



Thurrock Flexible Generation Plant

Environmental Statement Volume 2 Chapter 4: Environmental Impact Assessment Methodology

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**Environmental Impact Assessment
Environmental Statement**

**Volume 2
Chapter 4**

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Summary

This chapter describes the principles of the EIA process and the approach that has been taken to identify and evaluate the likely impacts and, subsequently, evaluate the significance of effects associated with Thurrock Flexible Generation Plant.

Qualifications

This document has been prepared by Natalie Brisland BSc (Hons), a Senior Consultant who has five years' experience of planning consultancy and environmental impact assessment, and Michael Fenny, a Principal Planner.

It has been checked by Tom Dearing, a Chartered Environmentalist and full Member of the Institute of Environmental Management and Assessment, who has nine years' experience of environmental impact assessment.

1. Introduction

1.1 Overview

1.1.1 This chapter of the Environmental Statement (ES) sets out the principles of the environmental assessment process. It details the approach that has been taken to identify and evaluate the likely impacts and significance of effects associated with Thurrock Flexible Generation Plant.

1.1.2 The EIA process that forms the basis of this ES, has been undertaken with reference to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as amended. Further details of the topic-specific methodologies (e.g. survey methodologies) are provided in each relevant topic chapter in Volume 3 of this ES and in the supporting appendices in Volume 6.

1.2 Environmental Impact Assessment legislation and guidance

1.2.1 The impact assessment methodology employed in this ES draws upon legislation, policy and guidance including:

- Council Directive 2011/92/EU of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (the EIA Directive), as amended by Council Directive 2014/52/EU;
- The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended);
- Overarching National Policy Statement for Energy (EN-1) (Department of Energy and Climate Change (DECC), 2011a);
- National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2) (DECC, 2011b);
- Advice Note Seven: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping (PINS, 2017);
- Advice Note Nine: Rochdale Envelope (PINS, 2018a);
- Advice Note Twelve: Transboundary Impacts and Process (PINS, 2018b);
- Advice Note Seventeen: Cumulative Effects Assessment (PINS, 2019);
- Highways England *et al.* (2019) Design Manual for Roads and Bridges, Volume 11, Section 2, Part 4. LA 104; and
- other guidance in relation to the principles of EIA, including:

- Department of the Environment, Transport and the Regions (DETR) (1997) Mitigation Measures in Environmental Statements;
- Institute of Environmental Management and Assessment (2004) Guidelines for Environmental Impact Assessment;
- Institute of Environmental Management and Assessment (2011) The State of Environmental Impact Assessment Practice in the UK. Special Report;
- Institute of Environmental Management and Assessment (2015a) Environmental Impact Assessment Guide to Shaping Quality Development;
- Institute of Environmental Management and Assessment (2015b) Climate Change Resilience and Adaptation;
- Institute of Environmental Management and Assessment (2016) Guide to Delivering Quality Development; and
- Marine Life Information Network (MarLIN) (2012) Sensitivity Assessment Rationale – A Summary.

1.2.2 Further details regarding the legislative context of the assessments undertaken in this ES are provided in Volume 2, Chapter 1: Introduction.

2. Key principles of assessment for Thurrock Flexible Generation Plant

2.1 Overview

2.1.1 The assessment for each environmental topic forms a separate chapter of this ES (Volume 3, Chapters 6 to 17). For each topic chapter the following components have been set out:

- identification of the study area for the topic specific assessments;
- description of the planning policy and guidance context;
- summary of consultation activity undertaken, including comments received in the Scoping Opinion and following the provision of the Preliminary Environmental Impact Report;
- description of the approach to assessment, including details of the methodologies used;
- description of the baseline environmental conditions; and
- presentation of the impact assessment undertaken, which includes:
 - identification of the maximum design scenario for each impact assessment;
 - a description of the measures adopted as part of the design of the proposed development, including mitigation and design measures which seek to prevent, reduce or offset environmental effects;
 - an assessment of the likely impacts and effects associated with the proposed development;
 - identification of any further mitigation measures required in respect of likely significant effects (in addition to those measures adopted as part of the project design);
 - identification of any future monitoring required; and

2.1.2 For each topic, an assessment of any cumulative effects with other major developments is provided in Volume 4, Chapters 19 to 30.

2.1.3 Inter-related effects (i.e. inter-relationships between environmental topic areas) are assessed in Volume 5, Chapter 31: Summary of Inter-related Effects.

2.2 Methodology and assessment criteria

2.2.1 Each topic chapter provides details of the methodology for baseline data collection and the approach to the assessment of effects. Each environmental topic has been considered by a specialist in that area.

