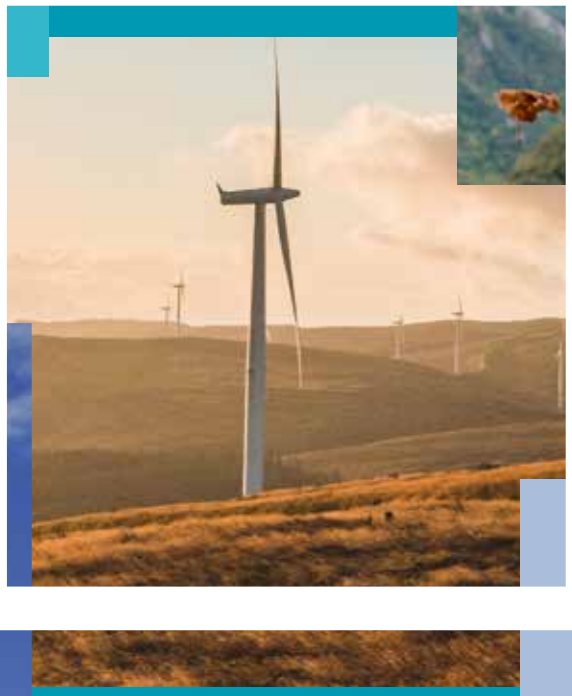
Positive for the planet

Renewable energy with a Biodiversity Net Gain



sse Renewables | For a better world of energy

About SSE Renewables

SSE Renewables is part of the SSE Group and a leading developer and operator of renewable energy, headquartered in the UK, with a growing presence internationally.

Our strategy is to drive the transition to a net zero future through the world class development, construction, and operation of renewable energy assets. We plan to double our current renewable generation capacity of 4GW to 8GW by 2026 and more than triple it to 13GW by 2031. This increase is expected to result in SSE Renewables generating at least 50TWh of renewable energy output by the end of the next decade, a fivefold increase from 2019 levels.

We're a team of around 1,500 renewable energy professionals based across the UK, Ireland, Spain, France, Italy, Greece, the Netherlands, Japan and the USA. With a heritage founded in hydro electricity generation, we've honed our skills in wind energy though 15-plus years of delivering world-leading projects with expertise in project design and optimisation, consenting and stakeholder engagement, financing, procurement, construction, and operations.

SSE Renewables growth targets

Renewable capacity growth:

Resulting in:

5x

renewable output growth by 2031 compared to 2019

About this report

The UNEP Emissions Gap Report 2022 shows that staying within the 1.5°C threshold of the Paris Agreement is in serious peril, with current policies expected to lead to the planet warming by 2.8°C by the end of the century. The consequences of this would have devastating effects on global biodiversity.

Along with building out the clean, renewable electricity needed to enable the planet to get to net zero, SSE Renewables is committed to building our developments in a way that is positive for the planet more broadly too. We have teams of people working across our business who carefully monitor and manage our impact on the natural world, and our commitment is to protect and enhance the environment – in the widest sense – as much as possible.

To hold ourselves to account on this commitment to nature, we have developed two new Biodiversity Net Gain (BNG) toolkits to quantify the impact of our projects on the local biodiversity value and help us determine the best way to create an overall positive impact. These toolkits will enable us to credibly measure and demonstrate progress against our target to generate BNG on newly consented large capital projects from 2025 onwards, and provide a starting point for developing a robust approach for measuring a BNG over our entire portfolio over time, which is our ultimate aim.

This report outlines our commitments for achieving BNG and the approach we have taken to date. Alongside the report, we have published our two BNG Toolkits and user guide on **sserenewables.com/sustainability** so that others can review our approach, implement it on their own projects, and we can evolve a consistent methodology for quantifying BNG together across the sector.

We welcome and encourage feedback on this report and our approach to delivering Biodiversity Net Gain to **SSERsustainabilityteam@sse.com.**

SSE Renewables is targeting

Biodiversity No Net Loss from 2023
and
Biodiversity Net Gain from 2025
on newly consented large onshore project

Contents

Image: Carmel Brennan, SSE Renewables Environment Team

What is biodiversity?

Biological diversity, or biodiversity, means the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems.

What is Biodiversity Net Gain?

Biodiversity Net Gain (BNG) is an approach to development that aims to leave the natural environment in a measurably better state than it was pre-development. It focuses on the change in the biodiversity value of a site, comparing the pre and post construction biodiversity values to ensure a positive impact overall.

Tackling the climate and nature emergencies together

Net zero must be our uncompromising goal. However, as we accelerate our investments in new, green technologies and build-out renewables at a scale and pace almost unimaginable a decade ago, an uncomfortable reality has emerged. That we can't protect the natural world without tackling the climate emergency, but we can tackle the climate emergency without protecting the natural world.

As proud custodians of renewable generation assets going back almost a century, SSE Renewables is a company with our roots in some of the most rugged, isolated, and beautiful places in the world. From hydro sites which have been operating for the last 90 years across the highlands of Scotland, to new wind farm and solar opportunities across Europe, we know it's our responsibility to build and maintain our sites in a manner that protects and enhances nature.

