02/26/14 Alaska Energy Authority Presentation: Renewable Energy Fund Grants and Emerging Energy Technology Fund

<TARGET><BILL></BILL><SUBJECT>02-26-14 Alaska Energy Authority Presentation Renewable Energy Fund Grants and Emerging Energy Technology Fund</SUBJECT><COMM>HENE28</COMM></TARGET>

Alaska Legislature
House Special Committee on Energy

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Agenda

Wednesday, February 26, 2014
8:00 – 10:00 a.m.
Barnes Committee Room (124)

Presentation by Sara Fisher-Goad, Executive Director, Alaska Energy Authority

- Renewable & Alternative Energy Resources
- Emerging Technologies
- Recommendations

* First hearing in first committee of referral
\+ Teleconferenced
= Bill previously heard/scheduled

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Renewable Energy Grant Fund and Emerging Energy Technology Fund

House Energy Committee

Feb. 26, 2014

ALASKA ENERGY AUTHORITY

Renewable Energy Grant Fund

- Diversifies Alaska's energy portfolio and supports State renewable goals
- Displaces volatile-priced fossil fuels
- Provides a vetting mechanism for energy projects
- Capitalizes on local energy resources
- Expands Alaska's renewable energy knowledge base
- Provides local employment
- Benefits businesses not eligible for PCE

Coffman Cove School Garn boiler.

Photo courtesy of Karen Petersen

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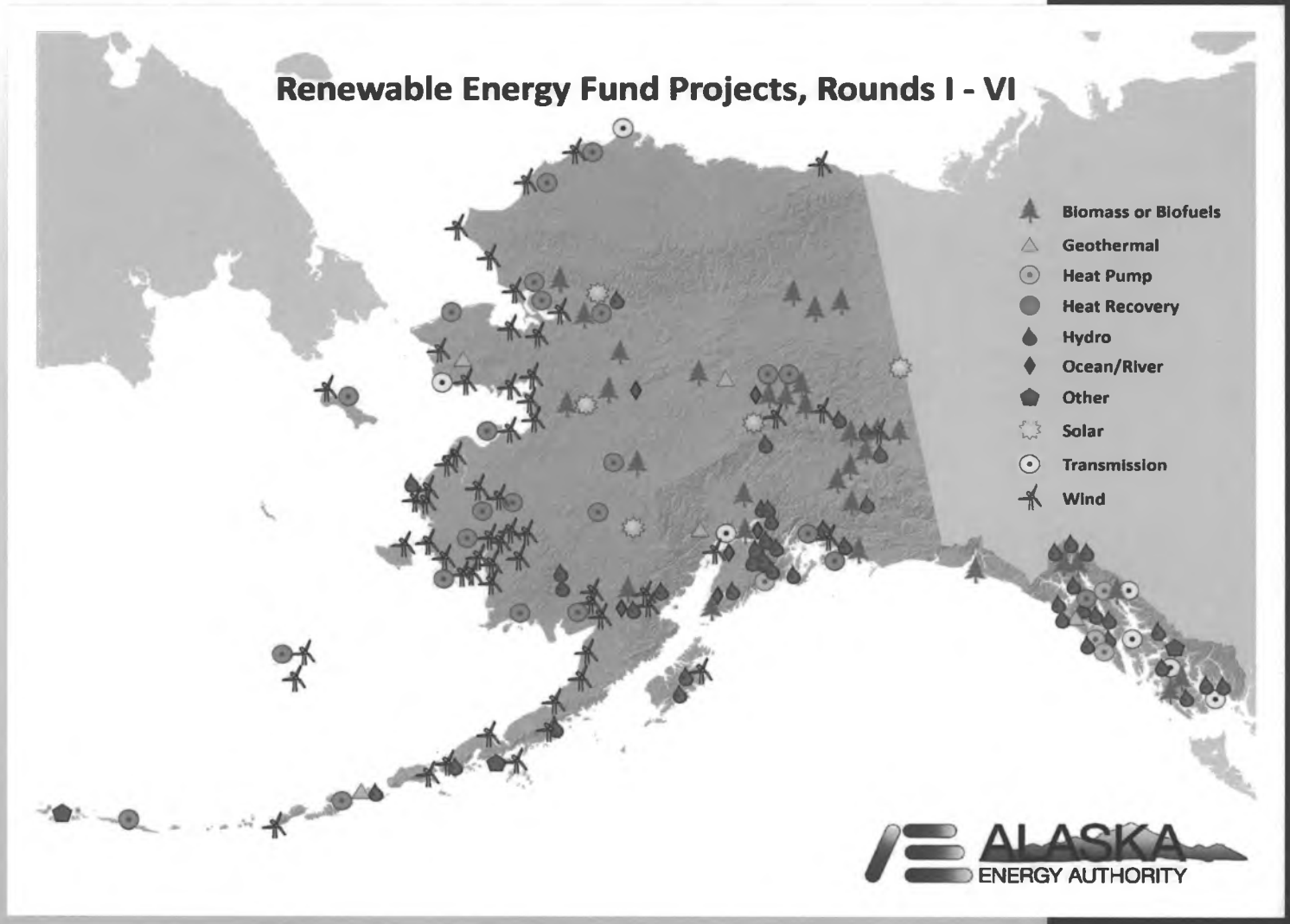
Renewable Energy Fund Grant and Funding Summary

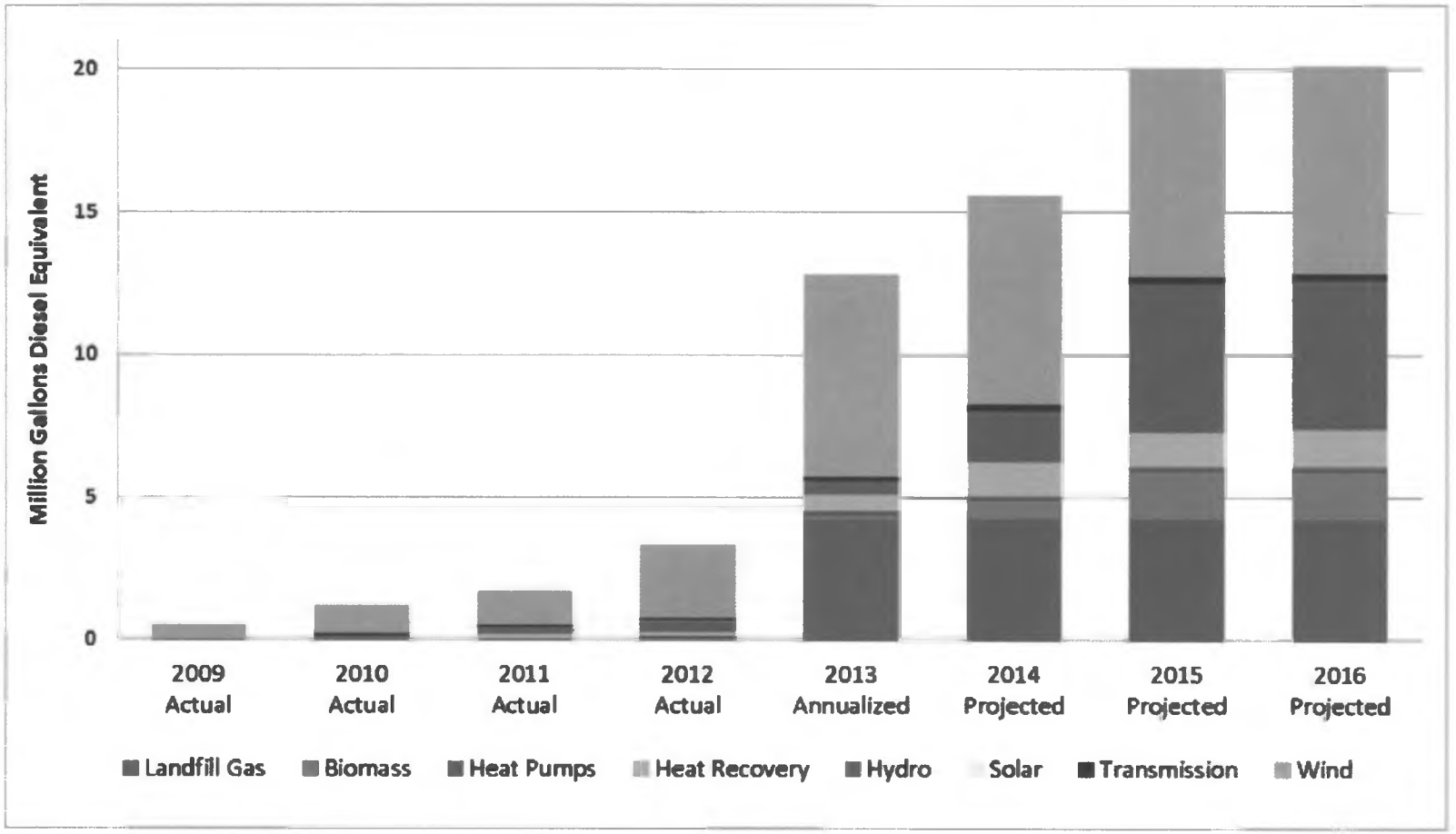
	Round I	Round II	Round III	Round IV	Round V	Round VI	Totals
Applications Received	115	118	123	108	97	85	646
Applications Funded	80[1]	30	25	74	19	23	251
Grants Currently in Place	26	10	13	51	17	16	133
Grants Completed and Closed	49	18	7	12	1	0	87
Grants Cancelled or Combined	5	2	4	1	0	0	12
Grants Unissued to Date[2]	0	0	1	10	1	7	19
Amount Requested[3] ($M)	$ 453.8	$ 293.4	$ 223.5	$ 123.1	$ 132.9	$ 122.6	$ 1,349.3
AEA Recommended ($M)	$ 100.0	$ 36.8	$ 65.8	$ 36.6	$ 43.2	$ 56.8	$ 339.2
Appropriated ($M)	$ 100.0	$ 25.0	$ 25.0	$ 26.6[6]	$ 25.9	$ 25.0	$ 227.5
Cash Disbursed ($M)	$ 72.3	$ 19.2	$ 14.0	$ 18.3	$ 8.2	$ .3	$ 132.3
Match Provided ($M) [4]	$ 20.7	$ 22.6	$ 10.5	$ 34.6	$ 8.2	$ 6.0	$ 102.6
Other Known Funding ($M) [4, 5]	$ 9.2	$ 1.6	$ 0.8	$ 14.5	$ 0	$ 0	$ 26.1

