BIODIVERSITY NET GAIN ASSESSMENT

Drax Bioenergy with Carbon Capture and Storage

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulation 5(2)(q)

Document Reference Number: 6.10

Applicant: Drax Power Limited

PINS Reference: EN010120

REVISION: 01

DATE: May 2022

DOCUMENT OWNER: WSP UK Limited

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PUBLIC

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1. INTRODUCTION

1.1. PROJECT BACKGROUND

1.1.1. WSP UK Ltd (WSP) was commissioned by Drax Power Limited (the Applicant) to undertake a Biodiversity Net Gain (BNG) assessment to support the 'Proposed Scheme' (as it will be hereafter referred).

1.1.2. The Proposed Scheme involves the installation of post-combustion carbon capture technology to capture carbon dioxide from up to two existing 660-megawatt electrical ('MWe') biomass power generating units at the Drax Power Station (Unit 1 and Unit 2).

1.1.3. The installation of this technology constitutes an extension to the biomass Units 1 and 2 and is referred to as post-combustion carbon capture as the carbon dioxide is captured from the flue gas produced during the combustion of biomass in Units 1 and 2. The Proposed Scheme is designed to remove approximately 95% of the carbon dioxide from the flue gas from these two units.

1.1.4. Details of the Proposed Scheme can be found in **Chapter 2** of the ES (**Site and Project Description**) (document reference 6.1.2). This BNG assessment is based on the Order Limits, shown on **Figure 1.1 (Order Limits)** (document reference 6.2.1.1), hereafter referred to as the 'Site'.

1.2. BIODIVERSITY NET GAIN

1.2.1. BNG is the end result of a process applied to development so that overall, there is a positive outcome for biodiversity, whereby the biodiversity value attributable to a development exceeds the baseline value. The process itself follows the mitigation hierarchy, which sets out that everything possible must be done to firstly avoid, secondly minimise and thirdly restore / rehabilitate losses of biodiversity on Site. Only as a last resort, residual losses are compensated for using biodiversity offsets, which are distinguished from other forms of mitigation in that they are outside of the development Site.

1.2.2. A BNG assessment report is intended to provide a detailed insight into the adherence of a project to the CIEEM, CIRIA and IEMA BNG good practice principles (which are presented in **Table 3-4**).

1.3. RELEVANT LEGISLATION AND POLICY

1.3.1. This appraisal has been compiled with reference to the following relevant nature conservation legislation, planning policy and the UK Biodiversity Framework from which the protection of sites, habitats and species is derived in England, including:

a. UK Government's 25 Year Environmental Plan (DEFRA, 2018)
b. Biodiversity 2020: A strategy for England's wildlife and ecosystem services (DEFRA, 2011);
c. National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021)

d. The Natural Environment and Rural Communities (NERC) Act (HMSO, 2006);
e. The Environment Act 2021 (HMSO);
f. The UK Post-2010 Biodiversity Framework (2011-2020) (JNCC and DEFRA, 2012)
g. UK Biodiversity Action Plan (UKBAP)[1];
h. The Hedgerows Regulations (1997);
i. Overarching National Policy Statement (NPS) for Energy (EN-1) (Department of Energy and Climate Change, 2011);
j. Draft Overarching NPS for Energy (EN-1) (Department for Buisness, Energy and Industrial Srategy, 2021)
k. Selby District Local Plan. – ENV9, ENV12 and ENV13. Updated in 2019. (Selby District Council, 2005); and
l. Selby District Core Strategy Local Plan. SP18 (Selby Distrct Council, 2013).

1.3.2. The National Planning Policy Framework makes clear the current expectations for development to achieve BNG in England. The Framework states underneath section 15, paragraph 174 (d) that development should contribute to enhancing the natural environment by 'minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures'. The Environment Act strengthens this requirement for BNG, however, there is currently a transition period for the Act which is anticipated to conclude in 2025 for NSIPs.

1.3.3. Once the relevant provisions are in force, the Act mandates projects under the Town and Country Planning Act 1990 to achieve a minimum of 10% BNG. The Government is currently consulting on the process for NSIPs (including the prospective introduction of a biodiversity gain statement), although a 10% target is also likely to apply to such projects. Whilst NSIPs are not currently required to achieve a 10% BNG the Applicant is targeting a 10% BNG for the Proposed Scheme.

1.3.4. The Act also includes measures (not yet in force) to strengthen the Natural Environment and Rural Communities Act 2006 duty on public bodies to have regard to the purpose of conserving and enhancing biodiversity.

1.4. SCOPE OF REPORT

1.4.1. The report documents the assessment of the outcome of BNG taking into consideration the Proposed Scheme as documented in **Chapter 2 (Site and Project Description)** (document reference 6.1.2) and associated mitigation and compensation which includes compensatory habitat provision outside of the Order Limits in an 'Off-site Habitat Provision Area'. The report is supported by a series of figures which include **Figure 1 (Land Use and Habitat Change Areas)** (document reference 6.10.1) and **Landscape and Biodiversity Management Plans** (document reference 6.6.1, 6.6.2 and 6.6.3) which form part of the **Outline Landscape and**

[1] The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework, however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant.

