

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) FOR THE PROPOSED COOM GREEN ENERGY PARK GRID CONNECTION

VOLUME 2 – MAIN EIAR

CHAPTER 8 - NOISE AND VIBRATION

Prepared for:

Coom Green Energy Park Limited



Date: April 2026

Document No:

P24308-FT-EGN-XX-RP-EN-0001

Core House, Pouladuff Road, Cork, T12 D773, Ireland

T: +353 21 496 4133 | E: info@ftco.ie

CORK | DUBLIN | CARLOW

www.fehilytimoney.ie

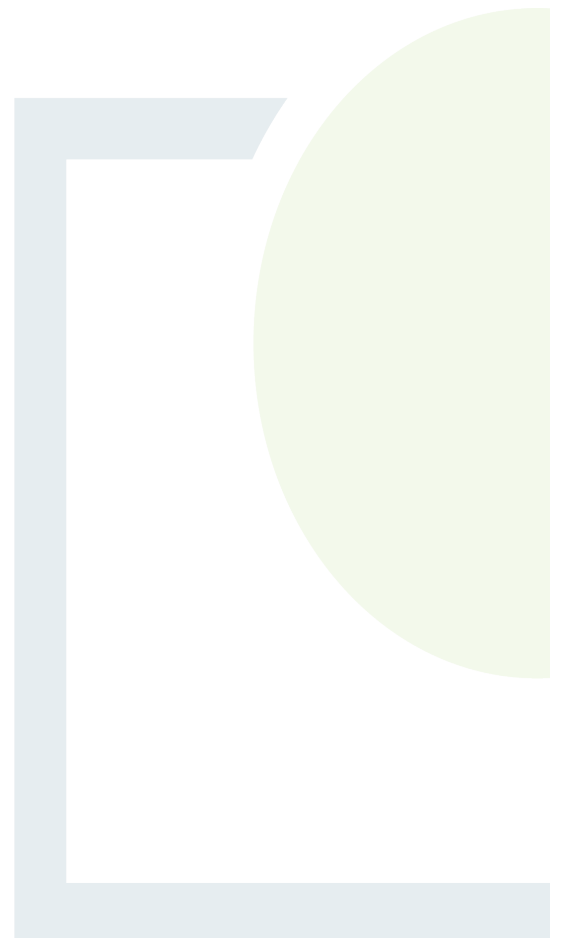


TABLE OF CONTENTS

8.	NOISE AND VIBRATION	1
8.1	Introduction.....	1
8.2	Statement of Authority	1
8.3	Study Area	2
8.4	Receiving Environment.....	2
8.5	Description of Noise and Vibration Potential Effects.....	2
8.5.1	Construction Noise and Vibration.....	2
8.5.2	Operational Noise	5
8.5.3	Significance of Impact	10
8.6	Potential Effects during Construction	11
8.6.1	Tree Felling.....	12
8.6.2	33 kV CNR.....	13
8.6.3	33 kV CNR Watercourse Crossing Works	15
8.6.4	110 kV GCR.....	15
8.6.5	110 kV GCR Watercourse and Motorway Crossing Works	16
8.6.6	Construction of Substation	17
8.6.7	Cumulative Construction Noise	20
8.7	Potential Effects during Operation.....	21
8.8	Potential Effects during Decommissioning.....	23
8.9	Cumulative Noise.....	24
8.9.1	Cumulative Construction Noise	24
8.9.2	Cumulative Operational Noise.....	25
8.9.3	Cumulative Decommissioning Noise.....	26
8.10	Mitigation Measures	26
8.10.1	Construction Phase	26
8.10.2	Operational Phase.....	27
8.10.3	Decommissioning.....	27
8.11	Residual Effects	27
8.11.1	Construction Phase	27
8.11.2	Operational Phase.....	28
8.11.3	Decommissioning Phase	28
8.12	References.....	29

LIST OF TABLES

	<u>Page</u>
Table 8-1: Threshold of Potential significant effect	4
Table 8-2: Threshold of Potential significant effect, based on proposed site working hours	5
Table 8-3: Average Daytime and Nighttime L_{Aeq} and L_{A90} based on noise survey at location N18	7
Table 8-4: Guidance Note NG4 – Noise Limit Values for Noise from Licensed Sites	7
Table 8-5: World Health Organisation Noise Criteria.....	9
Table 8-6: Project specific operational noise limits	9
Table 8-7: Description of Effects	10
Table 8-8: Duration and Frequency of Effects.....	11
Table 8-9: Tree Felling- Likely Plant and Predicted Levels	12
Table 8-10: Grid connection works - Likely Plant and Predicted noise Levels	14
Table 8-11: 110 kV GCR Grid connection works - Likely Plant and Predicted noise Levels	17
Table 8-12: Construction of Substation - Likely Plant and Predicted Levels.....	19
Table 8-13: Octave Band Sound Power Level Data for proposed equipment	21
Table 8-14: Predicted Substation Operational noise at nearest NSL (R142)*.....	22
Table 8-15: Octave Band Sound Power Level Data for proposed equipment	25



8. NOISE AND VIBRATION

8.1 Introduction

This chapter assesses the likely significant effects related to noise and vibration from the Proposed Development.

As described in detail in the Description Chapter 2 of this EIAR, the Proposed Development comprises the following:

- A 110 kV Underground Cable (UGC) Grid Connection Route (GCR) from the permitted onsite substation at Lackendarragh to the existing Barrymore 110 kV substation located near Rathcormac, Co. Cork (also referred to herein as the '110 kV GCR');
- A 33 kV Underground Cable (UGC) Collector Network Route (CNR) between the western and eastern arrays of the permitted Coom Green Energy Park (CGEP) development (also referred to herein as the '33 kV CNR');
- A 110 kV onsite substation at Lackendarragh, in line with the latest Eirgrid functional specifications (also referred to herein as '110 kV Substation').

This chapter assessed potential construction, operational and decommissioning noise and vibration effects from the Proposed Development.

The consented Coom Green Energy Park (CGEP) development has been assessed cumulatively with the Proposed Development. The Battery Energy Storage System (BESS) forms part of the consented CGEP development and has been assessed cumulatively with the Proposed Development.

Operational noise from the Proposed 110 kV Substation is assessed and compared with planning conditions associated with the consented CGEP development, in addition to relevant operational noise criteria.

Potential cumulative noise from other developments has been assessed for construction, operation and decommissioning phases of the Proposed Development.

8.2 Statement of Authority

Maureen Marsden, Fehily Timoney and Company (FT) is an Acoustic Engineer with a Master of Engineering degree in Acoustics and Vibration and over 20 years' experience, in noise and vibration, in particular in industrial noise, including wind farm and solar farm projects. Maureen is a member of the Institute of Acoustics and the Institute of Engineers Ireland. Maureen has worked with wind farm and renewable energy projects for over six years. She has undertaken baseline noise surveys for wind farms, assessed construction and operational noise for wind farm projects and developed noise curtailment strategies where required. In addition to writing Environmental Impact Assessment Chapters, she has responded to Requests for Information (RFI's) post EIAR submission and provided input to the legal response for Judicial Reviews. Maureen Marsden undertook the operational and construction noise assessment for the Proposed Development in preparation of the Noise and Vibration Chapter. The noise data for this development has been compared with best practice criteria, and mitigation has been provided as required.



8.3 Study Area

Construction noise has been assessed by comparing predicted construction activities against best practice construction noise criteria, namely BS5228 Part 1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1: Noise, at the nearest residential dwellings to the construction activities. As such, if the construction noise meets the relevant noise limits at the nearest locations, it will also be below the relevant noise limits at more distant residential locations.

