

Village Energy Efficiency Program
AEA VEEP Grant # 7520001 Administered by Alaska Building Science Network
Chignik Bay Final Report
Grant Amount: \$75,000



Community Summary

8 community buildings and teacher housing units received energy efficient lighting, weatherization, and heating upgrades as follows: City Office, Community Hall, Fire Hall, City Shop, Tribal Council Office, LPSD Boiler Building, LPSD Teacher Housing Tri-Plex

Retrofits Completed: June 2012

Village-Wide Lighting, Weatherization and Heating Retrofit Summary:

| | |
|--|-------------------------|
| • Projected Annual Electrical Savings (kWh): | 21,648 |
| • Projected Annual Electrical Cost Savings: | \$10,057 ^{1,2} |
| • Projected Annual Heating Fuel Savings (gallons): | 2,561 |
| • Projected Annual Fuel Cost Savings: | \$7,811 ³ |
| • Total Projected Annual Energy Cost Savings: | \$17,868 |
| • Total village wide In-kind contribution: | \$20,935 |
| • Total project cost including In-kind contribution: | \$95,935 |
| • Simple Payback (including In-kind contributions): | 5.37 years |

¹ kWh Rate [used to calculate electrical cost savings] for Lighting Measures (State of AK - AEA PCE Program Report FY 2011 avg): \$0.46

² kWh Rate [used to calculate electrical cost savings] for Weatherization & Heating Measures (AkWarm Library): \$0.46

³ #2 Heating Fuel Rate [used to calculate heating fuel savings] (AkWarm Library): \$3.05/gal

CITY OF CHIGNIK BAY OWNED BUILDINGS

City Office

Weatherization Retrofit Summary:



- Air sealed building to reduce air leakage.

| | |
|---|----------------|
| • Annual energy savings projection: | 1103 gallons |
| • Estimated Annual Heating Fuel Cost Savings: | \$3,364 |

Community Hall

Heating Retrofit Summary:

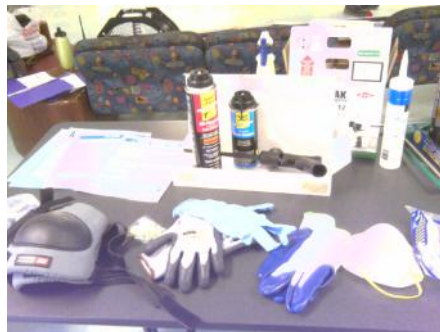


- Boiler combustion efficiency testing/tuning and training with City Maintenance staff.

- Annual energy savings projection: (SAVINGS NOT AVAILABLE)
- Estimated Annual Heating Fuel Cost Savings: (SAVINGS NOT AVAILABLE)

Fire Hall

Weatherization Retrofit Summary:



- Air sealed building to reduce air leakage.

- Annual energy savings projection: 709 gallons
- Estimated Annual Heating Fuel Cost Savings: **\$2,162**

City Shop

Lighting Retrofit Summary:



Materials Installed

Quantity

| | |
|---|----|
| Fluorescent 2-lamp electronic ballast, (1) 32 watt T8 lamp | 16 |
| Fluorescent 2-lamp electronic ballast, (2) 25 watt T8 lamps | 24 |
| Fluorescent T5 fixture, electronic ballast, (3) 54 watt T5 HO | 20 |

| | |
|---|------------------|
| • Pre-retrofit energy use: | 8.796 Kilowatts |
| • Post-retrofit energy use: | 5.232 Kilowatts |
| • Energy savings projection: | 3.564 Kilowatts |
| • Pre-retrofit to post retrofit energy reduction: | 41% |
| • Estimated Annual Savings: | kWh Saved: 6,237 |

| Hours Per Day / 250 Days Per Year | Electrical Savings | Comparative Avoided Diesel Use (gal) | Comparative Avoided Diesel Costs |
|--------------------------------------|-----------------------|--|--|
| 4 Hours/day | \$1,655.83 | 248.54 | \$671.05 |
| 7 Hours/day | \$2,897.71 | 434.94 | \$1,174.33 |
| 10 Hours/day | \$4,139.59 | 621.34 | \$1,677.62 |
| 1200 Hours/year (Est.) | \$1,987.00 | 298.24 | \$805.26 |

