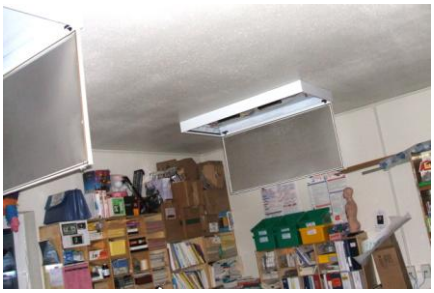
Village End Use Energy Efficiency Measures Program

AEA Grant # 2195234 Administered by Alaska Building Science Network

Tuluksak Final Report





Community Summary

12 community buildings and 12 teacher-housing units received energy efficiency upgrades as follows:

TNC Office, Clinic, Head Start, Jail, Post Office, Recreation Hall, VPSO Housing, Washeteria, Moravian Church, Tuluksak School Maintenance Garage, School Maintenance Shop, School Generator Connex

Retrofits Completed: November 2007 - December 2007

Village-Wide Lighting Retrofit Summary:

- Retrofitted 141 light fixtures with electronic ballasts & T8 lamps
- Installed 172 compact fluorescent light bulbs
- Pre-retrofit energy use for all lighting: 25.055 Kilowatts
- Post-retrofit energy use for all lighting: 11.124 Kilowatts
- Energy savings projection: 13.931 Kilowatts
- Pre-retrofit to post retrofit energy reduction: 56%

- Estimated Annual Savings:

kWh Rate (as of 12/2/08):$0.60 Fuel Cost (FY 2007 Ave): $3.01

Hours Per Day/ 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	$8,358.60	1213.50	$3,652.64
7 Hours/day	**$14,627.50**	2123.63	$6,392.12
10 Hours/day	$20,896.50	3033.75	$9,131.60

- Total project cost for all measures: $37,775
- Simple Payback (lighting measures only, using 7 hours/day lighting use run-time): 2.58 years
- Total village wide in-kind contribution: $ 3,693 (extended grant capacity by 9.8%)

Additional Energy Efficiency Measures:

- 2 local maintenance staff attended ABSN's 2-day Boiler Training Course in Bethel, AK
- 6 programmable thermostats were installed in school district owned teacher housing units.

Tuluksak Native Community Owned Buildings



ABSN Field Manager Harry Morgan goes over a lighting plan with TNC maintenance staff Peter Napoka Jr..

8 buildings owned by the Tuluksak Native Community received energy efficient lighting upgrades as follows:

TNC Office, JAIL, Clinic, Post Office, Head Start, Recreation Hall, VPSO Housing, Washeteria.

- Lighting upgrades completed in: November 2007
- Retrofitted 88 light fixtures with electronic ballasts & T8 lamps
- Installed 22 compact fluorescent light bulbs
- Pre-retrofit energy use for all lighting: 10.212 Kilowatts
- Post-retrofit energy use for all lighting: 5.677 Kilowatts
- Energy savings projection: 4.535 Kilowatts
- Pre-retrofit to post retrofit energy reduction: 44%

- Estimated Annual Savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
Locally Estimated	$4,440.84	644.72	$1,940.61
4 Hours/day	$2,721.00	395.03	$1,189.05
7 Hours/day	$4,761.75	691.31	$2,080.85
10 Hours/day	$6,802.50	987.59	$2,972.64

TNC Office



Materials Installed	Quantity
2-Lamp Fixture (w/existing electronic ballast) re-lamped with (2)25 watt T8 Lamps	4
4-Lamp Fixture (w/existing electronic ballast) re-lamped with, (4) 25 watt T8 lamps	1
4-Lamp Fixture (w/ (2) existing 2 Lamp electronic ballast) re-lamped with, (4) 25 watt T8 lamps	8
CFL-14 W	1

- Pre-retrofit energy use: 1380 watts
- Post-retrofit energy use: 1028 watts
- Energy savings projection: 352 watts
- Pre-retrofit to post retrofit energy reduction: 26%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
2000 Hours/year (Est.)	$422.40	61.32	$184.59
4 Hours/day	$211.20	30.66	$92.29
7 Hours/day	$369.60	53.66	$161.51
10 Hours/day	$528.00	76.66	$230.73

Notes: Existing electronic ballasts and 32 watt T-8 lamps installed previously. All fixtures re-lamped with 25 watt T-8 lamps for additional savings.

