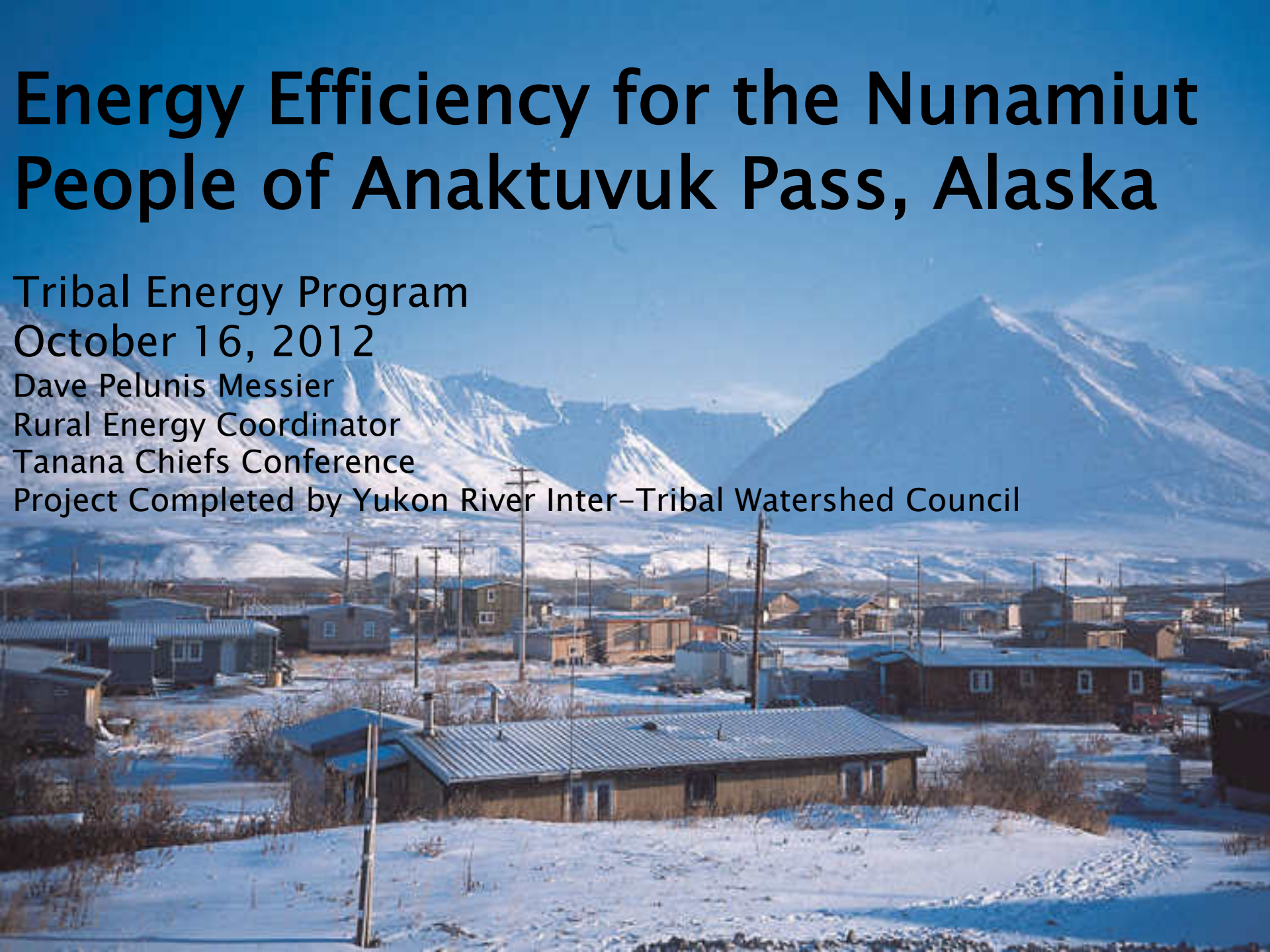
Energy Efficiency for the Nunamiut People of Anaktuvuk Pass, Alaska



