

Tribal Facilities Retrofits

"Freeing up resources through reduced demand"

2015 PROGRAM REVIEW

Central Council Tlingit & Haida Indian Tribes of Alaska

Elias Duran – Project Manager

Welcome!

Elias Duran – Property Manager

- Day to day operations of facilities
- Budget control over facilities
- Project needs for future space requirements
- Maintenance
- Capital improvements

Presentation Overview

- Brief history of the Tlingit & Haida Tribes
- Tour of our Juneau facilities
- Historical utility cost data
- Summary of Project Objectives
- Expected cost and emission reductions
- Strategic planning for future implementation

Our Proud Heritage



Two separate Tribes



United by common challenges

Surrounded by vast natural resources

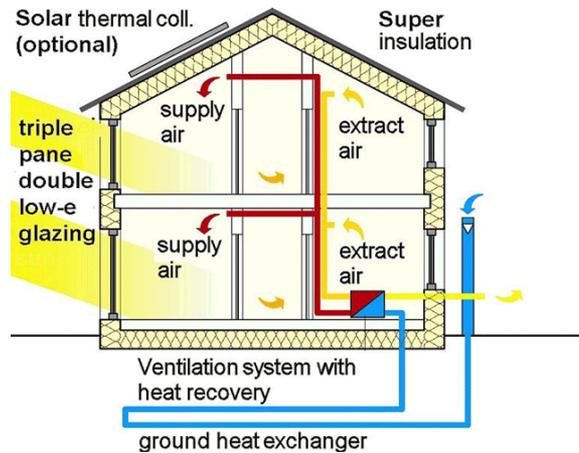


Our Challenges

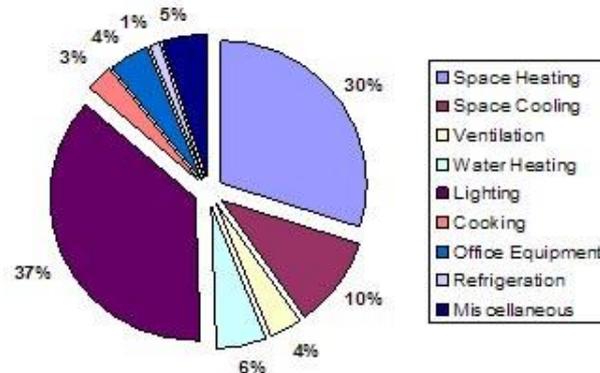
- **Services**

Central Council offers a variety of family-centered services focused on promoting and supporting safe and stable families. These services assist individuals in attaining the education and skills necessary to support healthy lifestyles, develop meaningful careers and engage in the traditional activities of their communities.

Striving to do more with less



Money Isn't All You're Saving



Energy Audit

PARTNERENERGY

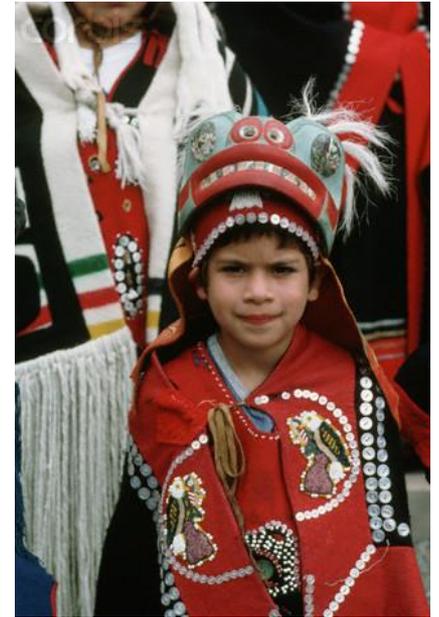
- On site inspection of our tribal facilities
- Evaluated each building's energy consumption
- Prepared Level II Audit
- Delivered list of Energy Efficiency Measures to address in retrofits

Andrew Hope Building

- Central Council Headquarters
- Approx. 41,000 square feet over three levels
- Constructed in 1985
- Wood Frame Construction



Elizabeth Peratrovich Hall



Biennial Celebration Event 2010

Energy Audit Findings

Hope Building

Recommended Energy Efficiency Measure	Estimated Installed Cost	Annual Cost Savings	Available Rebates	Simple Payback (Yrs)
Occupancy Sensors	\$4,270	\$3,871	N	1.1
CO/2 Demand Ventilation Control	\$8,400	\$11,013	N	.8
Variable Frequency Drives & High Efficiency Motors on AHU Supply Fans	\$14,000	\$1,704	N	8.2
Lighting Upgrade w/delamping	\$57,411	\$11,439	N	5
New High Efficiency Boilers w/night setback and Electric Hot Water Heater	\$77,300	\$4,318	N	17.9