2.2.2 Each topic chapter defines the scope of the assessment within the methodology section, together with details of the study area, desk study and survey work undertaken and the approach to the assessment of effects. The identification and evaluation of effects have been based on the information set out in Volume 2, Chapter 2: Project Description, environmental assessment good practice guidance documents and relevant topic-specific guidance where available.

2.3 Description of the environmental baseline conditions (Including future baseline conditions)

2.3.1 The existing and likely future environmental conditions in the absence of the proposed development are known as 'baseline conditions'. Each topic chapter includes a description of the current (baseline) environmental conditions. The baseline conditions at the site and within the study area form the basis of the assessment, enabling the likely significant effects to be identified through a comparison with the baseline conditions.

2.3.2 An evidence-based approach to environmental assessment has been used, which involves utilising existing data and information from sufficiently similar or analogous studies to inform baseline understanding and/or impact assessments. In this way, the evidence-based approach does not always require new data to be collected, or new modelling studies to be undertaken, in order to characterise the potential impact with sufficient confidence for the purposes of assessment.

2.3.3 Where relevant, each topic chapter of this ES (Volume 3, Chapters 6 to 17) sets out:

- the data that have been obtained from previous studies as well as publicly available desktop data sources, in defining the baseline environment; and
- where it is necessary, a description of additional data that have been collected in order to inform the impact assessment.

2.3.4 The baseline for the assessment of environmental effects is primarily drawn from existing conditions during the main period of the assessment work during 2018 and in some cases 2019.

2.3.5 The baseline for the assessment should represent the conditions that will exist in the absence of the proposed development at the time that the development is likely to be implemented. The anticipated start date for construction is 2021, with possible enabling works occurring in 2020. The programme would be of up to six years in duration, depending on the phasing of the proposed development. Further information about the construction programme assessed can be found in Volume 2, Chapter 2: Project Description.

2.3.6 Consideration has been given to any likely changes between the time of survey and the future baseline for the construction and operation of the proposed development. In some cases, these changes may include the construction or operation of other planned or consented developments in the area. Where such developments are built and operational at the time of writing and data collection, these have been considered to form part of the baseline environment. In other cases, planned future developments are considered within the assessment of cumulative effects.

2.3.7 The consideration of future baseline conditions has also taken into account the likely effects of climate change, as far as these are known at the time of writing. This has been based on information available from the UK Climate Projections project (UKCP18), which provides information on plausible changes in climate for the UK (Met Office Hadley Centre, 2018) and on published documents such as the UK Climate Change Risk Assessment 2017 Evidence Report (Committee on Climate Change, 2017).

Limitations

2.3.8 Each topic chapter identifies any limitations identified in the available baseline data and whether there were any difficulties encountered in compiling the information required.

2.4 Measures envisaged to prevent, reduce and where possible offset significant adverse effects

Introduction

2.4.1 Regulation 14(2) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (hereafter referred to as the EIA Regulations 2017) requires an ES to include “[a] description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment”.

2.4.2 The iterative approach to assessment employed for Thurrock Flexible Generation Plant involves a feedback loop during the impact assessment process. This is shown on Figure 2.1, below. A specific impact and the significance of the resulting effect is initially assessed and, if this is deemed to be a significant adverse effect in terms of the EIA Regulations, changes are made (where practicable) to relevant parameters or design of the proposed development in order to avoid, reduce or offset the impact. The assessment is then repeated and the process continues until the EIA practitioner is satisfied that:

- the effect has been reduced to a level that is not significant in terms of the EIA Regulations; or
- having regard to other constraints, no further changes may be made to design parameters in order to reduce the magnitude of impact (and hence significance of effect). In such cases, an overall effect that is still significant in terms of the EIA Regulations would be presented in the ES.