Biodiversity Strategy (document reference 6.6). The following information is set out in this report:

a. A description of baseline habitat types within and outside of the Order Limits;

b. A summary of the quantitative outcome predicted for the Proposed Scheme (based on a worst-case scenario of the Proposed Scheme parameters for the DCO submission);

c. Information regarding a potential future option of the Proposed Scheme which assesses a more realistic outcome for habitat change, including a summary of the quantitative outcome predicted for this scenario; and

d. Commentary regarding adherence to the Good Practice Principles (CIEEM, CIRIA, IEMA 2016).

2. METHODOLOGY

2.1. BNG ASSESSMENT

2.1.1. This BNG assessment was undertaken with reference to the following industry recognised best practice methodologies:

- **a.** Biodiversity Net Gain Good Practice Principles for Development (CIEEM, CIRIA and IEMA, 2016)
- **b.** Biodiversity Net Gain. Good Practice Principles for Development. A Practical Guide (CIEEM, CIRIA and IEMA, 2016);
- **c.** The Biodiversity Metric 3.0 (JP039) auditing and accounting for biodiversity - user guide (Natural England, 2021);
- **d.** The Biodiversity Metric 3.0 (JP039) Technical Supplement (Natural England, 2021); and
- **e.** BS8683:2021 Process for designing and implementing Biodiversity Net Gain – specification (British Standards Institute, 2021).

2.1.2. The Construction Industry Research and Information Association (CIRIA), the Chartered Institute for Ecology and Environmental Management (CIEEM) and the Institute of Environmental Management and Assessment (IEMA) have set out ten principles that define good practice for achieving BNG to be applied together as a single approach. This BNG assessment has assessed the Proposed Scheme for compliance with these good practice principles.

2.1.3. As part of this assessment of compliance a quantitative assessment of the biodiversity value of the baseline habitats was carried out. The initial BNG assessment is designed to provide guidance on compliance with the 10 BNG Good Practice Principles, and a summary of the baseline calculations. Further detail can be found on the Natural England website.

2.1.4. The Biodiversity Metric 3.0 (BM3.0) has been used to quantify the biodiversity value of existing habitats present on Site. Baseline calculations were then carried out to determine the quantitative effect the Proposed Scheme will likely have on biodiversity value (based on retained and lost baseline biodiversity units) and to inform requirements for further habitat compensation. To aid in estimating compensation requirements, it has been assumed that certain areas within the Order Limits will be retained, and some will be cleared. A worst-case scenario of habitat loss for these areas are located on **Figure 1 (Land Use and Habitat Change Areas)**. This plan has been devised based on the **Works Plans** (document reference 2.3) and includes areas of habitat change which include temporary and permanent loss. This is based on a worst-case scenario of the Proposed Scheme.

2.1.5. BM 3.0 calculates biodiversity units provided by area-based habitats, hedgerows and rivers / watercourses separately, which are calculated using the following units:

- **a.** Area-based habitats;
- **b.** Hedgerow habitats; and

c. River/watercourse habitats.

2.1.6. The quantitative outcome awarded to the Proposed Scheme is dependent on the area-based, hedgerow or river/watercourse habitat value with the lowest net percentage change value.

2.2. SOURCES OF HABITAT DATA

2.2.1. The BNG assessment is informed by:

a. A Phase 1 habitat survey of the Proposed Scheme, undertaken over several visits in 2021. The habitat survey was undertaken by experienced WSP ecologists, following best practice guidelines (Joint Nature Conservation Committee (JNCC, 2016)). This survey provided a baseline habitat database which details the habitat types present on Site and their area (in hectares (ha)). Habitats were translated from Phase 1 into UK Habitat Classification (UKHab) habitats using the 'G-9 Translation Phase 1' tab within the Biodiversity Metric 3.0, along with professional judgement from a suitably experienced ecologist. In the BM3.0, distinctiveness is pre-assigned for each habitat based upon the UKHab system.

b. A habitat condition assessment of the habitat areas was carried out retrospectively by an experienced ecologist in 2021. The condition assessment was undertaken using the Biodiversity Metric 3.0 Guidelines and the Biodiversity Condition Assessment Sheets (Natural England, 2021).

c. A UKHab habitat survey was undertaken in 2022 to collect baseline habitat data for Arthur's Wood and Fallow Field within the Off-Site Habitat Provision Area.

d. A River Condition Assessment was undertaken of all watercourse habitats within the Order Limits and within riparian encroachment zones[2] outside of the Order Limits. This included a field survey as per the Modular River Survey and a desk-based assessment looking at Modular River Physical (MoRPh) indices. This survey provided appropriate condition assessment data to support use within the river metric tab of BM 3.0. The survey was undertaken by accredited surveyors.

e. The Order Limits boundaries were converted to a shapefile using ArcGIS. The quantitative outcomes of the BNG assessment calculations were rounded to the nearest % between 100 and 101 and can then be categorised as achieving one of the outcomes listed in **Table 2.1** below.

Table 2-1 Quantitative Outcomes of BNG Calculations

Post-development biodiversity value	Predicted Scheme-wide outcome
Less than 100% of the baseline value	Net Loss (NL) of biodiversity
100% of baseline value	No Net Loss (NNL) of biodiversity

[2] Riparian encroachment zones are defined as a 10m zone from the top of a riverbank. Development within the riparian zone is termed riparian encroachment as per the Biodiversity Metric 3.0 User Guide.

Post-development biodiversity value	Predicted Scheme-wide outcome
101% or more of baseline value	Biodiversity Net Gain (BNG)

2.2.4. BM3.0 uses UKHab to classify habitat types. UKHab has therefore been used in this report. JNCC Phase 1 habitat types determined in the field survey were translated to UKHab (**Table 2.2**) by a suitably experienced ecologist consulting field data and the habitat translation information provided in the BM3.0 toolkit, to allow for use within BM3.0.

