



# Agenda

- Kipnuk Battery
- Projects/programs
  - Context
  - Engagement
  - Focus
  - Build
- Hallucinations
- Lessons Learned



# Kipnuk Light Plant

## Kipnuk Battery Energy Storage Project

2317-1546

### 3B: RESILIENCY

#### Project Summary

- The Kipnuk Light Plant, a tribally owned utility of the Native Village of Kipnuk will purchase, install, and integrate a 500kW/677 kWh Battery Energy Storage System (BESS) into its standalone community wind diesel grid. The BESS will enable 5,500 hours of diesel off/wind only operation and will increase the amount of displaced fuel from 41,850 gallons to 76,000.
- The long-term goal of the Tribe is to displace 50% of its diesel fuel use by 2030. The objective of this project is to increase Tribal Community Resilience. This project does that by providing up to 3 hours of non-fuel emergency power to 4 critical tribal facilities. This enables emergency repairs to be completed; reduces diesel dependency; and reduces costs by an estimated \$184,000 annually.

#### Key Personnel/Organizations

- Native Village of Kipnuk / Kipnuk Light Plant
  - Burt Paul – Utility Manager – Business and Technical Point of Contact
  - Contractors:
  - Dennis Meiners, Owner/Principal – Intelligent Energy Systems
  - Patrick Boonstra, Sr. Project Manager – Intelligent Energy Systems
- Federal funds requested: \$ 855,978**
- Cost-share proposed: \$ 95,109**
- Total Project Costs: \$ 951,087**



#### Project Outcomes

- This project advances Kipnuk’s long-term goal to reduce dependence on diesel fuel and thereby increase its resilience by:
- 1) increasing winter fuel displacement allowing the community to have sufficient fuel to make it through the winter without purchasing emergency fuel supplies;
  - 2) providing up to 3 hours of non-fuel emergency power to 4 critical tribal facilities, enabling power plant repairs to be completed;
  - 3) improving the overall community power system reliability, security, and resiliency; and
  - 4) reducing energy costs estimated at \$184,000 annually.