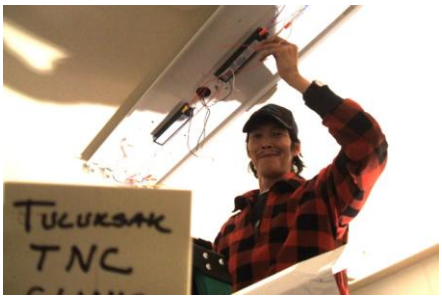
Jail

Materials Installed	Quantity
CFL-20 W	6

- Pre-retrofit energy use: 240 watts
- Post-retrofit energy use: 120 watts
- Energy savings projection: 120 watts
- Pre-retrofit to post retrofit energy reduction: 50%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
2040 Hours/year (Est.)	$146.88	21.32	$64.19
4 Hours/day	$72.00	10.45	$31.46
7 Hours/day	$126.00	18.29	$55.06
10 Hours/day	$180.00	26.13	$78.66

Clinic



TNC Maintenance staff David Phillip retrofits a fixture in the clinic.

Materials Installed	**Quantity**
2-lamp electronic ballast, (2) 32 watt T8 lamps	6
4-lamp electronic ballast, (3) 32 watt T8 lamps	1
4-lamp fixture (2) 2-lamp ballasts (4) 25 watt T8	3
CFL-14 W	4
• Pre-retrofit energy use:	1420 watts
• Post-retrofit energy use:	791 watts
• Energy savings projection:	629 watts
• Pre-retrofit to post retrofit energy reduction:	44%

• Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1800 Hours/year (Est.)	$679.32	98.62	$296.86
4 Hours/day	$377.40	54.79	$164.92
7 Hours/day	$660.45	95.88	$288.61
10 Hours/day	$943.50	136.98	$412.30

Notes: One 4-lamp fixture reduced to two T-8 lamps and one 4-lamp fixture de-lamped to three 25-watt T-8 lamps for additional savings.

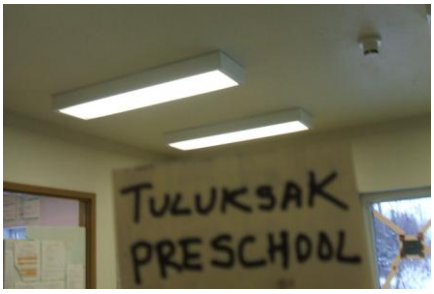
Post Office

Materials Installed	**Quantity**
CFL-27 W	3
• Pre-retrofit energy use:	250 watts
• Post-retrofit energy use:	81 watts
• Energy savings projection:	169 watts
• Pre-retrofit to post retrofit energy reduction:	68%

• Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1600 Hours/year (Est.)	$162.24	23.55	$70.90
4 Hours/day	$101.40	14.72	$44.31
7 Hours/day	$177.45	25.76	$77.54
10 Hours/day	$253.50	36.80	$110.78

Head Start



Energy efficient electronic ballasts and 25 watt T-8 lamps save energy while improving light level in classroom for a better learning environment.

Materials Installed	**Quantity**
2-lamp electronic ballast, (2) 25 watt T8 lamps	8
4-lamp electronic ballast, (3) 25 watt T8 lamps	16
CFL-20 W	1
• Pre-retrofit energy use:	2955 watts
• Post-retrofit energy use:	1596 watts
• Energy savings projection:	1359 watts
• Pre-retrofit to post retrofit energy reduction:	46%
• Estimated annual savings:	

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1600 Hours/year (Est.)	$1,304.64	189.41	$570.12
4 Hours/day	$815.40	118.38	$356.32
7 Hours/day	$1,426.95	207.16	$623.57
10 Hours/day	$2,038.50	295.95	$890.81

Notes: 16, 4-lamp fixtures de-lamped to three 25 watt T-8 lamps for additional savings.

Recreation Hall

Materials Installed	**Quantity**
2-lamp electronic ballast, (2) 25 watt T8 lamps	6
CFL-14 W	1
• Pre-retrofit energy use:	492 watts
• Post-retrofit energy use:	296 watts
• Energy savings projection:	196 watts
• Pre-retrofit to post retrofit energy reduction:	40%
• Estimated annual savings:	

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1352 Hours/year (Est.)	$159.00	23.08	$69.48
4 Hours/day	$117.60	17.07	$51.39
7 Hours/day	$205.80	29.88	$89.93
10 Hours/day	$294.00	42.68	$128.48