Tribal Energy Program
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Tanana Chiefs Conference
Project Completed by Yukon River Inter-Tribal Watershed Council

Nunamiut Corporation

- Nunamiut People- Inland Eskimo of Alaska
- Anaktuvuk – *place of caribou droppings*
- Corp = The Local Wal-Mart
  Hardware Store, Bank, Grocery Store, Restaurant, Hotel, Gas Station, radio station
- Energy:
  $.20-$.35/kWh, $9.25/gal oil

But let's be serious….
$8gal/13.8kwh = **$.579/kWh**

Buildings

- Village Store – 6,000 sq ft
- Village Restaurant (4,200 sq ft)
- Corporation Office/Hotel
- Managers House (732 sq ft)
- Nunamiut Corp Shop (7,000 sq ft)

Project Goals:

1. Reduce Energy Consumption in Corp. Buildings

2. Save Nunamiut Corp $

3. Involve the Community in Energy Efficiency– quantify and report results from the project

How Do We Achieve These Goals?

- LED Lighting, Efficient Controls
- High Efficiency Furnaces
- Improved Building Shell

How much is this timer wort

Economics and Energy Education

Payback on Lights:

T-12 Electromagnetic:

# of Bulbs:	*X*	*kW (consumed during use)*	*X*	*Hrs/Day*	*X*	*Days/yr*	*=*	*kWh/yr*	*X*	*kWh Rate*	*=*	*Cost/yr*	*/*	*# Units*	*=*	*Operating cost- per bulb for 1yr*
132	X	.04	X	10	X	350	=	18,480	X	$.35/kWh	=	$6,468	/	132	=	$49.00

LED Bulbs:

# of bulbs:	*X*	*kW (consumed during use)*	*X*	*Hrs/Day*	*X*	*Days/yr*	*=*	*kWh/yr*	*X*	*kWh Rate*	*=*	*Cost/yr*	*/*	*# Units*	*=*	*Operating cost- per bulb for 1yr*
132	X	.015	X	10	X	350	=	6,930	X	$.35/kWh	=	$2,425.5	/	132	=	$18.375

Expected Bulb Lifespan= 50,000 hrs
@ 10hrs/day ; 14 years

Estimated SAVINGS by switching from t-12 to LED ; $4,043/yr

Savings per bulb $30.62/yr
Payback per bulb (labor not included) = 1.6 yrs

Estimated Savings per bulb over 14 yr lifetime = $428.68/bulb x 132bulbs = $56,585.76

Insulate and Seal

- Triple Pane Windows in the Restaurant
- Blow in Cellulose
- Caulk and Seal

The Village Store

- Yearly Utility Cost to operate 3,200 sq ft store: $60k

  Can anybody guess what the majority of that $ is being spent on?

The Village Restaurant

- Yearly Utility Cost to operate 4,200 sq ft restaurant - $45K
  - Insulation
  - Heat Trace
  - Windows/Doors

Corporation Office

- Yearly Utility Cost to operate Corp Office/Hotel building - $30K
  - Insulation
  - Sealant
  - Minimizing Load
  - Efficient Use of Space

