

1/28/09

AK ENERGY

AUTHORITY

ENERGY

PLAN

UPDATE

Alaska Calista Regional Example 1-09.xls

Chikuminuk Hydro	Electric	16,000 kW	24,095,897 kWh
Kisaralik Hydro	Electric	30,000 kW	50,000,000 kWh
Newhalen Hydro	Electric	22,000 kW	50,000,000 kWh
Nyak Hydro	Electric	1,800 kW	4,700,000 kWh
Bethel Wind	Electric	9,600 kW	4,105,800 kWh
Amautluak Wind	Electric	9,000 kW	20,377,440 kWh
Generation			153,279,137 kWh

Load	127,799,965 kWh		
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Bethel			
	Electric	9,122 kW	39,955,247 kWh
	Heat	217,913 mmBTU	63,847,934 kWh

Kwethluk			
	Electric	264 kW	1,156,885 kWh
	Heat	23,687 mmBTU	6,940,229 kWh

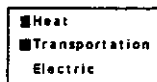
Eek			
	Electric	162 kW	712,095 kWh
	Heat	13,117 mmBTU	3,843,246 kWh

Quinhagak			
	Electric	385 kW	1,688,006 kWh
	Heat	21,912 mmBTU	6,420,158 kWh

Amatluak			
	Electric	123 kW	537,659 kWh
	Heat	9,210 mmBTU	2,698,506 kWh

Bethel

Energy Used



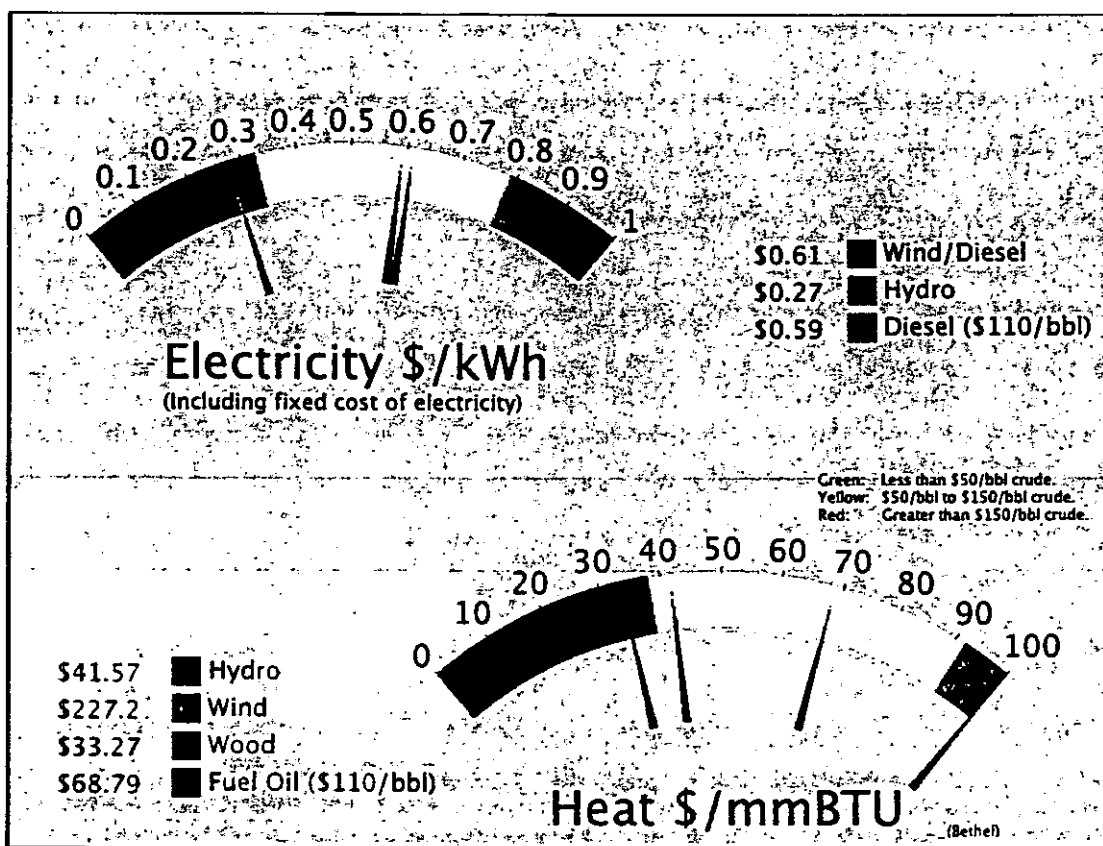
Total: **\$7,332** Per capita

Heat **\$2,442** Per capita

Transportation **\$874** Per capita

Electricity: **\$4,017** Per capita

POPULATION: 5653



Bethel

Regional Corporation
Calista Corporation

House 38

Senate : S

POPULATION 5653 LATITUDE: 60d 47m N LONGITUDE: 161d 45m Unorganized

LOCATION Bethel is located at the mouth of the Kuskokwim River, 40 miles inland from the Bering Sea. It lies in the Yukon Delta National Wildlife Refuge, 400 air miles west of Anchorage.

ECONOMY Bethel serves as the regional center for 56 villages in the Yukon-Kuskokwim Delta. Food, fuel, transportation, medical care, and other services for the region are provided by Bethel. 50% of the jobs in Bethel are in government positions. Commercial fishing is an important source of income; 200 residents hold commercial fishing permits, primarily for salmon and herring roe net fisheries. Subsistence activities contribute substantially to villager's diets, particularly salmon, freshwater fish, game birds and berries. Poor fish returns since 1997 have significantly affected the community.

HISTORY Bethel was first established by Yup'ik Eskimos who called the village Mumtrekhlogamute meaning Smokehouse People named for the nearby fish smokehouse. There were 41 people in Bethel during the 1880 U.S. Census. At that time, it was an Alaska Commercial Company Trading Post. The Moravian Church established a mission in the area in 1884. The community was moved to its present location due to erosion at the prior site. A post office was opened in 1905. Before long, Bethel was serving as a trading, transportation and distribution center for the region, which attracted Natives from surrounding villages. The City was incorporated in 1957. Over time, federal and state agencies established regional offices in Bethel.