Operational noise from the proposed substation has been assessed at the closest property to the proposed substation. Noise has been assessed relative to the EPA NG4 Guidance Criteria and BS4142:2014+A1:2019, Methods for rating and assessing industrial and commercial sound. In addition, operational noise is assessed against guidance from the World Health Organisation to develop project specific noise criteria. If the project guidance noise limits from operational noise are met at the closest properties, then noise limits will be met at more distant locations.

8.4 Receiving Environment

The area is a rural location and lightly populated. Existing noise sources in the area include noise from agricultural activities, forestry and road traffic noise on local roads.

For construction noise, BS5228 defines noise-sensitive premises (NSPs) as "any occupied premises outside a site used as a dwelling (including gardens), place of worship, educational establishment, hospital or similar institution, or any other property likely to be adversely affected by an increase in noise level".

For the construction noise assessment, the noise sensitive locations (NSL) are the closest property to the proposed works.

For operational noise, the definition of a NSL in the Environmental Protection Agency's (EPA) 2016 NG4 noise guidance note is:

'any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels'.

For the operational noise assessment, noise has been assessed at the closest residential location to the substation, which is over 600m south east of the boundary of the 110 kV Substation at Lackendarragh North.

8.5 Description of Noise and Vibration Potential Effects

The following sections describe the potential noise and vibration effects associated with the proposed construction and permanent works. For construction and permanent works, the noise and vibration criteria are set out where relevant.

8.5.1 Construction Noise and Vibration

Construction noise is generated from construction of the substation, tree felling activities, drainage and culvert works and the proposed GCR and CNR works. The GCR and CNR works include watercourse and motorway crossing works.



Noise from vehicles on local roads and access tracks is also generated from the delivery of the components and construction materials.

Vibration is generated by construction activities such as passing heavy goods vehicles. The threshold of human perception of vibration is in the range of 0.14mm/s to 0.3mm/s, described as “might just be perceptible”. The guideline values for damage to buildings from vibration are 15mm/s at 4Hz increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above.

Typical vibration generated from construction activities for the proposed grid connection works at the Coom Green Energy Park are:

- Tracked excavators and disc cutters from cable trenching (0.8mm/s at 4m)
- Pneumatic breakers for cable trenching (0.7 mm/s at 10 m)
- Excavation works (0.6 mm/s at 100 m)
- HGV traffic on normal road surfaces (0.01 to 0.5 mm/s) at footings of buildings located 20m from roadway.

The nearest sensitive locations are sufficiently distant that vibration will not be perceivable by residents at their dwellings and building damage will not occur from construction incurred vibration. As such, construction vibration will not be considered further in this chapter.

8.5.1.1 Construction Noise Criteria

There is no statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. In the absence of specific noise limits, appropriate emission criteria relating to permissible construction noise levels for a project of this scale may be found in the British Standard BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Noise.

BS 5228-1:2009+A1:2014 contains several methods for the assessment of the potential significance of noise effects. The ABC Method was used to derive appropriate noise limits for the Proposed Development. The threshold limit to be applied (as defined in Table 8-1) is dependent on the existing ambient noise levels (rounded to the nearest 5dB).



Table 8-1: Threshold of Potential significant effect

Threshold value period (L _{Aeq})	Threshold Value, in decibels (dB)		
	Category A	Category B	Category C
Night-time (23:00 - 07:00hrs)	45	50	55
Evenings and weekends (19:00 – 23:00 hrs, weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 hrs Sundays)	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
<p>Note Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values. Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values. Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.</p>			

The approach adopted here calls for the designation of a NSL into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. For the appropriate period (e.g. daytime), the ambient noise level is determined and rounded to the nearest 5 dB.

The baseline noise survey results ambient (free-field) noise levels were analysed from the Coom Green Energy Park Wind Farm (CGEP) EIAR. A correction of +3dB was added to the noise levels to convert free-field noise levels to façade noise levels. The ambient façade noise level when rounded to the nearest 5dB varies, but for the most part it is less than 60 dB L_{Aeq}. The nearest residential dwellings to the proposed development are afforded Category A designation (65 dB L_{Aeq,1hr} during daytime periods).

Section 8.6 provides the detailed assessment of construction activity in relation to this site.

If the modelled construction noise level exceeds the appropriate category value (e.g. 65 dB L_{Aeq,1hr} during daytime periods) then a potential significant effect is predicted and mitigation measures may be required to reduce the noise levels below the L_{Aeq,1hr} daytime noise limit.

The hours of construction activity for the Proposed Development will be limited to avoid unsociable hours as per Section 6.3 (d) of BS 5228: Code of practice for noise and vibration control on construction and open sites, Part 1: Noise. Construction operations will generally be restricted to between 08:00 hours and 19:00 hours Monday to Friday and between 0700:13:00 on Saturdays. However, to ensure that optimal use is made of fair-weather windows, or at critical periods within the programme, it could occasionally be necessary to work outside these hours. Any such out of hours working would be agreed in advance with the local planning authority. Further details on working hours and restrictions of same are provided in the CEMP in Appendix 2.2, Volume 3 of the EIAR. The applicable noise limits for the proposed working hours are summarised below in Table 8-2.



Table 8-2: Threshold of Potential significant effect, based on proposed site working hours

Threshold value period (L _{Aeq}) For proposed working hours	Threshold Value, in decibels (dB)		
	Category A	Category B	Category C
Night-time (23:00 - 07:00hrs)	45	50	55
Evenings and weekends* (19:00 – 23:00 hrs, weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 hrs Sundays)	55	60	65
Daytime (07:00 – 19:00) and Saturdays** (07:00 – 13:00)	65	70	75
Saturday** (13:00-18:00)	55	60	65
Note *In exceptional circumstances or in the event of emergency and agreed with the Planning Authority **Saturday working hours if required			

8.5.2 Operational Noise

There is no statutory Irish guidance relating to the maximum permissible noise level that may be generated during the operational phase of the proposed development. The Environmental Protection Agency (EPA) Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (Environmental Protection Agency, 2016) has guidance for licenced facilities. Technically the site is not a licenced site, however, this is included as it is referenced in conjunction with other standards for assessment of industrial noise.

The British Standard BS 4142: 2014+A1:2019 Methods for rating and assessing industrial and commercial sound sets out a noise assessment methodology for industrial noise sources (BS4142), is more appropriate for the proposed development. BS4142 assesses the impact of a new noise source, based on the change in noise level before and after the noise source is introduced. BS4142 requires that the context of a noise source is considered. For areas of low background noise, assessing the impact with reference to the change in noise limit is not always appropriate and absolute levels are more appropriate.

The World Health Organization (WHO) presents absolute noise levels which are appropriate for the proposed development as assessing the change in noise level with BS4142 is not appropriate, given the context of low noise level, detailed above. All of the above standards are used to derive suitable project operational noise limits.

8.5.2.1 *EPA Guideline Levels*

There is no statutory Irish guidance relating to the maximum permissible noise level that may be generated during the operational phase of a development of this nature. In the absence of specific noise limits, appropriate emission criteria relating to permissible operational noise levels for EPA licenced facilities was used.



The Environmental Protection Agency (EPA) Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (2016) provides noise guidance to operators, subject to IPPC or waste licences. While the proposed development does not fall under the remit of the EPA, the EPA's NG4 guidelines are considered the most appropriate noise assessment criteria as they follow best practice principles.