Our commitment is to be positive for the planet, to generate renewable energy in a way that values the natural world and safeguards it for decades to come through decarbonisation. That's why we have published our new 10-point plan for how we plan to deliver Biodiversity Net Gain across our business. Put simply, we are going to build out the renewable energy needed to reach net zero while at the same time leaving the natural environment around our sites in a measurably better state than we found it.

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We know this won't be a straightforward task. There remains a lot of uncertainty around how to achieve Biodiversity Net Gain, and how to measure it, in all contexts, in all geographies, and across all technologies, in a credible way. Our approach is to set targets which are underpinned by a robust methodology and clear action plan, and to demonstrate how we plan to fill the gaps where no methodology yet exists.

As a starting point, alongside this report detailing our approach, we have published our two onshore Biodiversity Net Gain Toolkits with user guides to enable any other organisation to use and to scrutinise. These toolkits provide a framework from which our approach will evolve and grow – with input and inspiration from environmental experts, consultants, regulators, policymakers, suppliers, and peers.

By committing to targets and ambitions with a fully transparent approach, we are making a simple but important point: that none of us will achieve our sustainability goals without openness and collaboration. It's down to all of us to work together to set common goals and standards, and make sure we are counting what matters in a consistent way.

Stephen Wheeler
Managing Director,
SSE Renewables

Committing to Biodiversity Net Gain

Our ultimate goal at SSE Renewables is to achieve Biodiversity Net Gain across all of our operations, from new developments to operational sites, and across all technologies and geographies. However, we know that the methodologies, policies and approaches to quantifying and creating BNG are rapidly evolving. Therefore we have developed a comprehensive 10-point plan to build on our approach to date and play a leading role in developing a robust and credible approach for BNG across the sector for the future.

Our 10-point plan for Biodiversity Net Gain

1. Deliver Biodiversity No Net Loss on major onshore projects consented from 2023

2. Deliver Biodiversity Net Gain on major onshore projects consented from 2025*

3. Embed BNG ambitions in decision-making at each stage of all new project developments from 2023

4. Use our BNG Toolkit and collaborate with partners to identify biodiversity improvements on operational sites

5. Evolve our BNG Toolkit and approach to enable use in all geographies

6. Actively participate in industry forums to support the development of BNG across all renewable technologies

7. Contribute to research projects and the creation of knowledge around BNG in the renewables sector

8. Trial new approaches for BNG on offshore projects, including digital innovations

9. Develop the concept of 'Habitat Banks' with a transparent methodology for applying BNG credits

10. Lead the BNG working group of the Powering Net Zero Pact, a collaboration of global power sector companies

* This includes repowering and decommissioning projects.

Understanding Biodiversity Net Gain

Every development site has an intrinsic 'biodiversity value', which is determined by a wide range of factors including the type, condition and area of a habitat. By quantifying the biodiversity value of a site pre-and post-development, we can understand the impact that activities have had on this biodiversity value, whether positive or negative, and understand the most effective ways of mitigating biodiversity losses and enhancing biodiversity gains.

BNG is achieved when an economic development creates more biodiversity value than existed before. It is based around the application of a standardised environmental metric, which measures the number of 'biodiversity units' on a site.

When thinking about BNG in the context of site development, it is important to follow the mitigation hierarchy, ensuring that avoidance and mitigation of biodiversity impacts is always prioritised. Where impacts are unavoidable (for example due to conflicting priorities and policies), the next stage should be to find ways to restore, and where possible enhance, biodiversity on site. Finally, if all other measures have been taken and there remains a residual biodiversity impact from development, then compensation may be required outside of the development, but ideally within the locale. This is to ensure that negative impacts from developments are addressed by either equivalent or preferably additional gains in biodiversity. To achieve this, early consideration of the baseline biodiversity value is required to ensure it provides sufficient area for habitat creation or enhancement, and thereby the ability to achieve a Biodiversity No Net Loss, and preferably a Biodiversity Net Gain.

The mitigation hierarchy

AVOIDANCE – measures taken to avoid potential negative biodiversity impacts

↓

MINIMISATION – measures taken to reduce the duration, intensity, extent and/or likelihood of impacts that can't be avoided

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ON-SITE RESTORATION – measures taken to enhance or recreate habitats after development impacts where avoidance or mitigation is not possible

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OFFSET/OFF-SITE COMPENSATION measures taken to compensate for any residual, adverse impacts

Recent developments

- In 2018, the UK Government published its 25-year plan for the environment.
- The UK Environment Act (2021) mandates BNG on new development projects.
- At COP26 in Glasgow in 2021, we saw a greater focus than ever on the dual crises of climate and nature.
- Scotland's current draft National Planning Framework (NPF4) discusses biodiversity decline in Scotland and 'positive effects for biodiversity' in the planning system.
- Projects such as Nature+ Energy in Ireland are researching ways in which the renewables industry, particularly onshore wind, can promote and manage biodiversity to halt the decline in species and tackle climate change.
- Ireland's draft 4th National Biodiversity Action Plan 2023-2027 aims to deliver a 'whole of government and whole of society' approach to the biodiversity crisis.

