August 2024

Viability Assessment of Biodiversity Net Gain in Essex

Final Report

Essex County Council and Essex Local Nature Partnership

SQW temple

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Executive summary

1. SQW and Temple Group have been commissioned by Essex County Council (ECC / The Council) and Essex Local Nature Partnership (ELNP) to undertake a viability assessment of the extra costs and impacts on financial viability of development for an increase from the mandatory minimum 10% to 20% biodiversity net gain (BNG) across Essex. The commission will primarily focus on assessing the high-level viability of Town & Country Planning Act 1990 (TCPA90) development across Essex for a range of residential and commercial development typologies at 20% BNG targets, and reviewing Nationally Significant Infrastructure Projects (NSIPs) coming forward across Essex and in particular, use the proposed nationally significant electricity transmission infrastructure project referred to as 'Norwich to Tilbury' (N2T) that is being promoted by National Grid Electricity Transmission (NGET) as a case study to analyse how BNG is presently being delivered.

2. The output of the assessment will allow the planning authorities in Essex and DLUHC to understand the viability implications of targeting higher BNG policy than the statutory minimum of 10% for TCPA90 development, and consider if and how such policy may influence / impact NSIPs delivery.

3. **It is important to note that this report is purposefully strategic in nature. The purpose of this report is to provide an initial viability assessment to inform local planning authorities in Essex who may be considering a higher BNG target for TCPA90 development or through engagement in the development consent process for NSIPs. This report does not constitute or replace the evidence base for any individual Local Planning Authority (LPA) Local Development Plan, nor remove the need for BNG to be tested at the local level or at the national level through the development consent process.**

Objectives of the commission

4. The key objectives of the TCPA90 element of the commission are as follows:

    - Provide an independent assessment of the potential effect of a 20% BNG target on the viability of residential and commercial development in Essex. The purpose of this assessment will be to determine if an uplift from the mandatory 10% BNG will materially affect the delivery of development in the county from a viability perspective;

    - The assessment will present a per dwelling cost of delivering 20% BNG across a range of site typologies. Though costs have been included to achieve 10% BNG we have not tested the viability of this specifically as it is

mandatory under legislation (Central government have already provided viability studies for 10% BNG across England, leading to the legislative 10%). In addition to the assessment, the project will devise a replicable approach, so that should an LPA within Essex wish to undertake an assessment specific to their area they can do so consistently.

- Wider objectives are to support the ecological case, understand the wider benefits of BNG (through ecosystem services), and explore the questions of onsite provision and offsite provision.

5. To achieve these objectives, SQW and Temple have ensured that the viability assessments follow the viability standards set out in the revised National Planning Policy Framework (NPPF), Planning Practice Guidance (PPG), RICS Professional Standard Financial viability in planning: conduct and report (May 2019), and RICS Professional Standard Assessing viability in planning under the National Planning Policy Framework 2019 for England (March 2021), as closely as possible.

6. The primary objective of the Planning Act 2008 (PA2008) element of the study is to answer the question: "**Would 20% BNG in Essex have a significant impact on the costs and financial viability of proposed NSIPs in Essex?**"

7. More specifically, this includes a broad review of extant NSIPs in Essex to estimate the likely effect of applying a 20% net gain target. This broad review would be informed, in part, using a more detailed case study of N2T to:

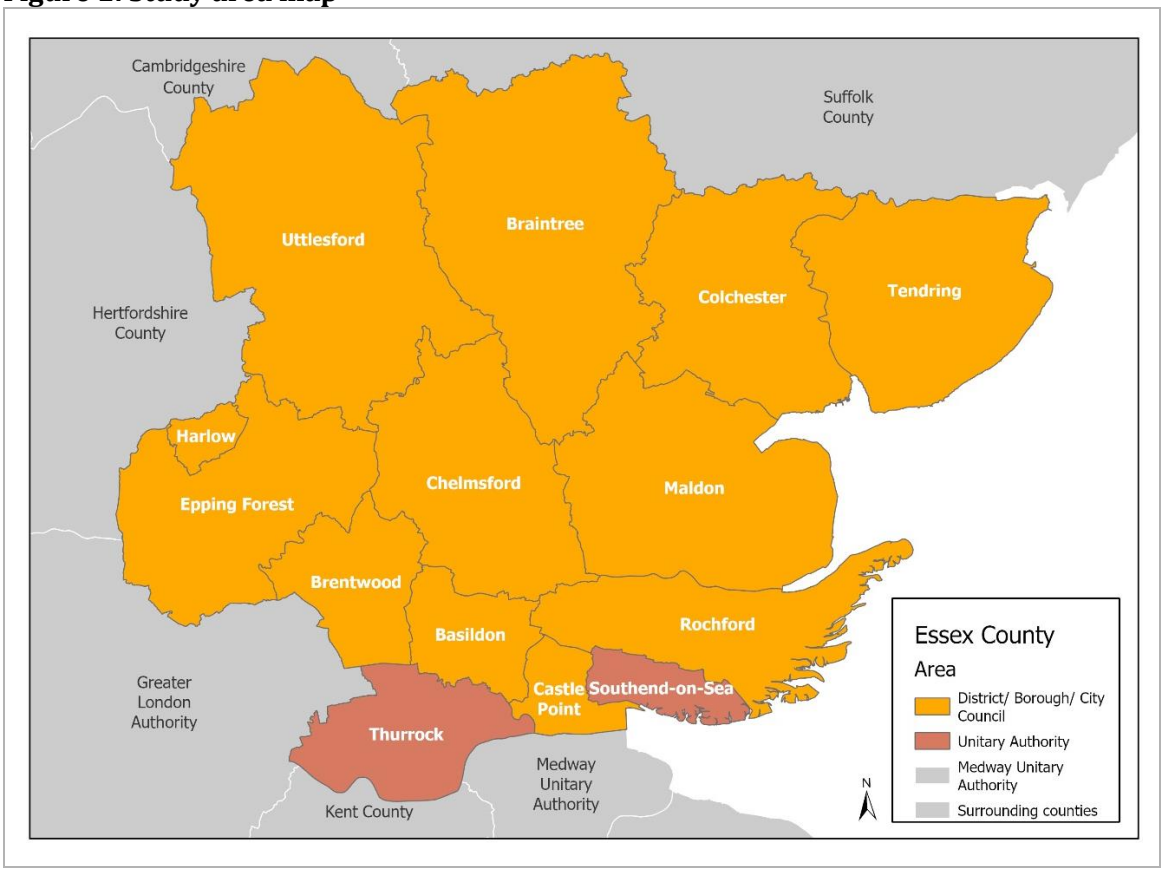
- Understand how BNG can be applied to linear NSIPs and what best practice may look like in terms of defining the extent of impacted habitat;
- Understand how BNG can be delivered, and what this may mean in terms of on and offsite options, how that may shape the development of both linear and single site NSIPs along with potential impacts on land take / retention and habitat management arrangements;
- Consider the potential magnitude of BNG / number of units that may be delivered;
- Consider how BNG investment may work 'cross-boundary' and the potential complexities / opportunities associated with prioritising local benefits vs regionally important priority habitats;
- Consider what opportunities and mechanisms there are for ECC and Local Authorities in Essex to engage with NSIPs to deliver enhanced levels of BNG both before and after the mandatory 10% BNG is in effect; and

- Consider the potential impacts of enhanced levels of BNG on overall project cost / viability and value for money from a public investment perspective.

Study area

8. This study covers Greater Essex, as shown in Figure 1. This includes 14 Authorities.

Figure 1: Study area map



Source: SQW, 2024

Conclusions

TCPA90

9. The key headline findings for BNG policy in Essex are as follows:

- **A shift from 10% to 20% BNG will not materially affect viability in the majority of instances when delivered onsite or offsite**.

- The biggest cost in most cases is to get to the mandatory, minimum 10% BNG. The cost increase to 20% BNG is, in most cases, much less and is generally small or negligible. Based on our scenario testing we estimate that:

  - the additional cost of achieving 20% BNG ranges from £2 - £27 per residential unit on brownfield sites[1] and from £77 to £308 per residential unit on greenfield sites.
  - this additional cost would impact residual land values by <0.1% for brownfield development land and <1.4% for greenfield development land.

- Because BNG costs are low when compared to other policy and development costs, in very few cases are they likely to be what renders development unviable for BNG policy of up to 20%.

- **The cost increase to 50% BNG is low for *brownfield* sites and unlikely to have a material impact on development viability in many cases, particularly in higher value areas. For *greenfield* sites, the additional cost associated with 50% BNG may have a more material impact on development viability but the costs remain small compared to other policy costs**. Based on our scenario testing we estimate that:

  - the additional cost of achieving 50% BNG ranges from £20 - £214 per residential unit on brownfield sites and from £636 to £1,232 per residential unit on greenfield sites.
  - this additional cost would impact residual land values by <0.7% for brownfield development land and between 3% and 5.4% for greenfield development land.

- Some developers report that they are having issues delivering the mandatory 10% BNG on some of their sites. This is not surprising during the transitionary period following the adoption of new policy because Local Plan site allocations and historic land deals will not have factored in the additional cost and land take requirements to achieve BNG. This demonstrates the importance of considering BNG from the outset during site allocation and master planning stages. Developers should ensure that they can efficiently provide it onsite if this is what they plan to do (mitigation hierarchy insists on onsite provision before moving to offsite). Because of these existing challenges, Local Authorities who wish to pursue BNG in excess of 10% may expect some pushback on the policy and therefore may need robust local viability assessment to support it. However, this study shows an assessment is likely to demonstrate viability will not be negatively impacted (to a material extent) for BNG increases of up to 20%, and even beyond this level in some areas. The above conclusion reflects the viability position where BNG requirements have been considered and factored in throughout the land acquisition and planning application process. **In the short term, enhanced BNG policy changes may**

[1] Brownfield scenarios assume sites are located on previously developed land that has not been allowed to re-establish vegetation of biodiversity value.

cause greater levels of disruption and viability impact where the cost and land take requirements of increased levels of BNG provision have not been factored into existing proposals. Local Authorities may wish to take this into account when designing and implementing policy. If onsite were to be the primary focus of enhanced provision, increasing land take may result in the lowering of average housing densities, so more land may be required to deliver housing. However, the majority of this burden relates to the mandatory 10% BNG and the increase to get to 20% BNG is comparably small; offsite solutions are also available. Therefore this should not be seen as a barrier to BNG policy in excess of 10%, but is a consideration for LPAs.

- In certain situations **where the starting biodiversity baseline is low i.e. on cleared brownfield sites**, it might prove easy for developers to provide considerably larger increases over 20%. In some cases, even an increase to 50% BNG or more will not render development unviable. LPAs may wish to consider this when developing new policies and could, for example, **consider a minimum threshold for BNG applied in absolute terms in addition to a percentage increase.** This may allow them to deliver higher levels of BNG where it is appropriate to do so.

PA2008 - NSIPs

10. Overall, our analysis indicates that **most types of NSIP can deliver somewhere between a small net loss and around 10% net gain within the project design**, with offsetting[2] assumed to be needed to make up shortfalls of biodiversity units, depending on the type of NSIPs.

11. NSIP promoters across Essex are concerned that high demand for biodiversity units could inflate costs, potentially forcing them to purchase more expensive statutory credits. Conversely, landowners are worried that an oversupply of biodiversity units could lower their value, reducing the economic incentives for providing these units.

12. These contrasting concerns highlight the need for a balanced approach to managing the demand and supply of biodiversity units. The public sector, principally host local authorities, could play a crucial role in analysing and coordinating the expected demand and supply of biodiversity units within local geographies. This balance is essential to avoid significant cost fluctuations of the biodiversity units required to deliver BNG for NSIPs, and offer confidence that

[2] Offsetting being the delivery of offsite biodiversity enhancements to provide biodiversity gain equivalent to any shortfall in biodiversity units required to achieve the biodiversity objective of the scheme.

escalating BNG costs will not undermine attempts to deliver enhanced BNG by making it too expensive to deliver, or justify in value for money terms.

13. The key areas of focus for discussion between Essex CC and its local authority partners in Essex and NSIP promoters should target opportunities **to enable scale of delivery of biodiversity offsetting units and to keep the cost of offsetting units down**, for example through economies of scale.

14. By **enabling discussion and seeking a position on how to address the issues of local offsetting delivery and balancing supply and demand of offsetting**, Essex CC and its local authority partners have the potential to influence the determination of how these details will be addressed in future legislation, guidance and national and local policy.

15. The study also raises a number of areas that should be considered in the development of Biodiversity Statements and associated legislation, policy and guidance for NSIPs.

16. Defining the extent of impacted habitat within many linear NSIPs is challenging and will depend on principles set out in national secondary legislation, policy and guidance on BNG for NSIPs. However, limited legislation, policy and guidance is available for implementing BNG, particularly for NSIPs. **Future policy and guidance should provide clarity on how the boundary for calculating BNG for NSIPs is defined, particularly for linear NSIPs that do not have clear boundaries.**

17. **The treatment of temporary loss of low distinctiveness habitats could be reviewed** where low distinctiveness habitats will be restored to their previous state on completion of construction works, but not within two years, and be returned to the landowner to control. Under the TCPA90 guidance, the effect of restoring these habitats would be excluded from the BNG outcomes because the management is not legally secured for 30 years, even though the habitats will revert to their pre-development state. This could have a negative impact on the NSIPs and biodiversity outcomes by increasing costs, potentially diverting funding from other investments, and removing the incentive to restore these habitats as soon as possible.

18. The approach to local delivery of offsetting does not necessarily deliver the best outcomes for NSIPs or biodiversity, particularly linear NSIPs, in the same way as TCPA90 development. **A review of different approaches to local offsetting delivery for linear NSIPs may yield insights into the benefits of alternatives in delivering better outcomes for biodiversity and local communities**, including investment in strategic biodiversity sites and ensuring local socio-economic benefits.

19. Different types of NSIPs have different and variable characteristics in relation to BNG. **The proposed system of biodiversity gain statements allows for variation between the biodiversity gain objectives that different project types can set as well as the detail of the mechanisms to achieve it.** This means that solar farm NSIPs, with or without battery storage, could set a higher biodiversity gain objective, which could be a positive step towards the Government's objectives as set out in the Environmental Improvement Plan 2023[3] (EIP2023). Conversely, maintaining a lower objective and allowing potential promoters of solar farm NSIPs, with or without battery storage to use excess units to provide offsetting could support other NSIPs or TCPA90 development in achieving net gain.

20. Whilst LPAs are central to setting the policy framework for enhanced BNG provision (in excess of the mandatory 10%) through local development plan policies for TCPA90 development as TCPA90 development must be determined in accordance with the local development plan unless material considerations dictate otherwise, local planning policies are only a material consideration of varying weight when the relevant Secretary of State is determining development consent for an NSIP. There is a need for greater clarity in national planning policy for NSIPs to support local host authorities and NSIP promoters seeking to justify the additional cost and value for money to the local economy, environment and health and wellbeing of host communities of delivering greater than the mandatory biodiversity objective for NSIPs.

21. **Future national planning policy and guidance should be clearer on the expectation of delivering BNG for NSIPs, including greater than the mandatory biodiversity objective.** This is especially relevant where there are BNG policies in local development plans requiring greater than 10% BNG for TCPA90 development. This study has highlighted how challenging it is for promoters of some NSIPs to assess the cost and justify value for money to government bodies and other regulators of delivering beyond 10% BNG for NSIPs.

The role for Essex CC across TCPA90 development and NSIPs

22. Essex CC has a potentially important role in enabling discussion and resolving key challenges to BNG delivery in Essex for both TCPA90 development and PA2008 NSIPs, which could influence national policy and guidance and set precedent for both planning regimes. This could include:

- **understanding the predicted scale of need for biodiversity units to facilitate TCPA90 development and NSIPs across the county** where this

[3] Environmental Improvement Plan 2023 – First revision of the 25-year Environment Plan. Defra: https://www.gov.uk/government/publications/environmental-improvement-plan

cannot be provided onsite, in particular in relation to specific habitat types, and the timing of demand;

- **a study of the potential availability of land in Essex for offsetting** could provide assurance as to whether the supply is likely to be sufficient to meet the demands of TCPA90 development and NSIPs. A study at the county-level geography would be particularly advantageous for the developers of major TCPA90 development and NSIPs promoters who require larger or multiple sites for offsetting, as well as providing a more comprehensive understanding of the county's potential offsetting resources;

- identifying **opportunities within the Local Nature Recovery Strategies to integrate the offsetting demands of NSIPs** and for NSIPs to support the delivery of the LNRS;

- **identifying key local priorities** for biodiversity enhancement from TCPA90 development and NSIPs (which will be largely delivered through the LNRS); and

- identifying priorities where offsetting investment can deliver additional value to the local economy, environment and health and wellbeing of local communities, such as access to nature, recreation, tourism, active travel and other ecosystem services, through a comparative analysis of needs and benefit opportunities.

Overall conclusion and implications

23. In summary, the additional costs to achieve 20% BNG is a relatively small percentage of overall cost, for both TCPA90 development and NSIPs in Essex.

24. There is a huge potential for NSIPs to provide a significant amount of BNG in Essex due to their size and scale, and the large number of NSIPs proposed. Whilst NSIPs can provide some level of BNG onsite, most of them have a shortfall and BNG will have to be delivered offsite through the purchase of biodiversity units. N2T has demonstrated that NSIPs will generate a high demand for biodiversity units in Essex that will continue to grow as Essex continues to host increasing numbers of NSIPs. This demand could further intensify if national policy and guidance require a biodiversity objective in excess of 10% for NSIPs and / or if local development plans were to include policies requiring all development to deliver BNG in excess of the 10% mandatory for TCPA development.

25. This study indicates that the cost of purchasing biodiversity units for offsetting can vary widely and notably, statutory credits could double the cost of BNG provision compared with the use of local biodiversity units. This variability in costs

necessitates careful consideration and strategic planning to ensure that there is sufficient availability of local biodiversity units in Essex at a reasonable price.

26. This study has shown that NSIP promoters are concerned that high demand for biodiversity units could inflate costs, potentially forcing them to purchase more expensive statutory credits. Conversely, landowners are worried that an oversupply of biodiversity units could lower their value, reducing the economic incentives for providing these units.

27. These contrasting concerns highlight the need for a balanced approach to managing the demand and supply of biodiversity units. The public sector, primarily host local authorities, could play a crucial role in analysing and coordinating the expected demand and supply of biodiversity units within local geographies. This balance is essential to avoid significant cost fluctuations of the biodiversity units that can negatively impact the viability of both TCPA90 development and NSIPs.

28. Assuming an adequate supply of biodiversity units to keep costs at or below the £25,000 figure used in this study, adopting 20% BNG policy across Essex would not have a significant impact on the financial viability of TCPA90 development.

29. The ability of NSIP promoters to delivery beyond any mandatory biodiversity objective will depend on a number of factors individual to the promoter, type and location of NSIP. The use of N2T as a case study has demonstrated that the lack of national policy and guidance on delivering beyond the anticipated mandatory 10% BNG for consumer funded NSIPs makes this particularly challenging to justify to the energy regulator, Ofgem, who require energy infrastructure to demonstrate (amongst other considerations) value for money to the public. The absence of local planning policy requiring all development to deliver greater than the mandatory 10% BNG set for TCPA development makes quantifying and qualifying BNG as value for money to the local economy, environment and health and wellbeing of host communities a challenge for all NSIPs. The uncertainty around the supply and cost of biodiversity units available for offsetting across Essex to meet the demand for BNG offsetting further complicates delivery.

1. Introduction

1.1 SQW and Temple Group have been commissioned by Essex County Council (ECC / The Council) and Essex Local Nature Partnership (ELNP) to undertake a viability assessment of the extra costs and impacts on financial viability of development for an increase from the mandatory minimum 10% to 20% biodiversity net gain (BNG) across Essex. The funding for this work has been provided to ECC by the Department of Levelling Up, Housing and Communities (DLUHC) through the National Infrastructure Planning Reform: Innovation and Capacity Fund[4]. The commission will:

- assess the high-level viability of Town & Country Planning Act 1990 (TCPA90) development across Essex for a range of residential and commercial development typologies at 20% BNG targets, and assess the potential viability impact of enhanced BNG policy requirements, and

- review Nationally Significant Infrastructure Projects (NSIPs) coming forward across Essex and in particular use the proposed nationally significant electricity transmission infrastructure project referred to as 'Norwich to Tilbury' (N2T) that is being promoted by National Grid Electricity Transmission (NGET) as a case study to analyse how BNG is presently being delivered. This will contribute to the evidence base being used to inform emerging national and local policy and guidance in relation to the provision of BNG for NSIPs, with a particular focus on the implications of and opportunities for enhanced BNG provision.

1.2 The output of the assessment will allow the planning authorities in Essex and DLUHC to understand the viability implications of targeting higher BNG policy than the statutory minimum of 10% for TCPA90 development, and consider if and how such policy may influence / impact NSIPs delivery.

1.3 **It is important to note that this report is purposefully strategic in nature. The purpose of this report is to provide an initial viability assessment to inform local planning authorities in Essex who may be considering a higher BNG target for TCPA90 development or through engagement in the development consent process for NSIPs. This report does not constitute or replace the evidence base for any individual Local Planning Authority (LPA) Local Development Plan, nor remove the need for BNG to be tested at the local level or at the national level through the development consent process.**

[4] https://www.gov.uk/guidance/national-infrastructure-planning-reform-innovation-and-capacity-fund-round-2

Objectives of the commission

1.4 The key objectives of the TCPA90 element of the commission are as follows:

- Provide an independent assessment of the potential effect of a 20% BNG target on the viability of residential and commercial development in Essex. The purpose of this assessment will be to determine if an uplift from the mandatory 10% BNG will materially affect the delivery of development in the county from a viability perspective;

- The assessment will present a per dwelling cost of delivering 20% BNG across a range of site typologies. Though costs have been included to achieve 10% BNG we have not tested the viability of this specifically as it is mandatory under legislation (Central government have already provided viability studies for 10% BNG across England, leading to the legislative 10%). In addition to the assessment, the project will devise a replicable approach, so that should an LPA within Essex wish to undertake an assessment specific to their area they can do so consistently.

- Wider objectives are to support the ecological case, understand the wider benefits of BNG (through ecosystem services[5]), and explore the questions of onsite provision and offsite provision;

- To achieve these objectives, SQW and Temple have ensured that the viability assessments follow the viability standards set out in the revised National Planning Policy Framework (NPPF), Planning Practice Guidance (PPG), RICS Professional Standard Financial viability in planning: conduct and report (May 2019[6]), and RICS Professional Standard Assessing viability in planning under the National Planning Policy Framework 2019 for England (March 2021[7]), as closely as possible.

1.5 The primary objective of the PA2008 element of the study is to answer the question: **"Would 20% BNG in Essex have a significant impact on the costs and financial viability of proposed NSIPs in Essex?"**

[5] Ecosystem services are services provided by the natural environment that benefit people, such as health and wellbeing, food provisioning, pollution protection, carbon sequestration, flood resilience etc.
[6] The document was published in May 2019 as a Guidance Note and was reissued in April 2023 as a Professional Standard.
[7] The document was published in March 2021 as a Guidance Note and was reissued in April 2023 as a Professional Standard.

1.6 More specifically, this includes a broad review of extant NSIPs in Essex to estimate the likely effect of applying a 20% net gain target. This broad review would be informed, in part, using a more detailed case study of N2T to:

- Understand how BNG can be applied to linear NSIPs and what best practice may look like in terms of defining the extent of impacted habitat;
- Understand how BNG can be delivered, and what this may mean in terms of on and offsite options, how that may shape the development of both linear and single site NSIPs along with potential impacts on land take / retention and habitat management arrangements;
- Consider the potential magnitude of BNG / number of units that may be delivered;
- Consider how BNG investment may work 'cross-boundary' and the potential complexities / opportunities associated with prioritising local benefits vs regionally important priority habitats;
- Consider what opportunities and mechanisms there are for ECC and Local Authorities in Essex to engage with NSIPs to deliver enhanced levels of BNG both before and after the mandatory 10% BNG is in effect; and
- Consider the potential impacts of enhanced levels of BNG on overall project cost / viability and value for money from a public investment perspective.

Why are Essex considering the viability of a 20% BNG target?

1.7 ELNP is promoting that a county-wide target of 20% BNG be adopted within Essex. The County's Green Infrastructure Strategy identifies a need to "successfully integrate new and existing green infrastructure into new development such as housing, industrial premises and the transport infrastructure". This is in response to the following drivers[8]:

- Essex's biodiversity resources have been highly depleted, with around 14% of the County currently considered natural green infrastructure. This trend is also apparent nationally, with 1 in 6 species threatened with extinction in Great Britain[9]. This has led ECC and ELNP to aim to deliver 30% of Essex as natural

[8] Bullet points adapted from Essex Green Infrastructure Strategy: Evidence of the Green Infrastructure in Essex and Understanding the Key Drivers. 2020. Available here. Pages 26-27.
[9] State of Nature. 2023. Available here

green infrastructure by 2030. The proposed increase from 10% to 20% BNG will in turn assist in reaching this target.

- Essex is experiencing significant and unprecedented levels of growth. The County needs an additional 179,657 homes by 2036, and its population is expected to reach 2,133,100 by 2041. The greatest population increases are projected in Colchester, Basildon and Chelmsford. Infrastructure is required to support this.

- As of 2017, 18% of Essex's population had access to woodlands, and 36% of the population lived within 500m of accessible woodlands. Access to natural capital is crucial to the County's social and economic prosperity.

- Essex is one of the top 10 areas at risk of surface water flooding in the UK, and tends to experience more frequent extreme weather events due to climate change.

- As of 2017, 13,832 of Greater Essex's population lived in Air Quality Management Areas, and 22.1% of the population were inactive. This is contributing to a growing demand for health services.

