



Department for
Energy Security
& Net Zero

Overarching National Policy Statement for Energy (EN-1)

March 2023



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1 Introduction

1.1 Background

- 1.1.1 This National Policy Statement (NPS) sets out national policy for the energy infrastructure described in Section 1.3 below.
- 1.1.2 It has effect for the decisions by the Secretary of State on applications for energy developments that are nationally significant under the Planning Act 2008. For such applications this NPS, combined with any technology specific energy NPS where relevant, provides the primary policy for decisions by the Secretary of State.
- 1.1.3 Under the Planning Act 2008, where an NPS has effect, the Secretary of State must also have regard to any local impact report¹ submitted by a relevant local authority, any relevant matters prescribed in regulations, the Marine Policy Statement (MPS) and any applicable Marine Plan, and any other matters which the Secretary of State thinks are both important and relevant to the planning decision.
- 1.1.4 The Planning Act 2008 also requires that, where an NPS has effect, the Secretary of State must decide an application for energy infrastructure in accordance with the relevant NPSs except to the extent the Secretary of State is satisfied that to do so would:
- lead to the UK being in breach of its international obligations
 - be in breach of any statutory duty that applies to the Secretary of State
 - be unlawful
 - result in adverse impacts from the development outweighing the benefits
 - be contrary to regulations about how its decisions are to be taken
- 1.1.5 Applicants should therefore ensure that their applications, and any accompanying supporting documents, are consistent with the instructions and guidance in this NPS, any relevant technology specific NPS and any other NPSs that are relevant to the application in question.
- 1.1.6 This NPS, in particular the policy and guidance on generic impacts in Part 5, may also be helpful to local planning authorities (LPAs) in preparing their local impact reports.

¹ A report prepared under section 60 of the Planning Act 2008.

- 1.1.7 Part 5 of the Planning Act 2008² sets out the requirements for consultation and publicity of any application for a Development Consent Order before any application is made, including a duty to consult the local community³.

1.2 Role of this NPS in the wider planning system

- 1.2.1 In England this NPS, in combination with any relevant technology specific NPSs, may be a material consideration in decision making on applications that fall under the Town and Country Planning Act 1990 (as amended).
- 1.2.2 Whether the policies in this NPS are material and to what extent, will be judged on a case-by-case basis and will depend upon the extent to which the matters are already covered by applicable planning policy.
- 1.2.3 The Secretary of State may also receive applications for variations to existing consents for energy infrastructure under section 36C of the Electricity Act 1989 for which this NPS, in combination with any relevant technology specific NPSs, may be a relevant consideration.
- 1.2.4 Under the Marine and Coastal Access Act 2009, the Marine Management Organisation (MMO) will determine applications under section 36 and section 36A of the Electricity Act 1989 where they relate to a generating station in English waters provided that the application does not exceed the capacity threshold set out in the Planning Act 2008.
- 1.2.5 The MMO will determine applications in accordance with the MPS and any applicable marine plans, unless relevant considerations indicate otherwise.
- 1.2.6 This NPS, in combination with any relevant technology specific NPSs, may be a relevant consideration for the MMO when it is determining such applications.
- 1.2.7 The MMO may also receive applications for a marine licence for other energy infrastructure that falls outside the scope of the Planning Act 2008 or the Electricity Act 1989 for which the NPSs may be a relevant consideration.
- 1.2.8 They may also be a relevant consideration in the preparation of relevant marine plans.

² <https://www.gov.uk/government/publications/guidance-on-the-pre-application-process-for-major-infrastructure-projects>

³ <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/>

1.2.9 The role of the MPS and marine plans in relation to Secretary of State decisions is set out in Section 4.4.⁴

1.3 Scope of the Overarching National Policy Statement for Energy

1.3.1 This Overarching National Policy Statement for Energy (EN-1) is part of a suite of NPSs issued by the Secretary of State of Department for Energy Security and Net Zero (DESNZ). It sets out the government's policy for delivery of major energy infrastructure.

1.3.2 A further five technology specific NPSs for the energy sector cover:

- natural gas electricity generation (**EN-2**);
- renewable electricity generation (both onshore and offshore) (**EN-3**);
- gas supply infrastructure and gas and oil pipelines (**EN-4**);
- the electricity transmission and distribution network (**EN-5**);
- and nuclear electricity generation (**EN-6**).

1.3.3 Further technology specific NPS may be designated and added to the suite if it becomes appropriate to do so. These should be read in conjunction with this NPS where they are relevant to an application.

1.3.4 The Planning Act 2008⁵ sets out the thresholds for nationally significant infrastructure projects (NSIPs) in the energy sector. The Act defines the following forms of energy infrastructure as being an NSIP⁶:

- **electricity generating stations, (meeting the thresholds set out in the Planning Act 2008)**. This includes onshore generating stations (but not onshore

⁴ Welsh Ministers are responsible for marine licences for operations carried out in both inshore and offshore Welsh waters, under the Wales Act 2017, provided that the application does not exceed the capacity threshold set out in the Planning Act 2008. NRW are responsible for issuing, enforcing and ongoing management of the marine licence in Welsh waters.

⁵ Part 3 Planning Act 2008.

⁶ Since the Energy NPSs were first designated, there have been four relevant amendments to the Planning Act 2008 which affect the application of the Act to electric lines and energy generating stations: i) the Planning Act 2008 (Nationally Significant Infrastructure Projects) (Electric Lines) Order 2013 removed lines of less than 2km and certain replacement lines from the definition of nationally significant electricity lines; ii) the Infrastructure Planning (Onshore Wind Generating Stations) Order 2016 removed all onshore wind generating stations in England and Wales from the definition of nationally significant energy generating stations; iii) the Wales Act 2017 devolved responsibility for development consent decisions in relation to all electricity generating stations with 350MW capacity or less in Wales (and made amendments to remove electricity lines associated with such stations from the definition of nationally significant electricity lines); and iv) the Infrastructure Planning (Electricity Storage Facilities) Order 2020 removed all forms of electricity storage, other than pumped hydroelectric storage, from the definition of nationally significant energy generating stations.

wind or electricity storage, except hydroelectric storage) generating more than 50 megawatts (MW) in England and 350MW in Wales. It also includes offshore generating stations generating more than 100MW offshore in territorial waters adjacent to England and within the English part of the Renewable Energy Zone and those generating more than 350MW in territorial waters adjacent to Wales and the Welsh part of the Renewable Energy Zone (the Welsh Zone as defined by section 158 of the Government of Wales Act 2006). For these types of infrastructure, this Overarching NPS (EN-1) in conjunction with any of the relevant technology-specific NPSs will be the primary policy for Secretary of State decision making

- **large gas reception and liquefied natural gas (LNG) facilities and underground gas storage facilities (meeting the thresholds set out in the Planning Act 2008).** For this infrastructure EN-1 in conjunction with EN-4 (for natural gas only) will be the primary policy for Secretary of State decision making
- **cross-country gas and oil pipe-lines and Gas Transporter pipe-lines (meeting the thresholds and conditions set out in the Planning Act 2008).** For this infrastructure EN-1 in conjunction with EN-4 (for natural gas only) will be the primary policy for Secretary of State decision making
- **above ground electric lines at or above 132kV (meeting the thresholds set out in the Planning Act 2008).** For this infrastructure, EN-1 in conjunction with the Electricity Networks NPS (EN-5) will be the primary basis for Secretary of State decision making

1.3.5 Where the need for a particular type of energy infrastructure set out above is established by this NPS, but that type of infrastructure is outside the scope of one of the technology specific NPSs, this NPS alone will have effect and will be the primary basis for Secretary of State decision making. This will be the case for, but is not limited to, unconventional hydrocarbon extraction sites, hydrogen pipeline and storage infrastructure, Carbon Capture Storage (CCS) pipeline infrastructure and other infrastructure not included in EN-2 or EN-3.

1.3.6 As set out in the written ministerial statement of 7 December 2017⁷, EN-6 only has effect in relation to nuclear electricity generation deployable by the end of 2025, but also continues to provide information that may be important and relevant for projects which will deploy after 2025. This NPS (EN-1) will have effect⁸ in relation to any new applications for nuclear electricity generation deployable after 2025, particularly in so far as it continues to establish the need for energy generation, including nuclear. A new technology specific NPS for nuclear electricity generation deployable after 2025 is proposed and will be developed to sit alongside this NPS.

1.3.7 In addition to the above specific categories of NSIP, section 35 of the Planning Act 2008 allows the Secretary of State to give a direction that a particular development,

⁷ See <https://questions-statements.parliament.uk/written-statements/detail/2017-12-07/HCWS321>

⁸ Subject to the transitional arrangements set out at Section 1.6 below.

that does not meet one of the statutory NSIP categories (either because it involves novel technology or due to capacity size), should nonetheless be treated as development for which development consent is required.

- 1.3.8 The Secretary of State may give a direction, on receipt of a qualifying request, in relation to a proposed development in England, English waters, or a Renewable Energy Zone, except any part of a Renewable Energy Zone in relation to which the Scottish Ministers have functions.
- 1.3.9 The Secretary of State must be satisfied that the proposed development is or forms part of a project in the field of energy, or a business or commercial project of a prescribed description; and that it is nationally significant either by itself or in combination with one or more other developments in the field of energy.
- 1.3.10 EN-1, in conjunction with any relevant technology specific NPS, will be the primary policy for Secretary of State decision making on projects in the field of energy for which a direction has been given under section 35.
- 1.3.11 The Planning Act 2008 enables the Secretary of State to issue a development consent order including consent for development which is associated with the energy infrastructure NSIP (subject to certain restrictions set out in section 115 of the Act). Government has issued guidance to which the Secretary of State must have regard in deciding whether development is associated development⁹.
- 1.3.12 EN-1, in conjunction with any relevant technology specific NPS, will be the primary policy for Secretary of State decision making on associated development.
- 1.3.13 The Planning Act 2008 enables the Secretary of State to issue a development consent order that can make provision relating to, or to matters ancillary to, the development of the energy infrastructure NSIP. This may include, for example, the authorisation of tree lopping and the compulsory acquisition of land or rights over land.

1.4 Geographical coverage

- 1.4.1 The Secretary of State will decide all applications for NSIPs in England and Wales, adjacent territorial waters or in the UK Renewable Energy Zone (REZ) (defined in section 84(4) of the Energy Act 2004) except any part in relation to which Scottish Ministers have functions.
- 1.4.2 In Scotland and in those areas of the REZ where Scottish Ministers have functions, the Secretary of State will have no functions under the Planning Act 2008 in relation to consenting energy infrastructure projects except as set out in this section.

⁹ See <https://www.gov.uk/government/publications/planning-act-2008-associated-development-applications-for-major-infrastructure-projects>

However, energy policy is generally a matter reserved to UK Ministers and this NPS may therefore be a relevant consideration in planning decisions in Wales and Scotland.

- 1.4.3 The Secretary of State has no functions in relation to planning applications in Wales that do not relate to nationally significant infrastructure. In Wales, the Secretary of State will not examine applications for LNG facilities, gas reception facilities or gas transporter pipelines. The Secretary of State will only examine applications for underground gas storage facilities in Wales, where the applicant is a licensed gas transporter, and the storage is in natural porous strata (rather than in cavities); precise details are set out in EN-4 and section 17 of the Planning Act 2008.
- 1.4.4 The Secretary of State will only examine electricity generating stations in Wales, in territorial waters adjacent to Wales or in the Welsh Zone if their capacity is greater than 350MW. Otherwise, such proposals will fall within the Welsh marine licensing process managed by Natural Resources Wales.
- 1.4.5 The Secretary of State will examine applications for cross country oil and gas pipelines (meeting the conditions set out in section 21 of the Planning Act 2008) that have one end in England or Wales and the other in Scotland.
- 1.4.6 In Northern Ireland, planning consents for all NSIPs, as well as most energy policy, are devolved to the Northern Ireland Executive, so the Secretary of State will not examine applications for energy infrastructure in Northern Ireland and the NPSs will not apply there.

1.5 Period of validity and review

- 1.5.1 This NPS will remain in force in its entirety unless withdrawn or suspended in whole or in part by the Secretary of State. It will be subject to review by the Secretary of State in order to ensure that it remains appropriate.
- 1.5.2 The exact timing of a review will depend how specific circumstances apply to each NPS, but it is expected that a public announcement on the consideration as to whether a review is required should be made at least every 5 years.
- 1.5.3 Information on the review process is set out in paragraphs 10 to 12 of the Annex to CLG's letter of 9 November 2009¹⁰ and the DLUHC guidance on Review of NPSs.¹¹

¹⁰ See <https://www.gov.uk/guidance/planning-guidance-letters-to-chief-planning-officers>

¹¹ See <https://www.gov.uk/guidance/planning-act-2008-guidance-on-the-process-for-carrying-out-a-review-of-existing-national-policy-statements>

1.6 Transitional provisions following review

- 1.6.1 The suite of energy NPSs were first designated in 2011. In the 2020 Energy White Paper¹² a review of the NPSs, pursuant to section 6 of the Planning Act 2008, was announced. That review resulted in a number of amendments to the NPSs.
- 1.6.2 The Secretary of State has decided that for any application accepted for examination before designation of the 2023 amendments, the 2011 suite of NPSs should have effect in accordance with the terms of those NPS.
- 1.6.3 The 2023 amendments will therefore have effect only in relation to those applications for development consent accepted for examination, after the designation of those amendments. However, any emerging draft NPSs (or those designated but not yet having effect) are potentially capable of being important and relevant considerations in the decision-making process. The extent to which they are relevant is a matter for the relevant Secretary of State to consider within the framework of the Planning Act 2008 and with regard to the specific circumstances of each development consent order application.

1.7 The Appraisal of Sustainability and Habitats Regulations Assessment

- 1.7.1 All the NPSs have been subject to an Appraisal of Sustainability (AoS) required by the Planning Act 2008 and the Environmental Assessment of Plans and Programmes Regulations 2004. A Habitats Regulations Assessment (HRA) has also been prepared in accordance with the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017. These are published alongside this NPS and available at <https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements>.

12 See <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

2 Government policy on energy and energy infrastructure development

2.1 Introduction

- 2.1.1 The Energy White Paper, published in December 2020¹³, outlined a strategy to transform the energy system, tackling emissions while continuing to ensure secure and reliable supply, and affordable bills for households and businesses. This was built on by the Net Zero Strategy¹⁴, published in October 2021, which set out a long-term plan for the economy-wide transition to net zero that will take place over the next three decades. The British Energy Security Strategy¹⁵, published in April 2022, and the Growth Plan of 23 September 2022¹⁶ further reinforced ambitions and the importance of addressing our underlying vulnerability to international oil and gas prices and reducing our dependence on imported oil and gas.
- 2.1.2 To produce enough energy required for the UK and ensure it can be transported to where it is needed, a significant amount of infrastructure is needed at both local and national scale. High quality infrastructure is crucial for economic growth, boosting productivity and competitiveness. Part 3 of this NPS provides further details on the need for and importance of energy to economic prosperity and social well-being.
- 2.1.3 The National Infrastructure Strategy (NIS)¹⁷ committed to boosting growth and productivity across the whole of the UK, levelling up and strengthening the Union through investment in rural areas, towns, and cities, from major national projects to local priorities. It also committed to government putting the UK on the path to meeting its net zero emissions target by 2050 by taking steps to decarbonise the UK's power networks which together account for over two-thirds of the UK emissions – and take steps to adapt to the risks posed by climate change.
- 2.1.4 This energy NPS considers the large-scale infrastructure which will be required to ensure the UK can provide a secure, reliable, and affordable supply of energy, while also meeting our decarbonisation targets.

¹³ See <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

¹⁴ See <https://www.gov.uk/government/publications/net-zero-strategy>

¹⁵ See <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

¹⁶ See <https://www.gov.uk/government/publications/the-growth-plan-2022-documents>

¹⁷ See <https://www.gov.uk/government/publications/national-infrastructure-strategy>

2.2 Net zero by 2050

2.2.1 In June 2019, the UK became the first major economy to legislate for a 2050 net zero Greenhouse Gases ('GHG') emissions target through the Climate Change Act 2008 (2050 Target Amendment) Order 2019.¹⁸ In December 2020, the UK communicated its Nationally Determined Contributions to reduce GHG emissions by at least 68 per cent from 1990 levels by 2030.¹⁹ In April 2021, the government legislated for the sixth carbon budget (CB6), which requires the UK to reduce GHG emissions by 78 per cent by 2035 compared to 1990 levels.²⁰

2.3 Meeting net zero

2.3.1 Energy underpins almost every aspect of our way of life. It enables us to heat and light our homes; to produce and transport food; to travel to work and for leisure. Our businesses and jobs rely on the use of energy. Energy is essential for the critical services we rely on – from hospitals to traffic lights and mobile devices. It is difficult to overestimate the extent to which our quality of life is dependent on adequate energy supplies.

2.3.2 In October 2021 we published the Net Zero Strategy.²¹ This set out the government's vision for transitioning to a net zero economy and the policies and proposals for decarbonising all sectors of the UK economy to meet our net zero target by 2050, making the most of new growth and employment opportunities across the UK.

2.3.3 Our objectives for the energy system are to ensure our supply of energy always remains secure, reliable, affordable, and consistent with meeting our target to cut GHG emissions to net zero by 2050, including through delivery of our carbon budgets and Nationally Determined Contribution. This will require a step change in the decarbonisation of our energy system.

2.3.4 Meeting these objectives necessitates a significant amount of energy infrastructure, both large and small-scale. This includes the infrastructure needed to convert primary sources of energy (e.g. wind) into energy carriers (e.g. electricity or hydrogen), and to store and transport these energy carriers into and around the country. It also includes the infrastructure needed to capture, transport and store carbon dioxide. The requirement for new energy infrastructure will present opportunities for the UK and contributes towards our ambition to support jobs in the UK's clean energy industry and local supply chains.

¹⁸ See legislation.gov.uk/ukdsi/2019/9780111187654

¹⁹ See <https://www.gov.uk/government/publications/the-uks-nationally-determined-contribution-communication-to-the-unfccc>

²⁰ See <https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035>

²¹ See <https://www.gov.uk/government/publications/net-zero-strategy>

- 2.3.5 The sources of energy we use will also need to change. Today, our energy system is dominated by fossil fuels. Although representing a record low, fossil fuels still accounted for just over 76 per cent of energy supply in 2020.²² We will need to dramatically increase the volume of energy supplied from low carbon sources and reduce the amount provided by fossil fuels.
- 2.3.6 We need to transform the energy system, tackling emissions while continuing to ensure secure and reliable supply, and affordable bills for households and businesses. This includes increasing our supply of clean energy from renewables, nuclear and hydrogen manufactured using low carbon processes²³ (low carbon hydrogen) and, where we still emit carbon, developing the industry and infrastructure to capture, transport and store it.
- 2.3.7 Decarbonisation means we are likely to become more dependent on some forms of energy compared to others. Using electrification to reduce emissions in large parts of transport, heating and industry could lead to more than half of final energy demand being met by electricity in 2050, up from 17 per cent in 2019, representing a doubling in demand for electricity.²⁴ Low carbon hydrogen is also likely to play an increasingly significant role.
- 2.3.8 This switch will break down the siloes which have traditionally existed between separate heat, transport, and electricity networks. We will need to adapt existing networks or build new ones to integrate low carbon hydrogen into the system and enable the transport and storage of carbon dioxide.
- 2.3.9 To ensure that supplies remain reliable and to keep our energy affordable we will also need to reduce the amount of energy we waste, using new and innovative low carbon technologies and more energy efficiency measures.
- 2.3.10 This transformational approach tackles long-term problems to deliver growth that creates high-quality jobs across the UK and makes the most of the strengths of the Union. However, this transformation cannot be instantaneous. The use of unabated natural gas and crude oil fuels for heating, cooking, electricity and transport, and the production of many everyday essentials like medicines, plastics, cosmetics and household appliances, will still be needed during the transition to a net zero economy. This will enable secure, reliable, and affordable supplies of energy as we develop the means to address the carbon dioxide and other greenhouse gases associated with their use, including the development and deployment of low carbon alternatives.