VPSO Housing

Materials Installed	Quantity
CFL-20 W	1
CFL-23 W	4

- Pre-retrofit energy use: 360 watts
- Post-retrofit energy use: 112 watts
- Energy savings projection: 248 watts
- Pre-retrofit to post retrofit energy reduction: 69%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1500 Hours/year (Est.)	$223.20	32.40	$97.54
4 Hours/day	$148.80	21.60	$65.02
7 Hours/day	$260.40	37.80	$113.79
10 Hours/day	$372.00	54.01	$162.56

Washeteria

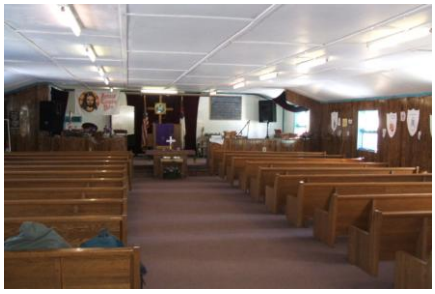
Materials Installed	Quantity
2-lamp electronic ballast, (2) 25 watt T8 lamps	9
4-lamp electronic ballast, (3) 25 watt T8 lamps	4
4-lamp electronic ballast, (4) 25 watt T8 lamps	4
CFL-23 W	1

- Pre-retrofit energy use: 2175 watts
- Post-retrofit energy use: 1106 watts
- Energy savings projection: 1069 watts
- Pre-retrofit to post retrofit energy reduction: 49%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1800 Hours/year (Est.)	$1,154.52	167.61	$504.52
4 Hours/day	$641.40	93.12	$280.29
7 Hours/day	$1,122.45	162.96	$490.50
10 Hours/day	$1,603.50	232.80	$700.72

Notes: Five 4-lamp fixture reduced to two T-8 lamps and four 4-lamp fixtures de-lamped to three 25 watt T-8 lamps for additional savings.

Moravian Church



Materials Installed	Quantity
1-lamp electronic ballast, (1) 25 watt T8 lamp	13
2-lamp electronic ballast, (2) 25 watt T8 lamps	5

- Pre-retrofit energy use: 940 watts
- Post-retrofit energy use: 547 watts
- Energy savings projection: 393 watts
- Pre-retrofit to post retrofit energy reduction: 42%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
800 Hours/year (Est.)	$188.64	27.39	$82.43
4 Hours/day	$235.80	34.23	$103.04
7 Hours/day	$412.65	59.91	$180.32
10 Hours/day	$589.50	85.58	$257.61

Yupiit School District Owned Buildings

3 buildings and 12 Teacher Housing Units owned by the Yupiit School District received energy efficient lighting upgrades as follows:

Tuluksak School Maintenance Garage, School Maintenance Shop, School Generator Connex, Teacher Housing #6, Teacher Housing #7, Teacher Housing #8, Teacher Housing #9, Teacher Housing #10, Teacher Housing #11, Teacher Housing #12, Teacher Housing #13, Teacher Housing #14, Teacher Housing #15, Teacher Housing #16 and Teacher Housing #17.

- Lighting upgrades completed in December 2007
- Retrofitted 53 light fixtures with electronic ballasts & T8 lamps
- Installed 150 compact fluorescent light bulbs
- Pre-retrofit energy use for all lighting: 14.843 Kilowatts
- Post-retrofit energy use for all lighting: 5.447 Kilowatts
- Energy savings projection: 9.396 Kilowatts
- Pre-retrofit to post retrofit energy reduction: 63%

- Estimated Annual Savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	$5,637.60	818.47	$2,463.59
7 Hours/day	**$9,865.80**	1432.32	$4,311.27
10 Hours/day	$14,094.0	2046.17	$6,158.96

Additional Energy Efficiency Measures:

- 6 programmable thermostats were installed in school district owned teacher-housing units.

Notes: For programmable thermostats in teacher housing units we work with local maintenance staff. Our goal is to set thermostats to a night time set-back of 62 - 64 degrees and a daytime / evening / weekend temp of 68-70 degrees. If occupants are interested and willing to go beyond that, maintenance staff work with them to program the thermostat to 62 degrees during the weekdays when teachers are away working. Programmable thermostats used and maintained as programmed are known to achieve an overall fuel savings of between 5 and 10% over non-programmed thermostats.