Table 2-2 Translation of baseline habitats from JNCC Phase 1 habitats to UKHab

JNCC Phase 1 habitat type	UKHab
A1.1.2 Broadleaved woodland plantation	w1g Other broadleaved woodland
A1.3.2 Mixed woodland	w1h Other mixed woodland
A1.2.2 Coniferous woodland	w2c Other coniferous woodland
A2.1 Dense/continuous scrub	h3h mixed scrub
A2.2 Scattered scrub	w1g6 Line of trees
A3.1 Broadleaved scattered trees	w1g Other broadleaved woodland
B4 Improved grassland	g4 Modified grassland
B6 Species poor semi-improved grassland	g3c Modified grassland
C3.1 Ruderal tall herb and fern	g3c Ruderal/Ephemeral
G2 Running water	r1e Ditch
F1 Swamp	f2e Reedbeds
J1.1 Arable land	c1c Cropland cereal crops
J1.2 Amenity Grassland	g4 Modified grassland
B2.2 Semi improved neutral grassland	g3c Other neutral grassland
B2.2 Semi improved neutral grassland (poor quality)	g4 Modified grassland

JNCC Phase 1 habitat type	UKHab
J2.1.1 Species rich intact hedge	h2a Native sp rich hedge
J2.1.2 Species poor intact hedge (alongside J2.6 dry ditch)	h2a Native hedgerow (with ditch)

2.2.7. As per **Figure 1.2 (Indicative Site Layout Plan)** (document reference 6.2.1.2) and the **Works Plans**, the BNG assessment is based on four main areas. These are:

a. Drax Power Station Site (including area for street furniture modification);

b. East Construction Laydown Area;

c. Habitat Provision Area; and

d. Off-Site Habitat Provision Area.

2.3. IRREPLACEABLE HABITATS AND HABITATS OF PRINCIPAL IMPORTANCE

2.3.1. Following national good practice guidance, irreplaceable habitats and statutory designated Sites are excluded from BNG calculations. BNG or NNL of biodiversity cannot be achieved for the Proposed Scheme as a whole if there is a negative impact on an irreplaceable habitat or a statutory designated Site.

2.3.2. The Site was overlaid with Natural England's Ancient Woodland Inventory dataset to identify presence of irreplaceable habitat on Site. Statutory designated Sites were identified by overlaying publicly available Open-Source Natural England datasets with the Order Limits and Off-Site Habitat Provision Area.

2.3.3. Habitats of Principal Importance (HPI) were identified by overlaying publicly available Opensource Natural England datasets with the Site boundary, followed by a quality assurance assessment to ensure that the national dataset was consistent with the habitat types found on the ground. Where there were inconsistencies in habitat type, the field survey data were assumed to be correct. HPI were identified to enable indicative compensation requirements to target achievement of like-for-like habitat replacement for HPI.

2.4. LIMITATIONS AND ASSUMPTIONS

2.4.1. The following limitations and assumptions have been applied when using the above methodologies. None of the present limitations were considered to be significant.

BASELINE BIODIVERSITY

2.4.2. The biodiversity unit calculations do not account for temporary and / or indirect impacts to habitats outside of the Order Limits and Off-Site Habitat Provision Area boundary arising during construction of the Proposed Scheme. At present no such areas are expected to be required. In the event that they were, these would need to be addressed at a later stage.

2.4.3. The baseline habitat conditions within the Site have been determined retrospectively, based on existing data gathered during the PEA carried out during 2021 and targeted condition assessments in 2022 for the Off-Site Habitat Provision Area. Some of the survey visits were not conducted within optimal survey times for habitats contained within the Site, including woodland and grassland.

2.4.4. It is important to recognise that the quantification of biodiversity is one of a number of factors to be considered when assessing the impact of the Proposed Scheme on biodiversity. It should be noted that this initial BNG assessment report does not cover potential impacts of the Proposed Scheme on protected species and designated sites which are set out in **Chapter 8** (**Ecology**) of the ES (document reference 6.1.8) and the **Habitat Regulations Assessment Report** (document reference 6.8.1).

2.4.5. The Proposed Scheme has set aside areas within the Order Limits and outside for the purposes of ecological and landscape mitigation and compensation. The area set aside within the Order Limits is referred to as the Habitat Provision Area whilst the area outside the Order Limits is called the Off-Site Habitat Provision Area. The Proposed Scheme does not depend on this area to facilitate construction, with no temporary or permanent habitat loss required for demolition, construction, or decommissioning activities. This area is required/proposed only for the purpose of achieving ecological and landscape mitigation and enhancement, and for supporting BNG. Inclusion of this area as being 'on-site' would make achieving a Biodiversity Net Gain more challenging.

2.4.6. The Applicant has therefore taken an approach which is informed by the Consultation on Biodiversity Net Gain Regulations and Implementation document issued by the Department for Environment, Food and Rural Affairs (Department for Environment, Food and Rural Affairs, 2022), specifically page 45 and 46, 'Process and demonstrating biodiversity net gain gains' of Part 2: Applying the biodiversity net gain objective to different types of development, which states:

'*We have heard from stakeholders that NSIPs often need to incorporate significant areas for environmental mitigation or compensation within their development site boundaries. This may have the effect of making biodiversity net gain relatively more challenging than for development consented under the Town and Country Planning Act 1990. This is because the percentage gain would also apply to these mitigation areas and other development types may be able to exclude such areas from their development boundary and treat them as off-site enhancements (so that the percentage gain target does not apply*).

