Tribal Facilities Retrofits
“Freeing up resources through reduced demand”

2015 PROGRAM REVIEW
Central Council Tlingit & Haida Indian Tribes of Alaska
Elias Duran – Project Manager
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

- Solar thermal coll. (optional)
- Super insulation
- triple pane double low-e glazing
- Ventilation system with heat recovery
- ground heat exchanger

![Energy Star Logo]

Money Isn't All You're Saving

- Space Heating
- Space Cooling
- Ventilation
- Water Heating
- Lighting
- Cooking
- Office Equipment
- Refrigeration
- Miscellaneous

![Piggy Bank in Grass]
Energy Audit

- 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

<table>
<thead>
<tr>
<th>Recommended Energy Efficiency Measure</th>
<th>Estimated Installed Cost</th>
<th>Annual Cost Savings</th>
<th>Available Rebates</th>
<th>Simple Payback (Yrs)</th>
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<tbody>
<tr>
<td>Occupancy Sensors</td>
<td>$4,270</td>
<td>$3,871</td>
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<td>CO/2 Demand Ventilation Control</td>
<td>$8,400</td>
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<td>Variable Frequency Drives &amp; High Efficiency Motors on AHU Supply Fans</td>
<td>$14,000</td>
<td>$1,704</td>
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<td>$57,411</td>
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<td>New High Efficiency Boilers w/night setback and Electric Hot Water Heater</td>
<td>$77,300</td>
<td>$4,318</td>
<td>N</td>
<td>17.9</td>
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</tbody>
</table>
Edward K. Thomas Building

- Constructed in 1982
- Approx. 11500 sf over 2 floors
- Admin Offices
## Energy Audit Findings

### Edward K. Thomas Building

<table>
<thead>
<tr>
<th>Recommended Energy Efficiency Measure</th>
<th>Estimated Installed Cost</th>
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<th>Available Rebates</th>
<th>Simple Payback (Yrs)</th>
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<tbody>
<tr>
<td>Occupancy Sensors</td>
<td>$2,030</td>
<td>$835</td>
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<td>High Efficiency Boilers w/night setback and Electric Hot Water Heater</td>
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<tr>
<td>Lighting Upgrade w/delamping</td>
<td>$17,309</td>
<td>$2,577</td>
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</table>
Douglas Headstart

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

## Douglas Headstart

<table>
<thead>
<tr>
<th>Recommended Energy Efficiency Measure</th>
<th>Estimated Installed Cost</th>
<th>Annual Cost Savings</th>
<th>Available Rebates</th>
<th>Simple Payback (Yrs)</th>
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<tr>
<td>Occupancy Sensors</td>
<td>$1,170</td>
<td>$115</td>
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<td>High Efficiency Boilers w/night setback</td>
<td>$37,700</td>
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<td>Lighting Upgrade w/delamping</td>
<td>$3,263</td>
<td>$243</td>
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Vocational Training & Resource Center

- Approx. 9800 sf
- Built in 1998
- Open to public
- Employee and Client training services
## Energy Audit Findings

### VTRC

<table>
<thead>
<tr>
<th>Recommended Energy Efficiency Measure</th>
<th>Estimated Installed Cost</th>
<th>Annual Cost Savings</th>
<th>Available Rebates</th>
<th>Simple Payback (Yrs)</th>
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<td>Occupancy Sensors</td>
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<td>$981</td>
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<td>$3,817</td>
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<td>Programmable T-stats w/night setback</td>
<td>$21,000</td>
<td>$1,981</td>
<td>N</td>
<td>10.6</td>
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## Aggregate EEM’s

<table>
<thead>
<tr>
<th>Energy Efficiency Measure (EEM)</th>
<th>Hope Bldg</th>
<th>EKT</th>
<th>Vocational</th>
<th>Tribal Courthouse</th>
<th>Warehouse</th>
<th>Douglass Headstart</th>
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<tbody>
<tr>
<td>Lighting Occupancy Sensors</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>Lighting Upgrade with Delamping</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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<tr>
<td>VFDs &amp; Premium Efficiency Motors on AHU Supply Fans</td>
<td>X</td>
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<tr>
<td>New High Efficiency Modulating Boilers with Night Setback</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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<tr>
<td>Temperature Heating Setpoint Night Setback</td>
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<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>CO₂ Demand Ventilation Control</td>
<td>X</td>
<td></td>
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</table>

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
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
Comparing The Cost To Light Annually

Let's 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 X 165 watts = 16,500W/1000 = 16.5 KW
  - 16.5KW X 4016 annual hrs = 66,264 KWH yearly
  - 66,264KWH X .11cents per KWH = **$7,289.04 annually to run**

VS.

- **2x2 LED Troffer** - 100 X 36 = 3600W/1000 = 3.6 KW
  - 3.6KW X 4016 annual hrs. = 14,458 KWH yearly
  - 14,458KWH X .11cents per KWH = **$1590.38 annually to run.**

**Savings = $5,698.66 per year**
EP Hall Renovation

09/05/2014
Third Floor Rebuild
Third Floor Rebuild
Third Floor Rebuild
Third Floor Rebuild
So What’s Next

Continue with LED upgrades for entire building
## Lighting Analysis
### Tlingit & Haida Tribe of Alaska
#### September 2014

### Cost of Energy ($/KWH)

<table>
<thead>
<tr>
<th>Luminaire Type</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity of Luminaries (W)</td>
<td>188</td>
<td>188</td>
<td>188</td>
<td>188</td>
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<tr>
<td>Energy Consumption (KWH)</td>
<td>123,666</td>
<td>3,010</td>
<td>8,738</td>
<td>9,776</td>
<td>24,725</td>
<td>12,709</td>
<td>2,333</td>
<td>196,456</td>
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<tr>
<td>Energy Cost ($/yr)</td>
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<td>231</td>
<td>660</td>
<td>1,376</td>
<td>2,333</td>
<td>2,171</td>
<td>323</td>
<td>196,456</td>
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<tr>
<td>Maintenance Cost per Luminaire ($/yr)</td>
<td>5.000</td>
<td>140</td>
<td>360</td>
<td>440</td>
<td>500</td>
<td>1,271</td>
<td>1,271</td>
<td>8,040</td>
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<tr>
<td>Total Maintenance Cost ($/yr)</td>
<td>5,060</td>
<td>1,420</td>
<td>273</td>
<td>1,394</td>
<td>1,420</td>
<td>1,271</td>
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<td>8,040</td>
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<tr>
<td>Total Cost - 15 Years ($)</td>
<td>87,921</td>
<td>8,660</td>
<td>18,660</td>
<td>21,736</td>
<td>19,422</td>
<td>11,232</td>
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<td>12.20</td>
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### New: LED Luminaires with occupancy controls

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<th>Luminaire Type</th>
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<td>188</td>
<td>188</td>
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<tr>
<td>Energy Consumption (KWH)</td>
<td>31,736</td>
<td>1,394</td>
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<td>751</td>
<td>520</td>
<td>400</td>
<td>293</td>
<td>4,857</td>
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<tr>
<td>Energy Cost ($/yr)</td>
<td>8,140</td>
<td>1,271</td>
<td>2,333</td>
<td>1,271</td>
<td>1,271</td>
<td>1,271</td>
<td>1,271</td>
<td>8,140</td>
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<tr>
<td>Total Cost - 15 Years ($)</td>
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<td>8,040</td>
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</table>

### Simple Payback (yr)

12.20
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