Quantifying Biodiversity Net Gain

At SSE Renewables, we are passionate about reversing biodiversity loss and enhancing the natural environment where possible, so that the amazing flora and fauna in the places we operate is protected for both present and future generations. To achieve our goal of leaving the natural environment in a measurably better state than we found it – and identify how we can go further and faster – we have developed a methodology and toolkit for quantifying BNG.

Developing our BNG Toolkits

While there is an absence of a recognised framework in Scotland and Ireland for quantifying BNG, the ambition to achieve positive biodiversity improvements on SSE Renewables' assets remains. The UK Government's Department for Environment, Food and Rural Affairs (Defra) has developed a new biodiversity calculation tool (the Biodiversity Metric 3.1, referred to from this point on as the 'Defra Biodiversity Tool') to establish a standard metric to quantify biodiversity losses and gains. Developers in England and Wales are required to use this calculation tool to demonstrate that they will deliver a minimum 10% BNG (110% of baseline value) of biodiversity units. SSE Renewables have taken this tool as the starting point for developing a toolkit to deliver biodiversity gain in the Scottish and Irish context.

In developing SSE Renewables' approach to BNG, we worked with environmental consultants WSP to evaluate the suitability of the Defra Biodiversity Tool. We completed three case studies on three development sites utilising the Defra Biodiversity Tool (see appendix on page 15 for more information) to understand how it would calculate net changes in practice. We found a number of limitations with the tool in its applicability for different geographies with different kinds of habitats, particularly areas with a high concentration of peat bogs as are found in Scotland and Ireland compared to England.

Using this information and the learnings from the case studies, we incorporated adaptations to the Defra Biodiversity Tool to create two new BNG toolkits which are appropriate in Scottish and Irish contexts while still implementing the criteria and calculation principles from Defra. The changes identified for inclusion in the Scotland and Irish focused toolkits included:

- Distinctiveness
- Red line boundary
- Irreplaceable habitats
- Difficulty for enhancement
- Strategic significance
- Time to target condition

More information on the challenges and why we believe changes were required for each of the above areas can be found in 'Evaluating and adapting the Defra Biodiversity Tool' in the appendix on page 15.

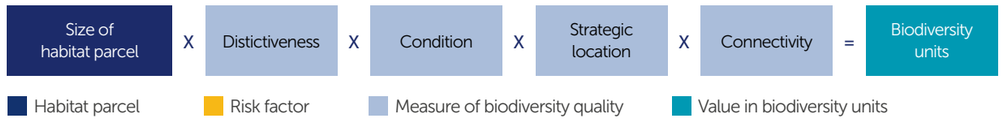
To ensure full transparency of our approach, we have published both of our new BNG toolkits – (1) BNG Site Optioneering Toolkit and (2) BNG Full Toolkit – in full on our website along with a technical user guide. As well as allowing scrutiny and review of our approach, we hope that, by making the toolkits and technical user guides publicly available, they will provide a useful resource for third party users, industry partners and interested parties to assess their own developments as we move towards a standardised approach for quantifying and delivering BNG across our sector.

We welcome feedback on these toolkits and consider them a starting point for further evolution as we move into new geographies and technologies.

Establishing the baseline

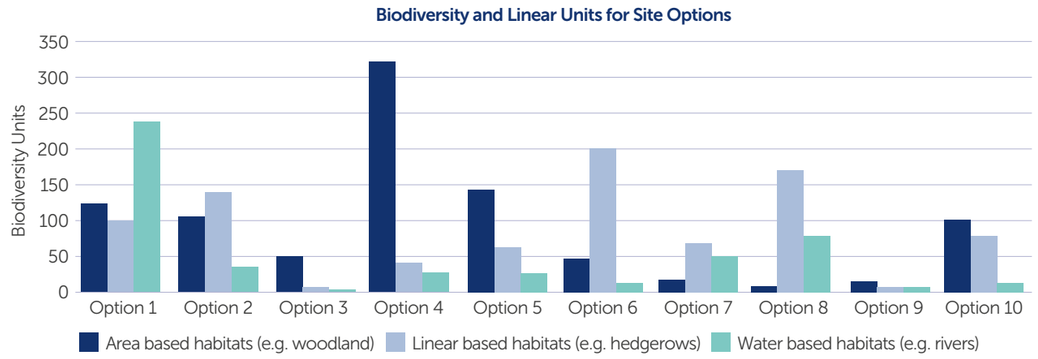
To understand the pre-development biodiversity value baseline on our projects, we will undertake a habitat assessment (including all temporary areas), together with a condition assessment of all habitats associated with the development. In addition, to establish the baseline biodiversity value associated with the site, we must identify the connectivity and strategic significance of habitats. The approach to calculating the baseline number of Biodiversity Units is shown in Figures 1-3, with additional information on the approach detailed in the appendix on page 15.

