



**COFFEE POINT WIND**

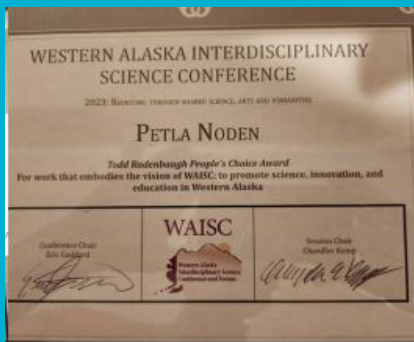
# **CHUGGIUNG LIMITED, SAGOYAK INC MANOKOTAK NATIVES LIMITED**

**Wind- Solar- Boat Launch and Grid interconnect**

Renewable Energy Plan for Dillingham, Manokotak, Clark's Point, and Aleknagik

Pelta Noden





# Sustainability-Inspired Accomplishments





**ALASKA**  
**from** **SPACE**

choggiung IPP 1-2 megawatt  
solar+battery

Sagoyak IPP 8-12 megawatt windfarm/ grid  
tie partner with KMO and DLG village  
corps.

Manokotak



Solar Array

KMO village Corp solar

choggiung boat storage and landing

Grid tie to CLP

Dillingham

Crane Point

Ekuk

- Eight plus megawatt wind farm and solar project
- Dillingham, Aleknagik, and Manokotak.
- Wind in Bristol Bay easily reaches speeds from 5-50, ave. 12 mph
- Energy generation fluctuations that accommodate with integrated storage tech
- Grid load stability is achieved through the use of dump loads (power storage for intermittency); batteries, thermal loads (steam generation), and fly wheels (momentum driven wheels storing kinetic energy that are used as short term electrical load storage).

2D





Thomas Geraghty

May 6 · 🌐

A bird's eye view.

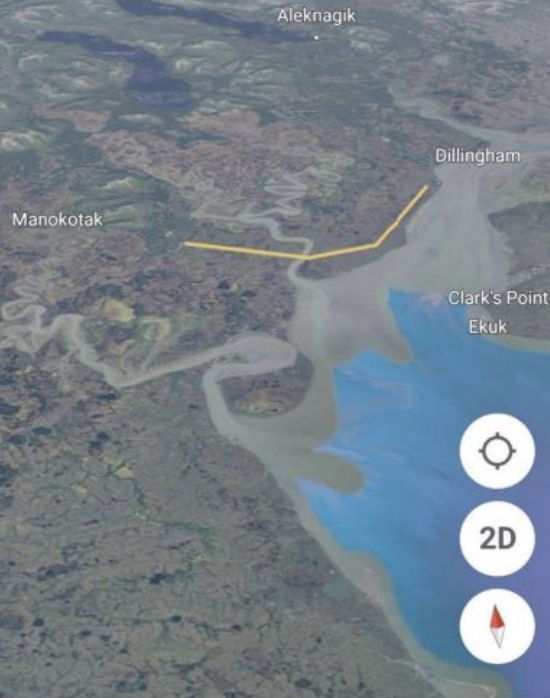
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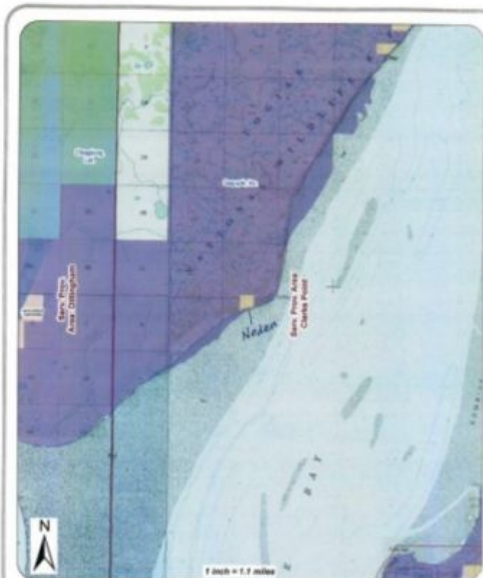


State Park



Distance ⓘ

15.8 mi ▼



**Native Allotment Information**  
(Allotment maps - 1910's & 1920's)

Legend

- Native Allotment
- Unsettled Allotment
- Partially Unsettled Allotment
- Settled Allotment
- Unsettled Allotment (1910's)
- Unsettled Allotment (1920's)
- Other



**“That free fusion reactor in the sky conveniently converts ~4 millions tons of mass into energy every second. We just need to catch an extremely tiny amount of it to power all of civilization.” -Elon Musk**

“More energy from the sun falls on the earth in one hour than is used by everyone in the world in one year.”

