Sustainable Solar Energy for Hughes Village Council, Hudotl'eekkaakk'e Tribe

A project to increase energy security and tribal resiliency in Hughes Alaska

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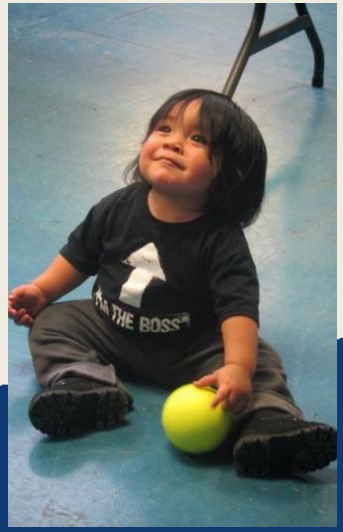
Tanana Chiefs Conference

Hughes, Alaska

- Koyukon Athabascan community
- 210 Air miles northwest of Fairbanks
- Fly in Only for Fuel using DC4's built in the 50's and 60's

Hughes, Alaska – Community Vision

"We are a community who value their subsistence way of life, our children and elders, and our healthy lifestyles. We will take direction from our elders through hands-on learning and story-telling. We are preparing our next generation to continue our work. We approach our work with open minds and open hears and the intention to build a community that is designed by its members to be a place safe from floods and reflective of our values and our lifestyles. We are continuously seeking a higher quality of life. "



Community Planning Progress

Community Planning Initiated in 2002, Successes:

-Construction of new teacher clinic (Completed)

-Construction of outdoor basketball court (Completed)

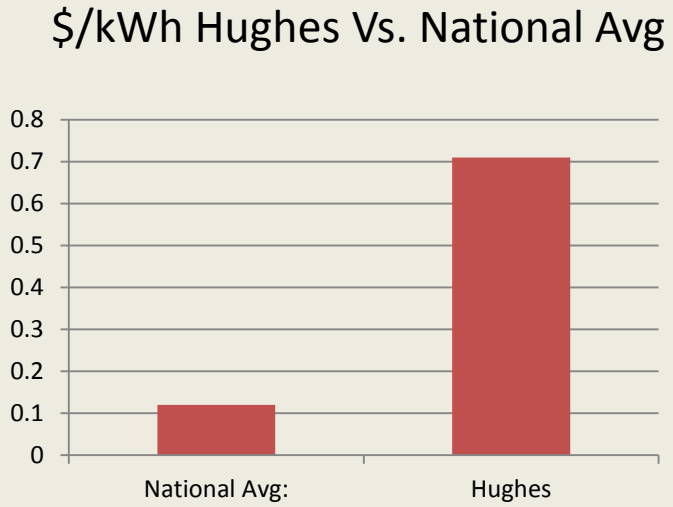
- VHF Radios for residents (Completed)

- Completion of a new landfill (Completed)

- Biomass Heating Project (Completed)

- Reduce Reliance on Imported Diesel fuel for electric generation (ongoing, Thanks DOE!)