The EPA's NG4 guidance note requires that sites are screened to determine whether they are a 'quiet area'. There are multiple criteria that must be met and as the site is less than approximately 14.5km from the outskirts of Mallow, which has a population above 10,000 people and is also within 3km of the consented CGEP, it is not classified as a 'quiet area'.

Since the site it is not in a 'quiet area', NG4 requires the site to be screened to determine if the site is in an 'area of low background noise'. Background noise levels are examined to see if they satisfy the following criteria:

- Average Daytime (07:00-19:00) Background Noise Level ≤ 40 dB L_{AF90} , and;
- Average Evening (19:00-23:00) Background Noise Level ≤ 35 dB L_{AF90} , and;
- Average Night-time (23:00-07:00) Background Noise Level ≤ 30 dB L_{AF90} .

Substation noise and Battery noise is a constant noise source and does not vary with windspeed. Prevailing background noise measured as part of the Coom Green Energy Park has been reviewed to determine if the area is an area of low background noise. Only the background noise up to 5m/s is considered appropriate. In addition NG4 normally only considers noise measurements up to a maximum windspeed of 5m/s.

Table 8-3 presents noise levels based on noise measurements conducted at the closest noise monitoring location to the proposed substation, as part of the Coom Green Energy Park EIAR. Table 8.3 presents average daytime and night time levels for background noise (L_{A90}) and ambient noise (L_{Aeq}) Periods where rainfall occurred during the measurement have been excluded and noise measured in windspeeds only up to 5m/s have been included.

Given the measured background noise levels, the area is considered an 'area of low background noise'. Therefore the noise limits for an area of low background noise presented in Table 8.4 apply. Limits may be imposed at boundary positions and/or at NSL's.

In addition to the numerical limit, the NG4 guidance note states that during the daytime and evening periods, rigorous efforts should be made to avoid clearly audible tones and impulsive noise at all NSL's. A penalty of 5 dB for tonal and/or impulsive elements is applied to the daytime and evening measured $L_{Aeq,T}$ values to determine the appropriate rating level $L_{Ar,T}$. During night-time, no tonal or impulsive noise from the facility should be audible at any NSL.



Table 8-3: Average Daytime and Nighttime L_{Aeq} and L_{A90} based on noise survey at location N18

Location	Background Noise $L_{A90,10min}$ (dB) and Ambient noise L_{Aeq} at location N18	
	L_{Aeq} (average)	L_{A90} (average)
N18 Daytime	39	28
N18 Night time	30	25

Based on noise survey conducted during CGEP between 09/02/2019 and 24/02/2019.
 Daytime based on arithmetic average of noise measured over 10-minute intervals between 0700-2300
 Daytime based on arithmetic average of noise measured over 10-minute intervals between 2300-0700
 Intervals where rain occurred are excluded. Data only includes noise measured when standardised wind speed at 10m height is at or less than 5m/s.

Table 8-4: Guidance Note NG4 – Noise Limit Values for Noise from Licensed Sites

Period	Area of low background Noise Limit	All other areas Noise Limit
Daytime (07:00 to 19:00 Hrs)	45 dB(A) $L_{Ar,T}$	55 dB(A) $L_{Ar,T}$
Evening-time (19:00 to 23:00 Hrs)	40 dB(A) $L_{Ar,T}$	50 dB(A) $L_{Ar,T}$
Night-time (23:00 to 07:00 Hrs)	35 dB(A) $L_{Aeq,T}$	45 dB(A) $L_{Aeq,T}$

8.5.2.2 BS4142 Criteria

The proposed development has been assessed using the methodology in BS4142:2014+A1:2019 Methods for rating industrial and commercial sound has been used to assess the impact of the sound.

This standard has a number of descriptors:

Ambient sound level, $L_a=L_{Aeq,T}$ This is the equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T.

Background sound level, $L_{A90,T}$ This is the A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured with a Fast time weighting.

Residual sound, $L_r = L_{Aeq,Tr}$ This is the ambient sound remaining at the assessment location when the specific sound (i.e. the source being assessed), is suppressed to such a degree that it does not contribute to the ambient sound.

Specific Sound Level, ($L_S=L_{Aeq,Tr}$) This is the equivalent continuous A-weighted sound pressure level of the specific sound source (i.e. the source being assessed) at the assessment location over a given reference time interval T_r . The reference time interval is 1 hour during the day (07:00 to 23:00) or 15 minutes at night (23:00 to 07:00).



Rating Level ($L_{ar,Tr}$) This is the specific sound plus any adjustment for the characteristic features of the sound.

BS4142 assesses the potential impact of a sound by comparing the difference between the rating level of the specific source and the background noise level, considering the context under which the sound occurs. Generally, the greater the difference the greater the magnitude of the impact:

- A difference of +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of +5dB is likely to be an indication of an adverse impact, depending on the context.

BS4142 notes that where the initial estimate of the impact needs to be modified due to the context the following needs to be considered:

1. The absolute level of the sound. Where the absolute noise levels are low, absolute noise levels may be more relevant, particularly at night.
2. The character and level of residual sound compared to the character and level of specific sound.
3. Sensitivity of receptor to sound and whether design measures that improve the acoustic environment can be considered (e.g. façade insulation, ventilation or acoustic screening)

In this assessment the background levels are low <30 dB L_{A90} , during all periods, so the context needs to be considered. The current version of BS4142 does not quantify low background noise levels. However, the 1997 version of BS 4142 defined very low background sound levels as being less than about 30 dB L_{A90} , and low rating levels as being less than about 35 dB $L_{Ar,Tr}$. Therefore the noise limits set out by the World Health Organisation apply as detailed below.

8.5.2.3 World Health Organisation Criteria

The World Health Organisation published guidance "Guidelines for community noise" in 1999, defining levels of noise in specific environments. It is a longstanding document and is widely accepted as industrial guidance and is referenced by other guidance, such as NG4. This document states:

"At night time, outside sound levels about 1m from facades of living spaces should not exceed 45 dB LAeq, so that people may sleep with windows open".

"To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB LAeq on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB LAeq. "¹

For the purpose of this assessment the outdoor limit of 45 dB L_{Aeq} at the property façade is considered appropriate to protect against potential sleep disturbance at night.

¹Also quoted in BS 4142:2014+A1:2019 Technical Note, published by the UK Association of Noise Consultants (ANC), March 2020



ISO 1996-2:2017 states that the difference between a microphone 2m in front of a façade and a free-field microphone is close to 3 dB as in an ideal case where no other vertical reflecting obstacle influences sound propagation to the studied receiver. For this assessment the free field level has been assumed to be 42 dB L_{Aeq} at night time.

World Health Organisation Night Noise Guidelines for Europe 2009 define noise criteria for L_{night} , which is the equivalent outdoor sound pressure associated with a particular type of noise during the night (at least 8 hours) over a period of a year, outside. A limit of L_{night} , outside of 40 dB is equivalent to the lowest observed adverse effect level (LOAEL) for night noise. As stated within these guidelines, "these guidelines are applicable to the Member States of the European Region, and may be considered as an extension to, as well as an update of, the previous WHO Guidelines for community noise (1999)"

Table 8-5: World Health Organisation Noise Criteria

Specific Environment	Critical health effect(s)	L_{Aeq} dB(A)	Time base (hours) L_{Aeq}	$L_{Amax, fast}$
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime & evening	35	16	
Inside bedrooms	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open, Façade level, night-time	45	8	60

8.5.2.4 Project Noise Criteria

Based on the criteria outlined above, the proposed operational noise limits for the project are summarised in Table 8-12. The levels are presented as a rated noise level and should include corrections for tonality, impulsivity and intermittency, if required, as defined in BS4142.