Nunamiut Corp Shop

Original setup

- 12 x 400 watt/ HID Highbay = ? kW

Option 1: Replace with t5

- 12 x 324 watt/fixture t5 = ? kW

Option 2: Replaced with LED Highbay

12 x 120 watt/LED highbay = ? kW

Nunamiut Corp Shop

Original setup

- 12 x 400 watt/ HID Highbay =4.8 kW
  4.8 kW x 6000hrs x .25/kWh = $7,200

Option 1: Replace with t5

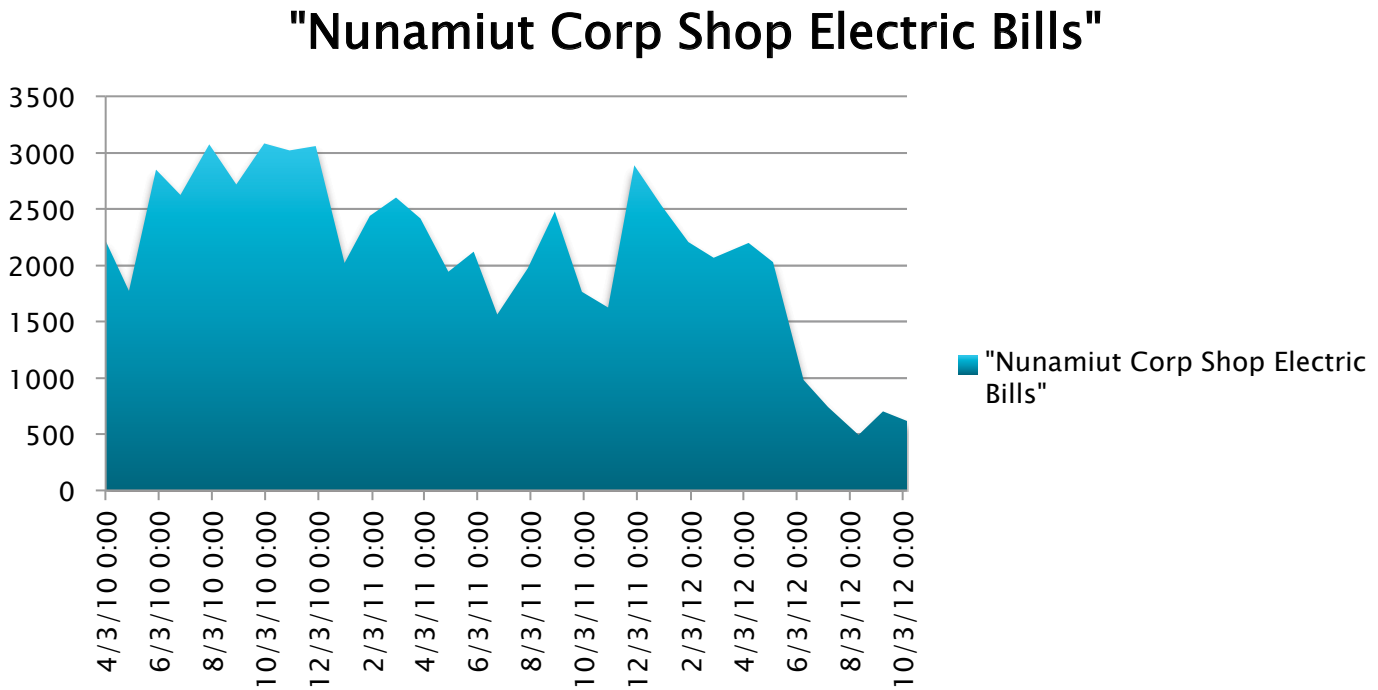
- 12 x 324 watt/fixture t5 = 3.88 kW
  3.88 x 6000 hrs x .25/kWh = $5,820

Option 2: Replace with LED Highbay

- **12 x 120 watt/LED highbay = 1.44 kW**
  1.44 x 6000 hrs x .25 = $2,160

Nunamiut Shop Electric Bills

Can you guess when we changed the lights?



RESULTS

Building	5 yr $ Savings	Cost of Materials	5 yr kWh Savings
Corp Office	[illegible]	[illegible]	[illegible]
Store	[illegible]	[illegible]	[illegible]
Shop	[illegible]	[illegible]	[illegible]
Restaurant	[illegible]	[illegible]	[illegible]
TOTAL	[illegible]	[illegible]	[illegible]

Gallons of Diesel Saved at 13.8kWh/gal:

30,029 Gal

@ $8/gal = $240,233

Comparison…

- 4.4 kW solar array in Nenana, AK
  - installed cost of ~$5/watt = ~$20k
  - 5,100kwh/yr production
  - 5 year energy production: 25,500 kWh's
  - At Anaktuvuk Pass rates: <u>11 yr payback period</u>

Thank you

QUESTIONS?