CHIGNIK BAY TRIBAL COUNCIL OWNED BUILDINGS

Tribal Council Office

Total Building Savings All Measures:

| | |
|--|---------|
| • Projected Annual Electrical Savings (kWh): | 2,156 |
| • Projected Annual Electrical Cost Savings: | \$1,002 |
| • Projected Annual Heating Fuel Savings (gallons): | 269 |
| • Projected Annual Fuel Cost Savings: | \$820 |
| • Total Projected Annual Energy Cost Savings: | \$1,822 |

Lighting Retrofit Summary:



Materials Installed

Quantity

| | |
|---|---|
| Fluorescent 2-lamp electronic ballast, (2) 25 watt T8 lamps | 3 |
| Fluorescent 3 Ft, 2-lamp electronic ballast, (1) 25w T8 Lamps | 1 |
| Fluorescent 3-lamp electronic ballast, (3) 25 watt T8 lamps | 1 |
| CFL-14 W | 3 |
| CFL-19W | 2 |
| CFL-27 W | 4 |
| CFL-9 W | 5 |

| | |
|---|------------------|
| • Pre-retrofit energy use: | 1.702 Kilowatts |
| • Post-retrofit energy use: | 0.470 Kilowatts |
| • Energy savings projection: | 1.232 Kilowatts |
| • Pre-retrofit to post retrofit energy reduction: | 72% |
| • Estimated Annual Savings: | kWh Saved: 2,156 |

| Hours Per Day / 250 Days Per Year | Electrical Savings | Comparative Avoided Diesel Use (gal) | Comparative Avoided Diesel Costs |
|--------------------------------------|-----------------------|--|--|
| 4 Hours/day | \$572.39 | 85.91 | \$231.97 |
| 7 Hours/day | \$1,001.68 | 150.35 | \$405.94 |
| 10 Hours/day | \$1,430.97 | 214.78 | \$579.92 |
| 2000 Hours/year (Est.) | \$1,144.77 | 171.83 | \$463.93 |

Tribal Council Office

Weatherization Retrofit Summary:

- Installed single programmable thermostat, including village staff training.
- Air sealed building to reduce air leakage.

- Annual energy savings projection: 269 gallons
- Estimated Annual Heating Fuel Cost Savings: **\$820**

LAKE AND PENINSULA SCHOOL DISTRICT OWNED BUILDINGS

Boiler Building

Lighting Retrofit Summary:



Materials Installed

Quantity

Fluorescent 2-lamp electronic ballast, (2) 25 watt T8 lamps 8

- Pre-retrofit energy use: 0.480 Kilowatts
- Post-retrofit energy use: 0.368 Kilowatts
- Energy savings projection: 0.112 Kilowatts
- Pre-retrofit to post retrofit energy reduction: 23%
- Estimated Annual Savings: kWh Saved: 196

| Hours Per Day / 250 Days Per Year | Electrical Savings | Comparative Avoided Diesel Use (gal) | Comparative Avoided Diesel Costs |
|--------------------------------------|-----------------------|--|--|
| 4 Hours/day | \$52.04 | 7.81 | \$21.09 |
| 7 Hours/day | \$91.06 | 13.67 | \$36.90 |
| 10 Hours/day | \$130.09 | 19.53 | \$52.72 |
| 500 Hours/year (Est.) | \$26.02 | 3.91 | \$10.54 |

School

Lighting Retrofit Summary:



Materials Installed

Quantity

| | |
|---|-----|
| Fluorescent 2-lamp electronic ballast, (2) 25 watt T8 lamps | 177 |
| Fluorescent 3-lamp electronic ballast, (3) 25 watt T8 lamps | 99 |
| Fluorescent 4-lamp electronic ballast, (4) 25 watt T8 lamps | 2 |
| CFL-14 W | 2 |

| | |
|---|------------------|
| • Pre-retrofit energy use: | 20.190 Kilowatts |
| • Post-retrofit energy use: | 15.676 Kilowatts |
| • Energy savings projection: | 4.514 Kilowatts |
| • Pre-retrofit to post retrofit energy reduction: | 22% |
| • Estimated Annual Savings: | kWh Saved: 7,900 |

| Hours Per Day / 250 Days Per Year | Electrical Savings | Comparative Avoided Diesel Use (gal) | Comparative Avoided Diesel Costs |
|--------------------------------------|-----------------------|--|--|
| 4 Hours/day | \$2,097.20 | 314.78 | \$849.92 |
| 7 Hours/day | \$3,670.11 | 550.87 | \$1,487.35 |
| 10 Hours/day | \$5,243.01 | 786.96 | \$2,124.79 |
| 1800 Hours/year (Est.) | \$3,774.97 | 566.61 | \$1,529.85 |

Teacher Housing Tri-Plex

Total Building Savings All Measures:

| | |
|--|---------|
| • Projected Annual Electrical Savings (kWh): | 5,159 |
| • Projected Annual Electrical Cost Savings: | \$2,397 |
| • Projected Annual Heating Fuel Savings (gallons): | 481 |
| • Projected Annual Fuel Cost Savings: | \$1,467 |
| • Total Projected Annual Energy Cost Savings: | \$3,864 |

Teacher Housing Tri-Plex

Lighting Retrofit Summary:



| <u>Materials Installed</u> | <u>Quantity</u> |
|---|-----------------|
| Fluorescent 2-lamp electronic ballast, (2) 25 watt T8 lamps | 25 |
| Fluorescent 4-lamp electronic ballast, (4) 25 watt T8 lamps | 6 |
| CFL-11 W | 6 |
| CFL-14 W | 19 |
| CFL-19W | 5 |
| CFL-9 W | 11 |

- Pre-retrofit energy use: 5.164 Kilowatts
- Post-retrofit energy use: 2.216 Kilowatts
- Energy savings projection: 2.948 Kilowatts
- Pre-retrofit to post retrofit energy reduction: 57%
- Estimated Annual Savings: kWh Saved: 5,159

| Hours Per Day / 250 Days Per Year | Electrical Savings | Comparative Avoided Diesel Use (gal) | Comparative Avoided Diesel Costs |
|--------------------------------------|-----------------------|--|--|
| 4 Hours/day | \$1,369.64 | 205.58 | \$555.06 |
| 7 Hours/day | \$2,396.87 | 359.76 | \$971.36 |
| 10 Hours/day | \$3,424.10 | 513.95 | \$1,387.66 |
| 1375 Hours/year (Est.) | \$1,883.26 | 282.67 | \$763.20 |

Teacher Housing Tri-Plex

Weatherization Retrofit Summary:

- Installed three programmable thermostats, including village staff training.
- Air sealed building to reduce air leakage.

| | |
|---|----------------|
| • Annual energy savings projection: | 481 gallons |
| • Estimated Annual Heating Fuel Cost Savings: | \$1,467 |

Chignik Bay, In-Kind Contribution Tracking Record - ABSN Energy Efficiency Projects:

| In-Kind Item | Dates | Hours Contributed | Hourly Wage | Value / Amount | Notes |
|--|----------------------------|-------------------|-------------|--------------------|---|
| Staff time for project contact, introduction & review of intro materials | | 3 | \$20.00 | \$60.00 | Number of entities x 1 hour each |
| Staff time for Attending teleconference | 11/10/10 | 2 | \$20.00 | \$40.00 | City time |
| Staff time for Attending teleconference | 11/10/10 | 2 | \$20.00 | \$40.00 | TC/IRA time |
| Staff time for Attending teleconference | 11/10/10 | 2 | \$20.00 | \$40.00 | School time |
| Conservative village office administrative percentage of total project cost less ABSN Admin %. Total project cost = \$89,600/village - (our admin percentage, (around 14%) Approx: \$12,544) = \$77,056 x 4% = \$3,082 (this 4% village admin cost estimate is spread across all entities we work with for the course of the grant for completing all energy efficiency measures). These are for cumulative, otherwise unaccounted time expense for village-based project support. | Aug '10 through Completion | | | \$3,082.00 | Each time we call, email, or fax a village entity, someone receives the communication, reviews and/or forwards the information, follows-up on requests, etc. Whether it is to set-up a teleconference, verify maintenance staff participation in lighting or boiler trainings, set-up in-kind lodging and transportation, lighting trainings, track a shipment, verify completion of lighting in a given building, ship lamps and ballasts out of the village for recycling, request a labor reimbursement agreement, or invoice etc. Village expenses for phone charges, copying and fax costs, office supplies, etc. are part of this amount. |
| Lodging for ABSN Field Manager(s) - 1st Visit | 12/13/10 - 12/17/10 | 4 | \$80.56 | \$644.48 | City: Lodging, 2 Field Managers, \$80.56/ea. - 1st Site Visit |
| Transportation and fuel costs - 1st Visit | 12/13/10 - 12/17/10 | 4 | \$100.00 | \$500.00 | City: Truck Rental, plus \$100 fuel - 1st Site Visit |
| Lodging for ABSN Field Manager(s) - Wx Visit | 6/20/11 - 6/27/11 | 13 | \$76.00 | \$988.00 | City: Lodging, 2 Field Managers, \$76/ea. - Weatherization Upgrade Visit |
| Transportation and fuel costs - Wx Visit | 6/20/11 - 6/27/11 | 8 | \$75.00 | \$600.00 | City: Truck Rental - Weatherization Upgrade Visit |
| Lodging for ABSN Field Manager(s) - Lx Visit | 10/30/11 - 11/5/11 | 5 | \$84.00 | \$840.00 | City: Lodging, 2 Field Managers, \$84/ea. - Lighting Upgrade Visit |
| Transportation and fuel costs - Lx Visit | 10/30/11 - 11/5/11 | 6 | \$75.00 | \$450.00 | City: Truck Rental - Lighting Upgrade Visit |
| Bed Tax (Borough) | 10/30/11 - 11/5/11 | | | \$63.84 | City: Tax, 2 people - Lighting Upgrade Visit |
| Labor - Wx Upgrades (hourly + fringe) | 6/21/11 - 6/24/11 | 11 | \$26.40 | \$290.40 | City: Labor, Augustus Ayson - Weatherization Upgrades |
| Materials - Wx Upgrades | June '11 | | | \$50.00 | City: Materials (outlet covers & sheet rock) - Weatherization Upgrades |
| Materials - Wx Upgrades | June '11 | | | \$20.00 | School: Materials (siding screws w/washer) - Weatherization Upgrades |
| Labor - Lx Upgrades (hourly + fringe) | 10/30/11 - 11/5/11 | | | \$10,613.23 | School: Labor, 4 workers - Lighting Upgrades |
| Per diem - Lx Upgrades | 10/30/11 - 11/5/11 | 18 | \$42.00 | \$756.00 | School: Per diem, 3 workers - Lighting Upgrades |
| Travel - Lx Upgrades | 10/30/11 - 11/5/11 | | | \$1,166.00 | School: Travel, 3 workers - Lighting Upgrades |
| Materials - Lx Upgrades | 10/30/11 - 11/5/11 | | | \$65.00 | School: Ladder (8-10' step) - Lighting Upgrade Visit |
| Materials - Lx Upgrades | 10/30/11 - 11/5/11 | | | \$65.00 | City: Ladder (10' extension) - Lighting Upgrade Visit |
| Labor - Lx Upgrades (hourly + fringe) | March '12 | 8 | \$21.60 | \$172.80 | City: Labor, Adam Anderson - City Shop, High Bay Lighting |
| Labor - Lx Upgrades (hourly + fringe) | March '12 | 8 | \$26.40 | \$211.20 | City: Labor, Augustus Ayson - City Shop, High Bay Lighting |
| Shipping - Lx Upgrades | March '12 | | | \$176.64 | City: Shipping, USPS - City Shop, High Bay Lighting |
| TOTAL | | | | \$20,934.59 | |