1. Includes seven projects from an earlier solicitation issued by AEA. The amount of funding budgeted for these seven project from sources other than the Renewable Energy Fund totals $ 338,992.
2. Grants unissued are due mostly to grantee conditions that require earlier phases of work to be completed first or awaiting grantee action on the grant document.
3. Total grant amount requested by all applicants.
4. These totals are for awarded grants only.
5. $26.6 Million was appropriated for Round IV, and additional $10.0 million was re-appropriated from rounds I, II and III for use in Round IV.



Statewide Impacts

Renewable Energy Fund: Annual Fuel Savings



Renewable Energy Fund: Project Performance

Performance of Renewable Energy Fund Projects in Operation

Technology Type	Grantee	Project Name	Operation Start Date	2011 Energy Production Electrical (MWh)	2011 Energy Production Thermal (MMBtu)	2011 Fuel Displaced Diesel (Gal x1000)	2011 Fuel Displaced Value ($ x 1000)	2012 Energy Production Electrical (MWh)	2012 Energy Production Thermal (MMBtu)	2012 Fuel Displaced Diesel (Gal x1000)	2012 Fuel Displaced Value ($ x 1000)	Jan - Sep 2013 Energy Production Electrical (MWh)	Jan - Sep 2013 Energy Production Thermal (MMBtu)	Jan - Sep 2013 Fuel Displaced Diesel (Gal x1000)	Jan - Sep 2013 Fuel Displaced Value ($ x 1000)	Cumulative Total (2009-Sep 2013) Energy Production Electrical (MWh)	Cumulative Total (2009-Sep 2013) Energy Production Thermal (MMBtu)	Cumulative Total (2009-Sep 2013) Fuel Displaced Diesel (Gal x1000)	Cumulative Total (2009-Sep 2013) Fuel Displaced Value ($ x 1000)
LANDFILL GAS	Municipality of Anchorage	Anchorage Landfill Gas Electricity	2012 Aug	-	-	-	$ -	-	-	-	$ -								
HYDRO	City of Alka	Chuninax Creek Hydroelectric	2012 Dec	-	-	-	$ -	-	-	-	$ -								
HYDRO	Cordova Electric Cooperative	Humpback Creek Hydroelectric Project Rehabilitation	2011 Jul	1,563	-	114.9	$ 410.3	3,510	-	270.0	$ 1,060.6								
HYDRO	Gustavus Electric Company	Falls Creek Hydroelectric Construction	2009 Jul	1,933	-	138.1	$ 483.3	1,956	-	150.4	$ 645.3								
SOLAR	Alaska Village Electric Cooperative	Kalskag Solar Construction	2012 Oct	-	-	-	$ -	-	-	-	$ -								
TRANSMISSION	Alaska Power and Telephone	North Prince of Wales Island Intertie Project	2011 Sep	311	-	16.4	$ 67.0	589	-	44.3	$ 161.7								
TRANSMISSION	Nome Joint Utility System	Nome Banner Peak Wind Farm Transmission	2010 Oct	955	-	53.9	$ 151.6	995	-	61.2	$ 193.3								
WIND	Alaska Environmental Power	Delta Area Wind Turbines	2010 Sep	1,641	-	95.9	$ 256.1	989	-	63.9	$ 132.9								
WIND	Alaska Village Electric Cooperative	Toksook Wind Farm	2009 Aug	560	-	37.7	$ 129.1	131	-	9.6	$ 38.6								
WIND	Alaska Village Electric Cooperative	Mekoryuk Wind Farm	2010 Nov	239	-	13.7	$ 49.5	147	-	10.4	$ 41.1								
WIND	Alaska Village Electric Cooperative	Quinhagak Wind Farm	2010 Nov	409	-	28.9	$ 105.6	500	-	38.1	$ 161.4								
WIND	Alaska Village Electric Cooperative	Emmonak/Alakanuk Wind	2011 Sep	63	-	4.5	$ 17.7	505	-	35.8	$ 142.0								
WIND	Alaska Village Electric Cooperative	Shaktoolik Wind Construction	2012 Apr	-	-	-	$ -	116	-	8.9	$ 35.7								
WIND	Golden Valley Electric Association	GVEA Eva Creek Wind Turbine Purchase	2012 Oct	-	-	-	$ -	13,091	-	921.9	$ 1,972.9								
WIND	Kodiak Electric Association, Inc	Pillar Mountain Wind Project	2010 Sep	12,448	-	870.7	$ 2,873.3	16,201	-	1,140.9	$ 4,211.8								
WIND	Kotzebue Electric Association	Kotzebue High Penetration Wind-Battery-Diesel Hybrid	2012 May	-	-	-	$ -	2,177	-	148.1	$ 549.9								
WIND	Nome Joint Utility System	Banner Peak Wind Farm Expansion	2013 Jul	-	-	-	$ -	-	-	-	$ -								
SubTotal Electric Only				20,122		1,375	$ 4,543.5	10,908		2,904	$ 9,337.1	1							
WIND	Aleutian Wind Energy	Sand Point Wind	2011 Aug	196	-	14.3	$ 64.9	792	-	58.1	$ 266.2								
WIND	Kwigillingok Power Company	Kwigillingok High Penetration Wind-Diesel Smart Grid	2012 Feb	-	-	-	$ -	-	-	-	$ -								
WIND	Puvurnaq Power Company	Kongiganak High Penetration Wind-Diesel Smart Grid	2010 Dec	88	-	6.6	$ 30.1	185	-	14.0	$ 63.4								
WIND	Tuntutuliak Comm Svcs Assoc	Tuntutuliak High Penetration Wind-Diesel Smart Grid	2013 Jan	-	-	-	$ -	-	-	-	$ -								
WIND	Unalakleet Valley Electric Co	Unalakleet Wind Farm	2009 Dec	958	-	58.2	$ 211.2	938	-	67.8	$ 247.6								
SubTotal Electric and Heat				1,242	-	79	$ 306.2	1,914		140	$ 577.2								
BIOMASS	Alaska Gateway School District	Tok Wood Heating	2010 Oct	-	3,217	24.4	$ 92.0	-	4,595	44.0	$ 147.0								
BIOMASS	Chilkoot Indian Association	Haines (Chilkoot) Central Wood Heating System Construction	2011 Oct	-	-	-	$ -	-	212	1.7	$ 6.8								
BIOMASS	Delta/Greely School District	Delta Junction Wood Chip Heating	2011 Sep	-	-	-	$ -	-	3,977	38.2	$ 133.5								
BIOMASS	Gulkana Village Council	Gulkana Central Wood Heating	2010 Oct	-	780	5.9	$ 23.5	-	780	7.0	$ 28.9								
BIOMASS	Native Village of Eyak	Cordova Wood Processing Plant	2011 Dec	-	1,500	11.4	$ 42.0	-	600	5.4	$ 25.2								
HEAT PUMPS	City and Borough of Juneau	Juneau Airport Ground Source Heat Pump	2011 May	-	5,117	37.1	$ 130.5	-	5,400	45.0	$ 169.0								
HEAT PUMPS	City and Borough of Juneau	Juneau Aquatic Ctr. Ground Source Heat Pump	2011 Apr	-	-	-	$ -	-	1,740	16.7	$ 61.4	-	2,068	29.5	$ 124.9	-	4,808	46.2	$ 186.2
HEAT PUMPS	City of Seward	Alaska Sealife Center Phase II Seawater Heat Pump Project	2011 Nov	-	-	-	$ -	-	-	-	$ -	-	2,836	27.8	$ 106.2	-	2,836	27.8	$ 106.2
HEAT RECOVERY	Golden Valley Electric Association	North Pole Heat Recovery	2009 Nov	-	5,240	61.5	$ 171.5	-	3,349	32.8	$ 90.6	-	-	-	$ -	-	9,595	106.0	$ 285.2
HEAT RECOVERY	Inside Passage Electric Cooperative	Hoonah Heat Recovery Project	2012 Aug	-	-	-	$ -	-	-	-	$ -	-	4,119	36.7	$ 178.7	-	4,119	36.7	$ 178.7
HEAT RECOVERY	McGrath Light & Power Company	McGrath Heat Recovery	2010 May	-	2,896	23.0	$ 156.7	-	2,617	25.2	$ 97.1	-	1,681	16.2	$ 120.1	-	8,356	76.6	$ 419.5
HEAT RECOVERY	City and Borough of Wrangell	Wrangell Hydro Based Electric Boilers	2011 Feb	-	6,889	66.0	$ 230.3	-	7,711	79.4	$ 134.5	-	4,998	61.5	$ 82.6	-	19,697	196.9	$ 447.4
SOLAR	Golden Valley Electric Association	McGrath Village Solar Thermal	2010 Jun	-	134	1.8	$ 7.1	-	130	1.9	$ 7.6	-	108	0.8	$ 6.8	-	433	5.0	$ 23.0
SubTotal Heat Only					25,782	731	$ 883.8		31,111	297	$ 891.7		33,896	312	$ 1,171.8		94,636	899	$ 3,077.5
TOTAL				21,364	25,782	1,884.9	$ 5,733.3	42,821	31,111	3,341.0	$ 10,806.1	114,384	71,126	9,571.1	$ 21,646.6	202,605	95,536	15,972.7	$ 41,601.1
									2013 Estimated Annualized Total			152,512	94,835	12,761.5	$ 28,862.1				