Table 8-6: Project specific operational noise limits

Specific Environment	$L_{Ar,T}$ dB(A) Freefield
Daytime Outdoor living area	50
Night time Outside bedrooms	42



8.5.2.5 Planning permission for Coom Green Energy Park Wind Farm

The development granted permission in 2020 (Planning reference: ABP-308885-20) included construction of up to 2no. on site electrical substations including a control building and electrical plant and equipment, including a transformer and battery energy storage facility.

Condition 5 for the permitted development states:

"The operation of the proposed development, by itself or in combination with any other permitted wind energy development, shall not result in noise levels, when measured externally at nearby noise sensitive locations which exceed:

- a) Between the hours of 0700 and 2300
 - I. *(The greater of 5dB(A) $L_{90,10min}$ above background noise levels, or 45dB(A) $L_{90,10min}$, at standardised 10m height above ground level windspeeds of 7m/s or greater,*
 - II. *40 dB(A) $L_{90,10min}$ at all other standardised 10 meters height above ground level windspeeds,*
- b) *43 dB(A) $L_{90,10min}$ at all other times.*

8.5.3 Significance of Impact

The criteria for determining the significance of impacts and the effects are set out in the EPAs 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports 2022'. The EPA guidelines do not quantify the impacts in decibel terms. In absence of such information, reference is made to relevant standards and guidance documents noise limits. If the predicted impact from the construction or operational phase are below the respective noise limits, it is considered that no significant effect occurs.

For this assessment, it has been assumed that NSL's have a medium to high sensitivity. Table 8-7 presents the Description of Effects, and Table 8-8 details the duration and frequency of effect criteria from the EPA guidelines.

Table 8-7: Description of Effects

Impact Significance	Criteria
Imperceptible	An effect capable of measurement but without noticeable consequences
Not significant	An effect which causes noticeable changes in the character of environment but without significant consequences
Slight effect	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate effect	An effect that alters the character of the environment in a manner that is consistent with existing and emerging trends
Significant effect	An effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Profound effects	An effect which obliterates sensitive characteristics



Table 8-8: Duration and Frequency of Effects

Duration and Frequency of Effects/Significance	Description
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year
Short-term	Effects lasting one to seven years
Medium term	Effects lasting seven to fifteen years.
Long term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years.
Reversible	Effects that can be undone, for example through remediation or restoration
Frequency of Effects	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly - or hourly, daily, weekly, monthly, annually

8.6 Potential Effects during Construction

The main activities that have been assessed for construction noise are as follows:

- Tree Felling works;
- Substation Construction;
- 33 kV CNR to CGEP Lackandarragh 110 kV Substation;
- 110 kV underground grid connection route from on -site Lackendarragh Station to existing 110 kV Barrymore Substation.

The total duration of the substation development is 12 months, the 110 kV UGC is 6.5 months and the 33 kV CNR Cable is 7 months. The Horizontal Directional Drilling works is estimated to be less than 1 month in duration.



8.6.1 Tree Felling

As described in Section 2.4.12 of Chapter 2, tree felling required for the Proposed Development amounts to 17.8 ha. Of this, 10.2 ha of this is already accounted for within the felling area included in the permitted CGEP. The additional felling required arises from the 33 kV CNR and the new footprint of the 110 kV Substation at Lackendarragh North. Potential construction noise from tree felling works has been considered in three main locations:

- the eastern section (closest NSL is 120m northeast of the works , east of the substation, at Moanlahan);
- the mid section of the tree felling along 33kV CNR (closest NSL is 50m east of the works at Chimneyfield), and;
- the western section along 33kV CNR (closest noise sensitive location is 220m south of the works at Mill Road).

Table 8-9 presents the predicted noise at the two closest dwellings to the works (east and mid section). Assuming all plant associated with tree felling operates at once, the predicted cumulative noise at the NSL 50m from the works is 66 dB $L_{Aeq,1hr}$, which is marginally (1dB) above the daytime noise limit of 65 dB $L_{Aeq,1hr}$. The predicted noise at the next closest location to the works is predicted to be below the daytime noise limit of 65 dB $L_{Aeq,1hr}$.

Therefore the noise associated with the felling activity, assuming all equipment operates at once, is expected to be just above the level indicating a **significant negative effect, temporary** in duration at a single property that is 50m from tree felling works.

Table 8-9: Tree Felling- Likely Plant and Predicted Levels

Plant	BS 5228 Ref.	Activity	Percentage on-time (%)	Predicted Noise Level at closest NSL (east section at 120m)	Predicted Noise Level at closest NSL (mid section at 50m)
Harvester §	C2.5	Harvesting trees	80	53	62
Forwarder μ	C4.53	Moving felled trees	80	53	63
Lorry *	C11.9	Transporting timber and brush off site	Two trips per hour	46	55
Cumulative				57	66
* Drive-by maximum sound pressure level § - Excavator BS 5228 Ref C2.5 μ - Lorry with lifting boom – C4.53					



8.6.2 33 kV CNR

As described in Chapter 2 - Development Description, the 33 kV CNR is 15.8 km in length, most of this is with the CGEP lands, with 1.1 km on public roads and 6 km on private lands.

Connection works will involve the installation of ducting, joint bays, drainage and ancillary infrastructure and the subsequent running of cables along private lands and the existing road network. This will require delivery of plant and construction materials, followed by excavation, laying of cables and subsequent reinstatement of trenches.

The grid connection works will be carried out over a 7-month period and where these works occur along roads, 'rolling road closures' will be implemented, whereby the site will progress each day along a road, which will have the effect of reducing the impact for residents. Note that for the 33 kV CNR only 1.1 km of the works are on public roads. The likely plant required during the construction works are presented in Table 8-10.

There are no properties within 10 m of the 33 kV CNR works, two properties between 10 and 25m of the works, three properties between 25 to 50m of the works and two properties within 50-100m of the works.

As Table 8-10 shows, the noise limit is met for properties at distances of 50m and above from the grid connection works, based on noise from individual items of plant. Therefore there is a potential for the noise limit to be exceeded at the five properties within 50m of the proposed works. The closest properties are approximately 10m from the works. Therefore the noise at these closest locations will exceed the noise limit by up to 14 dB, based on the operation of the noisiest item of plant. Therefore the construction noise limit will be exceeded at up to 5 properties within 50m of the 33 kV CNR works, based on noise from individual items of plant. On the basis that the predicted noise level exceeds the 65 dB $L_{Aeq, 1hr}$ noise limit, there will be a **significant adverse** effect at up to 5 properties within 50m of these works which will be **temporary** in duration. At properties more than 50m from the GCR works, as the daytime construction noise limit is met, there will be a **not significant** effect that is **temporary** in duration. Section 8.10.1 of this report discusses mitigation options for reducing the noise level at properties within 50m of the works.