Current Energy Status

PCE

Electric (Estimates based on PCE)

		Estimated Local Fuel cost @ \$110/bbl		\$6.60
Current efficiency	13.68 kW-hr/gal	Fuel COE	\$0.51 /kw-hr	/kw-hr
Consumption in 200	3,075,281 gal	Est OM	\$0.02 /kw-hr	Estimated Diesel OM \$799,105
Average Load	4,561 kW	NF COE:	\$0.06 /kw-hr	Other Non-Fuel Costs: \$2,530,895
Estimated peak loa	9122.2 kW	Total	\$0.59	Current Fuel Costs: \$20,301,775
Average Sales	39,955,247 kW-hours			Total Electric
				\$23,631,775

Space Heating (Estimated)

2000 Census Data	2008 Estimated Heating Fuel used:	1,815,943 gal	
Fuel Oil: 87%	Estimated heating fuel cost/gallon	\$7.60	
Wood: 1%	\$/MMBtu delivered to user	\$68.95	Total Heating Oil
Electricity: 5.5%	Community heat needs in MMBtu:	217,913	13,804,071

Transportation (Estimated)

Estimated Diesel: 649,616 gal	Estimated cost	\$7.60	Total Transportation
			\$4,938,121

Energy Total \$42,373,967

Possible Upgrades to Current Power Plant

Power Plant - Performance Improvement to higher efficiency

Upgrade needed:	Capital cost	\$0	
#N/A	Annual Capital cost	\$0	\$0.00 /kw-hr
Status NA	Estimated Diesel OM	\$799,105	\$0.02
Achievable efficiency 14.8 kW-	New fuel cost	\$18,831,562	\$0.47
New Fuel use 2,852,575	Avg Non-Fuel Costs:	\$3,330,000	\$0.06
	New cost of electricity	\$0.53	Savings
		per kW-hr	\$1,470,213

Diesel Engine Heat Recovery

Heat Recovery System Installed?	Capital cost	\$12,771,083	
Is it working now?	Annual ID	\$1,069,790	
BLDGs connected and working:	Annual OM	\$255,422	
	Total Annual costs	\$1,325,212	Savings
Water Jacket 461,292 gal	Value	\$3,506,558	
Stack Heat 307,528 gal	Heat cost	\$15.60 /MMBtu	\$4,519,052

Alternative Energy Resources

Hydro		Capital cost	\$79,756,000	per kW-hr	Heat Cost \$/MMBtu:
Installed KW	16000	Annual Capital	\$3,099,756	\$0.13	\$37.69
kW-hr/year	24095897	Annual OM	\$579,120	\$0.02	\$7.04
Site	Chikuminuk Lake	Fuel cost:	\$0	\$0.00	
Study plan effort	reconnaissance	Total Annual Cost	\$3,678,876	\$0.15	\$44.73
Plant Factor	50 %	Non-Fuel Costs		\$0.08	
Penetration	0.46	Alternative COE:		\$0.24	
		% Community energy	60%		Savings
		New Community COE	\$0.32		\$11,039,683
		<small>(includes non-fuel and diesel costs)</small>			

Alternative Energy Resources

Hydro		Capital cost	\$163,798,760	per kW-hr	Heat Cost \$/MMBtu:
Installed KW	30000	Annual Capital	\$7,281,651	\$0.15	\$42.67
kW-hr/year	50000000	Annual OM	\$423,000	\$0.01	\$2.48
Site	Kisaralik River	Fuel cost:	\$0	\$0.00	
Study plan effort	reconnaissance	Total Annual Cost	\$7,704,651	\$0.15	\$45.15
Plant Factor	50 %	Non-Fuel Costs		\$0.08	
Penetration	0.58	Alternative COE:		\$0.24	
		% Community energy	125%		Savings
		New Community COE	\$0.28		\$15,927,124
		<small>(includes non-fuel and diesel costs)</small>			

Alternative Energy Resources

Hydro		Capital cost	\$378,645,160	per kW-hr	Heat Cost \$/MMBtu:
Installed KW	22000	Annual Capital	\$23,561,665	\$0.47	\$138.07
kW-hr/year	50000000	Annual OM	\$423,000	\$0.01	\$2.48
Site	Newhalen River	Fuel cost:	\$0	\$0.00	
Study plan effort	reconnaissance	Total Annual Cost	\$23,984,665	\$0.48	\$140.55
Plant Factor	%	Non-Fuel Costs		\$0.08	
Penetration	0.55	Alternative COE:		\$0.56	
		% Community energy	125%		Savings
		New Community COE	\$0.68		(\$352,890)
		<small>(includes non-fuel and diesel costs)</small>			

Alternative Energy Resources

Hydro		Capital cost	\$10,541,654	per kW-hr	Heat Cost \$/MMBtu :
Installed KW	1800	Annual Capital	\$409,707	\$0.09	\$25.54
kW-hr/year	4700000	Annual OM	\$240,406	\$0.05	\$14.99
Site	NYAC Tuluksak River/State Cr.	Fuel cost:	\$0	\$0.00	
Study plan effort	reconnaissance	Total Annual Cost	\$650,113	\$0.14	\$40.53
Plant Factor	%	Non-Fuel Costs	\$0.08		
Penetration	0.14	Alternative COE:	\$0.22		
		% Community energy	12%		Savings
		New Community COE	\$0.55		\$1,832,324
		<small>(includes non-fuel and diesel costs)</small>			