Note: 9 months only for 2013

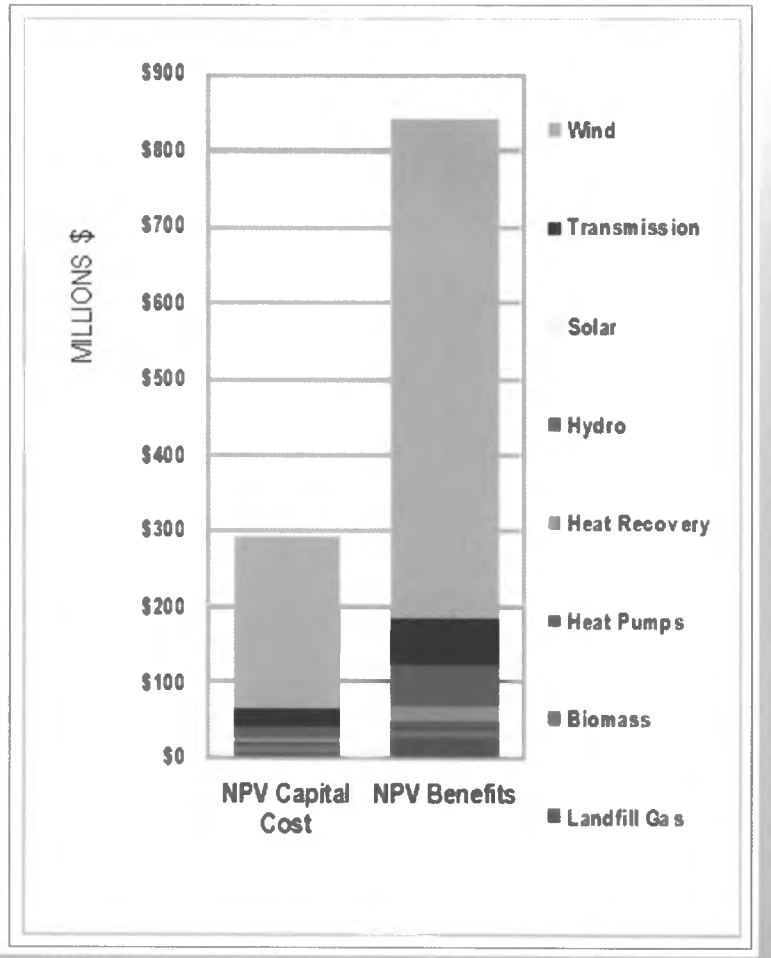
Jan - Sep 2013 Energy Production Electrical (MWh)	Jan - Sep 2013 Energy Production Thermal (MMBtu)	Jan - Sep 2013 Fuel Displaced Diesel (Gal x1000)	Jan - Sep 2013 Fuel Displaced Value ($ x 1000)
33,834	-	3,224.0	$ 1,602.0
285	-	21.9	$ 118.4
2,933	-	225.6	$ 809.6
1,490	-	114.6	$ 481.1
9	-	0.6	$ 2.3
644	-	48.4	$ 175.0
700	-	43.1	$ 138.2
210	-	13.6	$ 36.4
96	-	7.0	$ 26.1
123	-	8.7	$ 32.5
391	-	29.8	$ 116.7

Renewable Energy Fund: Value Generated

- For first 36 projects in operation
- Fund Investment of $82 million
- Total NPV cost of $290 million
- NPV Benefits: $840 million

NPV Benefits/ NPV Costs

2.9



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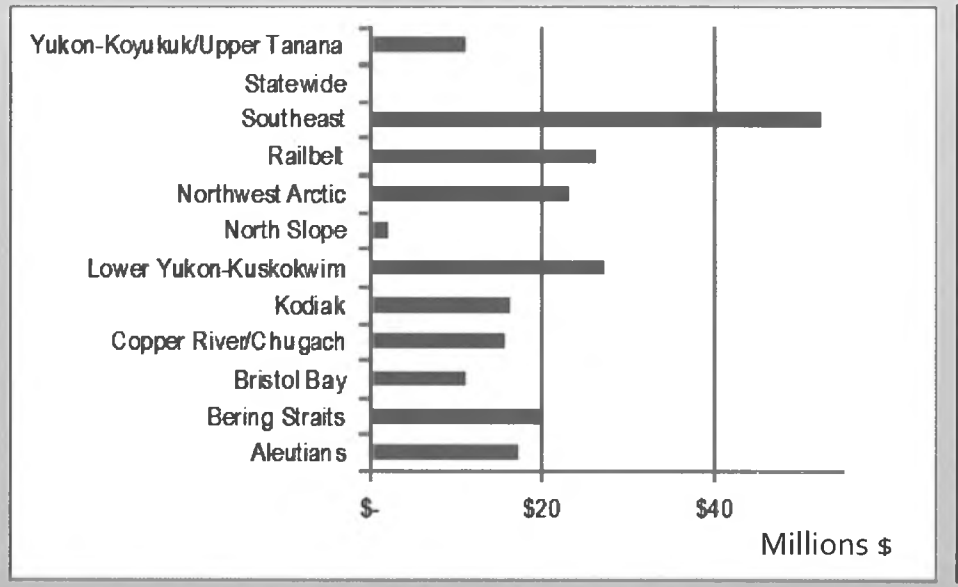
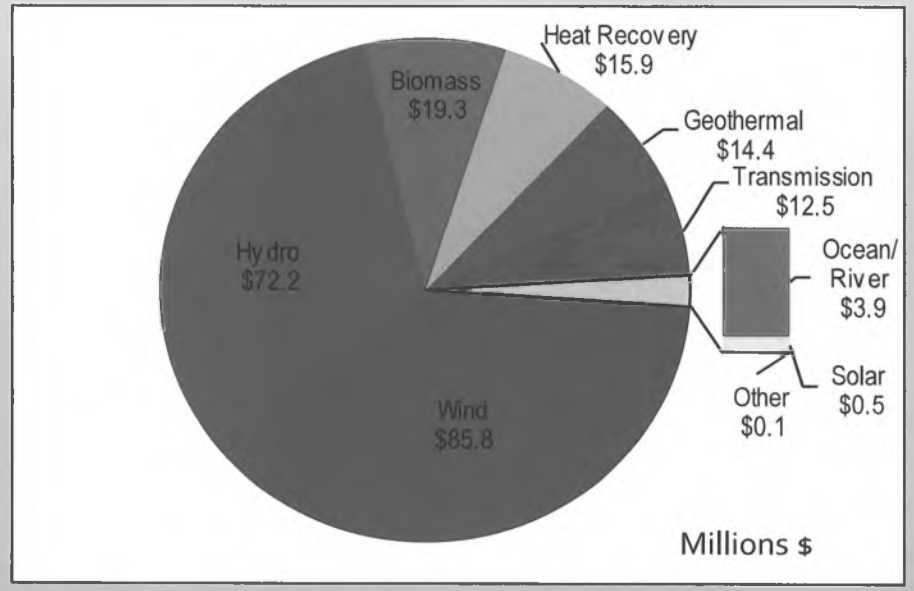
Appropriated Renewable Energy Fund Grants Rounds I-VI

