Klawock Low-Income Housing Pellet	Tlingit Haida Regional Housing Authority	Biomass	1.09	59.0	19	\$102,275	\$102,275	\$314,381	Design/Const	Full SP	\$102,275	\$6,008,209
16	Lower Yukon-Kuskokwim	1115	St. Mary's-Pitka's Point Wind	Alaska Village Electric Cooperative, Inc.	Wind	1	56.0	20	\$4,886,000	\$4,348,540	\$537,460	Construction	Full SP/Cap*	\$1,500,000	\$7,508,209
17	Bristol Bay	1166	Chignik Hydro Design & Permitting	City of Chignik	Hydro	1.03	63.0	22	\$6,610,000	\$1,305,000	\$70,000	Design	Full SP	\$1,305,000	\$8,813,209
18	Yukon-Koyukuk/Upper Tanana	1126	Huslia Water System & Clinic Biomass Boiler	City of Huslia	Biomass	0.67	40.7	23	\$503,990	\$499,000	\$89,990	Design	Partial	\$58,000	\$8,871,209
19	Yukon-Koyukuk/Upper Tanana	1120	Yerrick Creek Hydropower Project	Upper Tanana Energy, LLC (UTE)	Hydro	1.21	47.0	25	\$24,000,000	\$8,000,000	\$16,000,000	Construction	Full SP/Cap*	\$1,500,000	\$10,371,209
20	Copper River/Chugach	1110	Wood Boiler for the Native Village of Tazlina	Native Village of Tazlina	Biomass	1.06	68.7	26	\$324,807	\$270,807	\$54,000	Design/Const	Full	\$270,807	\$10,642,016
21	Bering Straits	1122	Koyuk Water System Heat Recovery	City of Koyuk	HeatRecovery	0.7	49.3	27	\$729,600	\$729,600	\$92,296	Design	Partial	\$50,000	\$10,692,016
22	North Slope	1137	Atkasuk Transmission Line Design & Permitting	North Slope Borough	Transmission	2.19	79.2	28	\$26,272,407	\$2,017,818	\$201,782	Design	Full/Cap*	\$1,500,000	\$12,192,016
23	Lower Yukon-Kuskokwim	1148	Scammon Bay Hydroelectric Project	City of Scammon Bay	Hydro	1.71	40.8	29	\$4,283,056	\$305,000	\$3,050	Recon	Partial	\$90,000	\$12,282,016
24	Bering Straits	1132	Wales Water System Heat Recovery	City of Wales	HeatRecovery	0.58	49.3	30	\$706,701	\$699,163	\$7,538	Design	Partial	\$50,000	\$12,332,016
25	Lower Yukon-Kuskokwim	1154	Eek Water System Heat Recovery	City of Eek	HeatRecovery	0.59	48.0	31	\$299,754	\$296,786	\$107,968	Design	Partial	\$50,000	\$12,382,016
26	Yukon-Koyukuk/Upper Tanana	1124	Grayling Water System Heat Recovery	City of Grayling	HeatRecovery	0.75	50.0	32	\$458,716	\$454,277	\$26,439	Design	Partial	\$50,000	\$12,432,016
27	Northwest Arctic	1119	Shungnak Wind-Diesel Design	Native Village of Shungnak	Wind	0.69	40.0	33	\$6,000,000	\$525,000	\$27,036	Feasibility	Partial	\$95,000	\$12,527,016
28	Aleutians	1158	Waterfall Creek Hydroelectric Construction Project	City of King Cove	Hydro	1.25	40.0	34	\$5,461,000	\$1,800,000	\$1,061,000	Construction	Full SP/Cap*	\$1,500,000	\$14,027,016
29	Yukon-Koyukuk/Upper Tanana	1105	Clearwater Creek Hydropower Project	Alaska Power Company	Hydro	1.23	42.8	35	\$15,922,000	\$413,600	\$103,400	Feasibility	Partial	\$40,000	\$14,067,016
30	Northwest Arctic	1112	100 Kilowatt Solar Array for Kotzebue	Kotzebue Electric Association Inc.	Solar	1.3	42.0	36	\$449,178	\$384,730	\$64,448	Feasibility	Partial	\$20,000	\$14,087,016
31	Kodiak	1138	Ouzinkie Hydroelectric Power Project	City of Ouzinkie	Hydro	0.62	42.8	37	\$5,541,549	\$2,516,385	\$8,840	Feasibility	Partial	\$88,400	\$14,175,416
32	Railbelt	1146	Grant Lake Hydroelectric Project	Kenai Hydro LLC	Hydro	1.28	45.7	38	\$59,067,808	\$4,000,000	\$36,000	Design	Partial SP	\$358,000	\$14,533,416
33	Railbelt	1145	IRHA Facility Biomass Feasibility Study	Interior Regional Housing Authority	Biomass	0.97	56.0	39	\$50,000	\$50,000	\$19,338	Feasibility	Full	\$50,000	\$14,583,416
34	North Slope	1136	Kaktovik Wind Diesel Design	North Slope Borough	Wind	1.02	48.8	40	\$4,565,200	\$440,000	\$44,000	Design	Full SP	\$416,584	\$15,000,000
Sub Total, Recommended Projects within \$15 million budget									\$207,047,704	\$40,727,065	\$20,123,335			\$15,000,000	
34	North Slope	1136	Kaktovik Wind Diesel Design	North Slope Borough	Wind	1.02	48.8	40	\$4,565,200	\$440,000	\$44,000	Design	Full SP	\$23,416	\$15,023,416
<i>The remainder of the list of recommended projects (below) are those that were not recommended for funding within the \$15 million budget as a result of REFAC recommendations regarding Stage 4 regional distribution.</i>															
10	Southeast	1135	Lepquinum Center Ground Source Heat Pump	Metlakatla Indian Community	HeatPump	1.8	77.0	12	\$3,479,490	\$3,445,040	\$34,450	Design/Const	Full**	\$18,473	\$15,041,889
35	Southeast	1109	Craig High School Wood Heat Conversion	Craig City School District	Biomass	1.98	82.5	3	\$679,950	\$493,100	\$186,850	Design/Const	Full**	\$493,100	\$15,534,989
36	Southeast	1108	Neck Lake Hydropower Project	Alaska Power Company	Hydro	0.94	63.5	13	\$3,011,475	\$391,200	\$97,800	Feas, Design	Full**	\$391,200	\$15,926,189
37	Southeast	1103	Sitka: Wastewater Treatment Plant Effluent Heat Pump	City & Borough of Sitka Public Works Dept.	HeatPump	1.41	83.5	7	\$740,000	\$627,000	\$168,278	Design/Const	Full**	\$627,000	\$16,553,189
38	Southeast	1142	Gateway Borough Rec & Schools Central Heating	Ketchikan Gateway Borough	Biomass	1.97	89.3	17	\$2,200,000	\$220,000	\$0	Feas, Design	Full**	\$220,000	\$16,773,189
39	Southeast	1104	SEAPA Wind Resource Assessment	The Southeast Alaska Power Agency	Wind	1.79	81.8	21	\$170,583	\$88,742	\$81,842	Recon, Feas	Full**	\$88,742	\$16,861,931
40	Southeast	1140	Ketchikan High School Biomass Boiler	Ketchikan Gateway Borough	Biomass	1.46	83.2	24	\$1,408,908	\$1,288,018	\$0	Construction	Full**	\$1,288,018	\$18,149,949
Total, All Recommended Projects									\$215,258,620	\$43,835,125	\$20,658,105			\$18,149,949 †	

Please see notes for all tables on pages 14 & 15.
Individual project summaries are available on AEA's website (see page 2).