Village of Chefornak & Naterqak Light Plant

U.S. Department of Energy
Office of Indian Energy
Program Review
Virtual Conference
November 15, 2023

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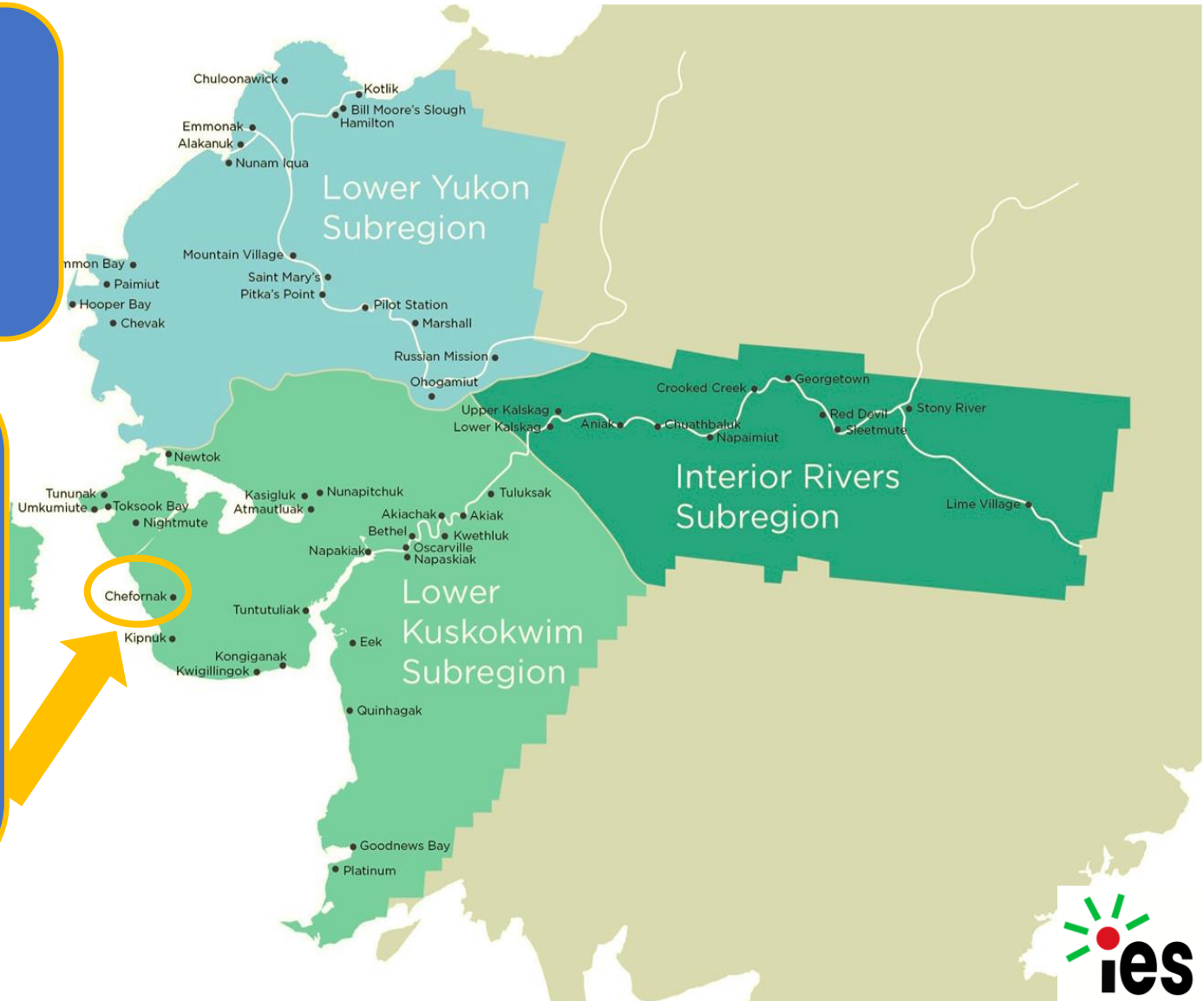
About the Village of Chefornak

About Chefornak

Population: 506
Median household income: $34,375
Price of diesel: $6.61/gal
Price of electricity: $0.55/kWh