By Energy Region



By Resource Type



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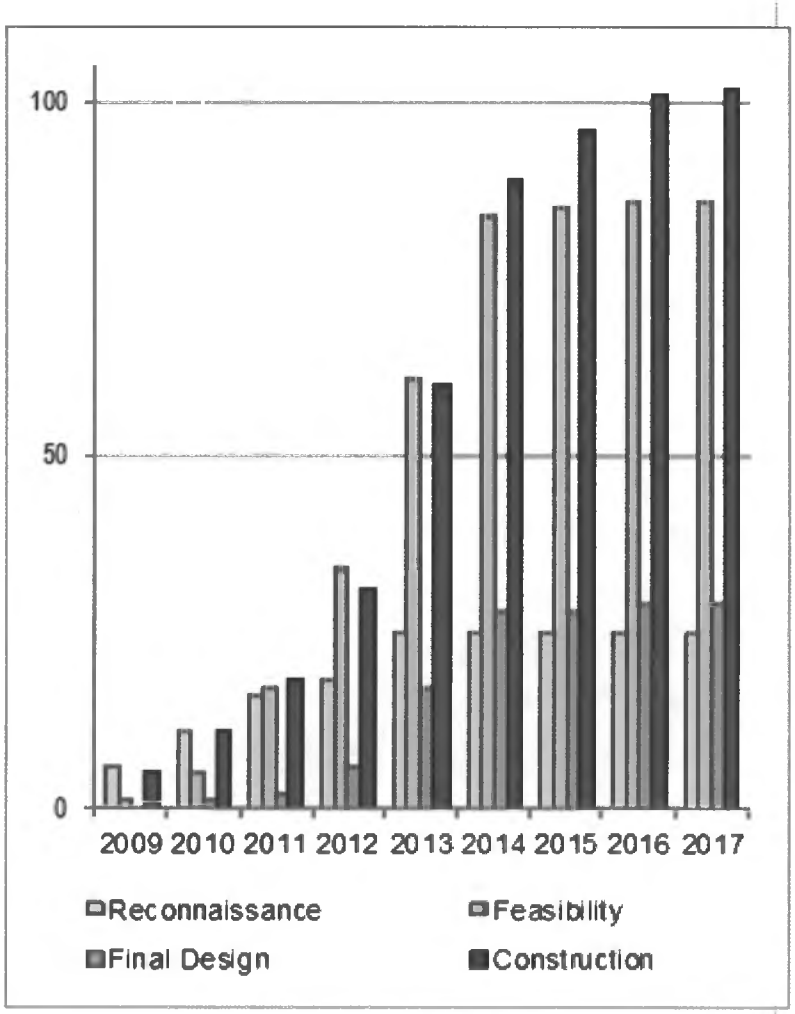
Scheduled Grant Completion

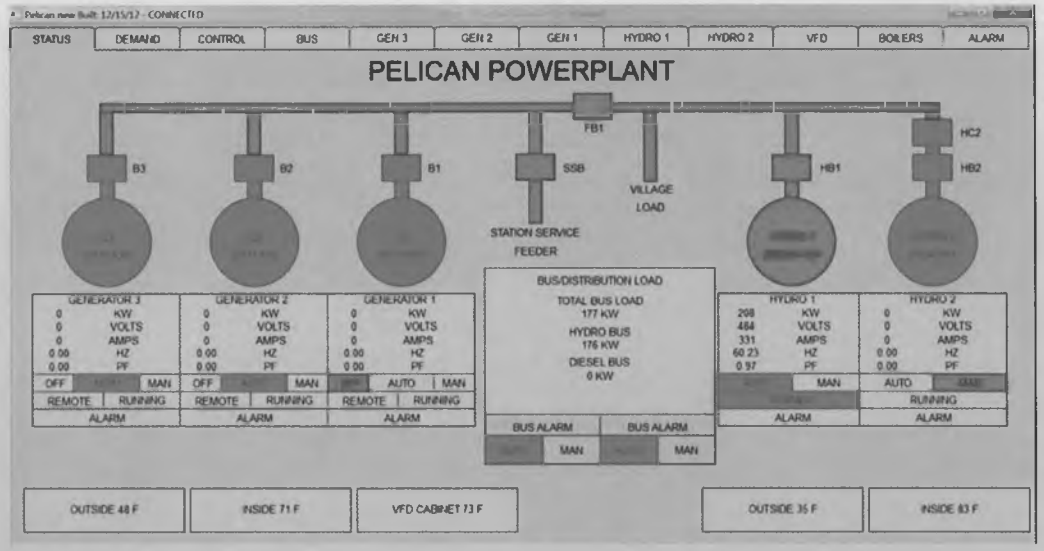


Grant Completion Schedule

- Grants issued in phases to ensure quality projects
- This year, completed construction grants will exceed completed feasibility grants
- Large increases in completed construction

Project Highlight: Pelican Hydro

- REF Funding: $1.95 million
- Total Cost: $5.8 million
- kWh/year: 948,522
- Gallons of diesel saved: 70,000
- First year savings: $312,000



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Pelican Hydro, Before, During and After

- Wood stave and blue tarp penstock before
- Aerial view of site during construction
- AEA project manager with new surge tank

Heat Exchanger

Project Highlight: Delta Junction School Biomass

- Completed in September 2011
- High-efficiency, low-emissions wood chip biomass heating system
- Wood chips come from Dry Creek Saw Mill waste product
- Funding $2 million grant/$2.8 million total
- Simple Pay Back: 13 years for Renewable Energy funds,19 years on total cost
- Successes:
  - During the first winter, saved $153,000 and 53,000 gallons in heating
  - Allowed the school to save 2 teacher positions, reopen music program and remodel the school kitchen
  - Potential to add additional facilities
  - Easy maintenance

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Project Highlight: Kodiak Renewables

- More than 95 percent of electricity from renewables
  - Hydro, wind, battery
- Less than 5 percent of electricity from diesel
- Pillar Mountain wind saved 1.8 million gallons of diesel in 2013 ($6.1 million savings)
  - Renewable Energy Fund Grants for wind and battery: $11.9 million
- Renewable energy grant to upgrade Terror Lake Hydro underway
  - Renewable Energy Fund Grant for Terror Lake: $4.5 million

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Renewable Energy Fund: Round VII Recommendations

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Renewable Energy Fund: Round VII

- Technical and economic analysis
  - Priority given to regions with high energy costs
- Capital Budget request includes $20 million
  - Can fund 26 projects: 17 heating and 9 electric or other projects
- Advisory committee recommended partial funding for two large hydro projects to fund five additional heating projects and one regional priority
- Requested fully fund hydro if additional funds available

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Round VII Heat Applications

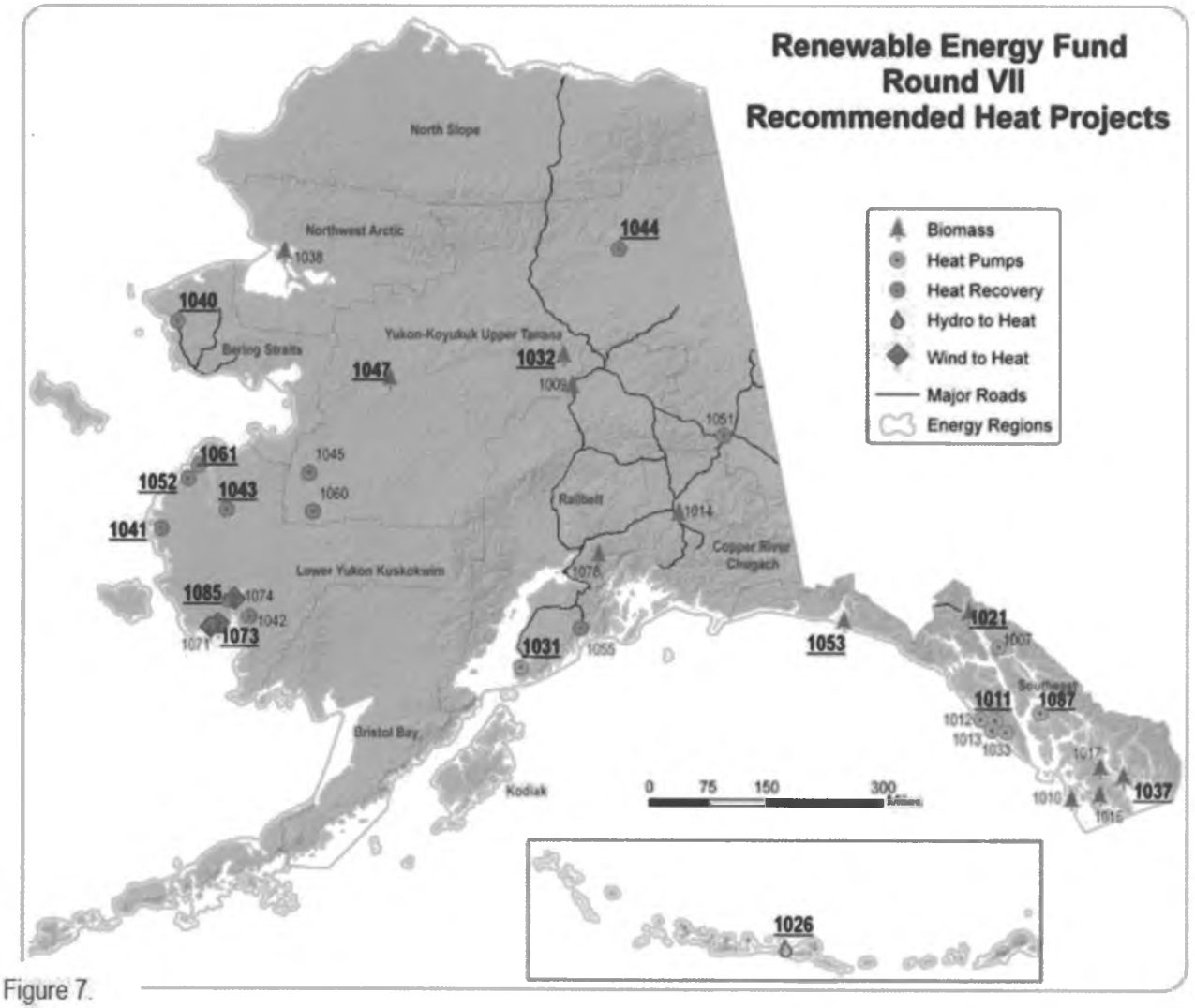

Figure 7.