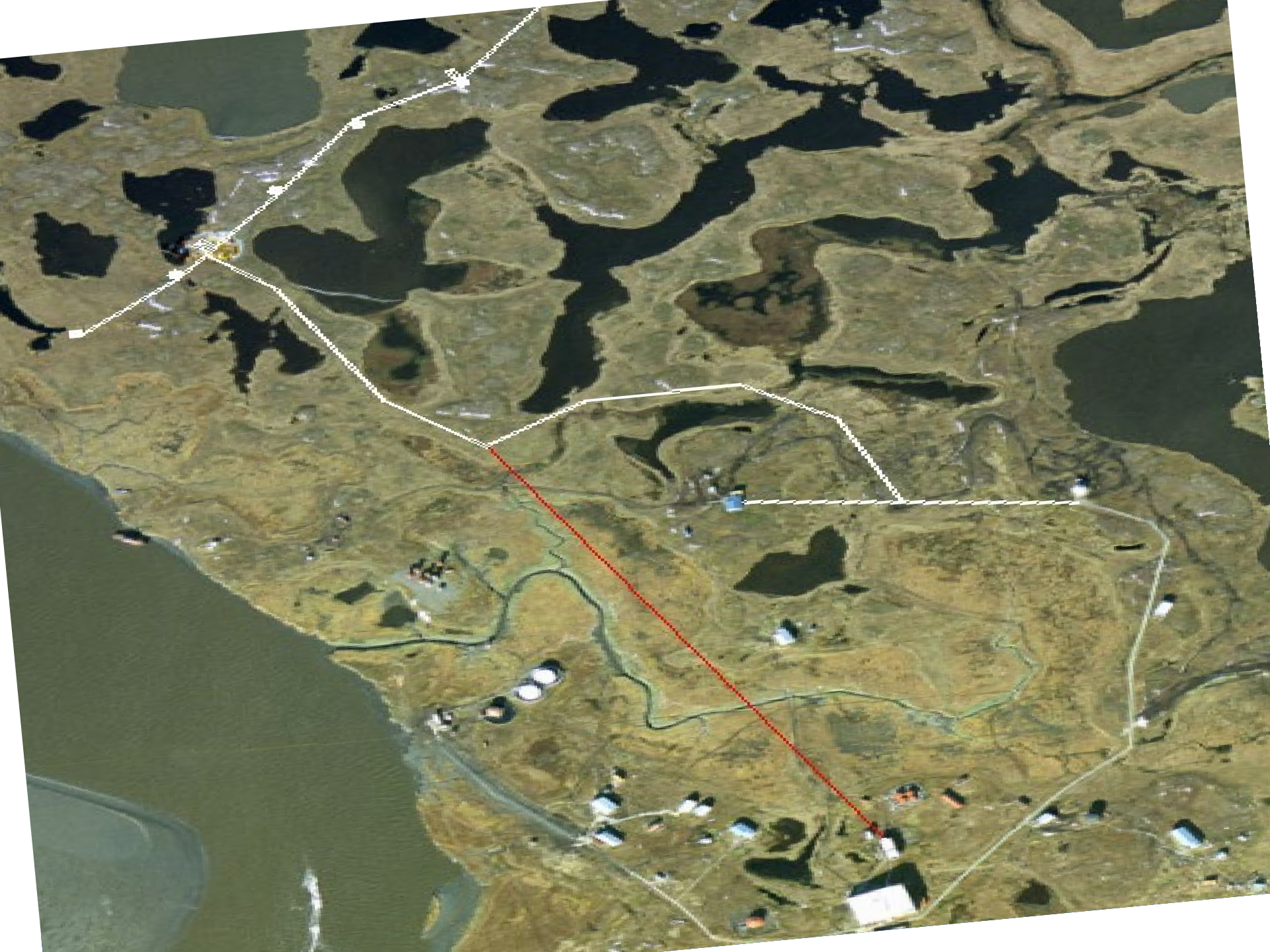
The BESS will enable 5,500+ hours of diesel off/wind only operations and will substantially increase the amount of displaced fuel from 41,850 gallons to 76,000, for a savings of ~\$184,000 in costs annually.

# CALISTA REGIO



CALISTA CORPORATION  
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## Local Regional Objectives