22 From table 1.1.1 of Digest of United Kingdom Energy Statistics (DUKES) 2021: inland consumption of primary fuels and equivalents for energy use, 1970 to 2020, available at

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1094291/DUKES_1.1.1.xlsx

23 This includes production of both green hydrogen (through water electrolysis with low carbon power) and blue hydrogen (through methane reformation with Carbon Capture and Storage)

24 The Impact Assessment for CB6 shows an illustrative range of 610-800TWh in 2050: See <https://www.legislation.gov.uk/ukdsi/2021/9780348222616/impacts>

- 2.3.11 The UK's oil and gas sector recognises the demand for oil and gas will be much reduced in the future, but also recognises the key role that it can play in helping the UK meet its net zero commitment. Clear action will need to be taken to build on the proven capabilities within the sector to lead in new and emerging energy technologies.
- 2.3.12 Some limited residual use of unabated natural gas and crude oil may even be needed beyond 2050 to meet our energy objectives. Due to policy uncertainties for the post 2050 period, a detailed assessment for this period has not been conducted at this stage. However, this can be consistent with our net zero target if any emissions are balanced by negative emissions from Greenhouse Gas Removal (GGR) technologies.

2.4 Decarbonising the power sector

- 2.4.1 Since the designation of the original EN-1 overall GHG emissions from the power sector have more than halved, from ~145MtCO₂e in 2011 to ~60MtCO₂e in 2019 (see figure 1). This can be mainly attributed to the proportion of renewable generation more than quadrupling from 10 per cent to 43 per cent between 2011 and 2020 whilst the share of electricity generation from coal reduced from 29 per cent to 2 per cent over the same period.²⁵

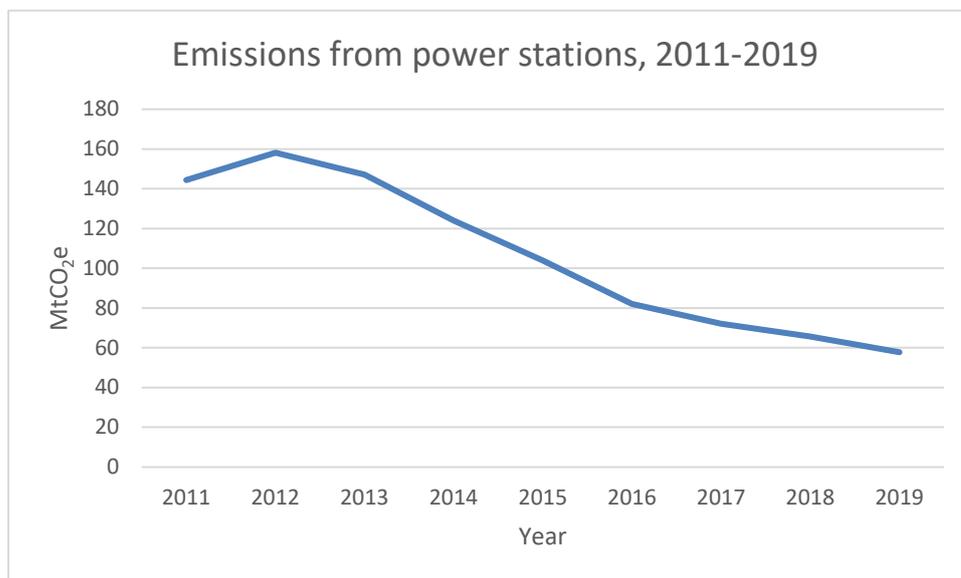


Figure 1: GHG emissions from power stations 2011-2019²⁶

25 BEIS (2022), Energy Trends, Table 5.1, See <https://www.gov.uk/government/statistics/electricity-section-5-energy-trends>.

26 BEIS (2020), Final UK greenhouse gas emissions national statistics, Table 1, See <https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2019>

- 2.4.2 A key mechanism for increasing deployment of low carbon generation has been the implementation of Contracts for Difference (CfD).
- 2.4.3 The CfD scheme opened in 2014, with CfDs being awarded to developers of eligible projects through a competitive bidding process administered by National Grid's Electricity Systems Operator (ESO). The scheme has been hugely successful in driving substantial deployment of renewable electricity capacity at scale whilst rapidly reducing costs. The competitive nature of the scheme has been a crucial factor in minimising the costs of decarbonisation for consumers, contributing to the price per unit of offshore wind falling by around 65 per cent between the first allocation round in 2015 and the fourth in 2021, making offshore wind one of the lowest cost ways of generating electricity.
- 2.4.4 Government is developing business models to incentivise the deployment of Carbon Capture, Utilisation and Storage (CCUS) facilities and low carbon hydrogen production in the UK. The British Energy Security Strategy²⁷ also committed to designing, by 2025, new business models for hydrogen transport and storage infrastructure.
- 2.4.5 We will put in place a commercial framework which will enable developers to finance the construction and operation of power CCUS and Industrial Carbon Capture (ICC) facilities and CO₂ transport and storage networks, stimulating a pipeline of projects and building a UK supply chain.
- 2.4.6 For Power CCUS, we will introduce the Dispatchable Power Agreement Business Model, to incentivise power CCUS to play a role in the electricity system which complements renewables.
- 2.4.7 In addition, for ICC, we will incentivise the deployment of carbon capture technology through the Industrial Carbon Capture Business Model for industrial users who often have no viable alternatives available to achieve deep decarbonisation, this will include Energy from Waste facilities.
- 2.4.8 We are also developing the Transportation and Storage regulatory investment ('TRI Model') which is based on an economic regulation funding model consisting of three elements: revenue model, economic regulatory regime and a government support package (GSP).
- 2.4.9 Since 2019 government has periodically consulted and provided updates on all CCUS business models.²⁸

²⁷ See <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

²⁸ Further detail on CCUS Business Models can be found on the [www.gov.uk](https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models) website: See <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-business-models>

2.4.10 In addition, the government has other levers to encourage further decarbonisation within the power sector:

- UK Emissions Trading Scheme (UK ETS)
- Carbon Price Support (CPS)
- Emissions Performance Standard (EPS)

2.5 Security of energy supplies

2.5.1 Given the vital role of energy to economic prosperity and social well-being, it is important that our supplies of energy remain secure, reliable and affordable.

2.5.2 We have highly diverse and flexible sources of gas supply and a diverse electricity mix, which ensures that households, businesses and heavy industry get the energy they need.

2.5.3 Great Britain's (GB) gas system has delivered securely to date and is expected to continue to function well, with a diverse range of supply sources and sufficient delivery capacity to more than meet demand.

2.5.4 This diversity in gas supply includes pipelines from the UK and Norway continental shelf (UKCS & NCS), interconnection with the Continent through the Interconnector Ltd and BBL pipelines, and three LNG terminals, providing GB with one of the largest LNG import infrastructures in Europe.

2.5.5 However as global energy costs rise due to demand soaring as the economy reopened after COVID-19 and the Russian invasion of Ukraine, security of supply requires a greater focus on domestic energy production.

2.5.6 The British Energy Security Strategy²⁹ emphasises the importance of addressing our underlying vulnerability to international energy prices by reducing our dependence on imported oil and gas, improving energy efficiency, remaining open minded about our onshore reserves including shale gas, and accelerating deployment of renewables, nuclear, hydrogen, CCUS, and related network infrastructure, so as to ensure a domestic supply of clean, affordable, and secure power as we transition to net zero.

2.5.7 The Capacity Market (CM)³⁰ is at the heart of the government's plans for a secure and reliable electricity system. The CM provides all forms of capacity capable of contributing to security of supply with the right incentives to be on the system and to

²⁹ See <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

³⁰ The Capacity Market is a competitive auction which ensures security of electricity supply by providing a payment for reliable sources of capacity. See <https://www.gov.uk/government/collections/electricity-market-reform-capacity-market>

deliver during periods of electricity system stress, for example during cold, still periods where demand is high and wind generation is low.

- 2.5.8 The CM is technology neutral, meaning it does not seek to procure specific volumes of capacity from particular types of technology. All types of capacity are able to participate – except for Capacity Providers in receipt of other specific categories of government support – but they must demonstrate sufficient technical performance to contribute to security of supply.
- 2.5.9 The CM operates alongside the GB wholesale electricity market and the services the National Electricity Transmission System Operator (NETSO) contracts to provide ancillary services to ensure second-by-second balancing of the electricity system.
- 2.5.10 In July 2019 the government introduced CO₂ emissions limits to the CM.
- 2.5.11 Plants burning fossil fuels that began generating after July 2019 must demonstrate that they emit below 550gCO₂/kWh electricity generated in order to be able to hold Capacity Market agreements.
- 2.5.12 Plants burning fossil fuels that began generating before July 2019 must either demonstrate that they emit below 550gCO₂/kWh electricity generated or must not emit more than 350kgCO₂ per year on average.
- 2.5.13 Plants unable to comply with these requirements are excluded from holding Capacity Market agreements from the Delivery Year 2024 onwards. This ensures that the CM is aligned with broader decarbonisation objectives by preventing the most polluting plants from participating.

2.6 Sustainable development

- 2.6.1 The government's wider objectives for energy infrastructure include contributing to sustainable development³¹ and ensuring that our energy infrastructure is safe.
- 2.6.2 Sustainable development is relevant not just in terms of addressing climate change, but because the way energy infrastructure is deployed affects the well-being of the environment, society and the economy, for both current and future generations. For example, the availability of appropriate infrastructure supports the efficient working of the market so as to ensure competitive prices for consumers. The regulatory framework also encourages the energy industry to protect the more vulnerable.

31 As defined in 1987 by the World Commission on Environment and Development report Our Common Future - See <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>

- 2.6.3 The planning framework set out in this NPS and the suite of energy NPSs takes full account of the objective of contributing to the achievement of sustainable development and this has been tested through the AoS.³²
- 2.6.4 The AoS has examined whether the NPS framework for the development of new energy infrastructure projects is consistent with the objectives for sustainable development, including consideration of other government policies such as those for the environment, economic development, health and transport.
- 2.6.5 Whatever incentives, rules or other signals developers are responding to, the government believes that the NPSs set out planning policies which both respect the principles of sustainable development and can facilitate, for the foreseeable future, the consenting of energy infrastructure on the scale and of the kinds necessary to help us maintain safe, secure, affordable and low carbon supplies of energy.

³² See [\[add hyperlink before publication\]](#)

3 The need for new nationally significant energy infrastructure projects

3.1 Introduction

- 3.1.1 This Part of the NPS explains why the government sees a need for significant amounts of new large-scale energy infrastructure to meet its energy objectives and why the government considers that the need for such infrastructure is urgent.
- 3.1.2 However, as noted in Section 1.7, it will not be possible to develop the necessary amounts of such infrastructure without some significant residual adverse impacts. These effects will be minimised by the application of policy set out in Parts 4 and 5 of this NPS. See also Part 2 of each technology specific NPS.

3.2 Secretary of State decision making

- 3.2.1 The government's objectives for the energy system are to ensure our supply of energy always remains secure, reliable, affordable, and consistent with net zero emissions in 2050 for a wide range of future scenarios, including through delivery of our carbon budgets and NDC.
- 3.2.2 We need a range of different types of energy infrastructure to deliver these objectives. This includes the infrastructure described within this NPS but also more nascent technologies, data, and innovative infrastructure projects consistent with these objectives.
- 3.2.3 New coal or large-scale oil-fired electricity generation is not consistent with the trajectory of our carbon budgets and the transition to net zero and so are not included within this NPS, and the government is taking active steps to phase them out of the energy system.
- 3.2.4 It is for industry to propose new energy infrastructure projects within the strategic framework set by government. With the exception of new coal or large-scale oil-fired electricity generation, the government does not consider it appropriate for planning policy to set limits on different technologies but planning policy can be used to support the government's ambitions in energy policy and other policy areas.
- 3.2.5 **The Secretary of State should assess all applications for development consent for the types of infrastructure covered by this NPS on the basis that the government has demonstrated that there is a need for those types of infrastructure which is urgent, as described for each of them in this Part.**

- 3.2.6 **In addition, the Secretary of State has determined that substantial weight should be given to this need when considering applications for development consent under the Planning Act 2008.**
- 3.2.7 **The Secretary of State is not required to consider separately the specific contribution of any individual project to satisfying the need established in this NPS.**
- 3.2.8 This NPS, along with any technology specific energy NPSs, sets out policy for nationally significant energy infrastructure covered by sections 15-21 of the Planning Act 2008.
- 3.2.9 Other novel technologies or processes may emerge during the life of this NPS, and can help deliver our energy objectives. Where these contribute towards the objectives set out in paragraph 3.2.1, the Secretary of State should determine that there is a need for such technologies and that substantial weight should be given to this need.
- 3.2.10 Where an energy infrastructure project is not covered by sections 15-21 of the Planning Act 2008 but is considered to be nationally significant, there is a power under section 35 of the Planning Act 2008 (which applies in England, English waters, a Renewable Energy Zone, except any part of a Renewable Energy Zone in relation to which the Scottish Ministers have functions, and Welsh waters and outside 12nm in Welsh waters) for the Secretary of State, on request, to give a direction that a development should be treated as a nationally significant infrastructure project for which development consent is required. In exceptional circumstances this could include novel technologies or processes which may emerge during the life of this NPS.
- 3.2.11 In these circumstances any application for development consent would need to be considered in accordance with this NPS. In particular:
- where the application is for electricity generation infrastructure not covered by sections 15-21 of the Planning Act, the Secretary of State should give substantial weight to the need established at paragraphs 3.3.4 to 3.3.7 of this NPS
 - where the application is for electricity network infrastructure not covered by sections 15-21 of the Planning Act, including underground or offshore infrastructure, the Secretary of State should give substantial weight to the need established at paragraphs 3.3.63 to 3.3.78 of this NPS
 - where the application is for hydrogen infrastructure not covered by sections 15-21 of the Planning Act, the Secretary of State should give substantial weight to the need established at paragraphs 3.4.12 to 3.4.21 of this NPS
 - where the application is for CCS infrastructure not covered by sections 15-21 of the Planning Act, the Secretary of State should give substantial weight to the need established at paragraphs 3.5.1 to 3.5.7 of this NPS

- where the application is for gas production infrastructure, conventional or unconventional, not covered by sections 15-21 of the Planning Act, the Secretary of State should give substantial weight to the need established at paragraphs 3.4.1 – 3.4.9 of this NPS

3.3 The need for new nationally significant electricity infrastructure

- 3.3.1 Electricity meets a significant proportion of our overall energy needs and our reliance on it will increase as we transition our energy system to deliver our net zero target. We need to ensure that there is sufficient electricity to always meet demand; with a margin to accommodate unexpectedly high demand and to mitigate risks such as unexpected plant closures and extreme weather events.
- 3.3.2 The larger the margin, the more resilient the system will be in dealing with unexpected events, and consequently the lower the risk of a supply interruption. This helps to protect businesses and consumers, including vulnerable households, from volatile prices and, eventually, from physical interruptions to supply that might impact on essential services. But a balance must be struck between a margin which ensures a reliable supply of electricity and building unnecessary additional capacity which increases overall costs of the system.
- 3.3.3 To ensure that there is sufficient electricity to meet demand, new electricity infrastructure will have to be built to replace output from retiring plants and to ensure we can meet increased demand. Our analysis suggests that even with major improvements in overall energy efficiency, and increased flexibility in the energy system, demand for electricity is likely to increase significantly over the coming years and could more than double by 2050 as large parts of transport, heating and industry decarbonise by switching from fossil fuels to low carbon electricity. The Impact Assessment for CB6 shows an illustrative range of 465-515TWh in 2035 and 610-800TWh in 2050.³³

The need for different types of electricity infrastructure

- 3.3.4 There are several different types of electricity infrastructure that are needed to deliver our energy objectives. Additional generating plants, electricity storage, interconnectors and electricity networks all have a role, but none of them will enable us to meet these objectives in isolation.
- 3.3.5 New generating plants can deliver a low carbon and reliable system, but we need the increased flexibility provided by new storage and interconnectors (as well as demand side response, discussed below) to reduce costs in support of an affordable supply.

33 See <https://www.legislation.gov.uk/ukdsi/2021/9780348222616/impacts>

- 3.3.6 Storage and interconnection can provide flexibility, meaning that less of the output of plant is wasted as it can either be stored or exported when there is excess production. They can also supply electricity when domestic demand is higher than generation, supporting security of supply. This means that the total amount of generating plant capacity required to meet peak demand is reduced, bringing significant system savings alongside demand side response (up to £12bn per year by 2050).³⁴ Storage can also reduce the need for new network infrastructure. However, neither of these technologies, as with demand side response, are sufficient to meet the anticipated increase in total demand, and so cannot fully replace the need for new generating capacity.
- 3.3.7 Electricity networks are needed to connect the output of other types of electricity infrastructure with consumers and each other. However, they are a means of transporting electricity rather than generating or storing it, so cannot replace those other types of electricity infrastructure in meeting the substantial increase in demand expected over the coming decades.

Alternatives to new electricity infrastructure

- 3.3.8 The government has considered alternatives to the need for new large-scale electricity infrastructure and concluded that these would be limited to reducing total demand for electricity through efficiency measures or through greater use of low carbon hydrogen in decarbonising the economy; reducing maximum demand through demand side response; and, increasing the contribution of decentralised and smaller-scale electricity infrastructure.
- 3.3.9 Reducing total demand for energy is a key element of the government's strategy for meeting its energy objectives and we expect that increased energy efficiency measures could lead to a reduction in final energy demand from around 1550 TWh in 2019 to around 1000 TWh in 2050. However even with a reduction in final energy demand the share of electricity in the system is likely to increase, potentially more than doubling by 2050 (see paragraph 3.3.3).
- 3.3.10 The precise level of electricity demand during the transition to net zero is uncertain and could be affected by alternative means of decarbonising these sectors, such as the use of low carbon hydrogen, and the pace of that decarbonisation. However, it is prudent to plan on a conservative basis to ensure that there is sufficient supply of electricity to meet demand across a wide range of future scenarios, including where the use of hydrogen is limited.
- 3.3.11 Demand side response, such as the use of thermal stores and smart charging of electric vehicles, can shift electricity demand, reducing the maximum amount of electricity required and therefore reduce the need for additional infrastructure.

32 See section 2.1. in "Modelling 2050: Electricity System Analysis", <https://www.gov.uk/government/publications/modelling-2050-electricity-system-analysis>

However, it cannot increase the total amount of electricity generated in the UK, or reduce the total amount of electricity consumed, and so cannot fully replace the need for new generating capacity to deliver our energy objectives.

- 3.3.12 Decentralised and community energy systems such as micro-generation contribute to our targets on reducing carbon emissions and increasing energy security. These technologies could also lead to some reduction in demand on the main generation and transmission system. However, the government does not believe they will replace the need for new large-scale electricity infrastructure to meet our energy objectives. This is because connection of large-scale, centralised electricity generating facilities via a high voltage transmission system enables the pooling of both generation and demand, which in turn offers a number of economic and other benefits, such as more efficient bulk transfer of power and enabling surplus generation capacity in one area to be used to cover shortfalls elsewhere.

Delivering affordable decarbonisation

- 3.3.13 The Net Zero Strategy³⁵ sets out the government's ambition for increasing the deployment of low carbon energy infrastructure consistent with delivering our carbon budgets and the 2050 net zero target. This made clear the commitment that the cost of the transition to net zero should be fair and affordable.
- 3.3.14 Value for money assessments are not required on applications for development consent for energy infrastructure projects. However, government will work to ensure there are market frameworks which promote effective competition and deliver an affordable, secure and reliable energy system and government support for specific technologies and projects will be dependent on clear value for money for consumers and taxpayers.
- 3.3.15 Based on our whole-system modelling, by 2050, emissions associated with power could need to drop by 95-98 per cent compared to 2019, down to 1-3 MtCO₂e. In the interim, to meet our NDC and CB6 targets, we expect emissions could fall by 70-75 per cent by 2030 and 80-85 per cent by 2035, compared to 2019 levels. These figures are based on an indicative power sector pathway contributing to the whole-economy net zero and interim targets.³⁶
- 3.3.16 If demand doubles by 2050, we will need a fourfold increase in low carbon generation and significant expansion of the networks that transport power to where it is needed. In addition, we committed in the Net Zero Strategy³⁷ to take action so that by 2035, all our electricity will come from low carbon sources, subject to security of supply,

³⁵ See <https://www.gov.uk/government/publications/net-zero-strategy>

³⁶ 3i. Power of the Net Zero Strategy: Charts and Tables See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1066450/nzs-charts-tables-v1.1.xlsx .

³⁷ See <https://www.gov.uk/government/publications/net-zero-strategy>

whilst meeting a 40-60 per cent increase in electricity demand. This means that the majority of new generating capacity needs to be low carbon.