Figure 1: SSE Renewables BNG Tool Scoring Baseline Matrix



With the BNG Site Optioneering Toolkit, the number of Biodiversity Units for each of the site options (factoring in differences in habitats, linear and water courses) can then be compared, which allows consideration of biodiversity within the environmental options assessment. An example output from the tool is represented in Figure 2. The tool identifies biodiversity hot spots and provides an estimation of habitat creation or enhancement required to meet no net loss/net gain targets at each site. This information is then used to inform design decisions and land requirements for the site.

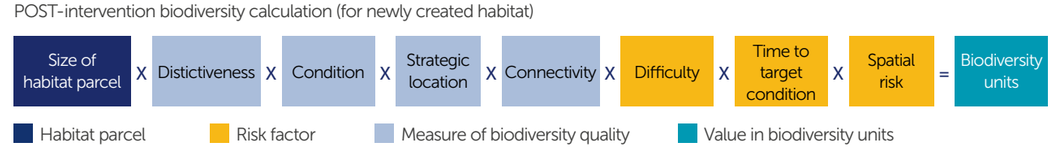
Figure 2: SSE Renewables Site Optioneering Toolkit Results



Understanding the net impact

After taking into account the areas of habitat that will be lost to development, a similar calculation is made for all the habitats that will be retained, created or enhanced and be present post-development. Difficulty, time and spatial issues are also accounted for, as can be seen in Figure 3.

Figure 3: SSE Renewables BNG Toolkit Net Change Scoring Matrix



The final stage of the assessment is to compare the number of Biodiversity Units on the site before development against the number of Biodiversity Units after the development has been completed. This provides the overall percentage of net loss or net gain.

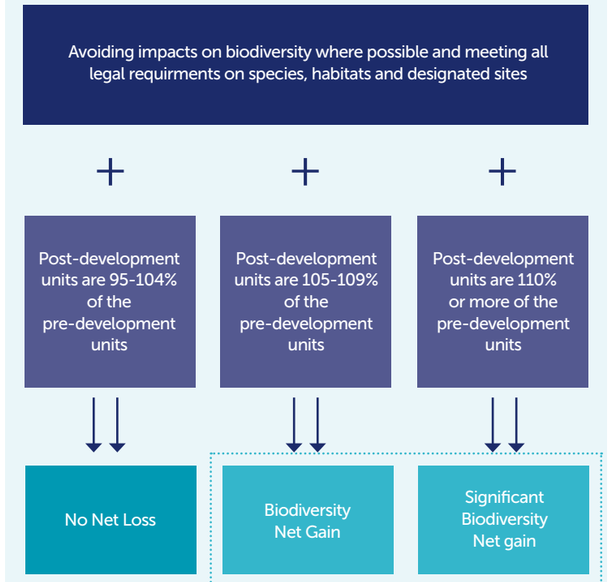
Targeting and achieving Biodiversity Net Gain

SSE Renewables has set targets for achieving BNG on newly consented onshore sites from 2025 onwards. A site is deemed to have achieved BNG if the number of Biodiversity Units post-development is greater than 105% of the baseline biodiversity value, and a significant BNG if it has achieved 110% or above.

Biodiversity No Net Loss and Biodiversity Net Gain Thresholds

While we recognise that the Environment Act (2021) in England and Wales mandates a 10% BNG, and SSE Renewables will strive to achieve this level of significant BNG, we believe targeting no less than a 5% improvement is currently appropriate for sites to be considered as delivering a BNG across our portfolio of assets. We will keep this under review, but the reasoning for this current position is outlined below:

- Government agencies in Scotland have not formed a view on an appropriate BNG threshold.
- In the north of Scotland, habitats can take a long time to restore which will potentially make delivery of BNG more challenging than in other parts of the UK.
- SSE Renewables' BNG targets for newly consented onshore projects apply across many different geographies, where BNG approaches are less well defined there will be bespoke considerations for the development of methodologies in these areas.
- Stretching the BNG threshold may start to drive behaviours that achieve a high Biodiversity Unit score but do not consider wider environmental and social value.



SSE Renewables is targeting

Biodiversity No Net Loss from 2023

and

Biodiversity Net Gain from 2025

on newly consented large onshore projects

Creating 'Habitat Banks'

Where habitat enhancement or creation is achievable above significant BNG (>10% compared to the baseline biodiversity value) for any given site, SSE Renewables is exploring whether the additional biodiversity value created could be recorded as a potential 'habitat bank'. In these cases, the additional areas of habitat that are created or enhanced could then be used as compensation for other development impacts, once all other attempts to reduce and mitigate impact, and undertake enhancement, has been exhausted. This approach incentivises further nature conservation efforts on existing sites in a way that is cost effective and efficient, and will support our overall ambition for our entire portfolio of assets across SSE Renewables to deliver a BNG.