Table 8-10: Grid connection works - Likely Plant and Predicted noise Levels

Plant	Activity	L _{Aeq} 1 hr at 10m dB BS 5228	Percentage on-time (%)	A-Weighted Sound Pressure Level, L _{Aeq} , dB at facade*			
				10m	25m	50m	100m
Grid Connection works							
Road sweeper (C4.90)	Sweeping and dust suppression	76	10	69	61	54	47
Mini excavator with hydraulic breaker (C5.2)	Breaking Road Surface	83	25	79	72	64	57
Vibratory roller (C5.27)	Rolling and Compaction	67	50	66	59	52	44
Wheeled excavator (C5.34)	Trenching	70	50	70	62	55	48
Hand-held circular saw (petrol) (C5.36)	Cutting Concrete Slabs	87	10	79	72	65	57
Dump truck (tipping fill) (C2.30)	Tipping Fill	79	10	72	64	57	50
Vibratory plate (petrol) (C2.41)	Compaction	80	10	79	71	64	57
Directional Drilling (at some watercourses, culverts, bridge structures)							
Directional drilling (2.44)	Directional drilling at culverts/watercourses	77	100	N/A	73	66	59
*Noise level predicted at specified distance from plant and at 4m height, representing first floor predictions, taking account of % on-time, ground absorption. Noise predictions include facade correction (+3dB)							



8.6.3 33 kV CNR Watercourse Crossing Works

As described in Chapter 2 - Development Description, the 33 kV CNR traverses 2 no. EPA mapped WFD Watercourses: the COOM_010, and the BRIDE (BLACKWATER)_010. The COOM_010 shall be traversed by HDD at 2 no. locations; one of which is located within the permitted CGEP development site where the internal wind farm access track crosses the river. The BRIDE (BLACKWATER)_010 shall be crossed by placing the proposed cable ducts in an existing stone arched bridge at Chimneyfield. Details of water crossing methodologies can be found in the TLI Construction Methodology Report in Appendix 2.1, Volume 3 and the CEMP in EIAR Volume 3, Appendix 2.2. The details of these works and nearest noise sensitive locations are summarised below:

- Crossing ID 54 over the Toor River. As the nearest NSL is over 1km north west of the proposed works. Based on the fact that the predicted noise levels at 100m from the works meet the daytime construction noise limits (Table 8-10), noise from these works is not significant.
- Crossing ID-52 under the Toor River. This location requires HDD drilling. As the nearest noise sensitive location is 980m south east of these works. From Table 8-10 noise predicted at over 100m from horizontal directional drilling works meet the daytime construction noise limits. Therefore noise from these works is not significant at the closest NSL.
- Crossing ID 46 Cable required to cross the Bride river, cable to be laid on existing stone arch bridge structure. The distance to the closest NSL is 190m west of the crossing and noise from these works meet the daytime limits (see Table 8-10). Therefore noise from these works is not significant at the closest NSL.

In summary, noise from WFD stream crossing works in the 33 kV CNR are predicted to be within the daytime construction noise limits and there is a **not significant effect** at the nearest properties which is **temporary** in nature.

The CEMP details watercourse crossings as existing structures that need to be crossed by infrastructure, installation of new structures, existing structures that need to be replaced or upgraded and crossing of existing open streams or drains. As stated in the TLI methodology, should planning permission be granted a detailed crossing schedule will be prepared at the detailed design stage to identify the method to cross this existing services. Noise from construction works associated with watercrossings other than those assessed above have not been considered, on the basis that these are no greater than works from the grid connection works.

8.6.4 110 kV GCR

Noise associated with construction works for the underground 110 kV GCR between the proposed substation at Lackendarragh North and the existing 110 kV Barrymore Substation, at Rathcormac has been assessed. As detailed in Chapter 2 Development Description, the 110 kV GCR is approximately 13.9 km in length, of which 12.1 km is along public roads.

The grid connection works will be carried out over a 6.5-month period and 'rolling road closures' will be implemented, whereby the site will progress each day along a road, which will have the effect of reducing the impact for residents. The likely plant required during the construction works are presented in Table 8-7.

Table 8-7 presents predicted noise level for a range of construction activities at distances of 10 m, 25 m, 50 m and 100 m from the works. The noise levels presented are predicted to exceed site noise limit of 65 dB maximum within 25m of the works and at 50m for certain items of plant (hydraulic breaker, circular saw).

For the 110 kV GCR, there are no properties within 10 m of the works, 12 properties between 10-25 m of the works, 45 properties between 25 to 50 m of the works and 12 properties between 50-100 m of the works.



Based on the assumption that grid connection plant operates individually, between 10-25m from the works the construction noise limit has the potential to exceed the daytime 65 dB $L_{ae, 1hr}$ criteria by up to 14 dB at 10m and up to 7 dB at 25 m, affecting 12 properties along the route. Between 25 m and 50m the daytime 65 dB $L_{Aeq, 1hr}$ limit will be exceeded by individual items of plant by up to 7 dB. The daytime limit is met at 50 m and greater distances from the proposed works.

Therefore as a result of the 110 kV GCR works, there will be a **temporary** (less than 3 days) **significant adverse effect** at up to 57 properties within 50m of the grid connection works. Beyond 50m the daytime construction noise limit is met and there is a **not significant temporary** effect.

Given the nature of the grid connection works, construction activities will not occur over an extended period at any one location. Mitigation measures are discussed in Section 8.6.

8.6.5 110 kV GCR Watercourse and Motorway Crossing Works

As set out in the "Coom Green Energy Park - 110 kV Grid & 33 kV Collector – Planning Stage Construction Methodology August 2025", Appendix 2.1, Volume 3 and the CEMP in EIAR Volume 3, Appendix 2.2. "There is a watercourse crossing and motorway crossing along the 110 kV both of which would require Horizontal Directional Drilling.

For the motorway crossing HDD works, the closest property to works, assuming these potentially take place west of the M8 Motorway, approximately 55m from the works. Based on the predicted noise level in Table 8-7 the noise level from directional drilling is predicted to be just met at this property. Note that as the property is next to the Motorway a higher construction noise limit is likely to apply to the property. Regardless, predicted noise from proposed HDD works are at this location predicted to meet the 65 dB $L_{Aeq, 1hr}$ noise limit.

For the 110 kV GCR works, as detailed in Chapter 11, Hydrology and Water Quality Chapter, HDD will be used at the proposed watercourse crossing at Farran North. The closest NSL is a single property south of the L1517, approximately 45m south of the proposed watercourse crossing. Note that this NSL is also next to a timber processing facility.

In summary, potential construction noise from HDD works associated with the motorway and watercourse crossing during the 110 kV GCR are anticipated to be marginally (3 dB) above the daytime construction daytime noise limit. Therefore there is anticipated to be an **adverse negative effect** that is **temporary** at a single property.

At other farther locations, predicted noise is anticipated to be below the construction daytime noise limit. Therefore there is anticipated to be a **slight negative effect** that is **temporary** from HDD works along the 110 kV GCR. HDD works across the whole scheme are anticipated to take a duration of one month.



Table 8-11: 110 kV GCR Grid connection works - Likely Plant and Predicted noise Levels

Plant	Activity	L _{Aeq} 1 hr at 10m dB BS 5228	Percentage on-time (%)	A-Weighted Sound Pressure Level, L _{Aeq} , dB at facade *			
				10m	25m	50m	100m
Grid Connection works							
Road sweeper (C4.90)	Sweeping and dust suppression	76	10	69	61	54	47
Mini excavator with hydraulic breaker (C5.2)	Breaking Road Surface	83	25	79	72	64	57
Vibratory roller (C5.27)	Rolling and Compaction	67	50	66	59	52	44
Wheeled excavator (C5.34)	Trenching	70	50	70	62	55	48
Hand-held circular saw (petrol) (C5.36)	Cutting Concrete Slabs	87	10	79	72	65	57
Dump truck (tipping fill) (C2.30)	Tipping Fill	79	10	72	64	57	50
Vibratory plate (petrol) (C2.41)	Compaction	80	10	79	71	64	57
Directional Drilling (at some watercourses, culverts, bridge structures)							
Directional drilling (2.44)	Drilling	77	100	N/A	73	66	59
*Noise level predicted at specified distance from plant and at 4m height, representing first floor predictions, taking account of % on-time, ground absorption. Noise predictions include facade correction (+3dB)							

8.6.6 Construction of Substation

The construction of the proposed Lackendarragh substation will be progressed in a number of phases:

- Site clearance and Preparation
- Preparation and pouring of foundations and floor areas
- Preparation of hardstanding areas
- Erection of blockwork/ installation concrete slabs
- General Construction including installation of electrical and mechanical plant



As stated in Section 8.1, construction noise from the proposed substation has been based on the construction noise within the EIAR for the Coom Green Energy Park. The proposed changes to the substation are considered to be negligible in terms of noise emissions and there will be no additional noise impacts beyond those identified in the original EIAR. Table 8-7 presents the assumed plant required for the different construction phases of the proposed buildings to be constructed on site. The nearest occupied dwelling (R142) will be approximately 520 m away. The cumulative predicted noise levels for the worst combination of plant (Site Clearance and Preparation) is predicted to be 46.3 dB $L_{Aeq,1hr}$ at the nearest occupied dwelling which is below the construction noise limit of 65 dB $L_{Aeq,1hr}$. The works associated with the construction of the substation are expected to have a **slight negative effect** that is **temporary** in duration.



