Alaska Wind Working Group MINUTES
Wednesday, December 1, 2023
10:00AM -12:00PM

Attendees:

Josi Hartley, AEA
Katya Karankevich, ANTHC
Audrey Alstrom, AEA
Brett Carrothers, HDR Engineering
Bruce Cain, AHTNA
Josh Craft, MEA
Tamra Lewis, MEA
Jordan Dubron, SusitnaEnergys
Ramsy Shubert, Susitna Energy
David Thomas, strategic services Homer Electric Association
Bernie Smith
Forest Button, AVEC
Martin Miller, Coffman Engineers
Mike Witham, Pacific Power Group
Quinlan Harris, AEA
Daniel Jensen, CIRI
David Clarke, Alaska Marine Power
Simon Harrison, Alaska Marine Power
Stephanie Nowers, KIS Consulting
Chris Rose, REAP
Michael Bergey, Bergey Wind Power
Mitch Roth, UAF (retired
Tom Atkinson, KEA
Matt Bergan, KEA
Aimie Survant, AVEC
Aldine Reynolds, BOEM
Andrea Mammoli, Sandia National Lab
Bailey Gamble, AVEC
Darren Westby, AVEC
Bill Stamm, AVEC
Daisy Huang, ACEP
Dan Smith, USDA Rural Development
Ed Jenkin, MEA
Faith Tyson, AK Renewables
Gary Newman, Golden Valley EA
Gwen Robinson, BOEM
Jacob Pomeranz, EPS
Jenny Starrs, REAP
Julie Estey, MEA
Katie Conway, Denali Commission
Kay Kreiss, Transition Sitka
Rick Knowles, BOEM
Mariko Shirazi, ACEP
Marty Schwarz, NREL
Petla Noden
Reese Huhta, UVEC
Phylicia Cicilio, ACEP
Ruben den Uyl, Northern Energy Capital
Ryan Johnston, AK Renewables
Sonny Adams, Atautchikun
Michael Rovito, APA
Dave Myers, STG
Carl Brothers, Frontier Power Systems
Emilia Hernandez, ACEP
Tyler McCandless, Tomorrow.io
Chris Connor, Northern Power Systems
Max Green, Tomorrow.io
Jeremy Vandermeer, ACEP

10:00 AM CALL TO ORDER

10:05 AM PROJECT/POLICY UPDATES

1) **YEKATERINA KRANKEVICH, ANTHC**
   Hooper Bay, Toksook Bay, and Chevak Wind Repowering Project & Kotzebue Wind to Heat Boiler

Overview of ANTHC's mission and work: ANTHC's focus is on lowering water and sewer bills in rural areas. Last 12 years have focused on a variety of projects - solar, hydro, wind to heat, energy efficiency, heat recovery, biomass, etc, that has resulted

in an average of $600 a year savings. However, low-hanging fruit has been tapped. Also have tried putting solar on community buildings, but that hasn't saved as much as hoped because there are still the fixed costs of running a utility in community.

Current project work: ANTHC is modeling the savings of adding wind in communities that already have wind, and using the excess wind to generate heat that will be sold at a reduced rate compared to avoided cost of gallon of diesel. All projects look at having an entity other than the utility own the wind to avoid a reduction in PCE reimbursement. Toksook Bay, Chevak and Hooper Bay projects have an estimated cost of about $10M each. If they combine the projects, costs come down by 10% or more.

Toksook Bay project details

- Adding 1MW wind + battery energy storage
- Noted PCE disincentivizes utilities from owning assets so the models looked at what would happen to rates if the city owned the system and sold power to AVEC at reduced rate of 80% of the avoided cost of a gallon of diesel
- Estimated net annual revenue of $437K to city (which owns water and sewer system) after O&M costs and setting aside funds for battery replacement
- Estimated **$1,650** savings per year per person to the 172 residential households. That could be used to lower water and sewer bill, pay down AVEC bills that are behind, or in other ways.
- Creates a circular economy, keeps money in community
- Noted that Shugnak made $100K for community in one year with similar model of selling power at 80% of avoided cost