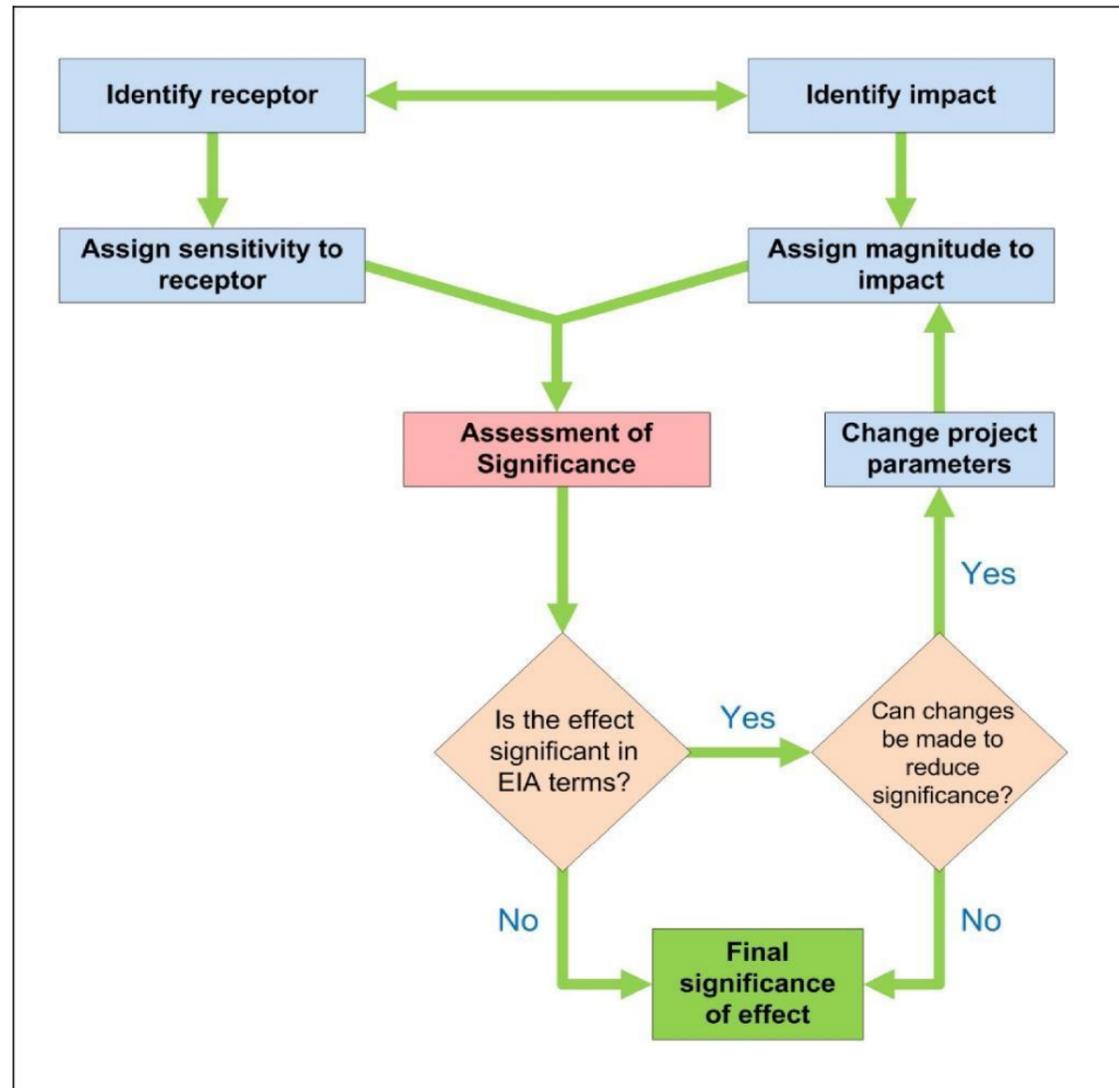


Figure 2.1: Iterative approach to measures adopted as part of the project within the Thurrock Flexible Generation Plant.

Measures adopted as part of the project

2.4.3 The iterative approach to the assessment process, as described in paragraph 2.4.2 above, has been used as a means of informing the design of the proposed development (through the identification of likely significant effects and development of mitigation measures to address these). The incorporation of such measures within the design of the proposed development demonstrates commitment to implementing the identified measures.

2.4.4 By employing this approach, the significance of effect presented in the ES is representative of the maximum residual effect that the project will have, should it be approved and constructed.

2.4.5 Volume 6, Appendix 2.1: Enhancement, Mitigation and Monitoring Commitments sets out a summary of the enhancement measures and mitigation commitments (including measures adopted as part of the proposed development) in the ES, produced following consultation. The means of implementation are specified for each of the commitments.