Round VII Standard Applications

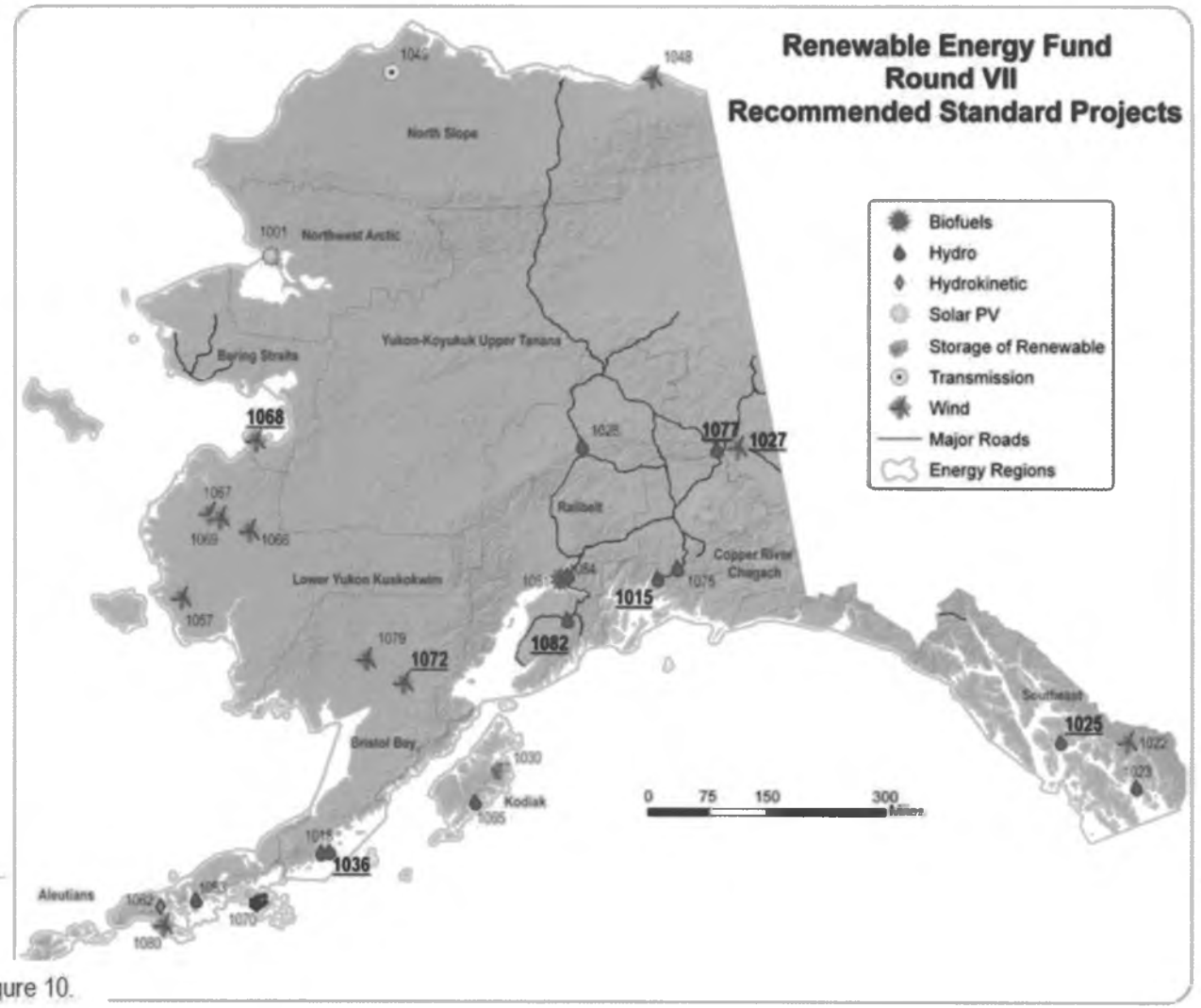

Figure 10.

Renewable Energy Fund Round VII: Recommended Heat Applications

Recommended funding by type

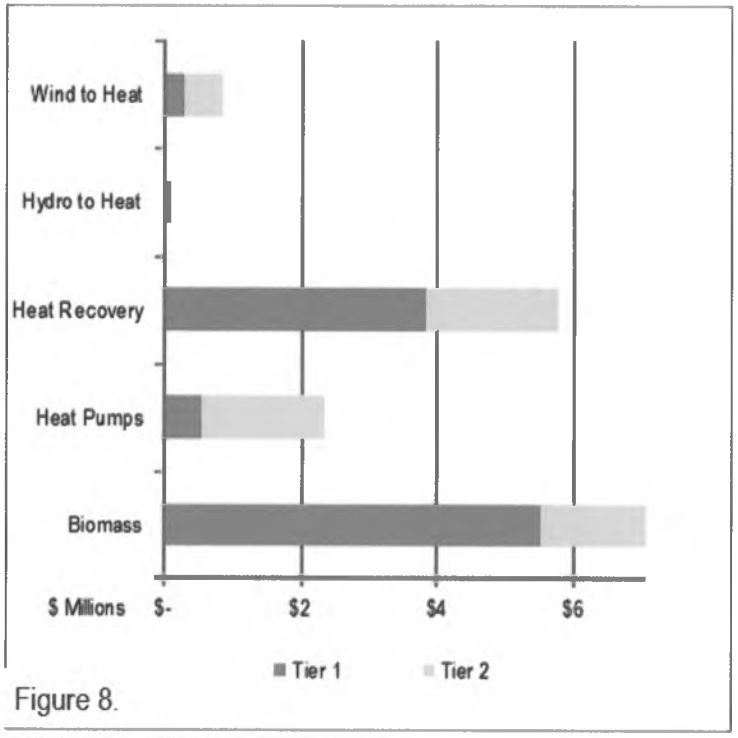

Figure 8.

Recommended funding by region

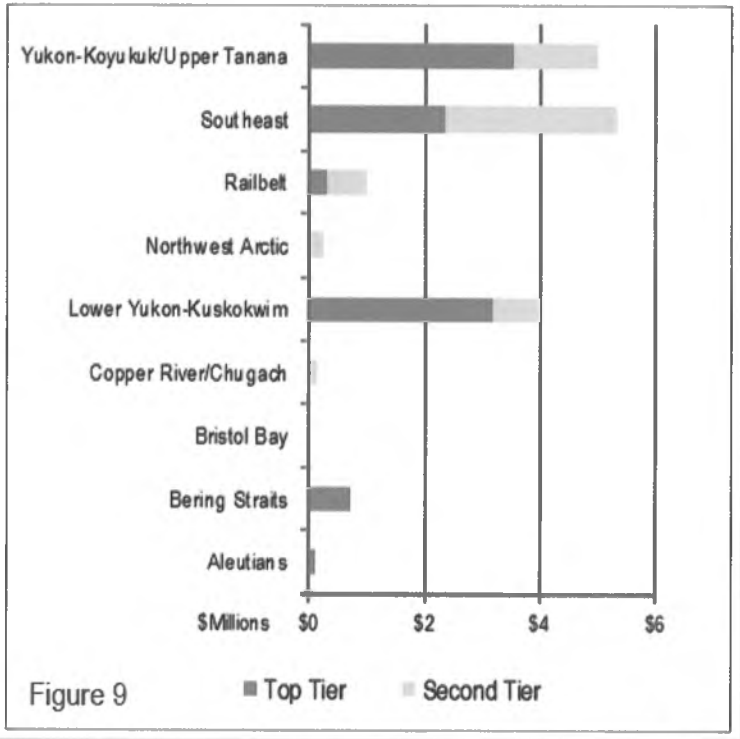

Figure 9

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Renewable Energy Fund Round VII: Electrical Applications Recommended

Recommended funding by type

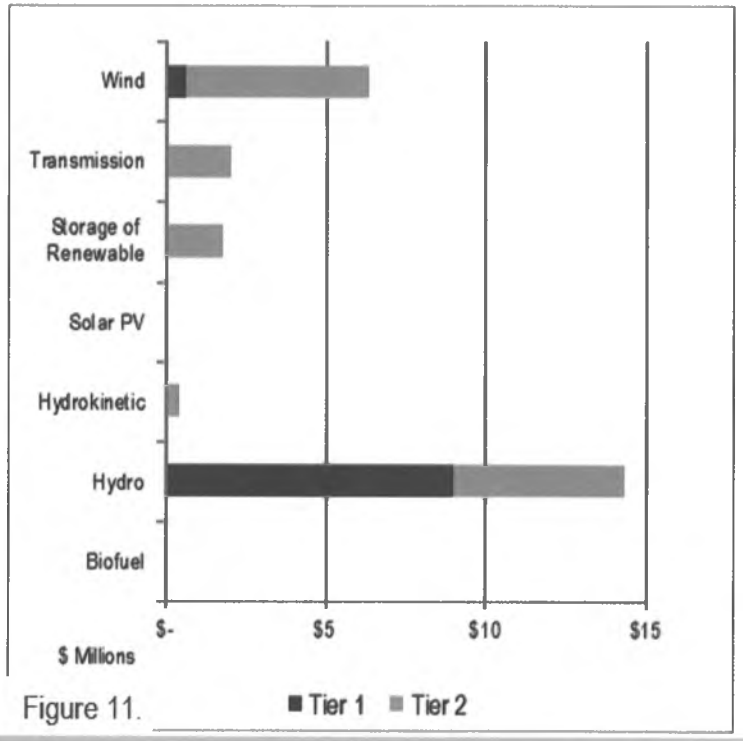

Figure 11.