- 3.3.17 However, new unabated natural gas generating capacity will also be needed as it currently plays a critical role in keeping the electricity system secure and stable. It will continue to be needed during the transition to net zero while we develop and deploy the low carbon alternatives that can replicate its role in the electricity system.
- 3.3.18 Our understanding of what the electricity system will need to deliver during the transition to 2050 and the best way of delivering it will evolve over time. For example, the level of demand it will need to meet will depend on the approach and pace of decarbonisation in other sectors, and the mix of infrastructure and technology that can deliver this in line with our energy and climate objectives will be affected by the different characteristics of existing and new technologies, their relative costs and deliverability. It will also be informed by the costs and availability of GGR technologies, such as Bioenergy with Carbon Capture and Storage (BECCS) and Direct Air Carbon Capture and Storage (DACCS).
- 3.3.19 Given the changing nature of the energy landscape, we need a diverse mix of electricity infrastructure to come forward, so that we can deliver a secure, reliable, affordable, and net zero consistent system during the transition to 2050 for a wide range of demand, decarbonisation, and technology scenarios.

The role of wind and solar

- 3.3.20 Wind and solar are the lowest cost ways of generating electricity, helping reduce costs and providing a clean and secure source of electricity supply (as they are not reliant on fuel for generation). Our analysis shows that a secure, reliable, affordable, net zero consistent system in 2050 is likely to be composed predominantly of wind and solar.³⁸
- 3.3.21 As part of delivering this, UK government announced in the British Energy Security Strategy³⁹ an ambition to deliver up to 50GW of offshore wind by 2030, including up to 5GW of floating wind, and the requirement in the Energy White Paper⁴⁰ for sustained growth in the capacity of onshore wind⁴¹ and solar in the next decade.⁴²
- 3.3.22 However, it is recognised that ensuring affordable system reliability, today and in the future, means wind and solar need to be complemented with technologies which

³⁸ See <https://www.gov.uk/government/publications/modelling-2050-electricity-system-analysis>

³⁹ See <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

⁴⁰ See <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

⁴¹ Applications for onshore wind should be considered by the relevant local planning authority.

⁴² This is a UK government ambition with the Welsh and Scottish Government's having set their own internal ambitions. See <https://gov.wales/sites/default/files/publications/2019-07/future-potential-for-offshore-wind.pdf> and See <https://www.gov.scot/publications/offshore-wind-policy-statement/>

supply electricity, or reduce demand, when the wind is not blowing, or the sun does not shine.

- 3.3.23 Applications for onshore wind of all sizes should be consented outside of the Planning Act 2008 process, unless the Secretary of State directs otherwise under section 35 of the Planning Act 2008.
- 3.3.24 Applications for offshore wind above 100MW or solar above 50MW in England, or 350MW for either in Wales, will continue to be defined as NSIPs, requiring consent from the Secretary of State (see EN-3).

The role of storage

- 3.3.25 Storage has a key role to play in achieving net zero and providing flexibility to the energy system, so that high volumes of low carbon power, heat and transport can be integrated.
- 3.3.26 Storage is needed to reduce the costs of the electricity system and increase reliability by storing surplus electricity in times of low demand to provide electricity when demand is higher. There is currently around 4GW of electricity storage operational in GB, around 3GW of which is pumped hydro storage and around 1GW is battery storage.
- 3.3.27 Storage can provide various services, locally and at the national level. These include maximising the usable output from intermittent low carbon generation (e.g. solar and wind), reducing the total amount of generation capacity needed on the system; providing a range of balancing services to the NETSO and Distribution Network Operators (DNOs) to help operate the system; and reducing constraints on the networks, helping to defer or avoid the need for costly network upgrades as demand increases.
- 3.3.28 Whilst important in providing balancing services, many of the storage facilities currently being deployed provide storage over a period of hours but cannot cost effectively cover prolonged periods of low output from wind and solar. There are a range of storage technologies that may be able to provide storage over longer periods of low wind and solar output (e.g. days, weeks or months) but many of these technologies are not yet available at scale or have an upper limit on deployment due to geographical constraints.
- 3.3.29 The Infrastructure Planning (Electricity Storage Facilities) Order 2020⁴³ removed all forms of electricity storage, other than pumped hydroelectric storage, from the definition of nationally significant energy generating stations under the Planning Act 2008.

⁴³ See <https://www.legislation.gov.uk/uksi/2020/1218/contents/made>

- 3.3.30 Applications for adding electricity storage to an existing generation station which has consent under the NSIP regime or under section 36 of the Electricity Act 1989 may also be consented outside of the Planning Act 2008 process, unless the Secretary of State directs otherwise under section 35 of the Planning Act 2008.
- 3.3.31 Applications for pumped hydro storage facilities below 50MW in England, or 350MW in Wales, will continue to be consented outside of the Planning Act 2008 process, unless the Secretary of State directs otherwise under section 35 of the Planning Act 2008. Those above 50MW in England, or 350MW in Wales, will continue to be defined as NSIPs, requiring consent from the Secretary of State.

The role of interconnectors

- 3.3.32 Interconnection can facilitate a secure, low carbon electricity system at low cost. The UK recognises the benefits of increasing levels of interconnection and has an ambition to realise at least 18 GW of existing and planned interconnector capacity by 2030.
- 3.3.33 At present our interconnection capacity consists of 8.4 GW: 4 GW links with France, 1 GW to the Netherlands, 1 GW to the island of Ireland (500 MW to Northern Ireland and 500 MW to the Republic of Ireland), 1 GW to Belgium and 1.4 GW to Norway. Further interconnectors are under construction to Denmark, the Republic of Ireland and Germany, with a number of further projects in the early stages of development. We also foresee the potential for future multi-purpose projects to combine offshore wind with market-to-market interconnection, which are considered in the section below.
- 3.3.34 However, there are limitations on the amount of capacity that can be built and although in theory interconnectors can provide additional supply whenever there is a shortfall in the domestic market, this is dependent on there being sufficient supply from other markets.
- 3.3.35 Interconnection can provide access to a diverse pool of generation allowing the import or export of cheaper electricity by responding to changes in market signals, and providing the system with additional flexibility. Interconnectors can provide a range of system services, such as voltage and black start services⁴⁴; and can also help to reduce the curtailment of renewable energy.⁴⁵

The role of combustion power stations

- 3.3.36 Combustion power stations use fuel for generation. This means that it is possible for them to provide dispatchable generation when the output from intermittent renewables is low, but they are dependent on the supply of fuel for generation. Most forms of combustion power also produce residual emissions, and where this is the

⁴⁴ <https://www.nationalgrideso.com/document/92386/download>

⁴⁵ BEIS (2020), Impact of interconnectors on decarbonisation
<https://www.gov.uk/government/publications/impact-of-interconnectors-on-decarbonisation>

case, their use will need to be limited over time unless they can decarbonise. All commercial scale (at or over 300 MW) combustion power stations fuelled by gas, coal, oil or biomass have to be constructed Carbon Capture Ready (CCR). More information on government policy on CCR requirements and plans to transition to a new regime, Decarbonisation Readiness, is set out in Section 4.8.

Energy from Waste

- 3.3.37 Energy from Waste (EfW) plants operate at over 90 per cent availability but also produce residual carbon emissions, due to the presence of fossil-based carbon which exists alongside the biodegradable materials in the waste.
- 3.3.38 The principal purpose of the combustion of waste, or similar processes (for example Advanced Conversion Technologies (ACTs) such as pyrolysis or gasification) is to reduce the amount of waste going to landfill in accordance with the Waste Hierarchy⁴⁶ and to recover energy from that waste as electricity or heat. Only waste that cannot be re-used or recycled with less environmental impact and would otherwise go to landfill should be used for energy recovery. This is to ensure that environmental impacts are minimised, and that the resource value extracted is maximised.⁴⁷
- 3.3.39 As the primary function of EfW plants, or similar processes is to treat waste, applicants must demonstrate that proposed facilities are in line with Defra's policy position on the role of energy from waste in treating municipal waste⁴⁸.
- 3.3.40 The proposed plant must not compete with greater waste prevention, re-use, or recycling, or result in over-capacity of EfW waste treatment at a national or local level.
- 3.3.41 Energy recovery from residual waste has a lower GHG impact than landfill⁴⁹ with the possibility for reducing emissions if plants are equipped with CCS. The amount of electricity that can be generated from EfW is constrained by the availability of its feedstock, which is set to reduce further by 2035 because of government policy.⁵⁰
- 3.3.42 EfW is only partially renewable due to the presence of fossil-based carbon in the waste. Only the energy contribution from the biogenic portion is counted towards renewable energy targets and therefore eligible for renewable financial incentives. If

⁴⁶ Waste Hierarchy as set out in regulation 12 of the Waste (England and Wales) Regulations 2011.

⁴⁷ Our waste, our resources: a strategy for England See

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf

⁴⁸ 2021 Waste Management Plan for England p.45: <https://www.gov.uk/government/publications/waste-management-plan-for-england-2021>

⁴⁹ See

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/284612/pb14130-energy-waste-201402.pdf

⁵⁰ See <https://www.gov.uk/government/publications/circular-economy-package-policy-statement>

the waste is pre-treated to separate out the biogenic fraction, then this can be considered wholly renewable.

Bioenergy

- 3.3.43 Bioenergy could provide either baseload or dispatchable low carbon generation.⁵¹ The need for negative emissions to offset residual emissions through BECCS, might provide a case for baseload deployment. In addition, the amount of bioenergy for generating electricity will be constrained by the availability of sustainable biomass and the extent to which it may be more cost effective in decarbonising other sectors (such as heat and transport) over the long-term.

Natural gas-fired plants

- 3.3.44 Closed Cycle Gas Turbines (CCGTs) using natural gas can be equipped with CCS which is intended to reduce emissions compared to unabated gas-fired plants by 90 per cent or more. Although they can provide flexible generation that is able to ramp up or down to meet demand, they are unable to provide the quick start peaking capacity which is required in a low carbon system.
- 3.3.45 Power CCUS has not been deployed in the UK to date and although the barriers to deployment are commercial rather than technical, it is reliant on the availability of infrastructure for the transportation and storage of CO₂. To realise the potential of power CCUS government will implement the Dispatchable Power Agreement and seek to bring forward at least one power CCUS plant in the mid 2020s through the CCUS Cluster Sequencing Process, subject to the outcome of that process including value for money and affordability considerations.
- 3.3.46 CCS may be able to be applied to technologies such as Open Cycle Gas Turbines (OCGTs), or reciprocating engines using natural gas but would reduce their ability to provide quick start peaking capacity. Whilst this is currently the way we secure domestic quick start peaking capacity at scale, the emissions they produce means that their role will need to be reduced over time as they transition or are replaced by low-carbon options, such as turbines fuelled with low carbon hydrogen or long-duration storage.
- 3.3.47 Quick start peaking capacity is only used infrequently, i.e. when it is necessary for security of supply, but may need to produce large amounts of electricity for short periods. Therefore, whilst the annual output (and therefore any associated

⁵¹ See Biomass Policy Statement available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1031057/biomass-policy-statement.pdf

emissions) is expected to be small, there may be a requirement for significant amounts of capacity to ensure a secure, reliable, and affordable electricity system.

- 3.3.48 Although the expectation is that low carbon alternatives will be able to replicate the role of natural gas in the electricity system over time, some natural gas-fired generation without CCS, running very infrequently, may still be needed for affordable reliability even in 2050. This can still be net zero consistent if the emissions from their use are balanced by negative emissions from GGR technologies.

Hydrogen

- 3.3.49 Low carbon hydrogen could be capable of replicating the role of natural gas in the electricity system, including providing both firm, flexible capacity in the future and a decarbonisation route for unabated combustion power plants. However, the supply of low carbon hydrogen for electricity generation is currently uncertain, and the operability of turbines fuelled solely by 100 per cent hydrogen (rather than blended with natural gas), needs to be developed and demonstrated at commercial scale. The British Energy Security Strategy⁵² sets out our ambition for up to 10GW of low carbon hydrogen production capacity by 2030, subject to affordability and value for money, at least half of which will come from electrolytic hydrogen, working with industry to develop a strong and enduring UK hydrogen economy. The Impact Assessment for CB6 shows an illustrative range for low carbon hydrogen of 85-125TWh in 2035 and 250-460TWh in 2050.⁵³

The role of nuclear power

- 3.3.50 Nuclear plants provide continuous, reliable, safe low-carbon power. They produce no direct emissions during operation and have indirect life cycle GHG emissions comparable to offshore wind. Power stations with an estimated lifetime of 60 years provide large amounts of low carbon electrical power, using a relatively small amount of land.⁵⁴ Nuclear, alongside other technologies could also offer broader system benefits, such as low carbon hydrogen production through electrolysis, or low carbon heat. In addition, nuclear generation provides security of supply benefits by utilising an alternative fuel source to other thermal plants, with a supply chain independent from gas supplies.
- 3.3.51 Our analysis suggests additional nuclear beyond Hinkley Point C will be needed to meet our energy objectives.⁵⁵ Nuclear technology is developing and opportunities for flexible use may grow as the energy landscape evolves. The role of nuclear power

⁵² See <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

⁵³ See <https://www.legislation.gov.uk/ukdsi/2021/9780348222616/impacts>

⁵⁴ Missing Link to a Liveable Climate, Lucid Catalyst, 2020 See <https://www.lucidcatalyst.com/hydrogen-report>

⁵⁵ Development Consent Order for Sizewell C was granted on 20 July 2022. See <https://infrastructure.planninginspectorate.gov.uk/projects/eastern/the-sizewell-c-project/>

could be fulfilled by large-scale nuclear, Small Modular Reactors, Advanced Modular Reactors, and fusion power plants.

3.3.52 As outlined in the British Energy Security Strategy⁵⁶, the government is increasing our plans for deployment of civil nuclear power by 2050s. To facilitate this, government has set out a number of nuclear ambitions, including developing an overall siting strategy for the long term, which could include both GW-scale and advanced fission technologies. This will inform the development of a new Nuclear NPS for the deployment of nuclear power stations after 2025.

The role of hydropower and marine technologies

3.3.53 Hydropower can provide relatively predictable and, in some cases, flexible low carbon generation but total capacity is limited by the topography of the UK. Wave and tidal can also provide relatively predictable low carbon power and could play a role in future if their costs can be reduced. However, total capacity is limited for tidal power and wave power is very closely correlated with wind.

3.3.54 These technologies, as with most other renewables, help provide security of supply as they are not reliant on fuel for generation and can improve reliability where they are not correlated with wind and solar.

3.3.55 However, due to limitations on the total capacity that could be installed, as they may not always be able to provide electricity when there is low output from wind and solar and their current costs, further additional forms of generating capacity will be required to meet our energy objectives.

The need for electricity generating capacity

3.3.56 All the generating technologies mentioned above are urgently needed to meet the government's energy objectives by:

- providing security of supply (by reducing reliance on imported oil and gas, avoiding concentration risk and not relying on one fuel or generation type)
- providing an affordable, reliable system (through the deployment of technologies with complementary characteristics)
- ensuring the system is net zero consistent (by remaining in line with our carbon budgets and maintaining the options required to deliver for a wide range of demand, decarbonisation and technology scenarios, including where there are difficulties with delivering any technology)

⁵⁶ See <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

3.3.57 Known generation technologies that are included within the scope of this NPS (and would be classed as an NSIP if above the relevant capacity thresholds set out under the Planning Act 2008) include:

- Offshore Wind (including floating wind),
- Solar PV,
- Wave,
- Tidal Range,
- Tidal Stream,
- Pumped Hydro,
- Energy from Waste (including ACTs) with or without CCS,
- Biomass with or without CCS,
- Natural Gas with or without CCS,
- Low carbon hydrogen,
- Large-scale nuclear, Small Modular Reactors, Advanced Modular Reactors, and fusion power plants,
- Geothermal

3.3.58 The need for all these types of infrastructure is established by this NPS and is urgent.

3.3.59 Government has concluded that there is a critical national priority (CNP) for the provision of nationally significant new offshore wind infrastructure (and supporting onshore and offshore network infrastructure).

3.3.60 As set out in EN-3, subject to any legal requirements, the urgent need for CNP Infrastructure to achieving our energy objectives, together with the national security, economic, commercial, and net zero benefits, will in general outweigh any other residual impacts not capable of being addressed by application of the mitigation hierarchy. Government strongly supports the delivery of CNP Infrastructure and it should be progressed as quickly as possible.

3.3.61 New coal or large-scale oil-fired electricity generation are not consistent with the trajectory of our carbon budgets and the transition to net zero and so are not included within this NPS, and the government is taking active steps to phase them out of the energy system.

3.3.62 Other novel technologies or processes may emerge during the life of this NPS, which are nationally significant and can help deliver our energy objectives. Where these

deliver on our objectives, then such technologies or processes can be regarded as needed, and as such should be given substantial weight. See section 3.2 above.

The need for new electricity networks

- 3.3.63 There is an urgent need for new electricity network infrastructure to meet our energy objectives.
- 3.3.64 The security and reliability of the UK's current and future energy supply is very highly dependent on having an electricity network which will enable new renewable electricity generation, storage, and interconnection infrastructure that our country needs to meet the rapid increase in electricity demand required to transition to net zero while maintaining energy security. The delivery of this important infrastructure also needs to balance cost to consumers, accelerated timelines for delivery and the minimisation of community and environmental impacts.
- 3.3.65 The need to connect to new sources of electricity generation and new sources of demand is not the only driver for new electricity network infrastructure. As the electricity system grows in scale, dispersion, variety, and complexity, work will be needed to protect against the risk of large-scale supply interruptions in the absence of sufficiently robust electricity networks. While existing transmission and distribution networks must adapt and evolve to cope with this reality, development of new transmission lines of 132kV (and over 2km) and above will also be necessary to preserve and guarantee the robust and reliable operation of the whole electricity system.
- 3.3.66 The volume of onshore reinforcement works needed to meet decarbonisation targets is substantial. National Grid ESO forecasts that over the next decade the onshore transmission network will require a doubling of north-south power transfer capacity due to increased wind generation in Scotland; substantial reinforcement in the Midlands to accommodate increased power flows from Scotland and the North of England; substantial reinforcement in London and the South of England to allow for Europe-bound export of excess wind generation from Scotland and the North of England; and substantial reinforcement in East Anglia to handle increased power flows from offshore wind generation⁵⁷ (this may also require additional offshore connections coming to land in England).
- 3.3.67 It is important to note that the crucial national benefits of increased system robustness through new electricity network infrastructure projects are shared by all users of the system.
- 3.3.68 Of particular strategic importance this decade is the role of offshore wind, as stated in the British Energy Security Strategy⁵⁸ (up to 50GW including 5GW floating by 2030) in our generation mix which presents a challenge of connecting a large volume of

⁵⁷ National Grid ESO, Electricity Ten Year Statement (October 2020)

⁵⁸ See <https://www.gov.uk/government/publications/british-energy-security-strategy>

generation located beyond the periphery of the existing transmission network. To support this ambition, supporting onshore and offshore transmission infrastructure is considered CNP Infrastructure. See para 3.3.59 above and 1.1.4 EN-5.

- 3.3.69 The historical approach to connecting offshore wind resulted in individual radial connections developed project-by-project. While this may continue to be the most appropriate approach for some areas with single offshore wind projects that are not located in the proximity of other offshore wind infrastructure, it is expected that for regions with multiple windfarms a more coordinated approach will be delivered. For these areas, this approach is likely to reduce the network infrastructure costs as well as the cumulative environmental impacts and impacts on coastal communities by installing a smaller number of larger connections, each taking power from multiple windfarms instead of individual point-to-point connections for each windfarm.
- 3.3.70 Connecting the volume of offshore wind capacity targeted by the government will require not only new offshore transmission infrastructure but also reinforcement to the onshore transmission network, to accommodate the increased power flows to regional demand centres.
- 3.3.71 Due to the time required to plan, approve and construct the required new onshore transmission infrastructure, to date the completion of these onshore reinforcements has often taken longer than the completion of the offshore wind farms for which they are being built. This could present a material barrier to the delivery of UK Government ambition to deliver up to 50GW of offshore wind by 2030.
- 3.3.72 The strategic approach to network planning, including the Holistic Network Design (HND) for onshore-offshore transmission, planned HND follow-on exercises and the proposed move to Centralised Strategic Network planning for the onshore-offshore network, allows for clearer identification of needs and includes upfront consideration of environmental and community impacts. These strategic network planning exercises should be taken into account in the consenting process, supporting those projects identified in the network designs/ plans to help expedite the progress of those projects as they are brought forward for consent. Further details are provided in Section 2.13 of EN-5.
- 3.3.73 The final Phase 1 report for National Grid ESO's Offshore Coordination Project⁵⁹ found that a more integrated approach to offshore transmission, which included efficient planning of the onshore network, could deliver consumer benefits of up to £6 billion by 2050, depending on how quickly it could be implemented. It also found that the number of new electricity infrastructure assets, including cables and onshore landing points could be reduced by up to 50 per cent over the same period, significantly reducing environmental impacts and impacts on coastal communities.