2.5 Identification of impacts and the assessment of significance of effects

Scope of impact assessment

2.5.1 Taking into account the nature, size and location of the proposed development (see Volume 2, Chapter 2: Project Description), the information provided in the scoping report and other consultation responses provided throughout the EIA process, the following topics have been identified as requiring consideration within this ES:

- Landscape and Visual Resources (Volume 3, Chapter 6);
- Historic Environment (Volume 3, Chapter 7);
- Land Use, Agriculture and Socio-Economics (Volume 3, Chapter 8);
- Onshore Ecology (Volume 3, Chapter 9);
- Traffic and Transport (Volume 3, Chapter 10);
- Noise and Vibration (Volume 3, Chapter 11);
- Air Quality (Volume 3, Chapter 12);
- Human Health (Volume 3, Chapter 13);
- Climate Change (Volume 3, Chapter 14);
- Hydrology and Flood Risk (Volume 3, Chapter 15);
- Geology, Hydrogeology and Ground Conditions (Volume 3, Chapter 16); and
- Marine Environment (Volume 3, Chapter 17).

2.5.2 A number of impacts have been scoped out based on the baseline information that has been collected. Further details are provided in Volume 2, Chapter 5: Scoping and Consultation and within each of the topic chapters.

Maximum design scenario

- 2.5.3 The assessment undertaken for the Thurrock Flexible Generation Plant has employed a maximum design scenario (Rochdale Envelope) approach. This approach allows for a proposed development to be assessed on the basis of maximum project design parameters in order to provide flexibility, while ensuring all potentially significant effects (adverse or beneficial) are assessed and reported. Those parameters include a range of potential values. The maximum design scenario approach employed for Thurrock Flexible Generation Plant is consistent with the Planning Inspectorate’s (PINS) Advice Note Nine: Using the Rochdale Envelope (PINS, 2018a). Further details of the legislative context of this approach are included in Volume 2, Chapter 2: Project Description.
- 2.5.4 This approach has been taken for the assessment because it is not possible to provide precise final design details of the proposed development, or the way it will be built, a number of years ahead of the time it will be constructed. Improvements in technology and construction methodologies occur frequently and an unnecessarily prescriptive approach could preclude the adoption of new, more cost-effective technology and methods, potentially affecting the viability of a project. Volume 2, Chapter 2: Project Description describes the project design and identifies the range of potential parameters for all relevant components.
- 2.5.5 For each of the impacts assessed within the topic chapters (Volume 3, Chapters 6 to 17), the maximum design scenario is identified from the range of potential options for each parameter within Volume 2, Chapter 2: Project Description. The maximum design scenario assessed is therefore the scenario which would give rise to the greatest potential impact. For example, the size of the buildings proposed would be of the maximum dimensions required. By identifying the maximum design scenario for any given impact, it can therefore be concluded that the impact (and therefore the effect) will be no greater for any other design scenario than that assessed for the maximum design scenario. By employing the maximum design scenario approach, the Applicant retains some flexibility in the final design of the plant and associated infrastructure, but within defined maximum parameters, which are assessed in this ES.

Sensitivity or importance of receptors

- 2.5.6 Receptors are defined as the physical or biological resource or user group that would be affected by a project. For each topic, baseline studies have informed the identification of potential environmental receptors. Some receptors will be more sensitive to certain environmental effects than others. The sensitivity or value of a receptor may depend, for example, on its frequency, extent of occurrence or conservation status at an international, national, regional or local level.

- 2.5.7 Sensitivity is defined within each topic chapter of this ES and takes into account factors including the:
 - vulnerability of the receptor;
 - recoverability of the receptor; and
 - value/importance of the receptor.
- 2.5.8 Sensitivity is generally described using the following scale:
 - high;
 - medium;
 - low; and
 - negligible.
- 2.5.9 In some cases, a further category of very high has been used.
- 2.5.10 An example of the definitions for each of these categories is set out in Table 2.1. These definitions have been adapted from the DMRB (Highways England *et al.*, 2019). Topic-specific definitions for each of these categories are provided in each of the topic chapters. The value of a receptor for each topic draws upon relevant topic specific guidance and material, including specialist knowledge, which is relevant to that topic.

Table 2.1: Definition of terms relating to the environmental value (sensitivity).

Value (sensitivity of the receptor)	Description
Very High	Very high importance and rarity, international scale and very limited potential for substitution.
High	High importance and rarity, national scale, and limited potential for substitution.
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

Magnitude of impact

- 2.5.11 Impacts are defined as the physical changes to the environment attributable to the project. For each topic, the likely environmental impacts have been identified. For each topic the likely environmental change arising from the proposed development has been identified and compared with the baseline (the situation without the proposed development). Impacts are divided into those occurring during the construction, operational and decommissioning phases of the proposed development.

2.5.12 The categorisation of the magnitude of impact is topic-specific but generally takes into account factors such as:

- extent;
- duration;
- frequency; and
- reversibility.

