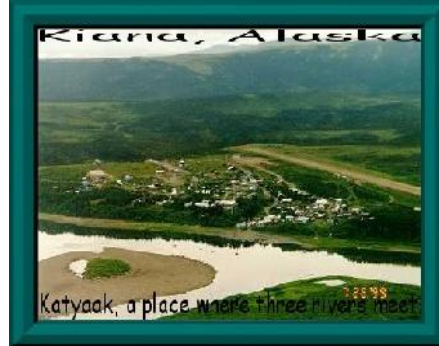


Village Energy Efficiency Program
AEA VEEP Grant # 7520001 Administered by Alaska Building Science Network
Kiana Final Report
Grant Amount: \$150,000



Center Photo: ©State of AK Division of Community and Regional Affairs

Community Summary

7 community buildings received energy efficient lighting, weatherization and heating upgrades as follows:
 Community Building, City Office, Public Safety Building, VPSO House, Fire House, Native Village Office, Friends Church

Retrofits Completed: November 2011

Village-Wide Energy Efficient Lighting, Weatherization and Heating Retrofit Summary:

• Projected Annual Electrical Savings (kWh):	9,447
• Projected Annual Electrical Cost Savings:	\$6,000 ^{1,2}
• Projected Annual Heating Fuel Savings (gallons):	2,285
• Projected Annual Fuel Cost Savings:	\$15,995 ³
• Total Projected Annual Energy Cost Savings:	\$21,995
• Total village wide In-kind contribution:	\$18,280
• Total project cost including In-kind contribution:	\$168,280
• Simple Payback (including In-kind contributions):	7.65 years

¹ kWh Rate [used to calculate electrical cost savings] for Lighting Measures (State of AK - AEA PCE Program Report FY 2011 avg): \$0.64

² kWh Rate [used to calculate electrical cost savings] for Weatherization & Heating Measures (AkWarm Library): \$0.64

³ #2 Heating Fuel Rate [used to calculate heating fuel savings] (AkWarm Library): \$7.00/gal

CITY OF KIANA OWNED BUILDINGS

City Office

Total Building Savings All Measures:

- Projected Annual Electrical Savings (kWh): 3,637
- Projected Annual Electrical Cost Savings: \$2,310

- Projected Annual Heating Fuel Savings (gallons): 712
- Projected Annual Fuel Cost Savings: \$4,984

- Total Projected Annual Energy Cost Savings: \$7,294

Weatherization Retrofit Summary:



- Installed four programmable thermostats.
- Added R-38 loose-fill fiberglass insulation to the attic.
- Air sealed building to reduce air leakage.

-
- Annual energy savings projection: 712 gallons
 - Estimated Annual Heating Fuel Cost Savings: **\$4,984**

City Office

Lighting Retrofit Summary:

Materials Installed	Quantity
Fluorescent 2-lamp electronic ballast, (2) 25 watt T8 lamps	3
Fluorescent 3-lamp electronic ballast, (3) 25 watt T8 lamps	11
Fluorescent 4-lamp electronic ballast, (4) 25 watt T8 lamps	4
CFL-14 W	1
CFL-19W	2
CFL-23 W	3
CFL-27 W	4
CFL-9 W	2

- Pre-retrofit energy use: 3.637 Kilowatts
- Post-retrofit energy use: 1.559 Kilowatts
- Energy savings projection: 2.078 Kilowatts
- Pre-retrofit to post retrofit energy reduction: 57%
- Estimated Annual Savings: kWh Saved: 3,637

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	\$1,319.95	165.97	\$622.40
7 Hours/day	\$2,309.90	290.46	\$1,089.21
10 Hours/day	\$3,299.86	414.94	\$1,556.01
2000 Hours/year (Est.)	\$2,639.89	331.95	\$1,244.8

Public Safety Building

Total Building Savings All Measures:

• Projected Annual Electrical Savings (kWh):	2,412
• Projected Annual Electrical Cost Savings:	\$1,532
• Projected Annual Heating Fuel Savings (gallons):	300
• Projected Annual Fuel Cost Savings:	\$2,100
• Total Projected Annual Energy Cost Savings:	\$3,632

Weatherization Retrofit Summary:

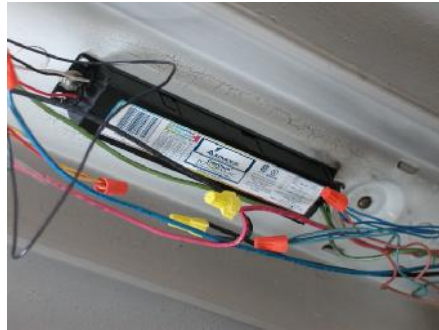


- Installed single programmable thermostat, including village staff training.
- Added R-38 batts to the attic.
- Air sealed building to reduce air leakage.
- Installed weather-stripping and bottom door sweeper on the front door.