⁵⁹ See <https://www.nationalgrideso.com/document/183031/download>

- 3.3.74 Multi-purpose interconnector projects also have the potential to deliver benefits by combining offshore transmission with market-to-market interconnectors – enabling reduced curtailment of offshore wind, and reduced landing points and capital expenditure. These benefits can be maximised if the planning of this infrastructure and the associated offshore wind farms are aligned, both domestically and with the connecting country’s planning process.
- 3.3.75 Further to the needs case above, it is recognised that the case for a new connection or network reinforcement is demonstrated if the proposed development represents an efficient and economical means of:
- connecting a new generating station to the network;
 - reinforcing the network to accommodate such connections; or
 - reinforcing the network to ensure that it is sufficiently resilient and capacious (per any performance standards set by Ofgem) to reliably supply present and/or anticipated future levels of demand.;

In considering the ‘economic and efficient’ approach the network project also needs to follow good design, avoidance and mitigation principles (and/ or biodiversity compensation where needed for transmission in the marine environment), as referenced in EN-5.

- 3.3.76 Moreover, given the crucial role of networks in connecting all of the other kinds of electricity infrastructure described above it is especially important that the Secretary of State considers network projects as elements of a coherent and strategically necessary system, whether or not they are linked together in specific NSIPs. For instance, when evaluating applications for new electricity networks infrastructure the Secretary of State should have regard to the fact that given
- i) the government’s strategic commitment to ambitious levels of interconnection capacity and offshore wind generation; and
 - ii) the tightly interdependent infrastructure chain linking interconnection and offshore generation with onshore demand centres

delays in the approval of associated new network developments could cause significant economic waste and set back the strategically vital goal of decarbonisation, and energy security.

- 3.3.77 Related to the above and considering the potential for unwarranted and avoidable disruption, inefficiency, and visual blight along the onshore - offshore boundary, the preference should be for coordination of onshore transmission, offshore transmission, and offshore generation and interconnector developments. This coordinated approach is likely to provide the highest degree of consumer, environmental, and community benefits.

- 3.3.78 The importance of accelerating does not, however, militate against the need for standalone electricity networks projects, and these projects are supported by this NPS and should continue to be assessed on their own merits.

Bringing forward new electricity infrastructure projects

- 3.3.79 Government has committed to reduce GHG emissions by 78 per cent by 2035 under carbon budget 6.⁶⁰ According to the Net Zero Strategy⁶¹ this means that by 2035, all our electricity will need to come from low carbon sources, subject to security of supply, whilst meeting a 40-60 per cent increase in demand.
- 3.3.80 Given the urgent need for new electricity infrastructure and the time it takes for electricity NSIPs to move from design conception to operation, there is an urgent need for new (and particularly low carbon) electricity NSIPs to be brought forward as soon as possible, given the crucial role of electricity as the UK decarbonises its economy.
- 3.3.81 It is not the government's intention in presenting any of the figures or targets in this NPS to propose limits on any new electricity infrastructure that can be consented in accordance with the energy NPSs.
- 3.3.82 It is not the role of the planning system to deliver specific amounts or limit any form of electricity infrastructure covered by this NPS.
- 3.3.83 A large number of consented projects can help deliver an affordable electricity system, by driving competition and reducing costs within and amongst different technology and infrastructure types. Consenting new projects also enables projects utilising more advanced technology and greater efficiency to come forward.⁶²
- 3.3.84 The delivery of an affordable energy system does not always mean picking the least cost technologies. A diversity of supply can aid in ensuring affordability for the system overall and relative costs can change over time, particularly for new and emerging technologies. It is not the role of the planning system to compare the costs of individual developments or technology types.
- 3.3.85 The government has other mechanisms to influence the delivery of its energy objectives and imposing limits on the consenting of different types of electricity infrastructure would reduce competition, increasing costs, and disincentivise newer, more efficient solutions from coming forward. This does not reduce the need for individual projects to demonstrate compliance with planning and environmental requirements or mean that everything that obtains development consent will get built.

⁶⁰ <https://www.gov.uk/guidance/carbon-budgets#setting-of-the-sixth-carbon-budget-2033-2037>

⁶¹ See <https://www.gov.uk/government/publications/net-zero-strategy>

⁶² An exception to this is EfW plants where the primary function is to treat waste and planning decisions will be made based on the demand for waste infrastructure. See EN-3 for further detail.

3.4 The need for new nationally significant gas infrastructure

- 3.4.1 Gaseous fuels have a key role in the UK energy landscape, accounting for around 30 per cent of UK energy production in 2020, and 40 per cent of demand.⁶³⁶⁴
- 3.4.2 They are used in the domestic sector for heating and cooking, in the industrial sector, as a source of energy and as a feedstock and, in the power generation sector, as a reliable source of flexible generating capacity.
- 3.4.3 In this section gas, unless otherwise specified, includes natural gas, biomethane and hydrogen.
- 3.4.4 We need a diverse mix of gas supply infrastructure including pipelines, storage and reception facilities in order to meet our energy objectives. Our gas infrastructure must, amongst other things, be sufficient to:
- meet ‘peak’ demand for gas. Gas market participants may aim to have some “redundancy” in their supply arrangements, above the minimum amount to meet peaks, to manage the risk that other capacity may not be available (for example, where undergoing maintenance)
 - allow for a sustained delivery of large volumes of gas, for example, demand over a particularly cold winter
 - provide access to the most competitive gas supplies. Because the price of gas sources will vary over time, this leads to some redundancy in gas supply infrastructure. Market participants may therefore see distinct value in having access to gas from different sources – imports by pipeline, imports as LNG, and gas from storage (especially close-to-market)

Meeting ongoing demand for natural gas

- 3.4.5 The Energy White Paper⁶⁵ signals a decisive shift away from unabated natural gas to clean energy. This transformation, as reiterated in the British Energy Security Strategy⁶⁶, cannot be instantaneous without jeopardising a secure, reliable, and affordable energy system.
- 3.4.6 Security of supply is a top priority as the UK moves to decarbonise gas supply. The gas system is expected to continue to function well, as it has done to date, with a

⁶³ UK gas demand decreased 6 per cent in 2020 compared to 2019, following several years of stable demand and was largely a result of restrictions in place to curb the Covid-19 pandemic.

⁶⁴ Digest of UK Energy Statistics: Chapter 4 – Natural Gas See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1060151/DUKES_2021_Chapters_1_to_7.pdf

⁶⁵ See <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

⁶⁶ See <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

highly diverse range of supply sources and sufficient delivery capacity to more than meet demand. As we decarbonise gas, the UK will consider all options to help us achieve the most climate impact at least cost, while maintaining a secure system.

- 3.4.7 Building on commitments in the North Sea Transition Deal⁶⁷, we will significantly reduce emissions from traditional oil and gas fuel supplies, whilst scaling-up the production of low carbon alternatives such as hydrogen and biofuels. Current gas prices spikes underline the need to move away from hydrocarbons as quickly as possible, but we will manage the transition in a way that protects jobs and investment, uses existing infrastructure, maintains security of supply, and minimises environmental impacts.
- 3.4.8 Assumed energy demand in our pathway is based on government's central assumptions about required technology uptake, with a variation to reflect the outstanding strategic decision on the potential role of hydrogen to heat buildings. We expect both natural gas and oil demand to more than halve by 2037 while overall, energy demand reduces significantly through increased efficiency and fossil fuels are replaced by new sources of energy.
- 3.4.9 We continue to work with the gas industry to seek views which will inform future policies (supported by a call for evidence), on the future of the gas system, with a focus on infrastructure and markets. This will enable us to determine how the gas market will need to evolve to ensure the right market and regulatory signals are in place to offer the necessary level of investment and maintenance throughout the transition. Gathering evidence on the amount of natural gas, biomethane, and hydrogen available and the ongoing role for gas will inform what action we must take.

Delivering affordable decarbonisation

- 3.4.10 Where low carbon alternatives can replace unabated natural gas, we will still need new gas infrastructure. Given the changing nature of the energy landscape, we cannot be certain on the precise role of natural gas, or gas infrastructure, in the future, but the approach we take must remain consistent with our energy objectives.
- 3.4.11 This means retaining the capability for using natural gas for low carbon dispatchable output in power stations equipped with CCS and as a feedstock for low carbon hydrogen production. Natural gas infrastructure might also be repurposed in the future for use by other gases required to deliver a net zero economy, such as low carbon hydrogen or for transportation of carbon dioxide to storage. Therefore, there is an ongoing need for retaining and developing the infrastructure for importing, storing and transporting gas.

⁶⁷ See <https://www.gov.uk/government/publications/north-sea-transition-deal>

The need for low carbon hydrogen infrastructure

- 3.4.12 There is an urgent need for all types of low carbon hydrogen infrastructure to allow hydrogen to play its role in the transition to net zero.
- 3.4.13 As set out in the UK Hydrogen Strategy⁶⁸, the government is committed to developing low carbon hydrogen, which will be critical for meeting the UK's legally binding commitment to achieve net zero by 2050, with the potential to help decarbonise vital UK industry sectors and provide flexible deployment across heat, power and transport.
- 3.4.14 The British Energy Security Strategy⁶⁹ sets out our ambition for up to 10GW of low carbon hydrogen production capacity by 2030, subject to affordability and value for money, at least half of which will come from electrolytic hydrogen, working with industry to develop a strong and enduring UK hydrogen economy. The Impact Assessment for CB6 shows an illustrative range for low carbon hydrogen of 85-125TWh in 2035 and 250-460TWh in 2050.⁷⁰ This demand for hydrogen will need the infrastructure that supports it, including pipelines and storage.
- 3.4.15 Hydrogen can be produced through water electrolysis with low carbon power ('green' hydrogen) or through methane reformation with CCS ('blue' hydrogen). The government's view is that a twin track approach of developing both green and blue hydrogen production will be needed to achieve the scale of low carbon hydrogen production required for net zero.
- 3.4.16 The Government is exploring whether to enable blending of up to 20% hydrogen by volume into the current natural gas distribution networks and is targeting a policy decision in 2023, subject to the outcomes from the ongoing economic and safety assessments and wider strategic considerations. If the decision to proceed with blending is positive, the Government will then look to start the legislative and regulatory process for enabling blending, as well as the process to make any physical changes to the distribution networks that are required. Given the timelines for this work, government does not anticipate blending at a commercial scale to commence before 2025, at the earliest.
- 3.4.17 The Government recognises the potential market building role of blending to help manage volume risk to hydrogen producers facing volatile or temporarily unavailable demand, as well as to bridge any potential gap whilst hydrogen transport and storage infrastructure develops. However as set out in our Hydrogen Strategy⁷¹, use of hydrogen is most valuable where other routes to decarbonisation do not exist or are limited, particularly where direct electrification is not an option. Therefore, we will be looking to ensure that blending does not displace the supply of hydrogen to those

⁶⁸ See <https://www.gov.uk/government/publications/uk-hydrogen-strategy>

⁶⁹ See <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

⁷⁰ See <https://www.legislation.gov.uk/ukdsi/2021/9780348222616/impacts>

⁷¹ See <https://www.gov.uk/government/publications/uk-hydrogen-strategy>

end users who require it to decarbonise. This is likely to be reflected in the design of any potential financial support that is available for hydrogen producers for blended volumes. More work is also required to prove the safety and feasibility case, and to better understand the costs and benefits, of repurposing the gas grid to 100 per cent low carbon hydrogen. DESNZ is currently working with industry stakeholders to ensure that all necessary research and development, testing and trialling work required is carried out. The Hydrogen Strategy⁷² also provides further information on our approach.

- 3.4.18 In the future, low carbon hydrogen may also become an internationally traded energy vector, piped or shipped from areas of low-cost production to areas of demand. While the development of this market is uncertain, the UK could become both an exporter and importer of low carbon hydrogen, potentially necessitating current gas infrastructure to be reconfigured or for new infrastructure to be put in place. As set out in the British Energy Security Strategy⁷³, there is a commitment to develop a certification scheme to support the international trade in low carbon hydrogen, by 2025.
- 3.4.19 The Hydrogen Strategy⁷⁴ recognises the critical enabling role that hydrogen transportation and storage (T&S) infrastructure will need to play in connecting hydrogen producers with consumers and balance misalignment in supply and demand. It committed government to undertaking a review of T&S requirements to support its ambitions, including the need for financial and regulatory support. Following feedback sought at the start of this review, the British Energy Security Strategy⁷⁵ sets out a commitment to design new business models for hydrogen T&S infrastructure by 2025, which will be essential to grow the hydrogen economy.
- 3.4.20 New hydrogen pipelines and underground storage for hydrogen (in both cases whether or not blended with natural gas) will require consent from the Secretary of State where they meet the definitions in sections 15-21 of the Planning Act 2008.
- 3.4.21 In considering applications, the Secretary of State will expect applicants to consider foreseeable future demand when considering the size and route of their investments. Applicants may therefore propose pipelines with a greater capacity than demand might suggest at the time of consenting. Existing legislation (The Offshore Petroleum Production and Pipe-lines (Assessment of Environmental Effects) Regulations 1999⁷⁶) already provides powers to require modification of pipelines where this would reduce the need for additional pipelines to be constructed in the future.

⁷² See <https://www.gov.uk/government/publications/uk-hydrogen-strategy>

⁷³ See <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

⁷⁴ See <https://www.gov.uk/government/publications/uk-hydrogen-strategy>

⁷⁵ See <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

⁷⁶ See <https://www.legislation.gov.uk/uksi/1999/360/contents/made>

The role of biomethane

- 3.4.22 As of January 2021, biomethane is the only green gas commercially produced in the UK, and can be injected into the gas grid, following suitable upgrading processes, for use as a lower carbon substitute for natural gas. As of April 2022, the Renewable Heat Incentive (RHI) had supported the deployment of 163 biomethane plants (143 Full applications and 20 Tariff Guarantee ones, with another 11 Tariff Guarantee applications outstanding) and had supported (paid for) 18,490 GWh of biomethane since the scheme launched in 2011⁷⁷. The reasons for this small uptake include the high capital required for biomethane plants, access to gas injection points and lack of feedstock availability.
- 3.4.23 The government's soon to be launched Green Gas Support Scheme (GGSS)⁷⁸ will also help decarbonise our gas supplies by increasing the proportion of green gas in the grid, through support for biomethane injection. We expect the GGSS will contribute 3.7MtCO_{2e} of carbon savings over Carbon Budgets 4 and 5, and 8.2MtCO_{2e} of carbon savings over its lifetime.
- 3.4.24 Some models are being trialled to overcome these barriers, such as a number of smaller anaerobic digestion (AD) facilities in rural areas feeding their biomethane into a single injection point on the gas grid. However, it is currently not seen as a stand-alone solution for gas decarbonisation.

Alternatives to new gas infrastructure

Heat networks

- 3.4.25 Heat networks are systems of insulated pipes that take heat from a central source and supply it to residential, commercial and public sector buildings to provide hot water, space heating and/or cooling.
- 3.4.26** Heat networks are a crucial technology for decarbonising the UK's heating, particularly in dense urban areas. They are uniquely able to unlock otherwise inaccessible sources of larger scale renewable and recovered heat such as waste heat and heat from waterway and mines. By using recovered heat from industry, geothermal energy and power generation, and accessing sources of ambient heat, heat networks can reduce overall production requirements for gas. In parts of the UK, heat networks will represent a lower cost route to decarbonisation than alternatives such as repurposing the gas network for low carbon hydrogen.
- 3.4.27 However, although heat networks can play a key role in decarbonising heating, they cannot fully replace the need for new gas infrastructure to supply areas without heat

⁷⁷ Non-Domestic and Domestic Renewable Heat Incentive (RHI) monthly deployment data (Great Britain): April 2022, table 1.1, 1.5 and 1.6. [See https://www.gov.uk/government/statistics/rhi-monthly-deployment-data-april-2022](https://www.gov.uk/government/statistics/rhi-monthly-deployment-data-april-2022)

⁷⁸ See <https://www.gov.uk/government/consultations/future-support-for-low-carbon-heat>

networks or to transport gas for the other purposes set out in this section. Heat networks currently supply around 2 per cent of the UK's heat supply.

Electrification and Energy Efficiency Measures

- 3.4.28 As discussed in paragraph 3.3.3, increased electrification of heat, combined with energy efficiency measures, could reduce the need for gas infrastructure but such infrastructure will still be required during the transition to net zero to ensure security of our energy supplies. It is prudent to plan on a conservative basis to ensure that there is sufficient supply of energy to meet demand across a wide range of future scenarios.

Demand Side Response

- 3.4.29 Demand side response allows large gas consumers to reduce the amount of gas they use during times of system stress in exchange for a payment. However, it cannot increase the total amount of gas available in the UK, or significantly reduce the total amount of gas consumed, and so cannot fully replace the need for new gas infrastructure to deliver our energy objectives.

Bringing forward gas infrastructure projects

- 3.4.30 It is not the role of the planning system to deliver or limit specific amounts of any form of gas infrastructure covered by this NPS. The government has other mechanisms to influence the delivery of a secure, reliable, affordable and net zero consistent gas infrastructure.
- 3.4.31 This does not reduce the need for individual projects to demonstrate compliance with planning and environmental requirements or mean that everything that obtains development consent will be constructed.
- 3.4.32 Within the strategic framework established by the government it is for industry to propose the specific types of developments that they assess to be viable. This is the nature of a market-based energy system. The Secretary of State should therefore act in accordance with the policy set out in Section 3.2 when assessing proposals for new gas NSIPs.

3.5 The need for new nationally significant carbon capture and storage infrastructure

- 3.5.1 There is an urgent need for new carbon capture and storage (CCS) infrastructure to support the transition to a net zero economy.

- 3.5.2 The Committee on Climate Change Committee states CCS is a necessity not an option.⁷⁹ As well as its role in reducing emissions associated with generating electricity from natural gas (see paragraph 3.3.49), CCS infrastructure will also be needed to capture and store carbon dioxide from hydrogen production from natural gas, industrial processes, the use of BECCS and from the air (DACCS). CCS infrastructure could be new or repurposed infrastructure.
- 3.5.3 The UK's Net Zero Strategy⁸⁰ and Industrial Decarbonisation Strategy⁸¹ reaffirm the importance of CCS in decarbonising energy intensive sectors such as chemicals, oil refining, and cement. The International Energy Agency⁸² further reinforce the need for CCS in the clean energy transition.
- 3.5.4 As set out in the Net Zero Strategy⁸³, our aim is to use CCUS technology to capture and store 20-30MtCO₂ per year by 2030, which will require the timely development and deployment of CCS infrastructure.
- 3.5.5 The UK has one of the largest potential carbon dioxide (CO₂) storage capacities in Europe, with an estimated 78 billion tonnes of CO₂ storage capacity under the seabed of the UKCS.
- 3.5.6 The deployment of new onshore CO₂ pipelines over 16.093 kilometres in length can expand CCS networks and are within scope of this NPS.
- 3.5.7 The CCUS investor roadmap⁸⁴ and CCUS supply chains roadmap⁸⁵ sets out how government and industry can work together to harness the power of a strong, industrialised UK CCUS supply chain, while ensuring that the CCUS sector as a whole remains investible, cost effective and focused on delivery.

Alternatives to new CCS infrastructure

- 3.5.8 The alternatives to new CCS infrastructure for delivering net zero by 2050 are limited. Producing hydrogen through water electrolysis with low carbon power ('green' hydrogen) does not rely on CCS but the government's view is that this method alone will not achieve the scale of low carbon hydrogen production required for net zero. Alternative methods of decarbonising industry include improving energy efficiency, electrification of heat, and fuel switching to hydrogen or biomass as fuel or feedstock. However, these alternatives are limited as many emissions are process emission.

⁷⁹ *Net Zero: The UK's contribution to stopping global warming*, p.23. See <https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf>

⁸⁰ See <https://www.gov.uk/government/publications/net-zero-strategy>

⁸¹ See <https://www.gov.uk/government/publications/industrial-decarbonisation-strategy>

⁸² See <https://www.iea.org/reports/ccus-in-clean-energy-transitions/a-new-era-for-ccus>

⁸³ See <https://www.gov.uk/government/publications/net-zero-strategy>

⁸⁴ See <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-investor-roadmap>

⁸⁵ See <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-ccus-supply-chains-a-roadmap-to-maximise-the-uks-potential>

CCS therefore has an essential role to play, either on its own or in combination with measures such as electrification and fuel switching.