2.5.13 With respect to the duration of impacts, the following has been used as a guide within this assessment, unless defined separately within the topic assessments:

- short term: a period of months, up to one year
- medium term: a period of more than one year, up to five years; and
- long term: a period of greater than five years.

2.5.14 The magnitude of an impact has generally been defined used the following scale:

- major;
- moderate;
- minor; or
- negligible.

2.5.15 In some cases, a further category of ‘neutral’ or ‘no change’ has been used.

2.5.16 An example of the definitions for each of these categories is set out in Table 2.2 below. The table describes both adverse and beneficial magnitudes of change. These definitions have been adapted from the DMRB (Highways England *et al.*, 2019). Topic specific definitions for each of these categories are provided in each topic chapter. The design of these topic specific scales draws upon relevant external policy, guidance, standards and other material, including specialist knowledge, which is relevant to that topic.

Table 2.2: Definition of terms relating to the magnitude of impacts.

Magnitude of impact	Description
Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (adverse)
	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality (beneficial)
Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements (adverse)

Magnitude of impact	Description
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (beneficial)
Minor	Some measurable change in attributes, quality or vulnerability, minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (adverse)
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (beneficial)
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (adverse)
	Very minor benefit to, or positive addition of one or more characteristics, features or elements (beneficial)
No change	No loss or alternation of characteristics, features or elements; no observable impact in either direction

Significance of effects

2.5.17 Effect is the term used to express the consequence of an impact (expressed as the ‘significance of effect’). This is identified by considering the magnitude of the impact and the sensitivity or value of the receptor.

2.5.18 The magnitude of an impact does not directly translate into significance of effect. For example, a significant effect may arise as a result of a relatively modest impact on a resource of national value, or a large impact on a resource of local value. In broad terms, therefore, the significance of the effect can depend on both the impact magnitude and the sensitivity or importance of the receptor.

2.5.19 In order to ensure a transparent and consistent approach throughout the assessment, a matrix approach has been adopted as a guide. There is, however, latitude for professional judgement where deemed appropriate in the application of the matrix. Where the matrix offers a choice of significance levels, professional judgement has been used to determine the most likely outcome. An example of the matrix used to inform the topic-specific methodologies in each topic is set out in Table 2.3. This matrix has been adapted from the DMRB (Highways England *et al.*, 2019).

Table 2.3: Matrix used for the assessment of significance of effect.

		Magnitude of Impact				
		No Change	Negligible	Minor	Moderate	Major
Sensitivity of Receptor	Negligible	Negligible	Negligible	Negligible or minor	Negligible or minor	Minor
	Low	Negligible	Negligible or minor	Negligible or minor	Minor	Minor or Moderate
	Medium	Negligible	Negligible or minor	Minor	Moderate	Moderate or Major
	High	Negligible	Minor	Minor or Moderate	Moderate or Major	Major or Substantial
	Very High	Negligible	Minor	Moderate or Major	Major or Substantial	Substantial
	The final significance of effect is based upon the expert's professional judgement as to which outcome delineates the most likely effect, with an explanation as to why this is the case.					

2.5.20 Except where otherwise set out, a significance of effect of moderate or greater is considered 'significant' in terms of the EIA Regulations.

2.5.21 In cases where a range is suggested for the significance of effect, there remains the possibility that this may span the significance threshold (i.e. the range is given as minor to moderate). In such cases the final significance is based upon the expert's professional judgement as to which outcome delineates the most likely effect, with an explanation as to why this is the case.

2.5.22 The definitions for each of the significance levels are shown in Table 2.4.

Table 2.4: Definition of significance levels.

Significance Level*	Definition adapted from Highways England <i>et. al</i> , 2019
Negligible	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.
Minor	These beneficial or adverse effects are generally, but not exclusively, raised as local factors. They are unlikely to be critical in the decision-making process, but are important in enhancing the subsequent design of the project.
Moderate	These beneficial or adverse effects have the potential to be important and may influence the decision-making process. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse or beneficial effect on a particular resource or receptor.

Significance Level*	Definition adapted from Highways England <i>et. al</i> , 2019
Major	These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.
Substantial	Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category. Effects upon human receptors may also be attributed this level of significance.

* the definitions of significance are in accordance with the latest edition of the DMRB (Highways England *et al.*, 2019) but retain the detail of the previous edition (Highways Agency, 2008), as these had been used in the Preliminary Environmental Impact Report and are considered to remain useful in providing clarity to the significance levels.