We are currently developing this approach to habitat banks which is currently in its infancy. We expect our approach to be distance focussed, for example only sites within a relative distance and with similar habitat types can share Biodiversity Units, however we will consult with stakeholders on our approach and provide full transparency as it develops.

Increasing demand for land

For SSE Renewables to support the twin goals of tackling climate change and generating BNG in a way that also delivers value for consumers, we need to ensure that land is available for new developments. Without careful management of land demand, ownership and use over the coming years, there will be an evolving and potentially significant risk to securing the land needed for renewable energy projects at an affordable price.

Land designations for national parks rightly safeguard natural beauty and natural conservation interests in many nations around the world. In places like Scotland, this means that approximately 30% of the country is protected from development. While this is a critical element for protecting the natural environment, it is important to recognise and carefully consider the impact of further reductions in available land for the affordable onshore renewable growth we need for a just transition to net zero.

Additionally, with huge focus on decarbonisation and achieving net zero targets, there is potential for growing competition for land due to carbon-offsetting opportunities. The risk of high demand for land being bought to either sell carbon credits, or to sell on this land at a higher price as demand for carbon-offsetting continues to grow, impacting the affordability of renewable developments will need to be monitored closely over time.

Biodiversity and social value: managing trade-offs

Using a metric to quantify Biodiversity Units based on habitat type is a 'proxy' for understanding the wider biodiversity value of a site. While this is fundamental to our approach on BNG, we also recognise that our developments have the potential to affect protected (or priority) species, wider ecosystem services and people, either directly or indirectly.

We are also aware that habitats which intrinsically take time to recover, or to create, such as peatlands, score poorly in the Defra Biodiversity Tool which may dissuade efforts to enhance or restore such habitats. We will therefore ensure that our BNG Toolkits are used in combination with wider environmental and social considerations when informing optioneering, detailed design and delivery. This may mean that the best 'overall' sustainable outcome does not provide the highest BNG. Where this is the case, the rationale behind this decision will be captured in our reporting.

We are also aware that other policy drivers provide both opportunities and challenges to delivering BNG. For example, the Scottish Government's Policy on Control of Woodland Removal promotes that when woodland is removed in association with development, developers will generally be expected to provide compensatory planting. On sites with commercial woodland, this could drive the direct replacement of less diverse habitats or high-density planting, rather than promoting higher value habitats or restoring valuable peatland habitats on which commercial plantations have historically been planted. In these situations, we will seek to work with government agencies and policy makers to ensure the best overall environmental outcomes are delivered.

Embedding Biodiversity Net Gain

There are a number of critical stages during a renewable energy project lifecycle, from site optioneering through to operations and maintenance, where BNG can be incorporated. We believe the earlier stages of our development process can be the most influential in helping us achieve our biodiversity targets, which is why BNG ambitions have been embedded within our publicly available Sustainable Procurement Code (available on **sse.com/sustainability**) and throughout our Large Capital Project governance framework.

From 1 April 2022, a Sustainability Assessment and Action Plan (SAAP) is required for all new or early development Large Capital Projects in SSE Renewables, ensuring that BNG considerations are incorporated into all phases of major project development, construction and operation. The table below shows how we plan to embed BNG through each stage of a project lifecycle.

Opportunity Assessment:

At the early opportunity assessment stage, high level constraints mapping will be used to identify areas of irreplaceable habitat, high biodiversity value and areas of opportunity where land has been historically degraded. These will be used to support strategic level decisions on areas that should be avoided or promoted.

Optioneering:

At project optioneering, during the initial design stage, high-level BNG assessments of different design options will be undertaken through the use of our bespoke BNG Site Optioneering Toolkit. The toolkit uses high-level mapping and readily available data sets (or detailed data where it exists) to predict indicative BU for different design options. The results of the assessment will inform our overarching design and Habitat Management Plan (HMP) Area selection process.

Environmental Impact Assessments and Consents:

Once the design/site has been selected for a project, habitat surveys will take place to inform the Environmental Impact Assessment (EIA) or Environmental Appraisal. The field information will be used in the Full BNG Toolkit to establish the biodiversity baseline for the project. Estimations of the habitat loss and associated restoration, enhancement and compensation to meet the BNG target will be generated through this process.

Construction:

BNG outputs will be included as a deliverable in the environmental requirements for all large construction contracts. Following construction, a habitat and condition assessment survey will be undertaken to understand the impact of any changes in design from the development stage. The data from this survey will be inputted into the BNG Full Toolkit to update the BNG impact estimate for the site. A project-level BNG Report will be produced which evaluates BNG delivery and includes any required changes to habitat management activities to meet BNG targets, for example track re-instatement and verges, further re-seeding/re-instatement requirements and continual on-site assessment of habitat changes.

Operation:

Long-term management plans will be developed for sites with input from local stakeholders. These will identify the required management activities to achieve BNG as identified through the toolkit and project-level BNG Report. These plans will also identify an appropriate long-term monitoring strategy, surveyed at intervals relevant to habitat type (such as grass meadow or peat bog) and at a relevant time period, such as every 5 years. We propose to monitor until the lower of either the BNG target being achieved or over a 30 year time period. Once we believe BNG has been achieved, we will carry out a final BNG calculation to validate success. When a project is repowered or decommissioned in the future, this will be treated as a new development with new BNG obligations which must be achieved on its own merit.