Table 8-12: Construction of Substation - Likely Plant and Predicted Levels

Phase	Plant	BS 5228 Ref.	Activity	Percentage on-time (%)	Predicted Noise Level at R142 L _{Aeq,1hr} dB(A)
Site Clearance and Preparation	Tracked excavator (22t)	C2.3	Clearing Site	80	42.2
	Dozer (11t)	C2.12	Ground excavation/ earthworks	80	41.8
	Loading Lorry	C10.8	Loading Sand to Lorry	80	40.4
	Cumulative				46.3
Preparation and pouring of Foundations	Tracked Excavator (25t)	C2.19	Ground excavation/ earthworks	80	38.6
	Concrete mixer truck + truck mounted concrete pump + boom arm	C4.32	Concrete pumping	80	39.0
	Lorry*	C11.9	Delivery of material	Maximum of 48 two-way trips per day	35.0
	Cumulative				42.6
Preparation of hardstanding areas	Articulated Dump Truck (23t)	C2.33	Delivery/Removal of Material	Maximum of 24 two-way trips per day	33.3
	Tracked Excavator (25t)	C2.19	Ground excavation/ earthworks	80	38.6
	Articulated Dump Truck (23t)	C2.32	Tipping Fill	20	28.2
	Dozer (14t)	C5.12	Spreading chipping/fill	80	37.9
	Vibratory roller (3t)	C5.27	Rolling and Compaction	80	27.8
	Lorry*	C11.9	Delivery of material	Maximum of 48 two-way trips per day	35.0
	Cumulative				43.0



Phase	Plant	BS 5228 Ref.	Activity	Percentage on-time (%)	Predicted Noise Level at R142 L _{Aeq,1hr} dB(A)
Erection of blockwork/ installation concrete slabs	Mobile telescopic crane (80t)	C4.39	Lifting concrete slabs	80	37.9
	Lorry* (32t)	C11.9	Delivery of material	Maximum of 48 two way trips per day	35.0
	Cumulative				39.7
General Construction including installation of electrical and mechanical plant	Generator	C4.84	Power for site cabins	100	27.9
	Telescopic handler	C4.54	Lifting Plant	80	39.6
	Angle grinder (grinding steel)	C4.93	Miscellaneous	80	41.8
	Cumulative				44.0
*Drive by maximum sound level					

8.6.7 Cumulative Construction Noise

This section considers potential cumulative noise, if different construction activities associated with this development, namely tree felling, substation and grid connection works, occur simultaneously. There are five properties close to the 33 kV CNR along Chimneyfield Road, east of Chimneyfield Woods (described as the mid section of felling works in Section 8.5.4.1). At these five properties there is potential for the 65 dB construction noise limit to be exceeded if both 33 kV CNR and tree felling works activities take place simultaneously.

In addition, there is potential for cumulative noise from proposed tree felling works at the eastern section of the scheme, east of the substation, at Moanlahan, if these occur simultaneously with the proposed 110 kV GCR works. This would result in exceedance of the 65 dB construction noise limit at two properties north and south of the forestry access track close to the proposed tree felling works.

As described in Chapter 2 - Development Description, details of developments for consideration for cumulative assessment are presented in Appendix 1.3, Volume 3. These developments have been considered for potential cumulative noise and vibration effects as part of this assessment. The permitted CGEP has been assessed cumulatively with the Proposed Development as part of this EIAR. This includes the permitted battery energy storage system adjacent to the Proposed 110 kV Substation. Please refer to Section 8.9.1 for this cumulative assessment.



8.7 Potential Effects during Operation

During operation of the proposed development, the noise sources considered as part of this assessment are from the Substation transformer.

Noise associated with the proposed equipment was predicted according to the International Standard ISO 9613-2: 2024 Acoustics - Attenuation of sound during propagation outdoors - Part 2: Attenuation of sound during propagation outdoors: General Method of Calculation using iNoise V2024.2 software.

The modelling assumes a worst case scenario where the Substation Transformer will operate for 100% of the time. This makes the noise modelling assessment a conservative/worst case exercise.

The ISO 9613 standard states that hard ground including concrete, tamped ground, which often occurs around industrial sites can be considered hard (ground effect, G=0). Porous ground, i.e. grass, trees or other vegetation, farming is classed as G=1. Mixed ground is a combination of hard and porous ground can take a value of G between 0 and 1. For the purpose of this assessment, the proposed substation site is classed as G=0. The remaining area, which is mainly agricultural, is classed as G=0.75. Atmospheric conditions of 10 °C and 70 % humidity were used as they represent a reasonably low level of air absorption. Receiver heights of 4.0 m were modelled, which represents a worst case scenario.

Predictions have been carried out based on an example transformer to be used at the Substation; the TrafoStar 63 MVA. The specification sheet includes a table detailing noise levels of 80 dB(A) and 93 dB(A) under typical and high conditions respectively, and that 65 dB(A) is achievable if requested. For the purpose of this assessment the 93 dB sound power level has been assumed for the transformer (see Table 8-13).

Table 8-13: Octave Band Sound Power Level Data for proposed equipment

Equipment	A-weighted Octave Band Centre Frequency (Hz)								Overall LWA
	63	125	250	500	1k	2k	4k	8k	
Transformer ¹	87.0	89.0	84.0	84.0	78.0	73.0	68.0	61.0	93.0
1. - Manufacturer's datasheet provided information on overall sound power levels. Octave band data was sourced from 'An Introduction to Sound Level Data for Mechanical and Electrical Equipment' CED Engineering									

It is expected that as technology advances, there will be reductions in the noise emissions from the equipment. Noise emission data represent the current information available for the equipment at the time of the assessment. The equipment will be sourced as part of a competitive tender process and key in the selection process is that equipment is selected which is not tonal in nature and does not exceed the maximum sound power provided in Table 8.13 above.

Table 8-14 summarises the predicted noise levels at the closest property to the substation, approximately 600m south east of the substation site boundary (R142), along a local road at Lackendarragh North and compares predicted levels with project noise limits.

In summary, from Table 8-14, during both the daytime and night time periods, the predicted noise is below the noise level where there is likely to be an indication of an adverse impact. In summary, the impact significance of operational noise from the proposed substation is **not significant** and is **long term** in duration.