Bringing forward CCS infrastructure projects

- 3.5.9 It is not the role of the planning system to deliver or limit specific amounts of CCS infrastructure covered by this NPS. The government has other mechanisms to influence the delivery of CCS infrastructure. This does not reduce the need for individual projects to demonstrate compliance with planning and environmental requirements or mean that everything that obtains development consent will get built.
- 3.5.10 Within the strategic framework established by the government it is for industry to propose the specific types of developments that they assess to be viable. This is the nature of a market-based energy system. The Secretary of State should therefore act in accordance with the policy set out at in Section 3.2 when assessing proposals for new CCS NSIPs.

3.6 The need for new nationally significant oil infrastructure

- 3.6.1 Oil products play an important role in the UK economy, providing around one third of the primary energy used. We currently rely on oil for over 95 per cent of our motorised transport needs.⁸⁶ Transport accounted for more than 70 per cent of final consumption of oil products in the UK in 2021, amounting to 37.7 million tonnes of oil⁸⁷, although the figures for both 2020 and 2021 were depressed by the impacts of Covid-19 and preliminary figures for early 2022 show that demand continues to rebound somewhat.
- 3.6.2 We need to reduce our dependence on oil by improving vehicle efficiency and using new alternative fuelled vehicles. From 2030 we will end the sale of new petrol and diesel cars and vans, 10 years earlier than previously proposed. However, until 2035 we will allow the sale of hybrid cars and vans that can drive a significant distance with no carbon coming out of the tailpipe. However, between 2030 and 2035, we will only allow the sale of new cars and vans if they have significant zero emission capability.

⁸⁶ From table 1.1 of Digest of United Kingdom Energy Statistics (DUKES) 2022: aggregate energy balances: gross calorific values, available at: <https://www.gov.uk/government/publications/digest-of-uk-energy-statistics-dukes-table-of-tables>

⁸⁷ From table 3.2 of Digest of United Kingdom Energy Statistics (DUKES) 2022: petroleum products: commodity balances, available at: <https://www.gov.uk/government/publications/digest-of-uk-energy-statistics-dukes-table-of-tables>

- 3.6.3 Transport is the largest share of demand for fuel but there are other uses which are important to the UK economy and life, including non-energy uses and the use of oils and liquefied petroleum gas for heating.
- 3.6.4 Over time technology changes, including electric vehicles and the generation of more heat from low carbon sources, together with energy efficiency policies such as seeking to encourage greater use of public transport will reduce demand for oil.
- 3.6.5 The technology to decarbonise light road transport is now being rolled out but the way forward for heavier road transport, shipping and aviation is not yet clear with several options, including electricity, low carbon hydrogen and low carbon fuels, still being developed.
- 3.6.6 Although analysis from the CCC suggests that demand for petroleum could reduce by 50 per cent by 2035, there will be an ongoing demand for oil-based fuels over the transition to net zero as the changes in demand will be slower than the changes in sales of new vehicles and until low carbon alternatives for heavier transport, shipping and aviation are developed.
- 3.6.7 The UK needs to ensure it has safe and secure supplies of the oil products it requires. Sufficient fuel and infrastructure capacity are necessary to avoid socially unacceptable levels of interruption to physical supply and excessive costs to the economy from unexpectedly high or volatile prices. These requirements can be met by sufficient, diverse and reliable supplies of fuel, with adequate capacity to import, produce, store and distribute these supplies to customers. This in turn highlights the need for reliable infrastructure including refineries, pipelines and import terminals and the need for flexibility in the supply chain to accommodate the inevitable risk of physical outages.
- 3.6.8 The UK has been a net importer of petroleum products since 2013, driven by continued rationalisation of the UK's refining capacity. However, the balance of import and export varies by product and region and this will continue to evolve as demand and supply adjust during the transition to a net zero carbon economy over forthcoming decades.

Petroleum product distribution

The Secretary of State should expect to receive a small number of significant applications for oil pipelines. The drivers for new downstream oil infrastructure such as pipelines and associated facilities include:

- meeting demand by end users, particularly for aviation fuel
- compliance with International Energy Agency obligations for compulsory oil stocking, which are set to increase as North Sea resources decline
- meeting requirements for lower emission fuels blended with biofuels (including ethanol), which are set to increase

- increasing imports of refined products (due to changing demand and supply patterns)
- replacing end of life assets and adjusting their design to meet new, safety, environmental or efficiency objectives
- emerging planning, safety and environmental protection requirements
- market requirements to improve supply resilience in order to meet demand in full, in a timely fashion, under credible emergency scenarios

3.6.9 New pipeline infrastructure could require associated works including oil processing plant to pump or filter blend products, storage tanks for bulk storage and product settling, road handling facilities for discharge into road tankers and jetties for loading and offloading sea tankers.

4 Assessment Principles

4.1 General Policies and Considerations

- 4.1.1 This part of EN-1, Assessment Principles, sets out the general policies for the submission and assessment of applications relating to energy infrastructure.
- 4.1.2 The Energy White Paper⁸⁸ and British Energy Security Strategy⁸⁹ emphasises the importance of the government's net zero commitment and efforts to fight climate change, as well as the need to maintain a secure and reliable energy system. The Levelling Up White Paper⁹⁰ calls on the Government to ensure investment in the transition to Net Zero benefits less well-performing parts of the UK, reducing emissions, facilitating economic development and the creation of jobs.
- 4.1.3 Given the level and urgency of need for infrastructure of the types covered by the energy NPSs set out in Part 3 of this NPS, the Secretary of State will start with a presumption in favour of granting consent to applications for energy NSIPs. That presumption applies unless any more specific and relevant policies set out in the relevant NPSs clearly indicate that consent should be refused.
- 4.1.4 The presumption is also subject to the provisions of the Planning Act 2008 referred to at paragraph 1.1.4 of this NPS.

Weighing impacts and benefits

- 4.1.5 In considering any proposed development, in particular when weighing its adverse impacts against its benefits, the Secretary of State should take into account:
- its potential benefits including its contribution to meeting the need for energy infrastructure, job creation, reduction of geographical disparities, environmental enhancements, and any long-term or wider benefits
 - its potential adverse impacts, including on the environment, and including any long-term and cumulative adverse impacts, as well as any measures to avoid, reduce, mitigate or compensate for any adverse impacts, following the mitigation hierarchy
 - in addition, in exercising functions in relation to Wales, the Secretary of State should act in accordance with duties placed upon public authorities, including Ministers of the Crown, by Section 6 of the Environment (Wales) Act 2016⁹¹ and seek to maintain and enhance biodiversity, and in so doing promote the

⁸⁸See <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

⁸⁹ See <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

⁹⁰ See <https://www.gov.uk/government/publications/levelling-up-the-united-kingdom>

⁹¹ See <https://www.legislation.gov.uk/anaw/2016/3/section/6/enacted>

resilience of ecosystems, so far as consistent with the proper exercise of the Secretary of State's functions

- 4.1.6 In this context, the Secretary of State should take into account environmental, social and economic benefits and adverse impacts, at national, regional and local levels. These may be identified in this NPS, the relevant technology specific NPS, in the application or elsewhere (including in local impact reports, marine plans, and other material considerations as outlined in Section 1.1).
- 4.1.7 Where this NPS or the relevant technology specific NPSs require an applicant to mitigate a particular impact as far as possible, but the Secretary of State considers that there would still be residual adverse effects after the implementation of such mitigation measures, the Secretary of State should weight those residual effects against the benefits of the proposed development.

Land rights

- 4.1.8 Where the use of land at a specific location is required to facilitate the development by providing for mitigation, landscape enhancement and biodiversity net gain, an applicant may, as part of its application to the Secretary of State, seek the compulsory acquisition of that land, or rights over that land.
- 4.1.9 The Secretary of State will consider any such application under the usual compulsory acquisition principles, taking into account the content of the NPSs.

Other documents

- 4.1.10 The policy set out in this NPS and the technology specific energy NPSs is intended to provide greater clarity around existing policy and practice of the Secretary of State in considering applications for nationally significant energy infrastructure, (or therefore the "benchmark" for what is, or is not, an acceptable nationally significant energy development).
- 4.1.11 The energy NPSs have taken account of the National Planning Policy Framework (NPPF), the Planning Practice Guidance (PPG) for England, and Planning Policy Wales and Technical Advice Notes (TANs) for Wales, where appropriate.⁹²
- 4.1.12 Other matters that the Secretary of State may consider both important and relevant to their decision-making may include Development Plan documents or other documents in the Local Development Framework.
- 4.1.13 Where the project conflicts with a proposal in a draft Development Plan, the Secretary of State should take account of the stage which the Development Plan document in England or Local Development Plan in Wales has reached in deciding

⁹² NPPF: See <https://www.gov.uk/government/collections/planning-practice-guidance>; PPG: Use of Planning Conditions: See <https://www.gov.uk/guidance/use-of-planning-conditions>; TANs: See <https://gov.wales/technical-advice-notes>

what weight to give to the plan for the purposes of determining the planning significance of what is replaced, prevented, or precluded.

- 4.1.14 The closer the Development Plan document in England or Local Development Plan in Wales is to being adopted by the LPA, the greater weight which can be attached to it.
- 4.1.15 In the event of a conflict between these documents and an NPS, the NPS prevails for the purpose of Secretary of State decision making given the national significance of the infrastructure.

Development consent

- 4.1.16 The Secretary of State should only impose requirements⁹³ in relation to a development consent that are necessary, relevant to planning, relevant to the development to be consented, enforceable, precise, and reasonable in all other respects.
- 4.1.17 The Secretary of State should consider the guidance in the NPPF, the PPG: Use of Planning Conditions, and TANs, or any successor documents, where appropriate.
- 4.1.18 The Secretary of State may consider any development consent obligations⁹⁴ that an applicant agrees with local authorities. These must be relevant to planning, necessary to make the proposed development acceptable in planning terms, directly related to the proposed development, fairly and reasonably related in scale and kind to the proposed development, and reasonable in all other respects.

Early engagement

- 4.1.19 Early engagement both before and at the formal pre-application stage between the applicant and key stakeholders, including public regulators, Statutory Consultees (including Statutory Nature Conservation Bodies (SNCBs)), and those likely to have an interest in a proposed energy infrastructure application, is strongly encouraged in line with the Government's pre-application guidance.⁹⁵
- 4.1.20 This is particularly so in the case of HRA matters covered in paragraphs 5.4.25 to 5.4.31 below, which explain the onus is on the applicant to submit sufficient information to enable the Secretary of State to conduct an Appropriate Assessment if required. This means that only applications which are fully prepared and comprehensive can be accepted for examination, enabling them to be properly

⁹³ As defined in section 120 of the Planning Act 2008.

⁹⁴ Where the words "planning obligations" are used in this NPS they refer to "development consent obligations" under section 106 of the Town & Country Planning Act 1990 as amended by section 174 of the Planning Act 2008.

⁹⁵ Planning Act 2008: guidance on the Pre-application process available at: See <https://www.gov.uk/government/publications/guidance-on-the-pre-application-process-for-major-infrastructure-projects>

assessed by the Examining Authority and leading to a clear recommendation report to the Secretary of State.

Financial and technical viability

- 4.1.21 In deciding to bring forward a proposal for infrastructure development, the applicant will have made a judgement on the financial and technical viability of the proposed development, within the market framework and taking account of government interventions.
- 4.1.22 Where the Secretary of State considers that the financial viability and technical feasibility of the proposal has been properly assessed by the applicant, it is unlikely to be of relevance in Secretary of State decision making (any exceptions to this principle are dealt with where they arise in this or other energy NPSs and the reasons why financial viability or technical feasibility is likely to be of relevance explained).

4.2 Environmental Principles

The government has announced plans to bring forward legislation to replace the existing EU-generated systems of Environmental Impact Assessment and Strategic Environmental Assessment with a domestic framework of environmental assessment. The new system would be brought forward through subsequent regulations following further consultation. Environmental assessment would still be required and if introduced relevant plans and projects would have to comply with such regulations. Until a new system is implemented, current legislation on environmental assessment continues to apply.

- 4.2.1 All proposals for projects that are subject to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) must be accompanied by an Environmental Statement (ES) describing the aspects of the environment likely to be significantly affected by the project.⁹⁶
- 4.2.2 The Regulations specifically refer to effects on population, human health, biodiversity, land, soil, water, air, climate, the landscape, material assets and cultural heritage, and the interaction between them.
- 4.2.3 The Regulations require an assessment of the likely significant effects of the proposed project on the environment, covering the direct effects and any indirect, secondary, cumulative, transboundary, short, medium, and long-term, permanent

⁹⁶ The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

and temporary, positive and negative effects at all stages of the project, and also of the measures envisaged for avoiding or mitigating significant adverse effects.⁹⁷

- 4.2.4 To consider the potential effects, including benefits, of a proposal for a project, the applicant must set out information on the likely significant environmental, social and economic effects of the development, and show how any likely significant negative effects would be avoided, reduced, mitigated or compensated for, following the mitigation hierarchy. This information could include matters such as employment, equality, biodiversity net gain, community cohesion, health and well-being.
- 4.2.5 For the purposes of this NPS and the technology specific NPSs the ES should cover the environmental, social and economic effects arising from pre-construction, construction, operation and decommissioning of the project.
- 4.2.6 Where the NPSs use the term 'environment' they are referring to both the natural and historic environments.
- 4.2.7 In the absence of any additional information on additional assessments, the principles set out in this Section will apply to all assessments.
- 4.2.8 In this NPS and the technology specific NPSs, when used in relation to environmental matters the terms 'effects', 'impacts' or 'benefits' should be understood to mean likely significant effects, likely significant impacts, or likely significant benefits.
- 4.2.9 As in any planning case, the relevance or otherwise to the decision making process of the existence (or alleged existence) of alternatives to the proposed development is, in the first instance, a matter of law. This NPS does not contain any general requirement to consider alternatives or to establish whether the proposed project represents the best option from a policy perspective. Although there are specific requirements in relation to compulsory acquisition and HRA sites.

Applicant assessment

- 4.2.10 The applicant must provide information proportionate to the scale of the project, ensuring the information is sufficient to meet the requirements of the EIA Regulations.⁹⁸
- 4.2.11 In some instances, it may not be possible at the time of the application for development consent for all aspects of the proposal to have been settled in precise detail. Where this is the case, the applicant should explain in its application which

⁹⁷ For guidance on the assessment of cumulative effects, see, for example, PINS Advice Note 17 regarding Cumulative Effects Assessment (August 2019) See <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/12/Advice-note-17V4.pdf>

⁹⁸ See <https://www.gov.uk/guidance/environmental-impact-assessment>

elements of the proposal have yet to be finalised, and the reasons why this is the case.

- 4.2.12 Where some details are still to be finalised, the ES should, to the best of the applicant's knowledge, assess the likely worst-case environmental, social and economic effects of the proposed development to ensure that the impacts of the project as it may be constructed have been properly assessed.⁹⁹
- 4.2.13 To help the Secretary of State consider thoroughly the potential effects of a proposed project in cases where the EIA Regulations do not apply and an ES is not therefore required, the applicant should instead provide information proportionate to the scale of the project on the likely significant environmental, social, and economic effects.
- 4.2.14 References to an ES in this NPS and the technology specific NPSs should be taken as including a statement which provides this information, even if the EIA Regulations do not apply and where the NPSs requires specific information to be provided in the ES. Such information should still be provided in this statement.
- 4.2.15 Applicants are obliged to include in their ES, information about the reasonable alternatives they have studied. This should include an indication of the main reasons for the applicant's choice, taking into account the environmental, social and economic effects and including, where relevant, technical and commercial feasibility.
- 4.2.16 In some circumstances, the NPSs may impose a policy requirement to consider alternatives.
- 4.2.17 Where there is a policy or legal requirement to consider alternatives, the applicant should describe the alternatives considered in compliance with these requirements.

Secretary of State decision making

- 4.2.18 The Secretary of State should consider the worst-case impacts in its consideration of the application and consent, providing some flexibility in the consent to account for uncertainties in specific project details.
- 4.2.19 The Secretary of State should consider how the accumulation of, and interrelationship between, effects might affect the environment, economy, or community as a whole, even though they may be acceptable when considered on an individual basis with mitigation measures in place.
- 4.2.20 In addition, in exercising functions in relation to Wales, the Secretary of State should consider Section 6 of the Environment (Wales) Act 2016 and seek to maintain and

⁹⁹ Case law, beginning with *R v Rochdale MBC Ex p. Tew* [2000] Env.L.R.1 establishes that while it is not necessary or possible in every case to specify the precise details of development, the information contained in the ES should be sufficient to fully assess the project's impact on the environment and establish clearly defined worst case parameters for the assessment. This is sometimes known as 'the Rochdale Envelope'.

enhance biodiversity, and in so doing promote the resilience of ecosystems, so far as consistent with the proper exercise of the Secretary of State's functions.

- 4.2.21 Given the level and urgency of need for new energy infrastructure, the Secretary of State should, subject to any relevant legal requirements (e.g. under the Habitats Regulations) which indicate otherwise, be guided by the following principles when deciding what weight should be given to alternatives:
- the consideration of alternatives in order to comply with policy requirements should be carried out in a proportionate manner
 - only alternatives that can meet the objectives of the proposed development need to be considered
- 4.2.22 The Secretary of State should be guided in considering alternative proposals by whether there is a realistic prospect of the alternative delivering the same infrastructure capacity (including energy security, climate change, and other environmental benefits) in the same timescale as the proposed development.
- 4.2.23 The Secretary of State should not refuse an application for development on one site simply because fewer adverse impacts would result from developing similar infrastructure on another suitable site, and it should have regard as appropriate to the possibility that all suitable sites for energy infrastructure of the type proposed may be needed for future proposals.
- 4.2.24 Alternatives not among the main alternatives studied by the applicant (as reflected in the ES) should only be considered to the extent that the Secretary of State thinks they are both important and relevant to the decision.
- 4.2.25 As the Secretary of State must assess an application in accordance with the relevant NPS (subject to the exceptions set out in section 104 of the Planning Act 2008), if the Secretary of State concludes that a decision to grant consent to a hypothetical alternative proposal would not be in accordance with the policies set out in the relevant NPS, the existence of that alternative is unlikely to be important and relevant to the Secretary of State's decision.
- 4.2.26 Alternative proposals which mean the necessary development could not proceed, for example because the alternative proposals are not commercially viable or alternative proposals for sites would not be physically suitable, can be excluded on the grounds that they are not important and relevant to the Secretary of State's decision.
- 4.2.27 Alternative proposals which are vague or inchoate can be excluded on the grounds that they are not important and relevant to the Secretary of State's decision.
- 4.2.28 It is intended that potential alternatives to a proposed development should, wherever possible, be identified before an application is made to the Secretary of State (so as to allow appropriate consultation and the development of a suitable evidence base in relation to any alternatives which are particularly relevant). Therefore, where an

alternative is first put forward by a third party after an application has been made, the Secretary of State may place the onus on the person proposing the alternative to provide the evidence for its suitability as such and the Secretary of State should not necessarily expect the applicant to have assessed it.

- 4.2.29 Through the Environment Act 2021 the Government has set 13 legally binding targets for England covering the areas of: biodiversity; air quality; water; resource efficiency and waste reduction; tree and woodland cover; and Marine Protected Areas. The Secretary of State must consider duties under the Environment Act 2021 in relation to environmental targets and have regard to the policies set out in the Government's Environmental Improvement Plan for improving the natural environment.

4.3 Health

- 4.3.1 Energy infrastructure has the potential to impact on the health and well-being ("health") of the population. Access to energy is clearly beneficial to society and to our health as a whole. However, the construction of energy infrastructure and the production, distribution and use of energy may have negative impacts on some people's health.

- 4.3.2 The direct impacts on health may include

- increased traffic,
- air or water pollution,
- dust, odour,
- hazardous waste and substances,
- noise,
- exposure to radiation, and
- increases in pests.

- 4.3.3 New energy infrastructure may also affect the composition and size of the local population, and in doing so have indirect health impacts, for example if it in some way affects access to key public services, transport, or the use of open space for recreation and physical activity.

Applicant assessment

- 4.3.4 As described in the relevant sections of this NPS and in the technology specific NPSs, where the proposed project has an effect on humans, the ES should assess

these effects for each element of the project, identifying any potential adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate.