Priorities going forward

Implementation and review

Our immediate priority is to fully embed our 10-point plan for achieving BNG across our project-level activities and wider business portfolio. We know that BNG principles, methodologies and policies are rapidly evolving across geographies and for different types of developments, and are therefore committed to continually reviewing and refining our BNG approach, toolkit and multipliers in consultation with stakeholders as this exciting area evolves.

In line with our commitment to transparency on how we are implementing BNG, and making our toolkits and user guides open to all via our website, we welcome all feedback to **SSERsustainabilityteam@sse.com**.

Expanding our approach internationally

Our commitment to delivering BNG on newly consented onshore projects by 2025 has a foundation in our historic asset base, which has been focused on the UK and Ireland. With the expansion of SSE Renewables into international markets, including the recent acquisition of a 5.2GW portfolio of development projects across Spain, France, Italy and Greece comprising of 3.8GW of onshore wind and up to 1.4GW of co-located solar development opportunities, our aim is to align these projects to deliver BNG within the same timeframe. To do so will require engagement with our expert local teams, policy makers and relevant stakeholders to understand the challenges and opportunities associated with delivery of these targets. It will also require a revision of our BNG Toolkits to reflect the habitats which are prevalent in these territories. By adapting our toolkits to work in a range of international markets, we can ensure that biodiversity continues to be considered an integral component of the project development lifecycle, providing local benefits to both nature and society.

Moving into the marine and intertidal environment

SSE Renewables is currently building more offshore wind than any other company in the world, including the world's largest offshore wind farm. As we build out our pipeline of fixed bottom and floating offshore wind projects, in our home markets of the UK and Ireland and abroad, we are acutely aware of the criticality in ensuring the marine and intertidal environment is both protected and enhanced.

We believe the development of large-scale offshore wind assets can provide a unique opportunity to deliver positive change for marine and inetrtidal life. However, we also recognise that the complexity of the marine and inetrtidal environment requires further detailed consideration with regards to the development of a suitable BNG metric and will required extensive collaboration with conservation agencies, policy makers, other marine users and industry experts to deliver. While the principles of BNG in the marine environment continue to evolve, SSE Renewables will continue to actively engage in industry forums, identify collaborative research opportunities and promote shared-learnings with stakeholders.

Given the scale and complexity of the marine environment, we also recognise the value that technology will bring to monitoring environmental impacts and identifying opportunities for improvement. SSE Renewables' continued partnership with technology leaders such as Microsoft and Avanade has enabled us to deliver cutting-edge monitoring techniques, including the use of artificial intelligence systems to monitor species and further develop our approach to delivering BNG. We aim to expand our approach to date and combine other advanced techniques with a digital twin to build a game-changing live virtual copy of the marine environment.

Contributing to science and research

Approaches for generating BNG must be evidence-based to be effective and credible. SSE Renewables is actively contributing to knowledge and research to support informed decision-making and better environmental outcomes. Our default position is a commitment to transparency and to support research when feasible for the business. We are currently partnering with a number of external research initiatives and will explore ways to better share the extensive amount of data gathered during the development, construction and operation of our assets.

Collaborating with industry partners

SSE Renewables has extensive in-house experience in protecting and enhancing biodiversity through our team of environmental experts. However, we recognise that that our contribution to solving the climate and biodiversity crises will only be possible through shared-learning, transparency and genuine collaboration.

To that effect, we are striving to be industry leaders in promoting our approach to biodiversity protection and enhancement. The Powering Net Zero Pact is an SSE-led initiative created as a legacy of COP26, which brings together companies from across all tiers of the power sector to work together and deliver a fair and just transition to net zero. The signatories of the Pact operate across over 100 countries and work with more than 120,000 suppliers globally. Together we are working to deliver solutions on five key challenging areas of sustainability, including shared frameworks for achieving BNG. SSE Renewables is leading this working group, and will use this forum to share its progress on BNG to date as well as use insights to further evolve its approach. More information on the Pact can be found on **sse.com/pnzp**.

SSE Renewables is also a signatory to the UN Global Compact's Ocean Stewardship Coation and sits on its Offshore Wind Marine Spatial Planning Steering Group. This network of industry, NGOs, academics, governments and other organisations is currently running a number of sprint working groups focused on specific challenges in the offshore environment, including the development of shared frameworks for offshore biodiversity gain.

Appendix: Evaluating and adapting the Defra Biodiversity Tool

In evaluating the Defra Biodiversity Tool, we worked with environmental consultants WSP to pilot the use of the tool on three development projects to understand its applicability for SSE Renewables Scottish, Northern Ireland and Irish projects which share similar habitats.. A description of the development sites and the results using the Defra Biodiversity Tool in each scenario are detailed below, along with the adaptations made by SSE Renewables to ensure their relevance in the geographies where we operate.

