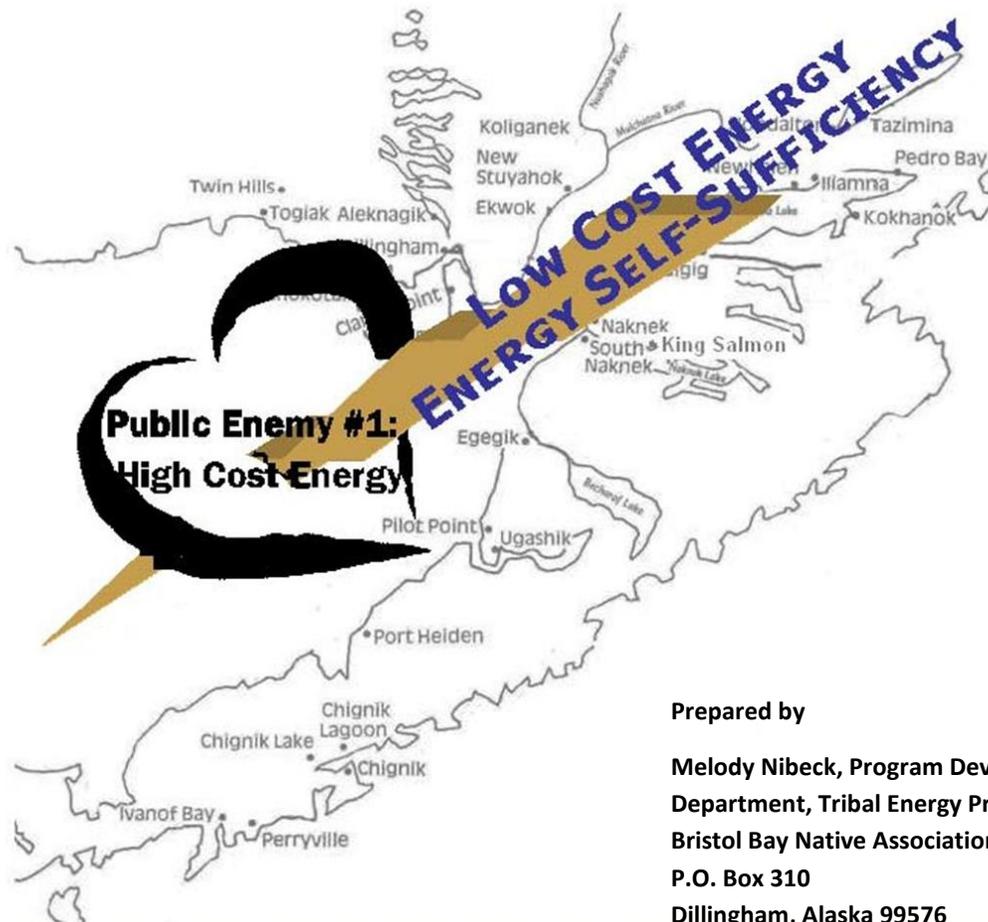


Bristol Bay Energy Policy & Implementation Strategies - Status Report -

A status report of the proposed short-term strategies written by Nels Anderson, Jr. and Greta Goto and presented to the Bristol Bay Partnership in 2008.



Prepared by
Melody Nibeck, Program Development
Department, Tribal Energy Program
Bristol Bay Native Association
P.O. Box 310
Dillingham, Alaska 99576

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Introduction

This document provides a status report of the proposed short-term strategies written by Nels Anderson, Jr. and Greta Goto in 2008 from the documents entitled,

1. "Bristol Bay Energy Policy and Energy Crisis Recovery Plan: Phase One"
2. "Implementation Strategies for the Bristol Bay Energy Policy and Energy Crisis Recovery Plan: Phase Two."

The short-term strategies are categorized; and include a brief description of the latest policies, programs and projects related to the region. The main focus and collection of information is on community- and facility scale projects, not commercial.

Categories

1. Power Cost Equalization (PCE), Energy Assistance, Conversion Fund
2. Energy Needs Assessment
3. Fuel Contingency, Regional Fuel Cooperative, Village Fuel Orders, Technical Assistance
4. Workforce Development
5. Sub-Regional, Regional, Railbelt, Statewide Interties
6. Alternative Energy, Natural Gas, Coal, Nuclear
7. Energy Efficiency and Conservation
8. Regional Energy Summit
9. Regional Development Cooperative, Authority
10. Energy Resource Center
11. Education Budget Line Item, Energy

Bristol Bay Energy Policy Statement

“The intent of the Bristol Bay Energy Policy is to reach the goal of affordable, reliable, safe and long-term energy and to realize energy self-sufficiency and security that supports and sustains the well-being of Bristol Bay people and communities and that promotes economic development opportunities.

- Bristol Bay will sustain its support for fully funding the Power Cost Equalization program and other energy assistance programs until they are no longer needed.
- Bristol Bay and its villages will:
 - Have adequate and affordable fuel sources to keep its communities heated and lighted year-round;
 - Maintain current diesel generation systems by making sure that all of its power plant operators have the best training available and learn fuel purchasing strategies;
 - Wean itself from use of diesel as its primary source of electrical energy;
 - Enjoy energy equity and access to energy sources the same as all other citizens of Alaska.
- Bristol Bay will promote energy conservation to reduce waste and lower heating and lighting costs for homeowners and public buildings.
- Bristol Bay will support and encourage exploration of all on-shore, private, state, and federal lands in the Bristol Bay region to find new sources of energy.
- Bristol Bay will support and encourage:
- Energy interties that connect Bristol Bay villages into a common Bristol Bay Energy Grid and to the Railbelt Energy Grid;
 - A State-Wide Energy Grid to achieve the goal of low cost energy;
 - Transportation corridor planning that will parallel energy grid development in Bristol Bay.
- Bristol Bay will search diligently for and promote acceptable energy alternatives that will reduce the carbon imprint in the Bristol Bay region.
- Bristol Bay will encourage Energy providers and producers to plan collectively for energy infrastructure development.”

(Anderson, Jr., and Goto)

Short-Term Strategies

1. Power Cost Equalization (PCE), Energy Assistance, Conversion Fund

“Continue support and advocate for full funding of the Power Cost Equalization program, Low Income Home Energy Assistance Program and other energy assistance programs until they are no longer needed. Convert PCE Endowment Fund into a Rural Energy Development Fund to finance Rural and Remote energy initiatives to achieve low cost energy for Bristol Bay villages once Bristol Bay villages no longer need the PCE program.” (Anderson, Jr., and Goto)

Power Cost Equalization

PCE Participation, Value

Eighteen utilities serving 25 communities in the region take part in the PCE program. Clark’s Point is currently working with the state and receiving the necessary training to join the program. This will put the region at 100 percent participation. The total value of the PCE program for Bristol Bay is around \$4,760,487. The average PCE rate is .4235 cents per kWh, and average payment to customers is about \$1,430 per year. The specifics per utility are listed below. The PCE information is taken from state reports for Fiscal Year 2013, the latest report available.

Community (Utility)		PCE Level	Eligible kWh	PCE Value	PCE Payment
		(rate)	(total)	(rate x total kWh)	(average, per customer, per year)
1	Chignik Bay	.34	241,101	\$81,974	\$1,164
2	Chignik Lagoon	.39	176,165	\$68,704	\$1,112
3	Chignik Lake	.57	134,935	\$76,913	\$1,529
4	Dillingham, Aleknagik (NETC)	.29	4,970,874	\$1,441,553	\$1,407
5	Egegik	.52	228,576	\$118,860	\$1,498
6	Ekwok (AVEC)	.51	199,593	\$101,79	\$2,122
7	Igiugig	.59	131,358	\$77,501	\$1,849
8	Illiamna, Newhalen, Nondalton (INN)	.18	894,452	\$161,001	\$758
9	Kokhanok Bay	.59	243,787	\$143,834	\$2,128
10	Koliganek	.36	280,942	\$101,139	\$1,269
11	Levelock	.49	126,237	\$61,856	\$1,534
12	Manokotak	.27	448,939	\$121,213	\$785
13	Naknek, South Naknek, King Salmon (NEA)	.40	2,801,698	\$1,120,679	\$1,236
14	New Stuyahok (AVEC)	.46	585,977	\$269,549	\$2,372
15	Pedro Bay	.60	65,235	\$39,141	\$1,280
16	Perryville	.33	121,417	\$40,068	\$684
17	Pilot Point	.36	182,887	\$65,839	\$1,145
18	Port Heiden	.33	217,301	\$71,709	\$1,233
19	Togiak (AVEC)	.43	1,237,439	\$532,099	\$1,826
20	Twin Hills	.46	141,435	\$65,060	\$1,660
21	Clark’s Point	n/a	n/a	n/a	n/a

Table 1: Bristol Bay Participation and Value, PCE Program, FY 2013

PCE Endowment Fund

The PCE Endowment Fund was created and capitalized in FY 2001 with Funds from the Constitutional Budget Reserve and the Four Dam Pool Project sale proceeds, and further capitalized in FY 2007 and FY 2012 with General Funds. The fund is managed by the Department of Revenue; and 7 percent of the fund's three year monthly average market value may be appropriated to the PCE Rural Electric Capitalization Fund for annual PCE program costs. The fund balance as of June 30, 2013 is \$840,214,875. The current market value should be able to support an expanded program.

PCE Legislation

Representative Edgmon introduced House Bill 39 in 2013, "An Act relating to the power cost equalization program." The bill proposed to raise the consumption cap on residential power covered by PCE from 500 kWh to 600 kWh per month, and include small-business rate payers. "Small-business rate payers" are defined as those who consume no more than 2,400 kWh per month. The legislation is sine die and will need to be re-introduced.

PCE Formula

There are on-going discussions to support "technical tweaks" to the PCE formula to better support the integration of renewable energy at the utility level. BBNA has been tracking the conversations with the Alaska Energy Authority, Alaska Center for Energy and Power, and Renewable Energy Alaska Project via the Rural Issues Committee. Recently the floor was lowered to 12 ½ cents and the ceiling was raised to \$1.00 making the average payments to participating households via utilities competitive with Anchorage, Fairbanks and Juneau. The uncertainty (confusion) in Cook Inlet gas supplies and short-term gas contracts with Anchorage utilities is pushing prices up and creating insecurity which may have some impact on the PCE program in the future.

$$\text{PCE Level} = [(\text{Non Fuel Costs/kWh Sold} + \text{Fuel Costs/kWh Sold}) - \text{Base Rate}] * 95\%$$

PCE Regulation

The Alaska Energy Authority noticed proposed changes to Title 3 of the Alaska Administrative Code in 2014. The new regulation addresses the state or federal funding of community facilities. The regulation states that community facilities are not eligible to receive power cost equalization if the costs of operating the facility are paid for with state, federal government, or private commercial interests. The regulation clarifies that the receipt of state or federal government payments is not considered state or federal government payment of operating costs if the local community receives the benefits of the power cost equalization payment rather than the federal government. The regulation identifies the conditions used to determine whether the local community receives the benefit and requires the community facility to certify that the receipt of the state or federal funding satisfies each of the allowable conditions. The proposed regulation change also amends the definition of a community building from being "open" to the general public to being "operated for the benefit" of the general public. BBNA provided written comments.

Status: Energy Assistance

Low Income Home Energy Assistance Program, Alaska Heating Assistance Program, CITGO-Venezuela Heating Oil Program, BBEDC Community Block Grant Program

BBNA administers and monitors state and federal actions linked to the Low Income Home Energy Assistance Program (LIHEAP), Alaska Heating Assistance Program (AKHAP) and CITGO-Venezuela Heating Oil Program. The governor has supported - in recent years - full funding of the Alaska Heating Assistance Program but allocations at the federal level have been uncertain.

BBEDC administers and monitors fuel/electric assistance for 17 communities as part of the Community Block Grant Program. The program provides grants to local government organizations (Tribal or City) to fund development of projects that promote sustainable community and regional economic development. The BBEDC Board determines the level of funding available to communities and whether the community can offer fuel/electric assistance to eligible low-income residents.

Status: PCE Conversion to Rural Energy Development Fund

Nothing to report

There are a number of technical and funding sources and opportunities available to develop energy projects.