We are therefore considering whether a distinction should be made for NSIPs between onsite habitats in the development area and any dedicated mitigation areas'

2.4.7. As a result, this area has been included within the 'off-site' tabs for area and hedgerow units within BM3.0 (as per the approach for the Off-Site Habitat Provision Area), this is considered to be an acceptable approach given the nature of the area and the reasons for which it has been included within the Order Limits. This approach has been communicated to Natural England.

POST-DEVELOPMENT BIODIVERSITY

2.4.8. An assumption has been made in relation to retained habitats within the Site. Habitat polygons that would remain entirely unaffected by the built footprint of the Proposed Scheme were marked as 'retained' within the BM 3.0 calculation tool. Where a habitat falls within a particular Works Plan number, a number of assumptions have been made regarding the habitat change. Habitats are considered to be permanently or temporarily lost or not lost at all based on the type of activity within that Works number. This is considered to be a reasonable worst-case scenario.

2.4.9. It is acknowledged that there will be scope to optimise habitat retention on Site, with the potential for more habitat units to be retained and/or enhanced during detailed design of the Proposed Scheme. For example, wholescale loss of all habitats within all Drax Power Station Construction Laydown Areas is unlikely to actually occur. A final BNG report utilising a finalised landscape plan would need to be undertaken in this instance, in order to accurately quantify where this retention, enhancement, and additional creation, would take place.

2.4.10. This will also allow off-Site ecological compensation requirements to be finalised where necessary. Predicted habitat change areas include those that are to be retained. Habitat loss / retention / enhancement categories of land can be viewed on **Figure 1 (Land Use and Habitat Change Areas)**.

2.4.11. Habitat creation and enhancement measures included within BM 3.0 are set out in further detail in the **Outline Landscape and Biodiversity Strategy** (OLBS) (document reference 6.10).

2.4.12. An alternative 'future scenario' of the Proposed Scheme has been presented as a sensitivity test. This reports the BNG outcome for a more realistic habitat loss scenario than the main 'worst-case scenario' assessed. The Applicant intends to explore whether assumptions around habitat loss required to facilitate the Proposed Scheme can be updated and reviewed prior to and during Examination of the Proposed Scheme. This may enable a firmer commitment to reducing habitat loss yet further to be made.

RIVER METRIC

2.4.13. A culverted section of Carr Dyke (a watercourse habitat) is located underneath the Power Station and runs for approximately 0.72 km from south-west to north-east. Although not directly impacted by the Proposed Scheme, the culverted section of Carr Dyke has been included within the River Metric calculations, as it falls within the Order Limits and is within areas included in the Order Limits that will be subject to construction activities.

3. RESULTS

3.1.1. The Site was checked against Natural England's Ancient Woodland Inventory dataset, no areas of Ancient Woodland or other irreplaceable habitat were identified within or in proximity to the Order Limits.

3.1.2. The Site was checked against Natural England's HPI dataset, and then checked with on-Site data collected for the PEA report. There are several HPI within the Order Limits, including hedgerows and reedbeds.

3.1.3. The outcome of the initial BNG assessment is summarised in **Table 3.1**.

3.1.4. **Table 3.1** and **Table 3.2** below summarises the outcome of the BNG calculation for the Proposed Scheme at the current stage (taking habitat data from BM 3.0), considering both on-Site and off-Site habitat loss, retention, reinstatement, creation and enhancement proposals.

Table 3-1 Headline Results of Biodiversity Metric 3.0 Calculation for the Proposed Scheme – On-Site

Biodiversity Units	Baseline Value	Units Retained and Created	Change in Units	Quantitative Outcome %
Habitat units	130.91	84.06	46.85	-35.78
Hedgerow units	14.47	14.20	0.27	-1.88
River Units	2.41	2.41	0.00	0.00

Table 3-2 Headline Results of Biodiversity Metric 3.0 Calculation for the Proposed Scheme – Off-Site

Biodiversity Units	Baseline Value	Units Retained	Units Created and Enhanced	Post-Development Value
Habitat units	71.66	4.46	118.82	123.29
Hedgerow units	5.60	0.36	13	13.36

3.1.5. The total unit change considering both on-Site and off-Site retention, creation and enhancement proposals is **4.79** for habitats and **7.48** for hedgerows. There is no change in river units.

3.1.6. The total on-site net % change plus off-Site surplus equates to a **3.66%** net gain in habitats and a **51.7%** net gain in hedgerows. The net % change for rivers remains at **0.00**% as there is no change to the baseline.

3.1.7. **Table 3.3** summarises the outcome of the BNG calculation for the Proposed Scheme considering a 'future scenario' sensitivity test. This calculation considers a possible

change in habitat retention and reinstatement proposals, located purely within the Woodyard. These proposals are based on an optioneering exercise that has been undertaken to ascertain if the Proposed Scheme could achieve at least a 10% BNG. These proposals do not form part of the DCO at this stage and will be subject to further consideration by the Applicant prior to and during Examination.

