

Agency: Commerce, Community and Economic Development**Grants to Named Recipients (AS 37.05.316)****Grant Recipient: Catholic Community Services****Federal Tax ID: 92-0042651****Project Title:****Project Type: Equipment and Materials**

Catholic Community Service - Haines Senior Center Heating System and Weatherization Improvements

State Funding Requested: \$65,000**House District: 5 / C**

One-Time Need

Brief Project Description:

-Remove old inefficient and deficient heating system from Haines Senior Center and replace with new energy efficient boiler and heating system.
-Replace single pane windows, install programmable thermostats, and insulate the attic to current standards.

Funding Plan:

Total Project Cost:	\$65,000
Funding Already Secured:	(\$0)
FY2013 State Funding Request:	<u>(\$65,000)</u>
Project Deficit:	\$0

*Funding Details:**New Funding request***Detailed Project Description and Justification:**

Haines Senior Center boiler and heating system is obsolete beyond useful life. Old system will be removed and new energy efficient heating system will be installed.

The energy audit by AEE projected a 57% reduction in fuel costs and 11% in electric costs if these projects were completed. At current energy prices, these projects would result in energy savings of approximately \$3700 per year. The significant cost savings associated with this proposed weatherization work, together with other cost savings and revenue raising measures the Center is undertaking, would make up the deficit in the budget, and allow the Center to remain open and viable for the foreseeable future.

Project Timeline:

Project will be completed in FY 2013.

Entity Responsible for the Ongoing Operation and Maintenance of this Project:

Catholic Community Service - dba Haines Senior Center

Grant Recipient Contact Information:

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Has this project been through a public review process at the local level and is it a community priority? Yes No

<i>For use by Co-chair Staff Only:</i>
3:17 PM 5/2/2012

Alaska Energy Engineering LLC

25200 Amalga Harbor Road Tel/Fax: 907.789.1226
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Energy and Life Cycle Cost Analysis

July 26, 2010

Senior Center Energy Audit

Basis

25	Study Period (years)	3.0%	General Inflation
5.0%	Nominal Discount Rate	6.0%	Fuel Oil Inflation
1.9%	Real Discount Rate	2.0%	Electricity Inflation

Behavioral and Operational

Energy Analysis

Fuel Oil, gal	Est. Savings	Savings, gal	Elect, kWh	Est. Savings	Savings, kWh
1,500	-0.5%	-8	34,200	0.0%	0

	Year	Qty	Unit	Base Cost	Year 0 Cost
Construction Costs					
Senior Center-1: Weather-strip Exterior Doors	0	4	ea	\$150	\$600
Energy Costs					
Electric Energy	1 - 25	0	kWh	\$0.211	\$0
Fuel oil	1 - 25	-7.5	gallons	\$3.06	(\$654)
Net Present Worth					(\$54)

Senior Center-2: Install Programmable Thermostats

Energy Analysis

Component	Area	R-value	ΔT	kBTU	Boiler Effic	FO Gallons
Wall	2,208	15	-10	-2,743	75%	-28
Window	380	5	-10	-1,416	75%	-15
Roof	2,703	30	-10	-1,679	75%	-17
Floor	828	20	-5	-386	75%	-4
						-64

	Year	Qty	Unit	Base Cost	Year 0 Cost
Life Cycle Cost Analysis					
Construction Costs					
Install programmable thermostats	0	3	ea	\$150	\$450
Energy Costs					
Fuel oil	1 - 25	-64	gallons	\$3.06	(\$5,568)
Net Present Worth					(\$5,118)

Senior Center-3: Install Water-conserving Aerators

Energy Analysis

Fixture	(E) gpm	(N) gpm	Seconds/use	Uses/day	%HW	kBTU	Boiler Effic	FO Gallons
Lavatories	2.5	0.5	12	24	50%	-833	75%	-9

	Year	Qty	Unit	Base Cost	Year 0 Cost
Life Cycle Cost Analysis					
Construction Costs					
Replace lavatory aerators	0	2	ea	\$25	\$50
Energy Costs					
Fuel oil	1 - 25	-9	gallons	\$3.06	(\$745)
Net Present Worth					(\$695)

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Senior Center-4: Upgrade Interior Lighting

