

## Observation

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Application area: Garrane, Ballynagoul, Creggane and Charleville, Co. Limerick

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### My main point

I strongly object to the suggested project proposed by Garrane Green Energy. The idea of placing so many, so big wind turbines so close to settlements is not in harmony with a just, modern, green energy transition. The guidelines currently in use to protect neighbours from excessive levels of noise are not in line with the wind turbine development and the current knowledge on the health effects from exposure to noise, especially the serious health effects connected to low frequency noise. Long-term effects, especially, are not known, as this size of wind turbines has only been in operation for a few years, and only a small number of people have been exposed to such scale of wind turbine noise. Allowing this project to go ahead would be a gamble with the neighbours life quality and health.

### Human health concerns

*Garrane Green Energy does not acknowledge that their project poses a risk to human health despite wind turbine noise being addressed by WHO as of concern and as bringing a risk of adverse health effects.*

With a reference to the World Health Organisation (WHO) (2018) and Department of Health, Garrane Green Energy claim in their leaflet that there is no evidence that wind farms cause negative health impacts. This is simply not true. In the more recent report by WHO (2019), they specifically name out wind turbine noise as a concern and strongly recommend policy-makers to take action to reduce noise exposure from wind turbines. They recommend "reducing noise levels produced by wind turbines below 45 dB Lden, as wind turbine noise above this level is associated with adverse health" (WHO, 2019). In the same report WHO addressed the issue of low quantity of data. This low level of data limited them from preparing an in-depth guideline when it comes to night time exposure to wind farm noise, but they still address this as a separate issue that needs attention. I am very concerned that Garrane Green Energy tries to downplay, or even reject that there are health issues connected with being neighbours to a wind farm by referring to an older report by WHO. Even in cases where there is uncertainty and any particular health impact cannot be directly rejected as caused by exposure to wind turbine noise, I would flip the argument around: We as citizens should have the right to a precautionary principle, not allowing unnecessary risks to be imposed on us, in the same way as we are cautious about allowing excess levels of

certain chemicals in our food and water supplies. Noise pollution should be treated at the same critical level as toxic pollution. What society would indeed leave neighbours to be exposed to a known toxic release from an industry. Exposure which over the years might cause serious health conditions for individuals, which again might have a negative effect on society overall in terms of increased health cost and people being limited or unable to work due to their conditions.

#### *Research on exposure to wind turbine noise - low frequency noise*

WHO describes noise as an important public health issue of growing concern as it has negative impacts on both human health and well-being (WHO, 2019). Low frequency noise, sounds with frequencies below 200 Hz, is of particular concern. The most severe type of low frequency noise, known as infrasound, is characterised by frequencies lower than 20 Hz which means that the sound is felt rather than heard, providing it is loud enough (Jakobsen, 2001). Exposure to low frequency noise and infrasound vibration from turbines deceives the body into thinking that it is moving. This effect on how the body registers balance and motion then directly affects an array of brain functions (Pierpont, 2009), which again can result in numerous health issues in both short- and long-term.

Across Europe, noise from wind turbines has consequently been reported as more detrimental than traffic and industrial noise because this noise is present both day and night and all year round. Furthermore, researchers have shown a dose-response relationship between immission levels of wind turbine sound and self-reported noise annoyance (Pedersen & Waye, 2004; Pedersen, 2011; Bakker *et al.*, 2012), which demonstrates the high reliability of this data. Self-reported noise annoyances from people living close to large (1.5 to 3 MW) wind farms include: Sleep disturbance, headache and migraine, tinnitus, ear pressure, dizziness, vertigo, nausea, visual blurring, tachycardia, irritability, problems with concentration and memory etc. (Pierpont, 2009). Symptoms like these can also lead to much more serious health conditions in the long run.

One of the major problems associated with living close to wind turbines is that of sleep disturbance. Sleep deprivation is linked to a number of serious health conditions such as cardiovascular diseases including high blood pressure and stroke, but also metabolic conditions and mental health disorders such as depression and anxiety, which can emerge in otherwise healthy individuals and worsen symptoms in individuals with an underlying medical condition (Medic *et al.*, 2017). Long term consequences also give an increased risk of certain types of cancer (Sigurdardottir *et al.*, 2013; Thompson *et al.*, 2011). Because of a difference in atmospheric stability from day to night, wind turbine rotation speed during nighttime is often underestimated resulting in up to 15 dB higher sound levels during nighttime, relative to the same reference wind speed in daytime (van den Berg, 2004, 2005). This can cause sleep disturbance for people living in the areas surrounding wind farms. Due to this effect, van den Berg (2004) found that on a quiet night, wind turbines can be heard at distances up to several kilometers away. Therefore, if proper measures aren't taken to protect neighbours of wind farms from noise pollution, particularly low frequency noise during nighttime, it could have severe health impacts for a large number of individuals.