- 4.3.5 The impacts of more than one development may affect people simultaneously, so the applicant should consider the cumulative impact on health in the ES where appropriate.
- 4.3.6 Opportunities should be taken to mitigate indirect impacts, by promoting local improvements to encourage health and wellbeing, this includes potential impacts on vulnerable groups within society, i.e. those groups which may be differentially impacted by a development compared to wider society as a whole.

Secretary of State decision making

- 4.3.7 Generally, those aspects of energy infrastructure which are most likely to have a significantly detrimental impact on health are subject to separate regulation (for example for air pollution) which will constitute effective mitigation of them, so that it is unlikely that health concerns will either by themselves constitute a reason to refuse consent or require specific mitigation under the Planning Act 2008.
- 4.3.8 However, not all potential sources of health impacts will be mitigated in this way and the Secretary of State may want to take account of health concerns when setting requirements relating to a range of impacts such as noise.

4.4 Marine Considerations

- 4.4.1 The Marine Policy Statement is the framework for preparing Marine Plans and taking decisions affecting the marine environment, as per section 44 of the Marine and Coastal Access Act 2009. Marine plans apply in the 'marine area', which is the area from mean high water springs to the seaward limit of the Exclusive Economic Zone (EEZ). The 'marine area' also includes the waters of any estuary, river or channel, so far as the tide flows at mean high water spring tide.
- 4.4.2 Marine plans set out marine specific aspects of many of the assessment principles in Part 4 and 5 of this NPS.¹⁰⁰ Individual Marine Plans¹⁰¹ should be consulted to understand marine relevant specific considerations.
- 4.4.3 The cross-government Marine Spatial Prioritisation Programme will review how marine plans and the wider planning regime, legislation and guidance may need to

¹⁰⁰ For example, criteria for 'good design' for energy infrastructure (Section 4.6) and climate change adaptation (Section 4.9). Plan policies cover a wide range of topics in Part 5 of this NPS, including landscape and visual (Section 5.10), noise and vibration (Section 5.12) and water quality (Section 5.16).

¹⁰¹ The Welsh National Marine Plan and/or any applicable English regional marine plans

evolve to ensure a more holistic approach to the use of the seas is taken and to maximise co-location possibilities.

- 4.4.4 In Wales, the Welsh National Marine Plan¹⁰² sets out Welsh Ministers' expectations that nationally significant infrastructure projects contribute to the well-being of Welsh communities and the sustainable management of natural resources and should seek to deliver lasting legacy benefits for the local community, the economy and the environment.
- 4.4.5 Defra are producing guidance to help applicants and regulators understand how to use the mitigation hierarchy for environmental impacts on Marine Protected Areas (MPAs), including strategic approaches.¹⁰³
- 4.4.6 Applications for energy infrastructure that falls outside the scope of the Planning Act 2008 or the Electricity Act 1989 may require a marine licence. A deemed marine licence can also be granted as part of the DCO and is developed in consultation with regulators and statutory advisors. A Marine Licence is primarily concerned with the need to protect the environment and human health and to prevent interference with other legitimate uses of the sea. Marine Licences may be required for the marine elements of proposed developments (up to Mean High Water Springs), including associated development and activity such as cabling, dredging and offshore substations. Further information on marine licencing is provided in section 1.2 and 4.11.11 of this NPS and section 2.3.16 to 2.3.22 of EN-3.
- 4.4.7 Applicants are encouraged to approach the marine licensing regulator (MMO in England and Natural Resources Wales in Wales) in pre-application, to ensure that they are aware of any needs for additional marine licenses alongside their DCO application.

Applicant assessment

- 4.4.8 Applicants for a development consent order must take account of any relevant Marine Plans and are expected to complete a Marine Plan assessment as part of their project development, using this information to support an application for development consent.
- 4.4.9 Applicants are encouraged to refer to Marine Plans at an early stage, such as in pre-application, to inform project planning, for example to avoid less favourable locations as a result of other uses or environmental constraints.

¹⁰² See <https://gov.wales/marine-planning>

¹⁰³ See glossary for mitigation hierarchy definition

Secretary of State decision making

- 4.4.10 Section 104(2)(aa) of the Planning Act 2008 requires the Secretary of State to have regard to any appropriate marine policy documents when making a decision on an application for a development consent order where an NPS has effect.¹⁰⁴ This will include any Marine Plan which is in effect for the relevant area, or areas where the project crosses the boundary between plan areas.
- 4.4.11 In making a decision, the Secretary of State is responsible for determining how the Marine Plan informs the decision-making process. For example, the Secretary of State will determine if and how proposals meet the high-level marine objectives, plan vision, and all relevant policies.
- 4.4.12 In the event of a conflict between an NPS and any marine planning documents, the NPS prevails for purposes of decision making.

4.5 Environmental and Biodiversity Net Gain

- 4.5.1 Environmental net gain is an approach to development that aims to leave the natural environment in a measurably better state than beforehand. Projects should therefore not only mitigate harms, following the mitigation hierarchy, but also consider whether there are opportunities for enhancements.
- 4.5.2 Biodiversity net gain is an essential component of environmental net gain. Projects in England should consider and seek to incorporate improvements in natural capital, ecosystem services and the benefits they deliver when planning how to deliver biodiversity net gain.
- 4.5.3 Currently environmental net gain only applies to terrestrial and intertidal components of projects. Principles for Marine Net Gain are currently in development by Defra who will provide guidance in due course. There are provisions in the Environment Act 2021 to allow marine net gain to be made mandatory in the future.¹⁰⁵

Applicant assessment

- 4.5.4 Energy NSIP proposals, whether onshore or offshore, should seek opportunities to contribute to and enhance the natural environment by providing net gains for biodiversity, or the wider environment where possible.
- 4.5.5 In England applicants for onshore elements of any development are encouraged to use the most current version of the Defra biodiversity metric¹⁰⁶ to calculate their

¹⁰⁴ Where a decision is made under s105 of the Planning Act, section 58(3) of the Marine and Coastal Access Act 2009 will similarly require the Secretary of State to have regard to the marine plan.

¹⁰⁵ See <https://www.legislation.gov.uk/ukpga/2021/30/enacted>

¹⁰⁶ The Biodiversity Metric can be found at <http://publications.naturalengland.org.uk/publication/5850908674228224>

biodiversity baseline and present planned biodiversity net gain outcomes. This calculation data should be presented in full as part of their application.

- 4.5.6 Where possible, this data should be shared with the Local Authority and Natural England for discussion at the pre-application stage as it can help to highlight biodiversity and wider environmental issues which may later cause delays if not addressed.
- 4.5.7 In Wales, applicants should consider the guidance set out in Section 6.4 of Planning Policy Wales and the relevant policies in the Wales National Marine Plan¹⁰⁷.
- 4.5.8 Biodiversity net gain should be applied after compliance with the mitigation hierarchy and does not change or replace existing environmental obligations.
- 4.5.9 Biodiversity net gain can be delivered onsite or wholly or partially off-site. Any off-site delivery of biodiversity net gain should also be set out within the application for development consent.
- 4.5.10 When delivering biodiversity net gain off-site, developments should do this in a manner that best contributes to the achievement of relevant wider strategic outcomes, for example by increasing habitat connectivity or enhancing other ecosystem service outcomes. Reference should be made to relevant national or local plans and strategies, to inform off-site biodiversity net gain delivery. If published, the relevant strategy is the Local Nature Recovery Strategy (LNRS). If an LNRS has not been published, the relevant consenting body or planning authority may specify alternative plans, policies or strategies to use.
- 4.5.11 In addition to delivering biodiversity net gain, developments may also deliver wider environmental gains and benefits to communities relevant to the local area, and to national policy priorities, such as
- reductions in GHG emissions,
 - reduced flood risk,
 - improvements to air or water quality,
 - climate adaptation,
 - landscape enhancement, or
 - increased access to natural greenspace including trees and woodlands.

The scope of potential gains will be dependent on the type, scale, and location of specific projects. Applicants should look for a holistic approach to delivering wider

¹⁰⁷ See <https://gov.wales/welsh-national-marine-plan>

environmental gains and benefits through the use of nature-based solutions and Green Infrastructure.

- 4.5.12 The Environment Act 2021 mandated the preparation of Local Nature Recovery Strategies (LNRSs) across England. They are a new system of spatial strategies for nature recovery and will play a major role in providing detail on the best locations to create, enhance and restore nature and deliver wider environmental benefits. LNRSs will also agree priorities for nature recovery and map the most valuable existing areas for nature. They will be critical in delivering new government targets for species abundance and habitat creation commitments, as well as other pressing environmental outcomes for water and flood risk, carbon and tree planting and woodland creations. LNRSs will also drive the creation of a Nature Recovery Network (NRN), a major commitment in the government's 25 Year Environment Plan.
- 4.5.13 Applications for development consent should be accompanied by a statement demonstrating how opportunities for delivering wider environmental net gains have been considered, and where appropriate, incorporated into proposals as part of good design (including any relevant operational aspects) of the project.
- 4.5.14 Applicants should make use of available guidance and tools for measuring natural capital assets and ecosystem services, such as the Natural Capital Committee's 'How to Do it: natural capital workbook'¹⁰⁸, Defra's guidance on Enabling a Natural Capital Approach (ENCA)¹⁰⁹, and other tools that aim to enable wider benefits for people and nature.¹¹⁰
- 4.5.15 Where environmental net gain considerations have featured as part of the strategic options appraisal process to select a project, applicants should reference that information to supplement the site-specific details.
- 4.5.16 Opportunities for environmental, social, and economic enhancements, protection and mitigation measures are identified in a number of sections in Part 5 of this NPS, which provides guidance on the impacts of new energy infrastructure.

Secretary of State decision making

- 4.5.17 Although achieving biodiversity net gain is not currently an obligation on applicants, Schedule 15 of the Environment Act 2021¹¹¹ contains provisions which, when commenced, mean the Secretary of State may not grant an application for

¹⁰⁸ See <https://www.gov.uk/government/publications/natural-capital-committee-natural-capital-workbook>

¹⁰⁹ See <https://www.gov.uk/guidance/enabling-a-natural-capital-approach-enca>

¹¹⁰ For instance, Natural England is developing the Environmental Benefits from Nature tool, which is designed to work alongside Biodiversity metric 3.0 to provide developers, planners and other interested parties with a means of enabling wider benefits for people and nature from biodiversity net gain. This tool can be applied to locations in England and Wales, but some datasets may have limited coverage outside of England.

¹¹¹ See <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>

Development Consent Order unless satisfied that a biodiversity gain objective is met in relation to the onshore¹¹² development in England to which the application relates.

4.5.18 The biodiversity gain objective will be set out in a biodiversity gain statement (as defined under the Environment Act 2021). 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, as is the case with these energy NPSs.

4.5.19 Under the provision of the Environment Act 2021, any such separate biodiversity statement will be regarded as contained within these NPSs. The Act also contains the power to extend this requirement to offshore development.

4.6 Criteria for “Good Design” for Energy Infrastructure

4.6.1 The visual appearance of a building, structure, or piece of infrastructure, and how it relates to the landscape it sits within, is sometimes considered to be the most important factor in good design. But high quality and inclusive design goes far beyond aesthetic considerations. The functionality of an object - be it a building or other type of infrastructure - including fitness for purpose and sustainability, is equally important.

4.6.2 Applying “good design” to energy projects should produce sustainable infrastructure sensitive to place, including impacts on heritage, efficient in the use of natural resources, including land-use, and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible. It is acknowledged, however that the nature of energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of the area.

4.6.3 Good design is also a means by which many policy objectives in the NPS can be met, for example the impact sections show how good design, in terms of siting and use of appropriate technologies, can help mitigate adverse impacts such as noise.

4.6.4 Given the benefits of “good design” in mitigating the adverse impacts of a project, applicants should consider how “good design” can be applied to a project during the early stages of the project lifecycle.

Applicant assessment

4.6.5 To ensure good design is embedded within the project development, a project board level design champion could be appointed, and a representative design panel used

¹¹² The Environment Act 2021 also allows for an extension to offshore development in the future.

to maximise the value provided by the infrastructure. Design principles¹¹³ should be established from the outset of the project to guide the development from conception to operation.

- 4.6.6 Whilst the applicant may not have any or very limited choice in the physical appearance of some energy infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, land form and vegetation. Furthermore, the design and sensitive use of materials in any associated development such as electricity substations will assist in ensuring that such development contributes to the quality of the area. Applicants should also, so far as is possible, seek to embed opportunities for nature inclusive design within the design process.
- 4.6.7 Applicants must demonstrate in their application documents how the design process was conducted and how the proposed design evolved. Where a number of different designs were considered, applicants should set out the reasons why the favoured choice has been selected.
- 4.6.8 Applicants should consider taking independent professional advice on the design aspects of a proposal. In particular, the Design Council can be asked to provide design review for nationally significant infrastructure projects and applicants are encouraged to use this service.¹¹⁴ Applicants should also consider any design guidance developed by the local planning authority.
- 4.6.9 Further advice on what applicants should demonstrate by way of good design is provided in the technology specific NPSs where relevant.

Secretary of State decision making

- 4.6.10 In the light of the above and given the importance which the Planning Act 2008 places on good design and sustainability, the Secretary of State needs to be satisfied that energy infrastructure developments are sustainable and, having regard to regulatory and other constraints, are as attractive, durable, and adaptable (including taking account of natural hazards such as flooding) as they can be.
- 4.6.11 In doing so, the Secretary of State should be satisfied that the applicant has considered both functionality (including fitness for purpose and sustainability) and aesthetics (including its contribution to the quality of the area in which it would be

¹¹³ Design principles should take into account any national guidance on infrastructure design, this could include for example the Design Principles for National Infrastructure published by the National Infrastructure Commission, the National Design Guide and National Model Design Code, as well as any local design policies and standards. See <https://nic.org.uk/studies-reports/design-principles-for-national-infrastructure>; See <https://www.gov.uk/government/publications/national-design-guide>; and See <https://www.gov.uk/government/publications/national-model-design-code>

¹¹⁴ The Chief Planner's 2011 Letter about design and planning can be found here: See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/8009/110520-Letter_to_Chief_Planning_Officers-_Design_and_Planning.pdf Further information on the Design Council can be found here: See <https://www.designcouncil.org.uk/>

located, any potential amenity benefits, and visual impacts on the landscape or seascape) as far as possible.

- 4.6.12 In considering applications, the Secretary of State should take into account the ultimate purpose of the infrastructure and bear in mind the operational, safety and security requirements which the design has to satisfy. Many of the wider impacts of a development, such as landscape and environmental impacts, will be important factors in the design process.
- 4.6.13 The Secretary of State should consider such impacts under the relevant policies in this NPS. Assessment of impacts must be for the stated design life of the scheme rather than a shorter time period.
- 4.6.14 The Secretary of State should consider taking independent professional advice on the design aspects of a proposal. In particular, the Design Council can be asked to provide design review for nationally significant infrastructure projects.¹¹⁵
- 4.6.15 Further advice on what the Secretary of State should expect applicants to demonstrate by way of good design is provided in the technology specific NPSs where relevant.

4.7 Consideration of Combined Heat and Power (CHP)

- 4.7.1 Combined Heat and Power (CHP) is the generation of usable heat and electricity in a single process. A CHP station may either supply steam direct to customers or capture waste heat for low-pressure steam, hot water, or space heating purposes after it has been used to drive electricity generating turbines. The heat can also be used to drive absorption chillers, thereby providing cooling.
- 4.7.2 In conventional thermal generating stations, the heat that is raised to drive electricity generation is subsequently emitted to the environment as waste. Supplying steam direct to industrial customers or using lower grade heat, such as in district heating networks, can reduce the amount of fuel otherwise needed to generate the same amount of heat and power separately.
- 4.7.3 CHP is technically feasible for many types of thermal generating stations, including nuclear, EfW, BECCS and hydrogen, although the majority of CHP plants in the UK are fuelled by gas.
- 4.7.4 Using less fuel to generate the same amount of heat and power, reduces emissions, particularly CO₂. The government has therefore committed to promoting Good

¹¹⁵ The Chief Planner's 2011 Letter about design and planning can be found here: See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/8009/110520-Letter_to_Chief_Planning_Officers-Design_and_Planning.pdf Further information on the Design Council can be found here: See <https://www.designcouncil.org.uk/>

Quality CHP, which denotes CHP that has been certified as highly efficient under the CHP Quality Assurance programme.¹¹⁶ Schemes need to achieve a specified quality index and power efficiency in order to qualify for government support associated with the programme.

- 4.7.5 In 2020, there was 6.1GW of Good Quality CHP¹¹⁷ in the UK, providing 7.7 per cent of electricity¹¹⁸ and saving an estimated 9.66 Megatonnes CO₂ per annum¹¹⁹. There is a recognised cost-effective potential for Good Quality CHP to continue to provide benefits due to efficiencies inherent in cogeneration.
- 4.7.6 To be economically viable as a CHP plant, a generating station needs to be located sufficiently close to industrial, non-domestic or domestic customers with heat demands. The distance will vary according to the size and type of the generating station and the nature of the heat demand.
- 4.7.7 For industrial purposes, customers are likely to be intensive heat users such as chemical plants, refineries, or paper mills. CHP can also be used to provide lower grade heat for light industrial users such as commercial greenhouses, or more commonly for hot water and space heating, including supply through district heating networks.

Applicant assessment

- 4.7.8 Guidance issued by the then Department for Trade and Industry (DTI) in 2006,¹²⁰ will apply to any application to develop a thermal generating station under the Planning Act 2008. Applications for thermal stations must either include CHP proposals or contain evidence demonstrating that the possibilities for CHP have been fully explored to inform the Secretary of State's consideration of the application.
- 4.7.9 In developing proposals for new thermal generating stations, applicants should consider both the current and future opportunities for CHP from the start, and it should be adopted as a criterion when considering locations for a project.
- 4.7.10 Given how important liaison with potential customers for heat is, applicants should not only consult those potential customers they have identified themselves but also bodies such as Local Enterprise Partnerships (LEPs) and Local Authorities, obtaining

¹¹⁶ See <https://www.gov.uk/guidance/combined-heat-power-quality-assurance-programme>

¹¹⁷ Such ratings are achieved by examining data for fuel used, power generated, heat supplied, and hours run. To be confirmed as Good Quality CHP: Existing systems must achieve a QI of 100, and a power efficiency of 20%. New systems must achieve a QI of 105.

¹¹⁸ Good quality CHP capacity and total generation from CHP: from table 5.15 of Digest of United Kingdom Energy Statistics (DUKES) 2021: Combined Heat and Power (CHP) generation and capacity overview, available at. Total electricity generated: from table 5.6 of Digest of United Kingdom Energy Statistics (DUKES) 2021: Electricity fuel use, generation and supply, available at.

¹¹⁹ From table 7.11 of Digest of United Kingdom Energy Statistics (DUKES) 2021: CHP - savings of carbon dioxide emissions, available at.

¹²⁰ Guidance on background information to accompany notifications under Section 14(1) of the Energy Act 1976 and applications under Section 36 of the Electricity Act 1989.

their advice on opportunities. Further advice is contained in the 2006 DTI guidance¹²¹ and applicants should also consider relevant information in regional and local energy planning and heat demand mapping.

- 4.7.11 Where the applicant is not be able to reach an agreement with a potential customer, they should provide evidence demonstrating the reasons for this, and why it will not be reasonably possible to reach an agreement during the lifetime of the thermal station.
- 4.7.12 Utilisation of useful heat that displaces conventional heat generation from fossil fuel sources is to be encouraged and substantial weight will be given to applications incorporating CHP. If an applicant is putting forward a proposal for thermal generation without CHP they should:
- Explain why CHP is not economically or practically feasible;
 - provide details of any potential future heat requirements in the area that have been considered and the reasons the station could not meet them;
 - detail the provisions in the proposed scheme for ensuring any potential heat demand in the future can be exploited; and
 - provide an audit trail of dialogue between the applicant, prospective customers, the local area energy teams in local government and district heating energy supply companies.
- 4.7.13 CHP may require additional space than for a non-CHP generating station. It is possible that this might conflict with space required for a generating station to be CCR, as set out in Section 4.8. The material provided by applicants should therefore explain how the development can both be ready to provide CHP in the future, and also be CCR, or set out any constraints (for example space restrictions) which would prevent this.

Secretary of State decision making

- 4.7.14 Guidance issued by the then DTI in 2006,¹²² will apply to any application to develop a thermal generating station under the Planning Act 2008. The Secretary of State should have regard to the 2006 guidance, or any successor to it, when considering the CHP aspects of applications for thermal generating stations.
- 4.7.15 Given the importance which government attaches to CHP, if an application does not demonstrate that CHP has been adequately considered the Examining Authority should seek further information from the applicant.