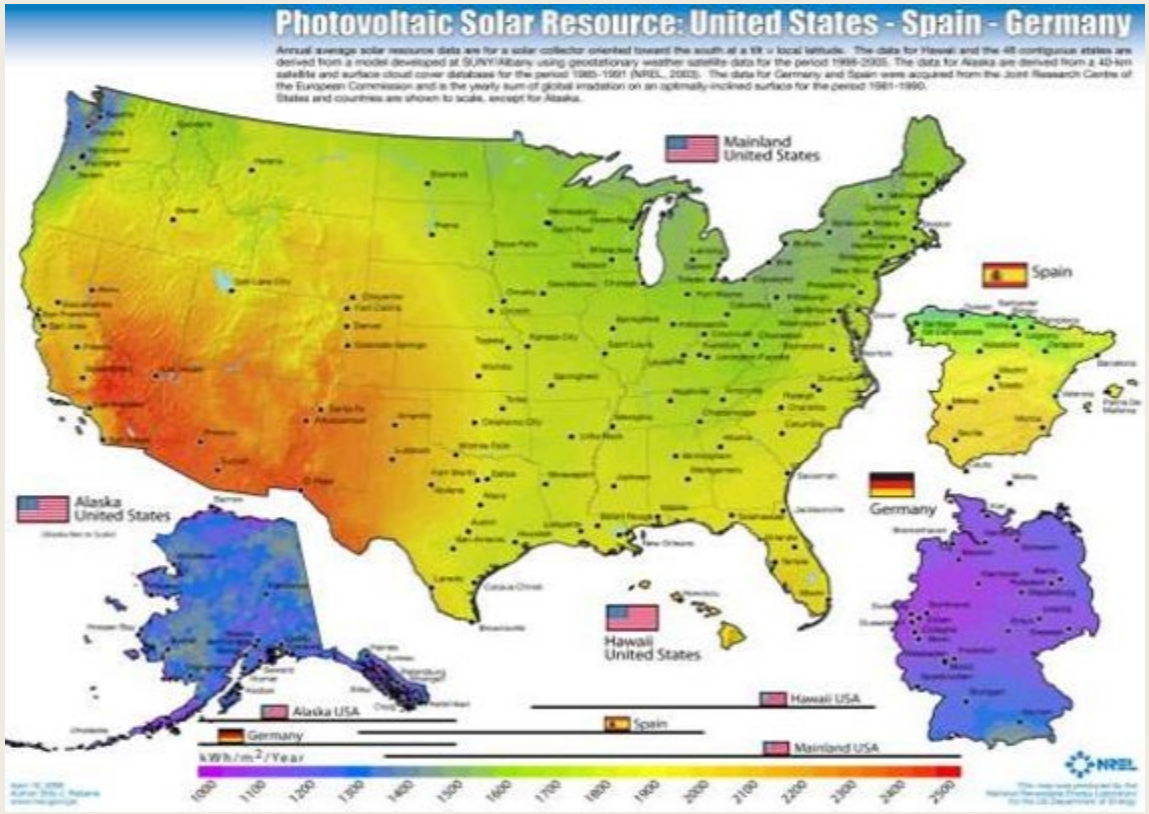
Where does YOUR Electricity come from?



The Challenge?

How do we get Hughes from HERE… To …HERE

But wait a sec, I thought Alaska didn't have much sun?



Did we mention the DC 4's…

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Renewable Portfolio Standard

Renewable/Efficiency Portfolio Standard:

"**NOW THEREFORE BE IT RESOLVED** that the city of Hughes, Alaska and the Hughes Tribal Council recognize the importance of communities working together to improve their energy situation…[and] that these entities choose to establish a goal of 50% diesel displacement in our community by the year 2025….meaning that 50% of the electricity generated and sold by the local utility will be from renewable energy sources"