Table 8-14: Predicted Substation Operational noise at nearest NSL (R142)*

Results (BS4142 Clause)	Daytime	Night time
Measured ambient plus predicted noise from proposed BESS	(Residual 39 dB + specific 22 dB=) 39 L _{Aeq, 10mins}	(Residual 30 dB + specific 22=) 31 L _{Aeq, 10mins}
Residual sound level	39 dB L _{Aeq, 10mins}	30 dB L _{Aeq, 10mins}
Background sound level (when source not in operation) (Clause 7.33)	28 dB L _{A90, 10mins}	25 dB L _{A90 (10 mins)}
Reference period	1 hour	15 minutes
Specific sound level (Clause 7.3.4/7.3.5)	22 dB L _{Aeq, 60mins}	22 dB L _{Aeq, 15mins}
Acoustic character correction (none applied) (Clause 9.2)	-	-
Rating level (no correction applied) (Clause 9.2)	22 dB L _{A90, 60mins}	22 dB L _{A90, 15mins}
Background sound level (Clause 8)	28 dB L _{A90, 10mins}	25 dB L _{A90, 10mins}
Excess of rating over background (Clause 11)	-5 dB	-3 dB
Results	The rating level is 5 dB less than the background noise. BS4142 states that where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context, as discussed below.	The rating level is 3 dB less than the background noise. BS4142 states that where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context. The context in this case is that both the background noise and the rating noise level are very low. Therefore an absolute noise level is a more appropriate criteria.



Results (BS4142 Clause)	Daytime	Night time
Uncertainty of assessment (Clause 10)	As the rating level is significantly below background noise, the uncertainty of the measurement is unlikely to change the outcome of the assessment. See discussion below	As the rating level is 3 dB below the criteria likely to be an indication of an adverse impact, depending on the context, the uncertainty is unlikely to influence the outcome of this assessment.
Project noise limit (Freefield) (Based on WHO criteria)	50	42 dB L _{Aeq}
Predicted noise level (no noise character corrections)	22 dB	22 dB
Comparison of predicted noise with project noise limit	27 dB below noise limit	20dB below noise limit

*NSL coordinates (R142 ITM X: 571158 ITM Y: 593129)

8.8 Potential Effects during Decommissioning

The decommissioning activities will use comparable equipment to the construction phase and the predicted noise from decommissioning activities will be equivalent or less than the construction noise levels and will comply with best practice noise limits at the time of decommissioning.

Upon decommissioning, the 110 kV substation and 110 kV GCR will be left in situ. The 33 kV CNR connecting each turbine will be removed from the cable ducting at joint bays along the cable. The access track will be excavated at the pull pits and re instated once the cables are removed. The cable ducting will be left in situ. Access tracks will remain in place.

On this basis decommissioning works will be less than during the construction phase. With the 33 kV CNR works there may be potential for noise limits to be exceeded if the cable pulling pit is located close to NSL's. During the construction works for the 33 kV CNR cable there is a potential for construction noise to be exceeded at up to 5 properties within 50m of the 33 kV CNR works. Potentially there will be a **significant adverse** effect at up to 5 properties during these works which will be **temporary** in duration. Properties at more than 50m from the 33 kV CNR works will experience a **slight negative effect** which will be **temporary** in duration.



8.9 Cumulative Noise

8.9.1 Cumulative Construction Noise

A list of the projects that have been considered in terms of cumulative noise are summarised in Appendix 1.3, Volume 3. The basis for construction noise assessment is to consider any projects which are granted planning permission, but are not yet constructed, and could be constructed during the construction of the proposed Substation and grid connection works. The projects from Appendix 1.3 are considered below:

- The consented Coom Green Energy Park development.
- The Bottlehill Landfill has been granted permission but has not been constructed and is not in use. Given that NSL's near the proposed Lackendarragh Substation are approximately 5km from the Bottlehill site, cumulative noise from construction or operation of this site has not been considered on the basis that it is too distant to contribute to noise near the substation.
- There is consent for a single wind turbine at 1.4 km from the site at Moneygorm. To date this has not been constructed. If it is constructed during the CGEP construction period, there is potential for cumulative construction noise from this development.
- Of the proposed solar farms, only solar farms very close to the proposed development would be considered to have the potential to contribute construction noise to the proposed scheme. There is a proposed solar farm at Castlelyons, Fermoy which is within 0.8km of the scheme. However the main site is over 10 km from the proposed substation and battery storage area for the Proposed Development. Therefore it is not considered that cumulative construction noise need to be considered from the Castlelyons Solar Farm.
- Forestry activity has the potential to contribute to construction noise levels at the site.

On the basis that the predicted noise from the CGEP (excluding the proposed development within this EIAR) are more than 10 dB below the construction noise daytime limit (65 dB $L_{Aeq,1hr}$.) for borrow pit operation, access roads, hardstands and drainage, turbine foundation installation and turbine installation construction activities, this will not contribute to cumulative noise from the CEGP Substation, 33 kV CNR and 110 kV GCR.

Therefore, the potential cumulative construction noise activities are forestry activities from adjacent lands and construction of the Moneygorm single turbine, if these occur at the same time as works associated with grid connection works.

The main CGEP construction activities assessed in this Chapter are associated with the substation construction. These are predicted to generate a very low level (46 dB $L_{Aeq,1hr}$) at the closest NSL (see Section 8.6.4). The Moneygorm wind turbine is over 800m south of the proposed substation area. Given the low level of construction noise predicted from the CEGP substation construction activities and the distance to the Moneygorm wind turbine, cumulative construction noise is considered to be below the daytime construction noise limits. Therefore, there is no change to the noise impact from cumulative construction works.

Section 8.6.1 provided typical noise levels from tree felling activities. There are forestry areas in the vicinity (50m at the closest point) of the closest NSL's to the proposed substation. Given the low levels of construction noise from the proposed substation, if forestry activities were to occur at the same time, they would be dominated by the forestry activities of the adjacent site and cumulative noise from substation construction would not affect this. The impact would be determined by the forestry activities in adjacent lands.



If noise from forestry works is above the construction noise limit these will be dominated by the forestry activities. Any forestry activities that occur within 50m of a NSL could have the potential to exceed the daytime construction noise limit. The forestry activities would need to be assessed by the operator of these activities. Cumulative noise at the locations close to the proposed felling activities has not been considered as this would take place in the same area and is unlikely to be able to take place concurrently.

8.9.2 Cumulative Operational Noise

With reference to Chapter 2 Description of the Development, Appendix 1.3 that details developments to be considered for potential cumulative effects, the following are assessed in terms of cumulative noise:

- Cumulative noise from the permitted CGEP including the consented BESS at the proposed substation.
- Bottlehill Landfill has been granted permission, and may operate during the proposed development operation. This is located approximately 5 miles from the proposed substation and is there not considered to have a cumulative impact
- The proposed Solar Farm at Castlelyons, Fermoy is over 10km from the proposed substation. Therefore the proposed solar farms are too distant to be considered in the cumulative assessment.
- Of the granted wind farms detailed in Appendix 1.3, only the single Moneygorm wind turbine is considered, as the remaining wind farms are too distant (over 19km) from the proposed development, and do not have the potential to give rise to cumulative noise effects.

Noise from the BESS has been predicted at the nearest noise sensitive location to the proposed substation. Noise has been predicted based on 2 fans per battery container, with 20 no. battery containers in total. The sound power data assumed for the proposed BESS is summarised in Table 8-15. The predicted noise at the nearest noise sensitive location from the BESS alone is 22 dB L_{Aeq} , resulting in cumulative noise from both the substation and BESS of 25 dB L_{Aeq} . This is below the level where there is an indication of an adverse Impact. Therefore cumulative noise from the proposed substation and consented BESS are expected to have a **not significant** that is **long term** in duration.

