

Fox Islands Electric Cooperative, Inc.

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Frequently Asked Questions (FAQs)

Fall 2010 Sound Study

Why is FIEC collecting data?

The Fox Islands Electric Coop is gathering data to help identify and better understand what mechanisms contribute the most to annoying sounds the turbines make. Once sources are identified, possible mitigations strategies can be identified and their associated costs can be estimated. In order to identify the most loud and annoying sounds, nearby residents are being asked to fill out daily logs at specific times and whenever the turbines sounds are most notable. Engineers at NREL and GE will then work with these data, in combination with those collected at the sound monitoring stations near the turbines and their prior knowledge of the sources of sound, to provide FIEC with more information on the sources and mitigation options.

Who will be the primary contact for the data collection effort?

FIEC has asked Karol Kucinski to be the liaison between the coop and the data collectors. He can be reached at 863-2053 or via email at karolkucinski@gmail.com. He will answer whatever questions are posed to him that he can or will seek answers to those he cannot. When appropriate, answers will be added to this FAQ for all community members to read. He can also provide extra log sheets as needed.

How long will the data collection effort be?

The data collection effort will be 30 - 45 days and is expected to be complete no later than the middle of November. A final decision as to an end date will depend, in part, on how many residents fill out the logs, and the wind conditions during the data collection period. The goal of data collection is to have roughly 100 responses when the turbines are in the top range of the loud and/or annoyance scales. To that end, Karol will check-in with respondents and potentially collect the logs preliminarily to gauge the need for further data collection.

When will residents know to stop filling out the logs?

Karol will be in contact with all data collectors to inform them when data collection is complete and no more logging is needed.

When will the data collection begin?

As of October 7, 2010, some residents have already begun to fill out (pilot) logs and any others can begin immediately with the final log sheets available on the FIW website (see "Where to get log sheets?" below). The more residents filling out logs at

the same time the better chance the engineers have to discover effects and identify contributors to the loud and annoying sounds.

Are there instructions available for those filling out the logs?

Instructions are provided here <http://www.foxislandswind.com/sound.html> and will also be available at the FIEC offices and from Karol.

Where can I get log sheets?

Log sheets are available for download at this link <http://www.foxislandswind.com/sound.html>, at the FIEC offices, and via Karol.

What role do NREL and GE have in the effort?

The engineers at NREL and GE know more about the turbines operations and the likely sources of sounds than anyone here on the island, and, therefore, their role will be to assist FIEC in indentifying the sources and providing possible mitigation strategies, with cost estimates, for FIEC to consider.

Will the NREL and GE engineers make recommendations to the FIEC?

No. The engineers' role is not to make recommendations, but, rather, to present their findings and let the FIEC make whatever decisions are appropriate from them.

Can the NREL and GE engineers be contacted directly?

The engineers have asked the FIEC to field questions on their behalf. Following their most recent visit to the island the team received a significant number of emails. Although the questions are interesting, and are largely dealt with here in the FAQ, the study team, on its limited budget and availability, does not have the ability to answer all questions and to respond to individual emails. Moreover, they believe additional information from the team regarding the research effort should be open to the entire community not just in individual email replies. Therefore questions should be directed to Karol Kucinski (karolkucinski@gmail.com), who will then funnel them to the team. The team will answer the questions via this FAQ.

Will the research address whether the turbines are in compliance with state DEP standards?

No, the goal of the research is to try to link the most annoying sounds to sources at the turbines and will not address whether the turbines are in compliance at the residents homes.

Will the study team employ more microphones on the ground, than the two currently deployed, as has been done in other research?

The data collection team is currently planning to bring a mobile microphone data collections system to the island during the study period to better identify the noise levels at different places around the island, including near the turbines themselves, to identify the dominant noise sources. Using a

combination of stationary and mobile microphone systems in addition to the operational behavior of the turbines should give enough information to determine the dominant noise sources.

Will the study team deal with directional sensitivity of sounds (i.e., they might be louder in one direction than in others at the same time)?

Depending on the dominant wind directions during the testing period, the team should be able to observe the impact of directivity on the wind turbine noise. It is known that most turbines are quieter in the rotor plane than directly upwind or downwind of the rotor plane and this will be verified with additional observations. NREL expects to be able to connect measured wind direction information from the turbines with log observations (e.g., at a given time neighbors upwind may be more annoyed than other neighbors). Measurements with the portable microphone system will also allow for additional quantification of the directivity. That said, the wake interactions between turbines are not thought to be a dominant noise source, as this phenomenon has never been observed. However, data taken at different yaw positions should provide evidence as to whether this interaction is important for noise.

Will the study team be addressing if the turbines proximity to each other is a contributing factor to the noise issue?

Noise from two turbines will be louder than a single turbine, when observed from between the turbines. Wake interaction between turbines is not believed to be an important noise source; however the data will be scrutinized for such an effect.

Will the study team be addressing overall dBA at the respondents' homes, and how much lowering the turbines to that level would cost the FIEC?

The team may have some mobile microphone measurements at resident's homes, however because the measurements are temporary, the conditions under which these occur may not be representative samples. Therefore, these measurements will be correlated to the stationary microphones to examine the relative difference between locations. The stationary microphones will have a much longer record and provide a larger amount of data for useful statistics.

As far as cost, the team will use some NREL-developed noise models to estimate relative loss of power production for the turbines, which in turn can be used to estimate energy production and ultimately cost increases. The latter will be a simple estimate based on bulk power price and not real time pricing of electricity on the island.

Will the study team be addressing targeted curtailment, for example, limiting operations during the evenings or the days in the summer?

Based on survey feedback, the study team will try to determine the most annoying time of day for turbine operation, correlate them with turbine operating and wind conditions. It might also be the case that certain wind directions may be the most annoying. Using this information the community can decide on curtailment options.

If the turbines are not in compliance, how will that impact the results of the experiment?

Compliance with DEP should not impact the study in that the team will be focused on identifying the most annoying conditions for noise and potential mitigation strategies.

How will the results be presented to the community and will the data from the research effort be made available to public scrutiny?

The study will be published as an NREL technical report, available to the public at the end of the project. Some of the data used for the report will likely be publically available, but not all of it, because portions are protected under intellectual property rights and because of a need to protect the individuals involved in the data collection effort.

In addition to the NREL report will the study be submitted to a journal for publication?

As with any research effort, until data is taken and scrutinized, it is unknown if the study will add knowledge to the literature and thus be suitable for journal publication.