Attachment A includes a list of the following:

- State Funding Options
- Federal Funding Options
- Private Equity Investments
- Debt Financing
- Energy Service Performance Contracting
- Clean Renewable Energy Bonds
- Qualified Energy Conservation Bonds
- Federal Tax Incentives
- Tax Equity Partnerships
- Power Purchase Agreements
- Net Metering

2. Energy Needs Assessment

“Conduct a Bristol Bay Regional Energy Needs Assessment for every community in the region to determine current and future electrical power and fuel needs. Coordinate with Bristol Bay regional organizations to avoid duplication of effort.” (Anderson, Jr., and Goto)

Status: Bristol Bay Energy Needs Assessment

Regional Energy Planning

BBNA is working in partnership with the Alaska Energy Authority and Southwest Alaska Municipal Conference on regional energy planning that involves an extension collection of data and information for a community energy assessment, and resource inventory analysis. The data points include:

Community Profile and Assessment:

Demographics	Residential Energy Efficiency
Government & Economy	Commercial Energy Efficiency
Diesel Infrastructure & Fuel Use	Bulk Fuel Tanks
Electric Generation & Sales	Transportation Access
Renewable Energy Resources	Public Infrastructure
Renewable Energy Projects	Public Buildings

Resource Inventory Assessment:

Biomass	Natural Gas
Geothermal	Food Security
Hydro Power	Energy Infrastructure
Solar	Transportation Infrastructure
Wind Energy	Transmission Lines
Energy Efficiency & Conservation	Energy Demand
Fossil Fuels	Large Loads & Mega Conceptual Projects
Bulk Fuel	Current Loads
Diesel Efficiency & Heat Recovery	Population Changes

The planning process has been divided into three phases with a corresponding timeframe:

Phase I	Preliminary Planning, Resource Inventory, Data Collection	2013
Phase II	Stakeholder Advisory Group, Community Outreach, Project Identification	2014-2015
Phase III	Technical & Economic Analysis, Draft Document	2015

More information is available at www.bristolbayenergy.org.

3. Fuel Contingency, Regional Fuel Cooperative, Village Fuel Orders, Technical Assistance

“Develop fuel contingency plans for village. Organize a regional fuel cooperative. Develop plans for village fuel orders, bill collection strategies, fuel buying and management training for utilities.” (Anderson, Jr., and Goto)

Status: Regional Fuel Contingency Plan(s)

Nothing to report

Status: Regional Fuel “Cooperative”

“Bristol Bay Native Association, Bristol Bay Bulk Fuel Purchasing, Potential and Interest in a Cooperative Buying Program”

BBNA sponsored a preliminary assessment of the region’s bulk fuel capacity and level of interest for a regional bulk fuel buying program. The report entitled, Bristol Bay Native Association, Bristol Bay Bulk Fuel Purchasing, Potential and Interest in a Cooperative Buying Program makes the following recommendations:

Short-Term

- Keep costs and requirements of participation low, especially until benefits of participation are better known.
- Find a coordinator who is a skilled administrator. Ideally one can be loaned part-time from an existing regional entity to keep startup costs low.
- Maximize savings from line haul efficiencies by maximizing the total volume of fuel to be ordered region wide.
- Maximize savings from lighter-age efficiencies by maximizing the number of purchasers in the same sub-region and community wherever possible.
- Review the contract terms and participation requirements for existing purchasing groups and adopt the ones that make the most sense.
- Establish a timeline for getting fuel requirements and proof of credit from participants in time to issue an RFP in February and award a contract in March, so fuel suppliers can put together a delivery schedule that maximizes their savings.
- After an initial trial year, consider multi-year contracts to lock in lower transportation prices, especially as a 2015 date for conversion to double-hulled tankers approaches.
- Determine if there is an entity in the region who can act as a financial backer to guarantee payment for the group.
- If credit will not be available through the purchasing group, require each community to arrange its own financing (or demonstrate they have sufficient funds) in a timely fashion, but provide administrative support to help them through the process.
- Help improve credit worthiness of participants through education and training. Consider requiring participation in Rural Alaska Fuel Services (RAFS) program or creating incentives for participation.

Long-Term

- Identify infrastructure improvements in participating communities that could lower costs further and prioritize on a regional basis. Look at the Denali Commission’s Barge Landing Report study conducted with the Army Corps of Engineers.

- Study the feasibility of investing in regional terminal storage and delivery barge sets, including the potential for purchasing or building a bulk fuel tank farm for local consumption in Dillingham, as recommended in the whitepaper by Andy Leman.

Status: Village Fuel Orders, Technical Assistance, Training

Rural Utility Business Advisers/Local Government Specialists

There is established support for village fuel orders and technical assistance in the region. The Rural Utility Business Advisers and Local Government Specialists reach out to communities several times a year to assess fuel supply, plans for purchasing fuel, and make referrals to the state loan program under the "Alaska Fuel Watch Program" if necessary. The advisers are located in Dillingham and serve all communities in the region.

House Bill 196, Bulk Fuel Loan Program

House Bill 196 by Representative Edgmon was signed into law on September 25, 2012. The bill merged two state loan programs into one streamlining the application process for the purchase of bulk fuel. The changes will help smaller communities access the much-needed capital to purchase large quantities of fuel. Many Bristol Bay communities participate in the program.

Community	
1	Chignik Lagoon
2	Chignik Lake
3	Clark's Point
4	Ekwok
5	Igiugig
6	Kokhanok
7	Koliganek
8	Levelock
9	Pedro Bay
10	Perryville
11	Pilot Point
12	Twin Hills

Table 2: Bristol Bay Participation, Bulk Fuel Loan Program

Alaska Fuel Price Report: Current Community Conditions

The price report contains a bi-annual collection of fuel prices (heating fuel and gasoline) quoted in 100 communities during the months of January and July. The report illustrates the current changes in fuel prices across the state, and provides a historical perspective. The report highlights the differences among communities and presents statistical data by region in relation to the monthly Alaska North Slope crude price. Several Bristol Bay communities participate in the survey.

Community	
1	Chignik
2	Clark's Point
3	Dillingham

4	Kokhanok
5	New Stuyahok
6	Nondalton
7	Togiak

Table 3: Bristol Bay Participation, Alaska Fuel Price Report

BIA-Alaska Resupply Program

The Alaska Resupply Program managed by the Bureau of Indian Affairs strives to provide affordable transportation and service costs to the Native populations and communities of Alaska. The history of the program goes back to 1893 where transportation of goods and services to Native communities were provided by the U.S. Coast Guard Cutter “U.S. Bear”. The last vessel operated by the Bureau of Indian Affairs was the “U.S.M.S. North Star III” who was decommissioned in the 1980’s. Since then the transportation of goods and services has been left to contract commercial carriers. The current master procurement plan is with the Department of Defense (Defense Logistics Agency Energy, Ground Fuels Division II), and within the plan the commercial carriers under contract are Delta, Crowley and Petro Marine. There are currently 14 communities under contract for fuel deliveries statewide including two from Bristol Bay.

Community	
1	Levelock
2	Pilot Point

Table 4: Bristol Bay Participation, BIA Resupply Program

Rural Alaska Fuel Services (RAFS)

RAFS is a non-profit agency based in Anchorage. The agency provides technical assistance and training to rural communities related to fuel accounting, records retention, billing, collections, budgets, planning, pricing analysis, and PCE reporting. Several Bristol Bay communities have used their services.

Community	
1	Aleknagik
2	Chignik
3	Chignik Lake
4	Clark’s Point
5	Dillingham
6	Egegik
7	Ekwok
8	Igiugig
9	Kokhanok
10	Manokotak
11	New Stuyahok
12	Pilot Point
13	Port Heiden
14	Togiak
15	Twin Hills

Table 5: Bristol Bay Participation, Rural Alaska Fuel Services

Bulk Fuel Upgrade Program

Twenty-four (24) communities in the region have or will have participated in the state-federal funded deployment program that pays for design, engineering, business planning and construction of bulk fuel storage. The table below outlines the communities and project phases.

	Community	Project Phase
1	Aleknagik	Completed
2	Chignik Bay	Completed
3	Chignik Lagoon	Completed
4	Chignik Lake	Completed
5	Clark’s Point	Completed
6	Egegik	Completed
7	Igiugig	Completed
8	Kokhanok	Completed
9	Koliganek	Completed
10	Levelock	Completed
11	Manokotak	Completed
12	Newhalen	Completed
13	New Stuyahok	Completed
14	Pedro Bay	Completed
15	Pilot Point	Completed
16	Port Heiden	Completed
17	Twin Hills	Completed
18	Perryville	Phase 3
19	Port Alsworth	Phase 1
20	Togiak	Phase 1
21	Naknek	Remaining
22	Nondalton	Remaining
23	Port Heiden (Relocation)	Remaining
24	South Naknek	Remaining

Table 6: Bristol Bay Participation, Bulk Fuel Upgrade Program

The area of concern is around operations and maintenance of the infrastructure once deployed.

Bulk Fuel Capacity (Shell Design)

The following information is design shell capacity for diesel and gasoline storage in the region. It does not denote consumption or include every single bulk fuel tank at the structure level.

	Diesel	Gasoline	Total
	(gallons)	(gallons)	(gallons)
Aleknagik/Dillingham	1,700,000	0	1,700,000
Chignik Bay	308,000	38,000	346,000
Chignik Lagoon	83,200	17,500	100,700
Chignik Lake	75,400	10,000	85,400
Clark's Point	84,000	12,000	96,000
Egegik	68,000	10,000	78,000
Ekwok	80,000	55,000	135,000
Igiugig	85,000	25,000	110,000
Iliamna/Newhalen/Nondalton	89,000	43,000	132,000
King Salmon/Naknek	1,700,000	0	1,700,000
Kokhanok	58,000	8,300	66,300
Koliganek	140,000	40,000	180,000
Levelock	120,000	18,000	138,000
Manokotak	175,000	55,000	230,000
New Stuyahok	513,600	86,000	599,600
Pedro Bay	36,000	8,000	44,000
Perryville	87,000	13,500	100,500
Pilot Point	138,000	37,000	175,000
Port Heiden	173,300	44,000	217,300
South Naknek	0	0	0
Togiak	334,600	112,300	446,900
Twin Hills	70,000	6,000	76,000

Table 7: Design Shell Capacity, Public

	Diesel	Gasoline	Total
	(gallons)	(gallons)	(gallons)
Bristol Fuels, Dillingham	1,470,000	828,000	2,298,000
Delta Western, Dillingham	989,772	401,058	1,390,830
Delta Western, Naknek	634,746	403,116	1,037,862
	Av Gas	Jet Fuel	Total
	(gallons)	(gallons)	(gallons)
Bristol Fuels, Dillingham	321,000	321,000	642,000
Delta Western, Dillingham	264,432	519,120	783,552
Delta Western, Naknek	273,336	298,620	571,956

Table 8: Design Shell Capacity, Private

4. Workforce Development

“Assess workforce development programs to ensure that the region’s workforce programs include energy development related training.” (Anderson, Jr., and Goto)

Status: Assessment

Regional Energy Training Pilot

BBNA and the Alaska Energy Authority are piloting a regional initiative to assess the workforce and level of participation in energy-related trainings offered by the state. The goal of the initiative is to improve participation in the training programs as a way to help reduce inefficiencies, emergencies and maintenance issues. The table below shows the type of training received for each community in the region.

