

Proposed High Brenfield Wind Farm by Low Carbon

Scotland and in particular Mid-Argyll and Kintyre is being vandalized by a plethora of Wind farms. Aside from the numerous objections I have to this proposal at High Brenfield, I would like to expand on the subject of infrasound.

Firstly, Scotland is already producing 113% green energy. The community here should have guessed that the installation of new pylons with increased cabling was not because of a sudden high demand for electricity in this area or due to new factories, increase in population, or more kettles and toasters being used. In fact the opposite is true and the population is in decline. It is to enable connection to the National Grid, which will also involve the installation of sub-stations along with large battery storage facilities for wind farms.

The land for this wind farm is owned by the Greshorn Trust, a company based in London. Low Carbon say the community will reap financial benefits from this, while these (mostly foreign) companies make £millions and your electricity bill will most likely not go down. I'm not sure whether the low frequency infrasound from wind turbines will affect my family or not, but there are people in Kintyre who are already suffering the ill-effects of infrasound. It's called vibro-acoustic disease. The UK and Scottish Governments should be investigating this thoroughly to protect the health and well-being of our citizens over financial gain. Vibro-acoustic disease was scientifically proven to exist in 1985 yet our Minister for Health is skeptical of this, even though she has met with this family face to face in their home.

**You cannot HEAR infrasound you can only HEAR audible noise.
You cannot measure infrasound accurately with a microphone, you should use a micro-barometer.**

Similarly, you cannot SEE infrared, but you can FEEL it, or use an infrared camera or special goggles.

Standing up close to a wind turbine you will hear the audible noise as the blades woosh through the air and also that of the gearbox and generator whirring. This will very quickly become inaudible as you walk away as higher frequencies don't travel a long distance, whereas infrasound does and cannot be heard.

Atmos Consulting have produced a 24 page Environmental Assessment Report on behalf of Low Carbon. It will bamboozle the majority of the population who care to read it, including me. However, if I may draw your attention specifically to chapter 11.4.4 Low Frequency and Infrasound; which states at its end, "*Infrasound is therefore scoped out of the assessment*". Implying it's not an issue, nothing to worry about.

Also please refer to chapter 11.3 Consultation:

"Concerns raised about an area of the Kintyre Peninsula where cumulative noise from three wind farms, individually appeared non problematic, but caused considerable distress and health issues to residents in a small hamlet in a natural bowl."

Surely an accurate measurement of infrasound and noise would have to be taken after the installation of all three wind farms? These measurements by experts should not be based on some hypothesis, existing installations or pure mathematics? Also, how can infrasound be "scoped out" of the equation when infrasound has caused "distress and health issues" to the residents of Kintyre?

Ardrishaig is not in a "bowl" but Inverneil is in a valley. As infrasound bounces off the hill opposite the wind farm it may create a node, or hot-spot where there could be a significantly high level of amplitude that would be intolerable. Indeed any enclosure, box or house could effectively amplify a certain frequency depending on the location and dimensions. It all depends where your house is. The folks who live a mere half mile from the affected household in Kintyre are also close to the turbines and yet feel no ill-effects. There are two factors to consider here; they have a higher tolerance level, or their house sits in an anti-node or quiet spot of low amplitude.

Wind farm-associated low-frequency vibration signals can propagate over long distances and in some cases up to 15km.

Experiment 1: While driving, open the rear window of your car. You will *hear the audible noise* of the wind and *feel the inaudible* annoying air pressure in your ear. This is the infrasound component.

Experiment 2: Fill your bath or large basin, wiggle one finger in the water and watch the waves emanate and bounce off the sides as they interfere with the wave from your finger – just like an echo if it were sound. Now put the whole palm of your hand in the water and push slowly side to side and make a bigger wave, which has a lower frequency, the wave length will be longer and the height (amplitude) will be higher and may spill over the sides. Imagine the water is sound over land and your hand is the turbine blade – where are you going to safely place your house?

