



Thurrock Flexible Generation Plant

**Environmental Statement Volume 6
Appendix 9.3: Biodiversity Net Gain Assessment**

Date: February 2020

Environmental Impact Assessment

Environmental Statement

Volume 6

Appendix 9.3

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This report is also downloadable from the Thurrock Flexible Generation Plant website at:

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Summary

This document provides a development-specific Biodiversity Net Gain (BNG) Assessment in accordance with the requirements of the National Planning Policy Framework (NPPF, 2019) and recognised industry guidance (CIEEM et al, 2019) for the proposed Thurrock Flexible Generation Plant.

Qualifications

This document has been prepared by Louisa Medland CEcol MCIEEM, a Principal Consultant, who has 12 years' experience of environmental impact assessment.

It has been checked by Matt Fasham CEnv MCIEEM, a Technical Director, with over 20 years' professional experience in consultancy in the UK.

1. Introduction

1.1 Background

- 1.1.1 A site-specific Biodiversity Net Gain (BNG) Assessment has been prepared for Thurrock Flexible Generation Plant (the proposed development).
- 1.1.2 Volume 3, Chapter 9 of the Environmental Statement provides a full assessment of the effects of the project on ecology and nature conservation and includes the results of ecological surveys previously undertaken on the site and used to provide a baseline for the BNG Assessment.
- 1.1.3 This report provides:
- Results of the on-site assessment of biodiversity value prior to development;
 - Results of the on-site assessment of biodiversity value following development taking into consideration landscaping and habitat creation designed into the project.
 - Results of the overall net gain assessment demonstrating whether net gain of >10% is achieved.
- 1.1.4 A net gain target of 10% is chosen because this is the level of net gain set out in the Environment Bill that is currently going through Parliament. Nationally Significant Infrastructure Projects such as Thurrock Flexible Generation Plant are exempt from the requirement to achieve mandatory net gain, as will be required for other development types when the Environment Bill passes. However, seeking net gain insofar as possible with the goal of achieving around +10% has been voluntarily adopted as a principle guiding the outline design of ecological mitigation and enhancement (see application document A8.7) and illustrative landscaping design (application document A2.9).

1.2 Biodiversity Net Gain definition

- 1.2.1 Biodiversity Net Gain is defined in Baker *et al* (2019) as:
- "Development that leaves biodiversity in a better state than before"*
- 1.2.2 The requirement for developments to seek to achieve BNG arises from the National Planning Policy Framework (NPPF) (2019), which states in Para. 170 that:
- "Planning policies and decisions should contribute to and enhance the natural and local environment by ... minimising impacts on and providing net gains for biodiversity."*

1.3 Methodology

- 1.3.1 There is no single set method for quantifying the assessment of BNG but one method is the use of biodiversity calculators to assess the biodiversity value of habitats pre- and post-development based on habitat type, distinctiveness and condition.
- 1.3.2 A biodiversity index is derived for the baseline and for the proposed development, and BNG is considered to be achieved where an increase in value is delivered (on or offsite), and where habitats of a higher value are not replaced exclusively with habitats of a lower value.
- 1.3.3 Defra made available its beta test update of its BNG assessment tool in July 2019, which was subsequently updated in December 2019. This tool has been used for the updated assessment in this report. The tool and associated documents were downloaded from:
<http://publications.naturalengland.org.uk/publication/5850908674228224>

1.4 Report structure

- 1.4.1 This report has the following structure:
- Section 2 provides the results of the BNG assessment;
 - Section 3 provides a summary of the biodiversity net gain that would be achieved.

2. Biodiversity Net Gain Assessment

2.1 Baseline

- 2.1.1 The baseline for assessment of BNG used the Phase 1 habitat map for the application site produced for the Preliminary Ecological Appraisal (Volume 6, Appendix 9.1). The extent, distinctiveness and condition of the habitats currently present on site is provided in Table 2.1 and Table 2.2, together with the extent of losses of each habitat type resulting from the proposed development.