Hughes Plant Operators and Gensets

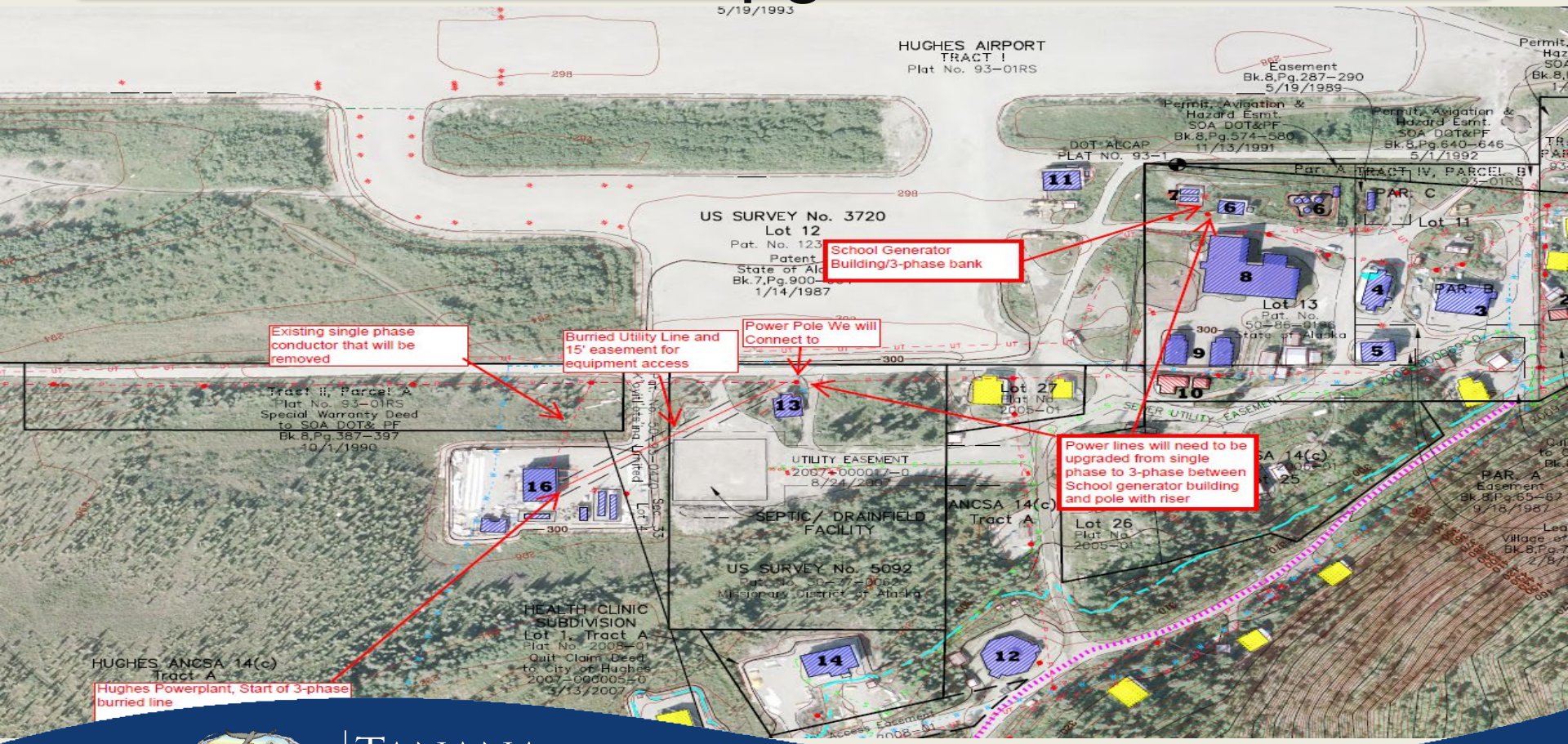
Project Goals

1. Increase Tribal Energy Security and Resiliency

2. Development of a replicable PV-Diesel hybrid electrical system that can be deployed in other villages

3. Implement a financial model that allows tribal ownership, reduces energy costs and does not negatively effect the PCE contribution to electric rates

Community Wide 3-phase Upgrade



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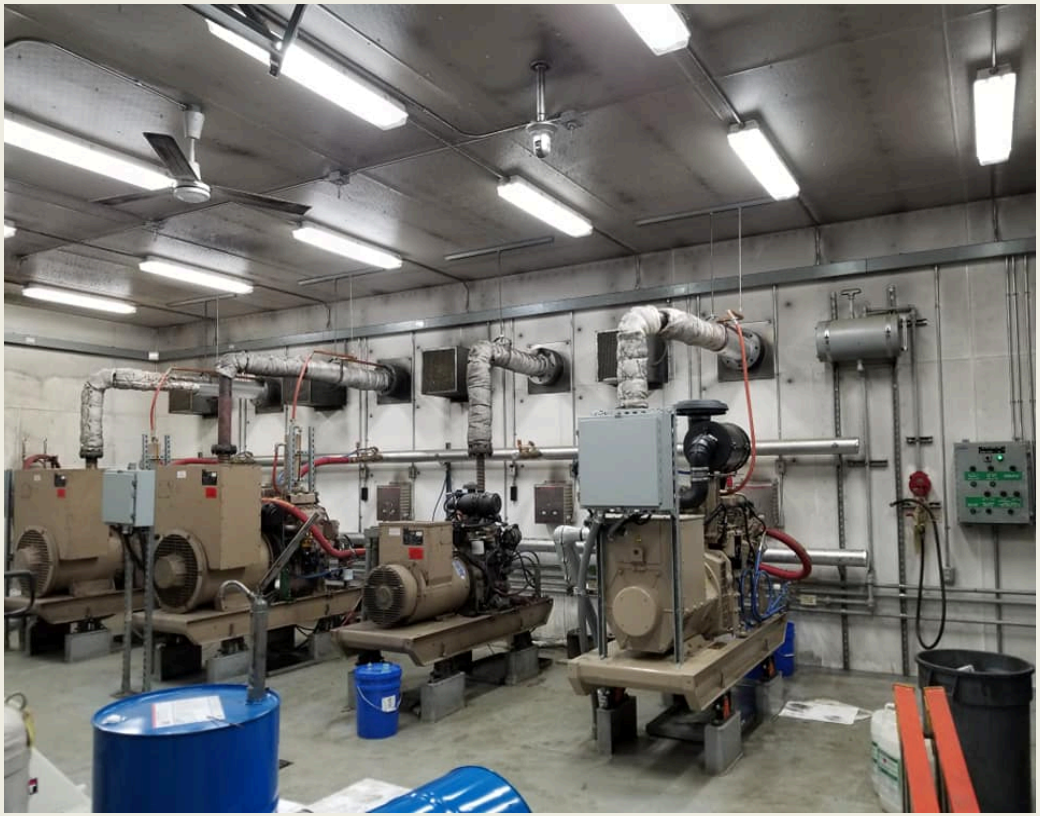
Community Wide LED Lighting Upgrade