-The National Renewable Energy Lab

“The two most abundant forms of power on Earth are wind and solar.

And they’re getting cheaper and cheaper.”

-Ed Begley, Jr.

## Coffee Point Wind/Solar farm

8-12 MW

-Class 3

-9-13 900kw EWT's

## Fire Island Wind- 17.6 MW

-class 3

-11 1.6 MW GE's

### *Meteorological Tower Data Synopsis*

Wind power class Class 3 - Fair

Wind speed annual average (30 meters)  
5.78 m/s

Maximum wind gust (2 sec. average) 30.9  
m/s, April 2005

Mean wind power density (50 meters)  
374 W/m<sup>2</sup> (calculated)

Mean wind power density (30 meters)  
230 W/m<sup>2</sup> (measured)

Weibull distribution parameters  $k = 2.01$ ,  
 $c = 6.29$  m/s

Roughness Class 3.66 (forest)

Power law exponent 0.286 (high wind  
shear)

Turbulence Intensity 0.124 (moderate)

Data start date April 23, 2004

End data date October 5, 2005

# Kodiak Electric Association Battery, Flywheel, Thermal Loads

-Kodiak has a 3 MW battery and a flywheel.

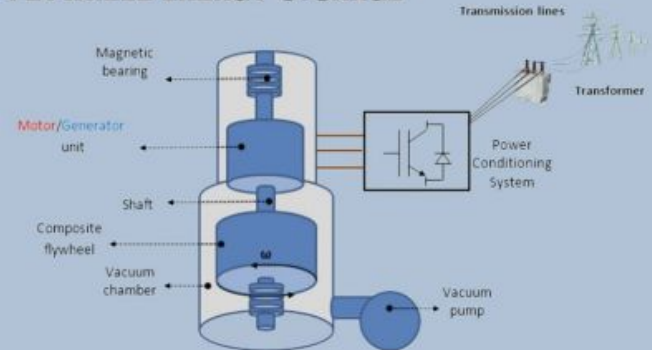
-The flywheel offers load balancing by covering small frequency response before the battery kicks in.

-Community/consumers are the only ones to share in profit of cooperation.



Battery Bank

## The working principle and structure of FLYWHEEL ENERGY STORAGE



# Battery Bank

-Works in conjunction with flywheel, thermal load, and diesel generators to provide a balanced grid load.

-Coffee Point Wind will benefit from this 1.9 MW battery for grid stability and load balancing.

-10 years ago, Dillingham spent an average of \$3.5M on diesel to Manokotaks \$87k annual average diesel bill

-Energy independence, stability from capricious diesel costs.



TESLA

Megapack enables low-cost, high-density commercial and utility projects at large scale. It ships ready to install with fully integrated battery modules, inverters, and thermal systems. [View Product Details](#)

**1.9 MW** **3.9 MWh**  
Power Energy

Megapack Quantity

Megapack Duration

Include Installation    
[Learn More](#)