Alternative Energy Resources

Wind Diesel Hybrid		Capital cost	\$39,415,684	per kW-hr	Heat Cost \$/MMBtu :
Installed KW	9600	Annual Capital	\$2,649,353	\$0.65	\$189.06
kW-hr/year	4105800	Annual OM	\$192,629	\$0.05	\$13.75
Met Tower?	no	Fuel cost:	\$0	\$0.00	
Homer Data?	no	Total Annual Cost	\$2,841,982	\$0.69	\$202.81
Wind Class	5	Non-Fuel Costs	\$0.08		
Avg wind speed	6.70 m/s	Alternative COE:	\$0.78		
		% Community energy	10%		Savings
		New Community COE	\$0.61		(\$673,531)
		<small>(includes non-fuel and diesel costs)</small>			

Biomass For Heat

		Garn heater installed cost	\$500,000
Heat Delivered:	425000	Annual ID	\$33,608
	BTU/hr		
Cords/day:	1.8	Capital per MMBt	\$13.18
Hours per year	6000	Fuel cost per MMBtu	\$20.09
Wood (cordwood or willows)	\$225	Total per MMBT	\$33.27
	\$/cord	Annual Heat	1.2%

Other Resources

Bethel

Tidal:
Wave:
Coal Bed Methane:
Natural Gas:
Coal:
Propane:

Renewable Fund Project List:For detailed information, consult the AEA web site. akenergyauthority.org

A project titled: Bethel Wind Farm Construction (BNC land) has been submitted by: Alaska Wind Power, LLC for a Wind Diesel Hybrid project. The total project budget is: \$8,710,000 with \$6,960,000 requested in grant funding and \$1,750,000 as matching funds.

A project titled: Bethel Wind Power x 4 has been submitted by: City of Bethel for a Wind Diesel Hybrid project. The total project budget is: \$3,197,986 with \$2,598,320 requested in grant funding and \$199,889 as matching funds.

A project titled: Bethel Wind Power x4_City of Bethel has been submitted by: City of Bethel for a Wind Diesel Hybrid project. The total project budget is: \$3,197,986 with \$2,598,320 requested in grant funding and \$599,666 as matching funds.

A project titled: Orutsaramiut Native Council has been submitted by: Orutsaramiut Native Council Incorporated for a Gas project. The total project budget is: \$70,200 with \$701,700 requested in grant funding and \$771,900 as matching funds.

Kwethluk

Energy Used



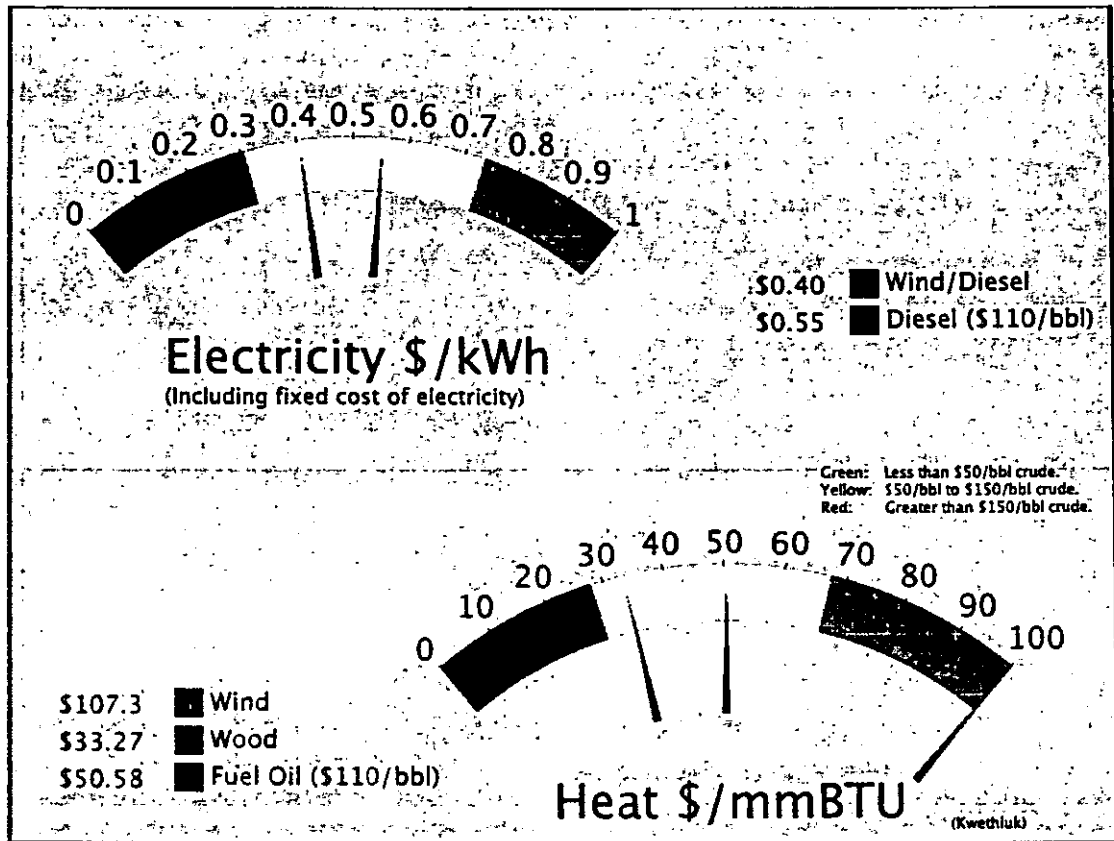
Total: **\$2,989** Per capita

Heat **\$1,530** Per capita

Transportation **\$547** Per capita

Electricity: **\$911** Per capita

POPULATION: 721



Kwethluk

Regional Corporation
Callista Corporation

House 38

Senate : S

POPULATION 721 LATITUDE: 60d 49m N LONGITUDE: 161d 26m **Unorganized**

LOCATION This is a Yup'ik community located 12 air miles east of Bethel on the Kwethluk River at its junction with the Kuskokwim. The village is the second largest along the Lower Kuskokwim River, following Bethel.

ECONOMY The largest employers are the school district, village corporation, store and health clinic. 61 residents hold commercial fishing permits. Subsistence activities play a central role in the lifestyle; salmon, moose and caribou are the staples of the diet. Seal meat and seal oil are obtained in trade with coastal relatives and neighbors. Most families travel to fish camps each summer.

