

Village Energy Efficiency Program
AEA Grant # 7520001 Administered by Alaska Building Science Network
Deering Final Report
Grant Amount: \$100,000



Community Summary

6 community buildings received energy efficient lighting and weatherization upgrades as follows: City Shop, City Office, Deering Native Store, Ipnatchiaq Electric Power Plant, Vacuum Sewer Building, Washeteria/Water Treatment Plant

Retrofits Completed: October 2011

Village-Wide Energy Efficient Lighting and Weatherization Retrofit Summary:

• Projected Annual Electrical Savings (kWh):	12,975
• Projected Annual Electrical Cost Savings:	\$10,038 ¹
• Projected Annual Heating Fuel Savings (gallons):	2,866
• Projected Annual Fuel Cost Savings:	\$18,457 ²
• Total Projected Annual Energy Cost Savings:	\$28,495
• Total village wide in-kind contribution:	\$6,074
• Total project cost including In-kind contribution:	\$106,074
• Simple Payback (including In-kind contributions):	3.72 years

¹ kWh Rate [used to calculate electrical cost savings] for Lighting Measures (State of AK - AEA PCE Program Report FY 2011 avg): \$0.77

² #2 Heating Fuel Rate [used to calculate heating fuel savings] (AkWarm Library): \$6.44/gal

CITY OF DEERING OWNED BUILDINGS AND FACILITIES

City Shop

Lighting Retrofit Summary:



Materials Installed

Fluorescent 2-lamp electronic ballast, (2) 32 watt T8 lamps

Quantity

15

- Pre-retrofit energy use for all lighting: 1.260 Kilowatts
- Post-retrofit energy use for all lighting: 0.900 Kilowatts
- Energy savings projection: 0.360 Kilowatts
- Pre-retrofit to post retrofit energy reduction: 29%
- Estimated Annual Savings: kWh Saved: 630

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	\$278.53	29.68	\$139.19
7 Hours/day	\$487.43	51.94	\$243.59
10 Hours/day	\$696.33	74.20	\$347.98
1200 Hours/year (Est.)	\$334.24	35.61	\$167.03

City Office

Total Building Savings All Measures:

- Projected Annual Electrical Savings (kWh): 5,180
- Projected Annual Electrical Cost Savings: \$3,989

- Projected Annual Heating Fuel Savings (gallons): 1,203
- Projected Annual Fuel Cost Savings: \$7,747

- Total Projected Annual Energy Cost Savings: \$11,736

Lighting Retrofit Summary:



Materials Installed

<u>Materials Installed</u>	<u>Quantity</u>
Fluorescent 2-lamp electronic ballast, (2) 25 watt T8 lamps	33
Fluorescent 3-lamp electronic ballast, (3) 25 watt T8 lamps	1
Fluorescent 4-lamp electronic ballast, (4) 25 watt T8 lamps	8
CFL-14 W	1
CFL-20 W	1
CFL-27 W	2

- Pre-retrofit energy use: 5.360 Kilowatts
- Post-retrofit energy use: 2.400 Kilowatts
- Energy savings projection: 2.960 Kilowatts
- Pre-retrofit to post retrofit energy reduction: 55%
- Estimated Annual Savings: kWh Saved: 5,180

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	\$2,290.15	244.02	\$1,144.47
7 Hours/day	\$4,007.77	427.04	\$2,002.82
10 Hours/day	\$5,725.38	610.06	\$2,861.17
2184 Hours/year (Est.)	\$5,001.69	532.95	\$2,499.52

City Office

Weatherization Retrofit Summary:



- Installed programmable thermostat.
- Sealed and insulated previously un-insulated duct work in attic.
- Air sealed building to reduce air leakage.
- Added R-42 blow-in cellulose insulation to attic with Standard Truss.

• Annual energy savings projection:	1,203 gallons
• Estimated Annual Heating Fuel Cost Savings:	\$7,747

Ipnatchiaq Electric Power Plant

Lighting Retrofit Summary:



Materials Installed

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

Quantity

25

- Pre-retrofit energy use: 2.100 Kilowatts
- Post-retrofit energy use: 1.150 Kilowatts
- Energy savings projection: 0.950 Kilowatts
- Pre-retrofit to post retrofit energy reduction: 45%
- 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	\$735.02	78.32	\$367.31
7 Hours/day	\$1,286.28	137.06	\$642.80
10 Hours/day	\$1,837.54	195.80	\$918.28
2000 Hours/year (Est.)	\$1,470.03	156.64	\$734.62

Vacuum Sewer

Lighting Retrofit Summary:



Materials Installed

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

Quantity

10

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- Pre-retrofit energy use: 0.840 Kilowatts
 - Post-retrofit energy use: 0.460 Kilowatts
 - Energy savings projection: 0.380 Kilowatts
 - Pre-retrofit to post retrofit energy reduction: 45%
 - Estimated Annual Savings: kWh Saved: 665

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	\$294.01	31.33	\$146.92
7 Hours/day	\$514.51	54.82	\$257.12
10 Hours/day	\$735.02	78.32	\$367.31
250 Hours/year (Est.)	\$73.50	7.83	\$36.73

Washeteria/Water Treatment Plant

Lighting Retrofit Summary:



Materials Installed

Materials Installed	<u>Quantity</u>
Fluorescent 2-lamp existing electronic ballast, re-lamped with (2)	16
Fluorescent 3-lamp existing electronic ballast, re-lamped with (3)	11
Fluorescent 4-lamp existing electronic ballast, re-lamped with (4)	1
CFL-14 W	18