Site Location Alaska ▾

Desired Delivery Date Q4 2024 ▾

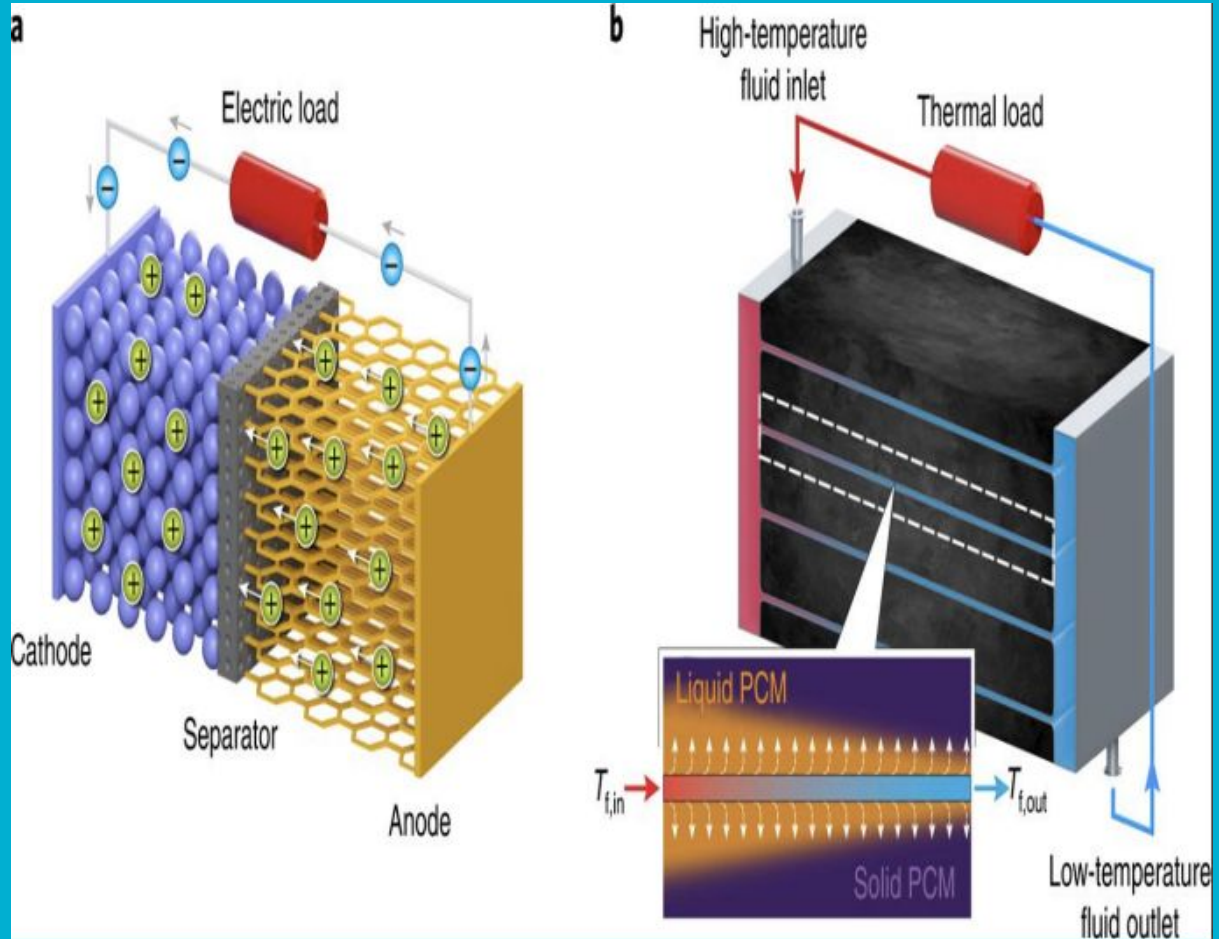
Estimated Price **\$2,847,100**  
Subject to change, taxes not included

1.9 MW Battery Bank: Load Balancing Battery with 10-15 year typical lifespan

# Thermal Load

-Thermal load uses excess electricity generated by wind and converts it into heat, which can be used to heat homes and businesses or converted back into electricity via steam turbine.

-It would be much more efficient to use excess electricity to heat home and businesses.





# Project Phase Breakdown

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**Phase 1** Develop Corporation, or Cooperative agreement with Tribal Entities, private entities, Utilities, and Stakeholders, and draw up a business plan/strategic energy plan.

**Phase 2** Develop 1 MW solar array on chug land with chugging being owner of utility working closely with power producer Nushagak Cooperative at vortac and interconnection to grid with infrastructure

**Phase 3** Expand south with sagoyak inc as owner of utility scale wind turbines

**Phase 4** Install Boat launch at mouth of Snake River on Choggiung Limited Land and connect Manokotak and Dillingham via grid tie and install solar array Near Weary River Access road in KMO

# Power Purchase Agreement

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- Tribal Corporations negotiate terms of P.P.A. with Nushagak Cooperative
- Tribal Corporations form conglomerate selling electricity to Nushagak Cooperative
- Establish as an Independent Power Producer IPP
- Nushagak Cooperative utilizes P.C.E in purchasing power from C.P.W.

# Financing

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- U.S. Department of Energy's Office of Clean Energy Demonstrations: point contact person Brian O Donnchadha, Tribal Engagement Specialist (240-252-8577, [brian.odonnchadha@hq.doe.gov](mailto:brian.odonnchadha@hq.doe.gov))
  - ERA Energy Improvement in Rural Areas, \$1 Trillion
  - Energizing Rural Communities Prize, \$15 Million
- U.S. Department of Energy's Office of Indian Energy
- Build America Buy America (BABA) for Geofoam plant in Dillingham, owned and operated by Chuggiung Limited (old upshot building and yard)
  - <https://www.energy.gov/management/build-america-buy-america>
- Bureau of Indian Affairs Department of Energy and Mineral Development (BIA DEMD)
  - <https://www.bia.gov/bia/ots/demd>

# Outreach

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Tribes educating our communities, including:

- Workforce development training
- 3x5 Mail Outs
- Radio
- Newspaper
- Open Houses for stakeholders
- Community engagement

# Grid Intertie

The yellow line on map depicts proposed grid intertie. 15.52 miles from Vortac to Manokotak Airport for Transmission line.

\$50,000/mile at 15.52 Miles is \$776,000.