1.8 Assessments by both Defra and Natural England[10] have shown that raising BNG requirement of up to 20% was not expected to have a significant effect on the financial viability of housing development. The studies, based on national figures, concluded that:

- With careful design and early consideration, onsite BNG can be delivered at little to no cost.

- When delivered onsite, BNG is usually cost-neutral.

- If BNG costs are significant, it is the landowner that will bear them rather than the developer through reduced land prices.[11]

- House prices and developer profits appear inelastic with respect to extra costs, with land prices absorbing the change.

- An increase in the BNG requirement does not need to impact the number of dwellings, as some of the net gain can be delivered offsite.

[10] Vivid Economics and Environmental Finance, Outline Business Case for a Natural Environment Impact Fund, report prepared for Defra, June 2018.
[11] In accordance with residual development appraisal methodology, all development costs including policy costs are deducted from the Gross Development Value of the scheme to arrive at the Residual Land Value, which is the maximum a developer is able to pay a landowner to acquire a development site.

- BNG is not expected to reduce the number of affordable housing units.
- It is unlikely to lead to a significant increase in existing average developer contributions.
- The level of net gain requirement makes relatively modest difference to the costs of mitigating and compensating for impacts when assessed against the more significant costs of achieving no net loss and wider development policy objectives and biodiversity requirements.
- The additional investment required to move from a 10% net gain to 20% does not mean twice the expense.

1.9 The case for a 20% BNG target in Essex has been discussed to varying extents by different Local Planning Authorities, with discussions in varying stages, from early consideration up to implementation within Local Plans. Therefore, it is hoped that the findings from this locally-based study can further inform local policy on BNG.

Wider environmental value

1.10 Environmental Net Gain remains a central part of the Government's Environmental Improvement Plan 2023[12]. This plan sets out a clear ambition to roll out BNG, aiming to enhance the built environment and ensure that habitats are left in an improved state than prior to development commencing.

1.11 The potential benefits of BNG include enhancing nature, promoting health and wellbeing, improving places, providing green jobs to support the economy, and contributing to climate change mitigation and adaptation[13]. Essex County Council's Annual Budget 2024-2025 also sets out that: "Increasing green infrastructure captures carbon, reduces flood risk, overheating and soil degradation, while supporting pollinators crucial to farming. Increasing green space for public access also benefits physical and mental health"[14].

1.12 When considering business cases for public sector investment or intervention, this value can now be monetised and quantified through various tools for aspects such as:

- Sustainable Drainage Systems (SuDS) that reduces risk of damage to property
- Mental and physical health benefits from access to nature and open space

[12] HM Government. Environmental Improvement Plan 2023. Page 9.
[13] Essex Local Nature Partnership BNG Guidance. See here
[14] Essex County Council. 2024. Annual Plan and Budget. Here

- Climate change resilience, such as droughts, heatwaves, and storms
- Improved landscape quality and heritage enhancement
- Air quality, land quality and water quality enhancements

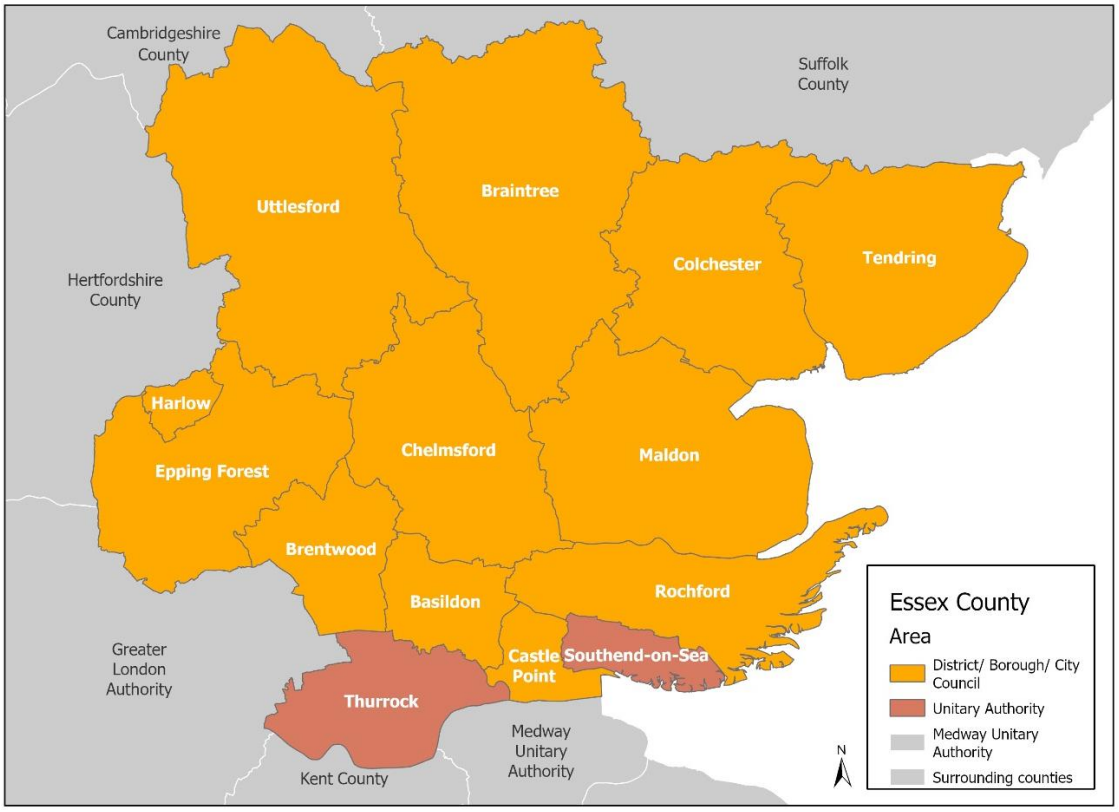
1.13 Although quantifying and monetising the benefits and costs of changes to natural capital is outside the scope of this study, and not part of the formal development viability process, it should be noted that the financial cost of implementing BNG may lead to enhanced values. We have not included a value premium associated with enhanced BNG for the purposes of this study.

Study area

1.14 This study covers Greater Essex, as shown in Figure 1-1. This includes 14 Authorities:

- Basildon Borough Council
- Braintree District Council
- Brentwood Borough Council
- Castle Point Borough Council
- Chelmsford City Council
- Colchester City Council
- Epping Forest District Council
- Harlow Council
- Maldon District Council
- Rochford District Council
- Tendring District Council
- Uttlesford District Council
- Southend-on-Sea City Council (Unitary Authority)
- Thurrock Council (Unitary Authority)

Figure 1-1: Study area map



Source: SQW, 2024

Report structure

1.15 This report follows the structure set out below:

Chapter 2 – Policy context

Here we consider the National Planning Policy Framework (NPPF), Planning Practice Guidance (PPG); National BNG legislation and guidance, and National Policy Statements and guidance for NSIPs.

Town and Country Planning Act 1990 (as amended) (TCPA90)

Chapter 3 – Methodology

This section sets out our methodology used to assess the viability of

	development and the viability impact of enhanced BNG.
Chapter 4 – Development typologies	Here we set out our development typologies and accompanying assumptions around BNG.
Chapter 5 - Value inputs and assumptions	We provide evidence and conclude on development value inputs and underlying assumptions.
Chapter 6 – Cost inputs and assumptions	We provide evidence and conclude on development cost inputs and underlying assumptions.
Chapter 7 – Viability testing results	In this section, we set our viability results from our modelling alongside sensitivity testing

Planning Act 2008 (as amended) (PA2008) for Nationally Significant Infrastructure Projects (NSIPs)

Chapter 8 – Norwich to Tilbury Case Study	In this section, we focus on the Norwich to Tilbury case study.
Chapter 9 – Overview of NSIPs in Essex and the broader perspective	This section sets out our methodology used to analyse NSIPs and the analysis of the 10 other NSIPs in Essex.
Chapter 10 – What does this mean for BNG delivery in Essex?	This section sets out the results from our analysis and their implications
Chapter 11 – Conclusions	In this section we provide our conclusions on the viability of BNG in Essex, drawing

on key messages from our analysis of TCPA90 and PA2008 development.

Limitations of the report

1.16 The appraisals and conclusions contained within this report are intended for the purposes of informing policy and guidance formulation and to support local authority engagement in the development consent process. SQW's advice has been provided to support the authorities in policy making and in negotiation as outlined in Valuation Standards 1 of the RICS Valuation Standards - Global and UK Edition. It is not a formal "Red Book" valuation and should not be relied upon as such. Likewise, Temple has derived indicative costs per development typologies based upon a review of literature, experience of projects and professional judgement.

1.17 SQW and Temple accept no liability to any party other than ECC and ELNP.

RICS practice statement

1.18 Our study has been carried out in accordance with the RICS Financial Viability in Planning: Conducts and Reporting Professional Standard, May 2019, as such we confirm the following:

- **Objectivity, impartiality and reasonableness:** Throughout this commission from appointment to completion at all times we have acted with objectivity, impartially and without interference when carrying out our viability assessment. We can confirm that no performance-related fees have been paid in relation to this commission.

- **Conflicts of interest:** we confirm that we have no conflict of interest in providing this advice and we have acted independently and impartially.

2. Policy context

2.1 Though this is not a plan-wide viability assessment, our method and approach have been informed from national primary legislation and national, and local planning policy and guidance as closely as possible. This is important because ELNP can play a key role in encouraging Local Planning Authorities to amend policy to require 20% BNG.

2.2 We have reviewed the key sections in the relevant documents below, starting with the National Planning Policy Framework (NPPF) and associated viability Planning Practice Guidance (PPG). The revised NPPF was first published in July 2018 and was subsequently updated in February 2019, July 2021, September 2023 and December 2023. The PPG is continually updated with the most recent revisions to the viability section in February 2024.

2.3 We have also considered the relevant sections of the Environment Act (2021) in relation to BNG, Local Authority biodiversity policy and the Government's Environmental Improvement Plan 2023.

2.4 In terms of NSIP legislation and policy, we have reviewed The Planning Act 2008 (PA2008), the National Infrastructure Strategy 2020, The Environment Act 2021 (Section 99 and Schedule 15), the Government's NSIP Reform Action Plan (2023), and National Policy Statements (NPSs).

NPPF

2.5 The NPPF details the Government's planning objectives for England and how these should be applied. It also provides a framework within which locally prepared plans for housing and other development can be produced.[15]

2.6 It confirms the importance of the development plan in the decision-making stages through planning applications. The NPPF states that it should be followed when local plans are being prepared and that it should be a material consideration in planning decisions.[16]

2.7 The December 2023 revision of the NPPF focuses on deliverability which is demonstrated in the following sections:

[15] MHCLG, NPPF, July 2021, para 1
[16] MHCLG, NPPF, July 2021, para 2

Development contributions

2.8 Paragraph 34: 'Plans should set out the contributions expected from development. This should include setting out the levels and types of affordable housing provision required, along with other infrastructure (such as that needed for education, health, transport, flood and water management, green and digital infrastructure). Such policies should not undermine the deliverability of the plan.'

Planning conditions and obligations

2.9 Paragraph 58: 'Where up-to-date policies have set out the contributions expected from development, planning applications that comply with them should be assumed to be viable. It is up to the applicant to demonstrate whether particular circumstances justify the need for a viability assessment at the application stage. The weight to be given to a viability assessment is a matter for the decision maker, having regard to all the circumstances in the case, including whether the plan and the viability evidence underpinning it is up to date, and any change in site circumstances since the plan was brought into force. All viability assessments, including any undertaken at the plan-making stage, should reflect the recommended approach in national planning guidance, including standardised inputs, and should be made publicly available.'

Biodiversity

2.10 Paragraph 8: Achieving sustainable development seeks to achieve net gains across economic, social and environmental objectives. This includes improving biodiversity.

2.11 Paragraph 180: Planning policies and decisions should contribute to and enhance the local and natural environment by "minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks…".

2.12 Paragraph 185: plans should "identify and pursue opportunities for securing measurable net gains for biodiversity".

Viability PPG

2.13 The viability PPG is extensive and has many relevant sections which have been considered as part of our assessment. Certain excerpts have not been included in this section as they directly relate to specific inputs i.e. land value. A summary of the key passages from the PPG are as follows:

2.14 Paragraph 010 provides context around viability assessments. It states that *'viability assessment is a process of assessing whether a site is financially viable,*

by looking at whether the value generated by a development is more than the cost of developing it' […] '*in plan making and decision making viability helps to strike a balance between the aspirations of developers and landowners, in terms of returns against risk, and the aims of the planning system to secure maximum benefits in the public interest through the granting of planning permission.*'[17]

2.15 Ensuring that policy and local plans are deliverable is discussed further in the PPG and it outlines the role of stakeholders/promotors and the local planning authority.

2.16 Paragraph 002 states:

'It is the responsibility of site promoters to engage in plan making, take into account any costs including their own profit expectations and risks, and ensure that proposals for development are policy compliant. Policy compliant means development which fully complies with up to date plan policies. A decision maker can give appropriate weight to emerging policies. The price paid for land is not a relevant justification for failing to accord with relevant policies in the plan. Landowners and site purchasers should consider this when agreeing land transactions.' [18]

2.17 This is continued in paragraph 006:

'Plan makers should engage with landowners, developers, and infrastructure and affordable housing providers to secure evidence on costs and values to inform viability assessment at the plan making stage.

It is the responsibility of site promoters to engage in plan making, take into account any costs including their own profit expectations and risks, and ensure that proposals for development are policy compliant. Policy compliant means development which fully complies with up to date plan policies. A decision maker can give appropriate weight to emerging policies. It is important for developers and other parties buying (or interested in buying) land to have regard to the total cumulative cost of all relevant policies when agreeing a price for the land. Under no circumstances will the price paid for land be a relevant justification for failing to accord with relevant policies in the plan.

Where up-to-date policies have set out the contributions expected from development, planning applications that fully comply with them should be assumed to be viable. It is up to the applicant to demonstrate whether particular circumstances justify the need for a viability assessment at the application stage.'[19]

[17]MHCLG, PPG, Paragraph: 010 Reference ID: 10-010-20180724, Revision date: 24 07 2018
[18]MHCLG, PPG, Paragraph: 002 Reference ID: 10-002-20190509, Revision date: 09 05 2019
[19] MHCLG, PPG, Paragraph: 006 Reference ID: 10-006-20190509, Revision date: 09 05 2019

National BNG legislation and guidance

2.18 The NPPF sets a requirement in current national policy for the enhancement of biodiversity through the planning process where it states that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by […] minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures "…[20].

2.19 The Environment Act (2021) and the associated legislative framework introduced biodiversity gain as a condition of planning permission providing for a minimum of 10% increase in the post development biodiversity value compared to the pre-development value of onsite habitats. It applies, with limited exceptions, to all development governed by the Town and Country Planning Act from commencement in 2024 and will provide similar requirements for Nationally Significant Infrastructure Projects (NSIPs)21 when implemented. The Act came into force for TCPA applications in two phases, for large and small sites in February and April 2024 respectively, and the implementation of the requirement for NSIPs is planned for November 2025.

2.20 A BNG pre-commencement condition will now be attached to planning permissions. This means that once permission is granted, a biodiversity gain plan must be submitted and approved by the Local Planning Authority before the commencement of development. From here, the developer must implement the plan using onsite or offsite measures, or by exception and as a last resort purchasing statutory credits at a ratio of two credits for each biodiversity unit (BU). The Environment Act (2021) sets out a requirement for relevant authorities to develop local nature recovery networks and additionally provides mechanisms supporting conservation actions for the public good through the creation of conservation covenants. This provision in part supports the development of an offsite biodiversity unit market, which applies where development cannot achieve the target net gain onsite. As a last resort, it also provides for biodiversity units to meet the biodiversity gain objective where onsite and offsite delivery is unfeasible.

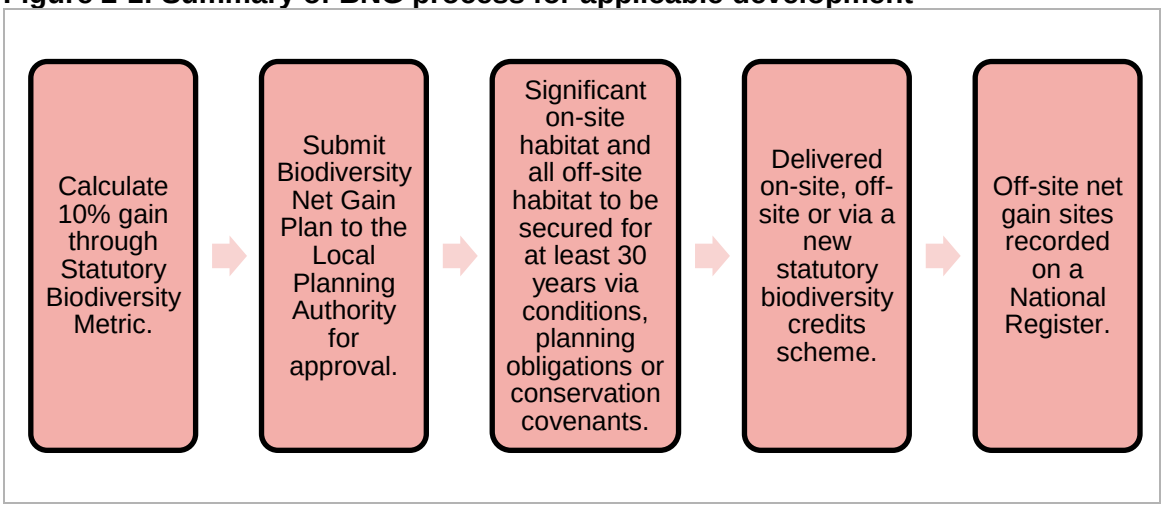
2.21 Significant onsite enhancements are areas providing significant uplift compared to the pre-development baseline, including medium or higher distinctiveness habitats, large changes in biodiversity units or large areas of habitat creation or enhancement. Once onsite options for delivering biodiversity net gain have been

[20] MHCLG, NPPF, July 2021, para 174
[21] Exemptions are set out within: The Biodiversity Gain Requirements (Exemptions) Regulations 2024

exhausted offsite biodiversity gains provided by registered providers and / or sites can be considered.

2.22 In cases with offsite or significant onsite gains, habitats must be managed and maintained for a minimum of 30 years. These responsibilities will be set out in a legal agreement. Offsite gains must also be registered on the public biodiversity gain sites register[22].

Figure 2-1: Summary of BNG process for applicable development



Source: Information adapted by SQW from PAS, 2024

2.23 BNG uses a standardised metric to assess impacts on biodiversity by using habitats as a proxy for biodiversity value. This is measured through the Statutory Biodiversity Metric, on which the Department for Environment, Food and Rural Affairs (DEFRA) published guidance in November 2023 and subsequently updated in February 2024[23]. The metric was used voluntarily for several years by professionals in the planning system, with previous versions published by Natural England. The tool assigns values to habitats by calculating four factors (Habitat size, distinctiveness, condition and location/strategic significance), which are multiplied by habitat areas to provide a score in 'biodiversity units'. Post-development habitats are evaluated in the same way, also taking account of additional factors in relation to time and difficulty of creation to provide a biodiversity unit score. This can be compared to the baseline score to produce a measure of BNG. The DEFRA Guidance also provides a simplified small sites metric, which can be used for small development, unless exempt[24].

2.24 Planning practice guidance on biodiversity net gain sets out expectations around how BNG should be applied through the planning process including practical guidance for applicants on submission requirements. The PPG's BNG chapter was

[22] DEFRA. 2024. Guidance: Understanding biodiversity net gain.
[23] DEFRA. 2024. Guidance: Statutory biodiversity metric tools and guides
[24] DEFRA. 2024. Guidance: Statutory biodiversity metric tools and guides

also updated in May 2024, to coincide with the introduction of the 10% requirement[25]. This sets out guidance for land managers, developers and Local Planning Authorities, on matters such as how BNG is applied and monitored through the planning process and which development are exempt. It also states that DEFRA's statutory tool should be used to calculate biodiversity value.

2.25 The PPG also provides specific advice for plan-makers of direct relevance to this report noting that where higher percentages above the statutory objective of 10% are sought "to justify such policies they will need to be evidenced including as to local need for a higher percentage, local opportunities for a higher percentage and any impacts on viability for development. Consideration will also need to be given to how the policy will be implemented."

2.26 In order to support small developers, non-profit organisation Future Homes Hub and the Local Government Associations Planning Advisory Service launched 'BNG Online' in April 2024[26]. This is a free digital resource which provides practical guidance to small developers on how to plan and manage BNG.

[25] Gov.UK. 2024. Guidance: Biodiversity net gain.
[26] Future Homes Hub and Planning Advisory Service. 2024. BNG Online. Here

Nationally Significant Infrastructure Projects (NSIPs)

2.27 A Nationally Significant Infrastructure Project (NSIP) is a large-scale development over a specific threshold that the government considers to be of national importance. Like its neighbouring counties Suffolk and Norfolk, Essex has specific natural and geographic advantages which make it an optimal location for NSIPs, particularly in relation to transport and energy.

2.28 NSIPs do not require planning permission from the local authority and the project promoter must make an application to the Planning Inspectorate (PINS) for a different type of permission called 'development consent'. An application for development consent is examined by PINS and a recommendation is made to the relevant Secretary of State (SoS), who will make the final decision.

2.29 An NSIP is primarily determined in accordance with National Policy Statements (NPS) that provide the planning policy framework for different types of nationally significant infrastructure. Development consent is often made in the form of a statutory instrument known as a Development Consent Order (DCO). The Planning Act 2008 (PA2008) provides the consenting regime for NSIPs[27].

2.30 The role of Essex CC in the development consent process is as an important statutory consultee, making representation on behalf of Essex. Any representation Essex CC or any host local authority makes in relation to an NSIP is a material consideration in the determination of an application by the SoS for development consent.

2.31 As set out in the Levelling Up and Regeneration Act 2023[28], Energy Act 2023[29] and National Infrastructure Strategy (2020)[30], the Government are seeking to make it faster, fairer and greener to gain consent for NSIPs[31]. In 2023, DLUHC produced a cross-government policy paper setting out a series of reforms to improve the planning system for NSIPs[32]. This set out a series of concerns surrounding the increasing time taken for DCO's to be granted; rises in extensions of time for project decisions; increasing documentation requirements and administrative burdens; and increases in the numbers of decisions successfully being legally challenged.

[27] Legislation.gov. Planning Act. 2008. Available here
[28] Legislation.gov. Levelling Up and Regeneration Act. 2023. Available here
[29] Legislation.gov. Energy Act. 2023. Available here
[30] HM Treasury. National Infrastructure Strategy. 2020. Available here
[31] Department for Levelling Up, Housing & Communities. 2023. Nationally Significant Infrastructure: action plan for reforms to the planning process
[32] Department for Levelling Up, Housing & Communities. 2023. Nationally Significant Infrastructure: action plan for reforms to the planning process

2.32 The Government has published National Policy Statements (NPSs), as defined under Section 65 of PA2008[33], which comprise the Government's objectives for the development of nationally significant infrastructure in a particular sector and state. They provide the framework within which Examining Authorities make their recommendations to the Secretary of State regarding decisions on NSIP applications, including reasons for the policy set out in the statement and an explanation of how the policy takes account of government policy relating to the mitigation of, and adaptation to, climate change, and how this will contribute to sustainable development. There are currently six NPSs for energy, prepared by the Department for Energy Security and Net Zero, three transport NPSs, produced by the Department for Transport, and three NPSs for water and waste, produced by the Department for Environment, Food and Rural Affairs.

2.33 Reform 3 of the Government's NSIP Action Plan sets out an ambition to realise better outcomes for the natural environment[34]. Paragraph 4.7 of the document states that BNG requirements will be incorporated for all NSIPs from November 2025. The application of BNG to NSIPs was first introduced in The Environment Act in 2021, which amended Section 103 to 105. A new Schedule 2a has also been inserted into The PA2008 to reflect the new BNG requirements. Schedule 15 of the Environment Act 2021 contains provisions which, when commenced, mean the Secretary of State may not grant an application for a Development Consent Order unless satisfied that a biodiversity gain objective is met in relation to the onshore development in England to which the application relates.

2.34 The biodiversity gain objective will be set out in a biodiversity gain statement (as defined under the Environment Act 2021[35]). Normally these statements would be included within an NPS, but the Act allows for the statement to be published separately where a review of an NPS has begun before the provisions are commenced. The mechanism of biodiversity gain statements allows for the biodiversity gain objective and calculation method to be set out for different types of NSIP, including allowance for offsite biodiversity gain and biodiversity units.

2.35 Whilst the biodiversity gain statements (and associated biodiversity gain objectives) are yet to be published, the existing NPSs do contain some initial guidance on the application of BNG to relevant NSIPs.

2.36 UK Government stated in February 2024 that "We have committed to BNG applying to NSIPs from November 2025. To support their readiness, we will consult on the

[33] Legislation.gov. Planning Act. 2008. Available here
[34] Department for Levelling Up, Housing & Communities. 2023. Nationally Significant Infrastructure: action plan for reforms to the planning process
[35] Legislation.gov. Environment Act 2021. Available here

biodiversity gain statement[s] in March 2024 and publish a final version, alongside further NSIP guidance, in September 2024"[36].

2.37 The Government's response to their consultation on BNG[37] includes an indication of their intentions in relation to NSIPs. The intent is for BNG to apply to all NSIPs (further regulations being required for marine projects) and to keep the approach broadly similar to TCPA90 development, completing a metric and biodiversity gain plan and applying a biodiversity site register for offsite gains (offsetting[38]). For NSIPs with mitigation areas within the project boundary, the Government does not intend to make a distinction between these mitigation areas and other onsite habitats (which are subject to BNG). The period for which gains must be secured will be set out in the relevant biodiversity gain statement but will be a minimum of 30 years, in line with the TCPA90 consenting regime.