HISTORY Archaeological evidence from a nearby site indicates that the area has been occupied since prehistoric times. The name Kwethluk is derived from "Kwikli," meaning "river." In the late 1800s, families from four villages on the Kwethluk River joined others living at the site. In 1889, an Eskimo lay worker for the Moravian Church was stationed at the village. A measles epidemic struck the village in the late 1890s. The Moravian Church built a chapel in 1896, followed by a Russian Orthodox Church in 1912. Discovery of gold in nearby creeks in 1909 attracted prospectors to the area, but the finds proved disappointing and most were gone by 1911. One placer deposit, discovered on the upper Kwethluk River, delivered a small yield and was worked until World War II. A Moravian orphanage was established three miles upriver. A BIA school with teacher's quarters was built in 1924. In 1939, the villagers owned 31,000 reindeers, used for food and skins. A tuberculosis epidemic at this time tragically reduced the population. A post office was established in 1947, and a Native-owned store opened in 1948. An airstrip was cleared in 1956. Snowmachines replaced dog teams in the 1960s as the principal form of winter transportation. The City was incorporated in 1975.

Current Energy Status

PCE

Electric (Estimates based on PCE)

Estimated Local Fuel cost @ \$110/bbl \$4.59

Current efficiency	13.49 kW-hr/gal	Fuel COE	\$0.46 /kw-hr	Estimated Diesel OM	\$23,138
Consumption in 200	116,368 gal	Est OM	\$0.02 /kw-hr	Other Non-Fuel Costs:	\$83,133
Average Load	132 kW	NF COE:	\$0.07 /kw-hr	Current Fuel Costs	\$534,083
Estimated peak loa	264.13 KW	Total	\$0.55	Total Electric	
Average Sales	1,156,885 kW-hours				\$640,354

Space Heating (Estimated)

2000 Census Data	2008 Estimated Heating Fuel used:	197,388 gal	
Fuel Oil: 86%	Estimated heating fuel cost/gallon	\$5.59	
Wood: 9%	\$/MMBtu delivered to user	\$50.70	Total Heating Oil
Electricity: 5.2%	Community heat needs in MMBtu:	23,687	\$1,103,321

Transportation (Estimated)

Estimated Diesel: 70,612 gal	Estimated cost	\$5.59	Total Transportation
			\$394,690

Energy Total \$2,138,365

Possible Upgrades to Current Power Plant

Power Plant - Performance Improvement to higher efficiency

Upgrade needed:	Capital cost	\$1,300,000	
Powerhouse Module	Annual Capital cost	\$108,897	\$0.09 /kw-hr
Status: Construction	Estimated Diesel OM	\$23,138	\$0.02
Achievable efficiency 14 kW-	New fuel cost	\$514,795	\$0.44
New Fuel use 112,166	Avg Non-Fuel Costs:	\$106,271	\$0.07
	New cost of electricity	\$0.51	Savings
	per kW-hr		(\$89,609)

Diesel Engine Heat Recovery

Heat Recovery System Installed? N	Capital cost	\$369,781	
Is it working now? N	Annual ID	\$30,975	
BLDGs connected and working:	Annual OM	\$7,396	
None	Total Annual costs	\$38,371	Savings
Water Jacket 17,455 gal	Value	\$97,568	
Stack Heat 0 gal	Heat cost	\$19.89 /MMBtu	\$59,197

Alternative Energy Resources

Wind Diesel Hybrid

Installed KW	400	Capital cost	\$3,071,563	per kW-hr		Heat Cost	\$/MMBtu:
kW-hr/year	907550	Annual Capital	\$206,457		\$0.23		\$66.65
Met Tower?	no	Annual OM	\$42,579		\$0.05		\$13.75
Homer Data?	yes	Fuel cost:	\$0		\$0.00		
Wind Class	5	Total Annual Cost	\$249,036		\$0.27	\$80.40	
Avg wind speed	7.50 m/s	Non-Fuel Costs			\$0.09		
		Alternative COE:			\$0.37		
		% Community energy	78%				Savings
		New Community COE	\$0.39				\$188,058
		(includes non-fuel and diesel costs)					

Biomass For Heat

Heat Delivered:	425000 BTU/hr	Gen heater installed cost	\$500,000
Cords/day:	1.8	Annual ID	\$33,608
Hours per year	6000	Capital per MMBt	\$13.18
Wood (cordwood or willows)	\$225 /cord	Fuel cost per MMBtu	\$20.09
		Total per MMBT	\$33.27
		Annual Heat	10.8%

Other Resources

Kwethluk

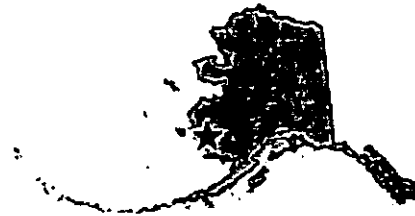
Tidal:
Wave:
Coal Bed Methane:
Natural Gas:
Coal:
Propane:

Renewable Fund Project List:

For detailed information, consult the AEA web site. akenergyauthority.org

Eek

Energy Used



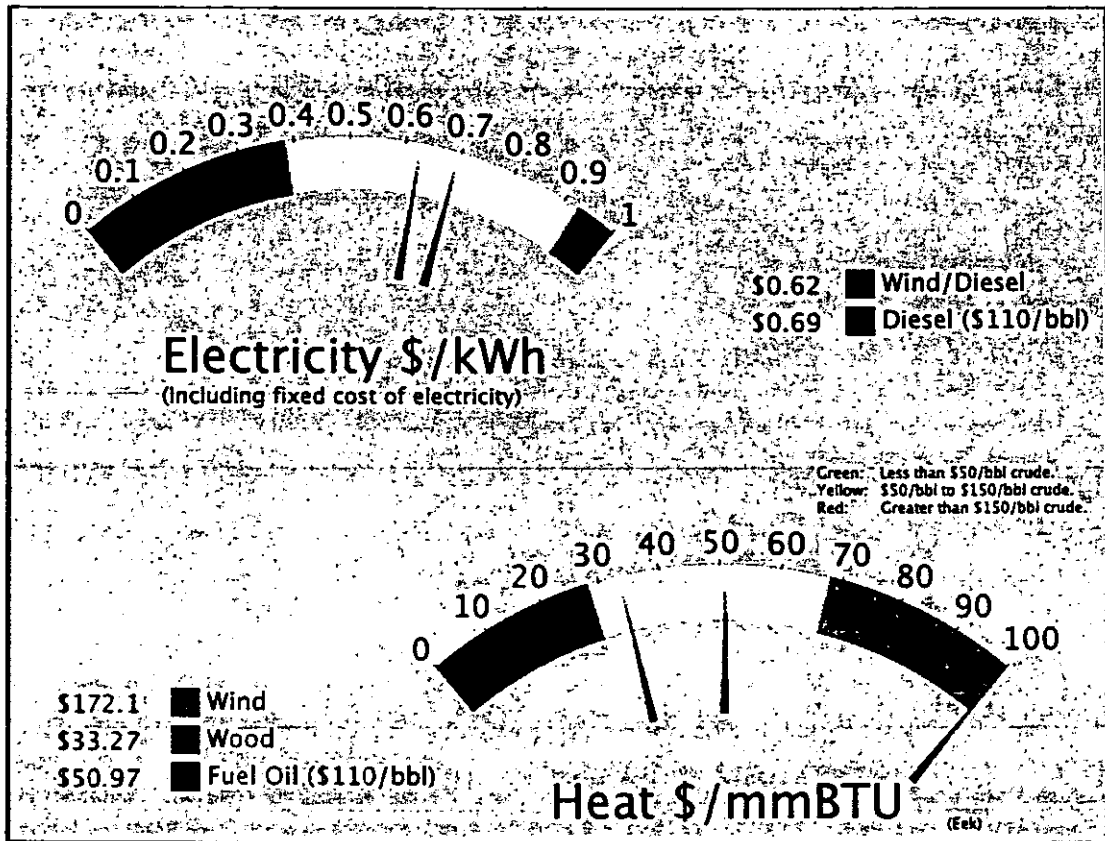
Total: **\$4,643** Per capita

Heat **\$2,160** Per capita

Transportation **\$773** Per capita

Electricity: **\$1,710** Per capita

POPULATION: 285



Eek

Regional Corporation
Calista Corporation

House 38

Senate : S

POPULATION 285 LATITUDE: 60d 13m N LONGITUDE: 162d 01m Unorganized

LOCATION Eek lies on the south bank of the Eek River, 12 miles east of the mouth of the Kuskokwim River. It is 35 air miles south of Bethel in the Yukon-Kuskokwim Delta, and 420 miles west of Anchorage.

ECONOMY Eek's economy is primarily subsistence- and commercial fishing-based. A few full-time positions are available at the school, City, and village office. All families participate in subsistence fishing; 44 residents hold commercial fishing permits. Poor fish returns and prices in recent years have significantly affected the economy.

HISTORY The village was originally located on the Apokok River, and moved to its present location in the 1930s. Constant flooding and erosion forced a relocation. A BIA school and a Moravian Church were constructed at the new site. A post office was established in 1949. The City was incorporated in 1970.

Current Energy Status

PCE

Electric (Estimates based on PCE)

Estimated Local Fuel cost @ \$110/bbl **\$4.63**

Current efficiency	13.44 kW-hr/gal	Fuel COE	\$0.42 /kw-hr	Estimated Diesel OM	\$14,242
Consumption in 200	64,071 gal	Est OM	\$0.02 /kw-hr	Other Non-Fuel Costs:	\$185,145
Average Load	81 kW	NF COE:	\$0.26 /kw-hr	Current Fuel Costs	\$296,796
Estimated peak loa	162.58 kW	Total	\$0.70	Total Electric	
Average Sales	712,095 kW-hours				\$496,183

Space Heating (Estimated)

2000 Census Data	2008 Estimated Heating Fuel used:	109,309 gal	
Fuel Oil: 100%	Estimated heating fuel cost/gallon	\$5.63	
Wood: 0%	\$/MMBtu delivered to user	\$51.08	Total Heating Oil
Electricity: 0.0%	Community heat needs in MMBtu	13,117	\$615,664

Transportation (Estimated)

Estimated Diesel: 39,103 gal	Estimated cost	\$5.63	Total Transportation
			\$220,241

Energy Total \$1,332,087

Possible Upgrades to Current Power Plant

Power Plant - Performance Improvement to higher efficiency

Upgrade needed:	Capital cost	\$1,300,000	
Powerhouse Module	Annual Capital cost	\$108,897	\$0.15 /kw-hr
Status Pending	Estimated Diesel OM	\$14,242	\$0.02
Acheivable efficiency 14 kW-	New fuel cost	\$284,855	\$0.40
New Fuel use 61,493	Avg Non-Fuel Costs:	\$199,387	\$0.26
	New cost of electricity	\$0.76	Savings
	per kW-hr		(\$96,956)

Diesel Engine Heat Recovery

Heat Recovery System Installed? Y	Capital cost	\$227,610	
Is it working now? Y	Annual ID	\$19,066	
BLDGs connected and working:	Annual OM	\$4,552	
Powerhouse, Mechanics Hut	Value		
Water Jacket 9,611 gal	\$54,130	Total Annual costs	\$23,618
Stack Heat 0 gal	\$0	Heat cost	\$22.24 /MMBtu
			Savings
			\$30,512

