

Tyonek Energy Efficiency Project

Dana Trufer-Moudra, Cold Climate Housing Research Center, part of National Renewable Energy Laboratory

A collaboration between:

- Native Village of Tyonek
- Tyonek Tribal Conservation District, and
- Cold Climate Housing Research Center (part of National Renewable Energy Laboratory)

2022 Virtual Program Review

US Department of Energy, Office of Indian Energy

Wed, November 16th, 2022 4pm MST

Project partners to Native Village of Tyonek

- Tyonek Tribal Conservation District - providing “technical and financial assistance to landowners and stakeholders within the District to help them achieve their conservation goals”
- Cold Climate Housing Research Center, part of National Renewable Energy Lab - “promoting and advancing the development of healthy, durable and sustainable shelter for Alaskans and other circumpolar people.”

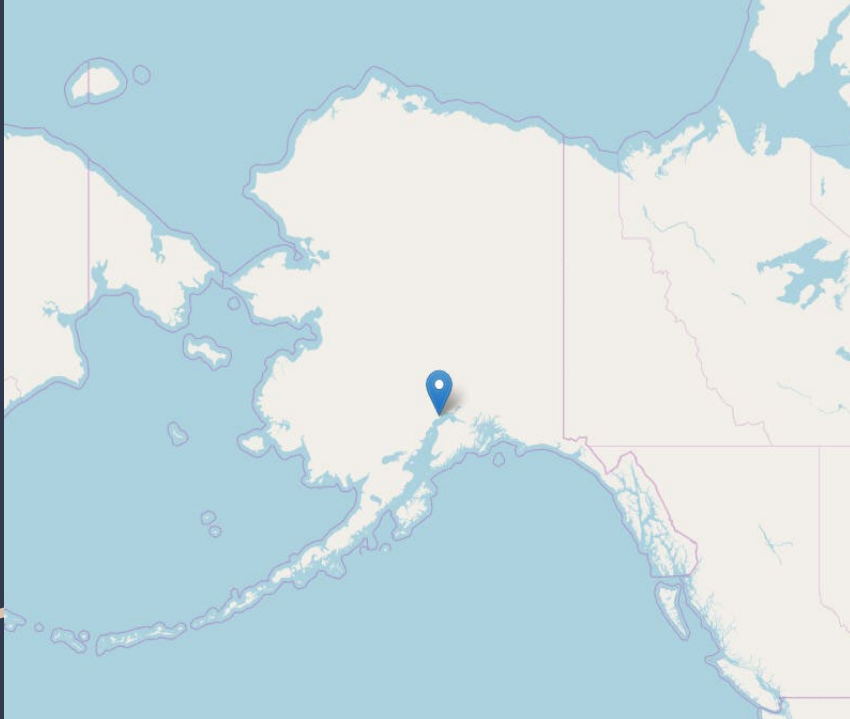


COLD CLIMATE
HOUSING RESEARCH CENTER

Parts of the Home Retrofit:

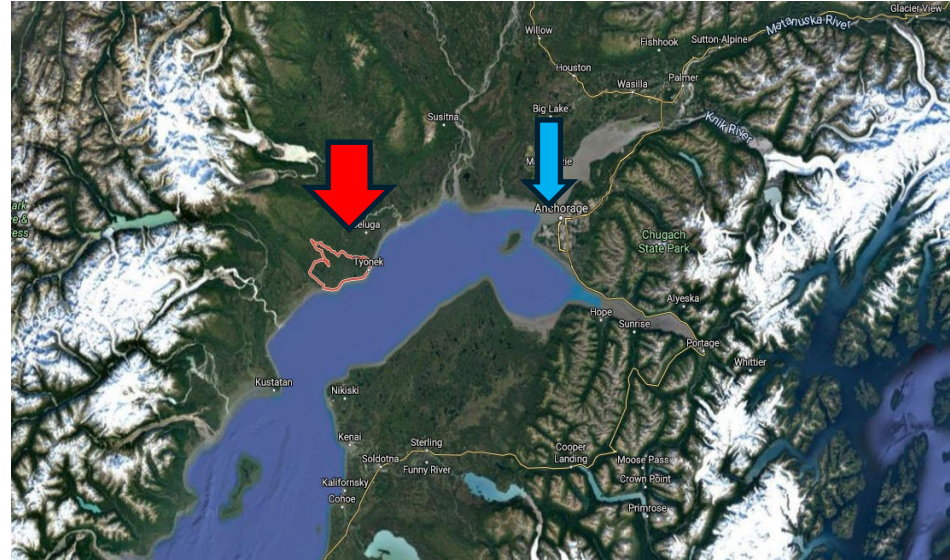
INNOVATIVE HOUSING DESIGN & RESEARCH

Location of Native Village of Tyonek



Tyonek

Anchorage



Native Village of Tyonek

The Native Village of Tyonek is a Dena'ina Athabascan village located 43 miles southwest of Anchorage on the coast of Alaska. Tyonek, located on the Cook Inlet, is accessible by plane or boat. It is home to the Tebughna, or "Beach People."