Table 2.1: Baseline assessment of biodiversity value (nonlinear habitats)

Habitat type	Approx. area (ha)	Distinctiveness score	Condition score	Ecological connectivity score	Strategic significance score	Value (biodiversity units) *	Area of habitat retained	Area of habitat enhanced	Baseline value of retained habitats	Baseline value of enhanced habitats	Area of habitat lost (ha)	Value of habitats lost
Woodland and forest - Lowland mixed deciduous woodland	0.174	High	Fairly Good	Medium	Area/compensation not in local strategy/ no local strategy	2.87	2.871	0	2.87	0.00	0.00	0
Heathland and shrub - Mixed scrub	0.8931	Medium	Moderate	Low	Area/compensation not in local strategy/ no local strategy	7.15	1.40	0.0306	1.40	0.25	0.69	5.4952
Grassland - Other neutral grassland	14.5175	Medium	Moderate	Low	Area/compensation not in local strategy/ no local strategy	116.14	0.02	6.3118	0.02	50.49	8.20	65.624
Grassland - Modified grassland	2.3967	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	4.79	0.5171	0.0913	1.03	0.18	1.79	3.58
Grassland - Modified grassland	2.3666	Low	Fairly Poor	Low	Area/compensation not in local strategy/ no local strategy	7.10	1.1844	0.0192	3.55	0.06	1.16	3.49
Sparsely vegetated land - Ruderal/Ephemeral	1.026	Low	Fairly Poor	Low	Area/compensation not in local strategy/ no local strategy	3.08	0.5984	0.2466	1.80	0.74	0.18	0.54
Wetland - Reedbeds	0.076	High	Moderate	Medium	Area/compensation not in local strategy/ no local strategy	1.00	0.0004		0.01	0.00	0.08	1.00
Lakes - Ditches	0.9614	Medium	Moderate	Low	Area/compensation not in local strategy/ no local strategy	8.84	0.5258	0.3724	4.84	3.43	0.06	0.58
Urban - Developed land; sealed surface	2.0302	V.Low	N/A - Other	N/A	Area/compensation not in local strategy/ no local strategy	0.00	2.0212		0.00	0.00	0.01	0.00
Cropland - Cereal crops	46.9822	Low	N/A - Agricultural	N/A	Area/compensation not in local strategy/ no local strategy	93.96	18.7843	18.3207	37.57	36.64	9.88	19.75
Urban - Vacant/derelict land/ bareground	0.9025	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	1.81			0.00	0.00	0.90	1.81
Rocky shore - Artificial low energy littoral rock	0.0961	low	Moderate	High	Area/compensation not in local strategy/ no local strategy	0.44	0.0961		0.44	0.00	0.00	0.00
Rocky shore - Artificial low energy littoral rock	0.1465	low	Fairly Good	High	Area/compensation not in local strategy/ no local strategy	0.84	0.1395		0.80	0.00	0.01	0.04
Coastal Saltmarsh -saltmarshes and saline reedbeds	0.5954	High	Fairly Good	High	Area/compensation not in local strategy/ no local strategy	10.27	0.5344		9.22	0.00	0.06	1.05
Intertidal sediment - Littoral mud	2.0438	High	Fairly Good	High	Area/compensation not in local strategy/ no local strategy	35.26	1.2438		21.46	0.00	0.80	13.80
Intertidal sediment - Littoral mud	3.1693	High	Fairly Good	High	Area/compensation not in local strategy/ no local strategy	54.67	2.4128		41.62	0.00	0.76	13.05
Intertidal sediment - Littoral sand and muddy sand	0.0911	High	Fairly Good	High	Area/compensation not in local strategy/ no local strategy	1.57	0.0776		1.34	0.00	0.01	0.23
Urban - Artificial unvegetated, unsealed surface	0.6459	V.Low	N/A - Other	N/A	Area/compensation not in local strategy/ no local strategy	0.00	0.6459	0.091	0.00	0.00	0.49	0.00
Total	79.11					349.79	28.55	25.29	127.96	91.41	25.27	130.43