The types of training include:

- Bulk Fuel Operations
- Utility Clerk Operations
- Power Plant Operations
- Advanced Power Plant Operations
- Hydro Operations
- Bulk Fuel Business Operations
- Electric Business Operations
- PCE Utility Clerk Operations

	Community	Training	Year of Training
1	Aleknagik	Bulk Fuel Operations	2002, 2004, 2007, 2011
2	Chignik Bay	Power Plant Operations, Utility Clerk, Advanced Power Plant Operations	1998, 2001, 2002, 2003, 2004, 2005
3	Chignik Lagoon	Power Plant Operations, Bulk Fuel Operations, Utility Clerk	1997, 2002, 2003
4	Chignik Lake	Utility Clerk, Bulk Fuel Operations, Power Plant Operations, Advanced Power Plant Operations	1999, 2001, 2004, 2005, 2006, 2007, 2009, 2012
5	Clarks Point	Utility Clerk, Bulk Fuel Operations, Power Plant Operations	2000, 2002, 2003
6	Dillingham	Unknown	Unknown
7	Egegik	Power Plant Operations, Advanced Power Plant Operations	2004, 2013
8	Ekwok	Power Plant Operations, Bulk Fuel Operations, Advanced Power Plant Operations, Utility Clerk	1998, 2002, 2003, 2004, 2005, 2006, 2007, 2008
9	Igiugig	Power Plant Operations, Bulk Fuel Business Operations, Bulk Fuel Operations, Advanced Power Plant Operations	1997, 1998, 2008, 2009, 2010, 2011
10	Iliamna	Hydro, Power Plant Operations, Advanced Power Plant Operations, Bulk Fuel Operations	2006, 2011, 2012, 2013

11	King Salmon	Power Plant Operations	1996
12	Kokhanok	Unknown	Unknown
13	Koliganek	Unknown	Unknown
14	Levelock	Power Plant Operations, Utility Clerk, Bulk Fuel Operation	1997, 2000, 2001, 2002, 2009, 2013
15	Manokotak	Power Plant Operations, Utility Clerk, Bulk Fuel Operations, Advanced Power Plant Operations, Electric Business	1999, 2002, 2004, 2005, 2006, 2007, 2009
16	Naknek	Unknown	Unknown
17	Newhalen	Hydro	2007
18	New Stuyahok	Unknown	Unknown
19	Nondalton	Power Plant Operations	2007
20	Pedro Bay	Unknown	Unknown
21	Perryville	Utility Clerk, Power Plant Operations, Bulk Fuel Operations	1997, 1998, 2004, 2010, 2012
22	Pilot Point	Power Plant Operations, Advanced Power Plant Operations	2013
23	Port Heiden	Utility Clerk, Bulk Fuel Operations, Power Plant Operations, Bulk Fuel Business	1999, 2000, 2002, 2003, 2004, 2006, 2008, 2012
24	South Naknek	Unknown	unknown
25	Togiak	Bulk Fuel Operations	2003, 2004, 2007, 2008, 2011
26	Twin Hills	Utility Clerk, Power Plant Operations, Bulk Fuel Operations	2002, 2007, 2009, 2010

Table 9: Bristol Bay Participation, Energy Workforce Development & Training

5. Sub-Regional, Regional, Railbelt, Statewide Interties

“Develop plans for sub-regional, regional, Railbelt and statewide energy interties; a regional power grid that ultimately connects to a statewide energy grid.” (Anderson, Jr., and Goto)

Status: Sub-Regional Interties

Sub-Regional Interties

There are two sub-regional interties in the planning phases with the Alaska Village Electric Cooperative. They include:

- Ekwok-New Stuyahok
- Togiak-Twin Hills

Status: Regional Intertie

Nothing to report

Status: Bristol Bay - Railbelt Intertie

Nothing to report

Status: Statewide Intertie

Alaska Grid, the All Alaska Energy Project

The Alaska Grid, the All Alaska Energy Project is seeking funding for a feasibility analysis. The project proposes to deliver North Slope gas by means of High Voltage Direct Current (HVDC) transmission lines in a series of phases to urban and rural Alaska (Fairbanks, West Coast, Yukon-Kuskokwim and Southcentral). This is the only project being proposed that connects urban and rural Alaska for a true statewide solution, and the only project proposing the use of transmission lines, not pipelines, that can capture stranded renewable energy sources.

More information is available at: <http://allalaskaenergyproject.com/>.

Status: Power System Projects, Deployment

Rural Power Systems Upgrade Program

Twenty-three (23) communities in the region have or will have participated in the state-federal funded deployment program that pays for upgrades, repairs, replacements of generators, new generation systems and heat recovery projects in Rural Alaska. The table below outlines the communities and project phases.

	Community	Project Phase
1	Chignik Bay	Completed
2	Chignik Lake	Completed
3	Igiugig	Completed
4	Kokhanok	Completed
5	Levelock	Completed
6	Manokotak	Completed
7	Newhalen	Completed
8	Pedro Bay	Completed
9	Pilot Point	Completed
10	Tazimina	Completed
11	Chignik Lake	Phase III
12	Egegik	Phase III
13	Igiugig	Phase III
14	Pedro Bay	Phase III
15	New Stuyahok	Phase II
16	Twin Hills	Phase II
17	Clarks Point	Phase I
18	Koliganek	Phase I
19	Perryville	Phase I
20	Port Alsworth	Phase I
21	Port Heiden	Phase I
22	Togiak	Phase I
23	Chignik Lagoon	Remaining

Table 10: Bristol Bay Participation, Rural Power System Upgrade Program

The area of concern is around operations and maintenance of the infrastructure once deployed.

6. Alternative Energy, Natural Gas, Coal, Nuclear, Etc.

“Assess geothermal, hydro and hydro-diesel hybrid and small hydro systems including run-of-the-river, wind and wind-hybrid systems, natural gas, Coalbed methane, nuclear, peat, coal, nuclear, hydro, tidal, and other alternatives. Develop a plan for possible use of clean coal technology as a bridge energy source as the region moves toward renewable energy usage.” (Anderson, Jr., and Goto)

Status: Alternative Energy Assessment

Regional Renewable Energy Resource Maps

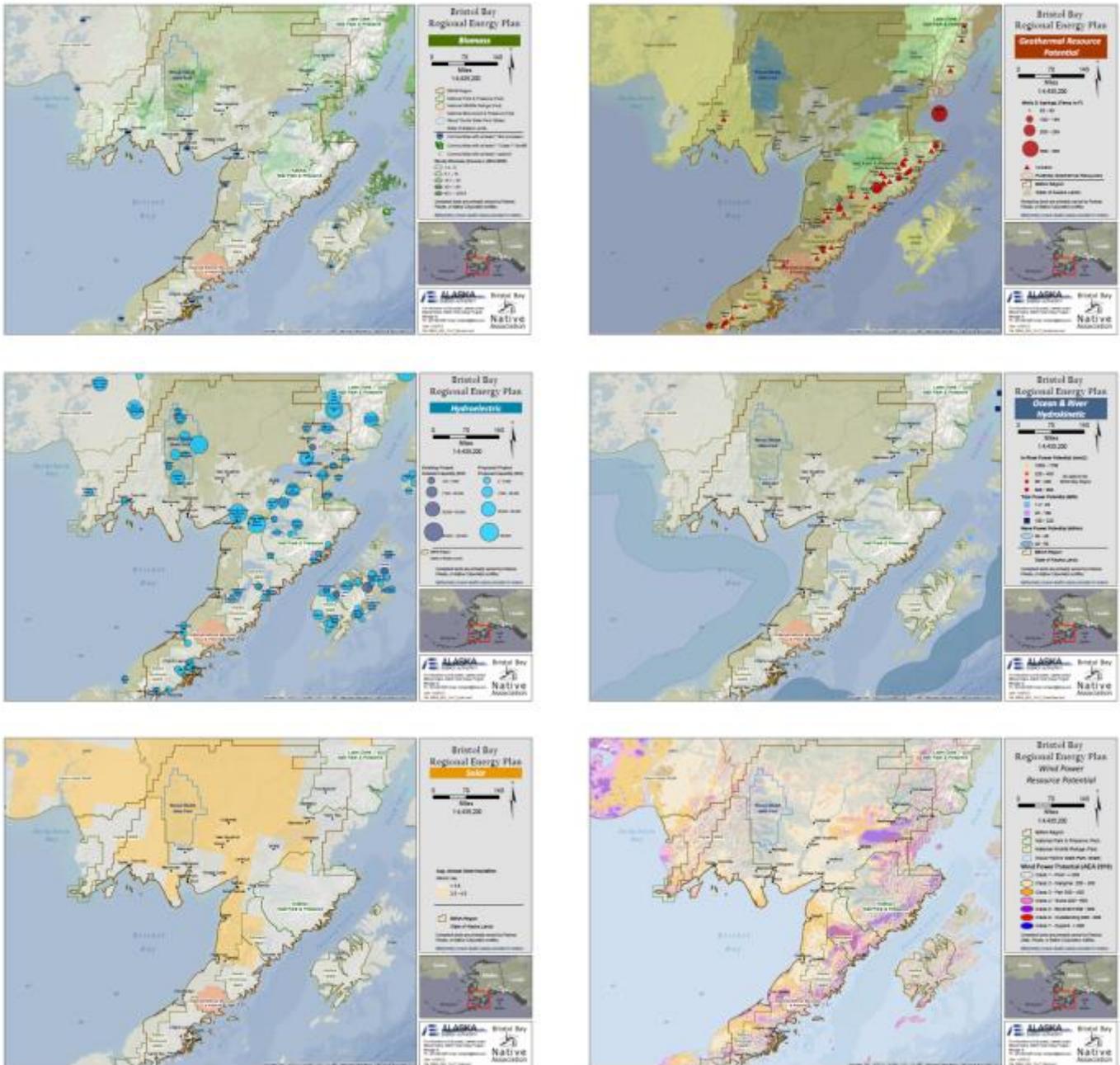
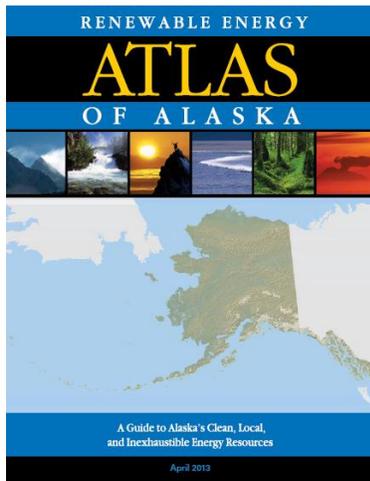


Figure 1: Renewable Energy Potential in Bristol Bay

“Renewable Energy Atlas of Alaska: A Guide to Alaska’s Clean, Local, and Inexhaustible Energy Resources”



The Atlas is a statewide look at renewable energy potential including existing statewide energy infrastructure. It also discusses renewable energy policies such as, net metering, renewable portfolio standards, renewable energy credits and tariff laws.

The maps and Atlas were produced using publically available GIS data sets. The regional maps were designed as a resource estimate for those interested in producing renewable energy, and do not account for the proximity or location of a resource to a community or eliminate the need for an on-site assessment. They were produced using publically available GIS data sets.

Figure 2: Statewide Renewable Energy Potential

How Does Bristol Bay Compare to Other Regions?

The Office of Indian Energy (Department of Energy) produced a high-level estimate of the technical potential for renewable energy resources on Native lands for the twelve Alaska Native Corporation regions. The report entitled, “Financing Opportunities for Renewable Energy Development in Alaska” used geospatial analysis to search for renewable resources for electric generation based on commercially viable technologies on developable lands. The below table was transcribed from the report.

	Utility Scale PV (GWh)	Hydropower (GWh)	Wind (GWh)	Solid Biopower (GWh)	Gaseous Biopower (GWh)	Geothermal Hydrothermal (GWh)
Ahtna Inc.	459,632.4	4,494.5	15,549.6	2.2	.1	10.6
Arctic Slope Regional Corp.	3,831,278.4	207.0	2,278.4	.8	.1	-
Bering Straits Native Corp.	583,633.8	121.6	100,918.8	1.1	.1	-
Bristol Bay Native Corp.	1,335,744.2	552.1	17,551.5	1.8	.1	-
Calista Corp.	718,295.4	749.7	246,798.2	3.2	.2	-
Chugach Alaska Corp.	107,729.0	542.6	52,422.7	3.8	4.8	-
Cook Inlet Region Inc.	440,530.4	6,799.7	15,228.9	36.8	54.8	18.3
Doyon Ltd.	3,339,765.3	7,346.1	62,864.1	75.1	.9	726.4
Koniag Inc.	13,049.2	93.9	252,216.2	1.3	.1	22.2
N.A.N.A. Regional Corp.	583,866.3	193.7	250,904.2	.8	.1	136.6
Sealaska Corp.	171,110.9	2,573.2	340,424.5	385.6	.6	219.6
The Aleut Corp.	101,479.8	13.0	20,287.1	.9	.1	3,401.2

Table 11: Technical Renewable Energy Potential on Native Corporation Lands

Status: Alternative Energy Development

Alaska Renewable Energy Fund

The Alaska Renewable Energy Fund, established in 2008 via House Bill 152, is the premier opportunity for assessing and developing alternative energy projects. The fund provides financing for reconnaissance, feasibility, design, permitting and construction of wind, solar, geothermal, waste heat, hydrothermal, wave, tidal, hydropower, biomass, fuel cells and natural gas projects. The fund supports community and facility scale projects.

Renewable Energy Advisory Board

Senator Hoffman and Representative Edgmon are appointed members of the fund’s advisory board. There have been seven rounds with a focus on regional ranking using a benefit/cost ratio. The tables below list the project applications from each of the rounds.

