

Appendix 11.4: Candidate turbine manufacturer's noise emission data



Third octave sound power levels

Nordex N149/5.X

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Third octave sound power levels with serrated trailing edge – Mode 0

Mode 0

hub height 105 m – 105.6 dB(A)

third octave sound power levels [dB(A)] at standardized wind speeds v_s										
Frequency	3 m/s	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s
10 Hz	37.6	38.8	42.3	46.7	48.1	48.5	48.5	48.5	48.5	48.4
12.5 Hz	42.4	43.6	47.2	51.6	53.0	53.3	53.3	53.3	53.3	53.3
16 Hz	47.0	48.2	51.8	56.2	57.6	57.9	57.9	57.9	57.9	57.9
20 Hz	51.4	52.6	56.1	60.5	61.9	62.3	62.3	62.3	62.3	62.3
25 Hz	55.8	57.0	60.5	64.9	66.3	66.2	66.2	66.2	66.2	66.2
31.5 Hz	59.9	61.1	65.0	69.4	70.8	71.7	71.7	71.7	71.7	71.7
40 Hz	65.8	67.0	69.4	73.8	75.2	75.3	75.3	75.3	75.3	75.3
50 Hz	67.0	68.2	72.7	77.1	78.5	80.4	80.4	80.4	80.4	80.4
63 Hz	71.9	73.1	75.2	79.6	81.0	81.7	81.7	81.7	81.7	81.7
80 Hz	74.8	76.0	78.9	83.3	84.7	84.5	84.5	84.5	84.5	84.5
100 Hz	75.8	77.0	80.9	85.3	86.7	89.2	89.2	89.2	89.2	89.2
125 Hz	78.0	79.2	81.9	86.3	87.7	87.7	87.7	87.7	87.7	87.7
160 Hz	81.3	82.5	84.9	89.3	90.7	89.0	89.0	89.0	89.0	89.0
200 Hz	80.4	81.6	84.9	89.3	90.7	90.3	90.3	90.3	90.3	90.3
250 Hz	81.7	82.9	86.4	90.8	92.2	91.2	91.2	91.2	91.2	91.2
315 Hz	82.9	84.1	88.0	92.4	93.8	94.5	94.5	94.5	94.5	94.5
400 Hz	83.3	84.5	88.3	92.7	94.1	94.1	94.1	94.1	94.1	94.1
500 Hz	82.0	83.2	88.0	92.4	93.8	94.3	94.3	94.3	94.3	94.3
630 Hz	83.2	84.4	89.6	94.0	95.4	96.3	96.3	96.3	96.3	96.3
800 Hz	82.5	83.7	89.2	93.6	95.0	95.4	95.4	95.4	95.4	95.4
1000 Hz	83.8	85.0	90.6	95.0	96.4	96.2	96.2	96.2	96.2	96.2
1250 Hz	83.4	84.6	90.1	94.5	95.9	95.5	95.5	95.5	95.5	95.5
1600 Hz	82.9	84.1	89.8	94.2	95.6	94.5	94.5	94.5	94.5	94.5
2000 Hz	81.4	82.6	88.1	92.5	93.9	93.3	93.3	93.3	93.3	93.3
2500 Hz	79.1	80.3	85.7	90.1	91.5	91.3	91.3	91.3	91.3	91.3
3150 Hz	76.9	78.1	81.5	85.9	87.3	88.6	88.6	88.6	88.6	88.6
4000 Hz	76.8	78.0	76.7	81.1	82.5	84.6	84.6	84.6	84.6	84.6
5000 Hz	72.2	73.4	74.3	78.7	80.1	79.8	79.8	79.8	79.8	79.8
6300 Hz	68.5	69.7	72.7	77.1	78.5	79.6	79.6	79.6	79.6	79.6
8000 Hz	66.6	67.8	70.6	75.0	76.4	77.7	77.7	77.7	77.7	77.7
10000 Hz	62.7	63.9	66.7	71.1	72.5	73.5	73.5	73.5	73.5	73.5
Total sound power level	94.0	95.2	99.8	104.2	105.6	105.6	105.6	105.6	105.6	105.6

Third octave sound power levels with serrated trailing edge – Mode 0

hub height 120 m – 105.6 dB(A)