2.38 The RTPI published a response to the Department for Environment Food and Rural Affair's (DEFRA) consultation on BNG in 2022. Questions 17 onwards covered guidance in relation to BNG and NSIPs, and Part 3 of the document Sectoral concerns

2.39 Following the announcement of these BNG requirements for TCPA90 development and NSIPs, there has been concern across the built environment sector surrounding the lack of guidance. The National Audit Office has raised concerns that the requirements are being launched without the necessary elements for their implementation. Echoing such concerns, the RTPI reported that as of February 2024, 81% of planners in the public sector needed further "guidance, advice, and support"[39]. Additionally, 68% of all planners needed more staff and skills, and 61% required more case studies of best practices.

2.40 The RTPI have raised concerns with the application of BNG for development under the Town and Country Planning Act 1990[40]. They caution that requiring a BNG Plan to be submitted after planning permission has been granted might pose challenges to planners, as biodiversity will have already been a key consideration in the

[36] Government Environment Blog – The Biodiversity Net Gain Statutory Instruments explained: https://defraenvironment.blog.gov.uk/2023/11/29/the-biodiversity-net-gain-statutory-instruments-explained/
[37] BNG consultation outcome: Government response and summary of responses https://www.gov.uk/government/consultations/consultation-on-biodiversity-net-gain-regulations-and-implementation/outcome/government-response-and-summary-of-responses
[38] Offsetting being the delivery of offsite biodiversity enhancements to provide biodiversity gain equivalent to any shortfall in biodiversity units required to achieve the biodiversity objective of the scheme.
[39] RTPI. 2024. RTPI echoes National Audit Office's concerns over lack of support for Biodiversity Net Gain implementation. here
[40] RTPI. 2022. Final RTPI response BNG regulations and implementation. Here

officers' prior assessments. They consider it counterproductive to approve an application without prior evidence that it can deliver a 10% BNG.

2.41 The RTPI also identifies a need for more detailed guidance and plans regarding the development of a local market for biodiversity land, as these will be crucial for the delivery of Biodiversity Plans where offsite delivery is required. They caution that currently, no equivalent market of this nature exists.

2.42 The document also raises a series of other concerns in relation to the proposals around habitat banking and the complexities associated with calculating additionality, such as differentiating between measures that protect existing biodiversity and those that deliver BNG. The RTPI has also called for more clarity regarding the type and level of information collected to monitor BNG, and how this might impact Local Authority resourcing and capacity.

2.43 The Chartered Institute of Ecology and Environmental Management (CIEEM) has shared that whilst they welcome the application of BNG to NSIPs, they believe the Government should expedite the implementation before November 2025[41]. This is because NSIPs are often the most damaging to the environment and have the largest budgets. CIEEM also advocates for BNG requirements extending beyond 10%, and the 30-year maintenance. CIEEM also raise concerns the metric must take into account the longer delivery timeframes which characterise NSIPs. For example, they note that 'temporary' habitat losses are likely to be present for several years.

[41] CIEEM. Biodiversity Net Gain Regulations and Implementation. 2022. Here

Town and County Planning Act 1990 (as amended) (TCPA90)

3. Methodology

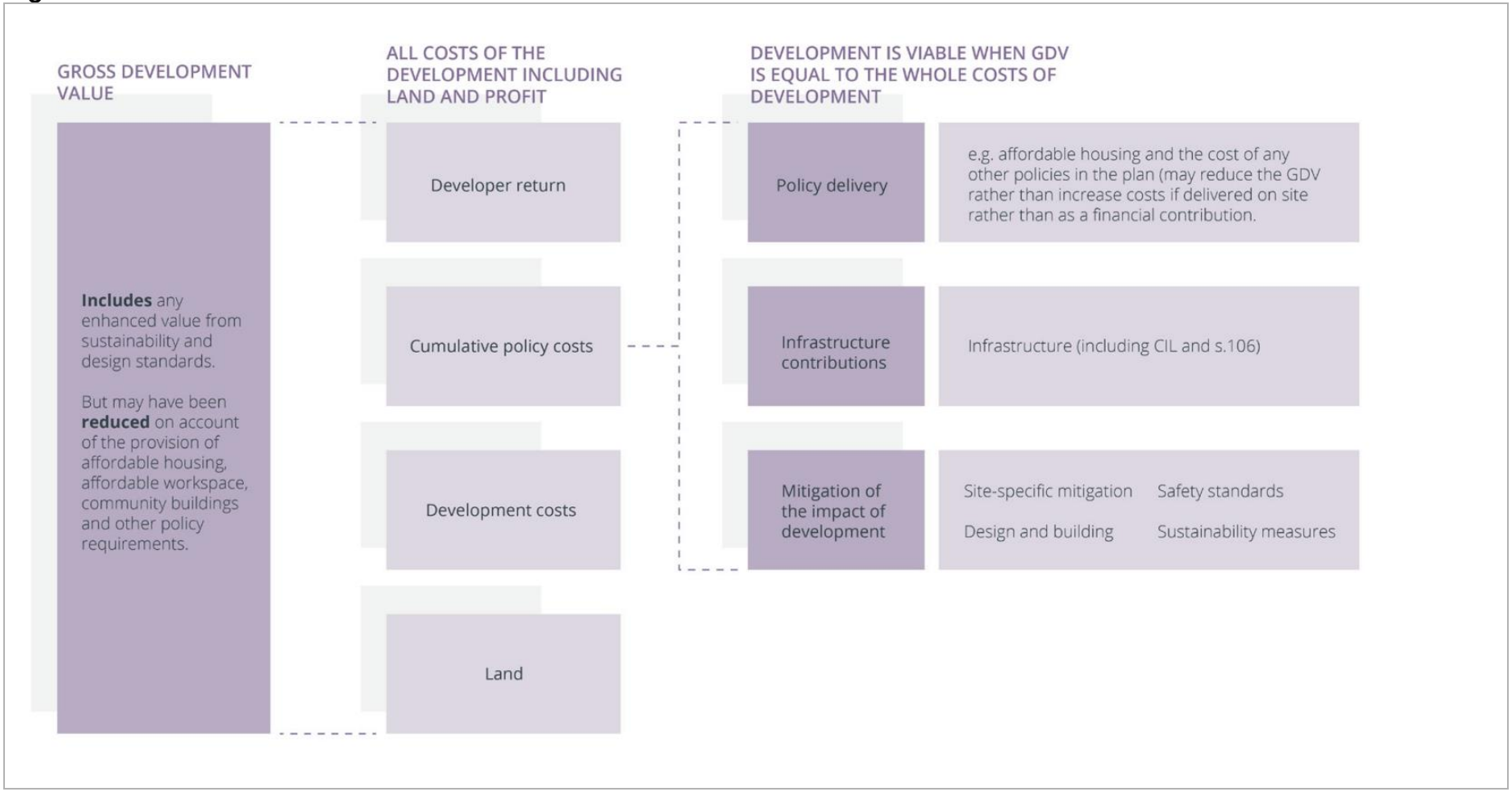
3.1 In this section of the report, we set out our methodology to establish the potential viability impact of increasing the BNG objective to at least 20% in Essex for TCPA90 development. We have outlined both the approach to viability testing and to estimating different costs and land take requirements for varying levels of BNG.

Viability principles

3.2 In principle, all planning gain will be deducted from the uplifted land value once planning permission is granted. In short, for financially viable development, the value of the land usually increases significantly once planning permission is granted when compared to the pre-permission state. Some of this increase in value goes to provide planning policy contributions, including affordable housing and S106/CIL, rather than to the landowner. When policies are being set it is important that a balance is struck to ensure that development remains viable. It is therefore critical not to take a one size fits all approach and that viability is understood on an individual site basis when possible.

3.3 We rely on a residual value approach to calculate viability and draw conclusions to whether there is additional surplus for planning gain. Figure 3-1 below shows the residual valuation framework set out by the RICS in their *Assessing viability in planning under the National Planning Policy Framework 2019 for England* (2021).

Figure 3-1: Residual valuation framework

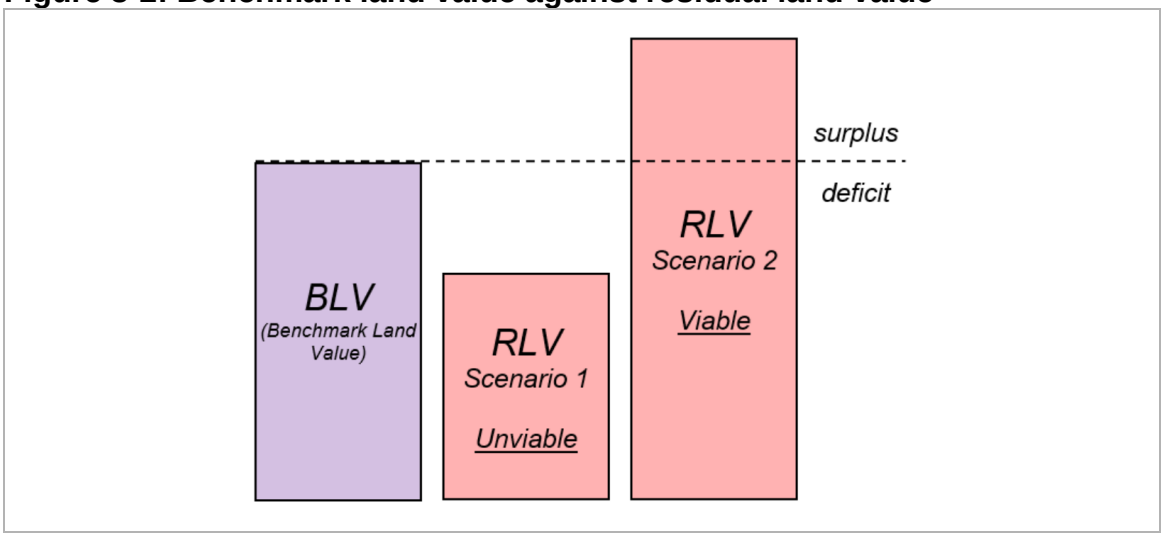


Source: RICS, 2021

3.4 We consider a scheme to be viable if the total gross development value (GDV) is more than the total development costs of the scheme. The total development costs include land costs, build costs, developers' profit, planning obligations and interest. If the sum of all cost elements listed exceeds the GDV then we consider the scheme to be unviable.

3.5 In order to advise on the ability of development to support an increase in BNG we have benchmarked the residual land value (RLV) from the viability analysis against a suitable benchmark land value (BLV). The BLV represents the minimum land value a reasonable land owner would require for the site to make it available for development. There is established guidance on calculating BLV that we have applied. If the RLV exceeds the BLV then the scheme is viable and produces a surplus you can see this illustrated in Figure 3-2.

Figure 3-2: Benchmark land value against residual land value



Source: SQW, 2021

Viability approach for this study

3.6 Essex is a large geographical area making viability testing challenging, as there are numerous variations in planning policy, market dynamics and the nature of development sites. There is an accepted methodology for testing emerging local plans for development viability and as we have outlined, we have followed this reasonably closely.

Typology based approach

3.7 In Local Plan viability testing a typology approach to viability testing is used and we have applied a similar approach here. Essentially a range of development typologies have been determined to best represent the type of development that is likely to come forward in the area. This approach allows viability to be tested for an

area without testing every individual site. Unlike in Local Plan viability testing, we have not tested strategic sites separately because there are too many across all 14 LPAs and it is not within the scope of this study. We have ensured that our typologies include larger sites to ensure they are considered.

3.8 In devising our typologies we have reviewed allocations in adopted and emerging Local Plans, existing Local Plan viability evidence bases and our own understanding of the market. Though as part of a Local Plan viability assessment, a quantitative assessment of proposed allocations can be undertaken, due to the strategic nature of this study this has not been possible. Our typologies are outlined in detail later in this report.

Development appraisal inputs – costs and values

3.9 The NPPF outlines that you do not have to use inputs which relate to specific sites and that standardised inputs are reasonable, *'All viability assessments, including any undertaken at the plan-making stage, should reflect the recommended approach in national planning guidance, including standardised inputs, and should be made publicly available.'*[42].

3.10 For plan-wide testing, national viability guidance states that '*For broad area-wide or site typology assessment at the plan making stage, average figures can be used, with adjustment to take into account land use, form, scale, location, rents and yields, disregarding outliers in the data. For housing, historic information about delivery rates can be informative.'*[43]

3.11 It is standard practice in plan-wide assessments to create a range of value zones across a local authority area to test the different values that can be achieved geographically. In this assessment, the geographical area is too large and creating value zones in this way would be confusing and may end up contradicting what has already been established in existing local plan evidence bases. Instead, we have tested a range of values through sensitivity analysis with the range informed by our market research.

3.12 Regarding development costs the PPG states that these should be reflective of the local market. Costs should be bespoke for the local area and take into account any local specific costs where possible. In this assessment, we have looked at costs over the whole study area and have sensitivity tested them using an evidence-based range in a similar fashion to values.

[42] MHCLG, NPPF, July 2021, paragraph 58
[43] MHCLG, PPG, Paragraph: 011 Reference ID: 10-011-20180724, Revision date: 24 07 2018

Planning policy costs

3.13 By planning policy costs we mean CIL, S106 and affordable housing costs. When undertaking a strategic viability assessment for local plan assessment purposes you would directly be testing the emerging planning policies. As we are considering a wide study area we have taken a view on the general level of these policy costs throughout the region. For example, we have assumed a starting point for affordable housing by considering all local plan policies and have sensitivity-tested this input in a similar way to costs and values.

3.14 BNG has been considered separately as this is the focus of this assessment. Our method regarding BNG costing is set out later in this document.

Benchmark land value (BLV) methodology

3.15 One of the most challenging inputs in any viability assessment is BLV (also referred to as threshold land value) and in recent years there has been much discussion around different methods of determining it. In this assessment, BLV is an even more challenging input to establish due to the large geographical area. To determine our BLV we have considered the secondary evidence presented in individual LPAs local plan viability assessments.

3.16 The primary approach for assessing the BLV is the existing use plus a premium (EUV+), or alternative use value (AUV) where appropriate as suggested in the PPG and the recently published RICS viability guidance[44]. For this study, AUV is not used as the AUV will have to be supported by evidence of the costs and values of the alternative use on an individual site basis. The PPG states in regards to existing use plus premium:

'To define land value for any viability assessment, a benchmark land value should be established on the basis of the ***existing use value (EUV) of the land, plus a premium*** *for the landowner. The premium for the landowner should reflect the minimum return at which it is considered a reasonable landowner would be willing to sell their land. The premium should provide a reasonable incentive, in comparison with other options available, for the landowner to sell land for development while allowing a sufficient contribution to fully comply with policy requirements. Landowners and site purchasers should consider policy requirements when agreeing land transactions. This approach is often called 'existing use value plus (EUV+)'.*[45]

[44] RICS, March 2021, Assessing viability in planning under the National Planning Policy Framework 2019 for England
[45] MHCLG, 05 May 2019, PPG, Paragraph: 013 Reference ID: 10-013-20190509

3.17 The PPG goes on to outline what should be taken into account when determining BLV:

- *'be based upon existing use value*
- *allow for a premium to landowners (including equity resulting from those building their own homes)*
- *reflect the implications of abnormal costs; site-specific infrastructure costs; and professional site fees'*

'Viability assessments should be undertaken using benchmark land values derived in accordance with this guidance. ***Existing use value should be informed by market evidence of current uses****, costs and values.* ***Market evidence can also be used as a cross-check of benchmark land value but should not be used in place of benchmark land value.*** *There may be a divergence between benchmark land values and market evidence; and plan makers should be aware that this could be due to different assumptions and methodologies used by individual developers, site promoters and landowners.*

This evidence should be based on developments which are fully compliant with emerging or up to date plan policies, including affordable housing requirements at the relevant levels set out in the plan. Where this evidence is not available plan makers and applicants should identify and evidence any adjustments to reflect the cost of policy compliance. This is so that historic benchmark land values of non-policy compliant developments are not used to inflate values over time.

In plan making, the landowner premium should be tested and balanced against emerging policies. In decision making, the cost implications of all relevant policy requirements*, including planning obligations and, where relevant, any Community Infrastructure Levy (CIL) charge should be taken into account.'* [46]

3.18 Determining an appropriate level of premium can be difficult and there is no accepted method. The PPG states *'The premium should provide a reasonable incentive for a land owner to bring forward land for development while allowing a sufficient contribution to fully comply with policy requirements.*

Plan makers should establish a reasonable premium to the landowner for the purpose of assessing the viability of their plan. This will be an iterative process informed by professional judgement and must be based upon the best available evidence informed by cross sector collaboration.' [47]

[46] MHCLG, 09 May 2019, PPG, Paragraph: 014 Reference ID: 10-014-20190509
[47] Ibid

3.19 We must also consider the balance between the different interests of stakeholders i.e. developers, landowners and the local planning authority: *'to secure maximum benefits in the public interest through the granting of planning permission.'*[48]

3.20 We have taken into account a number of factors when determining an appropriate level of premium these include:

- **RICS Assessing viability in planning under the National Planning Policy Framework 2019 – published March 2021 effective from July 2021.** The RICS guidance states: *"There is no standard amount for the premium and the setting of realistic policy requirements that satisfy the reasonable incentive test behind the setting of the premium is a very difficult judgement."*[49]. The guidance goes on to state *"For a plan-making FVA, the EUV and the premium is likely to be the same for the same development typology, but it would be expected that a site that required higher costs to enable development would achieve a lower residual value. This should be taken account of in different site typologies at the plan-making stage."*[50]

- **The Harman Report**[51] - now over 10 years old, this report was introduced alongside the 2012 NPPF to provide guidance around viability in the planning system as it became a greater consideration. Because of its age, the Harman Report does not align with the most recent PPG which advocates for the use of EUV plus premium as the single approach to benchmark land value. This being said the Harman Report does state that future policy will impact land values and landowners' expectations must adjust. The Harman Report is consistent with more recent guidance and does suggest that market values for land can be used as a 'sense check' though should not solely be relied upon to determine BLV. An interesting observation the Harman Report makes is that the fact that on large strategic sites landowners are likely to be able to take a very long term view when disposing of their assets. The reality is that when large amounts of greenfield land are sold it is usually a 'once in a lifetime' opportunity and landowners will often be family trusts or institutions that have held the land for a long period of time. To reflect these facts landowners on greenfield sites will expect a significantly higher premium than urban located brownfield sites.

- **HCA Area-wide Viability Model –** in Appendix 1 Transparent Viability Assumptions the document provides guidance on the amount of appropriate premium to apply. This piece of evidence is now dated though it is still useful to

[48] MHCLG, 24 July 2018, PPG, Paragraph: 010 Reference ID: 10-010-20180724
[49] RICS, March 2021, Assessing viability in planning under the National Planning Policy Framework 2019 for England . Paragraph 5.3.3
[50] Ibid paragraph 5.3.7
[51] Local Housing Delivery Group Chaired by Sir John Harman, 20 June 2012, Viability Testing Local Plans, Advice for planning practitioners

consider. The guidance states '*Benchmarks and evidence from planning appeals tend to be in a range of **10% to 30% above EUV in urban areas**. For greenfield land, benchmarks tend to be in a range of **10 to 20 times agricultural value**'.*

- **North Essex Authorities EIP – letter from the planning inspector -** A total of three garden communities in Essex were included in the local plan providing a significant amount of housing growth. The key area of interest in this letter is the consideration the planning inspector gave to the premium element of the land value in the viability assessment. The EUV included in the assessment was £10,000 per gross acre of agricultural land. The inspector determined that a premium of 10x would be sufficient to incentivise a landowner to release the land for development. The letter states, '*the necessarily substantial requirements of the Plan's policies' a price 'below £100,000/acre could be capable of providing a competitive return to a willing landowner'.59 The Inspector, however, judged that 'it is extremely doubtful that, for the proposed GCs, a land price below £50,000/acre – half the figure that appears likely to reflect current market expectations – would provide a sufficient incentive to a landowner. The margin of viability is therefore likely to lie somewhere between a price of £50,000 and £100,000 per acre.*'[52]

- **Planning appeal Land at Warburton Lane, Trafford (Appeal Ref: APP/Q4245/W /19/3243720) -** This planning appeal considered a greenfield development site where one of the main areas of disagreement was land value. The appeal was dismissed and the inspector agreed with the approach taken by the local authority. The council applied an EUV for agricultural land of £8,000 per acre to which a premium of x10 was applied though only to the net developable area of 33.75 acres. The undeveloped area of the site had only an EUV of £8,000 applied to it with no premium. The total benchmark land value equated to £2,900,00 against a total site area of 62 acres (25 hectares). The blended land value was therefore £46,945 per gross acre which equates to a 5.9x multiplier on the agricultural existing use value of £8,000 per acre.

3.21 The North Essex decision is interesting as it demonstrates that there is no fixed acceptable level for landowner premium. In fact, the premium could lie within a range which will vary based on the viability of the scheme when all costs are taken into account. When setting landowner premium it is important to not set it too high at the expense of planning obligations, or set it too low and risk the site not coming forward for development.

[52] Planning Inspectorate,15 May 2020, Examination of the Shared Strategic Section 1 Plan - North Essex Authorities, Paragraph 204

Approach to viability modelling

3.22 We have produced a bespoke Excel model to undertake our testing. Our model calculates the assumed BLV and includes it in the appraisal rather than using it as a separate benchmark. Therefore, as land value is taken into account in the development appraisal as a cost (and so is developer's profit) any residual value in excess of £0 constitutes viable development.

3.23 As we have noted above we have undertaken in depth sensitivity testing. This has allowed us to understand the viability of a range of values, costs and policy contributions across the region. We have used this sensitivity analysis to work out what levels costs and values need to be at to produce a viable scheme. Figure 3-3 below is a sensitivity table for costs and values. The examples show that at £410 psf, residential sale values, the development is viable, with build costs at £1,500 psm, but if build costs rise to £1,600 psm values need to be at least £430 psf to produce a viable scheme.

Figure 3-3: Example sensitivity test – residual land value in excess of BLV for residential GDV vs build costs

		Build cost £psm				
		£1,500	£1,525	£1,550	£1,575	£1,600
GDV £psf	£320	- 380,108,428	- 400,487,430	- 420,866,432	- 441,245,434	- 461,624,436
	£330	- 325,609,626	- 345,988,628	- 366,367,630	- 386,746,633	- 407,125,635
	£340	- 272,335,849	- 292,243,071	- 312,622,073	- 333,001,075	- 353,380,077
	£350	- 221,775,716	- 240,859,378	- 260,264,020	- 279,894,795	- 299,799,173
	£360	- 175,121,639	- 192,658,247	- 210,687,931	- 229,276,325	- 248,397,716
	£370	- 132,556,718	- 148,655,646	- 165,321,683	- 182,479,361	- 200,063,837
	£380	- 93,294,123	- 108,585,744	- 124,048,252	- 139,742,685	- 155,907,127
	£390	- 55,530,454	- 70,266,841	- 85,224,730	- 100,384,925	- 115,700,803
	£400	- 20,234,947	- 34,545,309	- 48,949,383	- 63,537,153	- 78,332,513
	£410	14,425,451	283,099	- 13,912,718	- 28,175,788	- 42,502,638
	£420	48,702,116	34,697,579	20,641,806	6,536,855	- 7,619,097
	£430	82,678,487	68,779,332	54,840,828	40,860,533	26,836,662
	£440	116,322,984	102,563,447	88,749,324	74,871,991	60,958,325
	£450	149,624,457	135,993,682	122,313,920	108,578,878	94,793,758
	£460	182,667,789	169,111,670	155,543,041	141,931,113	128,275,025
	£470	215,596,708	202,083,395	188,550,153	175,007,347	161,443,505

Source: SQW 2024

The Baseline Biodiversity Approach to BNG

Typology BNG calculations

3.24 For each of the typologies identified, a typical baseline was determined in the form of a hypothetical development site. Areas of typical baseline habitat types were estimated with reference to previous project experience and reviews of planning applications to compare examples of similar schemes. Conditions of habitats were also estimated to represent typical sites. This stage of the process required assumptions to be made, for example, the proportion of arable land and grassland

in a greenfield site. Details of assumptions and the reasoning behind decisions made for each typology are presented in Technical Annex B. These habitat types, areas and condition values were inputted into the Statutory Biodiversity Metric Calculator to provide a score.

3.25 To determine the baseline habitat makeup of the sites, the following general assumptions were applied across all of the typologies:

- Development will be targeted on sites of lower biodiversity value, consisting typically of non-priority habitats.

- All sites are assumed to be in areas of low strategic significance for biodiversity (i.e. not in designated networks or sites and not important for maintaining or improving connectivity of strategic sites). This assumption does not materially affect the outcomes as it is applied across all pre-development and post-development habitats, so the Calculator Tool applies the same weighting to all habitat parcels. Calculations do not include consideration of linear (hedgerow) or watercourse biodiversity units. It is assumed hedgerows can be restored and enhanced within the context of the scheme, without significant additional expenditure being incurred to achieve relevant BNG targets. Achieving net gain for watercourses can be a significant challenge, which may result in material impacts on the feasibility of developing some sites. However, due to the limitations on developing within flood-risk zones and the cost associated with delivering BNG for watercourses, it is assumed for this study that the vast majority of development sites will exclude watercourses (and associated riparian zones) from their red-line boundary, thereby avoiding any requirement to consider them in delivering net gain.

3.26 Caveats have been placed on some of the typologies with regard to their baseline habitats, for the purposes of this study. Those caveats are noted below:

- Brownfield sites were assumed to be mainly bare ground with little vegetation. This was in order to differentiate them as much as possible from the greenfield site typologies. Thus they had relatively low pre-development biodiversity units. In a real-world situation, if sites become re-vegetated through lack of disturbance, they would have the potential to be more equivalent to a greenfield site in terms of pre-development habitats and biodiversity units. Additionally, brownfield sites can be very varied in terms of their vegetations and there is a potential for some sites to have mosaic vegetation habitats which would make them of high ecological value. These types of sites have been excluded from this study.

