

# ALASKA WIND WORKING GROUP

JAN. 11, 2017

Anchorage, Alaska

## 11:30AM CALL TO ORDER

### In Person:

Givey Kochanowski, DOE Office of Indian Energy,  
Tom Wolf, Denali Commission  
Travis Hammond, TDX Power  
Natalie Hanson, Nuvista  
Martin Miller, Coffman Engineers  
Bob Seitz, Artech Engineering  
Crystal Enkvist, Alaska Power Assn.  
Bill Stamm, AVEC  
David Lockard, AEA  
Josh Craft, AEA  
Sid Atwood, Alaska Health Trackers  
Dennis Meiners, IES  
Eric Hanssen, ANTHC  
Sarah Fafard, Enterprise Engineering Group  
Chris Rose, REAP

### online:

Connie Fredenberg, Utility Management Assistance  
Jim McDowall, SAFT  
Rich Wies, UAF  
Dick Peck, Utility Innovations  
Rob Roys, Huntley and Associates  
Ian Baring Gould, NREL  
Ingemar Matthiason, NW Arctic Borough  
Reese Huhta, UVEC  
Doug Vaught, V3 Energy  
Andy Kruse, HOMER Energy  
John Glassmire, HOMER Energy  
Robert Wills, Intergrid  
Matt Metcalf, Price/Gregory

## INTRODUCTIONS

## UPDATES

### **COLVILLE LAKE ENERGY STORAGE PROJECT UPDATE (Jim McDowall, SAFT)**

- funded demonstration system
- 200 kw of storage, intentionally oversized so can handle excess PV when available
- 4 battery strings
- 35-150kw max load
- Will be updating battery management system. Plan to update to different software that modifies state of charge algorithm. Had

an issue with operation of battery, sometimes jump down below 20% that resulted in turning on 150 kW diesel.

Ian Baring-Gould: Why cycle charge algorithm in the AM? Why not mix in load following in the early morning to maximize PV capture in the afternoons? Have you looked at round trip efficiency impact of running power through battery vs running diesel at half load?

Jim M: Yes looked at RT efficiency. Would be good for winter months but not so efficient in summer months when load is low, around 35kw.

Robert Wills: Been working on Iguigig system, including ETF work with ORPC. Noted difficulty of maximizing systems with energy storage, very difficult calculation. Looking at genetic algorithm modeling vs state of charge algorithm.

David Lockard noted efficiency curves for Deere generators. (See chart from David attached with minutes)

Jim McDowall: In hindsight, would do less battery, would do about the same PV. Decision for current system was based on avoiding curtailment on an average PV production day.

Josh Craft what's the ROI? Jim. Don't have specific ROI. Do know saving 80,000 liters of fuel/year based on actual results so far. Looking to pay off investment in few years. Cost was \$8 million total, that includes lots of engineering costs because it was new type of project. Equipment costs were small fraction.

## **DISCUSSION ON OPTIMIZING EXISTING REMOTE WIND SYSTEMS/UNALAKLEET WIND UPDATE (Reese Huhta, UVEC)**

- Reviewed History of tank farm, wind farm and power plant, all relatively new. UNK was one of earliest wind power systems to get up and running under REF.
- Have 600 KW of wind, 6 Northwind 100s, no energy storage
- Have diesels that are Real high rpm engines, running them at low load
- 300kw electric boiler that provides heat to big community buildings
- November 2016 generated 7 millionth kWh from the wind farm.
  
- No major maintenance issues. Major issues are control and software.
- Saving 70,000 gallons/annually. \$1.4 million dollars to date. Total investment was \$4 million
- Fuel surcharge for customers is \$.1558. Without wind it would be 11 cents higher at \$.2658
  
- Challenge is making all the pieces work together
- Curtailing 30% of the time
- Don't have high confidence in boiler system, so manually curtail our

turbines to prevent overvoltage, or overfrequency situation

- Currently seeking funding for energy storage and additional generation
- Training local residents to do O & M on system
- Looking to do RFP for engineering solutions to wind-diesel, need help refining that
- Want to get to the point where just need one diesel or diesels off
  
- Hindsight: Would have done 4 turbines rather than 6, spent more on controls and data automation.
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Martin Miller – Is the main loss is from curtailment. Reese: Yes.

Reese: No RFP out right now for engineering solutions. Noted he sent data out to educational institutions and that rarely gets feedback. Sometimes hear about results at meetings. Heard some technologies not good for us, also heard synchronous condensers are the way to go.

Rich Wies: noted that he often is doing work for agencies, sounds like maybe a break down in the communication from agencies back to utility in terms of providing info.

Rich Wies: have you looked at upgrading distribution line from the wind farm to the power plant. YES

Givey K: DOE might be able to help with RFP if there is tie to tribal entities.

## **ROUND THE ROOM UPDATES (Emerging Energy Technology Fund, Policy, Upcoming Events, etc.)**

**Bill Stamm:** St Mary's/Pitkas Point putting in 900kw EWT and looking at siting turbine for Bethel

**Crystal Enkvist:** Sept. 12-15, 2017 annual APA meeting in Kodiak

**Bob Seitz:** Concerned about lack of proper engineering on earlier systems. He's working to bring in people with power systems experience that are interested/involved in working on remote grids

**Travis Hammond:** Looking for funding for 6 more wind turbines at St. Paul

**Bailey Gamble:** working on wind to heat systems and starting to work with AVEC to see how to optimize systems. Please connect with Bailey if you are interested in this

**Eric Hanssen:** Just did energy audit at UNK water treatment plant. Could get involved if the water treatment plant is involved in the wind system.

**Chris Rose:** REAP speaker Jan 12 Connecticut Green Bank Bert Hunter

- Meeting with national labs in April 19, AK Microgrid Partnership
- Build on training 19-20<sup>th</sup> in April in Bethel
- Railbelt creating tight power pool of 4 utilities
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**Dennis Meiners:** Future is renewable systems, diesel is done. Areas to focus on are building the systems at size where they are going to be cost effective. That will be large wind turbine, solar array and battery banks. Focus on optimizing systems and deploying them.

**Josh Craft:** Wrapped up round 3 EETF funding. Two projects selected. One of those is ORPC building off hydrokinetic project in Iguigig getting into grid forming controllers and inverters. ORPC will be doing wind and a hydro integration. Also Fairbanks Northstar Borough was selected for a gasification combined heat and power unit from Denmark. They are testing technology that is existing but not yet in use in Alaska

**Rich Wies:** Available if can provide any help in terms of technical assistance.

**John Glassmire:** Constantly updating the HOMER software. Noted HOMER has new release coming up with Matlab controller having more support for wind

**Daisy Huang:** ACEP also available to help with technical assistance

## **SET NEXT MEETING DATE & AGENDA ITEMS**

Late April/ Early May time frame. Potential agenda items::

- Kwig battery project
- Genetic algorithm modeling for batteries

**1:30PM    ADJOURN**