Chevak project details

- Adding 1mw wind + battery energy storage
- Estimated $2,818 per person per year community savings based on 140 residential homes.
- Total net revenue about $394K a year

Hooper Bay project details

- Adding 1mw wind + battery energy storage
- $3,818 per person per year savings to 146 households
- Net revenue about $558K a year
- Could pretty much eliminate water and sewer bills and put extra money toward infrastructure replacement funds

Kotzebue project details

- 2023 - Design finished on building wind to heat system for KEA. System to be installed by Sturgeon Electric in 2024. Noted Kotz just put in new water treatment plant which will be using more energy
  - Excess heat will go to boiler to be used to heat water treatment plant
  - 300KW boiler savings equivalent of 12,100 gallons or $54,300 a year
  - Noted KEA currently has 3 clients for wind to heat currently – the hospital, water treatment plant and park service (small 75kw boiler).

- Also working with Kotzebue IRA and KEA to have a tribally owned IPP add more wind. Looking at economics of installing 2 more EWT 1MW each turbines

Discussed Funding opportunities from IIJA AND IRA and noted her program has applied for $200M in grants in last 6 months. Noted ANTHC provides free technical assistance to villages, regional corp., tribes or city entity.

QUESTIONS

- **How efficient wind is converting to heat?** Wind to heat conversion is 100% because electricity being converted to radiant heat. Better than diesel which is at 85%.
- **Any thought of retiring Northwind fleet of turbines?** No, AVEC is still using these and getting benefit from them
- **Could IPP buy turbines in Kotzebue?** KEA has looked at this.
- **Looking at heat pumps?** If heating oil is over $5.50 a gallon, it starts to become cost effective even in more northern places.
  - On list to look at water-based heat pumps
  - NW Arctic Borough put heat pumps in Ambler with air source heat pump
- **Discussion on using heat pumps and concerns with variable load from wind:** This is not really a concern
  - Dave Thomas noted probably looking at larger heat pumps not as affected by changing electric loads for things like heating a washeteria water
  - Josh Craft noted heat pumps are now inverter based and have variable speed compressors so can ramp them up and down. Also using new refrigerants and higher efficiency heat exchangers
  - Andrea Mammolli noted variable speed heat pumps are the biggest selling type in Asia and Europe now
- **Are you looking at other turbines**? Did call Goldwind and Vestas about 1MW turbines and did not receive call back, perhaps because they are dealing in larger quantities than Alaska has.
- **What will be the use of the batteries. Going diesels off?** Yes, planning to go diesels off but will have to look at keeping gensets warm in the power plant. Battery sizing wise looking at relatively small batteries with about 15-30 minutes of run time to keep costs down.
- **How do you value that ancillary service that battery provides?** Estimated about 38kWhs = 1 gallon of Type 2 heating fuel.
- **IS ANTHC handling all the aspects of the IPP contract?** ANTHC works with the local utility, can help write contract that is fair to the utility and the entity receiving heat and has legal staff to help community negotiate. Noted AVEC community already has an IPP template from Shugnak. Hoping to keep that template the same.

2) ANDREA MAMMOLI, SANDIA NATIONAL LABORATORY

ACEP / Sandia work at St. Mary's

Gave his background with Sandia Lab. Principal member of Technical Staff, Renewable and Distributed Systems Integration. Reviewed history of power system architecture in St. Mary's and intertie to Mtn Village. Total load 400KW to 1MW.