- Greenfield sites have the potential to be a lot higher in existing diversity than assumed for this study. The greenfield sites in these typologies were assumed

to be mostly arable/crop farmland but could of course be sites of much higher value, such as those including habitats of principal importance. However, as these are rarely the sites chosen for development we believe the habitat choices within this study reflect the real world value for the majority of sites in these typologies.

3.27 Post-development habitat types were determined similarly to the baseline habitats with reference to previous experience and projects. An initial suite of developed site habitats was drafted, including retention and enhancement where appropriate, taking account of the gross-to-net proportions for developed land and land available for biodiversity and public open space.

3.28 These habitat areas were then adjusted to achieve a 10% BNG, where reasonably achievable onsite within the area available, based on the given gross-to-net ratios. This mirrors the process employed in design-stage consultation in schemes being developed according to BNG principles, although in real schemes, the 10% figure should be taken as a minimum rather than a target. Where 10% BNG is not reasonably achievable, the highest reasonable final biodiversity score has been used. The process of revising the post-development habitats has then been repeated to deliver a net gain of 20% where reasonably achievable onsite.

3.29 Where the net gain does not reach the given target percentage, the shortfall of biodiversity units was reported to inform the estimated cost of delivering the difference through offsite provision[53].

3.30 For determining the post-development makeup of the sites, it was assumed across all of the typologies that the mitigation hierarchy will be applied through the design of schemes, such that features of ecological value are retained as far as possible and development areas are located on habitats of lower biodiversity value.

3.31 Specific assumptions for each typology are detailed in Technical Annex B.

Habitat costs

3.32 In order to estimate costs for delivery of BNG for each of the typologies onsite, costs per hectare were applied to the habitat creation, management and monitoring requirements over an assumed 30-year period, outlined in the net gain calculations. This required identifying appropriate cost values for the necessary activities and capital costs to deliver these habitat outcomes (land take costs were not included here as these are covered within the typology viability assessment).

[53] Providing improvements away from the development site, either directly by the developer, or financial contribution to a third party.

3.33 Costs were derived through an examination of previous research into habitat creation costs, including Defra Impact Assessment and the supporting Assessing the Cost of Environmental Land Management in the UK report. Alongside this evidence from previous projects carried out by Temple involving onsite habitat creation, and input from external companies and technical experts were considered.

3.34 It was found that often habitat creation cost estimates from external sources and literature reviews varied widely. This was in some part due to costs varying as to whether they included management and monitoring or not, and reflects variation in contract values including those associated with sectoral specific contracts or requirements (e.g. traffic management requirements on the roads network), as well as regional variation. For example, the Defra BNG Market Analysis Study had estimates for habitat creation costs for woodland ranging from £10,821 to £195,061. Our estimated costs fall within the mid-range for most habitats. A detailed breakdown of costs and assumptions can be found in Technical Annex B.

3.35 It should be noted that, in line with usual practice for viability assessments to use current prices to establish costs, future management and monitoring costs are not adjusted for potential inflation over the assumed 30-year management period.

Essex Developers Group consultation

3.36 As part of this commission, we shared our initial assumptions with Essex Developers Group and provided them with an opportunity to comment. This resulted in a variety of feedback on topics such as build costs and interest rates. These comments have been incorporated into our assessments and discussions regarding the final assumptions.

4. Development typologies

4.1 In this section we have set out the development typologies tested as part of our modelling. As we explained in the previous chapter using a typology-based approach is reasonable for strategic viability testing as it is not feasible to test each individual site over such a large geography.

4.2 In accordance with the brief and client instructions agreed for this commission, and reflecting budgetary constraints, we have replicated the development scenarios used for SQW's previous work on BNG in Kent[54], with only minor alterations. It was considered that these scenarios are appropriate as the form and range of TCPA90 development anticipated to come forward in Essex is considered to be broadly consistent with those typologies used for Kent. It is therefore worth noting the approach that was adopted to arrive at the scenarios.

4.3 Our preferred method of determining typologies is to undertake both qualitative and quantitative analysis of proposed allocations coming forward in an area. However, due to the fact there are numerous LPAs with local plans at different stages of the process it would have been impractical to undertake quantitative analysis of allocations (i.e. grouping together all of a similar size, development type, density etc. and taking averages of specific metrics). Instead, we took a more qualitative approach to determining typologies.

4.4 Based on our own experience of the market we devised a range of typologies. These were then considered against the emerging Local Plans to ensure that we had a suitable range of options. Because of the size of the study area with a range of different markets this method is imperfect and there will be certain developments that will come forward that will not be captured by the typologies.

4.5 But because this is a strategic study, as long as the range of typologies represents the bulk of development in the region, this is enough to advise ECC and the Local Authorities in Essex on the viability of developments with different degrees of BNG.

4.6 As the focus of this study is testing the impact of different levels of BNG we have provided some context in regard to the assumptions made around the existing use/status of this site. This is important because the first part of a BNG assessment on a specific site is considering the pre-development biodiversity score. This acts as the starting point to which a % net gain is applied. Habitat assumptions were adjusted to reflect the Essex context.

[54] SQW. 2022. Viability Assessment of Biodiversity Net Gain in Kent.

Residential typologies

4.7 We have defined the residential typologies set out in Table 4-1.

Table 4-1: Residential development typologies

No. units	Land type	Predominant unit type	Starting site gross to net	Net dev density (DPH)	Total site size (HA)
5,000	Greenfield	Houses	50.00%	35	285.71
500	Greenfield	Houses	70.00%	35	20.41
100	Greenfield	Houses	85.00%[55]	40	2.94
25	Greenfield	Houses – lower density	90.00%[55]	20	1.39
500	Brownfield	Houses	90.00%	40	13.89
100	Brownfield	Flats and Houses	95.00%	55	1.91
25	Brownfield	Flats	97.50%	100	0.26

Source: SQW, 2024

Residential development baseline habitat assumptions

4.8 Assumed baseline habitats for each of the residential typologies are shown in Table 4-2. Details and justifications behind these assumptions are provided in the Technical Annex B.

Table 4-2: Residential development baseline habitat assumptions

Habitat classification	Description	Area (Ha)
5,000 unit Greenfield		
Cropland - Cereal crops	Arable farmland – generally main habitat found on greenfield sites for development	193.00
Grassland - Modified grassland	Grazed pasture/ silage crop – secondary main habitat on greenfield sites for development.	50.7

[55] The small (25 unit) and small-medium (100 unit) greenfield sites could not reasonably deliver a 10% net gain within the baseline site area and gross to net parameters. Therefore purchase of some off-site biodiversity units has been assumed within the 10% baseline for these scenarios.

Habitat classification	Description	Area (Ha)
Urban - developed land sealed surface	Buildings and hardstanding – old barns, turning circles, tracks and storage areas	1.00
Woodland and forest - Other woodland; mixed	Managed woodland within farm ownership – large greenfield sites generally contain some form of woodland either plantation or managed/unmanaged edge habitats.	26.00
Lakes - Ponds (Non- Priority Habitat)	Existing ponds - often small ponds found on farmland surrounded by scrub.	0.01
Heathland and shrub - Mixed scrub	Mix of bramble, hawthorn, blackthorn at the edges of woodland and unmanaged margins. Scrub is usual on non-cropland areas of greenfield sites.	15.00
500 unit Greenfield		
Cropland - Cereal crops	Arable farmland – generally main habitat found on greenfield sites for development	14.16
Grassland - Modified grassland	Grazed pasture/ silage crop – secondary main habitat on greenfield sites for development.	4.00
Urban - developed land sealed surface	Buildings and hardstanding – old barns, turning circles, tracks and storage areas	0.25
Sparsely vegetated land - early successional plants and ruderal/ephemeral.	Early successional plants such as found on previously developed land as well as tall ruderal vegetation, such as nettles, thistles, willowherbs and bramble. Quite usual to find in old abandoned sites that have been left for some time, especially in areas of broken ground.	0.25

Habitat classification	Description	Area (Ha)
Woodland and forest - Other woodland; broadleaved	Managed woodland within farm ownership – large greenfield sites generally contain some form of woodland either plantation or managed/unmanaged edge habitats.	1.5
Heathland and shrub - bramble scrub	Encroaching scrub from site margins. Often bramble with additional plants from adjacent sites.	0.25
100 unit Greenfield		
Cropland - Cereal crops	Arable farmland – generally main habitat found on greenfield sites for development	2.54
Cropland - Arable field margins tussocky	Arable field margins –areas left to become slightly better habitats	0.18
Woodland and forest - Other woodland; mixed	Shelterbelt plantations at site boundary. Often left to be in poor condition due to lack of management.	0.02
Heathland and shrub - Mixed scrub	Mix of bramble, hawthorn, blackthorn at the edges of woodland and unmanaged margins. Scrub is usual on non-cropland areas of greenfield sites.	0.20
25 unit Greenfield		
Grassland - Modified grassland	Grazed pasture/ silage crop – secondary main habitat on greenfield sites for development.	1.18
Sparsely vegetated land - early successional plants and ruderal/ephemeral.	Early successional plants such as found on previously developed land as well as tall ruderal vegetation, such as nettles, thistles, willowherbs and bramble. Quite usual to find in old abandoned sites that have been left for some time,	0.01

Habitat classification	Description	Area (Ha)
	especially in areas of broken ground.	
Heathland and shrub - Bramble scrub	Encroaching scrub from site margins. Often bramble with additional plants from adjacent sites.	0.05
Woodland and forest - Other woodland; mixed	Shelterbelt plantations at site boundary. Often left to be in poor condition due to lack of management.	0.10
Urban - Vacant/derelict land/ bareground	Vehicle turning and storage areas. Also, areas where old buildings have become derelict and ground is cracked.	0.05
500 unit Brownfield		
Urban - Developed land; sealed surface	Existing buildings and hard standing. Potentially old offices or warehouses.	7.50
Urban - Vacant/derelict land/ bareground	Vehicle turning and storage areas. Also areas where old buildings have become derelict and ground is cracked.	2.00
Urban - Artificial unvegetated, unsealed surface	Broken hard standing and potentially rubble from old buildings	2.00
Urban - Introduced shrub	Previous landscape planting, often left to invade other areas of the site.	0.30
Grassland - Modified grassland	Previous amenity grassland, left to potentially become better habitat as no longer managed. Also includes current amenity grassland (i.e. sports pitches etc).	0.30
Sparsely vegetated land - early successional plants and ruderal/ephemeral.	Early successional plants such as found on previously developed land as well as tall ruderal vegetation, such as nettles, thistles, willowherbs and bramble. Quite usual to find in old abandoned sites that	0.7

Habitat classification	Description	Area (Ha)
	have been left for some time, especially in areas of broken ground.	
Heathland and shrub - Mixed scrub	Mix of bramble, hawthorn, blackthorn at the edges of woodland and unmanaged margins. Scrub is usual on non-cropland areas of greenfield sites.	0.20
Woodland and forest - Other woodland; mixed	Shelterbelt plantations at site boundary. Often left to be in poor condition due to lack of management.	0.45
Lakes - Ponds (Non- Priority Habitat)	Existing pond, or old SUDS feature, often in poor condition with potential for old ponds to have become polluted/silted up.	0.05
Sparsely vegetated land - early successional plants and ruderal/ephemeral.	Early successional plants such as found on previously developed land as well as tall ruderal vegetation, such as nettles, thistles, willowherbs and bramble. Quite usual to find in old abandoned sites that have been left for some time, especially in areas of broken ground.	0.39
Grassland - Other neutral grassland	Road verges at the edge of the site. May have been previously seeded and then left to go wild. Also includes old gardens and recreation grounds derived from older grassland and not impacted by agriculture or landscaping.	0.39
100 unit Brownfield		
Urban - Vacant/derelict/ bare ground	Vehicle turning and storage areas. Also areas where old buildings have become derelict and ground is cracked.	0.1

Habitat classification	Description	Area (Ha)
Urban - Developed land sealed surface	Existing buildings and hard standing. Potentially old offices or warehouses.	1.40
Urban - Built linear features	Access road, old potentially poor condition	0.36
Heathland and shrub - Bramble scrub	Encroaching scrub from site margins. Often bramble with additional plants from adjacent sites.	0.03
Sparsely vegetated land - early successional plants and ruderal/ephemeral.	Early successional plants such as found on previously developed land as well as tall ruderal vegetation, such as nettles, thistles, willowherbs and bramble. Quite usual to find in old abandoned sites that have been left for some time, especially in areas of broken ground.	0.02
25 unit Brownfield		
Vacant/derelict/Bare ground	Vehicle turning and storage areas. Also areas where old buildings have become derelict and ground is cracked.	0.03
Urban - Developed land sealed surface	Existing buildings and hard standing. Potentially old offices or warehouses.	0.23

Source: SQW, 2024

Residential development mix

4.9 To determine the appropriate development mix we used our own professional judgment and considered LPAs' housing need evidence bases.

4.10 Table 4-3 shows the development mix inputs we have applied for residential market units. To account for the higher density typologies we have varied the mix depending on the predominant housing type i.e. housing or flats. Even in the housing predominant mix, we have included a very small amount of 1-bed flats, because most LPAs housing needs evidence bases identify a need for 1-bed units. In practice, these units are rarely delivered as houses as they are too small so we have included them in our testing as flats.

Table 4-3: Residential market mix inputs

Unit type	Housing typologies mix (excluding 25 unit Greenfield)	Lower Density Housing mix (25 unit Greenfield)	Housing and flatted typology mix (100 unit Brownfield)	Flatted typologies mix (25 unit Brownfield)
1 bed flat	10%	n/a	15%	50%
2 bed flat	n/a	n/a	15%	50%
2 bed house	35%	20%	30%	n/a
3 bed house	35%	30%	30%	n/a
4 bed house	20%	50%	10%	n/a

Source: SQW, 2024

4.11 Table 4-4 shows a different mix of affordable units. We have separated the residential mixes as the need identified in the LPAs Local Plan evidence bases across Essex are generally weighted towards smaller unit types.

Table 4-4: Residential affordable mix inputs

Unit type	Housing typologies mix (excluding 25 unit greenfield)	Lower Density Housing mix (25 unit Greenfield)	Housing and flatted typology mix (100 unit Brownfield)	Flatted typologies mix (25 unit Brownfield)
1 bed flat	35%	0%	35%	50%
2 bed flat	n/a	n/a	20%	50%
2 bed house	40%	40%	20%	n/a
3 bed house	20%	40%	20%	n/a
4 bed house	5%	20%	20%	n/a

Source: SQW, 2024

Residential unit sizes

4.12 To determine appropriate inputs for residential unit sizes we have considered a range of sources including minimum space standards, unit sizes from recently completed schemes and the sizes adopted in the individual LPA Local Plan Viability assessments.

4.13 Table 4-5 below shows the national minimum space standards. None of our inputs are lower than these figures.

Table 4-5: Minimum gross internal floor areas – space standards

Number of bedrooms(b)	Number of bed spaces (persons)	1 storey dwellings	2 storey dwellings	3 storey dwellings	Built-in storage
1b	1p	39 (37)[2]			1.0
	2p	50	58		1.5
2b	3p	61	70		2.0
	4p	70	79		
3b	4p	74	84	90	2.5
	5p	86	93	99	
	6p	95	102	108	
4b	5p	90	97	103	3.0
	6p	99	106	112	
	7p	108	115	121	
	8p	117	124	130	
5b	6p	103	110	116	3.5
	7p	112	119	125	
	8p	121	128	134	
6b	7p	116	123	129	4.0
	8p	125	132	138	

Source: DLCG, 2015 - Technical housing standards – nationally described space standard

4.14 Based on the above we have adopted the unit sizes in Table 4-6 for all typologies apart from the 25-unit greenfield scenario at 20dph.

Table 4-6: Residential unit sizes

Unit type	Unit sizes
1 bed flat	60 sqm
2 bed flat	72 sqm
2 bed house	85 sqm
3 bed house	100 sqm
4 bed house	115 sqm

Source: SQW, 2024

4.15 Table 4-7 shows that we have adopted marginally higher unit sizes for the 25-unit greenfield scenario at 20dph as the density is lower than the rest of the typologies. The mix inputs have stayed the same.

Table 4-7: Lower density residential unit sizes

Unit type	Unit sizes
1 bed flat	60 sqm
2 bed flat	N/A
2 bed house	90 sqm
3 bed house	110 sqm
4 bed house	130sqm

Commercial typologies

4.16 We have also tested a range of commercial typologies as part of our viability assessment. Again, in accordance with the agreed client brief and instructions, these reflect the typologies used for the SQW Kent BNG study as again those typologies were also considered suitable in the Essex context. The commercial typologies were derived from evidence from LPAs Local Plans and supporting evidence bases – Employment Land Reviews and Local Plan Viability Assessments; we have also used our professional judgement and experience of the commercial property market.

4.17 We have devised the following mix:

- Industrial
  - Small/medium – 500 sqm @ 40% site coverage
  - Large -10,000 sqm @ 35% site coverage
- Offices
  - 1,000 sqm footprint x 2 floors 2,000 sqm total
  - 40% site coverage
  - Approx. 2,500 sqm gross

Commercial development baseline habitat assumptions

4.18 Assumed baseline habitats for each of the commercial typologies, adjusted for the Essex context, are shown in Table 4-8. Details and justifications behind these assumptions are provided in the Technical Annex B.

Table 4-8: Commercial development baseline habitat assumptions

Habitat classification	Description	Area (Ha)
Small/medium industrial, 500sqm		
Urban - Developed land; sealed surface	Existing buildings and hard standing. Potentially old offices or warehouses.	0.07
Urban - Vacant/derelict land/ bareground	Vehicle turning and storage areas. Also areas where old buildings have become derelict and ground is cracked.	0.0245
Urban - Artificial unvegetated, unsealed surface	Broken hard standing and potentially rubble from old buildings	0.01
Sparsely vegetated land - early successional plants and ruderal/ephemeral.	Early successional plants such as found on previously developed land as well as tall ruderal vegetation, such as nettles, thistles, willowherbs and bramble. Quite usual to find in old abandoned sites that have been left for some time, especially in areas of broken ground.	0.015
Heathland and shrub - Mixed scrub	Encroaching scrub from site margins. Often bramble with additional plants from adjacent sites.	0.0125
Large industrial, 10,000sqm		
Cropland - cereal	Arable farmland – generally main habitat found on sites for development	2.20
Urban - developed land, sealed surface	Existing buildings and hard standing. Potentially old offices or warehouses.	0.30
Woodland; broadleaved	Shelterbelt plantations at site boundary. Often left to be in poor condition due to lack of management.	0.20
Heathland and shrub - Mixed scrub	Encroaching scrub from site margins. Often bramble with additional plants from adjacent sites.	0.15

Habitat classification	Description	Area (Ha)
Offices, 1,000sqm		
Vacant/derelict/Bare ground	Vehicle turning and storage areas. Also areas where old buildings have become derelict and ground is cracked.	0.03
Urban - developed land, sealed surface	Existing buildings and hard standing. Potentially old offices or warehouses.	0.2
Bramble scrub	Encroaching scrub from site margins. Often bramble with additional plants from adjacent sites.	0.01
Sparsely vegetated land - early successional plants and ruderal/ephemeral.	Early successional plants such as found on previously developed land as well as tall ruderal vegetation, such as nettles, thistles, willowherbs and bramble. Quite usual to find in old abandoned sites that have been left for some time, especially in areas of broken ground.	0.01

Source: Temple. 2024

5. Value inputs and assumptions

5.1 In this section we have outlined the development appraisal inputs used to determine gross development value (GDV) for sites across Essex. We have considered several sources when determining our value inputs. For residential we have relied upon REalyse software which pulls from land registry transactions, quoting prices and EPC unit size data. For commercial we have considered comparable transactions on both CoStar and Egi databases. The market research was undertaken from January to February 2024, and the full market report can be found in Annex D. All inputs were discussed with the Essex Developers Group for feedback prior to being adopted.

Market residential

5.2 Table 5-1 sets out the individual value inputs by unit type. Due to the wide range of values across Essex, we have adopted a sensitivity analysis approach. The mid value acts as the starting point within our development appraisal – this is a value of £400 psf. for both flats and houses. We have also included the lower and higher values which will act as 'bookends' to our sensitivity testing range. For houses, the lower value assumption is £250 psf. and the higher £550 psf. Noting that flats tended to have a greater price range than houses, the lower value for flats is £150 psf. and the higher £600 psf.

5.3 As part of our sensitivity analysis we tested values at £10 psf increments to provide more granularity on the viability balance. Where viability is more challenging i.e. brownfield lower density development the increments were adjusted to £20psf because a wider range was needed in the testing.

5.4 Table 5-2 applies the same £psf values as above but applies them to the lower density small greenfield 25 unit at 20 dph scenario. The overall value per unit is higher because of larger unit sizes.

Table 5-1: Residential values – range

Unit type	Unit size (sqm)	Lower values			Mid values			Higher values		
		Unit price £	£ psm	£psf	Unit price £	£psm	£ psf	Unit price £	£ psm	£psf
1-bed flat	60	£96,900	£1,615	£150	£258,360	£4,306	£400	£387,480	£6,458	£600
2-bed flat	72	£116,280	£1,615	£150	£310,032	£4,306	£400	£464,976	£6,458	£600
2-bed house	85	£228,735	£2,691	£250	£366,010	£4,306	£400	£503,200	£5,920	£550
3-bed house	100	£269,100	£2,691	£250	£430,600	£4,306	£400	£592,000	£5,920	£550
4-bed house	115	£309,465	£2,691	£250	£495,190	£4,306	£400	£680,800	£5,920	£550

Source: SQW, 2024

Table 5-2: Low density residential values - range (only for 20dph typology)

Unit type	Unit size (sqm)	Lower values			Mid values			Higher values		
		Unit price £	£ psm	£psf	Unit price £	£psm	£ psf	Unit price £	£ psm	£psf
1-bed flat	60	£96,900	£1,615	£150	£258,360	£4,306	£400	£387,480	£6,458	£600
2-bed flat	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2-bed house	90	£242,190	£2,691	£250	£387,540	£4,306	£400	£532,800	£5,920	£550
3-bed house	110	£296,010	£2,691	£250	£473,660	£4,306	£400	£651,200	£5,920	£550
4-bed house	130	£349,830	£2,691	£250	£559,780	£4,306	£400	£769,600	£5,920	£550

Source: SQW, 2024

Affordable housing

5.5 Local plans across Essex were reviewed to identify an appropriate affordable housing requirement. It is acknowledged that these varied been Local Planning Authorities, however, an overall figure of 30% was deemed to be the most representative.

5.6 We have also made assumptions based on the affordable housing tenure split. We have assumed the following tenure split which is also based on current policy with the inclusion of first homes:

- 70% social rent
- 30% intermediate/ first homes

5.7 We have assumed that affordable housing values will be calculated using a transfer value as a % of open market value (OMV). We appreciate that some LPAs may disaggregate out social rent or have an intermediate tenure in addition to first homes. To simplify things for this study we have taken a more general approach. Like open market residential, affordable transfer values will vary over the area. To determine them we have considered existing Local Plan evidence bases and our own experience:

- Social/affordable rent 50% of OMV
- 1st homes 70% of OMV[56]

Commercial

5.8 We have assumed that uses would be valued using the investment method by determining a market rent and capitalising it at an appropriate investment yield taking account of reasonable voids and purchaser costs. Our rent and yield inputs are shown below – like other inputs, a range has been tested through sensitivity testing:

- Office space
  - Rent: £22 psf.
  - Yield: 8%
- Smaller industrial space

[56] The maximum value allowed by first home guidance is £250,000 per unit. We have capped our value inputs for first homes at this level in our appraisals.

  - Rent: £12
  - Yield: 5.25%
- Larger industrial space (logistics)
  - Rent: £10 psf.
  - Yield: 5.25%

5.9 Other assumptions include:

- Gross to net for the office lettable floor space of 85%
- 12% has been deducted for management costs
- Voids / rent free periods of 9 months

6. Cost inputs and assumptions

6.1 In this section we outline all cost elements assumed in our development appraisals including policy costs, base build costs, fees, disposal and acquisition costs, developer's profit etc. We have relied on a range of sources to determine development costs including BCIS, comparable schemes and our own professional knowledge. All inputs were discussed with the Essex Developers Group for feedback prior to being adopted.

What costs to include?

6.2 The PPG explains the types of development costs that should be considered:

- *'build costs based on appropriate data, for example that of the Building Cost Information Service*
- *abnormal costs, including those associated with treatment for contaminated sites or listed buildings, or costs associated with brownfield, phased or complex sites. These costs should be taken into account when defining benchmark land value*
- *site-specific infrastructure costs, which might include access roads, sustainable drainage systems, green infrastructure, connection to utilities and decentralised energy. These costs should be taken into account when defining benchmark land value*
- *the total cost of all relevant policy requirements including contributions towards affordable housing and infrastructure, Community Infrastructure Levy charges, and any other relevant policies or standards. These costs should be taken into account when defining benchmark land value*
- *general finance costs including those incurred through loans*
- *professional, project management, sales, marketing and legal costs incorporating organisational overheads associated with the site. Any professional site fees should also be taken into account when defining benchmark land value*
- *explicit reference to project contingency costs should be included in circumstances where scheme specific assessment is deemed necessary, with a justification for contingency relative to project risk and developers return'* [57]

[57] MHCLG, 24 July 2018, PPG, 012 Reference ID: 10-012-20180724

Policy and infrastructure costs

6.3 Table 6-1 outlines our policy cost inputs. Because this study cuts across multiple Local Authority boundaries it is challenging to include accurate levels of policy costs for all areas. We have therefore taken a high level view and included the most prevalent costs:

Table 6-1: Included policy costs

Name	Cost	Notes
Electric charging points (residential only)	• £1000 per dwelling	Most new development is likely to be required to include electric charging points. The cost has been based on our own experience and by considering Local Plan viability evidence bases.
Accessible home costs - M4(2) and (3)	• 100% M4(2) with £1,400 per dwelling • 10% M4(3) £22,791 per dwelling	The figure of 100% for M4(2) follows a review of local planning policy, which found a large number of local authorities now require all new homes to be M4 (2). Costs / unit have been based on the guidance set out in Housing and disabled people: A toolkit for local authorities in England: Planning for accessible homes 2018
Affordable housing (residential only)	• 30% baseline - but varied by sensitivity testing	This has been included as outlined in the previous section of this report.
CIL (residential only)	• Greenfield £200 / sqm.	Although the majority of LA's don't have a CIL charging schedule, the lower value areas of Chelmsford and Southend do. Therefore, to ensure the study accounts for CIL obligations where these are charged, we've included an allowance. This figure has taken into account the charging schedules in the County. It is anticipated that the higher charges in Brentwood and Castle Point should be offset by the higher values obtainable in those areas.
Future Homes Standards	• 4,847 per house, • £2,256 per flat	Costs have been taken from MHCLG – The Future Home Standard 2019 Consultation on changes to Part L (conservation of fuel and power) and Part F (ventilation) of the Building Regulations for new dwellings. These are based on 'option 2- Fabric plus technology'.

