SUNNICA ENERGY FARM

EN010106

Volume 6

Environmental Statement

6.2 Appendix 11E: Operation Noise Modelling

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

18 November 2021
Version number: 00

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Sunnica Energy Farm

Environmental Statement
Appendix 11E: Operation Noise Modelling

Regulation Reference:	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	EN010106
Application Document Reference	EN010106/APP/6.2
Author	Sunnica Energy Farm Project Team

Version	Date	Status of Version
Rev 00	18 November 2021	Application Version

Table of contents

Table of Tables

1 Operational Noise Modelling

1.1 Modelling Notes

1.1.1 Construction noise predictions have been undertaken using the computer modelling software CadnaA® (v2019).

1.1.2 Calculations of sound propagation from plant has followed the methodologies from International Standards Organization (Part 1: 1993, Part 2: 1996) ISO 9613 – Acoustics – Attenuation of sound during propagation outdoors.

1.1.3 Inverters and transformers have been modelled as point sources with sound propagating uniformly in all directions, at a standard height of 3m above local ground level.

1.1.4 Battery storage areas have been modelled as area sources, with the overall sound power levels based on the number of BESS unit cooling fans and transformers within each area. Area sources have been modelled at a standard height of 3m above local ground level.

1.1.5 Surrounding ground conditions have been modelled as soft (G=0.8).

1.1.6 Air temperature was assumed to be 10 degrees and humidity 70%.

1.1.7 Two orders of reflection were modelled to take into account reflections from ground surfaces and buildings.

1.1.8 Land topography has been incorporated into the noise modelling.

1.1.9 All receptor points have been set at a standard height of 1.5m during the daytime (representative of a ground floor living room) and 4m during the night-time (representative of a first floor bedroom) above local ground levels.

1.1.10 Building massing in the surrounding area outside of the DCO Site boundary has been sourced from Ordnance Survey Open Map [redacted] and modelled with a standard height of 6m.

1.2 Sound Level Data

1.2.1 Sound level data for proposed inverters, transformers, and battery units have been provided by the client, and are summarised below.

1.2.2 Quoted sound pressure levels for the inverters are 79 dB(A) at a measurement distance of 1m.

1.2.3 Using formula $L_w = L_p + 10.\log(A)$

Where L_w = sound power level

L_p = sound pressure level at measurement distance 1m

A = exposed surface area of plant item (approx. $13m^2$)

The equivalent sound power level is calculated to be 90 dB(A).

1.2.4 Quoted sound power level for the transformers are 74 dB(A).

Table 1-1 Tolerances

		Tolerances
Peak Efficiency Index (PEI)	>99,465%	0%
No load losses	2750W	0%
Load losses	37000W	0%
Total losses	39750W	0%
Impedance voltage at 75C	7%	+/- 10%
Acoustic power level	<74 dB(A)	0%

1.2.5 Sound power level of transformers at the Burwell Substation Extension is based on a transformer on a previous project by the manufacturer (400/132kV, 240MVA), as below. As a transformer around 400/600MVA is required, a sound power level of 95 dB has been applied.

Table 1-2 Guaranteed "Sound Power" Levels

Guaranteed "Sound Power" level			
Transformer Main Tank	dB(A)	90 / 92	at 100% Un / at 102% Un + 50% Load
Cooling Plant	dB(A)	84	-

1.2.6 Quoted sound pressure level for cooling fans associated with each battery unit is 75 dB(A) at a measurement distance of 1m. Assuming that cooling fans operate as a point source due to their relatively small surface area, using formula $L_w = L_p + 20.\log(r) + 8$ (where r = distance from source), the equivalent sound power level is calculated to be 83 dB(A) for each cooling fan.