Tuluksak School Maintenance Garage



Materials Installed	**Quantity**
2-lamp electronic ballast, (2) 25 watt T8 lamps	4
• Pre-retrofit energy use:	288 watts
• Post-retrofit energy use:	188 watts
• Energy savings projection:	100 watts
• Pre-retrofit to post retrofit energy reduction:	35%

• Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	$60.00	8.71	$26.22
7 Hours/day	$105.00	15.24	$45.88
10 Hours/day	$150.00	21.78	$65.55

Tuluksak School Maintenance Shop


Materials Installed	**Quantity**
2-lamp electronic ballast, (2) 25 watt T8 lamps	25
• Pre-retrofit energy use:	2448 watts
• Post-retrofit energy use:	1175 watts
• Energy savings projection:	1273 watts
• Pre-retrofit to post retrofit energy reduction:	52%

• Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1500 Hours/year (Est.)	$1,145.70	166.33	$500.66
4 Hours/day	$763.80	110.89	$333.77
7 Hours/day	$1,336.65	194.05	$584.11
10 Hours/day	$1,909.50	277.22	$834.44

Notes: Existing lighting scenario: Several fixtures had burned out lamps at time of assessment. Discussions with local maintenance staff resulted in a decision to maintain fewer fixtures than original lighting plan. Local school maintenance staff therefore took every other fixture off line (nine 2-lamp fluorescent fixtures) for additional savings.

Tuluksak School Generator Connex

Materials Installed	Quantity
2-lamp electronic ballast, (2) 25 watt T8 lamps	3

- Pre-retrofit energy use: 216 watts
- Post-retrofit energy use: 141 watts
- Energy savings projection: 75 watts
- Pre-retrofit to post retrofit energy reduction: 35%

- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	$45.00	6.53	$19.66
7 Hours/day	$78.75	11.43	$34.41
10 Hours/day	$112.50	16.33	$49.16

Teacher Housing #6

Materials Installed	Quantity
2-lamp electronic ballast, (2) 25 watt T8 lamps	3
CFL-20 W	1
CFL-23 W	3

- Pre-retrofit energy use: 456 watts
- Post-retrofit energy use: 230 watts
- Energy savings projection: 226 watts
- Pre-retrofit to post retrofit energy reduction: 50%

- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
4 Hours/day	$135.60	19.69	$59.26
7 Hours/day	$237.30	34.45	$103.70
10 Hours/day	$339.00	49.22	$148.14
1500 Hours/year (Est.)	$203.40	29.53	$88.88

Teacher Housing #7

Materials Installed	Quantity
2-lamp electronic ballast, (2) 25 watt T8 lamps	3
CFL-20 W	1
CFL-23 W	3

- Pre-retrofit energy use: 456 watts
- Post-retrofit energy use: 230 watts
- Energy savings projection: 226 watts
- Pre-retrofit to post retrofit energy reduction: 50%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1500 Hours/year (Est.)	$203.40	29.53	$88.88
4 Hours/day	$135.60	19.69	$59.26
7 Hours/day	$237.30	34.45	$103.70
10 Hours/day	$339.00	49.22	$148.14

Teacher Housing #8

Materials Installed	Quantity
4-lamp electronic ballast, (3) 25 watt T8 lamps	1
CFL-20 W	2
CFL-23 W	4

- Pre-retrofit energy use: 589 watts
- Post-retrofit energy use: 207 watts
- Energy savings projection: 382 watts
- Pre-retrofit to post retrofit energy reduction: 65%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1500 Hours/year (Est.)	$343.80	49.91	$150.24
4 Hours/day	$229.20	33.28	$100.16
7 Hours/day	$401.10	58.23	$175.28
10 Hours/day	$573.00	83.19	$250.40

Notes: One 4-lamp fixture de-lamped to three 25 watt T-8 lamps for additional savings.

Teacher Housing #9

Materials Installed	Quantity
2-lamp electronic ballast, (2) 25 watt T8 lamps	2
CFL-20 W	11

- Pre-retrofit energy use: 969 watts
- Post-retrofit energy use: 314 watts
- Energy savings projection: 655 watts
- Pre-retrofit to post retrofit energy reduction: 68%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1500 Hours/year (Est.)	$589.50	85.58	$257.61
4 Hours/day	$393.00	57.06	$171.74
7 Hours/day	$687.75	99.85	$300.54
10 Hours/day	$982.50	142.64	$429.34

Teacher Housing #10

Materials Installed	Quantity
2-lamp electronic ballast, (2) 25 watt T8 lamps	2
CFL-20 W	12

- Pre-retrofit energy use: 1044 watts
- Post-retrofit energy use: 334 watts
- Energy savings projection: 710 watts
- Pre-retrofit to post retrofit energy reduction: 68%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1500 Hours/year (Est.)	$639.00	92.77	$279.24
4 Hours/day	$426.00	61.85	$186.16
7 Hours/day	$745.50	108.23	$325.78
10 Hours/day	$1,065.00	154.62	$465.40