Name	Cost	Notes
Infrastructure and S106	• Brownfield - £0 /unit (except Brownfield 500 units = £5000/unit) • Greenfield 25-100 units = £5000/ unit • Greenfield 500 units = £15,000 / unit • Greenfield 5000 units = £20,000 / unit	Determinations are based on a review of Local Plan Policy across the County. Whilst smaller brownfield sites are usually infill sites located in urban areas with existing services and facilities, larger brownfield sites (i.e. 500-unit brownfield scenario) would normally require additional infrastructure to support the scheme. Therefore, we assumed an infrastructure and S106 fees of £5000/unit are required for the 500-unit brownfield scenario.

Source: SQW, 2024

BNG costs

6.4 Table 6-2 shows the total costs for delivering 10% net gain onsite (baseline) and 20% net gain onsite and offsite. For the purpose of this study, we have assumed where the site is unable to provide sufficient BNG, required biodiversity units will be purchased offsite and no additional land will be purchased. An assumption that each biodiversity unit costs £25,000 was made based on information from ECC and supported by a review of published literature, with market rates typically ranging between £20,000 to £35,000 per unit, although some habitats may significantly exceed this. Further details of the cost review are provided in Annex B.

6.5 The BNG costs for the 100-unit brownfield scenario are significantly lower than the other brownfield scenarios due to the types of habitat that it was assumed to provide onsite to meet the BNG targets are cheaper.

Table 6-2: Delivery costs for 10% and 20% net gain[58]

Typology	Site size (Ha)	Total Costs 10% BNG	Total Costs 20% BNG onsite (where possible)	Total Costs 20% BNG offsite
5000 Unit Greenfield	285.71	£ 2,470,000	£ 2,856,500	£ 3,627,403
500 Unit Greenfield	20.41	£ 478,873	£ 614,376*	£ 614,378
100 Unit Greenfield	2.94	£ 74,150*	£ 90,050*	£ 90,050

[58] Where BNG targets cannot be delivered onsite within the baseline site parameters (highlighted with an asterisk in the table), the costs were estimated through purchase of required additional biodiversity units at £25,000 per unit.

25 Unit Greenfield	1.39	£	44,835*	£ *	52,535	£	52,535
500 Unit Brownfield	13.89	£	38,256	£	51,756	£	66,640
100 Unit Brownfield	1.91	£	675	£	1,575	£	1,225
25 Unit Brownfield	0.26	£	11,545	£	24,145	£	11,595
Large Industrial	2.85	£	18,810	£	19,800	£	32,310
Small Industrial	0.125	£	248	£	248	£	448
Offices	0.25	£	150	£	1,095	£	250

Source: SQW, 2024

All other costs

Base build cost

6.6 We have relied upon BCIS to determine base build costs – our inputs are shown in Table 6-3. We have rebased these costs to Essex County and reduced the sample size to 5 years where possible. For commercial uses we have taken a 15 years sample. We have applied the median cost quoted for all uses. We have applied median build costs.

6.7 The Essex Developers Group were consulted on the cost assumptions, and it was raised that they felt they were a slight underestimation. Therefore, also owing to the time lag in BCIS rates, these were each raised by a figure of £10 per sq. ft.

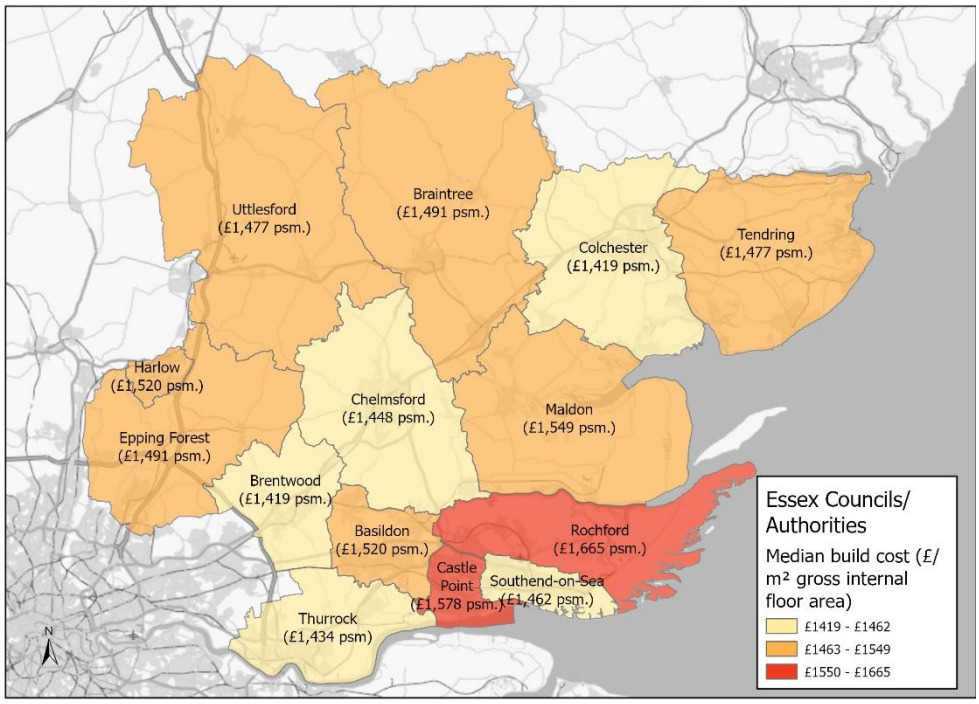
Table 6-3: Base build costs adopted

Unit type BCIS cost £ psm	Final cost assumption (BCIS median rate + £10 psm.)
Residential – houses (generally)	£1,603 / sqm. (£149/sqf.)
Residential – flats (generally)	£1,829 / sqm. (£170/sqf.)
Industrial (generally)	£1011 / sqm. (£94/ sqf.)
Offices(generally)	£2,454 / sqm. (£228/sqf.)

Source:

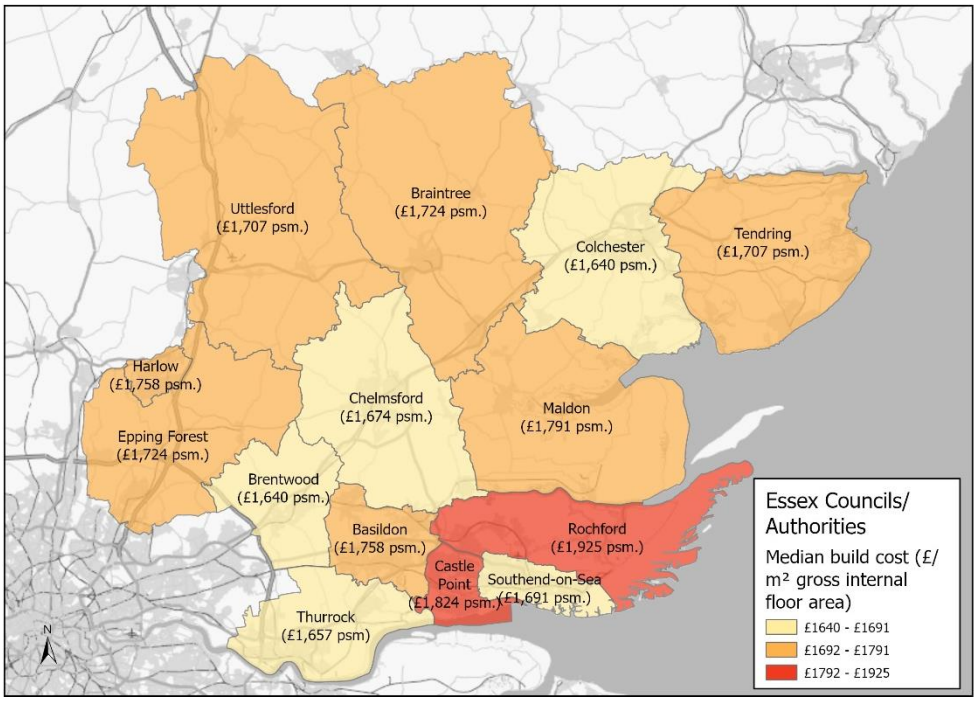
6.8 We have sensitivity tested build costs through considering the range of median BCIS costs across each LPA area. Figure 6-1 and Figure 6-2 shows the range of residential build costs for houses and flats rebased to each LPA.

Figure 6-1: Build costs for houses across Essex (Median BCIS)



Source: SQW with BCIS data, 2024

Figure 6-2: Build costs for flats across Essex (Median BCIS)



Source: SQW with BCIS data, 2024

External works

6.9 This allowance will cover all garages, services and onsite infrastructure. This has been based on our own professional judgement, from considering comparable sites and Local Plan Viability assessments in the region. We have applied an allowance of 15% of build costs to greenfield sites and 500 unit brownfield sites and 10% of build costs to the 100 unit and 25 unit brownfield sites.

Site abnormals

6.10 This has been included for brownfield development only. This is a challenging input to estimate as every brownfield site will face its own challenges. An allowance of £110,000 per net developable area is included, this is based on HCA (now Homes England) guidance on dereliction, demolition and remediation March 2015.

Planning fees

6.11 These have been included based on the nationally prescribed formula[59]. As stated in the formula these have been capped at a maximum of £405,000 per application.

Professional fees

6.12 We have drawn on our experience of similar schemes and have applied a professional fees allowance of 10% of build costs.

Development contingency

6.13 Our study found that Local Plan viability assessments in Essex adopt the assumptions of 2.5% to 5% for contingency, so we have used the 5% assumptions for the larger site typologies. However, noting industry feedback that smaller organisations are subjected to higher risks, we have used a 10% contingency on the smaller typologies with 25 units. This is to reflect current market conditions and bank lending requirements.

Developer profit

6.14 We have varied the profit by use which is a standard approach when undertaking viability modelling. For market residential we have allowed for a profit of 20% of GDV; this is in line with comparable schemes and is within the range included in the Viability PPG. We have applied a reduced level of profit at 6% of GDV to affordable units; this is a standard approach which is supported by the Viability PPG. For first homes, we have applied 20% on GDV to reflect that they are higher risk and not a traditional affordable tenure with units being sold to individuals rather

[59] Planning Portal, 2023. A guide to fees for Planning Applications in England. Available here

than registered providers. For the commercial uses we have targeted 20% profit on cost; profit on cost is an industry standard assumption for commercial uses.

Interest

6.15 Our study found that development finance companies are offering rates of around 7-8% per annum for reasonable covenant strength, so we have used a 7.5% assumption for the larger site typologies. However, noting industry feedback that SME borrowing is typically 9-13%, we have used a 10% interest rate on the smaller typologies with 25 units.

Marketing and disposal costs

6.16 We have included disposal costs at prevailing rates – these are reasonable allowances from our experience. The inputs are as follows:

- Marketing: 1.5% of GDV – only on market units
- Sales agents: 1% of GDV – only on market units
- Sales legal 0.5% of GDV
- Letting agent (commercial only) 10% of rental value
- Letting legal (commercial only) 5% of rental value
- Purchasers costs (commercial only) 6% of GDV

Land acquisition costs

6.17 We will discuss our land value inputs in the section below but have outlined our acquisition inputs here. We have assumed the following:

- SDLT – 5% of land (slabbed)
- Sales agents fees: 1% of land
- Sales legal fee: 0.5% of land

Land value assessment

6.18 In determining appropriate land values we have referred to the type of sites we have tested and the inputs used in Local Plan Viability assessments in the area. By its very nature land value is challenging to take a view on across such a wide area with a massive range of sites. As with other inputs we have sensitivity tested this input to show a wide range of possibilities.

6.19 Here we have provided a short summary of our land value inputs:

- Greenfield: drawing on local plan evidence base, we have assumed a benchmark land value of £500,000 per gross ha (£202,347 per gross acre).
- Brownfield: drawing on local plan evidence base, we have assumed a benchmark land value of £1,200,000 per gross ha (£485,633 per gross acre).

6.20 For the commercial typologies we have assumed that the small industrial and offices will be built on brownfield sites and the large industrial on a greenfield. We have assumed the following land values:

- Small industrial: £1,200,000 per gross ha (£485,633 per gross acre).
- Large industrial: of £500,000 per gross ha (£202,347 per gross acre).
- Offices: £1,200,000 per gross ha (£485,633 per gross acre).

Timescales

6.21 Our assumed timescales are set out in Table 6-4, they vary between typologies and we have made adjustments based on the type of units delivered.

Table 6-4: Development timescales

Typology	Lead in time	Build period	Sales period
5,000 unit greenfield - houses	8 months	120 months	120 months (starts 6 months into build period)
500 unit greenfield - houses	8 months	48 months	48 months (starts 6 months into build period)
100 unit greenfield - houses	8 months	24 months	24 months (starts 6 months into build period)
25 unit greenfield - houses	8 months	18 months	18 months (starts 6 months into build period)
500 unit brownfield - houses	8 months	48 months	48 months (starts 6 months into build period)
100 unit brownfield – houses flats	8 months	24 months	24 months (starts 6 months into build period)
25 unit brownfield - flats	8 months	18 months	18 months (starts on practical completion)
Small industrial	8 months	12 months	Sold fully let on practical completion

Typology	Lead in time	Build period	Sales period
Large industrial	8 months	24 months	Sold fully let on practical completion
Office	8 months	18 months	Sold fully let on practical completion

Source: SQW 2022

7. Viability results

7.1 In this section we set out the results of testing the viability impact of increasing BNG to 20% from mandatory 10% in Essex. We also explore the additional cost associated with 50% BNG.

Residential results

7.2 The results of the viability testing are discussed in this section but the development appraisal and full sensitivity testing can be found in Annex D.

7.3 Firstly, the costs for both onsite and offsite delivery on a total cost basis, as highlighted in the previous chapter in Table 6-2, are comparably small when considered against other sums included in the development appraisal. Table 7-1 below shows the additional BNG costs for each of the typologies. It assumes 10% BNG onsite as a baseline and then the additional £ per dwelling required to get to 20% BNG onsite and offsite respectively; offsite provision therefore inherently assumes a mixed approach, and in some of the onsite scenarios where onsite provision alone cannot meet the BNG target due to land area constraints the purchase of biodiversity units offsite are also assumed for top-up purposes.

7.4 Additional onsite provision is less expensive than additional offsite provision in large sites, including the 5,000 unit greenfield and 500 unit brownfield scenarios. Due to the site size of the 100 unit and 25 unit greenfield scenarios, offsite delivery is the only available option as they are unable to provide sufficient BNG of 20% onsite. For the 500 unit greenfield, 100 unit brownfield and 25 unit brownfield scenarios, the less expensive option is delivering the additional BNG with a mix of onsite and offsite delivery.

Cost per Dwelling

7.5 Table 7-1 shows the additional cost of achieving 20% BNG ranges from £2 - £27 per residential unit on brownfield sites[60] and from £77 to £308 per residential unit on greenfield sites. As demonstrated in Table 6-2 increasing BNG to 20% does not entail doubling the BNG costs due to economies of scale, the inclusion of higher scoring biodiversity uses for significantly less than double the cost on the same land, and the fact that the initial cost of replacing lost habitat associated with the development has already been accounted for. The cost increase of achieving 20%

[60] Brownfield scenarios assume sites are located on previously developed land that has not been allowed to re-establish vegetation of biodiversity value.

BNG is typically 15 – 35% higher than the cost of delivering mandatory 10% BNG (except for smaller brownfield sites where the cost is in any case negligible).

7.6 Table 7-1 also shows the additional BNG costs per dwelling to go from 20% to 50% BNG for each of the typologies assuming this additional provision is all delivered offsite. We can thus calculate that the additional cost of achieving 50% BNG over the mandatory 10% ranges from £20 - £214 per residential unit on brownfield sites and from £636 to £1,232 per residential unit on greenfield sites.

7.7 Whilst 50% BNG is not viability tested through scenario modelling, its potential cost impact is shown. Unsurprisingly, increasing BNG from 20% to 50% is significantly more expensive than increasing BNG from 10% to 20%. However, the cost increase of achieving 50% BNG is considerably less than 5 times the mandatory 10% BNG cost, and typically falls in the 0.5 to 2.5 times range (except for smaller brownfield sites where the cost is in any case negligible).

Table 7-1: comparison of BNG costs £ per dwelling

Typology	20% onsite per dwelling*	20% offsite per dwelling	The most commercially advantageous solution to 20%	Cost per dwelling	% increase in BNG cost from 10% to 20%	50% offsite per dwelling (from 20% BNG)
5,000 unit greenfield - houses	+£77.30	+£231.48	All onsite	+£77.30	15.6%	+£1,134.68
500 unit greenfield - houses	+£271.00	+£271.01	Mix of onsite and offsite	+£271.00	28.3%	+£829.80
100 unit greenfield - houses	N/A	+£159.00	All offsite	+£159.00	21.4%	+£477.00
25 unit greenfield - houses	N/A	+£308.00	All offsite	+£308.00	17.2%	+£924.00
500 unit brownfield - [61]houses	+£27.00	+£56.77	All onsite	+£27.00	35.3%	+£186.83
100 unit brownfield – houses flats	+£9.00	+£5.50	Mix of onsite and offsite	+£5.50	81.5%	+£27.00

[61] The brownfield typologies tested produce a low BNG cost because it is assumed that they comprise bare land and have a lower pre biodiversity score. Should a specific brownfield site have been left to go wild and have a higher pre-biodiversity score, the overall cost of BNG is likely to be closer to the greenfield scenarios.

25 unit brownfield - flats	£504.00	+£2.00	Mix of onsite and offsite	+£2.00	0.4%	+£18.00

Source: Temple & SQW 2024

Impact on Land Value

7.8 Table 7-2 shows the benchmark land value (BLV) for each typology and the total cost for 20% and 50% BNG. Benchmark land value is a constant cost for each typology even when costs and values are sensitivity tested, and represents the minimum land value a landowner would reasonably expect to receive for their land for development purposes. Because policy costs (including additional BNG costs) will negatively impact the development land value, using the benchmark land value as a comparison is useful because it clearly demonstrates the scale of BNG contributions and how they may impact the land value received. When compared to benchmark land value it is clear the cost of delivering BNG is comparatively small – in percentage terms, it does not exceed 6.02% for 20% BNG and 10.09% for 50% BNG and in some cases is considerably less. It also demonstrates that the *differences* in the cost of 10% BNG to 20% BNG are small with only marginal increases, ranging from 0.02% of the BLV to 1.33% of BLV. The differences in the cost of BNG from 10% to 50% are larger, ranging from 3.03% to 5.39% for greenfield sites, but are considerably smaller (<1% of BLV) for the brownfield scenarios.

Table 7-2: comparison of BNG cost against BLV

Typology	Benchmark land value	20% (onsite/offsite) total BNG cost[62]	Additional cost from 10 to 20% BNG	50% baseline total BNG cost	Additional cost from 10 to 50% BNG
5,000 unit greenfield - houses	£142,857,143	£2,856,500 2.00%	£386,500 0.27%	£8,529,875 5.97%	£6,059,875 4.24%
500 unit greenfield - houses	£10,204,082	£614,375 6.02%	£135,502 1.33%	£1,029,275 10.09%	£550,402 5.39%
100 unit greenfield - houses	£1,669,115	£90,050 5.40%	£15,900 0.95%	£137,750 8.25%	£63,600 3.81%
25 unit greenfield - houses	£1,015,435	£52,535 5.17%	£7,700 0.76%	£75,635 7.45%	£30,800 3.03%

[62] Utilising the most commercially advantageous solution according to Table 7-1.

500 unit brownfield - houses	£16,666,667	£51,755 0.31%	£13,499 0.08%	£145,172 0.87%	£106,916 0.64%
100 unit brownfield – houses flats	£2,296,651	£1,225 0.05%	£550 0.02%	£3,925 0.17%	£3,250 0.14%
25 unit brownfield - flats	£307,692	£11,595 3.77%	£50 0.02%	£12,045 3.91%	£500 0.16%

Source: SQW & Temple 2024

Comparison with Affordable Housing Costs

7.9 Affordable housing has been included in our testing at 30% on both brownfield urban sites and rural greenfield sites. Normally, this is the biggest policy cost for developers and the cost is considerably more significant than an increase in BNG. To demonstrate this, we have taken one of our typologies (500 unit greenfield) and run it at 100% market housing with 10% BNG to compare with its 30% policy target. Table 7-3 shows that the average cost of providing an affordable unit is £108,106 per unit for the developer.

Table 7-3: Cost of affordable housing calculation

Typology	500 unit greenfield typology
10% BNG (30% affordable) baseline surplus	-£1,729,869
10% BNG (0% affordable) baseline surplus	£14,486,100
Difference	£16,215,969
Difference per affordable unit (150 units)	£108,106

Source: SQW & Temple 2024

7.10 The costs for increasing BNG to 20% are shown in Table 7-1 range between £2 – £308 per dwelling. This equates to 0.002% - 0.28% of the cost of an affordable unit. Overall, this demonstrates that the cost of increasing BNG is comparably small compared to other policy costs like affordable housing.

Viability and sensitivity testing results

7.11 The purpose of this section is to test whether an increase from the mandatory 10% BNG to 20% BNG has a material impact on residential development viability by analysing the market values required to achieve viable development where 20%

BNG is applied in our scenarios and comparing this with the market values required to achieve viable development in the baseline 10% BNG scenario.

7.12 We have undertaken sensitivity testing across a range of cost and value inputs and Table 7-4 shows the headline results of the test. We have tested 20% onsite and 20% offsite BNG. The baseline 10% BNG is based on onsite provision where possible. Whilst the full sensitivity testing included in the viability appraisal is more incremental, we have only shown the lowest build cost of £1500 psm, the mid build costs of £1,600 psm and the highest build cost of £1,725 psm in this report summary. These build costs are set out in the columns three times under the different levels of BNG. In the rows, we have each of the residential typologies tested and in the respective cell, **we have noted the residential value required to render development viable on a psm/psf basis**.

7.13 As we noted in the methodology section of this report, our sensitivity testing uses £10psf increments of value, except 25 unit brownfield scenario where £20psf increments were used. It is impractical to use increments less than this because sensitivity testing tables become large and difficult to interpret.

7.14 Table 7-4 shows the threshold values required for onsite BNG to be viable across each of the typologies tested – full sensitivity tables are included in Annex D. The first thing to note is because the differences in BNG costs to increase to 20% are very small the impact on viability is also minimal. This results in all cases the same £psf value being included across 10%, 20% onsite and 20% offsite BNG.

7.15 Individual Local Authorities can compare value thresholds for Local Authorities with these figures to understand how the estimated costs of BNG provision compare to the build costs and values in their area. We have not sought to indicate specific districts where an increase may be viable because there are nuances/variations within districts regarding values and viability. The purpose of the table is to provide an indication of the values required at a specific build cost to viably provide enhanced BNG. As we have already noted this should not replace Local Plan evidence basis and Local Authorities should undertake their own detailed viability testing at a more granular level.

7.16 As a worked example, if you consider Table 7-4 and take the 5,000 greenfield scenario here the results show that at 10% BNG delivery onsite with build cost at £1,500 psm (£140 psf) residential sale values of at least £4,413 psm (£410 psf) are required to produce a viable scheme. If costs are higher at £1,600 psm (£149 psf) or £1,725 psm (£161 psf) then residential values of at least £4,629 psm (£430psf) and £4,844 psm (£450 psf) are required respectively to produce a viable scheme. If you move along the table to the right, for the same typology you can see the value thresholds required, at the same cost increments for both 20% onsite and

20% offsite BNG. The same process can be followed for all typologies both onsite and offsite.

7.17 Crucially**, the analysis shows that the additional cost associated with a shift from 10% to 20% BNG is sufficiently small that in all cases the residential value increase required to render development viable still lies within the same £10psf value increment.** This demonstrates the minimal impact on the viability of increasing BNG from 10% to 20% in all scenarios.

7.18 Another way to think about this is that the cost difference of changing to 20% BNG is not going to be a key determining factor of residential development viability in any area of Essex – other factors such as residential value, base build cost and other policy costs including affordable housing are so much more significant in the viability appraisal that they, not BNG, will determine overall scheme viability.