Development 1
A new wind farm development located in a commercial forestry (commercial forestry to be clear felled) in Scotland. Included in the Habitat Management Plan is 1,132 hectares of 'forest to bog' restoration and 468 hectares of open moorland blanket bog restoration.

Development 2
An extension to an existing onshore wind farm site in Scotland. Located in an open moorland setting which tied into the existing Habitat Management Plan for the site in addition to mitigation specifically for the extension which included 27 hectares of blanket bog restoration.

Development 3
A large-scale pumped storage hydro scheme in Scotland with no Habitat Management Plan. The assessment included the temporary and permanent habitat change due to the site's infrastructure.

Trialling the Defra Biodiversity Tool

Development 1 resulted in a 24% loss in biodiversity. This was largely due to the felling of coniferous plantation stands and replacement with bog habitat under the Habitat Management Plan. High risk factors associated with the creation of bog meant larger areas would be required to replace the Biodiversity Units lost. Development 1 revealed that the 'difficulty for enhancement' multiplier (a measure of the risk associated with creating or enhancing a particular habitat used to calculate the value of habitats post-development) is too stringent in relation to the specific circumstances where creation of bog habitat is required. Habitats that are inherently more difficult to enhance score more poorly than those that can be created or enhanced relatively easily (with little or no risk).

Development 2 resulted in a 20% loss in in non-irreplaceable biodiversity. It should be noted that, as in Development 1, Development 2's Habitat Management Plan targets blanket bog restoration. Because of the high-risk factors associated with its creation, the Habitat Management Plan actions did not replace the Biodiversity Units lost. Development 2 revealed that compensating for effects on bog during construction with bog restoration leads to large losses under the Defra Biodiversity Tool. This is due to the influence of the distinctiveness of the bog habitat prior to development and that habitats which take a long time to reach target condition score poorly using this tool.

Development 3 resulted in a 6% loss for area-based non-irreplaceable habitats and a 5% loss for linear habitats (river habitat). However, enhancement of area habitats post-development could have achieved a 7% BNG. Creation and enhancement of a new linear habitat would be required to achieve no net loss and a BNG for river habitat.

Across all three scenarios, a sizeable biodiversity net loss was predicted using the Defra Biodiversity Tool despite significant habitat improvement works and investment post-construction. The negative results in these scenarios demonstrated the need for a systematic review of the Defra Biodiversity Tool to understand what had caused the low scores, particularly in relation to blanket bog (peatland habitats) which are common in places like Scotland and Ireland. The main areas of the tool that were reviewed were the following multipliers:

- Distinctiveness
- Red line boundary
- Irreplaceable habitats
- Difficulty for enhancement
- Strategic significance
- Time to target condition

The challenge around peatland

The clear main limiting factor in the three development scenarios was how biodiversity impacts associated with peatland habitats were calculated. This is likely a bias built into the Defra Biodiversity Tool due to the relative scarcity of peatland in England and a measure to dissuade development on peat. However as noted by ClimateXChange Scotland (2022)[1], around 60% of the UK's peatland is located in Scotland and therefore developments in Scotland are much more likely to encounter peatland habitats. It is also noted by NatureScot (2020)[2] that estimates indicate 80% of Scotland's peatlands are damaged. Assessing peatland habitats accurately in a Scottish context offers a range of benefits, including incentivising private investment to restore damaged peatlands, developing and maintaining sites to increase biodiversity, and ultimately leaving sites in a better state than they were found for future generations to enjoy.

Distinctiveness

Distinctiveness is a collective measure of biodiversity and includes parameters such as species richness, diversity, rarity, and the degree to which a habitat supports species rarely found in other habitats.

Our BNG Toolkits classifies the relevant distinctiveness band (Very High/High/Medium/Low/Very Low) in the habitat matrix and will automatically assign the band to a selection. However, the tool provides greater flexibility when classifying condition. For example dry and wet modified bogs can be selected in the SSE Renewables BNG Toolkits, and therefore ecologists can select the most appropriate habitat type rather than trying to make a habitat fit within the 'blanket bog' category and reducing the condition, as is the case with the Defra Biodiversity Tool. We also take the approach that peatland habitats that are in moderate condition, or less, are treated as habitats for improvement and are not irreplaceable.

1 ClimateXChange Scotland (2022) https://www.climatexchange.org.uk/research/indicators-and-trends/indicators/nb11-extent-of-key-habitats-deep-peat/#:~:text=Scotland%20has%20about%2060%25%20of,the%20pressures%20of%20climate%20change.
2 NatureScot (2020). Scotland's National Peat Plan. https://www.nature.scot/professional-advice/land-and-sea-management/carbon-management/restoring-scotlands-peatlands

Red line boundary

A 'red line boundary' can vary depending on how we assess our sites. The calculations in both the Defra Biodiversity Tool and SSE Renewables BNG Toolkits include on-site and off-site habitat improvements. How the red line boundary is determined impacts the BNG requirements, with habitat included within the red line (on-site) boundary contributing to the BNG requirement. This includes when the habitat is retained and not directly affected by a project. Therefore, a project including habitat within the red line boundary that is not affected will have a greater net gain requirement than a project where the same habitat is not included in the red line boundary. This is because it increases the baseline Biodiversity Units against which BNG is measured. To this end, SSE Renewables will only include habitats within the red line boundary that are affected by the development. This could be limited to only the footprint of the wind farm infrastructure (including any buffer effects).