Recommended funding by region

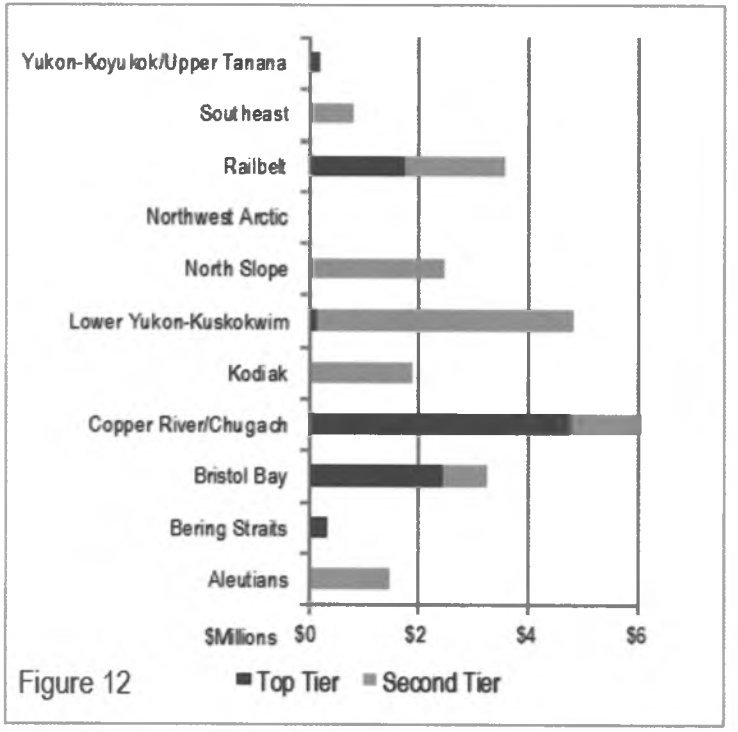

Figure 12

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Emerging Energy Technology Fund

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Testing Safe and Efficient Exhaust Thimble

Emerging Energy Technology Fund

"...make grants to eligible applicants for demonstration projects of technologies that have a reasonable expectation to be commercially viable within five years that are designed to:

- test emerging energy technologies or methods of conserving energy;
- improve an existing energy technology; or
- deploy an existing technology that has not previously been demonstrated in Alaska. "

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Arctic Field Testing of Eocycle Wind Turbine

Wind-Diesel Battery Hybrid for Kwigillingok

Emerging Energy Technology Fund

Energy Technology includes renewables, energy conservation and efficiency, hydrocarbons, enabling technologies and integrated systems.

- (2010) Program Legislation: AS 42.45.375
- Program Regulations: 3 AAC 107.700-799

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EETF: Process

- Two-step review process
  - Project abstracts and full applications
- Project abstracts reviewed by AEA staff and a seven-member advisory committee
  - Evaluated on technical merit
- Priority given to:
  - Alaska entities
  - Projects demonstrating post-secondary partnerships
  - Matching funds or in-kind commitments
  - Demonstration of potential for widespread deployment
- Top-ranking projects invited to submit detailed project applications and deliver presentations to AEA staff and the advisory committee

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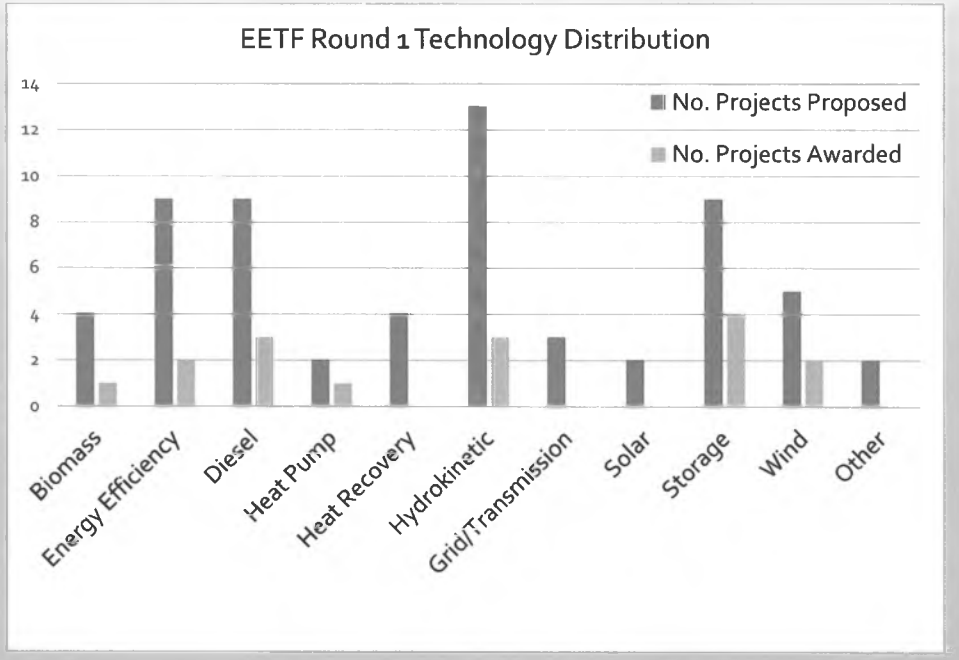
EETF: Project Awards

2012: First round of projects selected and funded

- Funds available: $8.9 million (through Denali Commission matching grant)
- Projects selected: 16 (15 awarded funding)
- Juneau, Fairbanks, Kodiak, Delta Junction, Nenana, Nikiski, Igiugig, Tuntutuliak, Kwigllingok and Kotzebue



2014: Second round of projects selected

- Funds available $2.3 million
- Projects recommended: six, pending funding
- Expecting award announcement within the month

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Modified '97 Eagle Talon EV Test bed

Modified 15 kW Genset

EETF: Project Highlight

Ultra-Efficient Generators and Diesel Electric Propulsion (Kodiak)

- Technology aims to provide more efficient diesel power generation
- Can be used in marine propulsion and stationary powerhouses
- Power dense motor and inverter/controller invented by operators of a machining and fabricating shop in Kodiak
- Commercial availability anticipated at project's end

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Installation of Slinky Loop

Installed 3-ton Heat Pump

EETF: Project Highlight

Cold Climate Heat Pump Demonstration (Fairbanks)

- Cold Climate Housing Research Center demonstrating the potential for ground source heat pumps as an efficient and economic heat source in colder climates
- Different ground surface treatments are applied to compare effects on the loop field
- Next phase is data collection

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March 12, 2014

The Honorable Doug Isaacson
House Energy Co-Chair
State Capitol, Room 13
Juneau, Alaska 99801

The Honorable Charisse Millett
House Energy Co-Chair
State Capitol, Room 403
Juneau, Alaska 99801

Dear Representatives Isaacson and Millet:

The Alaska Energy Authority (AEA) presented an update of the Renewable Energy Fund (RE Fund) and Emerging Energy Technology Fund (EETF) programs to the House Energy Committee on Feb. 26, 2014. This letter is to follow-up and answer questions that were asked during the committee hearing.

Project Management
During the discussion, Co-Chair Isaacson asked for a description of our project management.

AEA works to serve the community first and foremost. Our project managers, regional energy planning staff and technical assistance teams work with the communities to identify their unique needs and help them advance successful projects to construction. This may include identifying additional funding sources, connecting multiple governmental agencies to apply a holistic approach, and assisting to identify permitting needs and paths forward.

RE Fund project managers' work closely with grantees to move through stages and achieve milestones before releasing additional funds. Our goal is to issue grants with clear scopes of work and milestones to ensure successful project outcomes. As the grantee moves through project development and reaches milestone completion, they submit to AEA for reimbursement of allowable costs. There is flexibility in the process to provide funding for upfront project costs, like mobilization before a field season or large construction like hydroelectric projects.

Rural energy infrastructure projects are managed by AEA and the agency manages and constructs the project on behalf of the grantee. The RE Fund is a pass-through grant program. If the grantee or applicant requests, AEA has the capacity to manage the RE Fund project similar to our rural energy infrastructure projects.

I offer an example of St. George as the community-based approach to AEA project management. This complex project includes the coordination of AEA-managed and pass-through grants to the benefit and savings of the community.

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St. George: A Whole-System Approach

St. George is located in the Bering Sea on the northeast shore of St. George Island, the southernmost of the two Pribilof Islands. The island lies 47 miles south of St. Paul Island and 750 air miles west of Anchorage. Access to the island can be difficult as lingering fog or winds often make landing impossible. The wind driven salt spray and sand rapidly corrodes equipment.

The community's powerhouse and electrical distribution system were at the end of their design life. Power outages were frequent and the electrical distribution system had large line losses. The heat recovery system was inoperable.

The St. George project model enabled a "whole-system" design and construction plan as opposed to treating the individual projects separately, even though there are different funding sources and grants involved. The community was able to receive stable and efficient power from the powerhouse and incorporate renewable energy. The project included the design and construction of a new modular powerhouse, waste heat recovery system (to include the school), upgrades to the electrical distribution, a wind turbine system and integrated controls with remote monitoring.