Table 7-4: viability and sensitivity results – residential cost to value viability threshold

Typology		10% BNG onsite baseline			20% BNG onsite			20% BNG offsite		
		Build cost £1,500 psm (£140psf)	Build cost £1,600 psm (£149 psf)	Build cost £1,725 psm (£161 psf)	Build cost £1,500 psm (£140psf)	Build cost £1,600 psm (£149 psf)	Build cost £1,725 psm (£161 psf)	Build cost £1,500 psm (£140psf)	Build cost £1,600 psm (£149 psf)	Build cost £1,725 psm (£161 psf)
5,000 unit gf – houses	*Psf*[63]	£410	£430	£450	£410	£430	£450	£410	£430	£450
	Psm	£4,413	£4,629	£4,844	£4,413	£4,629	£4,844	£4,413	£4,629	£4,844
500 unit gf – houses	*Psf*	£390	£410	£430	£390	£410	£430	£390	£410	£430
	Psm	£4,198	£4,413	£4,629	£4,198	£4,413	£4,629	£4,198	£4,413	£4,629
100 unit gf – houses	*Psf*	£360	£380	£400	£360	£380	£400	£360	£380	£400
	Psm	£3,875	£4,090	£4,306	£3,875	£4,090	£4,306	£3,875	£4,090	£4,306
25 unit gf – houses	*Psf*	£370	£390	£420	£370	£390	£420	£370	£390	£420
	Psm	£3,983	£4,198	£4,521	£3,983	£4,198	£4,521	£3,983	£4,198	£4,521
500 unit bf – houses	*Psf*	£390	£400	£420	£390	£400	£420	£390	£400	£420
	Psm	£4,198	£4,306	£4,521	£4,198	£4,306	£4,521	£4,198	£4,306	£4,521
100 unit bf – houses flats	*Psf*	£390	£410	£420	£390	£410	£420	£390	£410	£420
	Psm	£4,198	£4,413	£4,521	£4,198	£4,413	£4,521	£4,198	£4,413	£4,521
25 unit bf – flats[64]	*Psf*	£440	£500	£520	£440	£500	£520	£440	£500	£520
	Psm	£4,736	£5,382	£5,597	£4,736	£5,382	£5,597	£4,736	£5,382	£5,597

Source: SQW & Temple 2024

[63] Psf – per square foot; Psm – per square metre
[64] Cost for 25 unit brownfield flatted scenario Min: £1,550 psm, Mid £1,800 psm, Max £1,900 psm

Commercial results

7.19 We tested three commercial scenarios as part of our modelling – our sensitivity testing can be found in Annex E. Using the baseline inputs we found industrial development to be viable in some cases and marginally unviable in others. For the smaller industrial typology depending on the build cost development becomes viable when rents are between £13 - £15 psf (at the baseline yield of 5.25%) or if yields are between 3.25 – 4.75% (at the baseline rent of £12psf). For the larger industrial typology depending on the build cost development becomes viable when rents are between £12 - £14 psf (at the baseline yield of 5.25%) or if yields are between 3.25 – 4.50% (at the baseline rent of £10psf).

7.20 Office development is unviable in our baseline scenario. Sensitivity testing shows that there would have to be substantial decreases in build costs and increases in capital values (most importantly yield compression) to render development viable. Any increase in BNG provision would only further increase the viability deficit rendering office development even more challenging.

7.21 Table 7-5 below shows the additional BNG costs for each of the commercial typologies. Similar to the residential scenarios, it assumes 10% BNG onsite as a baseline and then the additional £ per dwelling required to get to 20% BNG onsite and offsite respectively. Additional onsite provision is less expensive than additional offsite provision in industrial sites, but offsite delivery is significantly less expensive in office sites.

7.22 As demonstrated in Table 7-5 increasing BNG from 10% to 20% onsite and offsite does not entail doubling the BNG costs due to economies of scale and the inclusion of higher scoring biodiversity uses for significantly less than double the cost on the same land, and the fact that the initial cost of replacing lost habitat associated with the development has already been accounted for.

7.23 Table 7-6 shows the build cost for each commercial typology and the total cost for 10% and 20% BNG (either onsite or offsite depending on which is more commercially advantageous). It is clear that the cost of delivering BNG is relatively small when compared to build cost. It does not exceed 0.19% for 10% BNG and 0.2% for 20% BNG. It also demonstrates that the *differences* in the cost of BNG from 10% to 20% are small with only marginal increases.

Table 7-5: Comparison of BNG costs - Commercial

Typology	10% baseline	20% onsite*	Additional cost from 10% to 20%	20% offsite	Additional cost from 10% to 20%
Industrial – Large (10,000 sqm)	£18,810	£19,800	£990	£32,310	£13,500

Industrial – Small (500 sqm)	£248	£248	£0	£447	£200
Office (1000sqm)	£150	£1,095	£945	£250	£100

Source: SQW & Temple 2024

Table 7-6: Percentage of BNG cost against Build Cost - Commercial

Typology	Build Cost	10% baseline total BNG cost	20% (onsite/offsite) total BNG cost	Additional cost from 10 to 20% BNG
Industrial – Large (10,000 sqm)	£10,110,000	£18,810 0.19%	£19,800 0.20%	£990 0.01%
Industrial – Small (500 sqm)	£505,500	£248 0.05%	£248 0.05%	£0 0.00%
Office (1000sqm)	£5,774,118	£150 0.00%	£250 0.00%	£100 0.00%

Source: SQW & Temple 2024

Planning Act 2008 (as amended) (PA2008) - Nationally Significant Infrastructure Projects (NSIPs)

8. Norwich to Tilbury Case Study

Description of the NSIP

8.1 N2T is part of the Great Grid Upgrade, intended to reinforce the existing power supply network to accommodate new generation sources, including nuclear power, on and off-shore wind and solar farms, as well as meeting increased demand for low-carbon energy, such as from electric vehicles and home heating systems. The Great Grid Upgrade is the largest overhaul of the electricity grid in generations. It comprises 17 major infrastructure projects that will scale up the grid and update existing networks, boosting energy security, affordability and helping the nation become more self-sufficient.

8.2 The Project comprises a 400kV electricity transmission line over a distance of approximately 184km. This would include(under the current draft proposals):

- a new 400 kV electricity transmission connection of approximately 184 km overall length from Norwich Main Substation to Tilbury Substation via Bramford Substation comprising:
  - approximately 159 km of new overhead line supported on approximately 510 steel lattice pylons (approximately 50 m in height) some of which are gantries (typically up to 15m in height) within proposed Cable Sealing End (CSE) compounds, or existing or proposed substations; and
  - approximately 25 km of 400 kV underground cabling (some of which is located through the Dedham Vale Natural Landscape (an AONB).
- six new CSE compounds, each with new permanent access, to connect the overhead lines to the underground cables.
- a new 400 kV EACN substation, with a new permanent access, on the Tendring Peninsula. This is proposed to be an Air Insulated Switchgear (AIS) substation;
- substation extension works at the existing Norwich Main, and Bramford substations and works within the existing Tilbury Substation to connect and support operation of the new transmission connection; and
- temporary works associated with the construction of the Project.

BNG value assessment

Methodology of assessment

8.3 NGET was consulted, along with their ecological consultants, Arcadis, for the project, to identify what BNG data were available that could be used to inform this assessment and to explore answers to the questions as to how BNG is being applied in this context.

8.4 As a result of the consultation, it was identified that NGET has a complete set of habitat data for the project, albeit subject to further confirmation of habitat details once onsite surveying is completed. Data from their February 2024 interim evaluation using the statutory metric were provided in a table summarising total areas and biodiversity unit values for habitats, grouped according to their distinctiveness and trading rules. Very low distinctiveness habitats were combined into a single group, as were low distinctiveness habitats; medium distinctiveness habitats were grouped by broad habitat type; and high and very high distinctiveness habitats were listed individually. This allowed for a concise dataset to be compiled that could be used to understand trading rule deficits as well as overall net habitat change. This has used the following assumptions.

- Assessment was carried out using the statutory metric and, although this is designed for use on TCPA90 development, the instructions, rules and principles have been applied to this assessment, noting the specific considerations detailed below.
- The data are for the section of the project within Essex, parcels where 50% of the area or more were outside the county of Essex were excluded from the results and parcels where over 50% of the area was inside the county were included.
- Where surveys are currently incomplete, the assumed condition is based on an average of the habitat condition values of that habitat type already surveyed.
- Temporary loss is assumed to be restored to baseline habitat and condition; except in areas underneath pylon routes or over underground cable routes, where any woodland/tree habitats would be reinstated as mixed scrub in moderate condition and orchards would be reinstated as other neutral grassland in moderate condition.
- Where irreplaceable habitats, such as ancient woodland, were present, these were excluded from the biodiversity unit figures, as such habitats would need bespoke compensation outside of the Metric evaluation.

- Watercourses have been excluded from this study as mostly any impacts will be avoided, although they will need to be taken into account in the project. Hedgerows are also excluded from the study on the assumption that loss would be minimal and easily compensated within the context of the project.
- While these figures are taken from the current working calculations for the project, they are to be taken as being indicative and do not necessarily represent the exact outcomes that the project will deliver. Discrepancies in the total habitat areas are due to the exclusion of watercourses and minor overlaps or gaps in coverage; these will be resolved for the project, but are not considered to be significant in relation to the indicative valuation required for the purposes of this study

Key considerations for BNG assessment and delivery

8.5 The analysis and consultation regarding this project have highlighted a number of key issues in relation to applying BNG to this specific type of linear energy transmission NSIP, some of which are applicable to other NSIPs.

Land ownership / control and long-term maintenance

8.6 Unlike many infrastructure projects, with significant areas of permanent land-take, NGET does not own, and will not require the purchase of, most of the land within the project boundary. With the exception of some structures, such as substations, most of the land is retained within existing land ownership, with licences providing NGET with an easement or wayleave for maintenance access. These rights may be voluntary or compulsory, but EN-5 strongly encourages the use of permanent arrangements over voluntary wayleaves that could be terminated by the landowner. This has implications for future management of the habitats within the project boundary where it cannot necessarily be guaranteed that they will be managed for BNG for the standard minimum term of 30 years in line with current metric user guidance, if management cannot be secured through licensing agreements.

8.7 Where land can be returned to its previous state within two years, the impact can be deemed to be temporary, resulting in an evaluation of no net loss, and may potentially be excluded from the BNG assessment.

Habitat Restoration

8.8 Where appropriate the BNG assessment has assumed that habitats affected by temporary or short-term impacts will be restored to its previous state. However, some habitats cannot be restored, particularly woodland and trees, as these would cause a hazard in interaction with the overhead lines or buried cables. As such,

there will be inevitable loss of such habitats, as well as possible suppression of the condition of others, such as scrub, requiring ongoing maintenance. In such cases, any loss cannot be considered within the definition of temporary losses set out in the metric user guide.

Definition of BNG Boundaries

8.9 The selection of baseline boundaries for consideration for BNG is an important factor that is not always clearly defined for many NSIPs. During the evolution of project design, the project boundary may change significantly, which may cause issues in determining the potential habitat loss and offsetting requirements. However, even once the draft Order Limits are set, the actual construction footprint is likely to continue to change and including habitat areas that are not essential for the project will give a higher baseline value, thereby increasing the number of biodiversity units that need to be delivered to achieve the target level of net gain. For N2T, much of the habitats within the proposed project boundary are only required for temporary construction, or access, or may not be directly impacted at all. Selection of an appropriate boundary is, therefore, an issue particular to this kind of linear energy transmission NSIP, that may not be as relevant to other NSIPs. For this evaluation, based on NGET's current approach, the baseline includes the current draft Order Limits.

8.10 The inclusion, or exclusion of watercourses from consideration in the BNG assessment for NSIPs is an important factor to be taken into account. For TCPA90 projects, any watercourse within the site boundary, or where the riparian zone overlaps the boundary, needs to be considered and the relevant level of net gain delivered, even where there is no impact on it. For projects such as N2T, the majority of watercourses will be avoided and protected, or only subject to temporary impacts, and will have no permanent infrastructure or habitat change within their riparian zone, apart from oversailing (or tunnelled) cables. As such, delivering a 10% (or higher) net gain on all watercourses within the order limits is likely to result in a significant requirement for watercourse habitat enhancement that is disproportional to the scope and effects of the project.

Habitat Strategic Significance

8.11 Currently there is no Local Nature Recovery Strategy for Essex as this is still being drafted and will be subject to public consultation. This means that the criteria in the metric user guidance need to be used, and this introduces uncertainly over alignment with future biodiversity priorities, so there is no clear framework for the future determination of the strategic significance of habitat parcels. High strategic significance increases the biodiversity unit value of habitats in recognition of their location in relation to local strategic biodiversity networks. Within the metric user

guidance, habitat areas can be classified as 'high' where they deliver the specific habitats in the relevant location identified in strategic documents specified by the relevant planning authority, or as 'medium' where the habitat type can be shown to be ecologically important within its specific location but is not listed in a specified document. This is, however, an interim solution and the classification of the strategic significance of habitats is liable to change once the relevant LNRS is published.

8.12 The draft Essex Local Nature Recovery Strategy (LNRS) is being prepared for public consultation at the time of this report (July 2024). The draft LNRS is due to go out for public consultation in late summer 2024. Suffolk and Norfolk are in a similar situation, with their LNRS being prepared by the Norfolk & Suffolks Nature Recovery Partnership.

8.13 LNRS play a key role in BNG by providing a county-wide strategic approach to offsite BNG delivery. BNG provides developers and landowners the opportunity to contribute positively to the delivery on the ground of the Essex LNRS, by generating measurable biodiversity enhancement and creation as part of development projects, whilst meeting the housing and business needs of residents.

8.14 The LNRS contains strategic opportunity maps, showing the locations which have been identified as having 'strategic significance', i.e. the most potential to deliver benefits for nature and the wider environment. Sites of strategic significance offer an uplift of 15% on biodiversity units compared with other sites. Therefore, buyers of offsite BNG effectively benefit from a 15% bonus on units purchased in sites of strategic significance within the LNRS.

8.15 This is a particularly complex issue for linear NSIPs, such as N2T, because it crosses three counties and numerous districts with different local characteristics and biodiversity priorities.

Cross Authority Boundary Issues

8.16 The large-scale linear nature of the project also has implications for the valuation of potential offsite habitat enhancement (either on land acquired by the developer or through offsetting, where management is agreed with a third party land-owner). Under Town and Country Planning Act 1990 applications, where offsetting is provided outside the local authority area of impact, a fractional multiplier is applied, which reduces the biodiversity unit value. Beyond the adjacent authority area, this modifier is 0.5, so twice the offsetting habitat enhancement would be needed at this distance compared to local delivery. With a linear NSIP crossing so many authorities, it is not practical to expect that each habitat parcel lost or affected should be compensated within the same immediate area. While there may be sufficient available land for offsetting in the county, there are likely to be local

districts where the relevant offsetting capacity is limited. It is also unlikely to result in the best outcomes for biodiversity in all cases as it may prevent more significant interventions. The suggestion of an organisational portfolio approach, whereby entities use their other land holdings to support offsetting may help to deliver the biodiversity objective for the project, but this would still be subject to considerations of local delivery. However, this approach may be restricted for some organisations. As NGET highlighted, the limited land holdings around existing assets need to be prioritised for potential electricity use and they are reserved for delivering their statutory electricity duties. Consequently, it is unlikely that there will be significant surplus land available for BNG compensation. Therefore, NGET focuses on ensuring the best BNG outcomes, including identifying the right locations for BNG that can effectively contribute to reversing nature decline, rather than relying on organisational land holdings for offsetting.

8.17 During the consultation, NGET expressed their commitment to delivering biodiversity improvements and their objective is to achieve a 10% net gain overall. Those representatives consulted would also welcome the opportunity to go further.

8.18 Due to the nature of the project, there is some flexibility in the placement of pylons and access routes to reduce the impacts on habitats through avoidance of features of high biodiversity value. However, some losses will be unavoidable. Wherever practical, habitats affected by construction works will be restored to their previous habitat and condition, but woodland and trees cannot be allowed to re-establish under the power lines, or over buried cable easements. There will also be a loss in terms of biodiversity unit value of restored habitats where there are reductions in value due to time delay or difficulty of creation. In order to reduce the net loss of biodiversity value, the project will include dedicated mitigation areas, which will be managed for biodiversity following construction works. These are assumed to be 'other neutral grassland' in moderate condition for the purpose of this study, but there may be opportunities to deliver higher distinctiveness habitats.

8.19 Due to the limited availability of mitigation sites within the project boundary and restrictions to improving habitats after the completion of the works, there is a predicted loss in biodiversity value. In order to compensate for this loss and provide additional enhancement to achieve a 10% net gain, the shortfall of units is proposed to be met by offsetting, and securing offsite habitat enhancements to an equivalent value. This would include specific habitats to correspond with the higher distinctiveness habitats affected to ensure the trading rules are met and there is no net loss of any one habitat type or group. Additional bespoke mitigation will be agreed with Natural England to provide compensation for irreplaceable habitats (which are excluded from consideration under the BNG assessment).

Results of estimated BNG outcome

8.20 Following consultation on data requirements and availability, NGET provided a data table summarising the habitats present within the boundary and the levels of change in terms of area and biodiversity value. These values are presented in Annex B. These habitats are grouped by their distinctiveness band to allow evaluation of compliance with trading rules.

8.21 The overall baseline value of habitats was estimated to be 4,953 biodiversity units (BU); this was derived mostly from low distinctiveness habitats, such as arable farmland and intensive grassland, (65%), with significant contributions from medium distinctiveness neutral grasslands (18%) and high distinctiveness lowland mixed deciduous woodland (11%). Very-high distinctiveness habitats were also present in smaller proportions, including lowland dry acid grassland (2%) and lowland meadow, lakes, lowland fens and wood pastures (all <1%).

8.22 N2T is predicted to result in the loss of approximately 40% of the baseline in terms of biodiversity unit value, primarily from the temporary loss of low distinctiveness habitats (28% of the total baseline value). Permanent loss is equivalent to just 1% of the baseline value. Restoration of habitats and creation of medium distinctiveness grassland in dedicated mitigation sites are responsible for delivering partial compensation for these losses.

8.23 In summary, the proposed project, as assessed, could achieve a net loss of 6% over the baseline. To achieve a net gain of 10% would require an additional 804 BU. In addition, the project would require some of these units to be targeted to specific compensation to meet trading rules for wood pasture and lowland fens (very high distinctiveness), as well as a deficit of medium distinctiveness grassland and scrub. To achieve 20% net gain would require a total of 1,299 BU, *i.e*. 495 BU more than achieving 10%.

Viability considerations

8.24 To understand the potential impacts of enhanced levels of BNG on overall project cost / viability, we have consulted NGET to discuss issues around opportunities and challenges in delivering BNG. Following email exchange, the consultation was undertaken on 18 June and further information was provided. Issues around funding of the project, delivery of BNG, regulatory framework and flexibility around increasing the BNG % were explored.

8.25 The following documents were reviewed to further understand the potential impact of enhanced BNG% on the financial viability of NSIPs:

- National Grid Electricity Transmission 2021–2026 Environmental Action Plan (April 2021)
- National Grid Electricity Transmission webpage: How we're regulated
- Norwich to Tilbury - 2023 - Non-Statutory Consultation Feedback Report (April 2024)
- Norwich to Tilbury - Strategic Options Back Check and Review (April 2024)

Viability findings

8.26 Other than the key issues highlighted above with applying BNG to this specific type of energy NSIPs, our analysis and consultation has also highlighted viability considerations.

Project costs

8.27 Due to the size of the NSIPs, an enhanced biodiversity gain objective will significantly raise project costs. From our estimated BNG outcomes above, it would require an additional 804 and 1,299 biodiversity units to achieve a net gain of 10% and 20% respectively. With our assumptions of offsite BNG costs of £25,000 per biodiversity unit, 10% and 20% offsite BNG delivery would cost £20.1m and £32.5m respectively from the presently assessed baseline position of 10% loss. The estimated cost of purchasing offsite units for enhanced BNG provision of 20% (over the mandatory 10%) is approximately £12.4m (1.38% of the capital cost) as shown in Table 8-1 below.

8.28 However, these estimates, assuming an offsite BNG unit cost of £25, 000, are considerably less than the estimates provided to us during consultation with the N2T project team, who estimate that achieving 10% BNG would cost £46-50m, with an *additional* £30-40m required to reach 20% BNG. They were unable to supply more exact figures at this time.

8.29 It is our understanding that the primary difference is the assumed cost of purchasing offsite BNG units. The N2T team are particularly concerned about the capacity of local BNG offsetting projects to supply an adequate number of biodiversity units to mitigate N2T, other NSIPs and TCPA90 development over the timescales required and the inflationary pressures this will inevitably have on the biodiversity units market. NGET is concerned that reverting to statutory credits at a much higher cost rate may be necessary, particularly if higher levels of BNG were to be targeted.

8.30 However, ELNP has received information from the three farm clusters in Essex that there is considerable interest among the farming/landowning community in supplying BNG at a price of £25,000 per unit. ELNP is optimistic that it will be possible to meet the demand for biodiversity units for offsetting within Essex. Nevertheless, it is difficult to be certain about the cost of units and demand/supply ratios, until there is more evidence of actual deals to deliver offsite delivery of BNG in Essex.

8.31 As shown in Table 8-1, when comparing the total capital costs of the optimal overall onshore combination option[65] of £894m, the 10% BNG costs are about 5.14% to 5.59% of the capital cost. The additional costs to get to 20% BNG from 10% are 3.36% to 4.47% of the capital cost. These are very significant sums and could potentially be passed on to the bill payers. Hence, the additional BNG costs will have to be justified through robust policy with consideration of economic efficiency, coordinated investment and social benefits.

Table 8-1: Comparing BNG costs with NSIPs capital cost

	Capital cost	BNG costs to achieve 10%	10% BNG costs as a % of overall project cost	Additional BNG costs to achieve 20% from 10%	20% BNG costs (from 10% BNG) as a % of overall project cost
Our assumptions (section 8.21)	£894m	£20.1m	2.25%	£12.4m	1.38%
NGET assumptions (section 8.22)	£894m	£46-50m	5.14%-5.59%	£30-40m	3.36%-4.47%

Source: SQW & Temple, 2024

Funding mechanism

8.32 As a regulated business, NGET is funded by a price control mechanism which is agreed with and set by the energy regulator, the Office of Gas and Electricity Markets (Ofgem). NGET pay upfront the millions of pounds it costs to build a new power transmission line. The cost is then gradually passed to consumers through their electricity bills over the next 40 years. As part of the energy regulatory framework, they have to demonstrate to the Ofgem that N2T is offering value for money for the billpayer.

[65] Onshore option combining EAN 4 – Norwich Main to Bramford with capital costs of £355m and Circuit Lifetime Costs of £548m and EAS 2 – Bramford via a new coastal substation to Tilbury with capital costs of £539.3m and Circuit Lifetime Costs of £684m.

8.33 The energy regulatory framework managed by Ofgem imposes limits on spending. NGET has a legal statutory duty to be efficient, economic and coordinated (Electricity Act, 1989) and transmission licence conditions to meet. Therefore, demonstrating economic efficiency, coordinated investment and social benefits is crucial to maintaining regulatory compliance. Consequently, any additional costs must be justified and efficiently spent within the context of value for money to adhere to the regulatory framework.

BNG regulatory framework for NSIPs

8.34 The Environment Act 2021 introduces a mandatory requirement for 10% BNG for NSIPs, which will be in force from November 2025. Whilst it is not yet in force, NGET commits to deliver a net gain of at least 10% or greater in environmental value (including biodiversity) for N2T.

8.35 However, as the statutory requirement is not yet in effect, there is presently a lack of guidance and experience in delivering BNG for NSIPs. Due to the high costs and complexity of managing BNG, especially with the need to find willing landowners and secure long-term agreements, it is crucial to have a strategic approach to resource allocation and management to ensure the process can be effectively managed to support BNG delivery without compromising other aspects of the project. For example, the viability of the project and the delivery of the planning obligations.

8.36 NGET and their BNG consultants, Arcadis, stated that they are eagerly anticipating guidance from Natural England and engagement with local authority working groups to allow them to more accurately assess and cost the BNG position for N2T. They were unable to conclude if and how enhanced BNG policy at a local level may impact the requirement for enhanced levels of BNG for NSIPs bought forward under the development consent process, however they were aware of the need for NGET to manage its commercial risk with regard to what, if anything, is offered over and above the statutory minimum. It was thought that it would be quite difficult for regulated bodies such as NGET to risk not being able to recover the additional millions of pounds of cost associated with delivering enhanced BNG without very clear regulatory guidance from Ofgem on whether or not such additional costs, incurred to align with local plan policy requirements, were acceptable.

8.37 Local Authorities seeking to impose BNG requirements in excess of the 10% statutory minimum, and eager to secure compliance from NSIPs within their areas, may consider lobbying the government to raise the issue of how enhanced BNG provision at a local scale is addressed in the emerging guidance.

8.38 Since linear projects often span multiple authorities, they represent opportunities to identify and deliver BNG at scale at strategically important locations. However,

this can lead to variations in BNG provisions across different individual authorities. As such, flexibility for linear projects should be considered to facilitate more strategic and comprehensive BNG delivery. Additionally, the wider benefits of BNG such as improvements in natural capital, flood resilience, carbon sequestration, and contributions to environmental education in schools, learning/ research in universities, skills and job creation in the locality could be considered.

9. Overview of other NSIPs in Essex and the broader perspective

9.1 In addition to N2T, ten other NSIPs were identified by ECC for review that are either approved or proposed:

- Bramford to Twinstead (energy transmission)
- North Falls Offshore Wind Farm (renewable energy)
- Five Estuaries Offshore Wind Farm (renewable energy)
- Longfield Solar Farm (renewable energy)
- Rivenhall Integrated Waste Management (waste)
- Bradwell B (new nuclear)
- Oikos Marine & South Side Development (ports)
- M25 (highways)
- A12 (highways)
- Lower Thames Crossing (highways)

BNG value assessment

Methodology of assessment

9.2 A preliminary review of the ten other proposed NSIPs was carried out, collating publicly available data from the PINS website[66], these results are listed in Table 9-1. Because the nature and specific considerations of the NSIPs vary widely, they were grouped into similar project types to enable comparison and aid prediction of applicability for future NSIPs. Four categories of NSIPs were devised, which can be related to the project types covered by relevant National Policy Statements:

- linear energy transmission NSIPs, as described in NPS EN-5 (Electricity Networks Infrastructure), and including on-shore transmission elements of offshore generation projects, described under NPS EN-3 (Renewable Energy Infrastructure) ;

[66] https://national-infrastructure-consenting.planninginspectorate.gov.uk

- a solar energy farm, as described under NPS EN-3 (Renewable Energy Infrastructure);

- single site NSIPs, including a nuclear energy generation site as described under NPS-EN6 (Nuclear Power Generation), an energy-from-waste project as described under NPS EN-3 (Renewable Energy Infrastructure); and a port as described under the NPS for Ports; and

- highways NSIPs as described under the National Networks NPS.