Project Goals;

- Purpose of the study is how to further optimize the existing system that uses 3 diesel generators and 900kw EWT turbine.
- How to best integrate wind to minimize fuel consumption and reduce wear and tear on gensets.
- Variables looked at included optimize spinning reserve, use Grid Bridging, use of wind forecasting, use controllable thermal energy storage.
- Used MiGRIDS (Microgrid Renewable Integration Dispatch and Sizing) tool for analysis

Findings:

- Spinning reserve doesn't need full 100% backup especially at higher levels of wind power.
- For some power levels, 99% of the time the drop in wind will be 25% or less in next two minutes.
- Grid Bridging System: Looked at size of battery (500kw v 1MW) for effects on turning diesels off, diesel run time, number of times switching generator on and off, and diesel loading
- Wind Forecasting: Used 2-minute horizon and various wind power loads to look at overprediction. Can use this info to inform levels of backup generation. Noted wind is more consistent at higher wind speeds
- Combined Wind forecasting and Grid Bridging System (GBS): Battery significantly increases diesel savings and diesels off, but does increase diesel switching on and off
- Using Thermal Storage: (Could be boiler, could be individual houses) Brings stability to system, but also reduces wind imports to grid.
- GBS is the best way to reduce fuel consumption & maintenance.
- Capacity is more important than duration with battery. Forecasting helps.

Bill Stamm noted: The GBS BESS units have been delivered to St. Mary's, and provided with temporary power. Electricians are expected to complete installation in January with commissioning in Q1 2024.

QUESTIONS

What was the wind forecasting method? Was it just a persistence forecast? Based on last XXX minutes of wind?

Jeremy Vandermeer: We synthesized a forecast with different RMSE - so simply took the future wind, added some random error, and that was the synthesized forecast. The TESS control concept is modeled after existing AVEC wind-diesel systems using the SLC. The time of 2 minutes is because that is the time window needed to start a diesel generator to make up for any drop in wind

3) **JOSI HARTLEY, ALASKA ENERGY AUTHORITY (AEA)**

AEA Updates on Federal and State Funding Programs and Activities

REF Round 16

- 28 applications overall worth $37.8M
- 4 wind projects totaling $4M

  Project ranking underway. Goes to REF Advisory Commission Jan 9. Then will go to legislature. Final decision will be after session by June 2024

National Electric Vehicle Infrastructure program NEVI program

- 1st goal is to build out AK Alternative Fuel Corridor between Anchorage and Fairbanks. Sites have been chosen. Hoping to complete construction by 2024 season. May take 2 years.
- Chargers will be usable by all EVs, will be CCS
- Later goals to expand EV infrastructure to other highway systems (Richardson, Glenn, etc) and Marine Highway route

Alaska Rural EVSE (ARED)

- $1.67 million awarded from office of Energy Efficiency & Renewable Energy Vehicle Technologies Office for rural communities that want to install EV
- Working with partners - AML AK DOT, Launch Alaska, etc.
- Actively looking for participants

Solar for ALL competition.

- AEA has applied for $100M - $50M for community solar in rural Alaska. Other $50M would go toward residential rooftop solar throughout state administered by AHFC
- Will hear in March. Would not require match!

Statewide Grid Resilience and Reliability IIJA Formula Grant program

- $60M over next 5 years
- Have received $22.2M so far.
- Request for applications should be released soon
- Can cover wide range of projects - relocating power lines, improve grid resilience to extreme weather, fire resistant component, integrating distributed energy generation including microgrids & battery storage

AEA Award for Grid Resilience & Innovation Partnerships (GRIP)

- Received $206M award from DOE to pay HVDC (300MW) undersea cable between Kenai and Anchorage.
- Total project cost $413M, requires 50% match
- Performance period 8 years

Renewable Energy Village Energy Efficiency Program (RE-VEEP)

- $2.6M - 142 communities eligible
- Building scale renewables eligible for funding
- RFA will be available end of 2024

Energy Efficiency Revolving Loan fund program

- $4.57M program to be administered in conjunction with AHFC

$74M for Home Energy rebate program

- This will be for home energy efficiency rebates as well as home electrification and appliance rebates – working with AHFC on this

QUESTIONS:

NEVI project: What requirements are there for ensuring continued maintenance. Also noted Canadian company FLO technology doesn't currently allow for charges by kwh, only charging by minute. NEVI Project requires 5 years O & M, and standards require site hosts to have station be available 24/7 with 97% available uptime and there are measures to enforce this. Federal rule also requires charging by amount of energy, so that will be taken care of

Did the GRiP proposal also include BESS systems? Yes, it does. Ed Jenkin noted the BESS projects are a 30MW project in Southcentral and a 40 MW in Fairbanks area

Dan Smith: Noted GRiP project communities may be able to bundle projects but would need to make sure all the partners benefit from the project.