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Hughes Village

Future Site of Hughes Solar PV Array

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Site of Solar PV Array

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Site of Solar PV Array last year

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Solar PV Array

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Solar PV Array

Oct 30th 2018 Hughes, AK North of the Arctic Circle

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Logistics…

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Project Logistics

Material Cost of Racking and Solar PV Panels: $102,000

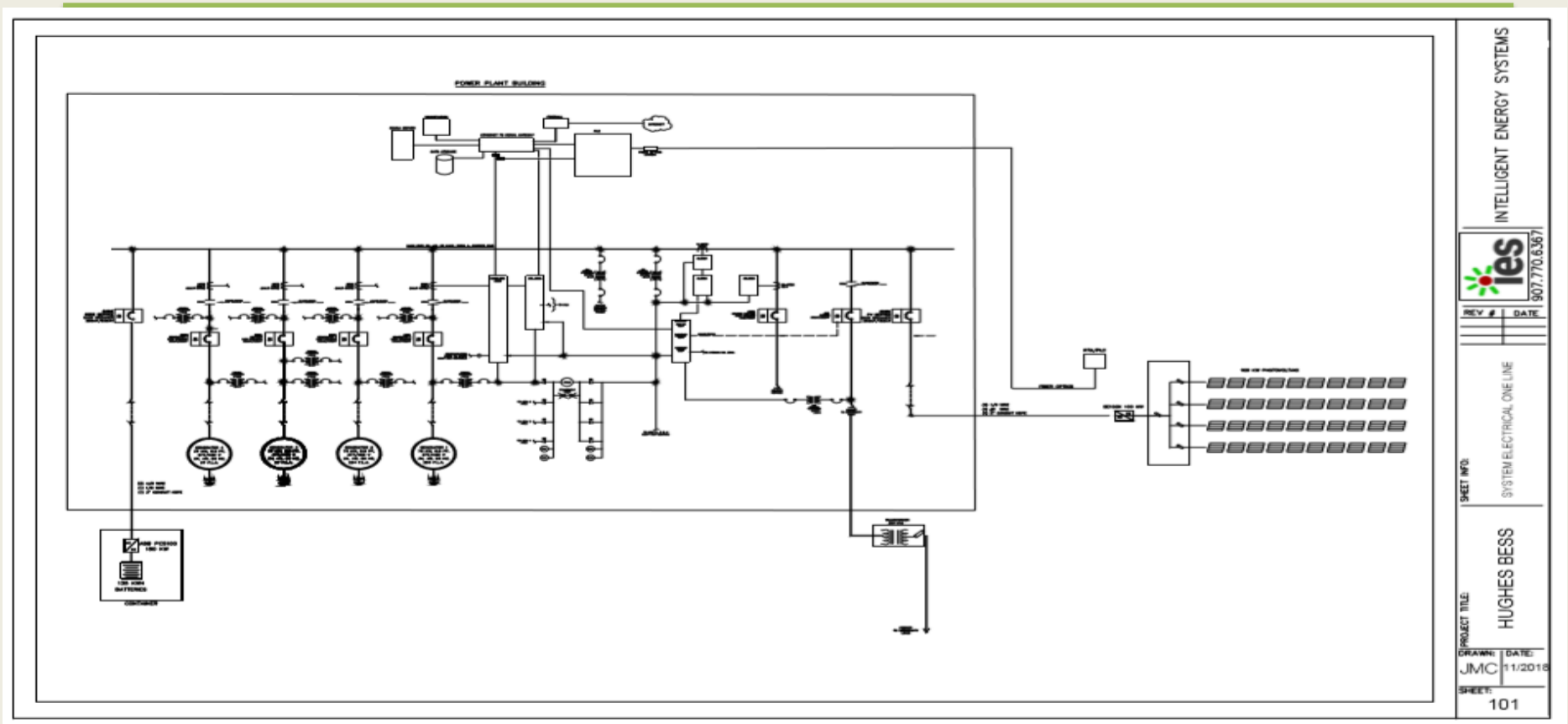
Cost of Shipping: $15k SEA→ Nenana + $15k Nenana → Hughes

