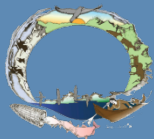


Interior Athabaskan Energy Capacity Building Network

Wes Alexander

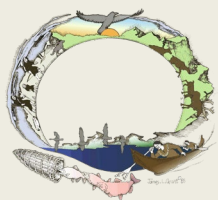
TCC Rural Energy Specialist

wes.alexander@tananachiefs.org



Tanana
Chiefs
Conference

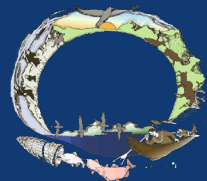
*"Stronger Together
for the Next 100 Years"*



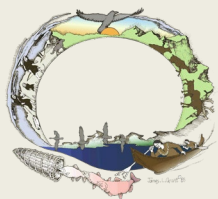
The Organization

Tanana Chiefs Conference is a Tribal Consortium representing 42 federally recognized tribes, and 37 villages.

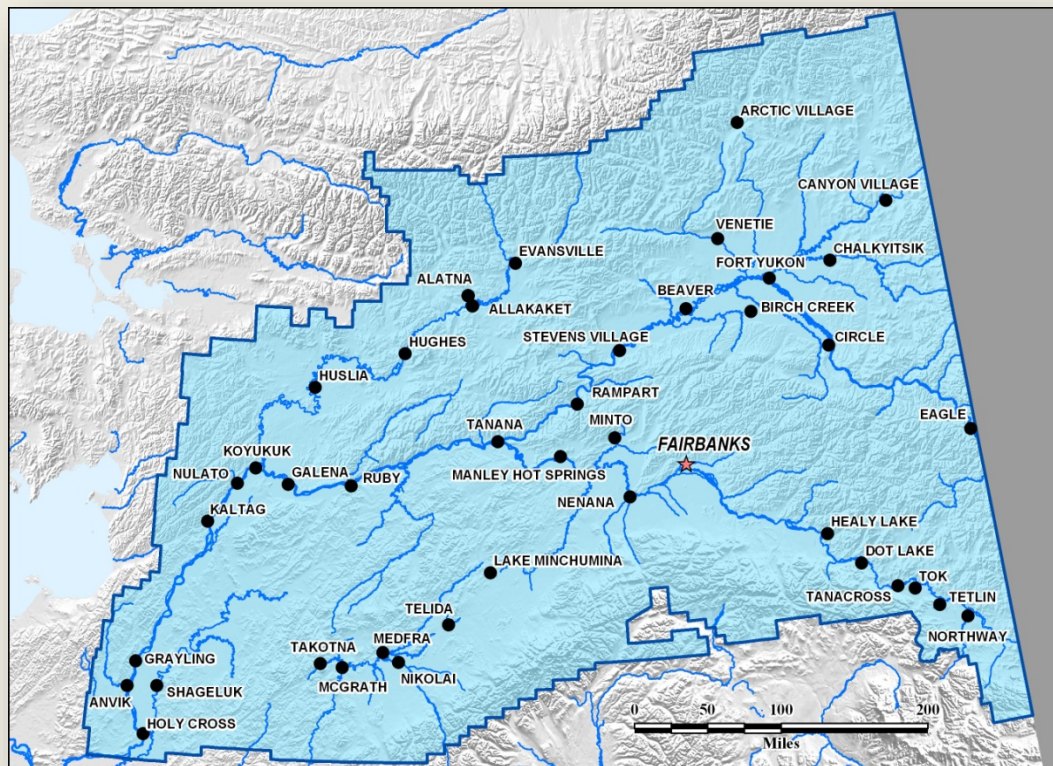
MISSION: “Tanana Chiefs Conference provides a unified voice in advancing sovereign tribal governments through the promotion of physical and mental wellness, education, socioeconomic development, and culture of the Interior Alaska Native people.”