* Calculated as: area x distinctiveness x condition x connectivity x strategic significance

Table 2.2: Baseline assessment of biodiversity value (linear habitats; hedgerows)

Habitat type	Approx. length (km)	Distinctiveness score	Condition score	Ecological connectivity score	Strategic significance score	Value	Length retained (ha)	Length enhanced (ha)	Baseline value of retained habitats	Baseline value of enhanced habitats	Length of habitat lost (ha)	Value of habitat lost
Line of Trees	0.306	Low	Moderate	Low	Area/compensation not in local strategy/ no local strategy	1.224	0.002	0.125	0.008	0.5	0.179	0.716
Native Species Rich Hedgerow with trees - Associated with bank or ditch	0.457	High	Moderate	Medium	Area/compensation not in local strategy/ no local strategy	6.0324	0.104	0.324	1.3728	4.2768	0.029	0.3828
Native Hedgerow	0.773	Low	Moderate	Low	Area/compensation not in local strategy/ no local strategy	3.092	0.035	0.686	0.14	2.744	0.052	0.208

2.2 Post-development habitats

- 2.2.1 The post-development habitats have been calculated using details of the habitat creation proposed, as shown in the Outline Ecological Management Plan (application document A8.7) and the Illustrative Landscaping Plan (application document A2.9). It should be noted that final landscape proposals have not been developed for all areas of the site and where this is the case draft calculations of the general habitat types likely to be included have been used.
- 2.2.2 Areas of new habitats proposed for the site and the biodiversity value as derived from the Defra calculation tool are provided in Table 2.3 and Table 2.4.
- 2.2.3 Areas of habitats proposed for enhancement and their biodiversity value are provided in Table 2.5 and Table 2.6.
- 2.2.4 The design produces a net gain score of +32.52 area habitat units on site, a gain of 9.3% on the baseline.
- 2.2.5 The design produces a net gain score of +1.29 hedgerow units on site, a gain of 12.44% on the baseline.
- 2.2.6 The net gain target is set at baseline value +10%, which has been achieved for hedgerow units but not for area habitat units.
- 2.2.7 The illustrative landscape design has not been finalised within all parts of the site and therefore there is scope to design in higher scoring habitats than those that have been assumed within the calculations. To be conservative, the current calculations assume the landscaping would be mostly amenity grassland (a low scoring habitat) with a reasonable amount of native shrub planting (a moderate scoring habitat). The inclusion in the final design of other higher scoring habitats would ensure the project achieved a 10% gain in biodiversity.
- 2.2.8 The principles of ecological mitigation are set out in the Outline Environmental Management Plan (OEMP), and full details of habitat creation, enhancement and management proposals will be formalised via the production of a Landscape and Ecological Management Plan (LEMP) prior to commencement.

Table 2.3: Assessment of post-construction biodiversity value from habitat creation (nonlinear habitats)