Alaska Renewable Energy Grant Fund, Round One

1	Lake & Peninsula Borough Wind Feasibility Study	Borough	Wind	Funded
2	Chignik Lake Area Wind-Hydro Final Design	Borough	Wind	Funded
3	Lake & Peninsula Borough Wood Heating Final Design	Borough	Biomass	Funded
4	Indian Creek Hydro Study	City	Hydro	Funded
5	Lake Elva Hydropower Construction	Utility	Hydro	Funded
6	Chignik Lagoon Hydro Feasibility Study	Utility	Hydro	Funded
7	Pike’s Ridge Geothermal Final Design	Utility	Geothermal	Not Funded
8	Naknek / King Salmon Fish Waste Feasibility Study	Utility	Biofuels	Not Funded
9	Snake Mountain Wind Farm Construction	BBAHC	Wind	Withdrawn

Table 12: Renewable Energy Applications, Bristol Bay, Round I

Alaska Renewable Energy Grant Fund, Round Two

1	Kvichak River	Utility	Ocean/River	Funded
2	Pilot Point High Penetration Wind/Diesel	City	Wind	Funded
3	New Stuyahok Wind Analysis	Utility	Wind	Funded
4	Bristol Bay Fish Waste	Utility	Biofuels	Not Funded
5	Tanalian River Hydro	IPP	Hydro	Not Funded
6	Grant Lake Phase III & IV	Utility	Hydro	Not Funded
7	Alternative Energy Assessment Perryville	Tribe	Other	Not Funded
8	Packers Creek Hydro	Utility	Hydro	Not Funded
9	Chignik Lake CBM	IPP	Biofuels	Not Funded

Table 13: Renewable Energy Applications, Bristol Bay, Round II

Alaska Renewable Energy Grant Fund, Round Three

1	Nushagak Area Hydropower Project (NAHP)	Utility	Hydro	Funded
2	New Stuyahok Wind-Feasibility Analysis	Utility	Wind	Funded
3	Pilot Point Wind Power & Heat	City	Wind	Funded
4	Port Alsworth Hydroelectric Construction Project	IPP	Hydro	Funded
5	Southwest Alaska Regional Geothermal Energy Project	Utility	Geothermal	Not Funded
6	Thermal Engine Generator System (TEGS) for Ugashik	Tribe	Heat Recovery	Not Funded
7	Chignik Lagoon Hydroelectric Project	Utility	Hydro	Not Funded

Table 14: Renewable Energy Applications, Bristol Bay, Round III

Alaska Renewable Energy Grant Fund, Round Four

1	Port Heiden Wind Turbine Project	Borough	Wind	Funded
2	Lake & Peninsula Wood Boilers	Borough	Biomass	Funded
3	New Koliganek Wind & Heat Recovery Feasibility Study	Tribe	Wind	Funded
4	Nushagak Community Wind Power Project	Utility	Wind	Not Funded
5	Southwest Alaska Regional Geothermal Energy Project	Utility	Geothermal	Not Funded
6	Packers Creek Hydroelectric Project	Utility	Hydro	Not Funded

Table 15: Renewable Energy Applications, Bristol Bay, Round IV

Alaska Renewable Energy Grant Fund, Round Five

1	Togiak Waste Heat Recovery Project	City	Waste Heat	Funded
2	Packers Creek Hydroelectric Project	Tribe	Hydro	Funded
3	New Stuyahok Heat Recovery Study	City	Heat Recovery	Not Funded
4	Reconnaissance Study Geothermal Potential	Tribe	Geothermal	Not Funded
5	Kvichak River RISEC Project	Utility	Ocean/River	Not Funded
6	Igiugig Wind, Solar, Hydrokinetic & Thermal Study	Tribe	Other	Not Funded

Table 16: Renewable Energy Applications, Bristol Bay, Round V

Alaska Renewable Energy Grant Fund, Round Six

1	High Penetration Wind Energy Project	Utility	Wind	Funded
2	Egegik Wind Feasibility Study	Borough	Wind	Funded
3	Tazimina Hydroelectric Project Capacity Increase	Utility	Hydro	Funded
4	New Stuyahok Heat Recovery	School District	Heat Recovery	Funded
5	Knutson Creek Hydroelectric Project Design	Tribe	Hydro	Funded
6	Levelock Wind Reconnaissance Study	Borough	Wind	Funded
7	Igiugig Wind Turbine Design	Borough	Wind	Not Funded
8	Bristol Bay Borough School District Energy Project	Borough	Solar	Not Funded

Table 17: Renewable Energy Applications, Bristol Bay, Round VI

Alaska Renewable Energy Grant Fund, Round Seven

1	Packers Creek Hydroelectric Project, Phase II	Tribe	Hydro	Funded
2	Igiugig Wind Resource Feasibility & Conceptual Design	Tribe	Wind	Funded
3	Koliganek Wind Diesel & Heat Recovery	Tribe	Wind	Not Funded
4	Chignik Hydroelectric Project Design & Permitting	City	Hydro	Not Funded
5	NEA Stack Heat to Power Project	Utility	Heat Recovery	Not Funded
6	Port Alsworth Hydropower Pre-Construction Phase	IPP	Hydro	Not Funded
7	Bristol Bay Borough School District Solar PV Project	Borough	Solar	Not Funded
8	Iliamna Solar Ground Mounted Energy System	Tribe	Solar	Not Funded

Table 18: Renewable Energy Applications, Bristol Bay, Round VII

Renewable Energy Projects, Other

There are several communities in the region reporting diesel offset from alternative energy infrastructure established separately from the Alaska Renewable Energy Fund.

1	Perryville	Wind	(10) 2.4 kW Skystream Wind Turbines with 4% Diesel Offset
2	Pilot Point	Wind	(2) 10 kW Bergey Wind Turbines with 1.4% Diesel Offset
3	Port Heiden	Wind	(1) 10 kW Bergey Wind Turbine
4	Ugashik	Wind, Solar	(2) 2.5 kW Proven; (1) 2.2 kW Solar Photovoltaic Panel
5	Iliamna, Newhalen, Nondalton	Hydro	824 kW (capable of 1.4 MW) with 121% Diesel Offset
6	Kokhanok	Wind	(2) Vestas V-17 90 kW Wind Turbines (rebuilt) with High Penetration
7	Igiugig	Wind	(4) 1.8 kW Skystream Wind Turbines & several vertical axis wind turbines in partnership with UAF and the Moore Foundation.
8	Clark's Point	Wind	(7) 2.4 kW Skystream Wind Turbines (Installation scheduled for summer, 2014)
9	Port Heiden	Geothermal	Feasibility

Table 19: Renewable Energy Projects, Other

Senate Bill 25, Alaska Sustainable Strategy for Energy Transmission & Supply (ASSETS), State of Alaska

The ASSETS legislation was signed into law on September 25, 2012 by the governor. It gives AIDEA the authority to use creative financing to fund projects related to the transmission and supply of power with a heavy emphasis on natural gas.

Senate Bill 23, Tax Credits, Undeveloped Oil & Gas Basins, State of Alaska

Senate Bill 23 was signed into law on September 25, 2012 by the governor. It gives tax credits for oil and gas exploration and production for work in undeveloped basins including the Egegik and Port Moller basins.

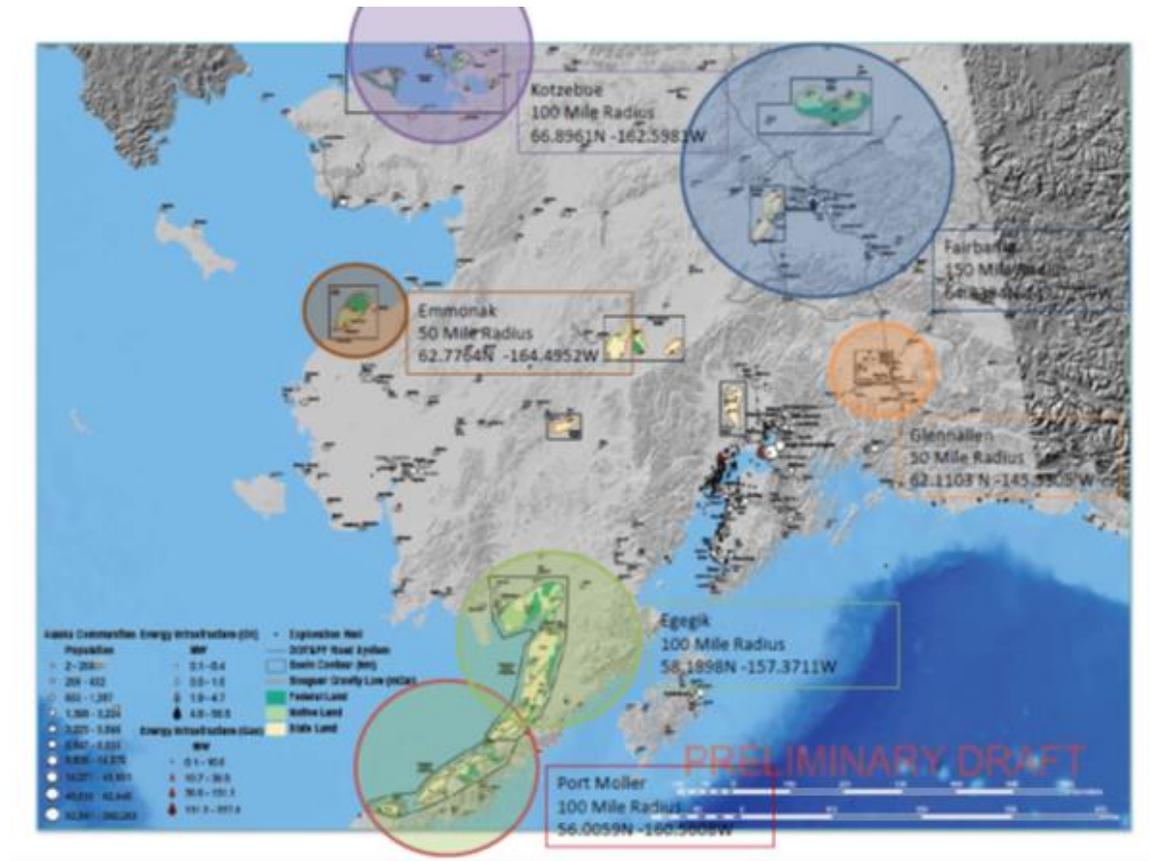


Figure 3: Gas Basins Linked to Senate Bill 23

Liquefied Natural Gas (LNG)

The concept of importing LNG is gaining momentum in the Southeast and Aleutian regions of the state. A private company (WesPac Energy, LLC) is interested in entering the Alaska LNG market and is talking with the discrete markets. The Alaska Energy Authority has contracted with the Alaska Center for Energy and Power to perform a high level market and feasibility analysis that will be presented to the Alaska Legislature in 2014. The analysis will include a look at all coastal communities south of Nome.

Senate Bill 138, (Sections 23 & 75), State of Alaska

Senate Bill 138 was signed into law on May 8, 2014 by the governor. The bill builds on prior efforts and gives the administration authority to negotiate contracts with the parties to the heads of agreement (HOA) and memorandum of understanding (MOU) to advance the project forward. The HOA is between the state, the Alaska Gasline Development Corporation, BP, ConocoPhillips, ExxonMobil and TransCanada. The MOU is between the state and TransCanada. The understanding provides for negotiation of a commercial agreement under which TransCanada would hold the state's interest in the gas treatment plant on the North Slope and in the pipeline, and invest necessary monies for the engineering and development phases of the project. The bill was signed into law in April, and most sections take effect immediately. There are two sections that address Rural Alaska.

Alaska Affordable Energy Fund (Section 23)

Section 23 creates the Alaska Affordable Energy Fund and directs 20 percent of the revenue from the state royalties transported in an Alaska LNG project — after payment to the Alaska Permanent Fund — to address energy needs. The purpose of the fund is to provide a source from which the legislature may appropriate money to develop the infrastructure necessary to deliver energy to areas of the state that are not expected to have or do not have direct access to a North Slope natural gas pipeline.

Plan and Recommendations (Section 75)

Section 75 directs the Alaska Energy Authority — in consultation with the Alaska Gasline Development Corporation, Alaska Industrial Development and Export Authority and Department of Revenue — to plan and make recommendations to the legislature on the infrastructure necessary to deliver affordable energy. The plan must identify ownership options, different energy sources (renewable and non-renewable), describe and recommend the means for generating, delivering, receiving and storing energy in the most cost-efficient manner. If there is no economically viable infrastructure available, the plan must make a recommendation to underwrite the cost of energy to make it more affordable. The authority must also consider the development of regional energy systems that can receive and store bulk fuel in quality and distribute that fuel within the region. The authority appears to be taking the following approach:

- Refining existing regional analyses
- Evaluating increased electrical transmission for use of heat compared to LNG delivery
- Costing LNG logistics and assessment of powerhouse conversions
- Collaborating with Department of Revenue to identify financing and funding options

The authority was given \$2,025,000 and must deliver a document to the legislature before January 1, 2017.