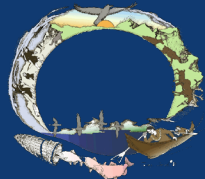
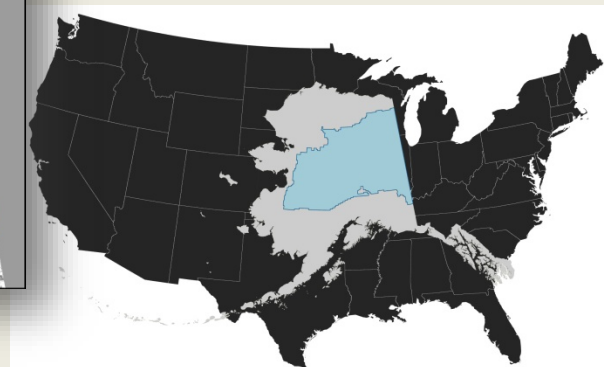
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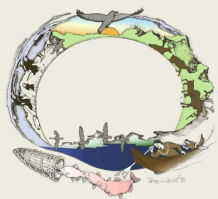
The Region



- 235,000 Square Miles
- 37% of the State
- Extreme Subarctic
- Majority off road system
- Avg. Village population is 100-150 people, 75KW
- Roughly the size of Texas, fewer miles of road than Rhode Island

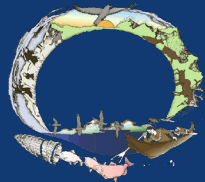


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IAECBN Goals

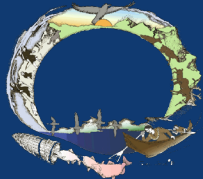
1. Reduce the cost of Energy in Rural Alaska
2. Build Capacity in Rural Communities
3. DO NOT get overwhelmed by the enormity of the challenge



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IAECBN 1st & 2nd Year Punch List

- Implement Interior Athabascan Energy Network (IAEN), hold quarterly meetings.
- Host annual in person energy meetings.
- Develop a high energy efficiency building performance standard.
- Build a capacity building “Power Pool” network.
- Create a series of 15 minute videos.
- Craft case studies of past energy projects.
- Form Community Energy Action Plans. CEAP’s



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IAEN Teleconferences



Tanana
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122 1st Ave. Suite 600
Fairbanks, AK 99701
907-452-8251

**Q3 Interior Athabascan Energy Capacity Building
Network Teleconference**

November 8th at 9:00am

Dial: 1-877-378-0449 and enter: 4024 8667

The TCC Energy staff will be hosting the third quarter IAECBN teleconference. Topics of discussion will include:

9:00 – 9:05 [Introductions for Everyone on the Phone](#)

9:05 - 9:30 [Updates on Energy Projects Across the Region](#)

- Huslia Biomass Project Update & Overview
- Tanacross Biomass Project Update
- Hughes Utility Scale Solar Electric w/Battery Backup Project
- Northway Solar Projects
- Holy Cross Solar Project
- Ruby, Hughes and Holy Cross LED Retrofit Projects

9:30 – 9:40 [Energy Project Funding Updates](#)





- VW Settlement – New Diesel Generator Engines, Heavy Equipment and Trucks

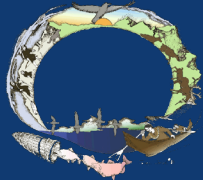
9:40 – 9:45 [Power Plant Maintenance Management System Implementation](#)

- 60 Hertz Computerized Maintenance Management System Update

9:45 – 10:00 [Housing Construction and Weatherization](#)

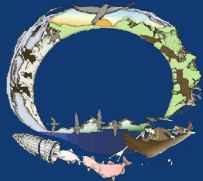
- TCC Housing and Weatherization Update
- IRHA Construction and Rehab Update
- Huslia Multipurpose Building / CCHRC Design Assist
- Holy Cross Tribal Building Weatherization Project

www.tananachiefs.org    



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IAEN Annual In Person Meeting



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Energy Efficient Buildings

- Formed an Agreement with our housing authorities to build to a 6 star minimum.
- Why 6 star?
- Using the AKwarm energy rating software.

Home Energy Rating Certificate

The Building Located At:
728 Cold Snap Ct.
North Pole, Alaska

Has Been Energy-Rated As:
★★★★★★
Six Star

Efficiency Score
96.3 points

1 star 2 star 3 star 4 star 5 star 6 star
0 20 40 60 80 100
BEES Score

Amount of CO2 Produced by the Home
16,900 pounds per year

Projected Annual Energy Costs
\$1,979 per year

Score with Renewables
96.3 points

Estimated Annual Energy Costs
Space Heating \$611
Water Heating \$383
Space Cooling \$0
Lights & Appl. \$984
Renewables \$0

Owner of Record: Interior Regional Housing Authority
Legal Description: LOT 4 BLOCK 5 MENDONE
Previously assessed as: 1S 1E 12 1247
Energy Rater: Dan Spillane
Arctic Technical Services

Date Construction Began: 7/2/2016
Certifying BEES: 2012
Energy Rating Date: 11/7/2016
File: B16102823.hm2
AKwarm: 2.6.1.0 Library: 8/9/2016

I certify that this Energy Rating is true and correct, to the best of my knowledge and belief, and the structure located on the above described property complies with the all the requirements of the building energy efficiency standards as required by Section .04 Part A. of the AHFC New Construction Inspection Guidelines, per the standards adopted by 15 AAC 155.010.