Table 3-3 Headline Results of Biodiversity Metric 3.0 Calculation Considering a Future Scenario for the Proposed Scheme – On-Site

Biodiversity Units	Baseline Value	Units Retained and Created	Change in Units	Quantitative Outcome %
Habitat units	130.91	101.52	29.39	-22.45
Hedgerow units	14.70	14.55	0.15	0.55
River units	2.41	2.41	0.00	0.00

3.1.8. The off-Site biodiversity value for the future scenario remains as per **Table 3-2**. The total unit change considering both on-Site and off-Site retention, creation and enhancement proposals for this scenario is **22.35** for habitats and **7.83** for hedgerows. There is no change in river units.

3.1.9. The total on-site net % change plus off-Site surplus for the future scenario equates to a **17.08%** net gain in habitats and a **54.14%** net gain in hedgerows. The net % change for rivers remains at **0.00**% as there is no change to the baseline.

3.2. QUALITATIVE RESULTS

3.2.1. **Table 3.4** below documents the adherence of the Proposed Scheme to each of the BNG good practice principles. Adherence of the Proposed Scheme to these principles is based on the current stage in the BNG process; it does not necessarily preclude future adherence.

Table 3-4 Adherence to the Qualitative Assessment of BNG

Principle	Description	Evidence of Compliance
1. Apply the mitigation hierarchy	Do everything possible to first avoid and then minimise impacts on biodiversity. Only as a last resort, and in agreement with external decision-makers where possible, compensate for losses that cannot be avoided. If compensating for losses within the development footprint is not possible or does not generate the most benefits for nature conservation, then offset biodiversity losses by gains elsewhere.	Details on avoidance and minimising of effects are considered in Chapter 8 (Ecology) of the Environmental Statement (document reference 6.1.8).
2. Avoid losing biodiversity that cannot be offset by gains elsewhere	Avoid impacts on irreplaceable biodiversity – these impacts cannot be offset to achieve No Net Loss or BNG.	No impacts to irreplaceable habitats are predicted.
3. Be inclusive and equitable	Engage stakeholders early, and involve them in designing, implementing, monitoring and evaluating the approach to BNG. Achieve BNG in partnership with stakeholders where possible and share the benefits fairly among stakeholders.	Natural England and North Yorkshire County Council have been consulted as part of the BNG process. See Table 8-1 Consultation Summary Table in Chapter 8 (Ecology) (document reference 6.1.8) of the Environmental Statement.
4. Address risks	Mitigate difficulty, uncertainty and other risks to achieving BNG. Apply well-accepted ways to add contingency when calculating biodiversity losses and gains in order to account for any remaining risks, as well as to compensate for the time between the losses occurring and the gains being fully realised.	The BNG assessment has used industry recognised risk multipliers included in BM 3.0.
5. Make a measurable Net Gain contribution	Achieve a measurable, overall gain for biodiversity and the services ecosystems provide while directly contributing towards nature conservation priorities.	A net gain of 3.66% in habitats and 51.7% in hedgerows has been achieved for the Proposed Scheme. This assessment has been undertaken based on a reasonable worst-case scenario for habitat loss and disturbance arising from the Proposed Scheme. A future scenario calculation has been undertaken based on more realistic (rather than worst-case) assumptions regarding habitat loss. The Applicant will revisit the assessment prior to and during Examination of the DCO to determine whether assumptions regarding habitat loss can be tightened and thus the net gain position bettered. This principle is achieved.
6. Achieve the best outcomes for biodiversity	Achieve the best outcomes for biodiversity by using robust, credible evidence and local knowledge to make clearly-justified choices when: ~ Delivering compensation that is ecologically equivalent in type, amount and condition, and that accounts for the location and timing of biodiversity losses; ~ Compensating for losses of one type of biodiversity by providing a different type that delivers greater benefits for nature conservation; ~ Achieving BNG locally to the development while also contributing towards nature conservation priorities at local, regional and national levels; ~ Enhancing existing or creating new habitat.	At the time of writing, this assessment used the most recent data and followed a rigorous method and quality assurance process. Habitat creation and enhancement is taking place within the Order Limits and within an area off-Site but in proximity to the Order Limits. As indicated in the Trading Summary tab of BM 3.0, there are losses not yet accounted for which include reedbed, grassland and scrub (these losses are accounted for, and all trading summary rules are met in the future scenario calculation that has been subject to sensitivity testing). This principle is achievable.

Principle	Description	Evidence of Compliance
	Enhancing ecological connectivity by creating more bigger, better and joined areas for biodiversity.	
7. Be additional	Achieve nature conservation outcomes that demonstrably exceed existing obligations (i.e., do not deliver something that would occur anyway).	The Habitat Provision Area and Off-Site Habitat Provision Area is proposed to deliver habitat compensation above and beyond simple reinstatement.
8. Create a Net Gain legacy	Ensure BNG generates long-term benefits by: ~ Engaging stakeholders and jointly agreeing practical solutions that secure BNG in perpetuity; ~ Planning for adaptive management and securing dedicated funding for long-term management; ~ Designing BNG for biodiversity to be resilient to external factors, especially climate change; ~ Mitigating risks from other land uses; ~ Avoiding displacing harmful activities from one location to another. Supporting local-level management of BNG activities.	The Applicant owns the majority of land within the Habitat Provision Area and all land within the Off-Site Habitat Provision Area and are able to commit to its long-term management. An Outline Landscape and Biodiversity Strategy (document reference 6.6), is to be submitted as part of the DCO application and supports adherence to this principle.
9. Optimise sustainability	Prioritise BNG and, where possible, optimise the wider environmental benefits for a sustainable society and economy.	Proposals for habitat creation include a range of habitats such as woodland, scrub and grassland which would contribute to wider environmental gains.
10. Be transparent	Communicate all BNG activities in a transparent and timely manner, sharing the learning with all stakeholders.	The outcome of this BNG assessment will be made public as part of the DCO application.

