



# **Galloper Wind Farm Eastern Super Grid Transformer Project**

Environmental Statement – Chapter 10 - Air Quality

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Galloper Wind Farm Limited





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## 10 AIR QUALITY

### 10.1 Introduction

- 10.1.1 This Chapter of the Eastern Super Grid Transformer (ESGT) Environmental Statement (ES) assesses the potential impacts of the proposed ESGT on air quality receptors. The chapter considers both the potential positive and negative impacts for the construction, operation, and decommissioning phases of the development.
- 10.1.2 Potential dust emissions associated with onshore construction activities are considered, in addition to vehicle exhaust emissions from construction, operational and decommissioning activities.
- 10.1.3 This chapter has been informed by the air quality assessment undertaken for the GWF ES, which in turn was informed by the construction of the Greater Gabbard Offshore Wind Farm (GGOWF) onshore substation and cable corridor, which is adjacent to the proposed ESGT development.

### 10.2 Guidance

- 10.2.1 The Overarching National Policy Statement (NPS) for Energy (EN-1) (DECC 2011a) has been reviewed during the preparation of this chapter. EN-5 (DECC 2011b) does not specifically consider air quality impacts.
- 10.2.2 EN-1 contains generic requirements for the assessment of impacts on air quality arising from Nationally Significant Infrastructure Projects (NSIPs) and their associated development.

### 10.3 Methodology

#### Study area

- 10.3.1 The study area includes the area of the proposed ESGT. For air quality impacts, the study area also includes the proposed construction vehicle route, between the A12 and the onshore development footprint.

#### Receptor sensitivity

- 10.3.2 The Mineral Policy Statement (ODPM, 2005) provides guidance on receptor sensitivity in regard to construction dust emissions. For receptors present in the Study Area, all are defined as Medium sensitivity with the exception of Home Farm, which is of Low sensitivity .

#### Assessment of impacts

##### Construction phase: Dust

- 10.3.3 DEFRA (2009) states that potential exposure to airborne dust beyond 200m of a source can be disregarded (for the purposes of assessment against the PM10 objective) if the background concentration is less than  $26\mu\text{g m}^{-3}$ . As published background PM10 are less than  $16.5\mu\text{g m}^{-3}$  (National Air quality Archive) (GWF ES Chapter 27), in this assessment, potential dust effects on air quality have been discounted beyond 200m from the ESGT study area.

**Construction Phase: Vehicle emissions**

- 10.3.4 Exhaust emissions from construction vehicles have the potential to adversely impact local air quality, particularly local ambient concentrations of nitrogen dioxide (NO<sub>2</sub>) and PM<sub>10</sub>, the two constituent pollutants of vehicle emissions which are most likely to breach their respective health-based objectives.
- 10.3.5 The peak construction phase for the ESGT is expected to occur in 2015. Therefore the highest construction vehicle emissions can be expected in this year. The peak number of HGV movements assumed was 144 per day, during the two continuous concrete pours needed for the ESGT. The average HGV movements throughout the construction period would be 2.5 per hour.
- 10.3.6 The effects of construction dust and emissions from non-road mobile machinery (NRMM) are dependent upon a variety of factors including operational on-times, loading, ground, the transient nature of the works and meteorological conditions, all of which are difficult to quantify accurately. As a result, emissions from NRMM were considered qualitatively within the context of existing air quality conditions. The GWF ES contained a list of NRMM which would be used during the onshore GWF works. It is assumed that the NRMM used during the ESGT will be similar (Table 10.1).

**Table 10.1 Non-road mobile machinery to be used during ESGT construction**

Phase	Plant
Site preparation	Dump truck 25t
	Mobile crane
	Grader
	Compressor for site cabin
	Tracked excavator
	Hydraulic piling
Substation works	Mobile crane
	Silent generator
	Concrete pump and cement mixer
	Wheeled loader
	Tracked excavator
Onshore cabling	Lorry
	Tracked excavator
	Dump truck 25ft
Site demobilisation	Mobile crane
	Lorry

- 10.3.7 The ESGT construction is not expected to give rise to other known pollutants other than PM<sub>10</sub> and NO<sub>2</sub>.

**Operational phase**

- 10.3.8 During the operational phase, the ESGT will not generate any regular traffic movements and the traffic volume is expected to return to pre-construction levels following completion of the development.