9.3 It should be noted that some projects may consist of multiple elements that can fall under different NPS project types; for example, energy generation projects may have separate grid connection elements and major projects such as new nuclear sites may have multiple sites and include significant highways project elements.

9.4 Three strategies were used to identify baseline habitats and to calculate the baseline biodiversity units for each NSIP. The strategy used depended upon the available data for each project. Each is outlined below:

- For each NSIP where full BNG calculations were available, the baseline habitat data and conditions were transferred from the metric used within the project (e.g. version 3.1 or 4) to the new statutory metric. This method provided the most accurate data on baseline units for the project. Conditions had to be assumed to be as presented in the project data, but this is a limitation to the accuracy of the outcome as the condition assessment criteria have changed between versions of the metric.

- For NSIPs where the outline BNG results table was available, but not the habitat areas or conditions, the outputs provided were used, noting that they were derived from previous versions of the metric, A review of the habitats present from habitat survey maps and aerial imagery allowed for a degree of verification of the baseline evaluation with reference to the statutory metric.

- For NSIPs where no BNG calculations or habitat areas were available, Temple's GIS team undertook to derive habitat areas from available phase 1 habitat maps or based on similar scenarios. An assumption of moderate condition for habitats was used, except where this was not appropriate to the habitat type of specific evidence of management. Project experience demonstrates that typical management regimes result in limitations to the condition of habitat such that 'good' condition is usually only found under specific conservation management.

9.5 As with the baseline habitat units a range of methods was used to calculate the post-development evaluation:

- Where full BNG assessments were available these were transferred into the statutory metric.

- Where overviews were available, but no detailed calculations, these metric outputs were used, with a review of available project design information to verify the evaluation with reference to the statutory metric.

- Where no BNG data were available, estimated post-development values were estimated. Where NSIP design information was readily available, habitats and areas could be estimated, with assumptions on conditions made to get to the best reasonable estimate of BNG outcomes. If no post-development mapping was available then assumptions were made on likely permanent and temporary habitat loss and the likely footprint of the development depending on the category of NSIP.

9.6 For all of these projects, the metric used (whether the statutory metric or previous versions) was intended for application to TCPA90 development, not NSIPs. The evaluations follow the instructions, rules and principles of the statutory metric (or previous version), but are subject to NSIPs-specific considerations discussed below.

9.7 Similarly to the approach to TCPA90 development, the evaluations excluded consideration of linear (hedgerow) biodiversity units and watercourse biodiversity units. It is assumed hedgerows can be restored and enhanced within the context of the project, without significant additional expenditure being incurred to achieve relevant BNG targets. Watercourses were assumed to be avoided for the purposes of assessing TCPA90 projects; however, NSIPs are less likely to be able to avoid impacts on watercourses. Mitigation would normally be provided for impacts within the scope of the project design, but the application of a biodiversity gain target may require additional enhancement measure to be delivered.

Results of BNG analysis

9.8 The ten NSIPs considered are presented in Table 9-1, along with N2T for comparison. This includes a brief description of each project and its current status and classification into a broad project type to assist with understanding the relevance of outcomes to other potential future projects. It also includes a summary of the scope of data used for the assessment and the approach used to determine the estimated BNG outcomes, as described in the methodology section.

Table 9-1: Summary of NSIPs considered

Project name	Type	Status	Description	Scope of data and approach
Norwich to Tilbury (N2T)	Linear energy transmission	Pre-application stage, submission expected by August 2025. Construction anticipated between 2027 and 2031	A new 184km 400kV overhead powerline installation.	Discussion with NGET and analysis of BNG data outputs provided.
Bramford to Twinstead Reinforcement	Linear energy transmission	At decision-stage, due September 2025. Construction anticipated to be completed by 2030.	Reinforcement of approximately 18km of overhead powerlines (including roughly 50 new pylons) and 11km of underground cabling systems. Approximately 27km of the existing overhead line and associated pylons are to be removed and the creation of a new Grid Supply Point substation.	Headline metric outputs (Version 3.1), taken directly from the Environmental Gain Report, 2023.
North Falls Offshore Wind Farm	Linear energy transmission	Pre-application stage, submission expected in 2024. Project construction due to be completed by 2030.	An offshore electricity generating station approximately 24.5km from its nearest point at the Port of Lowestoft. It is estimated to have an installed capacity in excess of 100MW and will principally comprise offshore wind turbines together with associated infrastructure (onshore and offshore) including a connection to the electricity transmission network.	No BNG has been completed, only a list of HPIs in the onshore scoping area; BNG estimates based on assumed baseline habitats and outline design plans.
Five Estuaries Offshore Wind Farm	Linear energy transmission	Pre-examination stage, application accepted in April 2024. Construction is anticipated between 2027 and 2030.	The Project includes an offshore wind farm located approximately 37 kilometres off the coast of Suffolk at its closest point in the southern North Sea; including up to 79 wind turbine generators and associated infrastructure making landfall between Frinton-on-Sea and Holland-on-Sea, the	Headline metric outputs (habitat condition assessment in v3.1 and metric completed in v4.0).

Project name	Type	Status	Description	Scope of data and approach
			installation of underground cables, and the construction of an electrical substation and associated infrastructure in the vicinity of Little Bromley in order to connect the development to NGET's proposed East Anglia Connection Node substation. All onshore infrastructure would be located in Tendring District, Essex.	
Longfield Solar Farm	Solar energy farm	Consent granted June 2023, but subject to a correction notice November 2023. Construction planned in 2024 to 2026.	Longfield Solar Farm is a new solar farm project which will use ground mounted solar photovoltaic (PV). The Project will be connected to the national electricity transmission network by an underground cable and includes an extension to the existing Bulls Lodge Substation. The site area is approximately 435ha.	BNG carried out in Metric 3.1 and converted into Statutory Metric.
Rivenhall Integrated Waste Management	Single site NSIP	At examination stage, due to close October 2024. Proposed to be operational in 2025.	The Rivenhall Integrated Waste Management Facility (IWMF) and Energy Centre development is for an extension to a generating station to enable electrical generating capacity of up to 65MW together with associated development. The Proposed Development will be contained within the IWMF building and will not result in any changes to the external works undertaken as part of the Consented Project.	It was considered that an assessment of the potential for impact on ecology and biodiversity would not be required for the Proposed Development and that this assessment was recommended to be scoped out of the EIA.

Project name	Type	Status	Description	Scope of data and approach
Bradwell B	Single site NSIP	Pre-application stage. Construction expected to start around 2027 and last 9-12 years	Proposal to build a new nuclear power station – the Bradwell B power station - comprising two UK HPR1000 nuclear reactors, together with associated buildings, structures, and components. Located to the south-east of the Bradwell A nuclear power station. The Main Site is c. 500ha, and the adjacent Accommodation Site is c.40ha. This study considers only the nuclear power station's operational footprint and does not include associated development, such as highways, grid transmission or subsidiary sites.	No BNG calculations have been carried out; BNG estimates are based on baseline habitats and outline design plans. An overview of the habitats covers several HPIs and close to coastal and floodplain grazing marsh.
Oikos Marine & South Side Development	Single site NSIP	Pre-application stage, submission expected in 2025. Construction anticipated to start around 2027.	The project, known as the Oikos Marine and South Side Development (OMSSD) project, will provide additional marine loading arms and infrastructure on two of the existing operational jetties, Jetty 1 and Jetty 2, at the Oikos Facility and include a capital dredge of the berth pocket to service Jetty 2. The OMSSD project will also include the redevelopment of the south side of the Oikos Facility to provide new storage tanks, providing an additional capacity of around 328,000m3 of storage, and associated operational infrastructure.	No BNG calculations have been carried out; BNG estimates are based on baseline habitats and outline design plans.
M25 Junction 28 improvements	Highways NSIP	Consent granted May 2022, subject to correction notice	The Project is an alteration of the existing junction 28 on the M25 which includes the provision of a dedicated loop road from the	No BNG completed, only baseline habitat mapping; BNG estimates

Project name	Type	Status	Description	Scope of data and approach
		February 2024. In construction and due to open in summer 2025.	M25 northbound carriageway heading eastbound onto the A12, the demolition and reconstruction of the existing A12 eastbound off-slip and of the M25 northbound entry slip road, together with other improvements to the existing junction 28 roundabout, M25 and A12 carriageways.	based on baseline habitats and outline plans
A12 Chelmsford to A120 widening	Highways NSIP	Consent granted 12 January 2024; completion due in 2027-2028	Widening of A12 between Chelmsford J19 and A120 (J25) from two lanes to three in each direction. Removal of junctions 20a, 20b and 23. Move junctions 21, 22 and 24 to make them all movement junctions; and create two bypasses	BNG completed in v3.1 and converted in the Statutory Metric.
Lower Thames Crossing	Highways NSIP		The Project would provide a connection between the A2 and M2 in Kent and the M25 south of junction 29, crossing under the River Thames through a tunnel.	Headline metric outputs (metric version 3.1).

Source: Temple, 2024

9.9 The findings of the BNG analysis are discussed below, including particular considerations that are specific to each project type. These findings are summarised in Table 9-2: . It should be noted that values provided regarding the number of biodiversity units needed to meet relevant targets are presented as the net unit values; the creation of habitats to deliver these units will require higher equivalent amounts of habitat delivery due to the factors for time and difficulty of habitat creation/ enhancement, which reduce the total biodiversity units delivered.

Linear energy transmission NSIPs

9.10 Key considerations for this type of project are primarily represented in the case study for N2T, above. Some of these projects will have a greater proportion of underground cable installation, compared to the primarily overhead cables used for N2T. The main considerations of restoring and returning land to previous land use and third-party management and limitations to post-construction habitats within the utility corridor remain similar for both types of cable options.

9.11 The Bramford to Twinstead project includes the loss of ancient woodland excluded from the BNG assessment and subject to separate bespoke mitigation. It also includes high distinctiveness habitats (lowland mixed deciduous woodland and wet woodland) that are not sufficiently compensated to meet trading rules. At present there is no design information for post-development habitats available for North Falls, as the detailed design will be decided post-application. The habitats within the project footprint are majority cropland (cereal and non-cereal). The assumption has been made that the work footprint will result in a loss of these habitats with an additional small percentage of modified grassland lost. As with the Five Estuaries project, it is assumed that habitats removed within the cable route corridor will not be restored within 2 years, and therefore these are considered lost and re-created rather than retained. All habitats to be lost are low distinctiveness.

9.12 The Five Estuaries project identified two options for the restoration of habitats after construction: to exclude restoration of habitats that cannot be returned to their previous condition within 2 years where third-party land ownership limits the potential to guarantee management for 30 years; or, to include these habitats, with appropriate temporal delay factors. For the purpose of this study, the assumption is to include these habitats, in line with the approach taken for N2T. The project includes the loss of a very high distinctiveness lowland meadow, but the extent of loss and any shortfall to meet trading rules is not provided. It is assumed for this study that compensation for this loss can be incorporated into the overall offsetting needed to meet the target net gain. The data obtained for the Bramford to Twinstead and Five Estuaries projects are taken from the headline figures from the metric calculation as no detailed habitat areas were available; as this was carried

out in version 3.1 of the metric, the results are unlikely to be directly comparable, leading to a changed level of net gain value, particularly if individual trees have not been accounted for fully. The baseline and post-development habitats for the North Falls project have been based on broad estimates and are only indicative of the order of net gain achievable.

9.13 The Bramford to Twinstead project achieved a net gain of 12.8%. Although this exceeds 10%, an additional 29.1 BU of priority woodland would be needed in order to meet trading rules. A further 160.3 BU would be required to raise this to 20%.

9.14 The North Falls project resulted in a loss of 1.64%. An additional 387.5 BU would be needed in order to attain a 10% net gain. A further 332.9 BU would be required to lift this to 20% (720.4 BU in total). The Five Estuaries project is predicted to achieve a net gain of 8.55%, requiring 8.6 additional BU to achieve 10% and 67.5 additional BU to achieve 20% (58.9 BU above that needed for 10%).

Solar farms

9.15 Typically solar farm projects are sited on areas of arable farmland or intensively managed grassland. The detailed layout of panels can be adjusted relatively easily to avoid higher distinctiveness habitats, with loss of such being typically limited to occasional mature trees and small sections of hedgerow to enable access, as is the case for Longfield Solar Farm. The permanent footprint of these projects is relatively small, being limited to access, localised infrastructure such as substations and the footings of the panels. For the operation of the project, the habitats within the solar array area can be managed largely as wildflower-sown grassland, although condition may be suppressed by the overshading of the panels. Other areas within the site can usually be retained and enhanced to compensate for the change from arable crops to grassland

9.16 The assessment for Longfield Solar Farm was carried out using version 3.1 of the metric. This was converted into the Statutory metric for the purpose of this study, but there is potential for variations in condition and valuation of features such as tree planting that may not be captured. The output values of the metric may therefore vary slightly from what is actually deliverable, but this is unlikely to be a major difference.

9.17 The Longfield Solar Farm proposal is predicted to result in a net gain of 82.5%, delivered onsite. No additional offsetting would therefore be required to achieve either 10% or 20% net gain. This is in line with other solar farm developments outside Essex, that are reported to achieve in the region of 80% net gain.

Single site developments

9.18 This grouping of project types is based on proposals that have a discrete, largely permanent site footprint. This potentially covers projects arising from a variety of sectors, with the three examples considered being energy-from-waste, nuclear energy and harbour facilities. Sites can vary significantly in baseline character; two of the sites considered are on previously developed land of low or negligible ecological value, while Bradwell B is located predominantly on arable farmland of low distinctiveness, but includes high distinctiveness saltmarsh and habitats within internationally important sites for coastal birds. Such marine sites are likely to require detailed bespoke mitigation for habitats and fauna (particularly birds) as part of integral project design, so these elements of habitat loss will generally be at least compensated for outside the need for BNG.

9.19 The Rivenhall Integrated Waste Management project scoped out habitat loss and ecology from their EIA due to the proposals being limited to existing buildings and infrastructure, so there would be no loss of habitats, making it exempt from BNG. Bradwell B is a major development of a new nuclear energy facility. Little information is available regarding the proposed project design and no BNG assessment has been undertaken. Estimation of the potential achievable level of net gain is based on estimated baseline habitats and a precautionary assumption that all land within the site boundary will be lost to structures and infrastructure and all biodiversity compensation and enhancement would need to be delivered off-site. compensation and enhancement would need to be delivered off-site. There are some areas of higher distinctiveness habitat, in particular salt marsh and some areas of woodland within the site, but overall the baseline value has been estimated based on being dominated by cropland (arable grassland and cereal crops).

9.20 Oikos Marine & South Side Development is a redevelopment of a previously developed site of low biodiversity value, with two areas totalling c.2ha that were previously set aside as biodiversity mitigation for adjacent developments. No detailed designs or BNG assessment are available for this project, so broad assumptions have been made to estimate the likely achievable net gain. The previously developed area of the site was assumed to be ‘vacant or derelict land’ (low distinctiveness habitat) in poor condition and the mitigation areas to be ‘other neutral grassland’ (medium distinctiveness habitat) in good condition. The project scoping report sets out the proposal to create a new habitat mitigation area in existing intensively grazed grassland to provide biodiversity enhancement, although specific details are not given. For the purpose of this study, it has been assumed that the proposed mitigation area will be of sufficient extent to provide 10% net gain for the project (equivalent to 14.1ha); any additional enhancement to achieve 20% would have to be delivered through offsetting.

9.21 The estimation of achievable net gain for both Bradwell B and Oikos Marine & South Side Development is based on broad estimations of both baseline and post-development habitats, assuming total loss of habitat within the site boundary as a precautionary scenario. Actual achievable outcomes could deliver significantly higher levels of net gain if elements of biodiversity value can be incorporated into the project design.

9.22 Bradwell B: The baseline value of the site is estimated at 1080 BU, so achieving 10% net gain would require 1,188 BU and 20% would require 1,296 BU (an additional 108 BU above achieving 10%). The Oikos Marine & South Side Development is assumed to achieve a net gain of 10% through the implementation of an offsite mitigation area; an additional 7.4 BU would be required to achieve a 20% net gain.

Highways projects

9.23 Highways projects will vary significantly in the characteristics of their biodiversity impacts depending on the scope of the proposals. Those projects considered generally involve the creation of new road elements or widening/ expansion of existing road elements, resulting in permanent loss of habitats, as well as a swathe of temporary or short-term loss for construction. Whilst route optioneering should take account of important biodiversity features, including high and very-high distinctiveness and irreplaceable habitats, there is often limited flexibility to avoid these features. These projects may, therefore, require bespoke mitigation and/ or dedicated compensation measures to make up for these losses. Unlike linear energy transmission NSIPs, land required for highways NSIPs would normally be acquired, by agreement or, if necessary, under compulsory purchase, and largely retained after construction is completed. In such cases, a compelling argument needs to be made to support the CPO. This includes any dedicated mitigation areas that are needed to minimise onsite habitat net loss or potentially to deliver net gain.

9.24 No BNG calculations were available for the M25 junction 28 improvements project, so habitat survey data were used to determine the baseline habitat values and outline design plans were used to estimate post-development habitats. The results are significantly limited by the broad estimation of habitats and assumption of condition, which was taken to be moderate unless evidence indicated otherwise.

9.25 The A12 Chelmsford to A120 widening project had a completed metric calculation available in version 3.1 of the metric. This was converted into the statutory version, although the condition was assumed to be as stated in the original calculations.

9.26 The Lower Thames Crossing project data available only included the headline results of the assessment using version 3.1 of the metric. These outputs were taken

at value for this study but are likely to be different if assessed under the statutory metric.

9.27 The M25 junction 28 improvements project achieved a 6.29% net gain over an estimated baseline value of 250 BU, requiring an additional 9.3 BU to achieve 10% and 34.3 to achieve 20% (25 BU above that needed for 10%).

9.28 The A12 Chelmsford to A120 widening project achieved a headline net gain of 39.35%, over a baseline value of 2540 BU. However, there was a net loss of higher distinctiveness habitats including priority habitat ponds, open mosaic habitat on previously developed land, lowland mixed deciduous woodland, wet woodland and reedbeds, which resulted in a trading rules deficit of 404 BU for high and very high distinctiveness habitats. It may have been possible, had this been considered as part of the project design at the time, for at least some of this to have been addressed through redesign on habitat restoration proposals, so that these priority habitats would have been delivered in place of the lower distinctiveness habitats proposed. A test of the values shows that replacing 'other neutral grassland' in good condition in the metric with the necessary areas of higher distinctiveness habitats to satisfy trading rules for these habitats, results in an indicative net loss of around 2.8 BU. For the purpose of this study, however, it is assumed that this loss would need to be offset in addition to the net gain achieved by the project to claim any overall net gain under current statutory (TCPA90) requirements. Therefore, the overall offsetting requirement for this project to achieve 10% is taken to be 404 BU (the trading rules shortfall); no additional offsetting would be needed to achieve 20% as the project can already deliver greater than this once the trading shortfall is addressed.

9.29 The Lower Thames Crossing project achieved a net gain of 7% over a baseline value of 7712 BU, requiring an additional 193 BU to achieve 10% net gain and 964 BU to achieve 20% (771 BU above that needed for 10%).

Summary of BNG outcomes

9.30 **Table 9-2** provides a summary of the BNG outcomes of each project, with the estimated number and cost of biodiversity units needed offsite to achieve a net gain of 10%, and the additional units needed to raise this to 20%. We assumed the cost for each biodiversity unit offsite is £25,000 per unit according to information from Essex County Council. The overall estimated project cost is also included, where available, to put these figures into the context of the scale of each project.

Table 9-2: Summary of BNG outcomes for NSIPs

Project Type	Project	Estimated BNG outcome	Offsetting BU/ cost to achieve 10%	Additional BU/ cost to achieve 20% from 10%	Overall project cost	Uplift to 20% from 10% BNG as a % of overall project cost
Linear energy transmission	Bramford to Twinstead Reinforcement	12.8%	29.1 / £727,500*	131.2 / £3,280,000	£499 million	0.66%
	North Falls Offshore Wind Farm	-1.64%	387.5 / £9,687,500	332.9 / £8,322,500	No information available	No information available
	Five Estuaries Offshore Wind Farm	8.55%	8.6 / £215,000	58.9 / £1,472,500	£3.5 billion	0.004%
Solar Farms	Longfield Solar Farm	82.5%	0 / £0	0 / £0	£240million (estimated)	N/A
Single site NSIPs	Rivenhall Integrated Waste Management	Exempt	n/a	n/a	n/a	n/a

Project Type	Project	Estimated BNG outcome	Offsetting BU/ cost to achieve 10%	Additional BU/ cost to achieve 20% from 10%	Overall project cost	Uplift to 20% from 10% BNG as a % of overall project cost
	Bradwell B	Assumed 100% loss	1188 / £29,700,000	108 / £2,700,000	No information available	No information available
	Oikos Marine & South Side Development	10%	0 / £0	7.4 / £185,000	No information available	No information available
Highways NSIPs	M25 Junction 28 improvements	6.29%	9.3 / £232,500	25 / £625,000	£140-£170 million	0.37%-0.45%
	A12 Chelmsford to A120 widening	39.35%	404 / £10,100,000*	0 / £0	£1.05-1.27 billion	0%
	Lower Thames Crossing	7%	193.2 / £4,830,000	771.2 / £19,280,000	£9 billion	0.21%
TOTAL UNITS			2,219.7	1,434.6 (3,654.3 units total for 20%)		

*entries marked with an asterisk include allowance for additional offsetting required to meet trading rules in excess of the units required to achieve the target net gain.

Source: SQW & Temple, 2024

Viability considerations

9.31 **Table 9-2** above shows that the additional costs to achieve a 20% net gain from a 10% net gain are insignificant as a % of overall project cost, ranging from 0.21% to 0.66% of the overall project cost.

9.32 The table also shows that 3,654.3 units (1,434.6 additional units) would be required to achieve a 20% net gain across the 10 selected NSIPs.

10. What does this mean for BNG delivery in Essex?

10.1 The estimated BNG outcomes determined from this study show that different types of NSIPs are capable of delivering differing levels of net gain within the project design and that there are different considerations and limitations to each type of project and specific to individual projects. Overall, however, they were mostly able to achieve some level of net gain, or a small net loss within the project.

10.2 Many of the projects considered had assessments carried out using earlier versions of the metric. While variations between the metric versions can go both ways, the overall trend is for the later versions to return lower BNG outcomes. This is particularly the case where individual scattered trees are present, which may not be fully captured in this review. However, the implementation of BNG legislation and policy is intended as a driver for change, so older projects that did not consider the need for net gain may have been able to deliver higher biodiversity benefits had they been designed with BNG in mind. This is illustrated by the A12 Chelmsford to A120 widening project that failed to meet current trading rules, but had these been taken into account during project design, mitigation could have focused on the appropriate habitats to compensate for the loss of higher distinctiveness habitats rather than over-delivering on lower distinctiveness habitats.

10.3 The assumption for all of these projects is that additional biodiversity units needed, beyond what is reasonably achievable within the project, to meet the assumed 10% target and any enhanced target, such as to 20%, would need to be secured through offsetting agreements with local landowners. This will depend on the availability of the relevant habitats in the offsetting market in the right location. Consultation with ELNP indicates that there is significant appetite from local landowners to invest in offsetting provision and the Green Essex Strategy[67] identifies that land cover of arable and horticultural land (which would be the likely target location for offsetting) accounts for 59% of the county's area. This suggests that there is potentially a significant resource for offsetting provision, but it will be important to identify the appropriate habitat types in the relevant locations in relation to the LNRS and demand from projects. The alternative of resorting to statutory credits is likely to be prohibitively expensive and detracts from the local benefits that would be derived from local delivery.

10.4 Of the large-scale nature and specific requirements of many types of NSIPs, impacts on high distinctiveness and irreplaceable habitats can be much harder to

[67] Green Essex, Essex County Council, 2019 https://consultations.essex.gov.uk/rci/green-essex-strategy/supporting_documents/GE_Appenddices_24042019_2%202.pdf

avoid than for most TCPA90 applications. This results in the need for costly, high difficulty offsetting or bespoke mitigation respectively. While bespoke mitigation for irreplaceable habitats is excluded from consideration in BNG, the overall costs of delivering should be considered alongside the typically high cost demands of these bespoke solutions.

10.5 For future developments that come forward, it is anticipated that BNG should be considered at the feasibility stage. However, as the assessment boundary is usually necessarily non-specific at this stage to allow for options appraisals and project design, assumptions need to be made to estimate the likely impact and BNG outcomes.

10.6 Securing offsetting sites and any dedicated mitigation areas in advance of works will be an important consideration in minimising the scale of biodiversity units needed to achieve any target net gain. The time taken for habitats to achieve their target state is a factor in the units delivered by any enhancement measures, so reducing the time this takes by advance implementation will increase the biodiversity unit value.

Linear energy transmission NSIPs

10.7 What should constitute 'local' offsetting in the context of major linear NSIPs is an open question at this stage. The approach taken under the TCPA90 BNG regulations is largely based on local authority boundaries, but this is not necessarily practical for such projects and may not deliver the best outcomes for biodiversity, local communities or the project. For N2T, it is anticipated that offsetting provision will be distributed within the relevant county (Essex, Suffolk and Norfolk). This will ensure some level of consistency in localisation of the investment of funds into biodiversity schemes. Delivering offsetting within the boundaries of the local authorities where impacts occur is likely to be an approach sought by the local authorities to maintain inward investment, but this will be limited by the availability of sites in the right location and could result in more piecemeal delivery and suppress investment in high-benefit strategic sites and regionally important priority habitats.