BBNA was the only entity statewide to participate in the AEA Board Meeting in May that discussed Section 75. The authority wants to form a team and build off of the current regional energy planning efforts. The Bristol Bay region is about to enter into Phase Two defined as the formation of a regional advisory group, outreach with utilities, and project identification at the local, sub regional and regional levels. The final phase will include a technical and economic analysis of some projects. Phase One baseline documents can be accessed at www.bristolbayenergy.org and will be distributed to stakeholders in the near-term. To date, the documents have been presented and discussed at several regional events.

Sections 23 and 75 are the first attempts in legislation to address energy issues at the regional level.

Special Report 66, “Fossil Fuel and Geothermal Energy Sources for Local Use in Alaska: Summary of Available Information”

The special report is a summary of fossil fuel and geothermal resource potential in the Bristol Bay region.

Conventional Oil and Gas Resource Recommendations

Previous reconnaissance-scale geologic fieldwork has established the framework geology of the Alaska Peninsula (Detterman and others, 1996). However, significant improvements in our understanding of the region’s petroleum potential could be achieved with additional detailed field mapping and stratigraphic studies. This type of work would build on the successful recent topical studies of the Alaska Peninsula by DNR geologists (Reifenstuhl and Decker, 2008). The petroleum industry has expressed clear interest in exploring federal waters of the southern North Aleutian basin, which is considered prospective for commercial-scale natural gas accumulations (Anchorage Daily News, 2005; Shell Exploration and Production, 2008). A significant discovery could potentially make gas available to markets in the Bristol Bay energy region; although this cannot occur until offshore federal leasing is reinitiated. Industry has shown only moderate interest in exploring leasable state acreage onshore and beneath state waters. These lands have been available for leasing since 2005 through the Alaska Peninsula area wide lease sale. Acquisition of high-quality modern seismic data would be required to determine whether there are exploration prospects on currently accessible lands that would be worth evaluating by drilling. New industry-led exploration would improve knowledge of the prospectively of state lands and any commercial discovery may have the potential to supply affordable energy resources to nearby communities.

Coalbed Methane Recommendations

The Chignik area does possess coal of sufficient rank to host Coalbed methane. The presence of gas in these coal seams was confirmed by significant mud log gas shows encountered during oil exploration drilling. However, compilations of available data conclude that stratigraphic and structural complexity poses a significant challenge to Coalbed methane exploration or development (Smith, 1995; Tyler and others, 2000). Prior to any exploration drilling, it is recommended that substantial geologic fieldwork be conducted in the area, including detailed geologic mapping, structural studies, and analysis of lateral changes in sedimentary units.

Tight Gas Sands Recommendations

The possibility exists for encountering fractured tight gas sands in portions of the Mesozoic section in the region, although available data suggest the probability of recovering commercial quantities of gas is low. In terms of unconventional resources, tight gas sands have the highest likelihood of providing producible quantities of hydrocarbons for local use. Nevertheless, this type of resource has not been extensively evaluated in the region and it would be difficult to entice commercial exploration for tight gas sands in this remote region. Although local exploration may succeed in identifying a resource, developing this type of unconventional play typically involves significant drilling and stimulation costs that could challenge its economic viability as a local source of energy.

Shale Gas Recommendations

Prior geologic investigations have not documented extensively fractured source rocks that are in the thermo genic gas window. The likelihood of finding commercial quantities of shale gas in the region is low and no further action is recommended at this time. However, unconventional shale oil has never been evaluated in the region and the high quality of oil-prone Mesozoic source rocks may warrant further geologic study to determine their potential.

Gas Hydrates Recommendations

Due to the lack of extensive, continuous permafrost in most of southern Alaska, the likelihood of finding gas hydrates in the region are very low, therefore no further action is recommended.

Coal Recommendations

Coals from the Chignik Field offer the greatest potential to produce an economic resource. Prior work has established the presence of an extensive resource with appropriate coal quality. However, available information suggests the stratigraphic and structural complexity of the area would pose a challenge to any effort to exploit this resource for local energy use. A robust assessment of the coal potential of the Chignik region would require significant geologic mapping and topical stratigraphic studies of the coal-bearing section. Although these investigations should be a necessary precursor to any exploratory program, ultimately subsurface drilling data would likely be required to delineate the resource and accurately appraise the economic viability of potential resource development. Available information suggests coals from other areas in the region are unlikely to represent an exploitable resource. However, prior work has been largely reconnaissance in nature, and additional field studies of the local geology could improve our knowledge of the potential for mineable coal in regions like the Ugashik Lakes area.

Geothermal Recommendations

Evidence for elevated subsurface heat flows in the Bristol Bay Region is closely associated with the Aleutian volcanic arc. Of the two thermal springs in the region, only Mother Goose has a discharge temperature >100°F (38°C). Steaming ground fumaroles and boiling-lake fumaroles are also abundant in the Mount Katmai region. However, these indications of active hydrothermal systems are currently located on protected federal lands and not available for development. In addition, the distance between population centers and known occurrences of elevated subsurface temperatures will be a limiting economic factor for geothermal exploration or development of any potential resource for local energy use.

7. Energy Efficiency and Conservation

“Advocate for conservation, energy efficiency and cost reduction initiatives.” (Anderson, Jr., and Goto)

Status: Energy Efficiency & Conservation Advocacy, Initiatives

Energy Savers Tips for Alaska Booklets

BBNA is a member of the SWAMC Energy Taskforce who spearheaded the Energy Savers Tips for Rural Alaska & Energy Savers Tips for Alaska booklet in 2009 and 2011, respectively. Thousands of books have been distributed to communities in the region and around the state. The book provides general explanations, helpful tips and resources on ways to save energy at home. The chapters include information on Your Home; Heating; Insulating & Air Sealing; Water; Lighting; Phantom Power; Living Room; Kitchen; Laundry; Appliances; Save; Monitor Usage; Safety; State Programs and Resources.

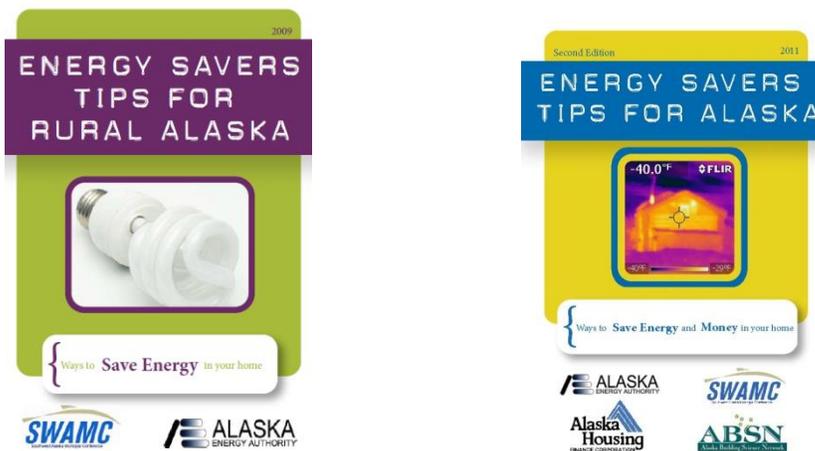


Figure 4: Energy Savers Tips Booklets

Bristol Bay Benchmarking Study

BBNA and BBEDC are working on collecting benchmark data on public facilities for use in developing a regional energy efficiency and conservation strategy. Data will be collected using a standard methodology to include, at a minimum, building type, age, square footage, fuel type, owner, and audit/renovation status and energy usage. Additional data fields may include bulk fuel tank owner and capacity, and the number and type of street lights or other public outdoor lighting. BBNA and BBEDC will work together to engage community liaisons to collect the data that will serve as a benchmark for conservation potential in the region, a cornerstone of energy planning. The data will be used in development of the Bristol Bay Regional Energy Plan and be provided to the Alaska Energy Authority's Energy Efficiency program staff.

Introduction to Energy Efficiency Booklet

BBNA participated in the writing of the Introduction to Energy Efficiency: A Guide to Managing Energy Use in Public & Commercial Facilities booklet as a peer reviewer. Hundreds of books have been distributed to Bristol Bay communities. The book provides general explanations, helpful tips and resources on ways to save energy in public and commercial facilities. The chapters include information on Life Cycle Costing; Key Saving Strategies; Energy Management; Energy Assessments; Investing in Energy Efficiency Measures; Tools and Resources.

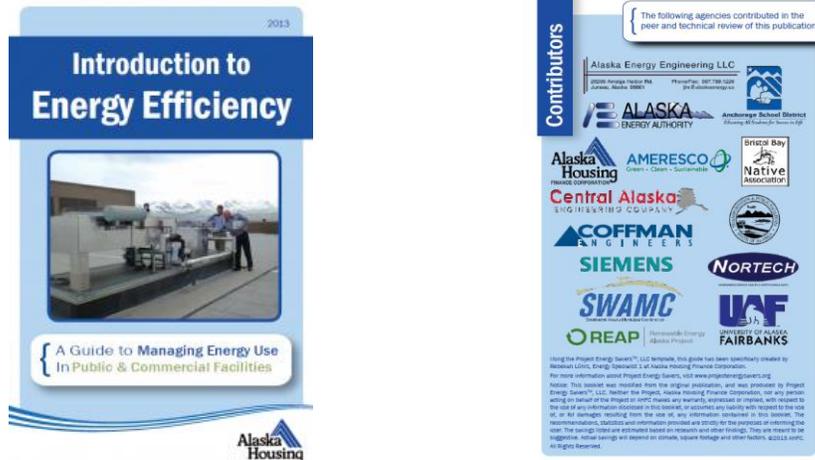


Figure 5: Energy Efficiency in Public and Commercial Facilities Booklet

Alaska Energy Efficiency Partnership

BBNA and other entities in the region are charter members of the Alaska Energy Efficiency Partnership. The partnership manages a website <http://www.akenergyefficiency.org/> to support the coordination of services and information in general on residential, commercial, educational and professional energy efficiency opportunities. The mission of the partnership is “to improve the coordination of efforts promoting the adoption of greater end-use energy efficiency measures and energy conservation behaviors in Alaska through information sharing and integrated planning so that Alaska may become the most energy efficient state in the nation.”

Renewable Energy Alaska Project, Rural Issues Committee

BBNA and other entities in the region are organizational members of the Renewable Energy Alaska Project (REAP) - a coalition of large and small Alaska utilities, businesses, conservation and consumer groups, Alaska Native organizations, and municipal, state and federal entities with an interest in developing Alaska’s vast alternative resources. BBNA participates on REAP’s Rural Issues Committee. The committee meets quarterly to discuss energy issues specific to rural Alaska. REAP also sponsors the Business of Clean Energy in Alaska Conference each year where BBNA is recognized as a supporter who helps spread the word about the conference.

Status: Energy Efficiency Development

Village Energy Efficiency Program

The Village Energy Efficiency Program is the premier opportunity for non-residential energy efficiency and conservation project development. The program provides funding for energy efficiency and conservation policy development, audits and upgrades in communities with less than 8,000 people. The table below lists the projects associated with the program in the Bristol Bay region.

1	Village Energy Efficiency Program	Naknek, South Naknek	\$300,000 (2013)
2	Village Energy Efficiency Program	Perryville	\$150,000 (2013)
3	Village Energy Efficiency Program	Egegik	\$150,000 (2013)
4	Village End Use Efficiency Program	Ekwok	Phase III (2010)
5	Village End Use Efficiency Program	Levelock	Phase III (2010)
6	Village End Use Efficiency Program	New Stuyahok	Phase III (2010)
7	Village End Use Efficiency Program	Chignik Lake	Phase II (2008)
8	Village End Use Efficiency Program	Pedro Bay	Phase II (2008)
9	Village End Use Efficiency Program	Port Heiden	Phase I (2006)

Table 20: Bristol Bay Participation, Village Energy Efficiency Program

Alaska Housing Finance Corporation White Paper

The Alaska Housing Finance Corporation financed and analyzed audit data from 327 municipal, state and school district-owned buildings. The paper presents the first major statistical look at energy use in public facilities across the state. It presents targeted recommendations for building owners and operators, building designers and leadership. In addition to project findings and statistical data, there are case studies, lessons learned and a list identifying commonly found energy efficiency measures that facility owners can implement to reduce energy use. This paper lays the groundwork for policy decisions, changes in building design, training needs for operators and energy management in facilities. Several Bristol Bay schools participated in the audits.