¹²¹ Guidance on background information to accompany notifications under Section 14(1) of the Energy Act 1976 and applications under Section 36 of the Electricity Act 1989.

¹²² Guidance on background information to accompany notifications under Section 14(1) of the Energy Act 1976 and applications under Section 36 of the Electricity Act 1989.

- 4.7.16 The Secretary of State should not give development consent unless satisfied that the applicant has provided appropriate evidence that CHP is included or that the opportunities for CHP have been fully explored.
- 4.7.17 If the Secretary of State (or the Examining Authority during the examination stage) is not satisfied with the evidence that has been provided, the Secretary of State (or the Examining Authority during the examination stage) may wish to investigate this with one or more of the bodies such as LEPs and Local Authorities.
- 4.7.18 Furthermore, if the Secretary of State (or the Examining Authority during the examination stage), when considering an application for a thermal generating station, identifies a potential heat customer that is not explored in the application (for instance, on the advice of the Local Authorities), the Secretary of State (or the Examining Authority during the examination stage) should request that the applicant pursues this.
- 4.7.19 The Secretary of State may also be aware of potential developments (for example from the applicant or a third party) which could utilise heat from the plant in the future, for example planned housing, and which is due to be built within a timeframe that would make the supply of heat cost-effective. Where it may be reasonably possible for the applicant to reach agreement with a potential heat customer during the lifetime of the station, the Secretary of State may wish to impose requirements to ensure that the generating station is CHP-ready and designed in order to allow heat supply at a later date.
- 4.7.20 If satisfied that the applicant has demonstrated that the need to comply with the requirement to be CCR will preclude any provision for CHP, the Secretary of State will not impose requirements to ensure that the generating station is CHP-ready.

4.8 Carbon Capture and Storage (CCS)

- 4.8.1 CCS is a technology that enables carbon dioxide that would otherwise be released to the atmosphere to be captured and permanently stored. It can be applied to any large point source of carbon dioxide, such as thermal generating power stations or other industrial processes that are high emitters.
- 4.8.2 Examples of three types of capture technology are:
- Pre-combustion capture: this method involves reacting fuel with oxygen or air, and in some cases steam, to produce a gas consisting mainly of carbon monoxide and hydrogen. The carbon monoxide is reacted with more steam in a catalytic shift converter to produce more hydrogen and CO₂. The CO₂ is then separated, and the hydrogen is used as fuel in a combined cycle gas turbine generating station.

- Post-combustion capture: this uses solvents or other methods to scrub CO₂ out of flue gases. The CO₂ is then released as a concentrated gas stream by a regeneration process.
 - Oxy-fuel combustion: in this process, fuel is burnt in an oxygen/CO₂ mixture rather than air to produce a flue gas that is predominantly CO₂. For gas-fired plants the technology could be used with a combined cycle system. Other oxy-fuel combustion power CCS plants are being developed using novel non-combined cycle systems.
- 4.8.3 Carbon capture rates achieved will depend on the application and a minimum capture rate may be required.
- 4.8.4 Carbon capture technologies offer the opportunity to decarbonise the electricity system whilst maintaining security of supply, providing reliable low carbon generation capacity.
- 4.8.5 The government has made its ambitions for CCS clear - committing to providing funding to support the establishment of CCS in at least four industrial clusters by 2030 and supporting, using consumer subsidies, at least one privately financed gas CCS power station in the mid-2020s.¹²³ In October 2021, the government published its Net Zero Strategy¹²⁴ which reaffirmed the importance of deploying CCUS to reaching our 2050 net zero target and also outlines our ambition to capture 20-30Mt of CO₂ per year by 2030.
- 4.8.6 The barriers to CCS deployment to date have been commercial rather than technical, and the business models, which may evolve over time, aim to support the deployment of the technology.
- 4.8.7 Part 3 of this NPS sets out the need for CCS and the role power CCS could play in our electricity system in more detail.
- 4.8.8 Gas-fired power CCS stations may still emit residual CO₂ and so will be required to comply with any Emissions Performance Standards (EPS) that might be applicable, but this is not part of the development consent process.
- 4.8.9 To ensure that no foreseeable barriers exist to retrofitting CCS equipment on combustion generating stations, all applications for new combustion plant which are of generating capacity at or over 300MW and of a type covered by The Carbon Capture Readiness (Electricity Generating Stations) Regulations 2013¹²⁵ should demonstrate that the plant is “Carbon Capture Ready” (CCR) before consent may be given.

¹²³ See <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution>

¹²⁴ See <https://www.gov.uk/government/publications/net-zero-strategy>

¹²⁵ See <https://www.legislation.gov.uk/uksi/2013/2696/made>

- 4.8.10 In the Energy White Paper¹²⁶, published in December 2020, government committed to consult on an expansion to CCR requirements. As part of this expansion, we intend to rename Carbon Capture Readiness to Decarbonisation Readiness.
- 4.8.11 A call for evidence¹²⁷ was held in Summer 2021 to gather initial views and evidence. A consultation is due to be held early in 2023.
- 4.8.12 If, as expected, that consultation leads to changes in the relevant legal or policy framework then those new requirements will apply and supersede the existing CCR requirements. In the meantime, CCR policy remains as set out in the section above.

Applicant assessment

- 4.8.13 The carbon capture plant required for a new build power CCS plant can be included as associated development¹²⁸ in the application for development consent for the relevant thermal generating station and will then be considered as part of that application.
- 4.8.14 The environmental impacts of a gas-fired power CCS station should be similar to an unabated gas-fired power station, and so the assessment principles for the generating station covered in EN-2 should be similarly applied.
- 4.8.15 As set out in Section 2.4 of EN-2, the main structures of thermal generating stations could be large, and so may have landscape and visual impacts. Carbon capture facilities could also be significant in size - they may require additional space to the generating facility which will need to be included within the design and EIA. For example, the main direct contact cooler, CO₂ absorber column and regenerator towers in post-combustion plants can be tall, but the overall size will be dependent on the technology and design.
- 4.8.16 As set out in Section 2.4 of EN-2, there will be noise and vibration impacts associated with the generating station. The carbon capture plant will also have noise and vibration impacts. Applications for development consent for generating stations with CCS should provide evidence that shows:
- (a) technically feasible plans for the CO₂ capture plant; and
 - (b) an ES that addresses impacts arising from the project and documentation to ensure compliance with all other existing policy, including that any of the plant's capacity which is not to be fitted with carbon capture at the outset meets the requirements for Carbon Capture Readiness (CCR).

¹²⁶ See <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

¹²⁷ See <https://www.gov.uk/government/consultations/decarbonisation-readiness-call-for-evidence-on-the-expansion-of-the-2009-carbon-capture-readiness-requirements>

¹²⁸ It is for the Secretary of State to decide on a case-by-case basis whether or not development should be treated as associated development.

- 4.8.17 An Environmental Permit (EP) will also be required from the Environment Agency (EA) or Natural Resources Wales (NRW) which incorporates conditions for operation of the carbon capture and storage installation.
- 4.8.18 There are several different capture techniques which might have slightly different environmental impacts and considerations, which should be set out in the application. For example, some capture technologies may require hazardous substances consent for solvents required during the capture process, such as nitrosamines, and fall under Control of Major Accident Hazards (COMAH)¹²⁹ solvents such as nitrosamines. Best Available Techniques (BAT) guidance,¹³⁰ assessment tool Horizontal 1¹³¹ and Environmental Assessment Levels¹³² should be used when understanding impacts from capture solvents such as nitrosamines.
- 4.8.19 Another example is the use of amine-based solvents in some types of post-combustion carbon capture which can create degradation products with potential impacts on air quality. The ES should reflect the latest research in areas such as amine degradation where understanding is still developing.
- 4.8.20 The chain of CCS has three links: capture of carbon, transport, and storage. Due to the approach of deploying CCS in clusters in the UK with shared transport and storage infrastructure, it is likely that development consent applications for power CCS projects may not include an application for consent for the full CCS chain (including the onward transportation and storage of CO₂).
- 4.8.21 However, development consent applications for power CCS projects should include details of how the captured CO₂ is intended to be transported and stored, how cumulative impacts will be assessed and whether any necessary consents, permits and licences have been obtained.
- 4.8.22 Applicants gaining consent for CCS infrastructure will need a range of consents from different bodies. One method for transporting captured carbon dioxide is through pipelines. These will be located both onshore and offshore. Onshore pipelines over 16.093 kilometres in length classify as NSIPs and require a development consent order. There are currently no cross-country carbon dioxide pipelines in the UK and considerable investment in pipelines will be required for the wider deployment of CCS. This initial investment could form the basis of more extensive carbon dioxide pipeline networks, which are likely to require greater capacity pipelines.
- 4.8.23 Applicants are expected to take into account foreseeable future demand when considering the size and route of their investments. Applicants may therefore

¹²⁹ See <https://www.hse.gov.uk/comah/>

¹³⁰ Post-combustion carbon dioxide capture: best available techniques (BAT), 2021. See <https://www.gov.uk/guidance/post-combustion-carbon-dioxide-capture-best-available-techniques-bat>

¹³¹ See <https://www.gov.uk/government/collections/risk-assessments-for-specific-activities-environmental-permits>

¹³² See <https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#environmental-standards-for-air-emissions>

propose pipelines with a greater capacity than demand at the time of consenting might suggest. Existing legislation (The Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999¹³³) already provides powers to require modification of pipelines where this would reduce the need for additional pipelines to be constructed in the future.

- 4.8.24 Another method for transporting carbon dioxide is by ship. Ports would enable the transfer of carbon dioxide from onshore infrastructure onto ships. Ports and associated infrastructure that process at least 5Mt of material (including CO₂) per year would qualify as NSIP Projects and require a development consent order from the Department for Transport. Such applications would be considered under the National Policy Statement for Ports¹³⁴, but the need for CCS infrastructure set out in this NPS is likely to be a relevant consideration. Port development falling outside of NSIP Projects would likely require a marine licence (see para 4.4.6) and local planning consent.
- 4.8.25 CO₂ can be permanently stored in deep geological formations, such as depleted oil and gas fields and saline aquifers. In the UK, the majority of locations thought to be best suited to storage of CO₂ are located offshore. The UK has an estimated offshore CO₂ storage capacity of 78Gt/CO₂¹³⁵ enough to store the equivalent of current total UK annual emissions for over 200 years.
- 4.8.26 The development of an offshore CO₂ storage industry will play a key role in helping to ensure the transition to a net zero economy. Establishing an offshore storage industry could also make the UK a global leader in storage services as countries eager to meet emissions targets pursue carbon capture. Efficiently maximising our offshore CO₂ storage capacity offers the best opportunity to realise our ambitions for CO₂ storage as set out in the Ten Point Plan.¹³⁶ Government do not currently envisage an onshore CO₂ storage industry developing against this backdrop.
- 4.8.27 Offshore CO₂ transport and storage infrastructure is not covered by this NPS, is subject to a separate permitting and licensing regime, and will require an applicant to secure a Carbon Dioxide Appraisal and Storage Licence and a Storage Permit; a Carbon Storage Lease and a Seabed Lease; offshore pipelines require a Pipeline Works Authorisation and notification in accordance with Pipelines Safety Regulations. Offshore CO₂ transport and storage proposals will need to be supported by an EIA. A suite of environmental approvals will also be required for the construction, development, and the operational phase.
- 4.8.28 In order to assure the Secretary of State that a proposed development is CCR, applicants must demonstrate that their proposal complies with guidance issued by

¹³³ See <https://www.legislation.gov.uk/ukxi/1999/360/contents/made>

¹³⁴ See <https://www.gov.uk/government/publications/national-policy-statement-for-ports>

¹³⁵ Energy Technologies Institute: Taking stock of UK CO₂ storage (2017): See <https://www.eti.co.uk/insights/taking-stock-of-UK-CO2-storage>

¹³⁶ See <https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution>

the Secretary of State in November 2009¹³⁷ or any successor to it. The guidance requires:

- that sufficient space is available on or near the site to accommodate carbon capture equipment in the future;
- the technical feasibility of retrofitting their chosen carbon capture technology;
- that a suitable area of deep geological storage offshore exists for the storage of captured CO₂ from the proposed combustion station;
- the technical feasibility of transporting the captured CO₂ to the proposed storage area; and
- the economic feasibility within the combustion station's lifetime of the full CCS chain, covering retrofitting, transport and storage.

4.8.29 Government envisages that the technical feasibility study for retrofitting CCS equipment will take the form of a written report and accompanying plant designs which:

- make clear which capture technology is currently considered most appropriate for retrofit in the future to the power station
- provide sufficient detail to enable the EA or NRW to advise the Secretary of State on whether the applicant has sufficiently demonstrated there are no currently known technical barriers to subsequent retrofit of the declared capture technology.

4.8.30 The assessment of technological feasibility could be against either:

- an appropriate reference document; or
- by the provision of sufficient technical detail by the applicant in their submitted plans and discussions with the advisory body.

4.8.31 Applicants should conduct a single economic assessment which encompasses retrofitting of capture equipment, CO₂ transport and the storage of CO₂. Applicants should provide evidence of reasonable scenarios, taking into account the cost of the capture technology and transport option chosen for the technical CCR assessments and the estimated costs of CO₂ storage, which make operational CCS economically feasible for the proposed development.

4.8.32 The preparation of an economic assessment will involve a wide range of assumptions on each of a number of factors, and government recognises the inherent uncertainties about each of these factors. There can be no guarantee that an assessment which is carried out now will predict with complete accuracy either in what circumstances it will be feasible to fit CCS to a proposed power station or when those circumstances will arise, but it can indicate the circumstances which would

¹³⁷ Carbon Capture Readiness. A guidance note for Section 36 Applications: See <https://www.gov.uk/government/publications/carbon-capture-readiness-ccr-a-guide-on-consent-applications>

need to be the case to allow operational CCS to be economically feasible during the lifetime of the proposed new station.

4.8.33 A model assessment structure is suggested in CCR guidance¹³⁸, although this is not the only way which the assessment could be addressed. Applicants must justify the capture, transport and storage options chosen for their proposed development.

4.8.34 If granted consent, operators of the power station will be required to:

- retain control over sufficient additional space on or near the site on which to install the carbon capture equipment and the ability to use it for that purpose.
- submit update reports on the technical aspects of its CCR status to the Secretary of State for DESNZ. These reports will be required within three months of the commercial operation date of the power station (so avoiding any burden on the operator with an unimplemented consent) and every two years thereafter. Should CCS equipment be retrofitted to the full capacity of the plant, the obligation to provide such reports will lapse.

Secretary of State decision making

4.8.35 CCS infrastructure will need a range of consents from different bodies. The Secretary of State should have regard to advice from these bodies and consider specifically advice from the EA or NRW as to the technical feasibility of the proposed carbon capture technology.

4.8.36 A number of considerations relevant for gas-fired power CCS stations should be similar to an unabated gas-fired power station. The Secretary of State should apply the assessment principles for the generating station covered in EN-2.

4.8.37 In considering CCR the Secretary of State should consult the EA or NRW on the applicants technical and economic feasibility assessments.

4.8.38 The Secretary of State should also have regard to advice from the EA or NRW as to the suitability of the space set aside on or near the site for CCS equipment.

4.8.39 If the Secretary of State, having considered these assessments and other available information including comments by EA or NRW, concludes that it will not be technically and economically feasible to retrofit CCS to a proposed plant during its expected lifetime, then the proposed development cannot be judged to be CCR and therefore cannot receive consent.

¹³⁸ Carbon Capture Readiness. A guidance note for Section 36 Applications: See <https://www.gov.uk/government/publications/carbon-capture-readiness-ccr-a-guide-on-consent-applications>

4.9 Climate Change Adaptation

- 4.9.1 Climate change mitigation is essential to minimise the most dangerous impacts of climate change, however previous global GHG emissions have already committed us to some degree of continued climate change. If new energy infrastructure is not sufficiently resilient against the possible impacts of climate change, it will not be able to satisfy the energy needs as outlined in Part 3 of this NPS.
- 4.9.2 Climate change is already altering the UK's weather patterns and this will continue to accelerate depending on global carbon emissions. This means it is likely there will be more extreme weather events, such as heavy rainfall and very hot days which will be more intense and more frequent. As well as climatic and seasonal changes such as hotter, drier summers and warmer, wetter winters, there is also a likelihood of increased flooding, drought, heatwaves, and intense rainfall events, as well as rising sea levels, increased storms and coastal change. Adaptation is therefore necessary to deal with the potential impacts of these changes that are already happening.
- 4.9.3 To support planning decisions, the government produces a set of UK Climate Projections¹³⁹ and has developed a statutory National Adaptation Programme¹⁴⁰. In addition, the government's Adaptation Reporting Power¹⁴¹ will ensure that reporting authorities (a defined list of public bodies and statutory undertakers, including energy utilities) assess the risks to their organisation presented by climate change.
- 4.9.4 The generic impacts advice in this NPS and the technology specific advice on impacts in the other energy NPSs provide additional information on climate change adaptation and should be read alongside this section. Section 5.6 on coastal change and Section 5.8 on flood risk in particular provide relevant guidance for consideration.

Applicant assessment

- 4.9.5 In certain circumstances, measures implemented to ensure a scheme can adapt to climate change may give rise to additional impacts, for example as a result of protecting against flood risk, there may be consequential impacts on coastal change (see Section 5.6). In preparing measures to support climate change adaptation applicants should take reasonable steps to maximise the use of nature-based solutions alongside other conventional techniques.
- 4.9.6 Integrated approaches, such as looking across the water cycle, considering coordinated management of water storage, supply, demand, wastewater, and flood

¹³⁹ The UKCP18 key results can be found here: See <https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/key-results>

¹⁴⁰ s.58 of the Climate Change Act 2008.

¹⁴¹ s.62 of the Climate Change Act 2008; See <https://www.gov.uk/government/publications/climate-change-second-national-adaptation-programme-2018-to-2023>

risk can provide further benefits to address multiple infrastructure needs, as well as carbon sequestration benefits.

- 4.9.7 In addition to avoiding further GHG emissions when compared with more traditional adaptation approaches, nature-based solutions can also result in biodiversity benefits and net gain, as well as increasing absorption of carbon dioxide from the atmosphere (see also Section 5.11 on the role of green infrastructure and Section 4.5 on environmental and biodiversity net gain).
- 4.9.8 New energy infrastructure will typically be a long-term investment and will need to remain operational over many decades, in the face of a changing climate. Consequently, applicants must consider the direct (e.g. site flooding, limited water availability, storms, heatwave and wildfire threats to infrastructure and operations) and indirect (e.g. access roads or other critical dependencies impacted by flooding, storms, heatwaves or wildfires) impacts of climate change when planning the location, design, build, operation and, where appropriate, decommissioning of new energy infrastructure.
- 4.9.9 The ES should set out how the proposal will take account of the projected impacts of climate change, using government guidance and industry standard benchmarks such as the Climate Change Allowances for Flood Risk Assessments,¹⁴² Climate Impacts Tool,¹⁴³ and British Standards for climate change adaptation,¹⁴⁴ in accordance with the EIA Regulations. This information will be needed by the Secretary of State.
- 4.9.10 Applicants should assess the impacts on and from their proposed energy project across a range of climate change scenarios, in line with appropriate expert advice and guidance available at the time.
- 4.9.11 Applicants should demonstrate that proposals have a high level of climate resilience built-in from the outset and should also demonstrate how proposals can be adapted over their predicted lifetimes to remain resilient to a credible maximum climate change scenario. These results should be considered alongside relevant research which is based on the climate change projections.
- 4.9.12 Where energy infrastructure has safety critical elements (for example parts of new gas-fired power stations or some electricity sub-stations), the applicant should apply a credible maximum climate change scenario. It is appropriate to take a risk-averse approach with elements of infrastructure which are critical to the safety of its operation.