Energy Analysis

	Number	Old Watts	New Watts	Hours/yr	Watts	kWh
CFL	2	75	20	260	-110.0	-29
2-lamp	2	96	68	2,548	-56.0	-143
4-lamp	4	196	136	2,548	-240.0	-612
	8				-406.0	-783

Life Cycle Cost Analysis

	Year	Qty	Unit	Base Cost	Year 0 Cost
Construction Costs					
Retrofit 2-lamp fixture	0	2	fixtures	\$42.00	\$84
Retrofit 4-lamp fixture	0	4	fixtures	\$64.00	\$256
Replace incandescent lamps with CFL	0	2	fixtures	\$15.00	\$30
Energy Costs					
Electric Energy	1 - 25	-783	kWh	\$0.211	(\$2,909)
Net Present Worth					(\$2,539)

Senior Center-5: Upgrade Boiler

Energy Analysis

Exist Gallons	Exist Effic	Load, Gallons	New Effic	New Gallons	Savings
1,490	81%	1,207	84%	1,437	-53

Life Cycle Cost Analysis

	Year	Qty	Unit	Base Cost	Year 0 Cost
Construction Costs					
Replace boiler	0	1	ea	\$6,500	\$6,500
Replace boiler	10	-1	ea	\$6,500	(\$5,385)
Energy Costs					
Fuel oil	1 - 25	-53	gallons	\$3.06	(\$4,641)
Net Present Worth					(\$3,526)

Senior Center-6: Insulate Boiler Room Piping

Energy Analysis

Length	Q _{exist}	Q _{new}	kBTU	Boiler Effic	FO Gallons
45	18	11	-2,759	75%	-28

Life Cycle Cost Analysis

	Year	Qty	Unit	Base Cost	Year 0 Cost
Construction Costs					
Insulate heating piping	0	45	lnft	\$15	\$675
Energy Costs					
Fuel oil	1 - 25	-28	gallons	\$3.06	(\$2,468)
Net Present Worth					(\$1,793)

Senior Center-7: Replace Exit Signs

Energy Analysis

Number	Watts _{exist}	Watts _{new}	Savings _{kWh}
4	30	2	-981

Life Cycle Cost Analysis

	Year	Qty	Unit	Base Cost	Year 0 Cost
Construction Costs					
Replace exit lights	0	4	ea	\$250	\$1,000
Energy Costs					
Electric Energy	1 - 25	-981	kWh	\$0.211	(\$3,646)
Net Present Worth					(\$2,646)

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Energy and Life Cycle Cost Analysis

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Senior Center-8: Install Point-of-use HW Heater

Energy Analysis

	<u>T_hot</u>	<u>T_cold</u>	<u>Length_ft</u>	<u>Gallons</u>	<u>kBTU</u>	<u>Boiler Effic</u>	<u>FO Gallons</u>	<u>kWh</u>
Cooling	120	55	70	3	-402	75%	-4	
	Length	BTU/ft	Hours					
Heat Loss	70	12	2,548		-2,140	75%	-22	
	Use /day	sec/use						
HW Use	24	12		624	416	75%	-4	122
				627			-30	122

Life Cycle Cost Analysis

	<u>Year</u>	<u>Qty</u>	<u>Unit</u>	<u>Base Cost</u>	<u>Year 0 Cost</u>
Construction Costs					
Install point-of-use HW heater	0	1	ea	\$1,000	\$1,000
Energy Costs					
Electric Energy	1 - 25	122	kWh	\$0.211	\$453
Fuel oil	1 - 25	-30	gallons	\$3.06	(\$2,647)
Net Present Worth					(\$1,194)

Senior Center-9: Increase Attic Insulation

Energy Analysis

<u>Area</u>	<u>R-old</u>	<u>R-new</u>	<u>kBTU</u>	<u>Boiler Effic</u>	<u>Fuel_gals</u>
2,703	35	54	-5,453	75%	-54

Life Cycle Cost Analysis

	<u>Year</u>	<u>Qty</u>	<u>Unit</u>	<u>Base Cost</u>	<u>Year 0 Cost</u>
Construction Costs					
Install R-19 batt insulation in attic	0	2,703	sqft	\$1.50	\$4,055
Energy Costs					
Fuel oil	1 - 25	-54	gallons	\$3.06	(\$4,697)
Net Present Worth					(\$643)