To avoid competition for land, SSE Renewables counts on-site BNG actions that are within proximity to the site and may include discreet parcels of land with their own distinct boundary. To this end, Habitat Management Plan enhancement areas will be much more targeted to provide accurate results. This approach is necessary on large-scale developments where pockets of land not ear-marked for restoration or improvement may skew the results of a development's impact and the level of mitigation required to offset those impacts.

Irreplaceable habitats

The irreplaceable habitats that SSE Renewables is likely to encounter on renewable energy sites are blanket bog and ancient woodland. In the Defra Biodiversity Tool, both habitats are treated as irreplaceable.

The SSE Renewables BNG Toolkits take a more nuanced approach, with only areas of blanket bog in higher than moderate condition deemed irreplaceable. In most cases on our sites, there will be peatland habitat which is in poor condition. Additionally, just by virtue of where many of our wind farms are located, peatland will be a common habitat that is both impacted and improved by our developments (via Habitat Management Plans) and therefore it was important to ensure a BNG assessment method that would accurately calculate the impacts and required mitigation in peatland habitats.

Ancient woodland is also considered irreplaceable in the Defra Biodiversity Tool. Woodland habitat recorded during initial site assessments and deemed to be of high distinctiveness should be checked against national ancient woodland inventories and historic mapping. If these and the ecological assessment are consistent with ancient woodland criteria, then the habitat should be classified as irreplaceable habitat and avoidance should be prioritised in accordance with the mitigation hierarchy. The BNG assessment can be used to collect bespoke mitigation and compensation requirements for engagement with stakeholder regarding compensation in exceptional circumstances, if necessary.

Difficulty for enhancement

Difficulty for enhancement multipliers are used as a measure of how difficult it is to create or enhance a particular habitat. The SSE Renewables BNG Toolkits calculates this risk using the Defra Biodiversity Metric Tool risk multipliers.

The difference in our toolkit is that the multiplier is selectable. This has been particularly helpful when assessing peatland habitats as the Defra Biodiversity Tool is fixed in its position that restoring blanket bog has a 'Very High' level of difficulty which effectively translates to only 10% of the area restored can be counted as successful. In SSE Renewables' extensive experience, and in consultation with industry partners, regulators, and academia, we are confident that the success figure can be higher. We have therefore proposed to assess blanket bog with a 'Medium' difficulty multiplier, meaning that we are targeting a minimum 67% success rate for our blanket bog restoration. We will continue to monitor and review our blanket bog restoration success rates on SSE Renewables sites to ensure this multiplier is appropriate.

Difficulty of creation /enhancement	Risk Multiplier
Very High	0.10
High	0.33
Medium	0.67
Low	1

Strategic significance

Strategic significance gives extra value to habitats that are located in optimum locations for biodiversity and other environmental objectives, such as areas that are the focus of green infrastructure or local biodiversity plans. The strategic significance scores in the SSE Renewables BNG Toolkits align with the Defra Biodiversity Tool and follow the same classification thresholds:

- **High:** The habitat and/or location is formally identified in local strategy, plan or policy such as Local Plans spatial biodiversity policies, Local Biodiversity Action Plans, and green infrastructure strategies.
- **Medium:** The habitat and/or location is ecologically desirable but not formally identified in local strategy, plan or policy such as Local Plans spatial biodiversity policies, Local Biodiversity Action Plans, and green infrastructure strategies.
- **Low:** The habitat and/or location is not identified in a local strategy, plan or policy OR no strategy or plan is in place in the area.

Time to target condition

Time to target condition is the number of years it is estimated to take before the restoration, enhancement or creation of a habitat reaches the pre-agreed target quality. The time to target condition will vary depending on the habitat type, habitat management and type of change (for example whether it's creation or enhancement). The SSE Renewables BNG Toolkits aligns with the Defra Biodiversity Metric scoring for time to target condition. However, our toolkit has greater flexibility from the prescribed years to target condition to account for situations where habitats are created in advance or when there may be delays in habitat creation. Allowing the greater flexibility also allows the time to target condition to be changed appropriately to align with the target habitat condition. For example, peatland restoration may result in quick hydrological changes, potentially restoring peatland to 'moderate' health in a relatively short 10-15 years. However, if the target condition is for a bog in good health, the time to target condition may be closer to 25-30 years. Time to target condition is highly dependent on the baseline conditions and desired condition of the restored habitats.

Years to target condition	Risk Multiplier
1	0.965
5	0.837
10	0.700
20	0.490
30	0.343

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