10.8 Linear energy transmission NSIPs in particular result primarily in temporary construction impacts, with most habitats being restored to their previous state on completion of works. The exceptions being for permanent structures and ongoing management restrictions, such as not allowing trees and woodland to develop along the cable route. However, mitigation onsite is generally limited as land is not owned by the developer, so mechanisms for ensuring long-term management are limited and potentially very complex and costly given the number of different parties that could be involved. Following the guidelines as they apply to TCPA90

applications means that land that is used for temporary access, but not returned to its current state within two years, would only be able to contribute to post-development values if it is held in management for net gain for at least 30 years, which is not a practical approach where the developer does not own the land. The Five Estuaries Off Shore Wind Farm project also highlighted this issue, citing a difference from a loss of 13.35% and a gain of 8.55% between discounting these habitats and including them in the evaluation. Similarly, if temporary losses are restored fully within two years could be excluded from the assessment boundary, this would significantly reduce the baseline value and therefore the number of biodiversity units needed to achieve the biodiversity gain objective. Future projects may need to take into account of this in programming construction work to minimise the temporary infrastructure that is not restored within two years.

10.9 These projects can generally minimise impacts on high distinctiveness and irreplaceable habitats, but some small-scale losses are likely to be unavoidable. The projects of this type that were considered, including N2T, were able to achieve a net gain of between -6% and 12.8%.

Solar farms

10.10 Solar Farms are typically able to achieve high levels of BNG, over 80% in the case of Longfield, as they can usually create higher value habitat, in the form of wildflower sown grassland, in the place of low distinctiveness arable farmland across the developed area of the project, as well as often having opportunities to deliver additional enhancement within the wider project boundary. The biodiversity value, and BNG valuation of land within the solar array will be suppressed by the presence of the panels, so projects claiming high levels of net gain may have to commit to significant and innovative solutions (such as controlled grazing) to ensure they achieve these results. It is perhaps also of note, that while the BNG metric does not differentiate in the value of cropland, there can be a correlation between lower grade agricultural land and higher biodiversity; solar farms generally target lower grade agricultural land and planning policy may restrict their installation in the best agricultural land. That this is not demonstrated in the metric means that there is a risk that the biodiversity benefits may not be as high as they appear.

10.11 As an outcome of 80% net gain is regularly achievable on solar farms, any increase of minimum requirement to 20%, or even higher would not have any implications for their delivery. If these projects achieve well above the target net gain requirement, they could sell the additional biodiversity units into the market as offsetting for other projects/ developments.

Single Site Projects

10.12 The single site projects considered were all located predominantly on previously developed land of mostly low biodiversity value. While these sites are likely to have been selected on the basis of access to infrastructure, it has the effect of reducing impacts on biodiversity. However, where there are features of importance, such as coastal habitats and bird populations at Bradwell B, these may not be practical to avoid. In such cases, bespoke mitigation outside the BNG framework is generally likely to be required, but some specific offsetting may be needed to compensate for the loss of high distinctiveness habitats.

10.13 In the case of the Rivenhall Integrated Waste Management project, there were no habitats of biodiversity value present as it sits within the existing development footprint, which exempts it from BNG. At the other extreme, although not present within the projects considered, there may be future cases where previously developed land supports high biodiversity value habitat mosaics. These are classified as 'open mosaic habitat on previously developed land', a habitat of principal importance, primarily for the high diversity and rarity of plant and invertebrate species it can support. In these cases, highly specific offsetting measures would be required to compensate for losses; while not difficult to recreate, suitable locations for this habitat type are not always readily available.

10.14 In the case of Bradwell B, the assumption in calculations was that all land within the site boundary would be developed, so although the habitats were largely of low value, the scale of the development means that a very high number of biodiversity units would be required to offset the losses. The Oikos Marine & South Side Development project is similar, but a dedicated offsite mitigation area has been identified as part of the project, which is an approach that is likely to be well suited to this type of NSIPs.

Highways projects

10.15 While the impacts of highways projects include a significant proportion of permanent land-take, the construction areas may be restored and managed to provide improved habitats post-development. With appropriate consideration of mitigation design, these projects are likely to mostly be able to achieve net gain, but will require provision of offsetting to achieve a 10% or higher target.

10.16 The nature of the road projects will have an effect on how mitigation is delivered. Widening projects within existing land take are likely to place additional pressure on residual land within the highway boundary, or require more offsetting. New construction highways projects, along with many other types of NSIPs, may create dedicated mitigation areas to compensate for biodiversity impacts, which would form part of the order limits and may be secured as part of land acquisition for the

project. However, the use of compulsory purchase orders is subject to restrictions that may not allow for additional land acquisition for BNG, especially to achieve an increased target net gain. Furthermore, the cost of land acquisition and subsequent management may be significantly higher than securing offsetting on third party land. These projects may, therefore, rely more on offsetting to achieve no-net-loss and net gain up to current targets as well as to deliver any additional requirements. In its BNG consultation response, the Government has stated that it does not intend to make any new provisions for compulsory acquisition; it will, however, consider providing guidance or reference in biodiversity gain statements that outline the reasonable alternatives developers should explore to deliver net gain before they consider compulsory acquisition of land.

Viability considerations

10.17 Whilst **Table 9-2** shows that the additional costs to achieve a 20% net gain from a 10% net gain are reasonable and insignificant as a % of overall project cost, the costs depend on the availability of local biodiversity units. Our case study on the N2T project found that the biodiversity unit cost assumptions from the project team are much higher than the £25,000 per unit cost we assumed. The main reason is the project team assumed that it may be necessary to utilise statutory credits instead of local biodiversity units.

10.18 As demonstrated in **Table 9-2**, NSIPs could make a major and valuable contribution to habitat enhancement in Essex due to their size. However, this is only possible if sufficient local biodiversity units are available at an affordable price. It would be extremely difficult for NSIP promoters to justify in value for money terms the provision of BNG in excess of the mandatory 10% were the costs excessive, and therefore if higher levels of BNG are to be targeted it is essential that a sufficient supply of local and affordable biodiversity units can be secured at design stage. ELNP have expressed confidence that there are enough farmers and other landowners interested in supplying biodiversity units across Essex that a sufficient supply of units can be sourced to meet this demand. The importance of robustly demonstrating such supply to promoters is clear.

11. Conclusions

TCPA90

11.1 Our testing has assessed the extra costs and potential impacts on financial viability within Essex of enhanced BNG over the mandatory minimum 10%. It is important to note that these conclusions are derived from testing seven residential and three commercial high-level generic typologies. Since BNG is inherently site-specific, this exercise provides only an indicative measure of viability. Individual Local Plan viability assessments are important to understand viability at a local level; **this study is not intended to replace or supersede Local Plan Viability Assessments but may be helpful in providing evidence to inform them**.

11.2 **In the typologies tested, increasing BNG to 20% has not significantly raised costs nor had a material impact on scheme viability.** Other factors such as local values and build cost are the key determining factors of viability, with additional BNG costs at the 20% level generally paling into relative insignificance in the development appraisal compared to these variables.

11.3 Whilst national policy advocates for an onsite first approach, some environmental groups including ELNP recognise that offsite provision also has an important role to play in delivering habitat enhancement particularly where this is supplied locally and strategically on opportunity areas that align with the emerging Essex Local Nature Recovery Strategy. This study has identified that in Essex **to achieve enhanced BNG at the 20% level the cost difference between onsite and offsite BNG provision is generally small.** Developers will generally pursue the most cost effective solutions which for the larger sites generally means onsite provision as this is typically less expensive due to site size, the availability of land for habitat enhancement (due to typically lower net to gross development area ratios), and the ability to provide a range of habitat types. However, in many instances it is unlikely that smaller greenfield sites would be able to deliver enhanced levels of BNG entirely onsite as the sizes and types of habitats deliverable are limited, therefore delivering offsite BNG to “top-up” what can be provided onsite is to be expected in these scenarios. Offsite provision may also be more feasible in areas where onsite BNG increases are challenging or expensive, such as brownfield urban sites.

11.4 Therefore, for more tightly constrained sites, whilst policy steers towards an onsite first approach, it is often commercially advantageous to purchase biodiversity units offsite once cost effective onsite provision has been exhausted. This is particularly true where onsite provision would require the acquisition of additional land. While offsite provision also requires land to be managed for BNG, the cost is included in the biodiversity units and land can be selected in areas with lower development

pressure, making it comparably cheaper than having to acquire additional land at development values or reduce development density by giving development land over to onsite BNG provision. Therefore, **it is important that a reasonable and affordable supply of biodiversity units are available to developers to enable them to achieve policy levels of BNG where onsite solutions are either impractical or prohibitively expensive**.

11.5 Our scenario modelling has demonstrated that **the magnitude of development viability impact of adopting a 20% BNG policy is in all instances small (and in some cases negligible).** However due to the wide range of market values and build costs across Essex we emphasise the importance of development viability testing for all policy contributions in Local Plan Viability Assessments. We recognise that in lower value areas development viability is a challenge. Therefore Local Authorities may wish to consider the benefits of enhanced BNG provision weighed against relatively small cost increases.

11.6 The key headline findings for BNG policy in Essex are as follows:

- **A shift from 10% to 20% BNG will not materially affect viability in the majority of instances when delivered onsite or offsite**.

- The biggest cost in most cases is to get to the mandatory, minimum 10% BNG. The cost increase to 20% BNG is, in most cases, much less and is generally small or negligible. Based on our scenario testing we estimate that:

  - the additional cost of achieving 20% BNG ranges from £2 - £27 per residential unit on brownfield sites[68] and from £77 to £308 per residential unit on greenfield sites.
  - this additional cost would impact residual land values by <0.1% for brownfield development land and <1.4% for greenfield development land.

- Because BNG costs are low when compared to other policy and development costs, they are unlikely to render development unviable for BNG policy of up to 20%.

- **The cost increase to 50% BNG is low for *brownfield* sites and unlikely to have a material impact on development viability in many cases, particularly in higher value areas. For *greenfield* sites, the additional cost associated with 50% BNG may have a more material impact on development viability but the costs remain small compared to other policy costs**. Based on our scenario testing we estimate that:

[68] Brownfield scenarios assume sites are located on previously developed land that has not been allowed to re-establish vegetation of biodiversity value.

- the additional cost of achieving 50% BNG ranges from £20 - £214 per residential unit on brownfield sites and from £636 to £1,232 per residential unit on greenfield sites.
- this additional cost would impact residual land values by <0.7% for brownfield development land and between 3% and 5.4% for greenfield development land.

- Some developers report that they are having issues delivering the mandatory 10% BNG on some of their sites. This is not surprising during the transitionary period following the adoption of a new policy because Local Plan site allocations and historic land deals will not have factored in the additional cost and land take requirements to achieve BNG. This demonstrates the importance of considering BNG from the outset during site allocation and master planning stages. Developers should ensure that they can efficiently provide it onsite if this is what they plan to do (mitigation hierarchy insists on onsite provision before moving to offsite). Because of these existing challenges, Local Authorities who wish to pursue BNG in excess of 10% may expect some pushback on the policy and therefore may need robust local viability assessment to support it. However, this study shows an assessment is likely to demonstrate viability will not be negatively impacted (to a material extent) for BNG increases of up to 20%, and even beyond this level in some areas. The above conclusion reflects the viability position where BNG requirements have been considered and factored in throughout the land acquisition and planning application process. **In the short term, enhanced BNG policy changes may cause greater levels of disruption and viability impact where the cost and land take requirements of increased levels of BNG provision have not been factored into existing proposals**. Local Authorities may wish to take this into account when designing and implementing policy. If onsite were to be the primary focus of enhanced provision, increasing land take may result in the lowering of average housing densities, so more land may be required to deliver housing. However, the majority of this burden relates to the mandatory 10% BNG and the increase to get to 20% BNG is comparably small; offsite solutions are also available. Therefore this should not be seen as a barrier to BNG policy in excess of 10%, but is a consideration for LPAs.

- In certain situations **where the starting biodiversity baseline is low i.e. on cleared brownfield sites**, it might prove easy for developers to provide considerably larger increases over 20%. In some cases, even an increase to 50% BNG or more will not render development unviable. LPAs may wish to consider this when developing new policies and could, for example, **consider a minimum threshold for BNG applied in absolute terms in addition to a percentage increase.** This may allow them to deliver higher levels of BNG where it is appropriate to do so.

PA2008 - NSIPs

11.7 Overall, our analysis indicates that **most types of NSIPs can deliver somewhere between a small net loss and around 10% net gain within the project design**, with offsetting assumed to be needed to make up shortfalls of biodiversity units, depending on the type of NSIPs.

11.8 Linear energy transmission NSIPs in particular must consider the loss and restoration of habitats, which are restricted by the promoter often not owning the land.

11.9 Linear highways NSIPs, appear to have comparable BNG outcomes to linear energy transmission NSIPs, although they have a greater permanent impact within the development footprint, they may be better able to secure land to deliver mitigation sites as part of the project.

11.10 NSIPs on single sites, such as ports and nuclear energy power stations are likely to result in the loss of onsite habitats, with the potential for delivering biodiversity gain through dedicated mitigation sites. This analysis did not consider potential associated development that may be linked to the principal development and form part of any DCO.

11.11 Solar farms with or without battery storage NSIPs have the potential to achieve relatively high BNG outcomes of around 80% net gain.

11.12 The detailed case study of N2T, with high level additional details from other NSIPs proposed in Essex provides some insight into the specific questions around delivering BNG for NSIPs, as opposed to TCPA90 development, and the implications of an uplifted minimum target.

Understanding how BNG can be applied to linear NSIPs and what best practice may look like in terms of defining the extent of impacted habitat

11.13 Defining the extent of impacted habitat within a linear energy transmission NSIP such as N2T will depend on the principles that are set out in any legislation and guidance on BNG for NSIPs. **The treatment of short-term impacts on land not owned by the NSIP promoter will have a significant impact on the cost of delivering net gain.**

11.14 To better predict the likely BNG outcomes of an NSIP at the feasibility stage, **a detailed review of an example NSIP, comparing estimated BNG outcomes at initial feasibility to final design**, could be valuable in developing more accurate projections of likely final BNG outcomes.

Understanding how BNG can be delivered, on and offsite options, land take, retention and habitat management arrangements

11.15 Traditionally, most types of NSIPs have relied on securing dedicated areas to deliver mitigation, including compensation for biodiversity impacts. **Dedicated areas for mitigation, including compensation are likely to remain an important component of the approach to BNG, but the availability of enhancements through the offsetting market provides a potential alternative**. Further studies could be valuable in comparing the costs and benefits of these different options.

11.16 Where dedicated mitigation areas cannot be secured directly as part of the NSIPs within their order limits, the assumption is that any shortfall to the biodiversity gain objective would be delivered through offsetting, by purchasing biodiversity units from local landowners willing to commit land to biodiversity enhancement and to maintaining it for at least 30 years. **Large landowners may be key to providing biodiversity units at the scale required for large, linear or multi-site NSIPs**.

11.17 **Securing offsetting sites and mitigation, including compensation areas in advance of works will be important to minimise the scale of biodiversity units needed to achieve biodiversity gain objectives** as the time delay in implementing habitat enhancements reduces the biodiversity units they are able to deliver.

11.18 Consideration of **programming temporary works to allow restoration of habitats within two years would minimise the loss of biodiversity units**.

11.19 **The cost of offsetting for BNG needs to be considered alongside any bespoke mitigation and compensation required for irreplaceable habitats**, which are excluded from BNG assessment, but would also need significant areas of land to be secured for biodiversity enhancement.

The potential magnitude of BNG / number of units / units that may be delivered

11.20 Due to the size and scale of most NSIPs, the overall baseline value of the habitats is usually very high compared to most TCPA90 development. Of the NSIPs considered, the highest baseline value was estimated at 7712 BU for the Lower Thames Crossing, N2T being the next highest at 4953 BU. As a consequence, the scale of biodiversity units needed to offset any percentage shortfall to the target net gain is likely to be sizeable**. As an illustration, the 804 BU needed for N2T to achieve 10% net gain would be equivalent to approximately 192ha of arable farmland being enhanced to wildflower-sown grassland** (‘other neutral grassland’, assuming no strategic significance or temporal modifiers). This area is

liable to increase significantly once the requirement for higher distinctiveness habitats, such as woodlands is considered.

11.21 **Overall, the eleven NSIPs reviewed would require an estimated total of 1930BU to increase from 10% net gain to 20% net gain**.

How BNG investment may work "cross-boundary" and the potential complexities / opportunities associated with prioritising local benefits vs regionally important priority habitats

11.22 The question of what should be considered 'local' is a key consideration for the future BNG framework for linear energy transmission and highway NSIPs (and potentially for other linear NSIPs, such as rail or pipelines). The local authority based approach taken for TCPA90 development (whereby offsite measures are subject to a reduction in biodiversity unit value if are not in the same local authority as the impacts) is not always suited to delivering the optimal solutions for either the NSIPs or for biodiversity. **A clear framework for determining local offsetting is needed for linear NSIPs.**

11.23 **N2T is working toward a county-level approach to offsetting**, which allows for investment in strategic biodiversity enhancement, but could result in conflict with district-level authorities where investment is taken to other districts.

11.24 **For projects on single sites, the TCPA90 approach to local offsetting is most appropriate**.

Opportunities and mechanisms for Essex CC and Local Authorities to work with NSIPs to deliver enhanced levels of BNG

11.25 NSIP promoters across Essex are concerned that high demand for biodiversity units could inflate costs, potentially forcing them to purchase more expensive statutory credits. Conversely, landowners are worried that an oversupply of biodiversity units could lower their value, reducing the economic incentives for providing these units.

11.26 These contrasting concerns highlight the need for a balanced approach to managing the demand and supply of biodiversity units. The public sector, principally host local authorities, could play a crucial role in analysing and coordinating the expected demand and supply of biodiversity units within local geographies. This balance is essential to avoid significant cost fluctuations of the biodiversity units required to deliver BNG for NSIPs and offer confidence that escalating BNG costs will not undermine attempts to deliver enhanced BNG by making it too expensive to deliver, or justify in value for money terms.

11.27 The key areas of focus for discussion between Essex CC and its local authority partners in Essex and NSIP promoters should target opportunities to **enable scale of delivery of biodiversity offsetting units and to keep the cost of offsetting units down**, for example through economies of scale.

11.28 By **enabling discussion and seeking a position on how to address the issues of local offsetting delivery and balancing supply and demand of offsetting**, Essex CC and its local authority partners have the potential to influence the determination of how these details will be addressed in future legislation, guidance and national and local policy.

Considerations for developing legislation, guidance and national and local policy

11.29 The study raises a number of areas that should be considered in the development of Biodiversity Statements and associated legislation, policy and guidance for NSIPs.

11.30 Defining the extent of impacted habitat within many linear NSIPs is challenging and will depend on principles set out in national secondary legislation, policy and guidance on BNG for NSIPs. However, limited legislation, policy and guidance is available for implementing BNG for NSIPs. **Future policy and guidance should provide clarity on how the boundary for calculating BNG for NSIPs is defined, particularly for linear NSIPs that do not have clear boundaries.**

11.31 **The treatment of temporary loss of low distinctiveness habitats could be reviewed** where low distinctiveness habitats will be restored to their previous state on completion of construction works, but not within two years, and be returned to the landowner to control. Under the TCPA90 guidance, the effect of restoring these habitats would be excluded from the BNG outcomes because the management is not legally secured for 30 years, even though the habitats will revert to their pre-development state. This could have a negative impact on the NSIPs and biodiversity outcomes by increasing costs, potentially diverting funding from other investments, and removing the incentive to restore these habitats as soon as possible.

11.32 The approach to local delivery of offsetting does not necessarily deliver the best outcomes for NSIPs or biodiversity, particularly linear NSIPs, in the same way as TCPA90 development. **A review of different approaches to local offsetting delivery for linear NSIPs may yield insights into the benefits of alternatives in delivering better outcomes for biodiversity and local communities**, including investment in strategic biodiversity sites and ensuring local socio-economic benefits.

11.33 Different types of NSIPs have different and variable characteristics in relation to BNG. **The proposed system of biodiversity gain statements allows for variation between the biodiversity gain objectives that different project types can set, as well as the detail of the mechanisms to achieve it.** This means that solar farm NSIPs, with or without battery storage, could set a higher biodiversity gain objective, which could be a positive step towards the Government's objectives as set out in the EIP23. Conversely, maintaining a lower objective and allowing potential promoters of solar farm NSIPs, with or without battery storage, to use excess units to provide offsetting could support other NSIPs or TCPA90 development in achieving net gain.

11.34 Whilst LPAs are central to setting the policy framework for enhanced BNG provision (in excess of the mandatory 10%) through local development plan policies for TCPA90 development as TCPA90 development must be determined in accordance with the local development plan, unless material considerations dictate otherwise, local planning policies are only a material consideration of varying weight when the relevant Secretary of State is determining development consent for an NSIP. **There is a need for greater clarity in national planning policy for NSIPs to support local host authorities and NSIP promoters seeking to justify the additional cost and value for money to the local economy, environment and health and wellbeing of host communities of delivering greater than the mandatory biodiversity objective for NSIPs**.

11.35 **Future national planning policy and guidance should be clearer on the expectation of delivering BNG for NSIPs, including greater than the mandatory biodiversity objective.** This is especially relevant where there are BNG policies in local development plans requiring greater than 10% BNG for TCPA90 development. This study has highlighted how challenging it is for promoters of some NSIPs to assess the cost and justify value for money to government bodies and other regulators of delivering beyond 10% BNG for NSIPs.

The role for Essex CC across TCPA90 development and PA 2008 NSIPs

11.36 Essex CC has a potentially important role in enabling discussion and resolving key challenges to BNG delivery in Essex for both TCPA90 development and PA2008 NSIPs, which could influence national policy and guidance and set precedent for both planning regimes. This could include:

- **understanding the predicted scale of need for biodiversity units to facilitate TCPA90 development and NSIPs across the county** where this cannot be provided onsite, in particular in relation to specific habitat types, and the timing of demand;

- **a study of the potential availability of land in Essex for offsetting** could provide assurance as to whether the supply is likely to be sufficient to meet the demands of TCPA90 development and NSIPs. A study at the county-level geography would be particularly advantageous for the developers of major TCPA90 development and NSIP promoters who require larger or multiple sites for offsetting, as well as providing a more comprehensive understanding of the county's potential offsetting resources;

- identifying **opportunities within the Local Nature Recovery Strategies to integrate the offsetting demands of NSIPs** and for NSIPs to support the delivery of the LNRS;

- **identifying key local priorities** for biodiversity enhancement from TCPA90 development and NSIPs which will be largely delivered through the LNRS; and

- **identifying priorities where offsetting investment can deliver additional value** to the local economy, environment and health and wellbeing of local communities, such as access to nature, recreation, tourism, active travel and other ecosystem services, through a comparative analysis of needs and benefit opportunities.

Overall conclusion and implications

11.37 In summary, the additional costs to achieve 20% BNG is a relatively small percentage of overall cost, for both TCPA90 development and NSIPs in Essex.

11.38 There is a huge potential for NSIPs to provide a significant amount of BNG in Essex due to their size and scale, and the large number of NSIPs proposed. Whilst NSIPs can provide some level of BNG onsite, most of them have a shortfall and BNG will have to be delivered offsite through the purchase of biodiversity units. N2T has demonstrated that NSIPs will generate a high demand for biodiversity units in Essex that will continue to grow as Essex continues to host increasing numbers of NSIPs. This demand could further intensify if national policy and guidance require a biodiversity objective in excess of 10% for NSIPs and / or if local development plans were to include policies requiring all development to deliver BNG in excess of the 10% mandatory for TCPA90 development.

11.39 This study indicates that the cost of purchasing biodiversity units for offsetting can vary widely and, notably, statutory credits could double the cost of BNG provision compared with the use of local biodiversity units. This variability in costs necessitates careful consideration and strategic planning to ensure that there is sufficient availability of local biodiversity units in Essex at a reasonable price.

11.40 This study has shown that NSIP promoters are concerned that high demand for biodiversity units could inflate costs, potentially forcing them to purchase more expensive statutory credits. Conversely, landowners are worried that an oversupply of biodiversity units could lower their value, reducing the economic incentives for providing these units.

11.41 These contrasting concerns highlight the need for a balanced approach to managing the demand and supply of biodiversity units. The public sector, primarily host local authorities, could play a crucial role in analysing and coordinating the expected demand and supply of biodiversity units within local geographies. This balance is essential to avoid significant cost fluctuations of the biodiversity units that can negatively impact the viability of both TCPA90 development and NSIPs.

11.42 Assuming an adequate supply of biodiversity units to keep costs at or below the £25,000 figure used in this report, adopting 20% BNG policy across Essex would not have a significant impact on the financial viability of TCPA90 development.

11.43 The ability of NSIP promoters to deliver beyond any mandatory biodiversity objective will depend on a number of factors individual to the promoter, type and location of NSIP. The use of N2T as a case study has demonstrated that the lack of national policy and guidance on delivering beyond the anticipated mandatory 10% BNG for consumer funded NSIPs makes this particularly challenging to justify to the energy regulator, Ofgem, who require energy infrastructure to demonstrate (amongst other considerations) value for money to the public. The absence of local planning policy requiring all development to deliver greater than the mandatory 10% BNG set for TCPA90 developments makes quantifying and qualifying BNG as value for money to the local economy, environment and health and wellbeing of host communities a challenge for all NSIPs. The uncertainty around the supply and cost of biodiversity units available for offsetting across Essex to meet the demand for BNG further complicates delivery.

Annex A: Review of Local Authority Housing Policies

Annex B: BNG technical note

Annex C: Property market report

Annex D: Residential testing example appraisal and sensitivity testing

Annex E: Commercial testing sensitivity testing

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