4) CHRIS ROSE, RENEWABLE ENERGY ALASKA PROJECT (REAP) – Policy Updates

Renewable Portfolio Standard (RPS) bill

- Would require 80% standard by 2040.
- Introduced last year, now in Senate Labor and Commerce and House Energy committee.
- Noted utilities are looking to import liquified natural gas.
- NREL has studied concept of RPS. Determined it was possible and is doing a foloup study looking at economics that is due out in January.

Green Bank Bill, also known as AK Energy Independence fund

- Now in last stops In Senate and House Finance committees.
- Bank would be housed at AHFC and develop loan products and programs to provide affordable loans for energy efficiency upgrades and renewable energy for residential, commercial, etc
- $20B from federal funding going to National and Regional Green Banks
    - Those funds could flow to state green bank here in Alaska to operate green bank here and start giving out loans.

Solar for All Program

- This is part Greenhouse Gas Reduction fund in Inflation Reduction Act
- First tranche of $7BA. EPA is looking at 60 awards so hopeful that AEA/AHFC will hopefully get $100M.
- Additionally, Tanana chiefs has applied with ANTHC for get $100M.

Community Solar

- Bill Wielchowski has proposed a bill. No hearing on it yet.
- Potential REAP legislation would also supplement this. Looking at annual net metering and also large commercial building with large roof space

Railbelt Reliability Council (RRC)

- This is mandated ERO for the Railbelt area
- Hoping to hire CEO relatively soon and then hire staff.

Transmission

- $206.5M grant for HVDC cable was the subject of legislative roundtable this week talking about state match. Also talking about what other transmission issues in Railbelt including talk about creating a transmission entity.

Renewable Energy Fund (REF)

- Lots of applications. Hoping to get solid funding for REF this year and next couple years

Emerging Energy Technology Fund (EETF)

- Some conversation to renew this. It was allowed to sunset in 2020

Chugach Electric Rate Case:

- Likely to be a hearing in June. REAP, AARP, and others intervening in case. First case in about a decade. REAP's focus is on rate design and making sure it incentivizes people to conserve natural gas

11:30 AM ROUND THE ROOM UPDATES

Chris Connor, Northern Power System (NPS). Installed 2 -100kw each turbines in Deadhorse in October. First machines in Alaska in 10 years. Turbines are providing power to Doyon's yard where they repair and refurb Doyon rigs between jobs. Offsetting consumption by 60 to 70% at yard. Motivation was sustainability initiatives and also potentially experimenting with new technology. Also noted that NPS makes the NW 100 wind turbine and now known as NPS 100.

Aldine Reynolds, Bureau of Ocean Energy Management (BOEM) – Cook Inlet working group getting together next Tuesday, right now just state and federal agencies. Also have a new BOEM AK Region director - Givey Kochanowski - who previously worked for US Department of Energy.

Katie Conway, Denali Commission:

- Have $4.5 million available to cover non-federal match for other federal funding, open funding opportunity now. https://www.denali.gov/non-federal-match-funding-assistance-for-federal-infrastructure-projects/
- Should have another funding for infrastructure projects available likely in February

Phylicia Cicilio, ACEP - Railbelt Decarbonization study update: Wrapping up study right now. Targeting 100% decarbonization by 2050 scenario. Also includes nuclear and carbon sequestration. Should have a public presentation on Jan. 18 in Anchorage. Anyone can join.

Bruce Cain, AHTNA: Willow Mountain Wind Assessment Project near Chitina is looking promising. Will know more later this year

Dan Smith, USDA: Reminder that REAP grants are available, Capped quarterly RE or Energy efficiency. Grants for ag producers or rural small business, anywhere outside Anchorage.

12:00PM ADJOURN