Alternative Energy Resources

Wind Diesel Hybrid

Installed KW	200	Capital cost	\$1,760,485	per kW-hr	Heat Cost \$/MMBtu
kW-hr/year	453775	Annual Capital	\$118,332	\$0.26	\$76.41
Met Tower?	no	Annual OM	\$21,289	\$0.05	\$13.75
Homer Data?	yes	Fuel cost:	\$0	\$0.00	
Wind Class	5	Total Annual Cost	\$139,622	\$0.31	\$90.15
Avg wind speed	7.50 m/s	Non-Fuel Costs		\$0.28	
		Alternative COE:		\$0.59	
		% Community energy	64%		Savings
		New Community COE	\$0.61		\$58,579
		<small>(includes non-fuel and diesel costs)</small>			

Biomass For Heat

Heat Deliverd:	425000 BTU/hr	Garn heater installed cost	\$500,000
Cords/day:	1.8	Annual ID	\$33,608
Hours per year	6000	Capital per MMBt	\$13.18
Wood (cordwood or willows)	\$225 \$/cord	Fuel cost per MMBtu	\$20.09
		Total per MMBT	\$33.27
		Annual Heat	19.4%

Other Resources

Eek

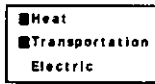
Tidal:
Wave:
Coal Bed Methane:
Natural Gas:
Coal:
Propane:

Renewable Fund Project List:

For detailed information, consult the AEA web site. akenergyauthority.org

Quinhagak

Energy Used



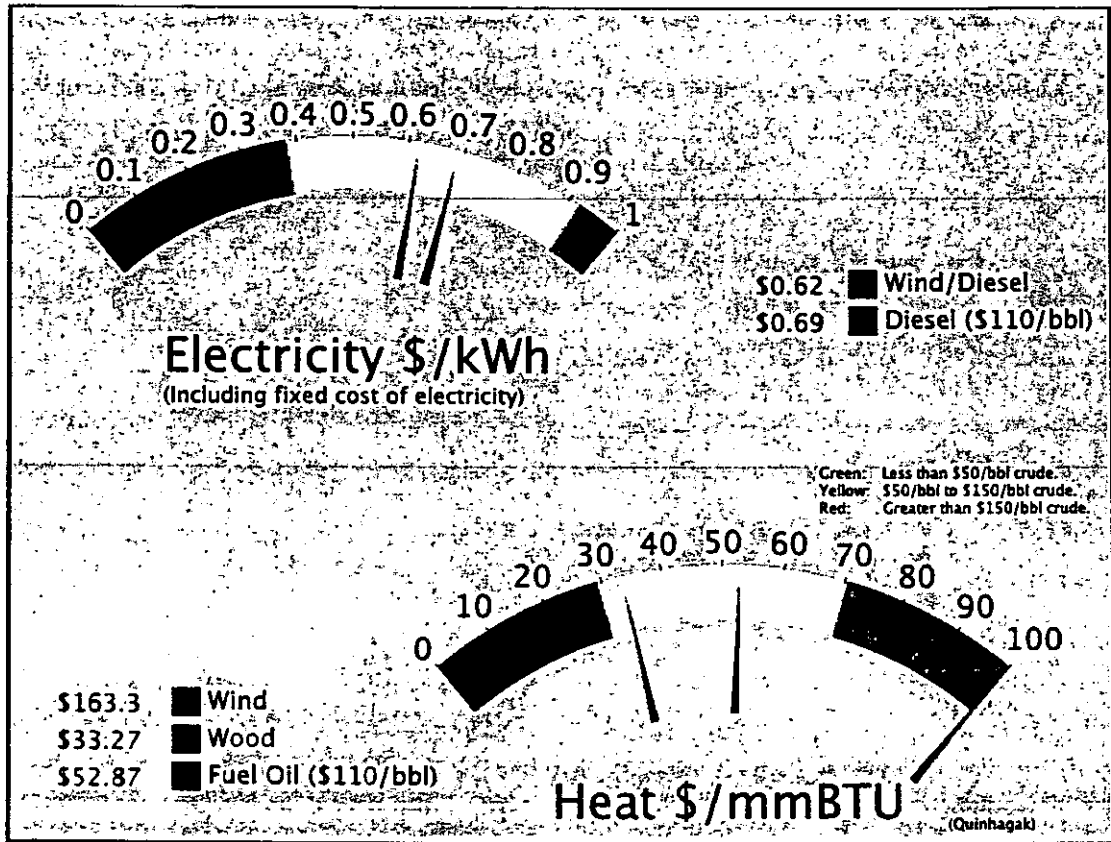
Total: **\$4,163** Per capita

Heat **\$1,659** Per capita

Transportation **\$594** Per capita

Electricity: **\$1,910** Per capita

POPULATION: 643



Quinhagak

Regional Corporation
Calista Corporation

House 38

Senate : S

POPULATION 643 LATITUDE: 59d 45m N LONGITUDE: 161d 54m Unorganized

LOCATION Quinhagak is on the Kanektok River on the east shore of Kuskokwim Bay, less than a mile from the Bering Sea coast. It lies 71 miles southwest of Bethel.

ECONOMY Most of the employment is with the school, government services or commercial fishing. Trapping, basket weaving, skin sewing and ivory carving also provide income. Subsistence remains an important part of the livelihood; seal and salmon are staples of the diet. 83 residents hold commercial fishing permits for salmon net and herring roe fisheries. Coastal Villages Seafood LLC processes halibut and salmon in Quinhagak.

HISTORY The Yup'ik name is Kuinerraq, meaning "new river channel." Quinhagak is a long-established village whose origin has been dated to 1,000 A.D. It was the first village on the lower Kuskokwim to have sustained contact with whites. Gavril Sarichev reported the village on a map in 1826. After the purchase of Alaska in 1867, the Alaska Commercial Co. sent annual supply ships to Quinhagak with goods for Kuskokwim River trading posts. Supplies were lightered to shore from the ship, and stored in a building on Warehouse Creek. A Moravian Mission was built in 1893. There were many non-Natives in the village at that time; most waiting for boats to go upriver. In 1904 a mission store opened, followed by a post office in 1905 and a school in 1909. Between 1906 and 1909, over 2,000 reindeer were brought in to the Quinhagak area. They were managed for a time by the Native-owned Kuskokwim Reindeer Company, but the herd had scattered by the 1950s. In 1915 the Kuskokwim River was charted, so goods were barged directly upriver to Bethel. In 1928, the first electric plant opened; the first mail plane arrived in 1934. The City was incorporated in 1975.