Senior Center-10: Install Baseboard Heaters

Energy Analysis

	<u>T_exist</u>	<u>T_new</u>	<u>R-value</u>	<u>Area</u>	<u>kBTU</u>	<u>Boiler Effic</u>	<u>FO Gallons</u>
Perimeter	85	55	25	828	-8,704	75%	-89
Floor	85	55	60	2,703	-11,839	75%	-121
					-20,543		-211

Life Cycle Cost Analysis

	<u>Year</u>	<u>Qty</u>	<u>Unit</u>	<u>Base Cost</u>	<u>Year 0 Cost</u>
Construction Costs					
Install baseboard heating units	0	100	lnft	\$45	\$4,500
Reconfigure crawlspace piping	0	1	LS	\$6,000	\$6,000
Insulate heating piping in crawlspace	0	400	lnft	\$12	\$4,800
Seal and insulate floor grilles	0	1	LS	\$2,000	\$2,000
Energy Costs					
Fuel oil	1 - 25	-211	gallons	\$3.06	(\$18,376)
Net Present Worth					(\$1,076)

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Senior Center-11: Replace Single Pane Windows

Energy Analysis

	Area	R-value	kBTU	Boiler Effic	Fuel_gals
Exist Windows	380	-1.25	-54,906	75%	-542
New Windows	380	5.0	13,727	75%	136
Total			-41,180		-407

Life Cycle Cost Analysis	Year	Qty	Unit	Base Cost	Year 0 Cost
Construction Costs					
Replace windows	0	380	sqft	\$85	\$32,300
Energy Costs					
Fuel oil	1 - 25	-407	gallons	\$3.06	(\$35,471)
Net Present Worth					(\$3,171)

Senior Center-12: Install Boiler Room Heat Recovery

Energy Analysis

Input MBH	Factor	Loss, MBH	Factor	Recovery, MBH	Recovery, kBTU	Boiler Effic	FO Gallons	CFM
300	1.5%	4.5	25%	-1.1	-7,290	75%	-75	200

Life Cycle Cost Analysis	Year	Qty	Unit	Base Cost	Year 0 Cost
Construction Costs					
Heat Recovery Unit, 200 cfm	0	1	ls	\$3,500	\$3,500
Supply and return ductwork and grilles	0	1	ls	\$2,000	\$2,000
Electric	0	1	ls	\$750	\$750
Annual Costs					
HRU Maintenance	1 - 25	1	hr	\$60.00	\$1,163
Energy Costs					
Fuel oil	1 - 25	-75	gallons	\$3.06	(\$6,521)
Net Present Worth					\$892

Senior Center-13: Turn Off Boiler During Summer

Energy Analysis

Boiler Heat Loss	Input MBH	Factor	Loss, kBTU	Boiler Effic	FO Gallons
	300	1.5%	-9,720	75%	-100

Hot Water Use	Gal/day	Gal/summer	kBTU	Boiler Effic	Fuel_gals	kWh
Kitchen	150	9,000	6,005	75%	-62	1,759
Toilets	2	96	64	75%	-1	19
Total		9,096	6,069		-62	1,778

Life Cycle Cost Analysis	Year	Qty	Unit	Base Cost	Year 0 Cost
Construction Costs					
Install electric HW heater, 120 gallon	0	1	ea	\$10,000	\$10,000
Install point-of-use HW heater	0	1	ea	\$1,000	\$1,000
Electrical service to HW heater	0	1	ea	\$1,500	\$1,500
Energy Costs					
Electric Energy	1 - 25	1,778	kWh	\$0.211	\$6,607
Fuel oil	1 - 25	-162	gallons	\$3.06	(\$14,123)
Net Present Worth					\$4,984

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Senior Center-14: Install Crawlspace Perimeter Insulation

Energy Analysis

Area	R-old	R-new	ΔT	kBTU	Boiler Effic	Fuel_gals
828	14	24	15	-3,238	75%	-32

Life Cycle Cost Analysis	Year	Qty	Unit	Base Cost	Year 0 Cost
Construction Costs					
Install 2" XPS insulation	0	714	sqft	\$6.00	\$4,284
Energy Costs					
Fuel oil	1 - 25	-32	gallons	\$3.06	(\$2,789)
Net Present Worth					\$1,495