Teacher Housing #11

Materials Installed	Quantity
2-lamp electronic ballast, (2) 25 watt T8 lamps	2
CFL-14 W	3
CFL-20 W	7
CFL-23 W	2

- Pre-retrofit energy use: 1044 watts
- Post-retrofit energy use: 322 watts
- Energy savings projection: 722 watts
- Pre-retrofit to post retrofit energy reduction: 69%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1500 Hours/year (Est.)	$649.80	94.34	$283.96
4 Hours/day	$433.20	62.89	$189.30
7 Hours/day	$758.10	110.06	$331.28
10 Hours/day	$1,083.00	157.23	$473.26

Teacher Housing #12

Materials Installed	Quantity
2-lamp electronic ballast, (2) 25 watt T8 lamps	5
CFL-14 W	3
CFL-23 W	3

- Pre-retrofit energy use: 854 watts
- Post-retrofit energy use: 346 watts
- Energy savings projection: 508 watts
- Pre-retrofit to post retrofit energy reduction: 59%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1500 Hours/year (Est.)	$457.20	66.38	$199.79
4 Hours/day	$304.80	44.25	$133.20
7 Hours/day	$533.40	77.44	$233.09
10 Hours/day	$762.00	110.63	$332.99

Notes: two 2-lamp fluorescent fixtures taken offline for additional savings.

Teacher Housing #13

Materials Installed	Quantity
4-lamp electronic ballast, (3) 25 watt T8 lamps	1
CFL-14 W	6
CFL-20 W	11

- Pre-retrofit energy use: 1209 watts
- Post-retrofit energy use: 379 watts
- Energy savings projection: 830 watts
- Pre-retrofit to post retrofit energy reduction: 69%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1500 Hours/year (Est.)	$747.00	108.45	$326.43
4 Hours/day	$498.00	72.30	$217.62
7 Hours/day	$871.50	126.52	$380.84
10 Hours/day	$1,245.00	180.75	$544.05

Notes: One 4-lamp fixture de-lamped to three 25 watt T-8 lamps for additional savings.

Teacher Housing #14

Materials Installed	Quantity
2-lamp electronic ballast, (2) 25 watt T8 lamps	1
CFL-14 W	6
CFL-20 W	8

- Pre-retrofit energy use: 912 watts
- Post-retrofit energy use: 291 watts
- Energy savings projection: 621 watts
- Pre-retrofit to post retrofit energy reduction: 68%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1500 Hours/year (Est.)	$558.90	81.14	$244.23
4 Hours/day	$372.60	54.09	$162.82
7 Hours/day	$652.05	94.66	$284.94
10 Hours/day	$931.50	135.24	$407.06

Teacher Housing #15

Materials Installed	Quantity
4-lamp fixture 3-lamp ballast (3) 25 watt T8 lamps	1
CFL-14 W	10
CFL-20 W	6
CFL-23 W	2
CFL-27 W	2

- Pre-retrofit energy use: 1398 watts
- Post-retrofit energy use: 434 watts
- Energy savings projection: 964 watts
- Pre-retrofit to post retrofit energy reduction: 69%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1500 Hours/year (Est.)	$867.60	125.96	$379.13
4 Hours/day	$578.40	83.97	$252.76
7 Hours/day	$1,012.20	146.95	$442.32
10 Hours/day	$1,446.00	209.93	$631.89

Notes: One 4-lamp fixture de-lamped to three 25 watt T-8 lamps for additional savings.

Teacher Housing #16

Materials Installed	Quantity
CFL-14 W	6
CFL-20 W	8
CFL-23 W	8

- Pre-retrofit energy use: 1420 watts
- Post-retrofit energy use: 428 watts
- Energy savings projection: 992 watts
- Pre-retrofit to post retrofit energy reduction: 70%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1500 Hours/year (Est.)	$892.80	129.62	$390.15
4 Hours/day	$595.20	86.41	$260.10
7 Hours/day	$1,041.60	151.22	$455.17
10 Hours/day	$1,488.00	216.03	$650.24

Teacher Housing #17

Materials Installed	Quantity
CFL-14 W	6
CFL-20 W	8
CFL-23 W	8

- Pre-retrofit energy use: 1540 watts
- Post-retrofit energy use: 428 watts
- Energy savings projection: 1112 watts
- Pre-retrofit to post retrofit energy reduction: 72%
- Estimated annual savings:

Hours Per Day / 250 Days Per Year	Electrical Savings	Comparative Avoided Diesel Use (gal)	Comparative Avoided Diesel Costs
1500 Hours/year (Est.)	$1,000.80	145.30	$437.34
4 Hours/day	$667.20	96.86	$291.56
7 Hours/day	$1,167.60	169.51	$510.23
10 Hours/day	$1,668.00	242.16	$728.90

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

In-Kind Item	Dates	Hours Contri-buted	Hourly Wage	Value / Amount	Notes
Staff time for project contact, introduction, and review of intro materials (Number of entities x 1 hour each)		3.00	$15.00	$45.00	list number of entities
Staff time for Attending teleconference (TC/IRA)		1.00	$15.00	$15.00	($15/hr is an ave. wage designated for village staff).
Staff time for Attending teleconference (Village Corp)		3.00	$15.00	$45.00	"
Staff time for Attending teleconference (School)		3.00	$15.00	$45.00	"
Maint. Staff time to accompany Field Manager on building assessments - 1st site visit					list entity and maint staff, add rows as necessary
Maint. Staff time to attend ABSN training					list entity and maint staff, add rows as necessary
Conservative village office administrative percentage of total project cost less ABSN Admin %. Total project cost = $37,775/village - (our admin percentage , (around 12%) Approx: $4,533) = $33,242 x 5.5% = $1,828 (this 5.5% 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 primarily for cumulative, otherwise unaccounted time expense for village- based project support.	Feb, '07 through			$1,828.00	Each time we call, email, or fax a village entity, someone has to receive the communication, review and/or forward the information, follow-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, request a labor reimbursement agreement, or invoice etc, etc. Village expenses for phone charges, copying and fax costs, office supplies, etc are part of this amount.
Lodging for ABSN Field Managers - 2nd site visit	11-12-15-07	5.00	$85.00	$425.00	Stayed at TNC quarters. Geoff 1 night, Harry 4 nights = 5 nights
Transportation and fuel costs during 2nd Site-visit		5.00	$50.00	$ 250.00	4 wheeler and trailer as needed for 5 days
LKSD Inkind labor for maint shop and teacher housing lighting upgrades		52	$20.00	$ 1,040.00	Assume $20/hr including fringe. Tally sheet estimates 51 hrs - say 52 hrs, to retrofit 53 linear fluorescent fixtures and install 150 cfl bulbs.
	TOTAL			$ 3,693.00	

Bethel Boiler Trainings at Yuut Elitnaurviat Learning Center, October 7-8 & 15-16, 2008

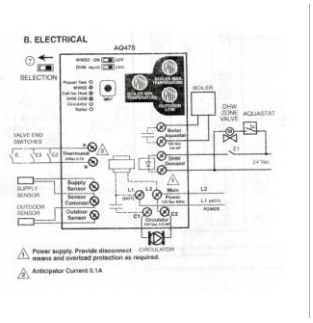
ABSN Master Boiler Technician Charlie Deer presents at Bethel area boiler training -Yuut Elitnaurviat, the Learning Center Shop in Bethel, October, 2008.

Training on oil burner combustion efficiency and maintenance.

Tuluksak Native Community maintenance staff Peter Gregory Jr. and Tuluksak School maintenance staff Joseph Sallaffie traveled to Bethel October 7 and 8, and 15 and 16, 2008 to participate in this training. ABSN partnered with Association of Village Council Presidents Housing Authority and YKHC's Yuut Elitnaurviat Learning Center to provide ABSN's 16-hour boiler training course to 4 rural maintenance staff from '07-'08 villages covered under this VEUEEM grant. Additionally 11 AVCP Housing maintenance staff from Bethel and surrounding western villages attended this training. Charlie Deer's training hours were covered by matching funds from ABSN. AEA VEUEEM grant funds were used to cover training coordination, air fare, meals and lodging in Bethel for VEUEEM grant village maintenance staff.

Components of a Bacharach Flu Gas Analyzing Kit used in boiler efficiency training and left with capable maint staff for use in their villages.

Smoke-test kit for analyzing flu gases for boiler efficiency



Schematic of outdoor temperature sensing boiler control

During this 16-hour course ABSN's boiler specialist Charlie Deer instructed maintenance staff in the fundamentals of boiler and fuel energy efficiency. Training topics covered: fuel, proper heating system sizing, testing boiler efficiency with a flu gas analyzer kit, cleaning and tuning boilers for energy efficiency, control options and proper control function, burner and nozzle components and function, outdoor temperature boiler controls, programmable thermostats, etc.