third octave sound power levels [dB(A)] at standardized wind speeds v_s										
Frequency	3 m/s	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s
10 Hz	37.6	39.1	42.6	47.1	48.1	48.5	48.5	48.5	48.5	48.4
12.5 Hz	42.4	43.9	47.5	52.0	53.0	53.3	53.3	53.3	53.3	53.3
16 Hz	47.0	48.5	52.1	56.6	57.6	57.9	57.9	57.9	57.9	57.9
20 Hz	51.4	52.9	56.4	60.9	61.9	62.3	62.3	62.3	62.3	62.3
25 Hz	55.8	57.3	60.8	65.3	66.3	66.2	66.2	66.2	66.2	66.2
31.5 Hz	59.9	61.4	65.3	69.8	70.8	71.7	71.7	71.7	71.7	71.7
40 Hz	65.8	67.3	69.7	74.2	75.2	75.3	75.3	75.3	75.3	75.3
50 Hz	67.0	68.5	73.0	77.5	78.5	80.4	80.4	80.4	80.4	80.4
63 Hz	71.9	73.4	75.5	80.0	81.0	81.7	81.7	81.7	81.7	81.7
80 Hz	74.8	76.3	79.2	83.7	84.7	84.5	84.5	84.5	84.5	84.5
100 Hz	75.8	77.3	81.2	85.7	86.7	89.2	89.2	89.2	89.2	89.2
125 Hz	78.0	79.5	82.2	86.7	87.7	87.7	87.7	87.7	87.7	87.7
160 Hz	81.3	82.8	85.2	89.7	90.7	89.0	89.0	89.0	89.0	89.0
200 Hz	80.4	81.9	85.2	89.7	90.7	90.3	90.3	90.3	90.3	90.3
250 Hz	81.7	83.2	86.7	91.2	92.2	91.2	91.2	91.2	91.2	91.2
315 Hz	82.9	84.4	88.3	92.8	93.8	94.5	94.5	94.5	94.5	94.5
400 Hz	83.3	84.8	88.6	93.1	94.1	94.1	94.1	94.1	94.1	94.1
500 Hz	82.0	83.5	88.3	92.8	93.8	94.3	94.3	94.3	94.3	94.3
630 Hz	83.2	84.7	89.9	94.4	95.4	96.3	96.3	96.3	96.3	96.3
800 Hz	82.5	84.0	89.5	94.0	95.0	95.4	95.4	95.4	95.4	95.4
1000 Hz	83.8	85.3	90.9	95.4	96.4	96.2	96.2	96.2	96.2	96.2
1250 Hz	83.4	84.9	90.4	94.9	95.9	95.5	95.5	95.5	95.5	95.5
1600 Hz	82.9	84.4	90.1	94.6	95.6	94.5	94.5	94.5	94.5	94.5
2000 Hz	81.4	82.9	88.4	92.9	93.9	93.3	93.3	93.3	93.3	93.3
2500 Hz	79.1	80.6	86.0	90.5	91.5	91.3	91.3	91.3	91.3	91.3
3150 Hz	76.9	78.4	81.8	86.3	87.3	88.6	88.6	88.6	88.6	88.6
4000 Hz	76.8	78.3	77.0	81.5	82.5	84.6	84.6	84.6	84.6	84.6
5000 Hz	72.2	73.7	74.6	79.1	80.1	79.8	79.8	79.8	79.8	79.8
6300 Hz	68.5	70.0	73.0	77.5	78.5	79.6	79.6	79.6	79.6	79.6
8000 Hz	66.6	68.1	70.9	75.4	76.4	77.7	77.7	77.7	77.7	77.7
10000 Hz	62.7	64.2	67.0	71.5	72.5	73.5	73.5	73.5	73.5	73.5
Total sound power level	94.0	95.5	100.1	104.6	105.6	105.6	105.6	105.6	105.6	105.6

Turbines Operating in Derragh Wind Farm: Nordex 100, 3.3MW with hub height of 100m with STE- Noise levels used for Prediction Model

Wind Speed (m/s)	Octave Band Centre Frequency (Hz)								dB L _{WA}
	63	125	250	500	1000	2000	4000	8000	
3	73.0	79.4	83.5	83.5	84.4	84.5	84.3	77.0	91.6
4	75.1	81.5	85.6	85.6	86.5	86.6	86.4	79.1	93.7
5	78.6	85.0	89.1	89.1	90.0	90.1	89.9	82.6	97.2
6	82.7	89.1	93.2	93.2	94.1	94.2	94.0	86.7	101.3
7	83.3	89.7	93.8	93.8	94.7	94.8	94.6	87.3	101.9
8	84.1	90.5	94.6	94.6	95.5	95.6	95.4	88.1	102.7
≥9	84.4	90.8	94.9	94.9	95.8	95.9	95.7	88.4	103.0

All predictions presented in this report to account for various uncertainties in the measurement of turbine source levels, a +2dB uncertainty factor has been added to the turbine noise emission values in line with guidance for wind turbine noise assessment contained in the IOA GPG.

As outlined, appropriate guidance is couched in terms of a L_{A90} criterion. The provided turbine noise is referenced in terms of the L_{Aeq} parameter. Best practice guidance contained within the IoA GPG states that “L_{A90} levels should be determined from calculated L_{Aeq} levels by subtraction of 2 dB”. Therefore, in accordance with best practice guidance, a 2dB reduction has been applied to the predicted results in this assessment.

Co-ordinates of Derragh Wind Farm

Turbine Ref.	Coordinates - Irish Grid (IG)		Turbine Model	Hub Height (m)
	Easting	Northing		
DT1	116,066	70,721	N100 3.3MW	100
DT2	116,437	70,643	N100 3.3MW	100
DT3	116,773	70,394	N100 3.3MW	100
DT4	117,461	70,421	N100 3.3MW	100
DT5	117,207	70,079	N100 3.3MW	100
DT6	117,478	69,831	N100 3.3MW	100