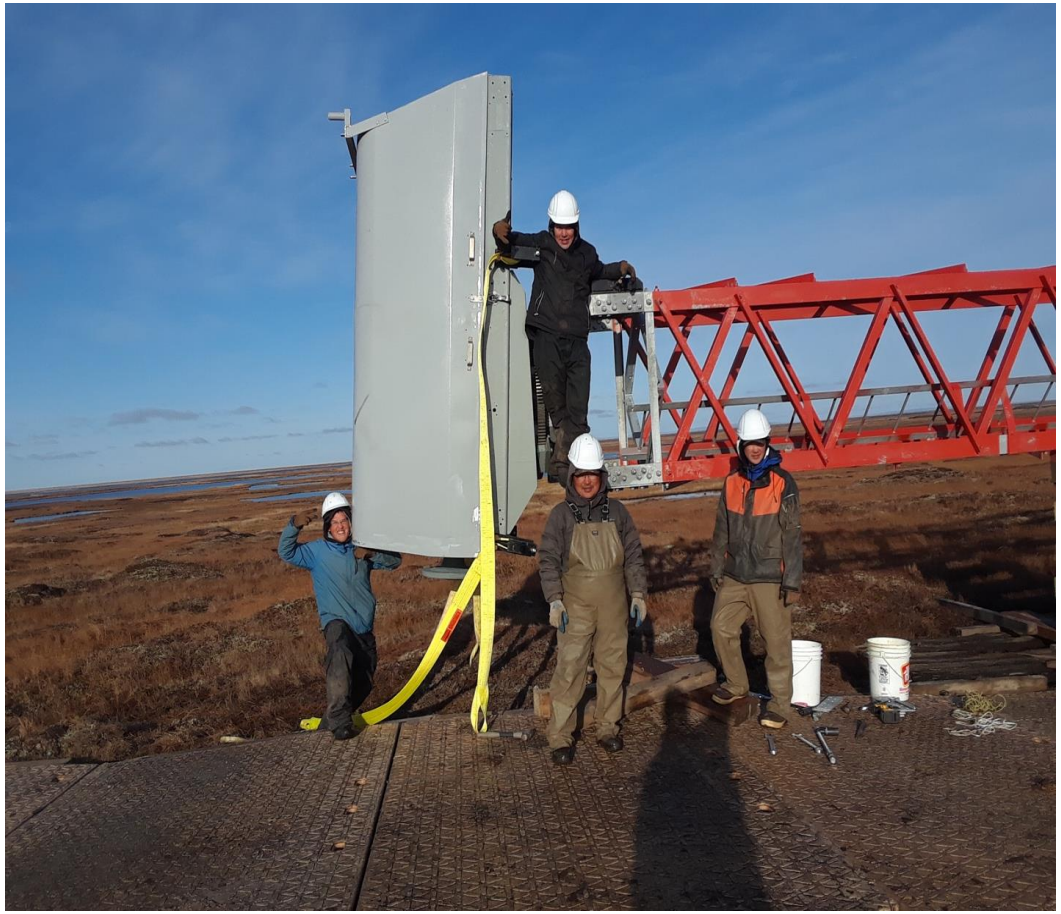
The Village of Chefornak is located where the arctic tundra meets the Bering Sea, with the extinct volcano, Tern Mountain visible to the distant south. Large, blocky rocks are a common sight in the Village. The Kinia River (Urrsukvaaq) and its many tributaries are important to the people of the village, because water travel is used for hunting and fishing by Village residents.



About Naterqak Light Plant

Naterqak Light Plant (NLP) is the Village of Chefornak's only utility. We are a federally recognized tribe in Western Alaska in the Yukon-Kuskokwim Delta.

- Governed by a Board of Directors.
- Managed by the Utility Manager.
- Employs up to nine people in the community (depending on the time of year).
- Operates on revenues from electricity sales and PCE subsidy payments from the State of Alaska.



Chefornak's Current Energy System

Chef's Wind-Heat System consists of
- (1) Power plant with Bulk fuel farm
- (3) Diesel gensets 350 kW
- (1) Heat recovery loop to the washeteria
- (1) load regulating boiler
- (3) 100kW Wind turbines on tilt up towers
- (20) ETS electric thermal stoves in homes
- (1) Hybrid Microgrid controller with SCADA

Chef Battery Energy Storage Project

Department of Energy
Office of Indian Energy Energy Infrastructure Deployment on Tribal Lands

A partnership between Village of Chefornak and the Naterqak Light Plant, owned by the City of Chefornak.

Period of Performance:
10/01/2021 to 1/31/2024

Project Overview

Install/Integrate *ABB Hitachi 500/677 kWh PowerStore* battery energy storage system (BESS) into the community wind-diesel grid. This BESS to be located by the power plant in a battery shelter for protection against the elements

-Improve Chefornak's energy resilience and security by increasing local, renewable energy
- Increase to 4,000 hours wind battery generation (diesel off).
- Displace a total of 58,000 gallons of diesel.
- The BESS will allow for higher wind penetration and help to stabilize the grid.

Project Objectives & Outcomes of BESS Installations

- BESS installation will provide renewable, rechargeable non-fossil fuel emergency power backup for community facilities.
- During a disruption in power generation or fuel supply, the BESS will provide emergency power to five (5) critical facilities:
  - Health clinic (1,200 sq ft)
  - Tribal Offices and Head Start Center (2,500 sq ft)
  - Washeteria (2,500 sq ft)
  - NLP/powerhouse (2,400 sq ft)
- Minimal power to homes to prevent subsistence foods from thawing.
- BESS will provide power for an estimated 3 hours for essential services, or 1 hour at the average load.

Project Challenges

- Logistics/Timing:
 - BESS is a long-lead time item 6+months
 - 2 possible barge deliveries a year in June and September. If we miss the schedule, we miss a year + of construction/installation and reduced diesel use expense. Air freight is available fro a combined cargo weight of 4,500 lbs at triple the cost of barging
- Reimbursable Funding Agreements:
Long-lead time equipment purchases are the first expense. Coming up with $400,000 or more for a down payment is a hardship for our small, subsistence-based Village.

Quyana Thank you

DoE Office of Indian Energy
USDA HEC
Alaska Energy Authority REF
Chefornak Tribal Council
Chefornak Tribal members
City of Chefornak
Intelligent Energy Systems
Frontier Power Systems