**Objectives:** Reduce dependency on fossil fuels

- Lower energy costs
- Foster local economy/jobs

**How:**

Leverage experience

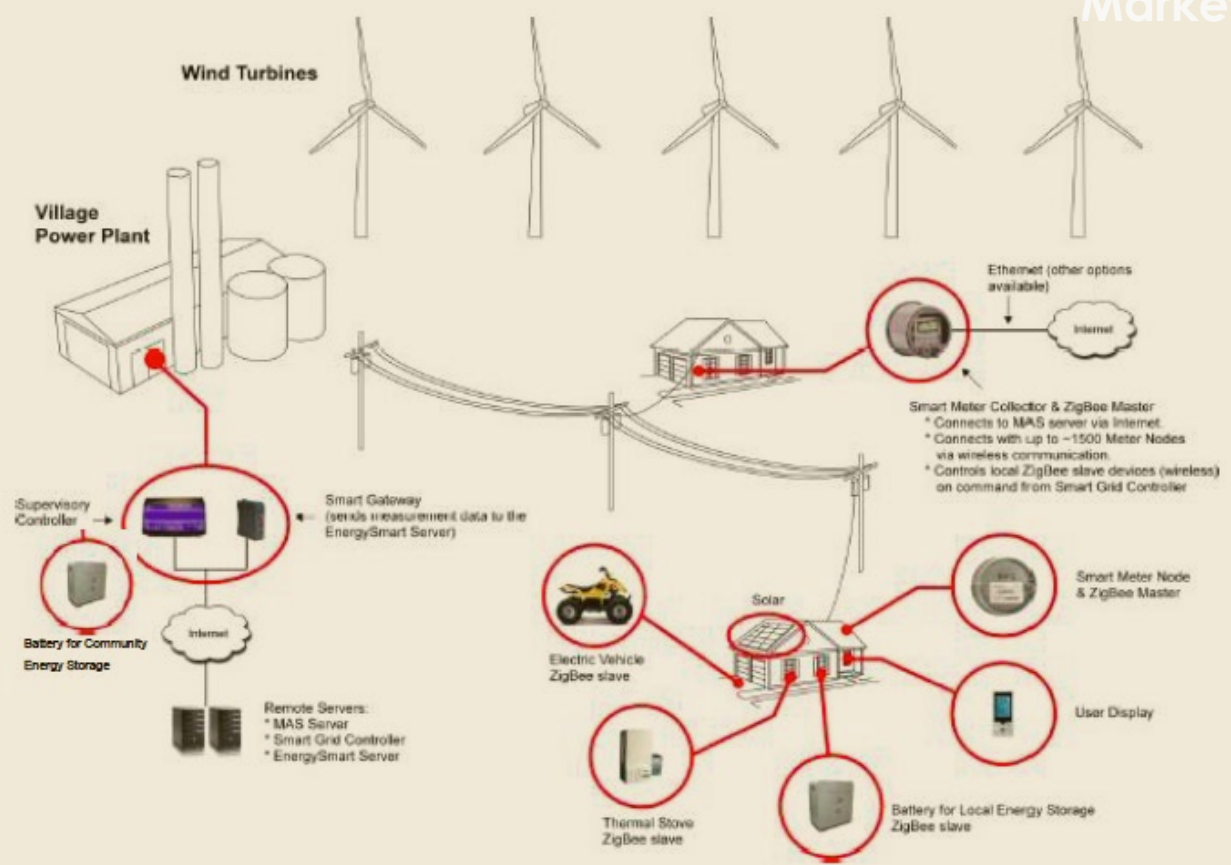
Listen and learn Build local capacity



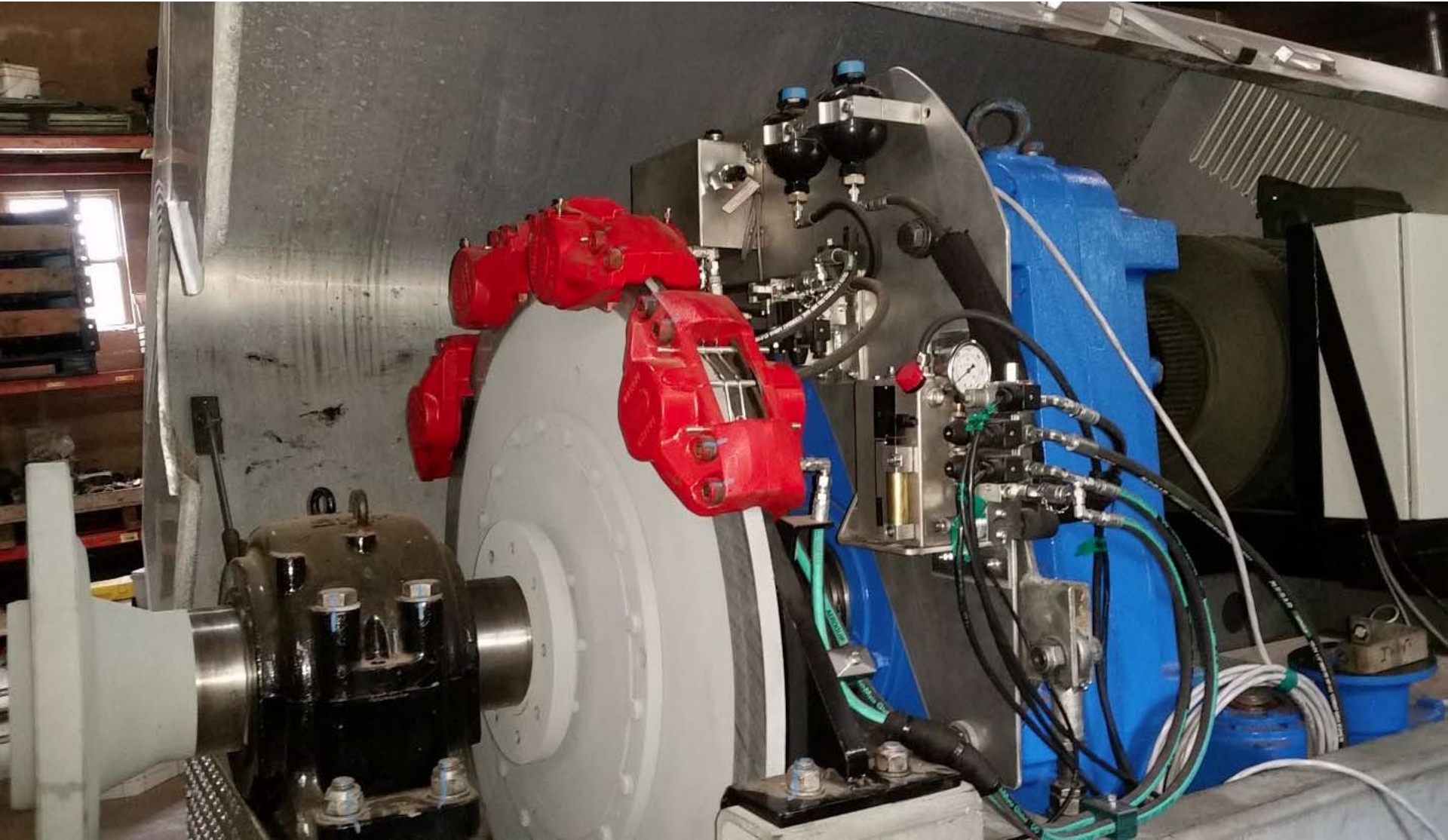
Markets:

# Hallucination 2005

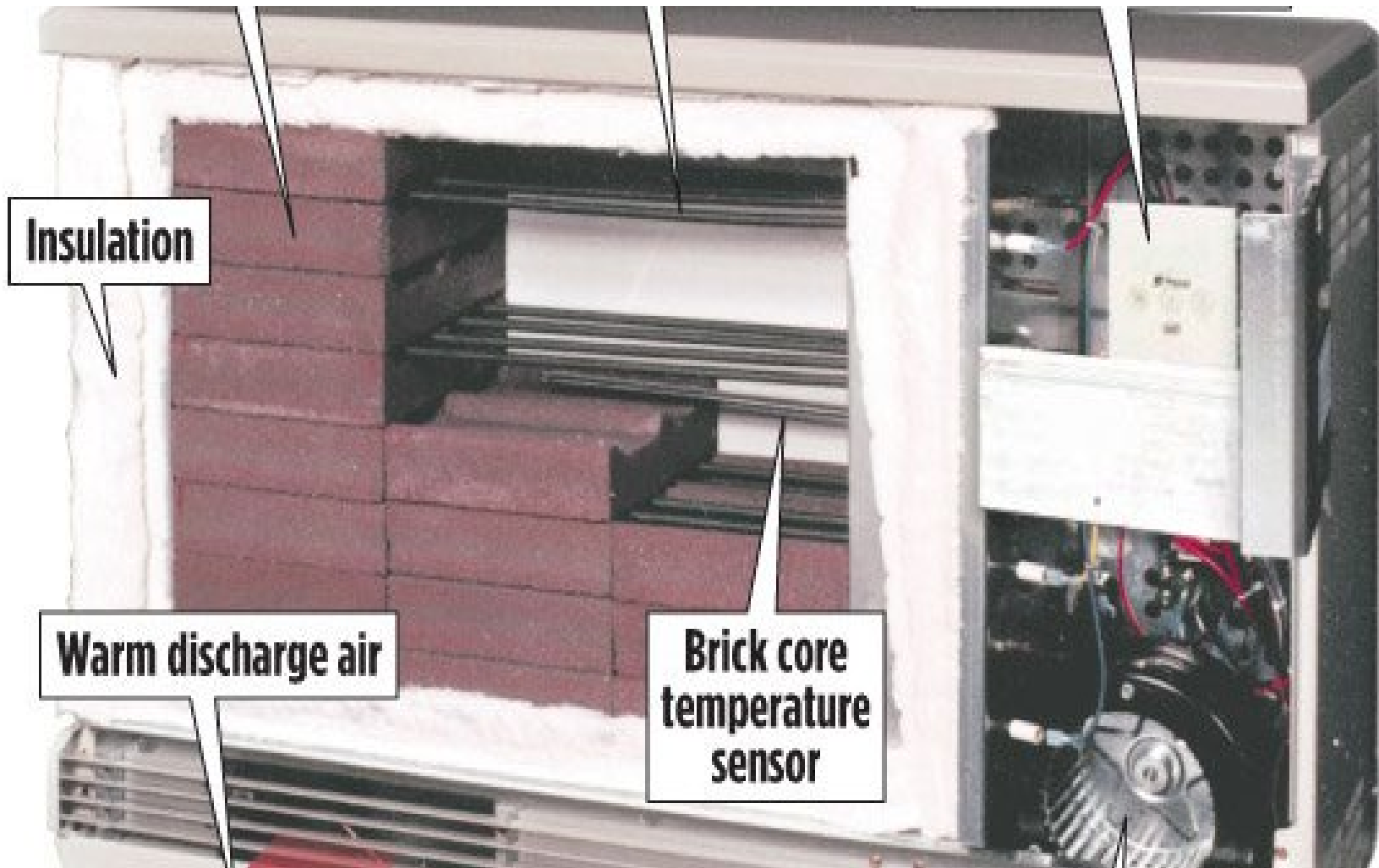
- Heterogenous control
- Wind
- Load Control
- Distribution
- Smart meters
- Internet
- Energy Storage
- EV's
- Water
- Hydrogen