1	Energy Audit Final Report	Aleknagik	Coffman Engineers & Central Alaska Engineering
2	Energy Audit Final Report	Twin Hills	Coffman Engineers & Central Alaska Engineering
3	Energy Audit Final Report	Chignik Lake	Central Alaska Engineering Company
4	Energy Audit Final Report	Nondalton	Central Alaska Engineering Company
5	Energy Audit Final Report	Egegik	Central Alaska Engineering Company
6	Energy Audit Final Report	Newhalen	Central Alaska Engineering Company
7	Energy Audit Final Report	Koliganek	Coffman Engineers & Central Alaska Engineering
8	Energy Audit Final Report	Ekwok	Coffman Engineers & Central Alaska Engineering
9	Energy Audit Final Report	Manokotak	Coffman Engineers & Central Alaska Engineering
10	Energy Audit Final Report	Perryville	Central Alaska Engineering Company

Table 21: Investment Grade Energy Audits, Bristol Bay Schools

Energy Efficiency & Conservation Block Grant

BBNA, BBNC and BBEDC teamed up to assist 14 tribes implement their Energy Efficiency & Conservation Block Grant allocations. The project brief is below.

BBNA Energy Efficiency & Conservation Project Summary

2010-2012



PROJECT DESCRIPTION:
The Bristol Bay Native Association submitted a joint application to the U.S. Department of Energy on behalf of 14 Tribes in the region for education, energy audits and retrofits on Tribally-owned buildings and homes.

TECHNICAL SUPPORT:
The Alaska Building Science Network provided technical support for audits and retrofits, including field work supervision, training of local labor, procurement, and shipping of building materials.



<http://akbuildingsciencenetwork.org/>

PROJECT CONTACT:
Melody Nibeck
Tribal Energy Program
Bristol Bay Native Association
P.O. Box 310
Dillingham, AK 99576
907.842.5257
mnibeck@bbna.com



- 52 buildings audited
- 34 buildings retrofitted using local labor
- 23 homes retrofitted for lighting
- 41 local workshops & training sessions held
- 788 "Energy Savers Tips for Alaska" booklets distributed
- "Energy Efficiency, the First Step to Renewable Energy" Conference
- 282 Fluorescent T8 Lamps & Electronic Ballasts installed
- 165 Compact Fluorescent Light Bulbs installed
- 606 LED A19 Light Bulbs distributed & LED Exterior Fixtures installed
- Upgraded attic Insulation, Air Leaks sealed
- Security Motion & Occupancy Sensors installed
- Toyo Stoves & Programmable Thermostats installed
- Doors & Windows replaced

ANNUAL ENERGY SAVED

104,191 kWh (\$52,644)

11,290 Gallons Fuel Displaced (\$62,800)

\$115,444 Total Savings

4.42 Years Simple Payback (average)

Aleknagik, Chignik Lake, Clark's Point, Ekuk, Ekwok, Koliganek, Levelock, Manokotak, Naknek, New Stuyahok, Nondalton, Portage Creek, Togiak & Twin Hills

Figure 6: Summary of Federal Funded Energy Efficiency Projects in Bristol Bay

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8. Regional Energy Summit

“Convene a Bristol Bay Energy summit for the single purpose of reviewing and adopting a Bristol Bay Energy Policy and Energy Crisis Plan.” (Anderson, Jr., and Goto)

Status: Summit

Nothing to report

Status: Summit, Other

Bristol Bay Energy Summit, the Path Forward 2008

The Bristol Bay Native Corporation hosted a regional energy summit in 2008 entitled “Bristol Bay Energy Summit, The Path Forward.” The summit looked at the potential short-term and long-term issues and solutions; and made policy recommendations. The summit concluded the following:

- The need to underwrite a uniform and affordable cost structure for electric and heating oil
- The need to grant money for energy efficiency measures at the residential, public and commercial levels
- The need to expand the PCE program to include commercial applications
- The need to fund alternative energy solutions with a focus on space heating

The “next steps” called for a detailed energy plan with costs and timelines, a legislative collective voice, and requests for capital appropriations.

“Energy Efficiency, the First Step to Renewable Energy” Conference 2009

BBNA hosted a regional energy conference to bring stakeholders together to learn and discuss energy efficiency and the important role it plays as the immediate or “first step” individuals, communities and businesses can take to reduce their everyday energy consumption. Eighteen (18) communities from around the region participated in the event held in Dillingham. The conference was a combination of presentations and workshops. The conference concluded the following:

- Partnership with Alaska Center for Energy and Power
- Prepare communities to participate in the Alaska Renewable Energy Grant Fund
- Prepare communities to participate in the Emerging Energy Technology Fund
- Find village solutions for promoting energy efficiency technology

9. Regional Development Cooperative, Authority

“Develop a Bristol Bay Regional Energy Development Cooperative and/or a Regional Development Authority when the Partners decide what organization will implement energy policies in the region.” (Anderson, Jr., and Goto)

Status: Regional Energy Authority, Cooperative

Nothing to report

10. Energy Resource Center

“Push for establishing an Energy Resource Center at the Bristol Bay Campus or at SAVEC.” (Anderson, Jr., and Goto)

Status: Energy Resource Center

UAF, Bristol Bay Campus, Environmental Science Lab

The campus has an established environmental science lab providing courses, occupational endorsements and education tools in sustainable energy, ecosystems and fisheries. The campus established a Sustainable Energy Occupational Endorsement, and promotes energy classes and workshops in the region. BBNA and other Bristol Bay partners and businesses are members of the council of advisors providing direction on the occupational endorsement.

11. Education Budget Line Item, Energy

“Create an education budget line item for school districts’ heating and electricity; take energy cost out of the School Foundation Formula.” (Anderson, Jr., and Goto)

Status: Schools, Energy, Foundation Formula

Koliganek K-12 School



Figure 7: Rendering of Energy Efficient School in Koliganek

UNIT was selected to construct a new 17,900 square foot K-12 school, boiler building, water tank, and supporting utilities. The new school will have a structural steel frame, concrete slab on grade, insulated wall/roof panels, metal siding and roofing. It has the potential to be a model for energy efficiency standards and construction for schools in the state.

House Bill 278, Foundation Formula, State of Alaska

House Bill 278 was signed into law on May 13, 2014 by the governor. The bill includes intent language to re-examine the foundation formula. The last time the formula was re-tooled and adopted by the Legislature was in 1998. The cost differential portion of the formula relies on the “Alaska Geographic Differential Study” from 2008 that uses a statistical analysis and cost of living index relative to Anchorage. The rhetoric around House Bill 278 referred to “economies of scale” and “size of school” not geographical differences indicating this is going to be a contentious issue in the future.

Appendix A, Project Financing & Partnerships

FINANCING

There are four primary sources of project funding for energy projects: public funding, private equity, commercial debt, and third-party tax-equity investment. While public financing through state and federal grant and loan programs is most common in Alaska, there is opportunity to expand into private financing in order to capture more project potential. Private financing options are being used successfully elsewhere and will become more important in Alaska if state and federal funding declines. While most programs are available to both taxable and tax-exempt organizations, it is important to consider tax status, project terms, and ownership interest when considering financing options (1).

State and Federal Funding Options

Table 54: State Funding Options for Energy Projects

AEA	Bulk Fuel Upgrades (BFU)	Grants
Dave Lockard (907) 771-3062 www.akenergyauthority.org/programsenergysystemupgrade.html	AEA also operates the Bulk Fuel Upgrades program, which replaces older bulk fuel tanks and infrastructure to bring them into compliance with state and federal regulations and reduces the risk of leaks and equipment failure. With significant funding from the Denali Commission, Bulk Fuel Upgrades have been completed in over 70 communities at a combined cost of over \$200 million. AEA has another 30 projects on its list.	Eligibility: Communities that are served by AVEC, the North Slope Borough, Alaska Power and Telephone Co, or connected by roads are not part of the Bulk Fuel Upgrades program.
AEA	Commercial Building Energy Audit (CBEA)	Grants
Cady Lister (907) 771-3039 www.akenergyauthority.org/EfficiencyAudits.html	The CBEA program provides grants that cover up to 100% of the cost of an energy audit for privately owned commercial buildings. Grant amount is based on the size and complexity of the building. A stipend is available for the auditor to travel to locations with one. The maximum reimbursement ranges from \$1,800 for buildings under 2,500 square feet up to \$7,000 for buildings from 60,000 to 160,000 square feet.	Eligibility: Private owners of non-residential buildings up to 160,000 square feet. Both for-profit and nonprofit businesses are eligible.
AEA	Emerging Energy Technology Fund (EETF)	Grants
Shawn Calfa (907) 771-3031 www.akenergyauthority.org/eetfundgrantprogram.html	The Emerging Energy Technology Fund was created by the Alaska Legislature to fund demonstration projects that test emerging energy technologies or methods that have a reasonable expectation to be commercially viable within five years. EETF funds can also be used to improve an existing technology or deploy one that has not previously been demonstrated in Alaska. Sixteen out of 70 applications were approved for funding in 2012.	Eligibility: The Renewable Energy Fund accepts applications from utilities, independent power producers, and local and tribal governments for the purpose of developing renewable energy projects. It does not provide funding for energy efficiency improvements.

AEA	Industrial Energy Audits of Seafood Processing Plants	Service
Cady Lister (907) 771-3039 www.akenergyauthority.org/eec-industrialenergyaudit.html	AEA launched an industrial energy audit program in 2010 to assist the seafood industry to better understand energy use in their plants in order to lower their carbon footprint and operating costs. The program has three parts: An energy audit kit (to measure power consumption of equipment and provide data to small and medium sized processors); an energy audit service for larger processors; an energy efficiency section on the Marine Advisory Program website to anonymously publish results of efficiency audits.	No subsidies currently available
AEA	Power Cost Equalization (PCE) Program	Subsidy
Jeff Williams (907) 771-3046 www.akenergyauthority.org/programspce.html	Alaska's Power Cost Equalization program provides economic assistance to residential customers and qualifying community facilities in rural areas of Alaska to offset the high cost of electricity compared with urban areas of the state. PCE pays a portion of approximately 30% of all kWh's sold by participating utilities. Participating utilities are required to reduce each eligible customer's bill by the amount that the State pays for PCE.	Eligibility: The Regulatory Commission of Alaska (RCA) determines if a utility is eligible and calculates the amount of PCE payable to the utility. AEA determines eligibility of community facilities and residential customers. Commercial customers are not eligible to receive PCE credit.
AEA	Power Project Fund (PPF)	Loans
Mike Catsi (907) 771-3060 www.akenergyauthority.org/programsloan.html	The Power Project Fund provides loans to local utilities, local governments or independent power producers for the development or upgrade of small-scale electric power production. The loan term is related to the life of the project. Interest rates vary between zero, at the low end, and tax-exempt rates at the high end.	Eligibility: Small-scale (<10 MW) electric power production, including conservation, bulk fuel storage and waste energy conservation.
AEA	Renewable Energy Fund (RE Fund)	Grants
Shawn Calfa (907) 771-3031 www.akenergyauthority.org	The Renewable Energy Fund was created by the Alaska Legislature in 2008 with the intent to appropriate \$50 million annually for five years. Actual appropriations have been around \$25 million in recent years, and the program has since been extended through 2023. In Round VI, 23 out of 85 projects were recommended for funding. Individual awards ranged from \$10,000 for a wind feasibility study to \$6.7 million for hydroelectric project construction.	Eligibility: The Renewable Energy Fund accepts applications from utilities, independent power producers, and local and tribal governments for the purpose of developing renewable energy projects. It does not provide funding for energy efficiency improvements.