Racking From Ohio →
Trucked to SEA →
Barged to ANC→
Trucked to NEN→

→ Barged 450 miles down the Yukon Tanana and Yukon River and 400 miles up the Koyukuk River

Installed Cost w/shipping: $1.52/watt
Installed Cost w/out shipping $1.25/watt

Micro Grid Control Package



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SAFT Intensium® Mini

Intensium® Mini, the outdoor energy storage system

Intensium® Mini outdoor energy storage system

Intensium® Mini provides compact, robust outdoor energy storage in a wide range of energy and power combinations suitable for renewable integration, industrial and commercial installations, utilities, and microgrid applications. Dedicated to medium-size energy storage projects ranging from 100 kW to 1 MW, it is used for peak power reduction, demand response, voltage control, capacity support, frequency regulation and spinning reserves, or a combination of these.

Intensium® Mini is a fully integrated storage system made up of 56 Synerion® modules, and provides high operational reliability over thousands of cycles with excellent energy efficiency. Its modular design accommodates a wide range of energy capacities and different power to energy ratios suitable for cycle durations from minutes to several hours. It is suitable for applications ranging from 80 to 480 kWh of energy capacity and from 240 to 1720 kW of power.

MARKET SECTORS

Inquire Now

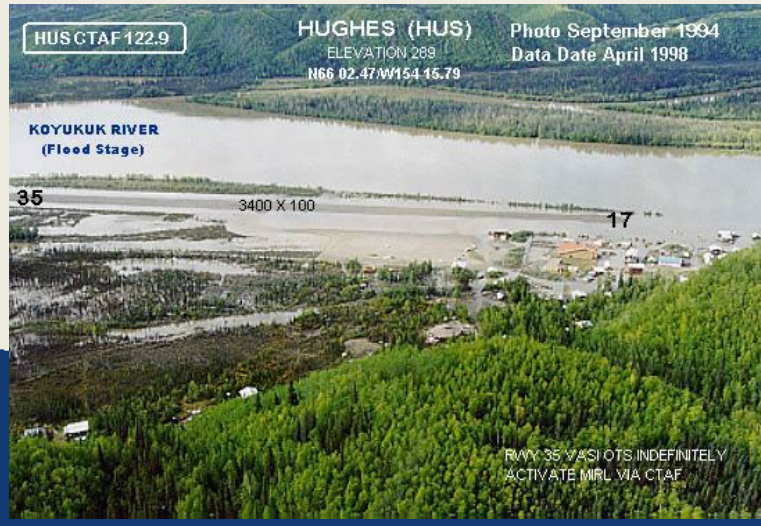
Project Challenges

1. Cost effective design and battery bank

2. ~~Single Phase limitation in the community of Hughes~~

3. Getting panels and battery bank out of the flood plain

4. Implementation of Effective Micro-grid Control System



Ana Basee' (Thank you!) Dept. of Energy for your support!

Questions?

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