Habitat type	Approx. area (ha)	Distinctiveness score	Target Condition score	Ecological connectivity score	Strategic significance score	Time until target condition achieved (years)	Temporal multiplier	Difficulty of creation or enhancement multiplier	Value ¹
Urban - Developed land; sealed surface	10.4464	V.Low	N/A - Other	N/A	Area/compensation not in local strategy/ no local strategy	0	1.000	1	0.00
Grassland - Other neutral grassland	0.4567	Medium	Fairly Good	Low	Area/compensation not in local strategy/ no local strategy	12	0.652	1	2.98
Grassland - Modified grassland	0.4285	Low	Fairly Poor	Low	Area/compensation not in local strategy/ no local strategy	5	0.837	1	1.08
Grassland - Modified grassland	3.8193	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	1	0.965	1	7.37
Heathland and shrub - Mixed scrub	1.4939	Medium	Good	Low	Area/compensation not in local strategy/ no local strategy	7	0.779	1	13.97
Grassland - Other neutral grassland	2.1261	Medium	Good	Low	Area/compensation not in local strategy/ no local strategy	15	0.586	1	14.95
Cropland - Cereal crops	5.312	Low	N/A -Agricultural	N/A	Area/compensation not in local strategy/ no local strategy	1	0.965	1	10.25
Urban - Artificial unvegetated, unsealed surface	0.4646	V.Low	N/A - Other	N/A	Area/compensation not in local strategy/ no local strategy	0	1.000	1	0.00
Urban - Vacant/derelict land/ bareground	0.192	Low	Poor	Low	Area/compensation not in local strategy/ no local strategy	1	0.965	1	0.37
Coastal Saltmarsh -saltmarshes and saline reedbeds	1.1	High	Fairly Good	High	Area/compensation not in local strategy/ no local strategy	15	0.586	0.33	3.67
Wetland - Reedbeds	0.039	High	Fairly Good	Medium	Area/compensation not in local strategy/ no local strategy	12	0.652	0.67	0.28
Lakes - Ditches	0.1918	Medium	Good	Low	Area/compensation not in local strategy/ no local strategy	10	0.700	1	1.61
Total	26.07								56.53

1: Value calculated as: area x distinctiveness x condition x connectivity x time x difficulty)

Table 2.4: Assessment of post-construction biodiversity value from habitat creation (linear habitats)

Habitat type	Approx. length (m)	Distinctiveness score	Target Condition score	Ecological connectivity score	Strategic significance	Time until target condition achieved (years)	Temporal multiplier	Difficulty of creation or enhancement multiplier	Value (area x distinctiveness x condition / time / difficulty)
Native Species-rich hedge	0.15	Medium (4)	Good (3)	Low (1)	Low (1)	10	0.70	0.67	0.84
Total	0.15								0.84

Table 2.5: Assessment of post-construction biodiversity value from habitat enhancement (nonlinear habitats)

Baseline habitat	Total habitat area	Baseline habitat units	Proposed habitat	Distinctiveness change	Condition change	Area (ha)	Distinctiveness score	Condition score	Ecological connectivity score	Years to target condition	Time to target multiplier	Difficulty of enhancement category	Difficulty of enhancement multiplier	Habitat units delivered
Heathland and shrub - Mixed scrub	0.8785	7.028	Heathland and shrub - Mixed scrub	Medium - Medium	Moderate - Good	0.016	Medium	Good	Low	3	0.899	Low	1	0.19
Grassland - Other neutral grassland	14.5175	116.14	Grassland - Other neutral grassland	Medium - Medium	Moderate - Fairly Good	6.3118	Medium	Fairly Good	Low	10	0.700	Low	1	59.33
Grassland - Modified grassland	2.3967	4.7934	Grassland - Other neutral grassland	Low - Medium	Lower Distinctiveness Habitat - Fairly Good	0.0913	Medium	Fairly Good	Low	12	0.652	Low	1	0.66
Grassland - Modified grassland	2.365	7.095	Grassland - Other neutral grassland	Low - Medium	Lower Distinctiveness Habitat - Fairly Good	0.0192	Medium	Fairly Good	Low	12	0.652	Low	1	0.15
Sparsely vegetated land - Ruderal/Ephemeral	1.026	3.078	Grassland - Other neutral grassland	Low - Medium	Lower Distinctiveness Habitat - Fairly Good	0.2466	Medium	Fairly Good	Low	12	0.652	Low	1	1.87
Lakes - Ditches	0.9614	8.84488	Lakes - Ditches	Medium - Medium	Moderate - Fairly Good	0.3724	Medium	Fairly Good	Low	2	0.931	Medium	0.67	3.44
Cropland - Cereal crops	45.0672	90.1344	Grassland - Other neutral grassland	Low - Medium	Lower Distinctiveness Habitat - Fairly Good	16.2163	Medium	Fairly Good	Low	12	0.652	Low	1	117.03
Urban - Artificial unvegetated, unsealed surface	0.5951	0	Grassland - Other neutral grassland	V.Low - Medium	Lower Distinctiveness Habitat - Fairly Good	0.091	Medium	Fairly Good	Low	12	0.652	Low	1	0.59
Heathland and shrub - Mixed scrub	0.0146	0.1168	Woodland and forest - Other woodland; broadleaved	Medium - Medium	Moderate - Fairly Good	0.0146	Medium	Fairly Good	Low	10	0.700	Medium	0.67	0.13
Cropland - Cereal crops	0.9391	1.8782	Woodland and forest - Other woodland; broadleaved	Low - Medium	Lower Distinctiveness Habitat - Fairly Good	0.9391	Medium	Fairly Good	Low	32+	0.320	Medium	0.67	3.49
Cropland - Cereal crops	0.3217	0.6434	Lakes - Ponds (Non-Priority Habitat)	Low - High	Lower Distinctiveness Habitat - Fairly Good	0.3217	High	Fairly Good	Medium	4	0.867	Low	1	4.70