Energy Rater Signature

11-7-16
Date

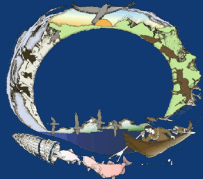
Return to: _____

Form PUR-101 v.3/1/16

TCC HOUSING

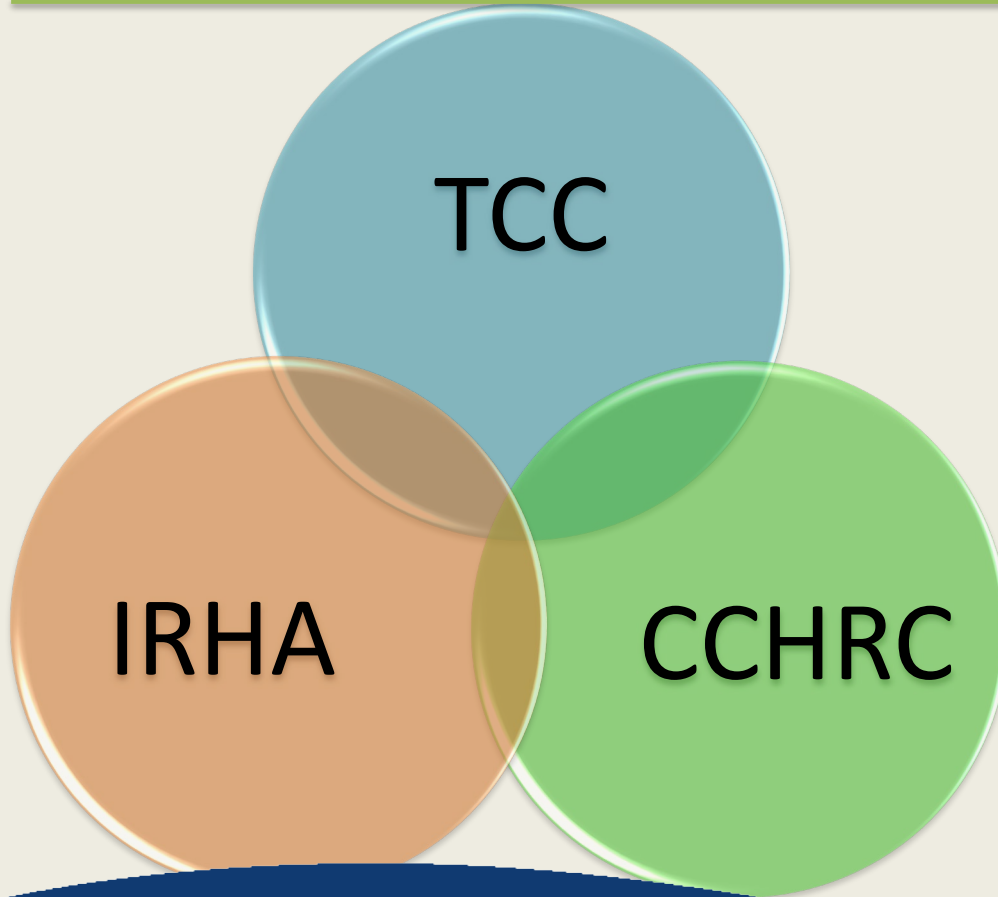


INTERIOR REGIONAL HOUSING AUTHORITY

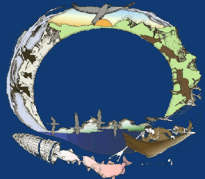


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The Agreement



- Working together to produce results.
- Concluded it's a win for all.



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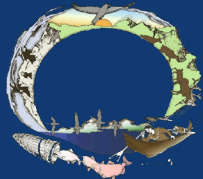
Forming A Power Pool

- Conglomerate of 11 independent Electric utilities.
- Spread across the entire region.
- What is the best way to link link them together?



Beaver	Chalkyitsik
Birch Creek	Ruby
Rampart	Stevens Village
Nikolai	Arctic Village

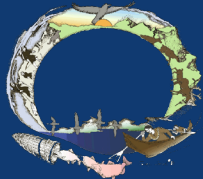
Hughes
Venetie
Koyukuk



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What Could Go Wrong???