4. CONCLUSION AND NEXT STEPS

4.1.1. The Proposed Scheme is achieving a net gain in area habitats, a net gain in hedgerow units and a no-net loss in river units. Overall, the Proposed Scheme could achieve a no-net loss. This outcome is based on the lowest outcome of the biodiversity metric calculation, which is 0.00% for river units. The BNG assessment is based on a reasonable worst-case scenario for habitat loss and disturbance arising from the Proposed Scheme, with habitat losses expected to be reduced as the design of the Proposed Scheme is refined. This BNG assessment has therefore taken a conservative approach to calculating the BNG outcomes for area-based and hedgerow units.

4.1.2. It is proposed that the BNG assessment is updated with information obtained from exploring additional opportunities within the Order Limits and outside such as the proposals included within the future scenario calculation. This would include revisiting areas of predicted loss as a result of the Proposed Scheme to ascertain if habitats can be retained and where possible, enhanced including meeting all trading rules.

4.1.3. Consultation with the Environment Agency is to be undertaken with regards to meeting a 10% net gain in river units. The Applicant is also exploring additional opportunities within the Order Limits to deliver BNG in relation to rivers.

4.1.4. The qualitative element of the BNG assessment should be revisited as the Proposed Scheme design progresses and hence BNG assessment is refined. This will support delivering adherence to the ten good practice principles set out in **Table 3.4**, above.

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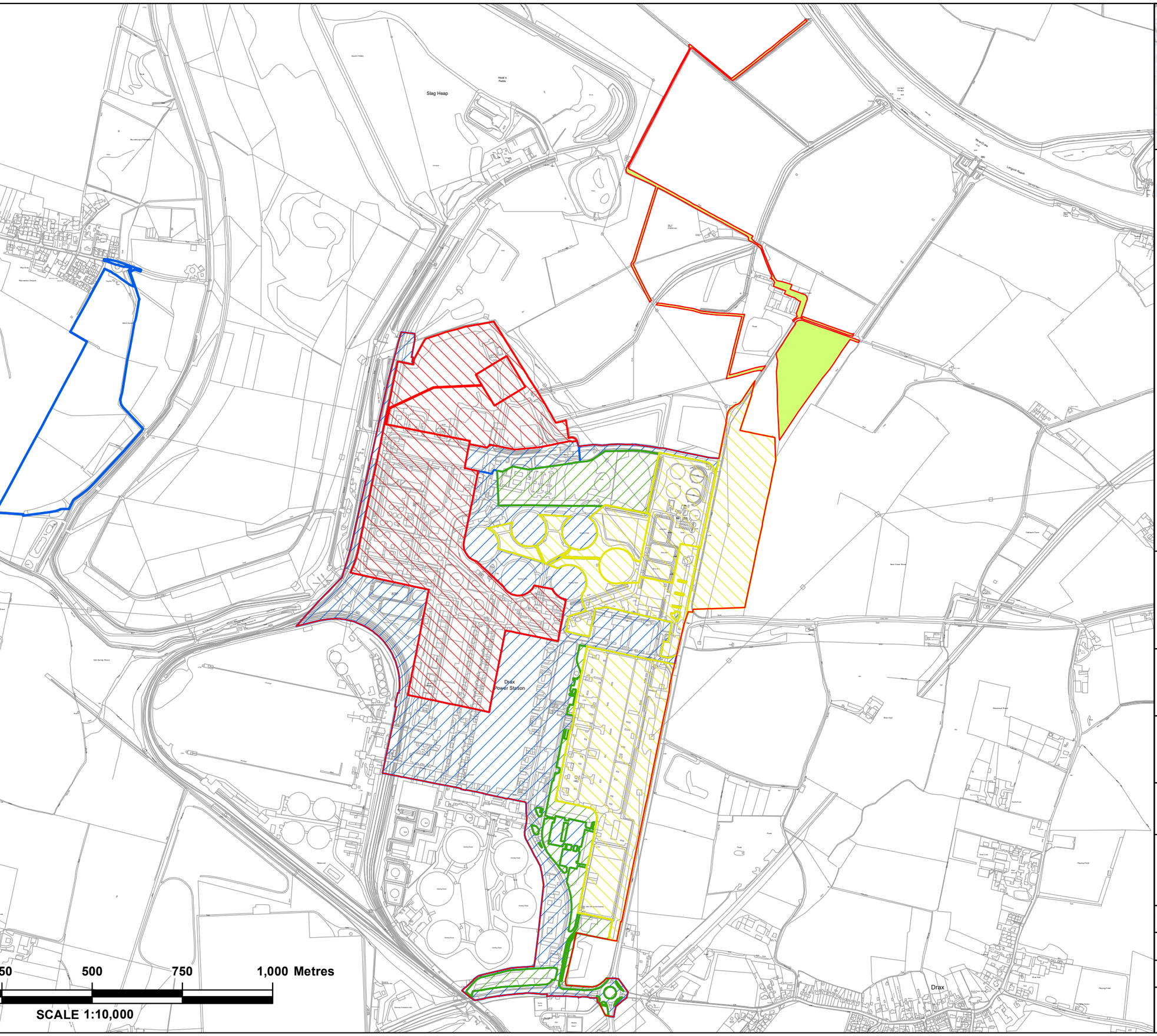
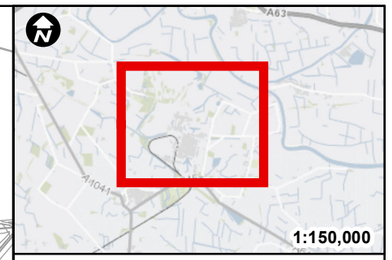
Figure 1 - Land Use and Habitat Change Areas