Edward K. Thomas Building

- Constructed in 1982
- Approx. 11500 sf over 2 floors
- Admin Offices



Energy Audit Findings

Edward K. Thomas Building

Recommended Energy Efficiency Measure	Estimated Installed Cost	Annual Cost Savings	Available Rebates	Simple Payback (Yrs)
Occupancy Sensors	\$2,030	\$835	N	2.4
High Efficiency Boilers w/night setback and Electric Hot Water Heater	\$37,300	\$6,621	N	5.6
Lighting Upgrade w/delamping	\$17,309	\$2,577	N	6.7

Douglas Headstart

- Built in 1962
- Approx. 3700 s.f. over 2 floors
- Wood Frame
- Mostly original construction
- Headstart program



Energy Audit Findings

Douglas Headstart

Recommended Energy Efficiency Measure	Estimated Installed Cost	Annual Cost Savings	Available Rebates	Simple Payback (Yrs)
Occupancy Sensors	\$1,170	\$115	N	10.1
High Efficiency Boilers w/night setback	\$37,700	\$1,359	N	27.7
Lighting Upgrade w/delamping	\$3,263	\$243	N	13.4

VTRC

- Vocational Training & Resource Center
- Approx. 9800 sf
- Built in 1998
- Open to public
- Employee and Client training services



Energy Audit Findings

VTRC

Recommended Energy Efficiency Measure	Estimated Installed Cost	Annual Cost Savings	Available Rebates	Simple Payback (Yrs)
Occupancy Sensors	\$1,980	\$981	N	2.0
High Efficiency Boilers w/night setback	\$77,300	\$3,817	N	20.3
Lighting Upgrade w/delamping	\$11,555	\$1,397	N	8.3
Programmable T-stats w/night setback	\$21,000	\$1,981	N	10.6

Aggregate EEM's

Energy Efficiency Measure (EEM)	Hope Bldg	EKT	Vocational	Tribal Courthouse	Warehouse	Douglass Headstart
Lighting Occupancy Sensors	X	X	X	X		X
Lighting Upgrade with Delamping	X	X	X			X
VFDs & Premium Efficiency Motors on AHU Supply Fans	X					
New High Efficiency Modulating Boilers with Night Setback	X	X	X			X
Temperature Heating Setpoint Night Setback			X		X	
CO2 Demand Ventilation Control	X					

This summary of EEM's became our workplan for the retrofits

Launching our Retrofit Project



New Boilers Installed



Phase 2 Lighting Upgrades



Disaster Strikes



Disaster Strikes



Disaster Strikes



Third Floor Demolition



Third Floor Demolition



Third Floor Demolition



Third Floor Demolition



Third Floor Demolition



EP Hall (Before)



EP Hall Demolition



EP Hall Demolition



Rebuild



Rebuild



Rebuild



Third Floor Rebuild



Opportunities

- As part of the rebuild project we contacted DOE and requested reallocating our remaining grant funds to make lighting upgrades to the Andrew Hope building.
- New LED lighting fixtures, relays and controls were installed

Cost Comparison

- **Comparing The Cost To Light Annually**
- Lets say you have existing 2 lamp T12 fixtures in an office environment:
- We have 100 total fixtures that run 11 hours a day at .11 cents per KWH.
- **T12 Fluorescent-** $100 \times 165 \text{ watts} = 16,500\text{W}/1000 = 16.5 \text{ KW}$
- $16.5\text{KW} \times 4016 \text{ annual hrs} = 66,264 \text{ KWH yearly}$
- $66,264\text{KWH} \times .11\text{cents per KWH} = \underline{\$7,289.04 \text{ annually to run}}$
- **VS.**
- **2x2 LED Troffer-** $100 \times 36 = 3600\text{W}/1000 = 3.6 \text{ KW}$
- $3.6\text{KW} \times 4016 \text{ annual hrs.} = 14,458 \text{ KWH yearly}$
- $14,458\text{KWH} \times .11\text{cents per KWH} = \underline{\$1590.38 \text{ annually to run.}}$
- ***Savings = \$5,698.66 per year***