Table 8-15: Octave Band Sound Power Level Data for proposed equipment

Equipment	A-weighted Octave Band Centre Frequency (Hz)								Overall LWA
	63	125	250	500	1k	2k	4k	8k	
HVAC fan for Battery container ¹ (2 per container)	66.9	68.0	72.5	72.9	69.6	66.3	60.6	53.0	78.0

Cumulative noise for the CGEP and Moneygorm wind turbine was assessed as part of the EIAR submission for the CGEP. There is no guidance for assessing cumulative noise from windfarms and other developments such as substations. Windfarms are normally assessed in terms of the L_{A90} . The substation is assessed in terms of the L_{Aeq} . It is generally accepted that for windfarm noise 2 dB is added to the L_{A90} to obtain the L_{Aeq} . The predicted noise from the substation is 22 dB L_{Aeq} . Comparing this with the minimum L_{A90} , noise level specified in the planning condition for the CGEP, predicted noise from the proposed development is at least 18 dB lower than the lowest noise limit (40 dB L_{A90}) set out in the CGEP noise limit.



8.9.3 Cumulative Decommissioning Noise

Decommissioning works are described in Chapter 2 Development Description Chapter Section 2.6. The 110 kV GCR will be left in situ. The 33 kV CNR that connects each turbine will be removed from the cable ducting, with a mechanical winch at joint bay/pull pit. The access track will be excavated with a mechanical excavator at each cable pulling pit location and will be reinstated once the cables are removed. The cable ducting will be left in situ. All access tracks will be left in place.

Noise from the 33 kV CNR decommissioning works are less than the construction works. During the construction works from the 33 kV CNR cable there was a potential for construction noise to be exceeded at up to 5 properties during the 33 kV CNR works. Potentially there will be a **significant adverse** effect at up to 5 properties during these works which will be **temporary** in duration.

The main source of noise from the 33 kV CNR decommissioning works is as a result of the removing the cable from the ducting. If the location of the equipment for winching can be sufficiently distant (at least 50m) from NSL's, and phasing of plant takes place so multiple items of plant do not operate simultaneously, this will reduce the noise impact. With these mitigation works in place there will be a **slight negative effect** at nearby NSL's which will be **temporary** in duration.

8.10 Mitigation Measures

8.10.1 Construction Phase

During tree felling works, when these works take place at the location at Chimneyfield where works are within 50m from the residential location, construction works should be phased, so that only one item of plant operates when within 60m of the closest property. Alternatively, if only one item of tree felling plant operates at any one time within 60m of the property, the noise limit will be met. This will mean that the daytime construction noise limit will be met at the closest property to the works. Other good practice works should be implemented as discussed below.

For both the 33 kV CNR and 110 kV GCR, the daytime limit will be exceeded when works are passing close to properties on the road. It is recommended that screening is implemented between works and adjacent properties within 50 m of grid connection works which can reduce the noise level by up to 10 dB. However, these works will be for a short duration at a particular property (i.e. typically less than 3 days).

It is recommended that a temporary noise barrier is used where GCR and CNR works occur within 50m of NSL's. These have the potential to mitigate noise by up to 10 dB. The barrier will have a minimum mass per unit surface area of greater than 7kg/m², with no gaps at the joints. To be effective, the minimum height of the barriers is such that no part of the noise source will be visible from the noise sensitive location. Just blocking the line of sight between noise source and receiver reduces noise by approximately 5 dB, increasing to 10 dB when well screened.

Section 8.9.1 considered cumulative noise from proposed tree felling and GCR works. To minimise the potential cumulative impact from these works, it is recommended that these are phased, so they do not occur simultaneously. Alternatively, if works are required to take place simultaneously, tree felling works should be at least 175m from the five properties east of Chimneyfield Woods and two properties at Moanlahan during simultaneous GCR works at these locations.

In addition, the following good practice construction noise mitigation measures will be implemented: The noise impact for construction works traffic will be mitigated by generally restricting movements along access routes to the standard working hours and exclude Sundays, unless specifically agreed otherwise.



Consultation with the local community is important in minimising the impacts and therefore construction will be undertaken in consultation with the local authority as well as the residents being informed of construction activities.

The construction works on site will be carried out in accordance with the guidance set out in BS 5228:2009+A1:2014. Proper maintenance of plant will be employed to minimise the noise produced by any site operations.

All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the project. Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.

The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to the proposed hours of working. However, to ensure that optimal use is made of fair-weather windows, or at critical periods within the programme, it could occasionally be necessary to work outside these hours. Any such out of hours working would be agreed in advance with the planning authority.

8.10.2 Operational Phase

The predicted noise from operation of the proposed substation and BESS are within the noise limits and therefore no mitigation is proposed.

8.10.3 Decommissioning

During the 33 kV CNR decommissioning works it is recommended that a temporary barrier is installed between NSL's and the works as detailed in section 8.10.1 Decommissioning works will have a **significant adverse effect** that is **temporary** at two properties. The impact at properties over 25m from the 33 kV CNR construction works will have a **slight effect** that is **temporary**.

8.11 Residual Effects

8.11.1 Construction Phase

During tree felling works, with the proposed mitigation, comprising phasing of the works when works occur within 60m of the closest NSL, the proposed construction noise will have a **slight effect** that is **temporary**.

During 33 kV CNR, with the proposed mitigation comprising phasing of the works and use of a temporary noise barrier, the daytime noise limit will be exceeded by up to 4 dB at properties within 25m of the works. The daytime limit at properties greater than 25m from the works will be met. Therefore, with mitigation, the 33 kV CNR works will have a **significant adverse effect** that is **temporary** at two properties. The impact at properties over 25m from the 33 kV CNR construction works will have a **slight effect** that is **temporary**.

During 110 kV GCR, with the proposed mitigation comprising phasing of the works, and use of a temporary noise barrier, the daytime noise limit will be exceeded by up to 4 dB at properties within 25m of the works. The daytime limit with mitigation at properties greater than 25m from the works will be met. Therefore, with mitigation the 110 kV grid connection works will have a **significant adverse effect** that is **temporary** at twelve properties. The impact at properties over 25m from the 110 kV GCR construction works will have a **slight effect** that is **temporary**.



8.11.2 Operational Phase

As there is no mitigation proposed, there is no change to the operational noise predicted from the operation of the proposed substation and BESS, as detailed in section 8.7. The predicted noise is below the level where there is likely to be an indication of an adverse impact. Therefore, there is a **not significant effect** due to the operational phase of the project in the **long term**.

8.11.3 Decommissioning Phase

With the mitigation in place, the impact during the decommissioning phase is anticipated to be less than during the construction phase. The impact of decommissioning works is anticipated to have a **slight negative effect** that is **temporary** in duration at the two properties within 25m of the works.



8.12 References

BS5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1: Noise, Part 1: Noise and Part 2: Vibration.

BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

The World Health Organisation, Guidelines for community noise, 1999.

World Health Organisation Night Noise Guidelines for Europe 2009.

Technical Note, published by the UK Association of Noise Consultants (ANC), March 2020

Environmental Protection Agency NG4 Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4), 2016.

BS 6472 2008, Guide to evaluation of human exposure to vibration in buildings.

EPA, Guidelines on the information to be contained in Environmental Impact Assessment Reports, Mau 2022

ISO 9613-2: 2024 Acoustics - Attenuation of sound during propagation outdoors - Part 2: Attenuation of sound during propagation outdoors: General Method of Calculation



FEHILY TIMONEY

DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

www.fehilytimoney.ie

 **Cork**

 **Dublin**

 **Carlow**