I have met with the "residents" mentioned above. This family is indeed suffering from the effects of infrasound. They are unable to sleep, have headaches, nausea and generally feel unwell. This affects all generations and even farm workers have refused to work there as they too feel unwell. This is vibro-acoustic disease.

Our Minister for Health and MSP for Argyll & Bute met with this family at their home. She does not recognize this condition to be a significant problem and is skeptical of its existence. There is a resident in Muasdale who is facing the prospect of a wind farm (Killean) on her door step along with 27 shipping container size lithium-ion batteries close to her house. She asked the Minister,

who agreed to a home visit "What am I supposed to do if I start to feel unwell?" The Minister's reply was "I'm not a physician".

They say human hearing ranges from 20 Hz to 20kHz (20,000Hz or cycles per second) Many of us will struggle to hear above 10kHz and below 40Hz. A high pitched whistle is around 1kHz. 80Hz is a low hum, but when you go below this frequency the ear becomes less efficient. You no longer hear and you start to feel vibration. (See link to online tone generator below)

Sound engineers will filter off frequencies below 35-40Hz not only to protect loudspeakers and amplifiers but more importantly to protect your well-being. You may have experienced the thump of a kick drum or bass guitar in your gut at a loud concert or club. This can be enjoyable for a few hours, though human tolerances to this vary. I have a friend who dislikes bass vibrating the floor, while others love it. However, imagine taking away all the audible sounds and leaving just that thump and vibration, pounding your organs and shaking the floor, like an earthquake – not so pleasant. Quite simply where the ear stops hearing the body starts feeling. Technically infrasound is anything below 20Hz. Other examples would be a neighbor playing loud music, or a band playing in the village hall at the end of your street. Generally, you won't make out the piece of music because all you are most likely to hear is the annoying thump. Low frequencies travel a far greater distance than high frequencies.

Often written in the manual for, or on the back of large sub-bass loudspeakers for large sound systems is a warning along the lines of "The crowd line should be at least 5m from this enclosure, intense low frequencies may induce nausea or vomiting at close proximity". This can also affect those with heart conditions or pacemakers.

Wind turbines will produce infrasound below 20Hz.

More loudspeakers = louder music
More wind turbines = more infrasound

Consider this – If you were to rapidly wave your hand in front of someone's face they would feel the air blowing and it would be annoying. If you had the strength and power to move your hand more than 20 times a second (20Hertz) technically you would be creating sound – audible noise. In reality you would have to reach about 40Hz before the person 'heard' anything.

A hair dryer, air raid siren, aircraft propeller, jet engine, kid's toy windmill and ... eh ... wind turbines! These are all things you only begin to hear as they spin faster and the frequency goes up, but at the start, as the fan spins slowly you will not hear it until it spools up through from infrasound to audible noise.

One of my own experiences of this was from the Gleniffer Braes near Paisley, some 4 miles from Glasgow airport. When the large Airbus A380 (or any jumbo jet) starts its engines the low frequency pulse can thump the air for a few

seconds as it spools up, because low frequencies travel longer distances. I can feel it before I hear it.

References

For a more detailed explanation please refer to this video on infrasound by Dr Mariana Alves-Pereira:

<https://www.youtube.com/watch?v=2Q7rgDH8M8s>

Have fun with this online tone generator:

<https://onlinetonegenerator.com/>

Listen to this on decent loudspeakers that can handle bass, ideally not on your phone or headphones. Have fun setting different frequencies and you will easily experience your limits of hearing. It starts at 440Hertz, which is the standard fundamental frequency of the note 'A' in music. Above 10,000Hz you will find it more difficult to hear, especially if you are over 50.

Now go to 100Hz then further down in increments of 10. You are now in the bass range where you are less likely to hear but start to feel the air move. Look closely at your speaker and you will see it visually moving and feel the pulse of air in front of it. By 40Hz it starts to be unpleasant. You may have to turn up the volume but be careful not to blow your speakers!

My thanks to Ardrishaig Community Council for their time dedicated to this proposed wind farm.

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