Before the rural power system upgrade (RPSU) was feasible the existing infrastructure needed to be stabilized. AEA secured funding for the stabilization project via a pass-through grant to the St. George Municipal Electric Utility. The City of St. George contracted with Marsh Creek, LLC for the purchase and installation of the required equipment.

A RE Fund pass-through grant provided wind turbine system funding. The City of St. George made procurements under authority of the grant and AEA provided technical assistance and recommendations. Coordination between the community and AEA takes advantage of AEA's RPSU experience to ensure that the wind turbine correctly interfaces with the entire power system and maintains a commonality of parts and systems making the system easier to troubleshoot or repair.

The City of St. George has procured the wind turbine, tower, variable frequency controller and associated materials. In coordination with the RPSU construction, the community procured installation services for tower assembly, turbine placement and electrical distribution. Under the RE Fund, the grantee submits reimbursement requests to the AEA project manager and after appropriate documentation is verified the funds are deposited into the project account. AEA works to provide accountability and prompt payment to vendors that are working on the project for the community.

An AEA-managed grant has funded the modular power generation building, waste heat recovery, upgrades to the distribution system and integrated controls. In accordance with the RPSU grant, AEA procured materials (in compliance with the State's procurement code) on behalf of the community and coordinated the construction of the powerhouse module by the City of St. George personnel.

The remote location of St. George required AEA to plan a unique approach to training the local operators and testing the combined power system. St. George received in-depth training and system

familiarization by participating in the actual construction of the powerhouse module and testing of the integration of the wind system.

The whole-system approach saved more than one million dollars in project costs and shortened the schedule by eight months. This close coordination also identified and resolved many technical issues before construction, thus avoiding costly field fixes.

With the new heat recovery system the utility receives new income from heat sales to the school and the school benefits by reduced heating fuel consumption resulting in lower costs. The integrated diesel / wind design is expected to provide a 10 percent increase in diesel generated power efficiency and an estimated annual fuel savings of $140,000 from wind generation. AEA is taking an innovative approach to this project by coordinating work on the powerhouse, distribution, heat recovery, and wind components in order to lower costs and ensure that all aspects of the final system work together effectively.

Project Timelines

Renewable Energy Grant Fund Projects

RE Fund projects are funded by phase and often the reconnaissance and feasibility studies dictate the viability of a project. This may not be achieved in a calendar year. Permitting typically takes place concurrently with feasibility through design steps.

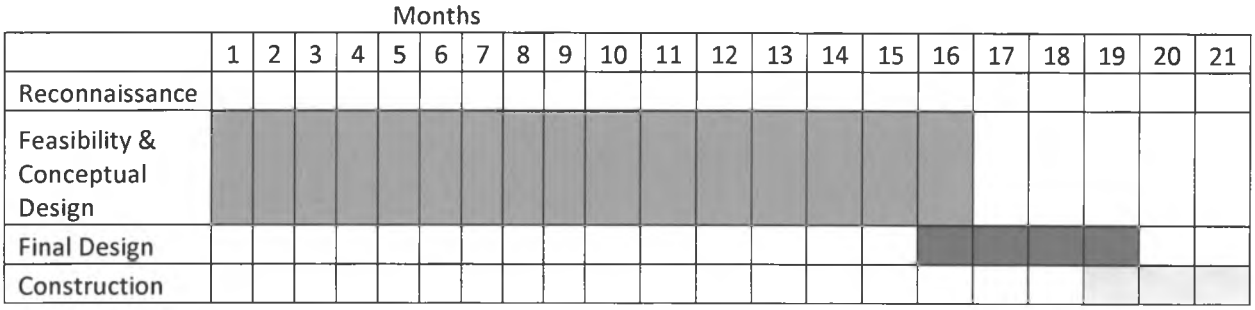
Below is a simplified timeline based on time required to complete each phase, organized by resource, assuming available funds:

Hydroelectric

	Years									
	1	2	3	4	5	6	7	8	9	10
Reconnaissance										
Feasibility & Conceptual Design										
Final Design										
Construction										

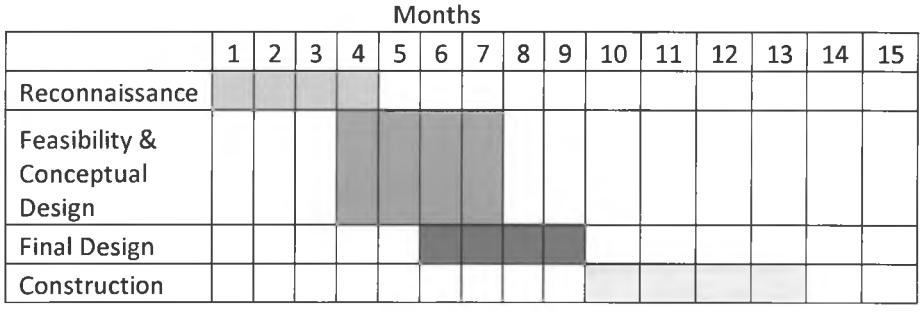
Hydroelectric projects as part of the Renewable Energy Grant Fund often qualify as small hydro projects and have a shorter licensing and construction timeline than a large hydro project like Susitna-Watana Hydro. Permitting can add time to the hydro final design phase.

Wind



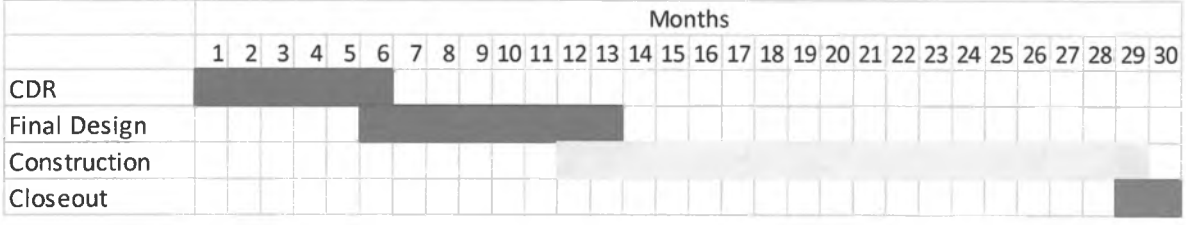
Wind reconnaissance is not included above because approximate wind availability is attainable through other existing sources. A detailed location-specific wind study is performed as part of the feasibility stage.

Biomass



Rural Energy Projects

Rural energy projects, like powerhouse upgrades, are AEA-managed grants. Assuming all funding is obtained, the typical AEA-managed project timeline is below:



Standards for Biomass Boilers

Co- Chair Isaacson asked about the process of selecting technologies for biomass systems and if only Garn systems are approved. Through the RE Fund, applicants procure the actual equipment and AEA's expectation is that the procured systems are high efficiency and result in low emissions. AEA does not require a specific brand of equipment, rather that the equipment meet these standards. ASTM International has been found to be the best standard and provides the best testing protocol to date. This organization publishes International standards on building codes, materials and products. As a result, we have included this set of standards in the RE Fund Request for Applications. Although Garn Boilers do meet this standard, we do not require Garn Boilers for RE Fund projects. We are currently funding a Portage and Main Enviro-Chip Burner boiler system in Mentasta that has achieved ASTM certification.

Fire Island Wind

Rep. Josephson asked about Fire Island Wind. Wind continues to play an important role in Alaska's renewable energy mix and other utility-scale wind projects came online in the Railbelt in 2013. Fire Island Wind, LLC is a subsidiary of Cook Inlet Region, Inc. (CIRI), and owns and operates the 11-tower, 17.6 megawatt wind turbine project. In Round 5, AEA reviewed a RE Fund application requesting funding for the Fire Island transmission line. The project was recommended for funding by AEA, but it was not funded because it ranked lower than that year's available Capital Budget funding amount.

Cost of Energy

Rep. Hughes had questions about the cost of energy and requested a list of communities with the highest and lowest electrical rates.

Included in this letter is additional information about electrical costs, but you may also be interested in an online tool that tracks energy sources and costs by community. The Alaska Energy Data Gateway posts helpful energy information for the public at https://akenergygateway.alaska.edu/.

Electrical Costs

Following is a list of Alaska communities that pay 12 cents and less per kilowatt hour (KWh). Six of the eight lowest-electrical cost communities are in the Southeast and have access to mature hydropower resources. Nuiqsut and Barrow are North Slope communities that benefit from North Slope natural gas.

Low-cost Electrical Communities:

Community Name	Population (2013)	Energy Region	Residential Rate ($/kWh)
Nuiqsut	452	North Slope	.08
Metlakatla	1,471	Southeast	.09
Sitka	9,039	Southeast	.09
Ketchikan	8,313	Southeast	.10
Petersburg	2,957	Southeast	.10
Wrangell	2,456	Southeast	.11
Juneau	33,064	Southeast	.12
Barrow	4,514	North Slope	.12

Data sources: DCRA community database and Alaska Energy Statistics 2011.

There are thirteen communities who currently pay more than one dollar per KWh (pre-Power Cost Equalization (PCE)). As you can see by the chart on the following page, these communities have very small populations- some declining in population- and are in remote regions of the state.