EP Hall Renovation



Phase 2 Third Floor Rebuild



Third Floor Rebuild



Third Floor Rebuild



Third Floor Rebuild



Third Floor Rebuild



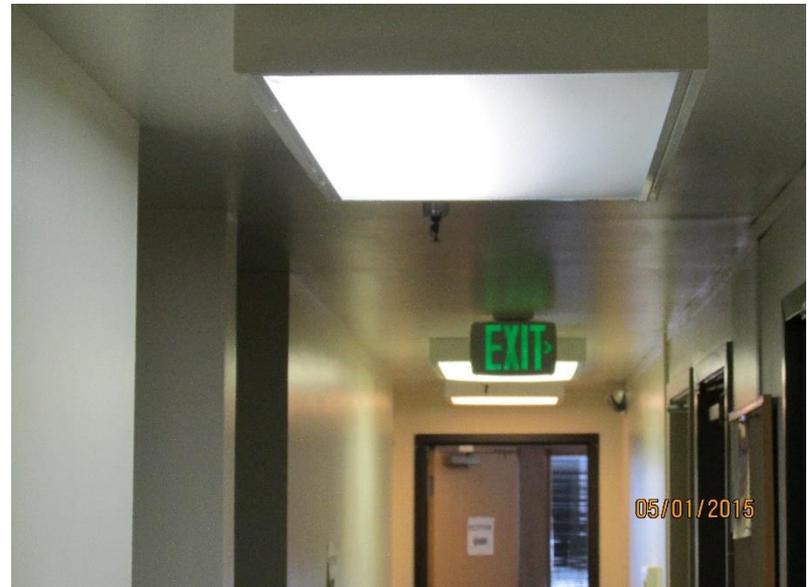
Third Floor Rebuild



So What's Next



Continue with LED upgrades for entire building



Cost Comparison



Lighting Analysis Tlingit & Haida Tribe of Alaska September 2014

Cost of Energy (\$/KWH)

0.10

Luminaire Designation	Existing	New
A	Recessed 2x4 fluorescent Troffer T8	2x4 LED troffers, switch controlled
B	Recessed 2x2 fluorescent	2x2 LED troffers, switch controlled
C	Recessed Linear fluorescent	wall mount led over mirror and on ceiling over stalls, occupancy sensor controlled
D	Recessed lowered fluorescent T5	Wall mount linear LED
E	Recessed can downlight fluorescent	Recessed Can Downlight LED
F	Enclosed 2 Lamp, 4ft Linear T12 Fluorescent	4ft linear lensed led recessed with occupancy sensor control
G	Exterior wall mounted HID	Exterior Wall mounted LED
H		Lighting Control Station
I		Occupancy Dual
J		Occupancy power Pack
K		Photoelectric Cell
L		Lighting Control Panels

Existing System operating full time at full brightness

Time of Operation (hrs/yr)	2600												Total
Luminaire Type	A	B	C	D	E	F	G	H	I	J	K	L	Total
Quantity of Luminaires	253	8	18	20	71	26	6	0	0	0	0	0	
Luminaire Power Demand (W)	188	188	188	188	188	188	188						
Energy Consumption (KWH)	123,666	3,910	8,798	9,776	34,705	12,709	2,933						196,498
Energy Cost (\$/yr)	\$12,367	\$391	\$880	\$978	\$3,470	\$1,271	\$293						\$19,650
Maintenance Cost per Luminaire (\$/yr)	20	20	20	20	20	20	20	0	0	0	0	0	
Total Maintenance Cost (\$/yr)	\$5,060	\$160	\$360	\$400	\$1,420	\$520	\$120						\$8,040
Replacement Cost per Luminaire (\$)	0	0	0	0	0	0	0	0	0	0	0	0	
Total Replacement Cost (\$)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost - 15 Years (\$)													\$415,346

New: LED Luminaires with occupancy controls

Time of Operation (hrs/yr)	1950												Total
Luminaire Type	A	B	C	D	E	F	G	H	I	J	K	L	Total
Quantity of Luminaires	217	6	11	7	53	22	6	45	39	10	1	3	
Luminaire Power Demand (W)	75	39	65	55	47	61	60						
Energy Consumption (KWH)	31,736	456	1,394	751	4,857	2,617	702	0	0	0	0	0	42,514
Energy Cost (\$/yr)	\$3,174	\$46	\$139	\$75	\$486	\$262	\$70						\$4,251
Maintenance Cost per Luminaire (\$/yr)	5	5	5	5	5	5	5	0	0	0	0	0	
Total Maintenance Cost (\$/yr)	\$1,085	\$30	\$55	\$35	\$265	\$110	\$30	\$0	\$0	\$0	\$0	\$0	\$1,610
Replacement Cost per Luminaire (\$)	650	600	740	830	694	664	1087	676	498	690	344	3744	
Total Replacement Cost (\$)	\$141,050	\$3,600	\$8,140	\$5,810	\$36,782	\$14,608	\$6,522	\$30,420	\$19,422	\$6,900	\$344	\$11,232	\$266,354
Total Cost - 15 Years (\$)													\$87,921
Simple Payback (yrs)													12.20

HVAC

Our new retrofit project will add;

- New DDC (Direct Digital Controls)
- VFD's (Variable Frequency Drives on pumps and return/supply air)
- New VAV boxes (Variable Air Volume)



Finally

- This is the end of my presentation.
- Thank you