AEA	Rural Power System Upgrades (RPSU)	Grants
Kris Noonan (907) 771-3061 www.akenergyauthority.org/programsenergysystemupgrade.html	With significant funding from the Denali Commission, AEA operates the RPSU program, which replaces outdated, inefficient village powerhouse and electrical distribution systems, adds or upgrades heat recovery and remote monitoring systems, and improves overall diesel efficiency through other upgrades including electronic fuel injectors, switchgears and controls. RPSU projects have been completed in over 50 communities, and AEA plans to complete projects in over 50 more.	Eligibility: Communities that are served by AVEC, the North Slope Borough, Alaska Power and Telephone Co. or connected by intertie are not part of the RPSU program.
AEA	Village Energy Efficiency Program (VEEP)	Grants
Rebecca Garrett (907) 771-3042 www.akenergyauthority.org/programsalternativveeep.html	AEA provides energy efficiency audits and improvements to community buildings primarily in rural Alaska through the Village Energy Efficiency Program.	Eligibility: Communities with no more than 8,000 residents. Priority is given to communities with the highest energy costs and fuel use.
AEA	Whole Village Retrofit	Grants
Rebecca Garrett (907) 771-3042 www.akenergyauthority.org/programsalternativveeep.html	A subprogram of VEEP, AEA has provided deeper energy efficiency retrofits in certain communities to demonstrate the impact energy efficiency can create when conducted thoroughly throughout a community. In recent years, recipients have included Nightmute, Fort Yukon, Emmonak and Alakanuk.	
AHFC	5-Star Plus New Home Energy Rebate	Cash Rebate
(877) 257-3228 www.akrebate.com	A cash rebate of \$7,500 is available for the purchase of a newly constructed 5-Star Plus home.	Eligibility: Must be original owner, not more than one year from time of completion. Individuals may not participate in a Home Energy Rebate and the Weatherization Program.
AHFC	Energy Efficiency Revolving Loan Fund (AEERLP)	Loans
Eric A. Havelock (907) 330-8245 www.ahfc.us/efficiency/energy-programs/energy-efficiency-revolving-loan-fund-aeerlp	AEERLP provides financing for permanent energy-efficient improvements to government-owned facilities. Financed improvements must be from the list of energy efficiency measures identified in an Investment Grade Audit. All improvements must be completed within one year of loan closing. Guaranteed savings from energy efficiency improvements are used to repay the loan. There is no maximum loan amount. The maximum loan term is 15 years.	Eligibility: Buildings must be owned by a government entity, such as the schools, local municipalities, state agencies, and University of Alaska buildings. Only improvements identified during an Investment Grade audit are eligible

AHFC	Energy Efficiency Interest Rate Reduction (EEIRR)	Interest Rate Reduction
www.ahfc.us/efficiency/energy-programs/interest-rate-reduction	AHFC offers an energy efficiency interest rate reduction (EEIRR) when financing new or existing 5-Star or 5-Star Plus rated homes or when borrowers purchase and make energy improvements to an existing home. Interest rate reductions apply to the first \$200,000 of the loan amount. A loan over \$200,000 receives a blended interest rate. The percentage rate reduction depends on the property's energy rating and whether there is access to natural gas.	Eligibility: Any property that can be energy rated and is otherwise eligible for AHFC financing may qualify for this program.
AHFC	Home Energy Rebate (HER) program	Cash Rebate
(877) 257-3228 www.akrebate.com	Homeowners receive rebates up to \$10,000 after making energy-efficient improvements through AHFC's Home Energy Rebate program. Before ("As-Is") and after ("Post-Improvement") energy ratings are required. In January 2013, the program was changed to allow homeowners who previously used the HER or 5-Star Plus New Home Rebate programs to receive second rebates up to \$10,000 for making recommended improvements.	Eligibility: The program is open to all owner-occupied, year-round Alaskan homeowners. There are no income requirements. Only one rebate per dwelling. Individuals may not participate in both AHFC's Weatherization and Home Energy Rebate Program.
AHFC	Second Mortgage for Energy Conservation	Loans
Alaska USA Federal Credit Union (888) 425-9813 www.ahfc.us/efficiency/energy-programs/second-mortgage-energy-conservation	Borrowers may obtain financing to make energy improvements on owner-occupied properties. All improvements must be completed within 365 days of loan closing (improvements not listed may not be included in the loan). For borrowers participating in the Home Energy Rebate Program, the rebate received will be applied toward the outstanding balance of loan. The maximum loan amount is \$30,000. The maximum loan term is 15 years.	Eligibility: Homes must be owner-occupied, and only improvements on the list of energy upgrades included with an energy audit by an AKWarm™ Certified Energy Rater are eligible.
AHFC	Weatherization Program	Cash Rebate
(800) 478-808 www.ahfc.us/efficiency/energy-programs/weatherization/	Individuals who meet income guidelines may apply for the Weatherization Program through one of two weatherization service providers that serve specific communities in region. The weatherization provider will provide program services at no cost to qualified applicants. Every home receives health and safety measures, efficiency improvements and client education.	Eligibility: Homeowners and renters with household income equal to 100% of median income. Priority to households with people over 55 and under 6. Individuals may not participate in both Weatherization and Home Energy Rebate Program.
ADOT&PF	STIP Community Transportation Program	Grants
Irene Gallion (888) 752-6329 www.dot.state.ak.us/stwdplng/cip_stip	Community partners can take advantage of federal surface transportation improvement funding through a competitive process that generally runs on a 2-year cycle. Sponsors have to provide the required match, which generally runs approximately 10% of project costs.	Eligibility: Anyone can nominate a project, but it must have the support of the community that will eventually own the asset.

AIDEA	Sustainable Energy Transmission and Supply (SETS) Development Fund	Loans & Loan Guarantees
www.aidea.org/programs/specialtyfinancing/sets.aspx	The SETS fund was created with Senate Bill 25 as part of the Alaska Sustainable Strategy for Energy Transmission and Supply (ASSETS). The bill gave the Alaska Industrial Development Export Authority (AIDEA) the ability to directly finance energy infrastructure projects by issuing loans or to partner with banks or credit unions. AIDEA can also offer loan or bond guarantees, defer principal payments, and capitalize interest on project financing. Terms of 30 or 50 years are available to qualified hydropower or transmission line projects. Legislative approval is required if AIDEA finances more than one-third of the capital cost of an energy project or provides loan guarantees that exceed \$20 million.	Eligibility: Qualified energy projects include: Transmission, generation, conservation, storage, or distribution of heat or electricity; Liquefaction, regasification, distribution, storage, or use of natural gas (except a natural gas pipeline project) for transporting natural gas from the North Slope or Cook Inlet to market; Distribution or storage of refined petroleum products.
ALASKA DCCED DCRA	Bulk Fuel Revolving Loan Fund	Loans
Jane Sullivan (907) 269-4614 commerce.alaska.gov/dnn/dcra/BulkFuelLoanProgram.aspx	The DCCED Division of Community and Regional Affairs (DCRA) now administers the state's single bulk fuel loan program. All loans must be paid within one year. The loan amount, added to the principle of all other bulk fuel revolving loans to the same borrower may not exceed \$750,000. A cooperative organization representing more than one community may qualify for a loan amount not to exceed \$1.8 million.	Eligibility: Loans may be made to a municipality or unincorporated village with a population under 2,000, or a private individual or company retailing fuel or electricity in such a community.
Alaska DCCED DED	Commercial Alternative Energy Conservation Loan Fund	Loans
Jim Andersen (907) 465-2510 commerce.alaska.gov/ded/fin/ae.cfml	DCCED provides loans up to \$50,000 to finance alternative energy systems or conservation in commercial buildings. Interest rates are fixed at time of loan approval. Maximum loan term is 20 years. Loan requests over \$30,000 require a letter of denial from a financial institution.	Eligibility: Loans must be for the purchase, construction, and installation of alternative energy systems or energy conservation improvement in commercial buildings.
Alaska DEED	Capital Improvement Projects (CIP)	Grants
www.eed.state.ak.us/facilities/FacilitiesCIP.html	School districts can use CIP funds to address energy efficiency measures. Securing additional energy efficiency funds from another source may increase a CIP application's competitiveness.	Eligibility: Alaska school districts
Alaska DHSS	Low Income Home Energy Assistance	Subsidy
Susan Marshall (907) 465-3099 dhss.alaska.gov/dpa/Pages/hap/	This federally funded program helps eligible families pay home heating bills and can assist with weatherization and energy-related minor home repairs. The federal Low Income Home Energy Assistance Program (LIHEAP) program is administered in Alaska by the Alaska Department of Health and Social Services (DHSS) through its Heating Assistance Program (HAP).	Eligibility: Families with incomes less than 225% of the federal poverty guidelines for Alaska may be eligible. Other factors that affect eligibility and final benefit amount include the family's community, type of dwelling and home heating system.

Table 55: Federal Funding Options for Energy Projects

BIA	Energy and Mineral Development Program (EMDP)	Grants
Dawn Chargin (720) 407-0652 www.bia.gov /WhoWeAre/AS-IA /IEED/DEMD/TT/TF	The Bureau of Indian Affairs (BIA) provides grants through an annual solicitation to help with the evaluation of conventional and renewable energy and mineral resources on Tribal lands. In return, the program provides Tribes and allottees with the information they need to promote their lands, negotiate the best agreements with partners or investors, and eventually develop their resources.	Eligibility: Activities can include initial exploration; market analyses; outreach and education to Tribes concerning energy or mineral development issues; economic evaluation and analyses; and promotion of completed projects at industry conferences and to prospective partners or investors.
BIA	Indian Affairs Loan Guaranty, Insurance, and Interest Subsidy Program	Loan Guarantees and Interest Subsidies
www.bia.gov /WhoWeAre /AS-IA/IEED /LoanProgram	The purpose of the BIA Guaranteed Loan program is to encourage eligible borrowers to develop viable Indian businesses through conventional lender financing. The direct function of the program is to help lenders reduce excessive risks on loans they make. That function in turn helps borrowers secure conventional financing that might otherwise be unavailable. BIA will guarantee a loan up to 90%. The interest subsidy covers the difference between the lender's rate and the Indian Financing Act rate.	Eligibility: Borrower must have 20% tangible equity in the project.
Denali Commission	Energy Program	Grants
Jodi Fondy (907) 271-3011 www.denali.gov	The Denali Commission is an independent federal agency with the authority to procure federal funding from Congress and a variety of federal agencies, such as the USDA. The commission has made energy its primary infrastructure theme since 1999. It primarily works with the AEA and AVEC to meet rural communities' energy infrastructure needs.	Eligibility: Projects include design and construction of replacement bulk fuel storage facilities, upgrades to community power generation, transmission and distribution systems, energy efficiency measures and alternative energy projects.
Denali Commission	Transportation Program	Grants
Tessa Axelson (907) 271-1624 www.denali.gov	Denali Commission's Transportation Program assists rural roads and waterfront development. The waterfront portion of the program addresses planning, design and construction of port, harbor and other rural waterfront needs. Congress did not extend funding for the Transportation Program beyond 2012, but commission staff continues to administer the program in coordination with the Transportation Advisory Committee (TAC). The TAC is the body who, recommends projects and advises on rural surface transportation needs in Alaska.	Eligibility: Eligible road projects include, but are not limited to, ATV board roads, local community road and street improvements, and roads and board roads to subsistence use sites. Waterfront project types include, but are not limited to, regional ports, barge landings and docking facilities.

HUD	Indian Community Development Block Grant (ICDBG)	Grants
portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/ih/grants/icdbg	The ICDBG Program provides direct grants for use in community and economic development, including housing rehabilitation, roads, water and sewer facilities, single or multipurpose community buildings, and a wide variety of commercial, industrial, and agricultural projects which may be recipient-owned and operated or which may be owned or operated by a third party.	Eligibility: Eligible applicants include any Tribe or Alaska Native village which has established a relationship to the Federal government as defined in the program regulations. In some instances, Tribal organizations may be eligible.
SBA	7(a) Loan Program	Loans and Loan Guarantees
www.sba.gov/category/navigation-structure/loans-grants/small-business-loans/sba-loan-programs/7a-loan-program	Congress established the 7(a) Loan Program under the Small Business Act to facilitate lending to small businesses. The program provides loan guarantees to for-profit businesses that are otherwise unable to secure funds through traditional lending. If the business is eligible, the Small Business Administration (SBA) will guarantee a maximum of 85% of the loan amount on loans up to \$5 million, and repayment periods may extend up to 25 years.	Eligibility: A business must meet industry-specific size limitations. Loans guaranteed through the program may be used for a wide variety of business purposes.
USDA-NRCS	EQUIP Seasonal High Tunnel Initiative	Grants and Technical Assistance
www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/?&cid=stelprdb1046250	The Seasonal High Tunnel Initiative provides financial and technical assistance to agricultural producers. Goals include extending the growing season and providing consumers with a local source of fresh produce. Maximum practice payment shall be for five percent of an acre and can be a single or multiple structures.	Eligibility: Individuals, legal entities, Tribes, or joint operations engaged in agricultural production.
USDA-RD	Energy Programs	Grants, Loans and Loan Guarantees
Energy Programs: www.rurdev.usda.gov/energy.html Grants: www.rurdev.usda.gov/RD_Grants.html Loans: www.rurdev.usda.gov/RD_Loans.html	USDA-RD has a \$181.1 billion loan portfolio and expects to administer \$38 billion in loans, guarantees, and grants in FY2013 (1). Several programs exist to promote the expanded use of biofuels and development of commercial-scale biorefineries.	Eligibility: Borrower must be rural small business or agricultural producer. Projects include feasibility, construction and energy efficiency improvements.