Baseline habitat	Total habitat area	Baseline habitat units	Proposed habitat	Distinctiveness change	Condition change	Area (ha)	Distinctiveness score	Condition score	Ecological connectivity score	Years to target condition	Time to target multiplier	Difficulty of enhancement category	Difficulty of enhancement multiplier	Habitat units delivered
Cropland - Cereal crops	0.6533	1.3066	Heathland and shrub - Mixed scrub	Low - Medium	Lower Distinctiveness Habitat - Fairly Good	0.6533	Medium	Fairly Good	Medium	5	0.837	Low	1	6.25
Total	69.7361	241.0587												197.8231

Table 2.6: Assessment of post-construction biodiversity value from habitat enhancement (linear habitats)

Baseline habitat	Total habitat area	Baseline habitat units	Proposed habitat	Distinctiveness change	Condition change	Area (ha)	Distinctiveness score	Condition score	Ecological connectivity score	Years to target condition	Time to target multiplier	Difficulty of enhancement category	Difficulty of enhancement multiplier	Habitat units delivered
Line of Trees	0.306	1.224	Line of Trees	Low - Low	Moderate - Good	0.125	Low	Good	Low	30	0.343415	Low	1	0.585854
Native Species Rich Hedgerow with trees - Associated with bank or ditch	0.457	6.0324	Native Species Rich Hedgerow with trees - Associated with bank or ditch	High - High	Moderate - Good	0.324	High	Good	Medium	20	0.490395	Medium	0.67	4.979403
Native Hedgerow	0.773	3.092	Native Hedgerow	Low - Low	Moderate - Good	0.686	Low	Good	Low	10	0.700282	Low	1	3.704787
Total	1.536	10.3484												9.270044

3. Summary

3.1.1 A summary screenshot from the calculator tool is provided below.

On-site baseline	<i>Habitat units</i>	349.79
	<i>Hedgerow units</i>	10.35
	<i>River units</i>	0.00
On-site post-intervention (Including habitat retention, creation, enhancement & succession)	<i>Habitat units</i>	382.31
	<i>Hedgerow units</i>	11.64
	<i>River units</i>	0.00
Off-site baseline	<i>Habitat units</i>	0.00
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Off-site post-intervention (Including habitat retention, creation, enhancement & succession)	<i>Habitat units</i>	0.00
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Total net unit change (including all on-site & off-site habitat retention/creation)	<i>Habitat units</i>	32.52
	<i>Hedgerow units</i>	1.29
	<i>River units</i>	0.00
Total net % change (including all on-site & off-site habitat creation + retained habitats)	<i>Habitat units</i>	9.30%
	<i>Hedgerow units</i>	12.44%
	<i>River units</i>	0.00%

4. References

Baker, J., Hoskins, R. & Butterworth, T. (2019). *Biodiversity Net Gain – good practice principles for development*. Ciria, London