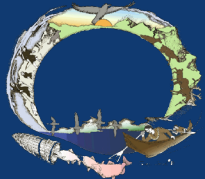
- 100% diesel power generation / 75kw average load.
- Operators have limited mechanical experience.
- No maintenance program.
- No scheduled repair & replacement program.



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Game Plan

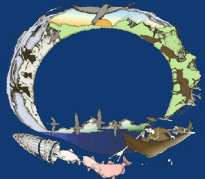
- Assist with sending power plant operators or new recruits to a PPO training and certification program.
- Initiate a Computerized Maintenance Management System.
- Building capacity through a supportive network.



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Maintenance Program

- Partnered with 60Hertz to develop and deploy a CMMS designed for rural Alaskan electric utilities.
- Pilot program included 5 participants from the “Power Pool”.
- What’s working / What’s not?



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Case Studies

- Condensed information
- Quick reading
- Easy to digest
- Accessible on the TCC website, annual energy meetings and the TCC annual convention.

BIOMASS HEAT

Wood heat project reduces fuel oil consumption and fosters community growth

In 2014, planning and construction began to integrate a wood fired boiler into the village of Koyukuk. This was accomplished through the cooperative efforts of Alaska Native Tribal Health Consortium, Koyukuk Tribal Council, Interior Regional Housing Authority and Tanana Chiefs Conference. The community of 90 residents is situated next to the confluence of the Yukon and Koyukuk River which is located about 300 miles west of Fairbanks.

The cold wood fired system is designed to deliver hydronic heat to the public washeteria, clinic and combined tribal & city office building through a series of insulated piping installed 2' underground. The heat is transferred to each building via a heat exchanger and then distributed throughout the buildings through either high mass wall mounted radiators or in-floor radiant heat systems. The two techniques are an effective means to provide space heat using lower temperature water. When this type of system is coupled to buildings with a high thermal performance it forms an ideal combination that results in less wood consumption. With the boiler in operation from the middle of September through early May, it delivers enough BTUs to supply 50% of the annual heating load, which in turn saves the village a significant amount of money otherwise spent on costly imported fuel oil.

Although a sustainable forestry harvest plan is in place, local wood vendors find it most efficient and cost effective to harvest drift wood directly from the Yukon River. The wood is cut into 4' lengths on the bank and then delivered by ATV to the wood storage yard and sold to the city for \$300 per cord.

The boiler is loaded by hand once in the morning and once in the evening. When the outside temperature plunges below -40 degrees, a third firing is necessary as the demand for heat increases.

Project Funding

Department of Energy: \$782,100

State of Alaska: \$89,000

City of Koyukuk: \$50,000

Equipment

1 Gam model 2000 wood boiler

Fuel Oil Savings

Annually: 5000 gallons

Local value: \$32,500 (2017)

Wood Consumption

36 cords annually

Jobs Created

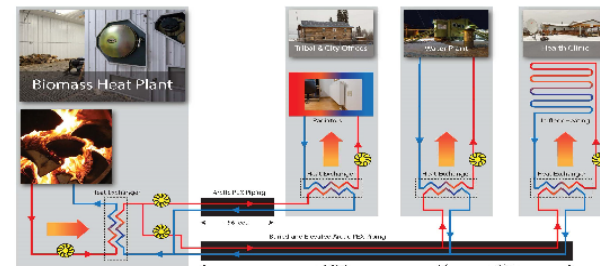
10 seasonal wood harvesters

2 part time boiler operators

Payback Period

28 years

KOYUKUK'S WOOD BOILER DISTRICT HEAT SYSTEM



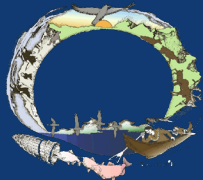
Putting it all together, Koyukuk's Biomass heat Plant currently provides heat for three buildings: the shared city and tribal administration building, water plant, and two 10,000-sq-ft high school buildings. Heat is distributed through radiators and in-floor radiant heating systems. (RF is the common abbreviation for "radiant floor heating," a type of electric or water-based floor heating system.)



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IRHA
INTERIOR REGIONAL HOUSING AUTHORITY



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Shared Information

- Broadcast project info across the region and beyond.
- More to come...

ENERGY EFFICIENCY FIRST

Maximizing building efficiency should always be the first steps taken before any renewable energy system is incorporated into a community.