Photo courtesy of Tebughna Foundation.

Native Village of Tyonek

- Tyonek is a closed and isolated community with plane transportation at a cost of \$260 (last year: \$240) roundtrip from Anchorage.
- There is no regular marine transportation in place.
- Gas \$7.25 (last year: \$5.25) per gallon.
- Wood \$150-\$200 per small pick-up truck load.
- Electricity comes from Chugach Electric, so same cost as "south" Anchorage, around \$0.20/kWh



Photo courtesy of Tebughna Foundation.

Native Village of Tyonek

Population:

- 957 Tribal members
- 124 in Tyonek

The area encompassed by the Tribal village is 22.3 square miles of land and 3.3 square miles of water.

Winter temperature typically ranges from 4 to 22 °F; summer temperatures average from 46 to 65 °F, extremes have been recorded -27 to 91 °F.

Average precipitation is 23 inches with 82 inches of snow.

Project:

Energy efficiency
improvements on
two Tribal buildings

- Tyonek Tribal Center
- Tyonek Native Corporation Satellite Office



Tyonek Tribal Center



The building is occupied from 9:00AM to 5:00PM five days per week as standard operating hours for the offices. The building is also used on weekends and during some evenings for community gatherings.

Tyonek Native Corporation Satellite Office



The building is occupied from 9:00AM to 4:00PM five days per week as standard operating hours for the offices. The bedroom is used on occasion when guests are staying in the building.

Energy efficiency improvements based on 2017 audits

Audits were completed in 2017 by staff from Alaska Native Tribal Health Consortium.

Main recommended improvements from audits include replacements of lights with LED lights and installation of set-back thermostats, maintenance of boilers and insulation of pipes; as well as air tightening and addition of insulation.

Project objectives and impacts

To reduce energy use in the rural village of Tyonek for better efficiency

To reduce the impacts on climate change

To keep the subsistence lifestyle

Retrofit and update older buildings into current

To better secure buildings for food security

Project objectives and impacts

To reduce energy use of the Tyonek Native Corporation Satellite Office by **21%** and to reduce energy use of the Tribal Center by **18%** through implementation of recommendations from the 2017 energy audits of those buildings.

Projected annual energy savings of \$2,859 for the Tyonek Native Corporation Satellite Office and \$2,500 for the Tribal Center.

Projected annual reduction in fuel oil #1 of 518 gallons for the Tyonek Native Corporation Satellite Office and 280 gallons for the Tribal Center.

Projected annual reduction in electricity (produced by Chugach Electric) of 2,499 kWh for the Tyonek Native Corporation Satellite Office and 7,310 kWh for the Tribal Center.

Project status

Current audit was done in February.

The auditor also included a pre-feasibility study about replacing secondary source of heat, baseboards, with air source heat pumps.



Image courtesy of Tonya Kaloa.

Project status

Learned of another project which is improving the community center with ARPA funding.

Coordination started: some impacts to this project, including timeline.



Image courtesy of Tonya Kaloa.

Project status

Possibility of improving heating as part of this project being explored



Image courtesy of Tonya Kaloa.

Project status

Outreach happening

- More in winter when people are in Tyonek



Image courtesy of Tonya Kaloa.

Project status

Electricity and fuel data

- Continuing to collect



Image courtesy of Tonya Kaloa.

Next steps

Identify our scope based on DOE information and other project

Send scope out for bids

Evaluate bids, hire electrician

Retrofit work

Analyze savings

Report

Lessons learned

- The helpline for fedconnect is very useful if the website has an old email address for you that no longer exists
- In small communities, people wear many hats
- Communication is important

Chin'an!
Thank you!

Dena'ina

Chin'an gheli.

Thank you very much.

Q'uch'a.

That's all.

Past activities



Brief relevant past activities

- Inspected Native village of Tyonek Tribal Center with thermal camera to reveal cold drafts and openings that take away heat from the building.
- Have been putting Frost King window insulating kits shrink film for indoor use to decrease energy cost. Its great for trapping in heat. Very easy to install and results are immediate.