### *Outdated guidelines used in Ireland*

Guidelines regulating how close wind turbines can be placed to human settlements has been put in place with the purpose of protecting people living close to wind farms. However, the guidelines that Ireland commits to are hopelessly behind and therefore no longer ensures neighbours to wind farms the necessary protection. Garrane Green Energy commits to a set-back distance of 4 times the total height of the wind turbines. Unfortunately, this measure is unsuitable for modern giant wind turbines, as it only protects people from extensive visual impacts of being neighbours to a wind farm, and not the serious issue of noise pollution. One of the major problems with wind turbines now being much bigger than in the past is that they produce relatively more low frequency noise (Møller & Pedersen, 2011; Pedersen et al., 2012). This type of noise travels longer and penetrates easier through people's houses and the current set-back distance does not account for this. Furthermore, individual set-back distances do not account for the cumulative effect of a high number of wind turbines producing low frequency noise in the same area (Josimović et al., 2023). In Denmark, a country that has a long history of generating wind energy, the problem of low frequency noise has been recognised. The previous noise limit of 45 dB at dwellings, which was established in 1991, was updated in 2012 to include specific limits for low frequency noise (Jakobsen, 2012). The current-in-use Danish guidelines therefore restrict the owner of wind turbines to guarantee that the low frequency noise levels, ranging from 10 to 160Hz should not exceed a threshold of an A-weighted level (LpALF) of 20 dB measured inside individual homes during wind speeds of 8 m/s and 6 m/s (Danish Ministry of Environment and Equality, 2019). This forces the wind farm companies to be much more cautious when it comes to set-back distance and how many wind turbines they place near settlements. Not only the size of the wind turbines matter, but also the total number of wind turbines (Josimović et al., 2023) in a particular type of landscape (Katinas et al., 2016) influence how much low frequency noise neighbours will be exposed to. Restrictions based on actual noise exposure offers a more fair and proportional level of protection rather than the out-dated purely distance-based set-back distances. As a minimum, Ireland should take on the same low frequency noise restrictions as Denmark has had since 2012, and ensure that the wind farm companies actually live up to such noise limits. The higher impact of noise during nighttime (van den Berg, 2004, 2005) should ideally also be accounted for, as although no formal guidelines exist on this yet (WHO, 2019) it is recognised as a big problem. Ignoring the issue of noise and its accumulated effect is to deny citizens a fundamental level of protection.

### **Concerns for biodiversity**

The negative health effects from low frequency noise outlined above would also affect animals in a similar way, and possibly to an even higher extent because some of their habitats would be located even closer to the wind turbines. I am in particular concerned about how Garrane Green Energy suggests placing wind turbines and a noisy substation very close to the Charleville lagoons. As one of the only large bodies of water in the wider region, the Charleville lagoons attract a large number of birds and bats. As flying species, both birds and bats would be at risk of collision with wind turbines while going to and from the Charleville lagoons. Bats have sensitive hearing and depend on echolocation during navigation and feeding. Therefore, bats would also be highly negatively affected by large

amounts of noise produced by several wind turbines so close to their feeding area, as such noise pollution evidently lead to decreased hunting efficiency in bats (Allen *et al.*, 2021).

The effect of ground disturbance and low frequency noise from wind turbines are often overlooked when it comes to ground dwelling animals, but a study from Poland has shown that voles living near wind turbines had a higher level of corticosterone, indicating a higher stress level (Łopucki *et al.*, 2018). In fact, this is likely to be the case for a large range of animals living in areas close to wind farms. We do have a responsibility to ensure the few remaining habitats that animals rely on in our country.

### **Concerns for the community: economy and road accessibility and safety**

Neighbours to this suggested wind farm would stand at a high risk of an economic loss due to devaluation of property. Based on data from 2.4 million house transactions and 6,878 wind turbines in Denmark, Andersen and Hener (2025) shows that house prices within a range of 1km from a modern giant wind turbine (120 meter tall or higher) are negatively affected with an average reduction of up to 12%, and an additional decrease in value of 8.1% if the houses are affected by shadow flicker. Another study of house prices in the west of Ireland showed similar results with a reduction in house prices of approximately 14.7% within 1km of a wind turbine (Gillespie & McHale, 2023). Furthermore, Dröes and Koster (2021) found significantly greater negative effects on house prices from turbines taller than 150m compared to turbines shorter than 50m, and that the effect on house prices is greatest at close proximity to turbines and decreases as distance increases. This also emphasises how the permitted distance to houses is out of tune with the negative effects of living close to a giant wind turbine, compared to smaller sized wind turbines.

Another concern is that of road accessibility and safety. The roads in this area are very small and would not be suitable for extensive traffic to an industrial scale wind farm area, not least during construction. In some places normal sized cars can only just about pass each other. If trucks and lorries would be more frequent on these roads, it would seriously limit the accessibility for locals and create potentially dangerous situations on the roads.

### **Flood risk**

Garrane Green Energy's suggestion to build a wind farm in a low land area would come with a risk of worsening the seasonal flooding in the local area. If the wind turbines would need a solid base then this will limit the capacity of the ground to soak water. Instead the water would have to go elsewhere. This could cause a higher risk of flooding of property and infrastructure such as rounds in the area, which with more extreme weather events in the future could cause a large scale of damage and therefore cause further economic loss to the locals.

### **Conclusion: There are other ways to have a just, modern green energy transition**

We do need to take action against climate change and turn towards more green energy solutions. However, as I have already stated, this should happen in a more just fashion. First of all by securing locals the proper protection facilitated by the increasing amount of research backing up how the current guidelines are unsuitable and insufficient when it comes to giant wind turbines and how close they can be allowed to human settlements. It shouldn't be necessary to sacrifice local communities to known disadvantages and negative health effects, not even in the name of green energy transition. As stated in the Aarhus Convention (1998), which Ireland has ratified, the public has a fundamental right to information, a right to be involved in environmental decision-making and a right to justice if actions are taken that violate their environmental rights. In the case of the project proposed by Garrane Green Energy, local communities were denied information and involvement for years. As the 'Landowner Agreement and Consent' document in Garrane's application shows, the first landowners were signed up in 2021 and the majority of environmental impact assessment work took place in 2022-2024. Garrane's first communication with the local community was not until April 2025 - that's four years after the company had started preparation for the project, and a mere four months before they submitted their planning application. I surely hope that the voices of locals will be allowed more weight in the decision-making process, given that the project will impact many aspects of their environment.

I respectfully request that An Coimisiún Pleanála refuse the proposed project permission, and that it work for better and fairer restrictions to ensure the public's rights.

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