### Decommissioning phase

10.3.9 Decommissioning of the ESGT will be undertaken in accordance with the relevant legislation at the time.

### Cumulative impacts

10.3.10 A cumulative assessment of vehicle emissions, associated with the onshore construction works for already consented GWF compound, the Sizewell B Dry Fuel Store construction, Sizewell A decommissioning and Sizewell C construction is captured as part of the construction stage impact assessment.

### Impact magnitude

10.3.11 Impact magnitude is derived using the receptor sensitivity to dust emissions against the distance between the receptor and the fugitive dust source (Table 10.2).

**Table 10.2 Impact magnitude matrix**

		Receptor sensitivity	
		Low	Medium
Distance between dust source and receptor (m)	>200m	Negligible	Negligible
	100-200	Negligible	Negligible
	50-100	Low	Medium
	0-50	Low	Medium

### Significance criteria

10.3.12 The impact magnitude, combined with the use of annual hourly sequential wind data representative of the region, allows the potential impact on air quality from fugitive dust emissions at sensitive receptors to be considered, in accordance with the significance matrix (Table 10.3).

**Table 10.3 Significance matrix**

Value / sensitivity	Magnitude			
	High	Medium	Low	Negligible
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible

## 10.4 Existing Environment

10.4.1 Background NO<sub>2</sub> and PM<sub>10</sub> parameters were well below objectives (National Air quality Archive) (see GWF ES Chapter 27 for details). Further, there are no Air Quality Management Areas (AQMA) within 20km of the proposed ESGT site and SCDC does not undertake air quality monitoring within the vicinity of the proposed ESGT site, indicating that air quality objectives, are likely to be exceeded.

### Receptor within the study area

10.4.2 Receptors sensitive to construction dust emissions, located within 650m of potential sources along the proposed cable corridor and substation site, are

presented in Table 10.4. The Sizewell Marshes SSSI is the nearest ecological receptor to the ESGT site.

**Table 10.4. Receptors sensitive to construction dust within the vicinity of the proposed ESGT**

Receptor	Location	Distance (m) and direction from the proposed ESGT
1	Coastguard Cottages, off Sizewell Gap	550m east
2	Public House (Vulcan Arms), Sizewell Gap	550m east
3	Home Farm, off Sizewell Gap	400m south
4	Rosery Cottages	120m north-east
5	Sizewell Marshes SSSI	50m north
6	Users of Sandy Lane Public Right of Way	20m north
7	Users of Sizewell Beach	650 east

## 10.5 Assessment of Impacts during Construction Phase

10.5.1 Fugitive dust emissions are anticipated to arise from the ESGT construction during activities such as excavation, movement of disaggregated material, construction vehicle movements, potential wind erosion of stockpiled materials, and general construction activities. The effects of dust emissions vary according to soil moisture content, nature of dust, distance to sensitive receptors and meteorological conditions. It is therefore difficult to accurately quantify potential impacts of dust emissions.

10.5.2 The prevailing wind direction is from the south-west and west (GWF ES Chapter 27 (Appendix 1.1)) and therefore of the receptors in Table 10.4, that are within 200m from the ESGT, (see Table 10.4) only 4 (Rosary Cottages), 5 (Sizewell Marshes SSSI), and 6 (Sandy Lane Bridleway) are considered to be potentially subject to significant dust exposure. However, with a predicted low to medium magnitude of exposure (see table 10.6 Impact Magnitude Matrix) the worst case impact has been predicted to be **minor adverse** in the absence of mitigation.

### Vehicle emissions and NRMM

10.5.3 The construction traffic movements predicted to occur during the construction period are presented in ESGT Chapter 9 Traffic and Transport. The traffic levels for the ESGT are not expected to exceed those predicted for the GWF onshore site. The maximum number of HGV movements associated with the ESGT is 144 a day, during the peak construction period.

10.5.4 The GWF ES Air Quality assessment predicted a negligible air quality impact in terms of emission from NRMM. The assessment found that emissions of NO<sub>2</sub> and PM<sub>10</sub> from the NRMM would be significantly lower within the context of baseline vehicle emissions. Emissions contributions would be both localised and temporary in duration. As the ESGT is predicted to require

similar NRMMs to the GWF onshore site, the impact for the ESGT is also predicted to be **negligible**.