Key:

- Order Limits
- Off-Site Habitat Provision Area
- Permanent Habitat Removal
- Temporary Habitat Removal
- Retained Habitats
- Modifications to Urban Features Only
- Habitat Provision Area

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PROJECT TITLE

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FIGURE 1:
LAND USE AND
HABITAT CHANGE AREAS

DRAWING STATUS

FOR ISSUE

DRAWN	CHECKED	APPROVED	AUTHORISED
LH	BS	LR	PP

SCALE @ A3 SIZE	DATE	REVISION
1:10,000	07/04/2022	P01

DRAWING NUMBER

EN010120-PA-ES-6.10.1-Sheet1

APPENDICES

APPENDIX A – BIODIVERSITY NET GAIN PRINCIPLES

Biodiversity Net Gain

Good practice principles for development

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CIEEM Chartered Institute of Ecology and Environmental Management

IEMA Transforming the world to sustainability

Contents

Introduction

Achieving Biodiversity Net Gain

Designing, building, operating and maintaining - each of these stages of a development scheme generates opportunities to help achieve an overall benefit for biodiversity. Realising these opportunities is vital because biodiversity, and the functions it provides, are essential to sustain our society and economy.

Achieving these net gains in biodiversity, where there are wider benefits for society, is more than simply outweighing losses with gains. It requires doing everything possible to avoid losing biodiversity in the first place, as well as involving stakeholders especially as partners. It also requires the gains in biodiversity to be valuable locally, and to make important contributions towards regional and national priorities for nature conservation. In other words, there is a right way to achieve 'Biodiversity Net Gain' that brings about long-lasting and meaningful benefits for our environment, society and economy.

This 'right way' is articulated in standards and guidelines produced by an international community on achieving No Net Loss and Net Gain targets for biodiversity. In the United Kingdom, the government has international and national commitments on biodiversity that include halting the loss of biodiversity and reaching net gains. Development can contribute significantly towards realising these commitments. However, until now there has been no standard for the UK industry on good practice for achieving Biodiversity Net Gain.

Establishing good practice

CIRIA, CIEEM and IEMA have developed the first UK principles on good practice to achieve Biodiversity Net Gain. These principles provide a framework that helps improve the UK's biodiversity by contributing towards strategic priorities to conserve and enhance nature while progressing with sustainable development. They also provide a way for industry to show that projects followed good practice.

It is important that these principles are tested, refined and improved through feedback and review. CIRIA, CIEEM and IEMA will undertake a first review within 12 months.

Supporting guidance

The principles are broad by necessity so that they apply to a wide-ranging industry. This means that their proper interpretation is critical. CIRIA, CIEEM and IEMA are developing guidance that will contain practical advice on implementing the Net Gain principles and definitions of key terms. This guidance will be available in 2017, and a steering group will be overseeing its production and consultation with a variety of stakeholders.

Part of that stakeholder consultation is discussing a credible, proportionate way to audit implementation of Biodiversity Net Gain. While this is in progress, developments claiming to achieve Biodiversity Net Gain must provide evidence that clearly demonstrates they have implemented and adhered to the good practice principles.

Biodiversity Net Gain

Good practice principles for development

Biodiversity Net Gain is development that leaves biodiversity in a better state than before. It is also an approach where developers work with local governments, wildlife groups, land owners and other stakeholders in order to support their priorities for nature conservation. These ten principles set out good practice for achieving Biodiversity Net Gain and must be applied all together, as one approach.

Principle 1. Apply the Mitigation Hierarchy

Do everything possible to first avoid and then minimise impacts on biodiversity. Only as a last resort, and in agreement with external decision-makers where possible, compensate for losses that cannot be avoided. If compensating for losses within the development footprint is not possible or does not generate the most benefits for nature conservation, then offset biodiversity losses by gains elsewhere.

Principle 2. Avoid losing biodiversity that cannot be offset by gains elsewhere

Avoid impacts on irreplaceable biodiversity - these impacts cannot be offset to achieve No Net Loss or Net Gain.

Principle 3. Be inclusive and equitable

Engage stakeholders early, and involve them in designing, implementing, monitoring and evaluating the approach to Net Gain. Achieve Net Gain in partnership with stakeholders where possible, and share the benefits fairly among stakeholders.

Principle 4. Address risks

Mitigate difficulty, uncertainty and other risks to achieving Net Gain. Apply well-accepted ways to add contingency when calculating biodiversity losses and gains in order to account for any remaining risks, as well as to compensate for the time between the losses occurring and the gains being fully realised.

Principle 5. Make a measurable Net Gain contribution

Achieve a measurable, overall gain[1] for biodiversity and the services ecosystems provide while directly contributing towards nature conservation priorities.

1 Net Gain has been described as a measurable target for development projects where impacts on biodiversity are outweighed by a clear mitigation hierarchy approach to first avoid and then minimise impacts, including through restoration and / or compensation. Adhering to these Net Gain principles (i.e. pursuing all principles together) will help in under-pinning good practice for achieving and sustaining Net Gain.