Further mitigation and future monitoring

2.5.23 In certain cases, further mitigation measures have been outlined after the assessment of significance within the topic chapters (Volume 3, Chapters 6 to 17). These cases are where:

- an effect is considered significant in terms of the EIA Regulations, when already including designed-in mitigation measures, and there are additional mitigation measures that could further reduce the level of effect; and/or
- mitigation has been proposed but has not yet been confirmed as feasible or deliverable (i.e. awaiting approval from regulators or agreement with other stakeholders) as agreed mitigation, or is as yet unproven (i.e. the mitigation is not yet proven to be effective at reducing the residual significance of effect).

2.5.24 Volume 6, Appendix 2.1: Mitigation, Enhancement, and Monitoring Commitments sets out a summary of the enhancement measures and mitigation commitments (including measures adopted as part of the proposed development) in the ES produced following consultation. The means of implementation are specified for each of the commitments.

2.5.25 Where relevant and necessary, future monitoring measures have been set out within the topic chapters.

Residual effects

2.5.26 Residual effects are defined as the effects remaining once all further mitigation measures have been taken into consideration. Following the identification of further mitigation measures as described above, the assessment re-evaluates the significance of effect.

3. Cumulative Effects Assessment

3.1 Introduction

3.1.1 Cumulative effects result from multiple impacts on receptors occurring in combination over time. This includes the assessment of effects of the proposed development together with other proposed (but not yet completed) development projects that are not included in the baseline environmental data gathered.

3.1.2 This section sets out the approach to the cumulative effects assessment (CEA) in this ES. The CEA is reported in Volume 4 of the ES.

3.2 Legislation and guidance

Legislation

3.2.1 The EIA Regulations require the ES to consider cumulative effects. Specifically, Schedule 4(5)(e) of the EIA Regulations requires the ES to include a description of the likely significant effects of the development on the environment resulting from the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.

Guidance

3.2.2 A range of guidance is available on CEA but at present there is no single agreed industry standard method. Relevant guidance taken into account in this assessment is as follows:

- Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects (Planning Inspectorate, 2019) and
- Advice Note Nine: Using the Rochdale Envelope (Planning Inspectorate, 2018a).

3.2.3 Advice Note 17 (Planning Inspectorate, 2019) provides a clear and systematic approach to cumulative effects assessment, in particular to identifying sites for consideration in the assessment. This guidance identifies the following types of development projects to be taken into account (adapted from the guidance note):

- projects under construction;
- consented applications not yet implemented;

- submitted applications not yet determined;
- local authority planning applications where a scoping report has been submitted;
- projects on Planning Inspectorate's Programme of Projects;
- sites identified in the relevant Local Development Plans (and emerging Local Development Plans – with appropriate weight being given as they move closer to adoption); and
- other plans and programmes (as appropriate) which set the framework for future development consent/approval, where such development is reasonably likely to come forward.

3.2.4 The guidance acknowledges that the availability of information on different development types will depend upon the status of the development and that consequently greater weight should be applied in the CEA to those development types with the greatest level of data certainty.

3.2.5 For the purpose of this assessment, cumulative effects have been defined as 'those that result from additive effects caused by other past, present or reasonably foreseeable actions together with the project itself and from synergistic effects which arise from the reaction between the effects of the project on different aspects of the environment'¹.

3.3 Approach to the assessment of cumulative effects

3.3.1 The approach taken for the CEA has two stages, each with a series of steps, to scope the cumulative assessment and allow for a focussed evaluation of the potentially significant effects of the proposed development in combination with other projects on sensitive environmental receptors.

3.3.2 In summary, the first stage seeks is a search exercise to create a longlist of developments with the possibility of cumulative effects and then to screen this to a short-list, removing developments where on review of the available information, no cumulative effects in any EIA topic area are considered likely.

3.3.3 In the second stage, the short-listed is refined on a topic by topic basis through identifying sensitive environmental receptors which could potentially experience a significant effect as a result of a cumulative development acting together with Thurrock Flexible Generation Plant. The predicted cumulative effects on these environmental receptors are then assessed all cumulative developments (where sufficient information is available) relevant to that topic area.