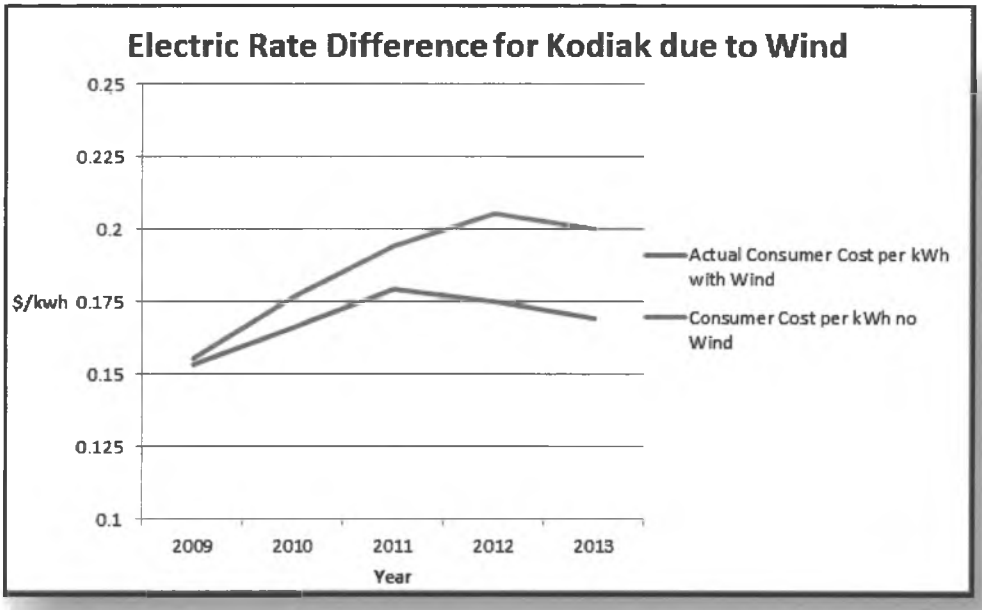
High-cost Electrical Communities:

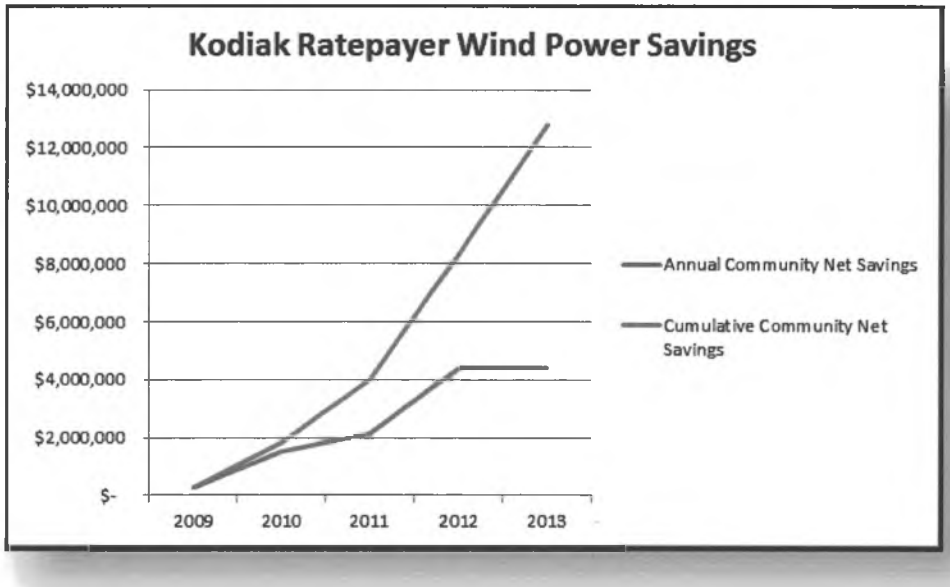
Community Name	Population (2013)	Energy Region	Residential Rate ($/kWh)	PCE Level ($/kWh)	Effective Rate ($/kWh)
Healy Lake	13	Yukon-Koyukuk/Upper Tanana	3.2789	0.8164	2.4625
Lime Village	25	Lower Yukon-Kuskokwim	1.7748	0.8164	0.9584
Adak	283	Aleutians	1.4556	0.8164	0.6392
Chuathbaluk	127	Lower Yukon-Kuskokwim	1.0814	0.8164	0.2650
Crooked Creek	93	Lower Yukon-Kuskokwim	1.0754	0.8164	0.2590
Red Devil	18	Lower Yukon-Kuskokwim	1.0754	0.8164	0.2590
Sleetmute	103	Lower Yukon-Kuskokwim	1.0754	0.8164	0.2590
Stony River	40	Lower Yukon-Kuskokwim	1.0754	0.8164	0.2590
Stevens Village	65	Yukon-Koyukuk/Upper Tanana	1.0700	0.4636	0.6064
Takotna	56	Yukon-Koyukuk/Upper Tanana	1.0220	0.5893	0.4327
Twin Hills	82	Bristol Bay	1.0040	0.4639	0.5401
St. George	97	Aleutians	1.0000	0.6465	0.3535

Data sources: DCRA community database and AEA PCE Database. Rates are from the most recent monthly PCE report as of March 2014, which for most communities is December 2013 or January 2014. Stevens Village has not participated in the PCE program since 2009 and its rates shown are as of then.

Kodiak Renewables

Kodiak was highlighted as a successful example of the integration of renewable energy resulting in lower power costs for Alaskans. Kodiak receives nearly all of its power from a combination of hydropower from Terror Lake and the Pillar Mountain Wind project. Below are two charts that identify the ratepayer savings as a result of the wind power and offset of diesel generation. According to the Kodiak Electric Association, annual savings are $4.5 million and residential rates are now 15.5 cents per KWh.



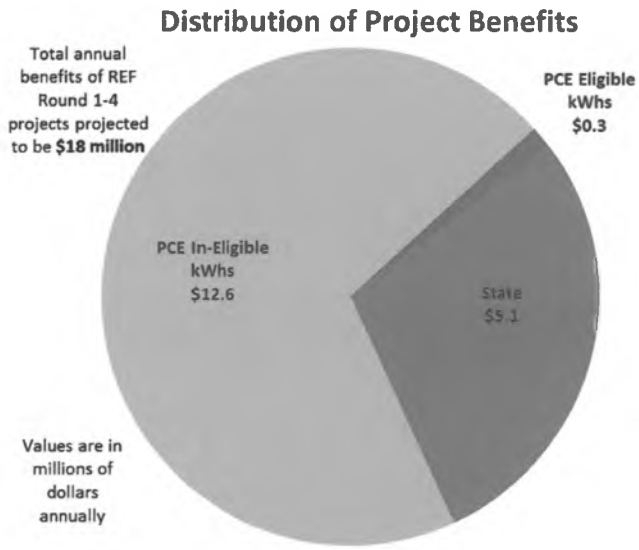


Information provided by Kodiak Electric Association

Renewable Energy and PCE

PCE provides assistance in rural Alaska to maintain and operate basic infrastructure and systems. As outlined in the power costs section of this letter, electrical rates in rural Alaska can be three to five times higher than in urban Alaska. Roughly 30 percent of all Kwhs sold by participating utilities are eligible for PCE, this includes residential customers and community facilities. State and federal facilities and commercial customers are not eligible.

Renewable energy projects benefit the non-PCE eligible customers the greatest; this includes rural Alaska's business community. Rounds 1-4 of the RE Fund result in $18 million in annual benefits to communities.



In smaller communities where a relatively substantial amount of intermittent electrical generation, such as wind, is incorporated into the electrical system the energy cannot always be absorbed into the load. These communities then must shift to a secondary load, often heat. There is concern that if excess renewable energy is incorporated as part of the PCE calculation it would artificially lower the PCE rate for the community members not receiving the secondary load benefit. AEA is currently exploring ways to segregate the secondary load from the primary electrical load for PCE calculations.

Emerging Energy Technology Fund Questions

The Emerging Energy Technology Fund (EETF) was established to promote the expansion of energy sources available to Alaskans by making grants for demonstration projects of technologies that have a reasonable expectation to be commercially viable within five years. There was committee discussion about AEA's ability to gain partial ownership of intellectual property rights of technology that was developed during the course of EETF projects, or if any other profit-sharing mechanism existed.

Per program statute, EETF projects can be designed to:

(1) Test emerging energy technologies or methods of conserving energy;
(2) Improve an existing energy technology; or
(3) Deploy an existing technology that has not previously been demonstrated in the state.

It is important to clarify that EETF is not a research and development (R&D) fund. While inventors of technologies in very early stages of development may be more interested in an arrangement that involves sharing intellectual property rights as a condition of R&D funding, such technologies are likely outside EETF program statute. Typically, projects that are either testing emerging technologies or improving existing technologies are already patented or have patents pending.

Projects that are deploying an existing technology that has not been previously demonstrated in Alaska include technologies that are generally currently commercially available and EETF applicants are not necessarily affiliated with the manufacturers or patent holders. A successful demonstration of an existing technology that is new to Alaska would ideally result in broader deployment and multiple commercial entities potentially marketing the technology. It is unclear how a profit-sharing mechanism could be implemented in this case without disadvantaging the awardee relative to other potential technology marketers. Of the 15 Round 1 EETF projects underway, seven awards were for amounts less than $300,000. A mandate for profit-sharing could possibly discourage such projects of smaller size from applying to the fund.

Thank you for the committee's attention to these energy issues. If you have any further questions, please contact me.

Sincerely,

Sara Fisher-Goad for
Executive Director