IPHA made significant improvements to the tribal & city office building prior to connecting it to the wood boiler heating circuit. A 50% overall reduction in energy consumption was achieved through major weatherization efforts. The retrofit consisted of adding insulation to the floor, wall and ceiling components to establish a high R-value building envelope. Triple pane windows, insulated doors, air-sealing and LED lighting were also measures that contributed towards the goal to significantly reduce the demand for heat and electricity. Efficient primary heating systems supplement heat from the wood fired boiler during extremely low temperatures and provide the main source of heat when the boiler is not in use in the Spring and Fall.

A 6kw grid-tie solar electric system was mounted to the roof of the tribal and city office building that supplies 65% of the total annual electrical demand.

Attention to detail was given by ANTHC and TCC during the planning phase of the clinic to ensure low heat loss and high efficiency was a top priority at the time of construction. The building was assembled using a Structural Insulated Panel (SIP) system with additional layers of foam attached to the exterior walls to achieve respective R-values of 50, 60 and 100 in the floor, wall and ceiling components.

The local construction crew members learned that weatherization and building to the highest efficiency standards were the first priority in reducing the amount of fuel oil consumption throughout the village. Koyukuk plans to weatherize additional buildings and will serve to build highly efficient buildings in the future.



City & Tribal Administration Building



Public Washeteria



Health Clinic



ALASKA ENERGY AUTHORITY



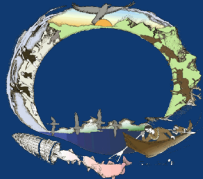
ALASKA NATIVE TRIBAL HEALTH CONSORTIUM



U.S. DEPARTMENT OF ENERGY

Koyukuk Tribal Council

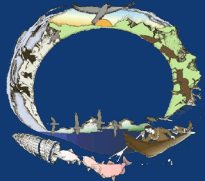
Office of Indian Energy



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Videos

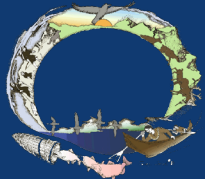
- Spot light on interior energy projects.
- Emphasis on the people that make them a success.
- Operating the video equipment.
- Available on TCC website.



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Community Energy Action Plans / CEAP's

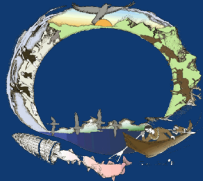
- Simple
- Address lowest hanging fruit.
- Step-by-step format that produces results.
- Also a way to gauge if a community is ready for more sophisticated energy projects.



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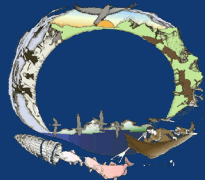
Other Projects / Northway

- “Other duties as assigned”
- Getting boots on the ground and building capacity.



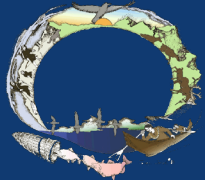
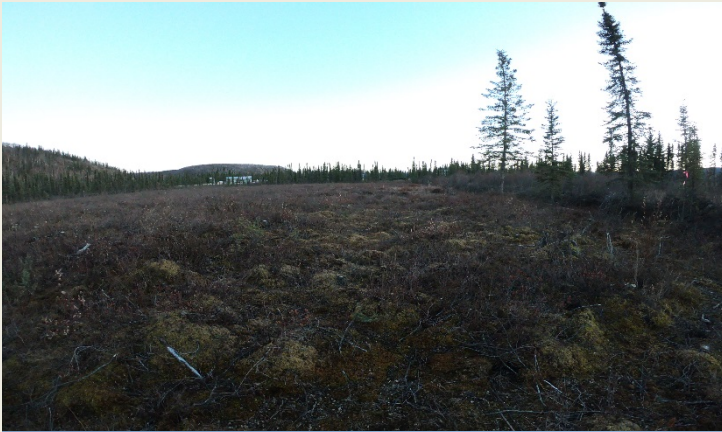
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More Projects / Arctic Village



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More Projects / Hughes

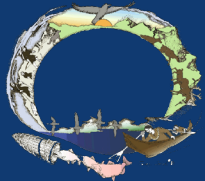


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The Big Picture

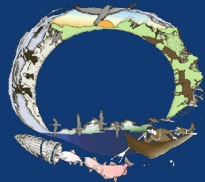


Building Capacity
Crawl – Walk - Run



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Thank you



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