- Pre-retrofit energy use: 3.150 Kilowatts
- Post-retrofit energy use: 1.892 Kilowatts
- Energy savings projection: 1.258 Kilowatts
- Pre-retrofit to post retrofit energy reduction: 40%
- Estimated Annual Savings: kWh Saved: 2,202

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	\$973.31	103.71	\$486.40
7 Hours/day	\$1,703.30	181.49	\$851.20
10 Hours/day	\$2,433.29	259.27	\$1,216.00
2400 Hours/year (Est.)	\$2,335.96	248.90	\$1,167.36

NATIVE VILLAGE OF DEERING IRA OWNED BUILDINGS AND FACILITIES

Native Store

Total Building Savings All Measures:

• Projected Annual Electrical Savings (kWh):	2,636
• Projected Annual Electrical Cost Savings:	\$2,039
• Projected Annual Heating Fuel Savings (gallons):	1,595
• Projected Annual Fuel Cost Savings:	\$10,272
• Total Projected Annual Energy Cost Savings:	\$12,311

Lighting Retrofit Summary:



Materials Installed

	<u>Quantity</u>
Fluorescent 4-lamp existing electronic ballast, re-lamped with (4)	13
Fluorescent 2-lamp electronic ballast, (2) 25 watt T8 lamps	5
Fluorescent 4-lamp electronic ballast, (4) 25 watt T8 lamps	8
CFL-11 W	2
CFL-9 W	4

• Pre-retrofit energy use:	3.684 Kilowatts
• Post-retrofit energy use:	2.178 Kilowatts
• Energy savings projection:	1.506 Kilowatts
• Pre-retrofit to post retrofit energy reduction:	41%
• Estimated Annual Savings:	kWh Saved: 2,636

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	\$1,165.19	124.15	\$582.29
7 Hours/day	\$2,039.09	217.27	\$1,019.00
10 Hours/day	\$2,912.98	310.39	\$1,455.72
2750 Hours/year (Est.)	\$3,204.28	341.43	\$1,601.29

Native Store

Weatherization Retrofit Summary:



- Doubled existing R-19 faced insulation to floor of back storage area.
- Insulated center wall of back storage with R-13 fiberglass batts; and installed two insulated metal doors as part of air sealing and partitioning off warm space.
- Insulated ceiling of store with two layers of 4" extruded polystyrene rigid foam.
- Added R-30 fiberglass batts around perimeter of ceiling and covered with Tyvek.
- Added R-42 blow-in cellulose insulation to attic with Standard Truss, and sealed attic hatch.
- Air sealed building to reduce air leakage.

• Annual energy savings projection:	1,595 gallons
• Estimated Annual Heating Fuel Cost Savings:	\$10,272

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

In-Kind Item	Dates	Quantity	Rate	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		2	\$20.00	\$40.00	TC/IRA
Staff time for Attending teleconference		1	\$20.00	\$20.00	City time
Staff time for Attending teleconference		2	\$20.00	\$40.00	School time
Maint. Staff time to accompany Field Manager on building assessment	11/15/10 - 11/17/10	2	\$20.00	\$40.00	City: Michael Jones - City Administrator
Maint. Staff time to accompany Field Manager on building assessment	11/15/10 - 11/17/10	2	\$20.00	\$40.00	City: Nelson - Water Plant Operator
Maint. Staff time to accompany Field Manager on building assessment	11/15/10 - 11/17/10	4	\$20.00	\$80.00	City: Ruth Moto - Manager, Ipnatchiaq Electric
Maint. Staff time to accompany Field Manager on building assessment	11/15/10 - 11/17/10	3	\$20.00	\$60.00	Tribe: Susie Clark - IRA Store Manager
Maint. Staff time to accompany Field Manager on building assessment	11/15/10 - 11/17/10	8	\$20.00	\$160.00	School: Steve Sharrow - NWABSD Heating Controls Specialist
Conservative village office administrative percentage of total project cost less ABSN Admin %. Total project cost = \$100,000/village - (our admin percentage, (around 14%) Approx: \$14,000) = \$86,000 x 4% = \$3,440 (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.	Feb, '09 through Completion			\$3,440.00	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 Managers	11/14/10 - 11/18/10	8	\$60.00	\$480.00	City: Lodging for Matt Oster & Dan Lung (\$60/night ea.) - 1st assessment site visit
Transportation and fuel costs	11/14/10 - 11/18/10	4	\$125.00	\$500.00	City: Transportation, 4-wheeler rental - 1st assessment site visit
Lodging for ABSN Field Managers	7/10/11 - 7/14/11	8	\$60.00	\$480.00	City: Lodging for Emmett Leffel & Dan Lung (\$60/night ea.) - Lighting Upgrade Visit
Transportation and fuel costs	7/10/11 - 7/14/11	2.5	\$125.00	\$312.50	City: Transportation, 4-wheeler rental - Lighting Upgrade Visit
Fuel Costs	7/10/11 - 7/14/11	5	\$5.55	\$27.75	City: Fuel, 4-wheeler - Lighting Upgrade Visit
Tribe Labor - Melvin Jones	7/10/11 - 7/14/11	18	\$15.00	\$270.00	TC/IRA: Labor - Lighting Upgrade Visit
Tribe Labor (Fringe) - Melvin Jones	7/10/11 - 7/14/11			\$23.82	TC/IRA: Fringe Costs - Lighting Upgrade Visit
	TOTAL			\$6,074.07	