#### Mitigation and residual impact

10.5.5 Although there is no requirement to provide mitigation, as potential effects are not significant, a Construction Code of Practice (CCoP) (Appendix 3.1) has been written and agreed for the GWF onshore site that will equally apply to construction of the ESGT. Consequently, relevant measures contained in the CCoP will reduce emissions from NRMM and these are:

- Construction vehicles and static plant will be well maintained. If continuous emissions of dark smoke occur then the relevant machinery will be identified to the Contractor who shall be required to investigate a practicable solution to reduce exhaust particulates; and
- All non-road mobile machinery (NRMM) will comply with either the current or previous EU Directive Staged Emission Standards (97/68/EC, 2002/88/EC, and 2004/26/EC). As new emission standards are introduced the acceptable standards will be updated.

### 10.6 Assessment of Impacts during Operational Phase

10.6.1 Following the completion of the construction phase, traffic volumes on the affected road network will return to normal. Occasional maintenance vehicles may be required to periodically visit the ESGT. However, the exhaust emissions associated with these vehicle movements, in the context of baseline traffic levels and air quality, will have **no impact** on local air quality.

### 10.7 Assessment of Impacts during Decommissioning Phase

10.7.1 It is expected that decommissioning of the ESGT substation will include similar activities to those adopted throughout the construction phase. As such, in terms of both vehicle and dust emissions associated with decommissioning activities, it is predicted that **negligible to minor adverse impacts** will occur at the previously identified dust sensitive receptors, as well as any new receptors which may be present when the ESGT is decommissioned.

### 10.8 Inter-relationships

10.8.1 Inter-relationships relevant to air quality include traffic and transport. Potential air quality impacts associated with traffic movements are discussed in Section 10.5.

### 10.9 Cumulative Impacts

10.9.1 The unmitigated impacts identified during the construction (Section 10.5), and decommissioning phases (Section 10.7) of the GWF project comprise:

- Negligible to minor adverse air quality impacts with respect to dust generated during construction and decommissioning.

10.9.2 No impacts with effects above negligible are anticipated for the operational phase of the project.

10.9.3 Other onshore activities in the study area include the GWF onshore site, GGOWF substation, Sizewell B Dry Fuel Store, proposed new nuclear development (Sizewell C) and the decommissioning of Sizewell A.

#### GWF onshore site

10.9.4 The ESGT construction will occur at the same time as the construction of the GWF onshore site. Therefore cumulative impacts have the potential to arise. Both the GWF onshore site and the ESGT will be subject to the measures stated in the CCoP (Appendix 3.1) which will reduce impacts to **negligible**.

#### GGOWF onshore electrical connection

10.9.5 The GGOWF operation does not involve any emissions to air and therefore there is no potential for cumulative impacts with the ESGT construction.

#### Sizewell Dry Fuel Store

10.9.6 The Sizewell Dry Fuel Store ES did not identify any significant air quality impacts (BEGL 2010). Therefore there are no predicted cumulative impacts.

#### Sizewell C

10.9.7 Given the absence of any details of the Sizewell C proposals, it is not possible to undertake a quantitative assessment of this potential cumulative impact.

#### Sizewell A decommissioning

10.9.8 The main decommissioning activity associated with the decommissioning is programmed to take place between 2009 and 2019 (British Nuclear Group 2005). The associated ES reports the potential for major adverse dust emissions to properties within 1km (which will include Rosery Cottages, Sizewell Village, Coastguard Cottages and the Vulcan Arms public house). Air quality impacts associated with Sizewell A decommissioning and GWF construction can both be managed through appropriate mitigation and reduced to negligible. Provided that the mitigation measures for both activities are fully implemented cumulative residual impacts are expected to reduce to negligible.

## 10.10 Monitoring

10.10.1 Due to the absence of significant impacts, air quality monitoring is proposed.

## 10.11 Summary

10.11.1 There are no potentially significant air quality impacts associated with the ESGT either in its own regard, cumulatively or inter-rated with other activities.

## 10.12 References

British Energy Generation Ltd (2010). Sizewell B Dry Fuel Store

Environmental Statement.

British Nuclear Group (2005) Sizewell A Environmental Statement

Department of Energy and Climate Change (2011a) Overarching National Policy Statement for Energy (EN-1)

Department of Energy and Climate Change (2011b) National Policy Statement for Electricity Network Infrastructure (EN-5)