¹ Adapted from: Cumulative Impact Assessment Guidelines (Renewable UK, 2013)

Stage 1 – identifying the long- and short-list of cumulative projects

- 3.3.4 The approach to identifying the long and short-list of cumulative projects has been undertaken has followed that in Planning Inspectorate Advice Note 17, with the following key steps:
- establishing a potential zone of influence (ZOI) of the proposed development;
 - undertaking a desk study of planning applications, development plan documents, relevant development frameworks and other available sources to identify a long-list of development projects that fall within the ZOI; and
 - screening and shortlisting those developments with potential for cumulative effects based upon temporal scope, the scale and nature of the project, the location of the project and other relevant factors.
- 3.3.5 Planning officers at Thurrock District Council were then consulted to identify any additional projects that should be added to or screened into the short-list of cumulative projects, or conversely to identify and short-listed projects that could be screened out. A short-list for the Preliminary Environmental Impact Report was agreed with Thurrock District Council on 31 August 2018.
- 3.3.6 Subsequently, further reviews and updates to the short-list were undertaken in January 2019 and June 2019 to identify other new developments or changes to the status of development projects which had come forward since the original short list was agreed.
- 3.3.7 Further detail about the method and approach that was adopted to establish the long and short-list of sites is provided in Volume 4, Chapter 18: Cumulative Effects Assessment Introduction and Screening of this ES. That chapter provides the final long- and short-lists of projects that were taken forward for consideration in stage two.

Stage 2 – topic by topic CEA approach

- 3.3.8 Following agreement of the short-list of cumulative projects for consideration in the CEA, the approach to evaluating the projects, refining the shortlist for each of the EIA topic areas and assessing the significance of potential cumulative effects has been undertaken as follows.

Identifying relevant cumulative impacts and receptors affected

- 3.3.9 The first step involved a review of the findings of the environmental assessments completed for each of the short-listed projects, where available, or other published information indicating potential development impacts. This information has been evaluated and projects were shortlisted for the topic area CEA if significant effects of the project were predicted or if the available information, in the topic author's professional judgement, suggested that impacts may cause significant effects in the cumulative scenario. Where sufficient information about a project to consider its potential for cumulative effects is not publicly available, the project has been discounted from further assessment.
- 3.3.10 For each EIA topic area, the review process also recorded information about the sensitive environmental receptors that were predicted to be affected by the cumulative projects. This review information has been collated in tables to identify where the environmental effects from different projects have the potential to exert cumulative effects on the same environmental receptor(s).
- 3.3.11 The focus on environmental receptors is important since it allows for a comprehensive assessment of the potential for significant effects from contributing projects as well as from the in-combination effects of different types of impact on the same receptor group. It also focuses the assessment on key groups or types of receptors which are sensitive to cumulative effects rather than on all receptors considered within the individual project EIA topic chapters.
- 3.3.12 The review of effects and receptors is recorded on a topic by topic basis which allows each EIA topic specialist to consider the potential for cumulative effects by reviewing the contribution of each cumulative project in turn.
- 3.3.13 The findings and analysis of significant effects and receptors provides the basis for the next stage of scoping the cumulative assessment on a topic by topic basis.

Assessment of cumulative effects

- 3.3.14 The prediction and evaluation of the significance of cumulative effects has been undertaken on a topic by topic basis using the shortlist of relevant projects and affected receptors identified for each EIA topic in the previous step.
- 3.3.15 The assessments have considered the potential additive cumulative effects in combination with other projects (for example, the loss of 2 pieces of woodland of 1 ha, resulting in 2 ha cumulative woodland loss) and from potential synergistic effects arising from the interactions of the combined effects (for example, two discharges combine to have an effect on a species not affected by discharges in isolation).

- 3.3.16 Where there has been uncertainty about the potential for significant cumulative effects in the scoping process these effects have been assessed on a precautionary basis.
- 3.3.17 The overall approach to evaluation of impact significance generally follows that adopted for the proposed development in isolation, where the significance of effects on receptors takes account of the magnitude of the predicted impacts and the sensitivity of the receiving environment. Significance is evaluated taking into account the mitigation measures which have already been committed as part of the EIA process for the Thurrock Flexible Generation Plant development, i.e. based on its residual effects as predicted in Volume 3.
- 3.3.18 In some cases, where limited environmental information about other proposed developments is available, specific magnitudes of impacts and degrees of significant effect (such as moderate or major) may not be possible to predict. In such cases, the assessment still seeks to discuss where there is the potential for cumulative effects to occur and to provide details of whether cumulative effects are likely to be significant. A statement is made as to whether the cumulative effects have the potential to be more significant than the effects of the Thurrock Flexible Generation Plant alone and, if so, whether this direction of change would be adverse or beneficial.
- 3.3.19 In CEA there are receptors which are common to a number of EIA topic areas, that is their value/importance and sensitivity is influenced and characterised by a range of physical, biological or social/cultural functions. For example, watercourses may be sensitive to cumulative effects due to their ecological, hydrological and amenity importance. Therefore, in addition to the assessment of cumulative effects from the various projects scoped into the CEA on each receptor group, an assessment has also been made of the potential for different types of impact acting in combination on the same key receptors. These inter-related effects are presented in Volume 5, Chapter 31.
- 3.3.20 Where significant cumulative effects are predicted, further mitigation has been considered where possible to avoid, reduce or offset such effects, and residual effects have been predicted.