Current Energy Status

PCE

Electric (Estimates based on PCE)

Estimated Local Fuel cost @ \$110/bbl \$4.84

Current efficiency	13.61 kW-hr/gal	Fuel COE	\$0.41 /kw-hr	Estimated Diesel OM	\$33,760
Consumption in 200	143,191 gal	Est OM	\$0.02 /kw-hr	Other Non-Fuel Costs:	\$438,882
Average Load	193 kW	NF COE:	\$0.26 /kw-hr	Current Fuel Costs	\$693,474
Estimated peak loa	385.39 kW	Total	\$0.69	Total Electric	
Average Sales	1,688,006 kW-hours				\$1,166,116

Space Heating (Estimated)

2000 Census Data	2008 Estimated Heating Fuel used:	182,597 gal	
Fuel Oil: 90%	Estimated heating fuel cost/gallon	\$5.84	
Wood: 9%	\$/MMBtu delivered to user	\$53.00	Total Heating Oil
Electricity: 0.0%	Community heat needs in	MMBtu - 21,912	\$1,066,913

Transportation (Estimated)

Estimated Diesel: 65,320 gal	Estimated cost	\$5.84	Total Transportation
			\$381,666

Energy Total \$2,614,695

Possible Upgrades to Current Power Plant

Power Plant - Performance Improvement to higher efficiency

Upgrade needed:	Capital cost	\$1,300,000	
Powerhouse Module	Annual Capital cost	\$108,897	\$0.06 /kw-hr
Status Pending	Estimated Diesel OM	\$33,760	\$0.02
Achievable efficiency 14 kW-	New fuel cost	\$674,170	\$0.40
New Fuel use 139,205	Avg Non-Fuel Costs:	\$472,642	\$0.26
	New cost of electricity	\$0.69	Savings
	per kW-hr		(\$89,592)

Diesel Engine Heat Recovery

Heat Recovery System Installed? Y	Capital cost	\$539,545	
Is it working now? Y	Annual ID	\$45,196	
BLDGs connected and working:	Annual OM	\$10,791	
Powerhouse Only	Total Annual costs	\$55,987	Savings
Water Jacket 21,479 gal	Value	\$125,500	
Stack Heat 0 gal	Heat cost	\$23.59 /MMBtu	\$69,513

Alternative Energy Resources

Wind Diesel Hybrid

Capital cost	\$3,071,563	per kW-hr	Heat Cost \$/MMBtu
Installed KW	400	Annual Capital	\$206,457
kW-hr/year	895168	Annual OM	\$41,998
Met Tower?	no	Fuel cost:	\$0
Homer Data?	yes	Total Annual Cost	\$248,455
Wind Class	4	Non-Fuel Costs	\$0.28
Avg wind speed	7.00 m/s	Alternative COE:	\$0.56
		% Community energy	53%
		New Community COE	\$0.61
		<i>(includes non-fuel and diesel costs)</i>	
		Savings	\$137,162

Biomass For Heat

Garn heater installed cost	\$500,000
Heat Deliverd:	425000 BTU/hr
Annual ID	\$33,608
Cords/day:	1.8
Capital per MMBt	\$13.18
Hours per year	6000
Fuel cost per MMBtu	\$20.09
Wood (cordwood or willows)	\$225 /cord
Total per MMBT	\$33.27
Annual Heat	11.6%

Other Resources

Quinhagak

Tidal:
Wave:
Coal Bed Methane:
Natural Gas:
Coal:
Propane:

Renewable Fund Project List:

For detailed information, consult the AEA web site: akenergyauthority.org

A project titled: Quinhagak Wind Farm Construction has been submitted by: Alaska Village Electric Cooperative for a Wind Diesel Hybrid project. The total project budget is: \$4,313,603 with \$3,882,243 requested in grant funding and \$431,360 as matching funds.