USDA-RD	High Energy Cost Grant	Grants
Kristi Kubista-Hovis (202) 720-9545 www.rurdev.usda.gov/UEP_Our_Grant_Programs.html	USDA High Energy Cost Grants are available for improving and providing energy generation, transmission and distribution facilities serving communities with average home energy costs exceeding 275% of the national average. Grant funds may be used for on-grid and off-grid renewable energy projects, energy efficiency and energy conservation projects serving eligible communities. In Alaska, High Energy Cost Grants are made through the Denali Commission for energy generation, transmission, and distribution facilities serving rural communities with average home costs exceeding 275% of the national average. Grants range \$75,000 to \$5 million.	Eligibility: Communities in which average home energy expenditures exceed 275% of the national average.
USDA-RD	Rural Energy for America Program (REAP)	Grants
www.rurdev.usda.gov/BCP_Reap.html	The Rural Energy for America Program offers several grant opportunities, including: 1) the Energy Audit and Renewable Energy Development Assistance Grant; 2) the Renewable Energy System and Energy Efficiency Improvement Guaranteed Loan and Grant Program; and 3) the Feasibility Studies Grant. Grants range from \$2,500 to \$500,000 or 25% of project costs, whichever is less.	Eligibility: Borrower must be rural small business or agricultural producer. Technologies include: biomass, solar, wind, hydro, hydrogen, geothermal. Applications include equipment, construction, permitting, professional service fees, feasibility studies, business plans, and land acquisition.
USDA-RD	Rural Utility Service (RUS)	Loans and Loan Guarantees
www.rurdev.usda.gov/UEP_About_Electric.html	The Rural Utility Service makes direct loans and loan guarantees to help finance the construction, improvement and replacement of rural electric utility infrastructure. RUS offers very low interest rate federal loans (~1%) with longer terms than banks, and they are willing to work with communities (101).	Eligibility: Borrowers must be electric utilities that serve customers in rural areas. Projects include electric distribution, transmission, and generation facilities.
US DOE	Section 1703 Loan Guarantee Program	Loan Guarantees
https://lpo.energy.gov/programs/1703-2	Section 1703 of Title XVII of the Energy Policy Act of 2005 authorizes the U.S. Department of Energy to support innovative clean energy technologies that are typically unable to obtain conventional private financing due to high technology risks. In addition, the technologies must avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases.	Eligibility: Must be pre-commercial technology. Technologies with more than three installations that have been active for more than five years are excluded.

US DOE-EERE	Energy Efficiency & Renewable Energy (EERE)	Various
<p>www.eere.energy.gov Funding Opportunity Exchange: https://eere-exchange.energy.gov/ Financial Opportunities by Audience: www1.eere.energy.gov/financing/audience.html</p>	<p>The U.S. Department of Energy’s Office of Energy Efficiency and Renewable Energy invests in clean energy technologies that strengthen the economy, protect the environment, and reduce dependence on foreign oil. The EERE website includes a database of funding opportunities and links to financial opportunities by audience (business, industry, universities, consumers, states and tribes, etc.)</p>	
US DOE-IE	START Alaska Program (START)	Technical Assistance / Grants
<p>Tracey LeBeau (202) 586-1272 www.energy.gov/indian-energy/resources/start-program</p>	<p>The DOE Office of Indian Energy Policy and Programs (DOE-IE) partners with the Denali Commission to provide on-the-ground technical assistance (TA) and financial support to help participating tribes with renewable energy project development. Alaska Tribal governments, selected through a competitive application process, are paired with DOE, NREL, and other experts with experience relevant to the Tribe’s clean energy technology and project development stage, including help conducting community-based planning and training. In the current round, each community can apply for \$250,000 for a specific energy-related activity projects, including energy storage infrastructure, renewable energy deployment, and energy efficiency.</p>	<p>Eligibility: Tribal governments in Alaska.</p>
US DOE-IE	Tribal Energy Program	Technical Assistance / Grants
<p>apps1.eere.energy.gov/tribalenergy/about.cfm</p>	<p>The U.S. Department of Energy’s Tribal Energy Program provides financial and technical assistance that enables tribes to evaluate and develop their renewable energy resources and reduce their energy consumption through efficiency and weatherization. The program also offers education and training opportunities designed to foster clean energy technology adoption, promote green jobs and growth, and strengthen Native communities.</p>	<p>Eligibility: Renewable energy and energy efficiency projects on tribal lands.</p>

Private Equity and Commercial Debt

Private financing is typically used for the development of large-scale renewable energy projects that exhibit sufficient rates of return to offset perceived risk and high transaction costs. While private financing often requires a relatively large project scale for economic viability, many regional Native corporations have sufficient land holdings, earnings, and project development expertise to take advantage of private financing for renewable energy development. Although larger Native corporations may be best suited for private financing arrangements, smaller village

corporations have potential to use private financing to fund portions of larger projects or group several projects together to attract capital (1).

Private equity can be used in conjunction with grants and federal and state tax credits to meet project funding requirements and bolster lender and investor confidence in overall project viability (1).

PRIVATE EQUITY INVESTMENT

The preconstruction phase of a large-scale project is typically funded with development equity, while capital for project construction is often provided through a combination of private investment and commercial debt (e.g., banks). Equity investors receive an ownership share in the project and are entitled to a portion of the distributable profits of the partnership (1).

Potential equity partners include Alaska Native corporations, village corporations, Tribal governments, federal and state government, local utilities and electric cooperatives, third-party developers, individual community members and nonprofit organizations.

DEBT FINANCING

In Alaska, debt financing for large projects can be sourced through entities such as commercial banks, credit unions, the U.S. Department of the Treasury (via its lending arm, the Federal Financing Bank), USDA, and now AIDEA (after passage of Senate Bill 25 in 2012).

While sources of bank debt do not have an ownership share in the project like equity investors, they do retain collateral claims on a project and may be required to approve major decisions in day-to-day management and operations. Still, if maintaining project ownership is a priority to a developer, it is preferable to structure the project's financing such that bank debt comprises a greater share of the capital structure than equity (1).

ENERGY SAVINGS PERFORMANCE CONTRACTING (ESPC)

Energy Savings Performance Contracting can be used to finance energy efficiency improvements through partnership with an Energy Savings Company or ESCO. ESCOs are often used by local governments and state and federal agencies to make improvements in government-owned buildings without up-front capital costs or budget appropriations. Typically, the ESCO conducts a comprehensive energy audit for the facility and identifies improvements. The ESCO designs and constructs a project that meets the agency's needs and arranges the necessary funding. The ESCO guarantees that the improvements will generate energy cost savings sufficient to pay for the project over the term of the contract. After the contract ends, all additional cost savings accrue to the agency. Contract terms up to 25 years are allowed (102).

Tax-Exempt Bonds

Local, state and Tribal governments also have the option of issuing tax-exempt bonds, which have the effect of lowering investment costs (compared with traditional borrowing), thereby lowering the cost of capital and the long-term cost of energy.

CLEAN RENEWABLE ENERGY BONDS (CREBS)

Clean Renewable Energy Bonds may be used by primarily public sector entities to finance a wide range of renewable energy projects. CREBs may be issued by rural electric cooperatives,

municipal utilities, schools, and local, state and Tribal governments. The bondholder receives federal tax credits in lieu of a portion of the traditional bond interest, resulting in a lower effective interest rate for the borrower. The issuer remains responsible for repaying the principal on the bond. Congress has made over \$1 billion available for CREBS. More information is available at www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US45F&ee=0

QUALIFIED ENERGY CONSERVATION BONDS (QECBS)

Congress authorized \$800 million in tax-exempt Qualified Energy Conservation Bonds (QECBs) in 2008 to finance qualified energy conservation projects. Allocations were made state by state based on population. In Alaska, \$7.1 million was allocated, but no bonds have been issued yet. When surveyed, many states indicated that they had not used the program due to high transaction costs associated with small allocations, debt aversion, and lack of awareness. More information is available at www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US51F

Tax Credits

Tax credits can lower capital costs by 40% to 50%. There are several federal tax credits currently available for qualified investments in renewable energy technologies, in addition to accelerated depreciation, which improves the economic viability of a project by reducing tax liability in the initial years of production. Current tax benefits are shown in Table 56. Note: Tax credits that expire in 2013 are not shown.

A 30% tax credit reduces the capital cost of a project by 30%. The federal government essentially pays for a third of the project. However, only taxable entities, such as Alaska Native corporations and third-party developers, can take advantage of these benefits. This provides an incentive for tax-exempt utilities and local governments to find ways to partner with taxable entities when developing renewable energy projects (101).

Table 56: Federal Tax Incentives for Renewable Energy

Tax Credit	Amount	Eligible Projects	Details
Investment Tax Credits (ITC)	30%	Solar, fuel cells (≤ 0.5 kW), small wind (≤ 100 kW), geothermal, microturbines (≤ 2 MW), and combined heat and power (≤ 50 MW)	Available when the project is placed in service. Expires 12/31/2016
New Market Tax Credit (NMTC)	39%	Investments in qualified community development entities (CDEs). Most Alaska villages qualify.	Claimed over a 7-year period. Starting in the year the investment is made
Modified Accelerated Cost Recovery System (MACRS)	NA	Accelerated depreciation is available to qualified investments in wind, geothermal, and solar technologies	Enables investment to be recovered over a 5-year schedule in lieu of the standard life of the asset.

Source: (1)

TAX-EQUITY PARTNERSHIPS

Tax-equity partnerships are financing arrangements that enable tax-exempt entities and taxable entities with insufficient tax liabilities, to take advantage of tax credits to lower a project's capital costs. While there are several variations on tax-equity partnerships, all require assigning project ownership to an investor with sufficient tax liability to fully capture available tax benefits. This is typically a large U.S. bank or insurance companies. Google has also made such investments. The taxable entity must retain ownership of the project until the tax credits have been fully captured, after which ownership can be transferred to the public utility or other tax-exempt entity (1).

Financing through tax-equity partnerships typically requires more complex transactions than other options in order to allocate risk and return among the parties involved. There are several ways to structure a tax-equity partnership: partnership flip, sale-leaseback, and pass-through lease. For more information, see *Financing Opportunities for Renewable Energy Development* listed under Resources for Communities at the end of this section.

Power Purchase Agreements and Net Metering

Net metering and third-party power purchase agreements provide additional mechanisms for project developers to capitalize on renewable energy deployment.

POWER PURCHASE AGREEMENTS (PPA)

A Power Purchase Agreement (PPA) is a legal contract between an electricity generator (seller) and a power purchaser (buyer). The seller is typically an independent power producer (IPP). The buyer is often a utility or large power user, such as a business, municipality, university, school, or hospital. The buyer enters into a long-term contract to pay a predetermined rate for the kilowatt hours delivered from the renewable energy asset. The length of the contract can range from 5 to 20 years. The PPA rate is typically fixed or pegged to a floating index on par with or below the current electricity rate being charged by the local utility company.

The renewable energy developer uses the contract to attract private investors who are comfortable with the customer's ability to make payments over the term of the agreement. If the energy payments over the life of the contract plus any other incentives produce a desirable return on investment, then investors will provide the up-front capital to finance the project. Such agreements play a key role in financing independently owned electricity generating assets.

The PPA financing structure is most appropriately utilized for a planned major renewable energy installation, where speed is less critical, since it requires coordination from all stakeholders. They may also be appropriate where projected revenues are uncertain and so some guarantees as to quantities purchased and price paid are required to make the project viable, or where there is one or a few major customers who will be taking the bulk of the product and who want price certainty and security of supply (103) (104).

NET METERING

Alaska's net metering regulations require that all utilities with retail sales of at least 5 GWh (5 million kWh) offer net metering to their customers for renewable energy systems up to 25 kW in capacity. Net excess generation (NEG) is reconciled each month, with the utility issuing the customer a credit for NEG. The state's interconnection guidelines mandate that all utilities that are required to offer net metering must also issue tariffs incorporating interconnection (1). In the

Bristol Bay region, net metering and interconnection policies apply only Nushagak Telephone and Electric Cooperative and Naknek Electric Association based on FY2012 sales volumes.

Freeing the Grid, an annual scorecard rating state-level net-metering and interconnection standards, gives Alaska's net-metering regulations a "C," citing the arbitrary system size limits not based on on-site load, monthly NEG reconciliation instead of indefinite NEG carryover, and ambiguity regarding renewable energy credit (REC) ownership as areas that reduce the impact of this policy on driving investments in renewable energy generation (1).

Resources for Communities

FINANCING OPPORTUNITIES FOR RENEWABLE ENERGY DEVELOPMENT IN ALASKA

The DOE Office of Indian Energy and NREL have put together a handbook on financing renewable energy development in Alaska. It provides an overview of existing and potential financing structures with a focus on four primary sources of project funding: government financed or supported, developer equity capital, commercial debt, and third-party tax-equity investment. It is available electronically at www.osti.gov/bridge.

More information on private financing is available in *Renewable Energy Development in Indian Country: A Handbook for Tribes*, published by the U.S. DOE Tribal Energy Program and available at apps1.eere.energy.gov/tribalenergy/pdfs/indian_energy_legal_handbook.pdf