4. Inter-Related Effects

4.1 Inter-related effects guidance

4.1.1 It is good practice to consider the inter-relationships between topics that may lead to environmental effects. For example, the separate impacts of noise and habitat loss may have an effect upon a single ecological receptor.

4.1.2 The approach presented in this ES has been developed with specific regard to PINS Rochdale Envelope Advice Note (Advice Note Nine) (PINS, 2018a), which states that:

“Inter-relationships consider impacts of the proposals on the same receptor. These occur where a number of separate impacts, (e.g. noise and air quality), affect a single receptor such as fauna.”

4.2 Approach to assessment of inter-related effects

4.2.1 The assessment of potential inter-related effects has been carried out concurrently considering two levels of potential effect:

- project lifetime effects: effects that occur throughout more than one phase of the proposed development (construction, operational and decommissioning) interacting to potentially create a more significant effect upon a receptor than if just assessed in isolation in a single phase; and
- receptor-led effects: effects that interact spatially and/or temporally resulting in inter-related effects upon a single receptor. For example, the effect upon habitat loss or disturbance may be greater when multiple sources of impact interact or combine to produce a different or greater effect upon this receptor than when single sources of impact are considered in isolation. Receptor-led effects might be short term, temporary or transient effects, or incorporate longer term effects.

4.2.2 The assessment of inter-related effects within the Thurrock Flexible Generation Plant EIA process has been undertaken with specific reference to the potential for such effects to arise in relation to key receptors or receptor groups. A descriptive assessment is included outlining the potential for individual effects to combine, incorporating qualitative and, where reasonably possible, quantitative assessments, to potentially create additional effects that may be of greater significance than the individual effects acting in isolation.

4.2.3 The term ‘receptor group’ is used to highlight the fact that the proposed approach to inter-relationships assessment will, in the main, not assess every individual receptor assessed at the EIA stage, but rather potentially sensitive groups of receptors.

4.2.4 These receptor groups are explained in the relevant topic chapters (Volume 3, Chapters 6 to 17) and are summarised in Volume 5, Chapter 31: Summary of Inter-related Effects.

4.2.5 The approach for assessing the potential inter-related effects on each ‘receptor group’ is as follows.

- i. A review of the ES topic chapters undertaken to identify receptor groups requiring assessment and the likely effects on each receptor group.
- ii. An assessment is made concerning on how individual effects may combine to create inter-related effects on each receptor group. This considers:
 - effects during construction, operational and decommissioning phases (i.e. ‘project lifetime effects’); and
 - multiple effects on a single receptor (i.e. ‘receptor-led effects’).

4.2.6 Where the significance of an effect within the topic-specific assessment has been identified as ‘no effect’ across all stages of the proposed development, the assumption has been made that these effects can not contribute to any inter-related effects. In determining the boundaries of the inter-related assessment, these effects are omitted from the inter-related effects assessment due to there being no effect from the Thurrock Flexible Generation Plant over the life time of the proposed development.

4.2.7 A further assessment of inter-related cumulative effects has been made following the same methodology. The cumulative development inter-related effects are presented in Volume 5, Chapter 31: Summary of Inter-related Effects.

5. Transboundary Effects

- 5.1.1 Transboundary effects arise when development within one European Economic Area (EEA) state affects the environment of another EEA state(s).
- 5.1.2 The need to consider such transboundary effects has been embodied by the United Nations Economic Commission for Europe (UNECE) Convention on EIA in a Transboundary Context, adopted in 1991 in the Finnish city of Espoo and commonly referred to as the 'Espoo Convention'. The Convention requires that assessments are extended across borders between Parties of the Convention when a planned activity may cause significant adverse transboundary impacts.
- 5.1.3 The Espoo Convention has been implemented by the EIA Directive and transposed into UK law under the EIA Regulations. Regulation 32 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as amended, requires that where the Secretary of State is of a view that an EIA application may have significant effect(s) upon the environment of another EEA state, or the Secretary of State receives a request for involvement from another EEA member state, it must undertake a prescribed process of consultation and notification.
- 5.1.4 A transboundary impacts screening exercise has been undertaken and is presented in Volume 6, Appendix 4.1: Transboundary Impacts Screening Note. No significant transboundary effects have been identified and therefore more detailed assessment of such effects has been scoped out of the assessment process.

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