

Ballyfeeny Green Energy Project



Environmental Impact Assessment Report Volume III

Appendix 10.6 – Directional Cumulative Assessment

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Directional Cumulative Assessment

Review of directional cumulative assessment at 1 no. property (NSL 18) with an exceedance of 0.4 dB during day-time period at 6 m/s for Turbine Technology Option 3.

When considering noise impacts of wind turbines, the effects of propagation in different wind directions can be considered. The day to day operations of the proposed development will not result in a worst-case condition of all noise locations being downwind of all turbines at the same time i.e. omni-directional, as per the noise predictions in the noise impact assessment chapter. To address this issue, a review of expected noise levels downwind of the turbines has been prepared for various wind directions in accordance with the IoA GPG Guidance.

For any given wind direction, a NSL can be assigned one of the following classifications in relation to turbine noise propagation:

- Downwind (i.e. $0^\circ \pm 80^\circ$);
- Crosswind (i.e. $90^\circ \pm 10^\circ$ and $270^\circ \pm 10^\circ$);
- Upwind (i.e. $180^\circ \pm 70^\circ$).

Figure 1 illustrates the directivity attenuation factor that can be applied to turbines when considering noise propagation in downwind conditions.

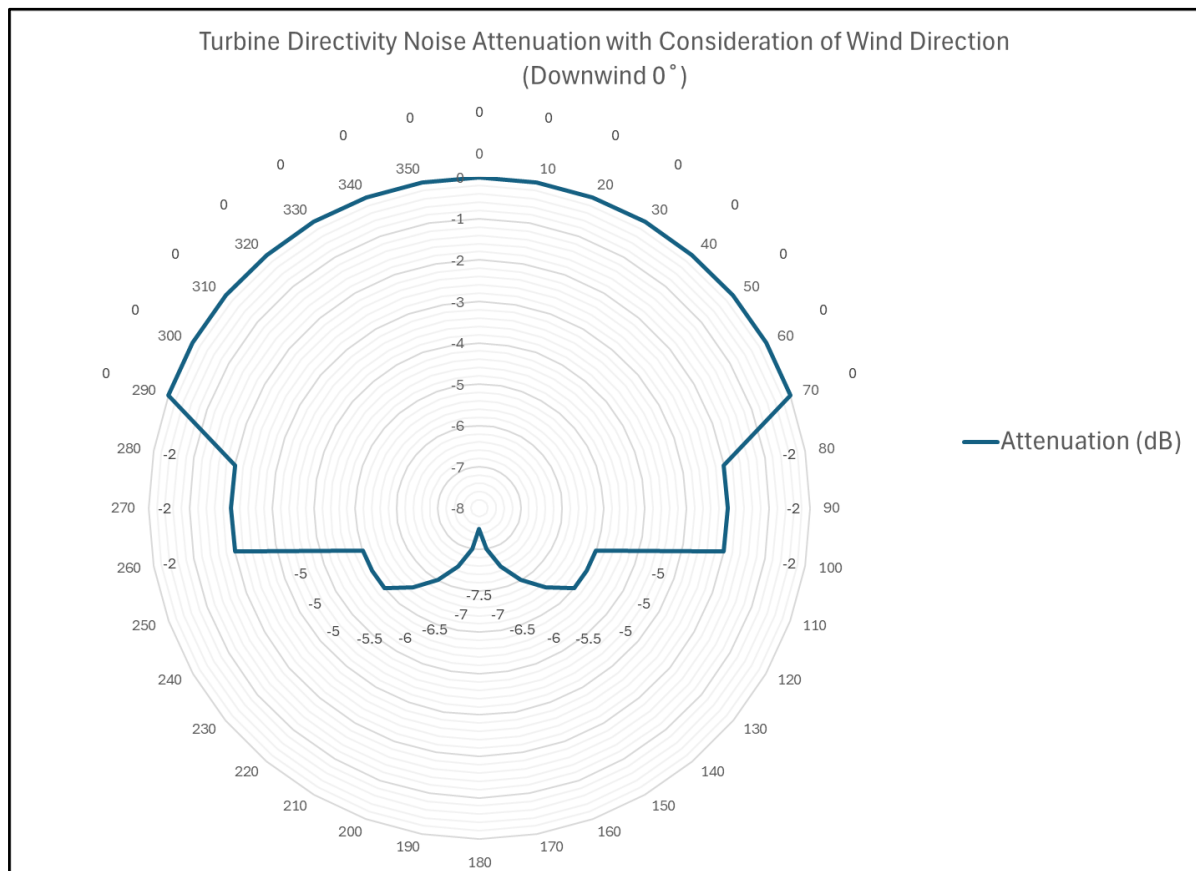


Figure 1. Turbine Directivity Attenuation with Consideration of Wind Direction

The number of locations with cumulative exceedances of the noise criteria is just 1 no. property of the 219 no. properties assessed. At NSL18 the exceedance was 0.4 dB during day-time at 6 m/s wind speed. Directional cumulative noise predictions models have been developed to identify the number and magnitude of exceedances to the noise criteria at NSL18 with the proposed turbines operating in standard mode.

Cumulative directional results for Turbine Technology Option 3 with all turbines operating in standard operating mode are presented in Table 1 to for each of the various wind direction sectors that have been assessed along with the noise limits.

Table 1. Summary of Cumulative Directional Results for Wind Turbine Technology Option 3 at NSL18.

	Noise Limits (dBA) per Standardised Wind Speeds V10						
	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s
Daytime Limit	40	40	40	45	45	45	45
Nighttime Limit	43	43	43	43	43	43	43
Wind Direction	Predicted Cumulative Noise Levels (dBA)						
North 0°	27.2	32.8	35.6	36.7	36.8	36.8	36.8
Northeast 45°	28.8	34.4	37.2	38.3	38.4	38.4	38.4
East 90°	30.5	36.1	38.9	40.0	40.1	40.1	40.1
Southeast 135°	31.6	37.2	39.9	41.1	41.2	41.2	41.2
South 180°	31.5	37.1	39.9	41.0	41.1	41.1	41.1
Southwest 225°	30.9	36.5	39.3	40.4	40.5	40.5	40.5
West 270°	29.4	35.0	37.8	38.9	39.0	39.0	39.0
Northwest 315°	27.3	32.9	35.7	36.8	36.9	36.9	36.9

When cumulative directionality is considered, there are no NSLs that exceed the noise criteria for Turbine Technology Option 3.