Principle 6. Achieve the best outcomes for biodiversity

Achieve the best outcomes for biodiversity by using robust, credible evidence and local knowledge to make clearly-justified choices when:

- Delivering compensation that is ecologically equivalent in type, amount and condition, and that accounts for the location and timing of biodiversity losses
- Compensating for losses of one type of biodiversity by providing a different type that delivers greater benefits for nature conservation
- Achieving Net Gain locally to the development while also contributing towards nature conservation priorities at local, regional and national levels
- Enhancing existing or creating new habitat
- Enhancing ecological connectivity by creating more, bigger, better and joined areas for biodiversity

Principle 7. Be additional

Achieve nature conservation outcomes that demonstrably exceed existing obligations (i.e. do not deliver something that would occur anyway).

Principle 8. Create a Net Gain legacy

Ensure Net Gain generates long-term benefits by:

- Engaging stakeholders and jointly agreeing practical solutions that secure Net Gain in perpetuity[2]
- Planning for adaptive management and securing dedicated funding for long-term management
- Designing Net Gain for biodiversity to be resilient to external factors, especially climate change
- Mitigating risks from other land uses
- Avoiding displacing harmful activities from one location to another
- Supporting local-level management of Net Gain activities

Principle 9. Optimise sustainability

Prioritise Biodiversity Net Gain and, where possible, optimise the wider environmental benefits for a sustainable society and economy.

Principle 10. Be transparent

Communicate all Net Gain activities in a transparent and timely manner, sharing the learning with all stakeholders.

2 Biodiversity compensation should be planned for a sustained Net Gain over the longest possible timeframe. For development in the UK, the expectation is that compensation sites will be secured for at least the lifetime of the development (e.g. often 25-30 years) with the objective of Net Gain management continuing in the future.

Acknowledgements

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Alex Saponja	Interserve
Bob Edmonds	SLR Consulting

The project team consisted of staff representatives from the three partner organisations, together with industry members of each organisation.
We would like to thank the numerous stakeholders who provided comment on earlier drafts of the principles in the form of online surveys, a consultation workshop and a webinar.

The Biodiversity Net Gain good practice principles were first drafted based on several sources: responses to the UK government's 2013 Green Paper Consultation on Biodiversity Offsetting; experience gained from the national pilot on biodiversity offsetting led by the UK's Department for Environment, Food and Rural Affairs; experience from Network Rail Infrastructure Projects' and from other leading corporations' work on net positive approaches; and also on principles developed for the international community by the Business and Biodiversity Offset Programme.

The draft principles were refined following initial consultation with various stakeholders including government, NGOs, regulators and private and public-sector organisations. The refined version was presented to over 450 professionals during a webinar where the majority supported this approach to Biodiversity Net Gain and the principles. The principles were revised based on feedback received during the webinar, assessed by the project team and the final set are presented in this document. It is envisaged that the principles will be further refined following a period of application, feedback and review.

Supporting guidance

The principles are broad by necessity so that they apply to a wide-ranging industry. This means that their proper interpretation is critical. CIRIA, CIEEM and IEMA are developing guidance that will contain practice advice on implementing the Net Gain principles and definitions of key terms. This guidance will be available in 2017, and a steering group will be overseeing its production and consultation with a variety of stakeholders.

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How you can get involved

If you would like to be kept informed of progress with our Biodiversity Net Gain practical guidance, please visit www/ciria.org/netgain for further information.

If you are able to sponsor or otherwise contribute towards the cost of developing the Biodiversity Net Gain practical guidance, please contact owen.jenkins@ciria.org

Biodiversity Net Gain

Good practice principles for development

CIRIA is the construction industry research and information association. It is an independent, not-for profit, member-based research organisation that exists to champion performance improvement in construction. Since 1960, CIRIA has delivered support and guidance to the construction, built environment and infrastructure sectors. CIRIA works with members from all parts of the supply chain to co-ordinate collaborative projects, industry networks and events. Its high quality guidance is delivered to industry through publications, training and other performance improvement activities. www.ciria.org

The Chartered Institute of Ecology and Environmental Management (CIEEM) is the leading professional membership body representing and supporting ecologists and natural environment managers in the UK, Ireland and abroad. Our Vision is of a society which values the natural environment and recognises the contribution of professional ecologists and environmental managers to its conservation. We have members drawn from across the employment sectors including local authorities, government agencies, NGOs, environmental consultancy, academia and industry. The diversity of our membership is our greatest strength, enabling us to take an integrated and holistic approach to furthering the management and enhancement of biodiversity and the ecological processes essential to a fully functional biosphere. www.cieem.net

IEMA is the worldwide alliance of environment and sustainability professionals. We believe there's a practical way to a bright future for everyone, and that our profession has a critical role to play. Ours is an independent network of more than 15,000 people in over 100 countries, working together to make our businesses and organisations future-proof. Belonging gives us each the knowledge, connections, recognition, support and opportunities we need to lead collective change, with IEMA's global sustainability standards as our benchmark. By mobilising our expertise we will continue to challenge norms, influence governments, drive new kinds of enterprise, inspire communities and show how to achieve measurable change on a global scale. This is how we will realise our bold vision: transforming the world to sustainability. www.iema.net

Balfour Beatty This initiative has also been supported by Balfour Beatty