• Annual energy savings projection:	300 gallons
• Estimated Annual Heating Fuel Cost Savings:	\$2,100

Public Safety Building

Lighting Retrofit Summary:



<u>Materials Installed</u>	<u>Quantity</u>
Fluorescent 2-lamp electronic ballast, (2) 25 watt T8 lamps	7
Fluorescent 4-lamp electronic ballast, (4) 25 watt T8 lamps	9
CFL-23 W	1
CFL-27 W	2

• Pre-retrofit energy use:	2.587 Kilowatts
• Post-retrofit energy use:	1.209 Kilowatts
• Energy savings projection:	1.378 Kilowatts
• Pre-retrofit to post retrofit energy reduction:	53%
• Estimated Annual Savings:	kWh Saved: 2,412

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	\$875.31	110.06	\$412.74
7 Hours/day	\$1,531.78	192.61	\$722.29
10 Hours/day	\$2,188.26	275.16	\$1,031.85
1375 Hours/year (Est.)	\$1,203.55	151.34	\$567.52

VPSO House

Total Building Savings All Measures:

• Projected Annual Electrical Savings (kWh):	644
• Projected Annual Electrical Cost Savings:	\$409
• Projected Annual Heating Fuel Savings (gallons):	236
• Projected Annual Fuel Cost Savings:	\$1,652
• Total Projected Annual Energy Cost Savings:	\$2,061

Weatherization/Heating Retrofit Summary:



- Replaced existing boiler with new energy efficient boiler and installed single programmable thermostat.
- Air sealed building to reduce air-leakage.
- Added R-30 fiberglass batts above existing batts in the attic, including over the attic hatch.

• Annual energy savings projection:	236 gallons
• Estimated Annual Heating Fuel Cost Savings:	\$1,652

VPSO House

Lighting Retrofit Summary:

<u>Materials Installed</u>	<u>Quantity</u>
Fluorescent 2-lamp electronic ballast, (2) 25 watt T8 lamps	10

- Pre-retrofit energy use: 0.828 Kilowatts
- Post-retrofit energy use: 0.460 Kilowatts
- Energy savings projection: 0.368 Kilowatts
- Pre-retrofit to post retrofit energy reduction: 44%
- Estimated Annual Savings: kWh Saved: 644

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	\$233.75	29.39	\$110.22
7 Hours/day	\$409.07	51.44	\$192.89
10 Hours/day	\$584.38	73.48	\$275.56
1375 Hours/year (Est.)	\$321.41	40.42	\$151.56

Community Building

Weatherization Retrofit Summary:



- Replaced existing boiler with new energy efficient boiler.
-
- Annual energy savings projection: 516 gallons
 - Estimated Annual Heating Fuel Cost Savings: **\$3,612**

Fire House

Weatherization Retrofit Summary:



- Added R-38 loose-fill fiberglass insulation to attic; flash coated the eaves with 4" urethane foam.
- Air sealed building to reduce air leakage.
- Weather-stripping added outside to garage doors.

-
- Annual energy savings projection: 243 gallons
 - Estimated Annual Heating Fuel Cost Savings: **\$1,701**

NATIVE VILLAGE OF KIANA OWNED BUILDINGS

IRA Office

Total Building Savings All Measures:

• Projected Annual Electrical Savings (kWh):	1,663
• Projected Annual Electrical Cost Savings:	\$1,056
• Projected Annual Heating Fuel Savings (gallons):	255
• Projected Annual Fuel Cost Savings:	\$1,785
• Total Projected Annual Energy Cost Savings:	\$2,841

Weatherization/Heating Retrofit Summary:



- Tuned up the boiler to 86% combustion efficiency, and installed two programmable thermostats.
- Insulated the boarded-up windows and caulked for airtightness.
- Air sealed building to reduce air leakage.
- Installed exterior flappers for the two exhaust fans in the bathroom.

• Annual energy savings projection:	255 gallons
• Estimated Annual Heating Fuel Cost Savings:	\$1,785

IRA Office

Lighting Retrofit Summary:

<u>Materials Installed</u>	<u>Quantity</u>
Fluorescent 2-lamp electronic ballast, (2) 25 watt T8 lamps	14
CFL-23 W	4

- Pre-retrofit energy use for all lighting: 1.686 Kilowatts
- Post-retrofit energy use for all lighting: 0.736 Kilowatts
- Energy savings projection: 0.950 Kilowatts
- Pre-retrofit to post retrofit energy reduction: 56%
- Estimated Annual Savings: kWh Saved: 1,663

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	\$603.44	75.88	\$284.54
7 Hours/day	\$1,056.02	132.79	\$497.95
10 Hours/day	\$1,508.60	189.70	\$711.36
2000 Hours/year (Est.)	\$1,206.88	151.76	\$569.09

KIANA FRIENDS CHURCH OWNED BUILDINGS*

Friends Church

Lighting Retrofit Summary:

<u>Materials Installed</u>	<u>Quantity</u>
Fluorescent 2-lamp electronic ballast, (2) 32 watt T8 lamps	26

- Pre-retrofit energy use for all lighting: 2.184 Kilowatts
- Post-retrofit energy use for all lighting: 1.560 Kilowatts
- Energy savings projection: 0.624 Kilowatts
- Pre-retrofit to post retrofit energy reduction: 29%
- Estimated Annual Savings: kWh Saved: 1,092

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	\$396.36	49.84	\$186.90
7 Hours/day	\$693.64	87.22	\$327.08
10 Hours/day	\$990.91	124.60	\$467.25
600 Hours/year (Est.)	\$237.82	29.90	\$112.14

***Note:** The community of Kiana opted to purchase materials and provide labor In-kind to complete energy efficiency retrofits for the **Friend’s Church**. To further maximize the value of the VEEP & EECBG, Alaska Building Science Network provided energy audits of various community buildings not included under VEEP/EECBG funding upon local request, while providing technical support and training as needed to complete upgrades.