# Turbine advancements



# 40 Thermal Stoves







Intelligent Energy Systems,  
LLC

## Battery Energy Storage System (BESS)





## Hypothesis

- Renewable based microgrids are becoming well established in rural Alaska
- Deployments will accelerate, number, scope, size
- Progress here may impact what you do





Intelligent Energy Systems, LLC

# Pace of Progress

## Diesel+Wind+ETS

Pilot Point

## Diesel+ Wind+ETS+Battery

Chefornak, Kipnuk, Atmautluak, Kokhanok, Kwethluk, Tuntutuliak

## Wind+ETS+Battery+Solar

Kongiganak, Kwigillingok, Buckland, Deering.

## Diesel+ Battery+Solar

Akiachak, Hughes





# Transition Drivers

## Markets:

The Railbelt Grid  
Southeast Alaska  
Remote Communities

Diesel  
Unregulated  
Tribal Ownership  
Growth trends

## Resources:

Wind  
Hydro  
Solar  
Energy Management

## Initiatives:

### Old:

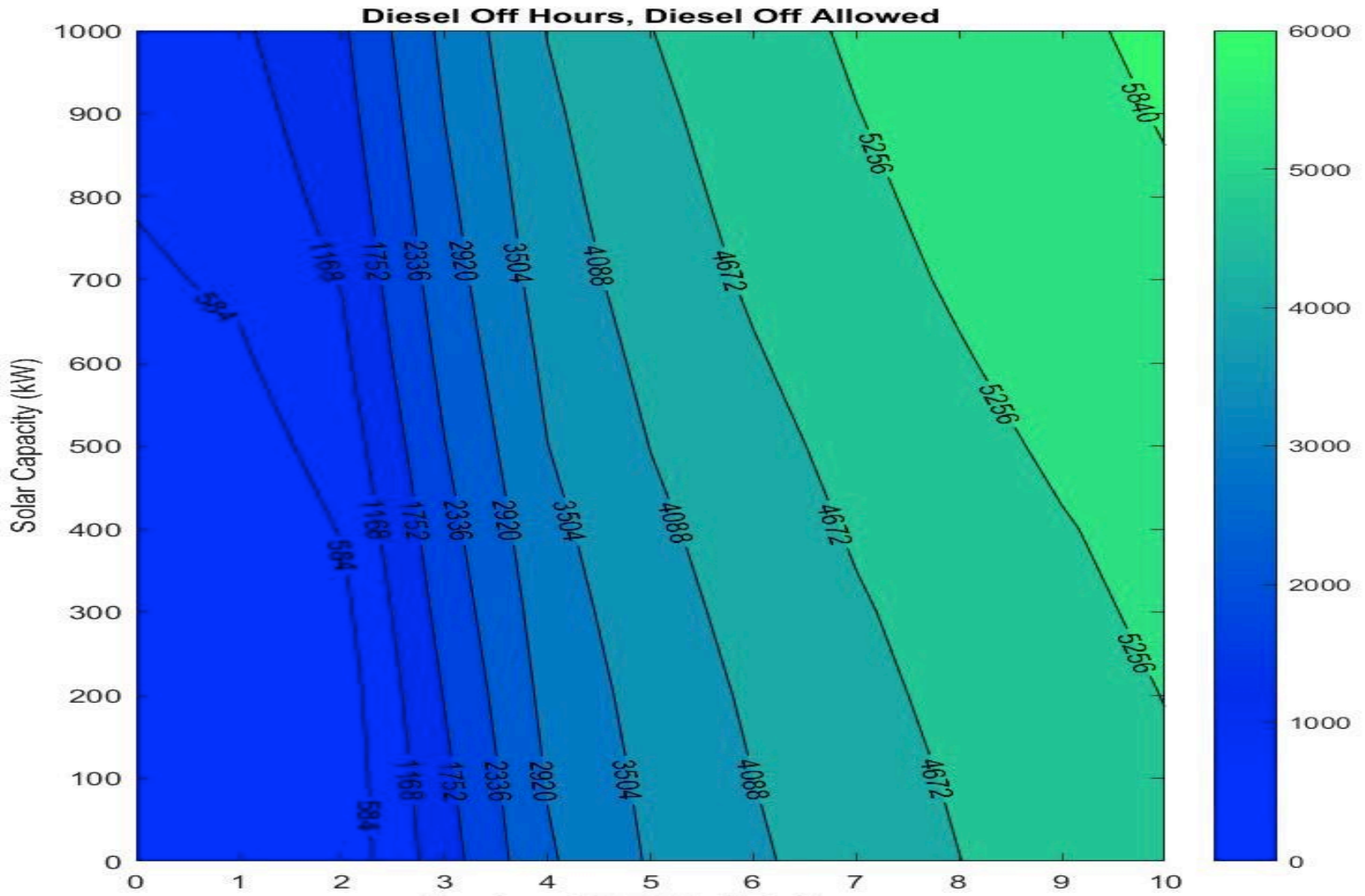
Power Cost Equalization  
Diesel Fuel  
Remote

### New:

Infrastructure ( Energy+)  
Climate Change  
Resiliency  
Work Force Development



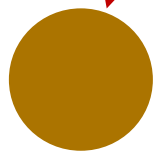
# Manage the transition:



## Create Value:

- Stage 1: Invest in a direction/grants

- Stage 2: Partner  
**De-risk, Learn by doing!**



**Stage 3: Co- Invest  
to increase  
deployment**

**Stage 4:  
Everybody'  
s In!**



# Local, Community, Regional Coherence



- Integrated Technology
- Economies of Scale
- High Penetration (only)
- Whole Community Systems
- Regional Clusters
- Build Capacity

# Support Team





# Capacity



- Need to build on success

# Create Meaningful Jobs





# Diesel Generators

Manage these



- Small communities

## Why Tribes

- Understand the urgency
- Independence breeds security
- Must innovate
- Can measure progress
- Local decision making





From Small Acorns.....

1. Start with You
2. Hallucinate
3. Pull the Goalie

Chaninik Wind Group villagers live subsistence lifestyles with few local jobs. These traditional Yupik villages rely on electricity to maintain home lighting, street lighting, telephone service, school service, clinic hours, and freezers to maintain a subsistence lifestyle. Reliable electricity is crucial to the residents of the Chaninik Wind Group.