Atmautluak

Energy Used



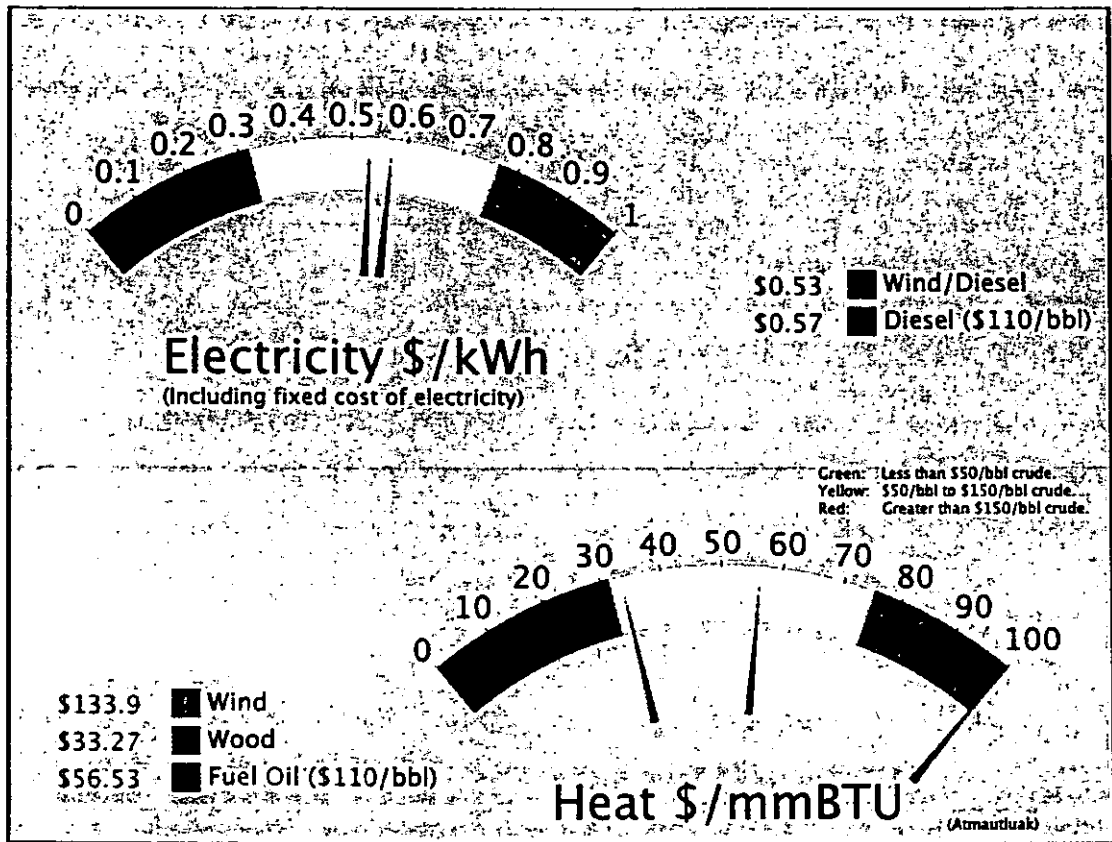
Total: **\$3,190** Per capita

Heat **\$1,572** Per capita

Transportation **\$562** Per capita

Electricity: **\$1,055** Per capita

POPULATION: 305



Atmautluak

Regional Corporation
Calista Corporation
House 38
Senate : S

POPULATION 305 LATITUDE: 60d 51m N LONGITUDE: 162d 16m **Unorganized**

- LOCATION** Atmautluak lies on the west bank of the Pitmiktakik River in the Yukon-Kuskokwim delta, 20 miles northwest of Bethel.
- ECONOMY** The school, retail businesses and the village government provide cash income to supplement the subsistence lifestyle. Thirty-one residents hold commercial fishing permits. Poor fish returns since 1997 have significantly affected the community.
- HISTORY** Yup'ik Eskimos have inhabited this region for thousands of years due to the area's rich resources, however Atmautluak itself was not settled until the 1960s. People moved to this site on higher ground to avoid flooding and for the rich resources of the area. A City was incorporated in 1976, but it was dissolved on Feb. 7, 1996 in favor of the traditional village council government.
-

Current Energy Status

PCE

Electric (Estimates based on PCE)

				Estimated Local Fuel cost @ \$110/bbl \$5.25	
Current efficiency	3.80 kW-hr/gal	Fuel COE	\$0.41 /kw-hr	/kw-hr	
Consumption in 200	41,567 gal	Est OM	\$0.02 /kw-hr	Estimated Diesel OM	\$10,753
Average Load	61 kW	NF COE:	\$0.15 /kw-hr	Other Non-Fuel Costs:	\$79,988
Estimated peak loa	122.75 kW	Total	\$0.57	Current Fuel Costs	\$218,081
Average Sales	537,659 kW-hours			Total Electric	
					\$308,823

Space Heating (Estimated)

2000 Census Data	2008 Estimated Heating Fuel used:	76,746 gal	
Fuel Oil: 95%	Estimated heating fuel cost/gallon	\$6.25	
Wood: 0%	\$/MMBtu delivered to user	\$56.66	Total Heating Oil
Electricity: 5.2%	Community heat needs in MMBtu	9,210	\$479,395

Transportation (Estimated)

Estimated Diesel: 27,454 gal	Estimated cost	\$6.25	Total Transportation
			\$171,494

Energy Total \$959,711

Possible Upgrades to Current Power Plant

Power Plant - Performance Improvement to higher efficiency

Upgrade needed:	Capital cost	\$0	
Status	Annual Capital cost	\$0	\$0.00 /kw-hr
Acheivable efficiency 14 kW-	Estimated Diesel OM	\$10,753	\$0.02
New Fuel use 11,278	New fuel cost	\$59,171	\$0.11
	Avg Non-Fuel Costs:	\$90,741	\$0.15
	New cost of electricity	\$0.54	\$158,911
			per kW-hr

Diesel Engine Heat Recovery

Heat Recovery System Installed?	Capital cost	\$171,855	
Is it working now?	Annual ID	\$14,396	
BLDGs connected and working:	Annual OM	\$3,437	
	Total Annual costs	\$17,833	Savings
Water Jacket 6,235 gal	Value	\$38,947	
Stack Heat 0 gal		\$0	
	Heat cost	\$25.88 /MMBtu	\$21,114

Alternative Energy Resources

Wind Diesel Hybrid

Installed KW 300	Capital cost \$2,438,000	per kW-hr	Heat Cost \$/MMBtu
kWh/year 679248	Annual Capital \$163,872	\$0.24	\$70.69
Met Tower? no	Annual OM \$31,868	\$0.05	\$13.75
Homer Data? yes	Fuel cost: \$0	\$0.00	
Wind Class: 6	Total Annual Cost \$195,740	\$0.29	\$84.43
Avg wind speed 8.10 m/s	Non-Fuel Costs	\$0.17	
	Alternative COE:	\$0.46	
	% Community energy	126%	Savings
	New Community COE	\$0.53	\$113,083
	<small>(includes non-fuel and diesel costs)</small>		

Biomass For Heat

Heat Delivered: 425000 BTU/hr	Garn heater installed cost \$500,000
Cords/day: 1.8	Annual ID \$33,608
Hours per year 6000	Capital per MMBt \$13.18
Wood (cordwood or willows) \$225 /cord	Fuel cost per MMBtu \$20.09
	Total per MMBT \$33.27
	Annual Heat 27.7%

Other Resources

Atmaultuak

Tidal:
Wave:
Coal Bed Methane:
Natural Gas:
Coal:
Propane:

Renewable Fund Project List:

For detailed information, consult the AEA web site. akenergyauthority.org