¹⁴² See <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> or See <https://gov.wales/climate-change-allowances-and-flood-consequence-assessments-cl-03-16>

¹⁴³ See <https://www.gov.uk/government/publications/climate-impacts-tool>

¹⁴⁴ See <https://www.iso.org/standard/68507.html>

Secretary of State decision making

- 4.9.13 The Secretary of State should be satisfied that applicants for new energy infrastructure have taken into account the potential impacts of climate change using the latest UK Climate Projections¹⁴⁵ and associated research and expert guidance (such as the EA's Climate Change Allowances for Flood Risk Assessments¹⁴⁶ or the Welsh Government's Climate change allowances and flood consequence assessments¹⁴⁷) available at the time the ES was prepared to ensure they have identified appropriate mitigation or adaptation measures. This should cover the estimated lifetime of the new infrastructure, including any decommissioning period.
- 4.9.14 Should a new set of UK Climate Projections or associated research become available after the preparation of the ES, the Secretary of State (or the Examining Authority during the examination stage) should consider whether they need to request further information from the applicant.
- 4.9.15 The Secretary of State should be satisfied that there are not features of the design of new energy infrastructure critical to its operation which may be seriously affected by more radical changes to the climate beyond that projected in the latest set of UK climate projections, taking account of the latest credible scientific evidence on, for example, sea level rise (for example by referring to additional maximum credible scenarios – i.e. from the Intergovernmental Panel on Climate Change or EA) and that necessary action can be taken to ensure the operation of the infrastructure over its estimated lifetime.
- 4.9.16 If any adaptation measures give rise to consequential impacts (for example on flooding, water resources or coastal change) the Secretary of State should consider the impact of the latter in relation to the application as a whole and the impacts guidance set out in Part 5 of this NPS.
- 4.9.17 Any adaptation measures should be based on the latest set of UK Climate Projections¹⁴⁸, the government's latest UK Climate Change Risk Assessment¹⁴⁹, when available¹⁵⁰ and in consultation with the EA's Climate Change Allowances for Flood Risk Assessments¹⁵¹ or the Welsh Government's Climate change allowances and flood consequence assessments¹⁵².

¹⁴⁵ See <https://www.metoffice.gov.uk/research/approach/collaboration/ukcp>

¹⁴⁶ See https://consult.environment-agency.gov.uk/engagement/bostonbarriertwao/results/appendix-9---flood-risk-assessments-climate-change-allowances_20170203.pdf

¹⁴⁷ See <https://gov.wales/climate-change-allowances-and-flood-consequence-assessments>

¹⁴⁸ See <https://www.metoffice.gov.uk/research/approach/collaboration/ukcp>

¹⁴⁹ See <https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-2022>

¹⁵⁰ s.56 of the Climate Change Act 2008.

¹⁵¹ See https://consult.environment-agency.gov.uk/engagement/bostonbarriertwao/results/appendix-9---flood-risk-assessments-climate-change-allowances_20170203.pdf

¹⁵² See <https://gov.wales/climate-change-allowances-and-flood-consequence-assessments>

- 4.9.18 The Secretary of State may take into account energy utilities' reports to the Secretary of State when considering adaptation measures proposed by an applicant for new energy infrastructure.
- 4.9.19 Adaptation measures should be required to be implemented at the time of construction where necessary and appropriate to do so. However, where they are necessary to deal with the impact of climate change, and that measure would have an adverse effect on other aspects of the project and/or surrounding environment (for example coastal processes), the Secretary of State may consider requiring the applicant to ensure that the adaptation measure could be implemented should the need arise, rather than at the outset of the development (for example increasing height of existing, or requiring new, sea walls).

4.10 Network Connection

- 4.10.1 The connection of a proposed electricity generation plant to the electricity network is an important consideration for applicants wanting to construct or extend generation plant.
- 4.10.2 In the market system and in the past, it has been for the applicant to ensure that there will be necessary infrastructure and capacity within an existing or planned transmission or distribution network to accommodate the electricity generated.
- 4.10.3 To support the achievement of the transition to net zero, government is accelerating the co-ordination of the development of the grid network to facilitate the UK's net zero energy generation development and transmission.
- 4.10.4 Transmission network infrastructure and related network reinforcement associated with nationally significant new offshore wind is considered as CNP Infrastructure. Further guidance can be found in 2.8.8 of EN-3 and 2.12.7 of EN-5.

Applicant assessment

- 4.10.5 The applicant must liaise with National Grid who own and manage the transmission network in England and Wales or the relevant regional DNO or TSO to secure a grid connection.
- 4.10.6 Applicants may wish to take a commercial risk where they have not received or accepted a formal offer of a grid connection from the relevant network operator at the time of the application.¹⁵³ In this situation applicants should provide information as part of their application confirming that there is no obvious reason why a network connection would not be possible.

¹⁵³ Although it is likely to have applied for one and discussed it with them.

- 4.10.7 The Planning Act 2008 aims to create a holistic planning regime so that the cumulative effect of different elements of the same project can be considered together. Co-ordinated applications typically bring economic efficiencies and reduced environmental impact. The government therefore envisages that wherever reasonably possible, applications for new generating stations and related infrastructure should be contained in a single application to the Secretary of State or in separate applications submitted in tandem which have been prepared in an integrated way, as outlined in EN-5. This is particularly encouraged to ensure development of more co-ordinated transmission overall.
- 4.10.8 On some occasions it may not be possible to coordinate applications. For example, different elements of a project may have different lead-in times and be undertaken by different legal entities subject to different commercial and regulatory frameworks (for example grid companies operate within OFGEM controls) making it inefficient from a delivery perspective to submit one application. Applicants may therefore decide to submit separate applications for each element. Where this is the case, the applicant should include information on the other elements¹⁵⁴ and explain the reasons for the separate application confirming that there are no obvious reasons for why other elements are likely to be refused.
- 4.10.9 If this option is pursued, the applicant accepts the implicit risks involved in doing so and must ensure they provide sufficient information to comply with the EIA Regulations including the indirect, secondary, and cumulative effects, which will encompass information on grid connections.
- 4.10.10 It is recognised that this may be the situation for some new offshore transmission projects, where applications for consent may be brought forward separate to (though planned with) the applications for associated wind farms¹⁵⁵ as outlined in EN-5.

Secretary of State decision making

- 4.10.11 The Secretary of State should consider guidance contained within EN-5.
- 4.10.12 The Secretary of State should be satisfied that appropriate network connection arrangements are/will be in place for a given project regardless of whether one or multiple (linked) applications are submitted.
- 4.10.13 Where the Secretary of State has decided to grant consent for one project this should not in any way fetter the Secretary of State's ability to take subsequent decisions on any related projects.

¹⁵⁴ It is acknowledged that different levels of information may be available at different times and as such applicants should take a proportionate approach to what information should be included.

¹⁵⁵ The transition to more co-ordinated transmission is led by two temporal workstreams under the Offshore Transmission Network Review (OTNR). Co-ordinated transmission projects are being brought forward as pathfinders as part of the 'early opportunities' workstream. For other offshore wind projects, their connection to a transmission network will form part of the holistic network design under the 'pathway to 2030' workstream.

4.11 Pollution Control and Other Environmental Regulatory Regimes

- 4.11.1 Issues relating to discharges or emissions from a proposed project, and which lead to other direct or indirect impacts on terrestrial, freshwater, marine, onshore, and offshore environments, or which include noise and vibration may be subject to separate regulation under the pollution control framework¹⁵⁶ or other consenting and licensing regimes, for example local planning consent or marine licences (see para 4.4.6 for more information).
- 4.11.2 The planning and pollution control systems are separate but complementary. The planning system controls the development and use of land in the public interest. It plays a key role in protecting and improving the natural environment, public health and safety, and amenity, for example by attaching conditions to allow developments which would otherwise not be environmentally acceptable to proceed and preventing harmful development which cannot be made acceptable even through conditions. Pollution control is concerned with preventing pollution through the use of measures to prohibit or limit the releases of substances to the environment from different sources to the lowest practicable level. It also ensures that ambient air, water, and land quality meet standards that guard against impacts to the environment or human health.
- 4.11.3 Pollution from industrial sources in England and Wales is controlled through the Environmental Permitting (England and Wales) Regulations 2016 (EPR)¹⁵⁷. The EPR requires industrial facilities to have an EP and meet limits on allowable emissions to operate.
- 4.11.4 Larger industrial facilities undertaking specific types of activity are also required to use Best Available Techniques (BAT) to reduce emissions to air, water, and land. Agreement on what sector specific BAT standards are, will now be determined through a new UK-specific BAT process.¹⁵⁸

Applicant assessment

- 4.11.5 Applicants should consult the MMO (or NRW in Wales) on energy NSIP projects which would affect, or would be likely to affect, any relevant marine areas as defined in the Planning Act 2008 (as amended by section 23 of the Marine and Coastal Access Act 2009). Applicants are encouraged to consider the relevant marine plans in advance of consulting the MMO for England or the relevant policy teams at the Welsh government.

¹⁵⁶ See <https://www.gov.uk/government/publications/integrated-pollution-prevention-and-control-developing-and-setting-of-best-available-techniques-bat-provisional-common-framework>

¹⁵⁷ See <https://www.legislation.gov.uk/uksi/2016/1154/contents/made>

¹⁵⁸ See <https://www.gov.uk/government/publications/integrated-pollution-prevention-and-control-developing-and-setting-of-best-available-techniques-bat-provisional-common-framework>

- 4.11.6 Many projects covered by this NPS will be subject to the EP regime, which also incorporates operational waste management requirements for certain activities. When an applicant applies for an EP, the relevant regulator (usually EA or NRW but sometimes the local authority) requires that the application demonstrates that processes are in place to meet all relevant EP requirements.¹⁵⁹
- 4.11.7 Applicants should make early contact with relevant regulators, including EA or NRW and the MMO, to discuss their requirements for EPs and other consents. Early contact with relevant regulators is strongly encouraged to ensure that applications take account of all relevant environmental considerations and that the relevant regulators are able to provide timely advice and assurance to the Secretary of State.
- 4.11.8 Wherever possible, applicants should submit applications for EPs and other necessary consents at the same time as applying to the Secretary of State for development consent.

Secretary of State decision making

- 4.11.9 In considering an application for development consent the Secretary of State should focus on whether the development itself is an acceptable use of the land or sea, and the impact of that use, rather than the control of processes, emissions or discharges themselves.¹⁶⁰
- 4.11.10 The Secretary of State should work on the assumption that the relevant pollution control regime and other environmental regulatory regimes, including those on land drainage, water abstraction and biodiversity, will be properly applied and enforced by the relevant regulator. The Secretary of State should act to complement but not seek to duplicate them.
- 4.11.11 The Secretary of State's consent may include a deemed marine licence and the MMO will advise on what conditions should apply to the deemed marine licence.
- 4.11.12 The Secretary of State and MMO should cooperate closely to ensure that energy NSIPs are licensed in accordance with environmental legislation.
- 4.11.13 In considering the impacts of the project, the Secretary of State may wish to consult the regulator on any management plans that would be included in an EP application.
- 4.11.14 The Secretary of State should be satisfied that development consent can be granted taking full account of environmental impacts.
- 4.11.15 Working in close cooperation with EA or NRW and/or the pollution control authority, and other relevant bodies, such as the MMO, the SNCB, Drainage Boards, and water

¹⁵⁹ See <https://www.gov.uk/government/publications/environmental-permitting-guidance-core-guidance--2>

¹⁶⁰ See paragraph 188 of section 15 of the NPPF

and sewerage undertakers, the Secretary of State should be satisfied, before consenting any potentially polluting developments, that:

- the relevant pollution control authority is satisfied that potential releases can be adequately regulated under the pollution control framework
- the effects of existing sources of pollution in and around the site are not such that the cumulative effects of pollution when the proposed development is added would make that development unacceptable, particularly in relation to statutory environmental quality limits

4.11.16 The Secretary of State should not refuse consent on the basis of pollution impacts unless there is good reason to believe that any relevant necessary operational pollution control permits or licences or other consents will not subsequently be granted. On this basis, it is reasonable for the Secretary of State to consider residual amenity issues only when considering whether the development itself is an acceptable use of the land or sea, and on the impacts of that use.

Applicant assessment

4.11.17 Applicants must consult the Hazardous Substances Authority and the HSE at pre-application stage if the project is likely to need hazardous substances consent.

4.11.18 HSE sets a consultation distance around every site with hazardous substances consent and notifies the relevant local planning authorities. The applicant should therefore consult the local planning authority at preapplication stage to identify whether its proposed site is within the consultation distance of any site with hazardous substances consent and, if so, should consult the HSE for its advice on locating the particular development on that site.

4.12 Safety

4.12.1 The Health and Safety Executive (HSE) is responsible for enforcing a range of occupational health and safety legislation some of which is relevant to the construction, operation and decommissioning of energy infrastructure.

4.12.2 Some technologies, for example the use of salt caverns for underground gas storage, will be regulated by specific health and safety legislation. The application of these regulations is set out in the technology specific NPSs where relevant.

4.12.3 Some energy infrastructure will be subject to the Control of Major Accident Hazards (COMAH) Regulations 2015.¹⁶¹ These Regulations aim to prevent major accidents involving dangerous substances and limit the consequences to people and the environment of any that do occur. COMAH regulations apply throughout the life cycle

¹⁶¹ See <https://www.hse.gov.uk/comah/background/comah15.htm#main>

of the facility, i.e. from the design and build stage through to decommissioning. They are enforced by the Competent Authority comprising HSE or ONR (Office for Nuclear Regulation, for nuclear) and the EA acting jointly in England and by the HSE and NRW acting jointly in Wales, and the HSE and Scottish Environment Protection Agency (SEPA) acting jointly in Scotland.

- 4.12.4 The same principles apply here as for those set out in the previous section on pollution control and other environmental permitting regimes.

Applicant assessment

- 4.12.5 Applicants should consult with the HSE on matters relating to safety.
- 4.12.6 Applicants seeking to develop infrastructure subject to the COMAH regulations should make early contact with the Competent Authority.
- 4.12.7 If a safety report is required it is important to discuss with the Competent Authority the type of information that should be provided at the design and development stage, and what form this should take. This will enable the Competent Authority to review as much information as possible before construction begins, in order to assess whether the inherent features of the design are sufficient to prevent, control and mitigate major accidents.

Secretary of State decision making

- 4.12.8 The Secretary of State should be satisfied that a safety assessment has been done, where required, and that the Competent Authority has assessed that it meets the safety objectives described above.

4.13 Hazardous Substances

- 4.13.1 All establishments wishing to hold stocks of certain hazardous substances above a threshold need 'Hazardous Substances Consent.'¹⁶²
- 4.13.2 HSE will assess the risks based on the development consent application. Where HSE does not advise against the Secretary of State granting the consent, it will also recommend whether the consent should be granted subject to any requirements.

Secretary of State decision making

- 4.13.3 Where hazardous substances consent is applied for, the Secretary of State will consider whether to make an order directing that hazardous substances consent

¹⁶² Further information is available at the HSE's website: HSE: Land use planning - Hazardous substances consent

shall be deemed to be granted alongside making an order granting development consent.¹⁶³ The Secretary of State should consult HSE about this.

4.14 Common Law Nuisance and Statutory Nuisance

- 4.14.1 Section 158 of the Planning Act 2008 confers statutory authority for carrying out development consented to by, or doing anything else authorised by, a development consent order.
- 4.14.2 Such authority is conferred only for the purpose of providing a defence in any civil or criminal proceedings for nuisance. This would include a defence for proceedings for nuisance under Part III of the Environmental Protection Act 1990 (EPA) (statutory nuisance)¹⁶⁴ but only to the extent that the nuisance is the inevitable consequence of what has been authorised.
- 4.14.3 The defence does not extinguish the local authority's duties under Part III of the EPA 1990 to inspect its area and take reasonable steps to investigate complaints of statutory nuisance and to serve an abatement notice where satisfied of its existence, likely occurrence or recurrence.
- 4.14.4 The defence is not intended to extend to proceedings where the matter is "prejudicial to health" and not a nuisance.

Secretary of State decision making

- 4.14.5 At the application stage of an energy NSIP, possible sources of nuisance under section 79(1) of the EPA 1990 and how they may be mitigated or limited should be considered by the Secretary of State so that appropriate requirements can be included in any subsequent order granting development consent (see Section 5.7 on Dust, odour, artificial light etc. and Section 5.12 on Noise and vibration).
- 4.14.6 The Secretary of State should note that the defence of statutory authority is subject to any contrary provision made by the Secretary of State in any particular case in a development consent order (section 158(3) of the Planning Act 2008). Therefore, subject to Section 5.7 and Section 5.12, the Secretary of State can disapply the defence of statutory authority, in whole or in part, in any particular case, but in so doing should have regard to whether any particular nuisance is an inevitable consequence of the development.

¹⁶³ Hazardous substances consent can also be applied for subsequent to a DCO application. However, the guidance in 4.13.1 still applies i.e. the applicant should consult with HSE at the pre-application stage and include details in their DCO

¹⁶⁴ See <https://www.legislation.gov.uk/ukpga/1990/43/part/III>

4.15 Security Considerations

- 4.15.1 National security considerations apply across all national infrastructure sectors.
- 4.15.2 DESNZ works closely with government security agencies including the Centre for the Protection of National Infrastructure (CPNI) and the National Cyber Security Centre (NCSC) to provide advice to the most critical infrastructure assets on terrorism and other national security threats, as well as on risk mitigation.
- 4.15.3 In the UK's civil nuclear industry, security is also independently regulated by the Office for Nuclear Regulation (ONR).
- 4.15.4 Government policy is to ensure that, where possible, proportionate protective security measures are designed into new infrastructure projects at an early stage in the project development. Where applications for development consent for infrastructure covered by this NPS relate to potentially 'critical' infrastructure, there may be national security considerations.
- 4.15.5 DESNZ will be notified at pre-application stage about every likely future application for energy NSIPs, so that any national security implications can be identified.

Applicant assessment

- 4.15.6 Where national security implications have been identified, the applicant should consult with relevant security experts from CPNI, ONR (for civil nuclear) and/or DESNZ to ensure security measures have been adequately considered in the design process and that adequate consideration has been given to the management of security risks.
- 4.15.7 The applicant should only include sufficient information in the application as is necessary to enable the Secretary of State to examine the development consent issues and make a properly informed decision on the application.

Secretary of State decision making

- 4.15.8 If CPNI, ONR (for civil nuclear) and/or DESNZ are satisfied that security issues have been adequately addressed in the project when the application is submitted to the Secretary of State, it will provide confirmation of this to the Secretary of State. The Secretary of State should not need to give any further consideration to the details of the security measures in its examination.
- 4.15.9 In exceptional cases, where examination of an application would involve public disclosure of information about defence or national security which would not be in the

national interest, the examination of that evidence may take place in a closed session as set out under Examination Procedure Rules¹⁶⁵.

4.15.10 The SoS must also consider duties under other legislation including duties under the Environment Act 2021 in relation to environmental targets and the Government's Environmental Improvement Plan.

¹⁶⁵ See <https://www.legislation.gov.uk/uksi/2010/103/contents/made>

5 Generic Impacts

5.1 Introduction

- 5.1.1 This part considers generic impacts that arise from the development of all of the types of energy infrastructure covered by the energy NPSs (such as landscape and visual impacts) or arise in similar ways from the development of energy infrastructure covered in at least two of the energy NPSs. In some cases, the technology specific NPSs provide detail on the way these impacts arise, or are to be considered, in the context of applications specific to the technology in question. Impacts which are limited to one particular technology are only covered in the relevant technology specific NPS.
- 5.1.2 The list of impacts (generic and technology specific) and the relevant policy in this Part and in the impact section of the technology specific NPSs is not exhaustive. The NPSs address those impacts and means of mitigation that are anticipated to arise most frequently. They are not intended to provide a list of all possible effects or ways to mitigate such effects. The Secretary of State should therefore consider other impacts and means of mitigation where it determines that the impact is relevant and important to its decision.
- 5.1.3 The technology specific NPSs may state that certain impacts should be given a particular weight. Where they do not, the Secretary of State should follow any policy on the level of weight to be given to such impact set out in this NPS. Applicants should identify the impacts of their proposals in the ES in terms of those covered in this NPS and any others that may be relevant to their application.
- 5.1.4 Some of the impact sections in this NPS and the technology specific NPSs refer to development consent requirements or obligations, or conditions of a deemed marine licence, as means of securing appropriate mitigation. The fact that the possible use of requirements, obligations or conditions are not mentioned in relation to other impacts does not mean that they may not be relevant.
- 5.1.5 Some of the impact sections in this NPS and the technology specific NPSs also refer to bodies whom the applicant or the Secretary of State should consult. The references to specific bodies are not intended to be exhaustive. The fact that in other impact sections no mention is made of such consultation does not mean that the applicant or the Secretary of State should not, where appropriate, engage in it.¹⁶⁶ Applicants must also ensure they consult the relevant bodies about their proposed applications in accordance with section 42 to 44 of the Planning Act 2008 and the

¹⁶⁶ The Secretary of State may choose to consult in certain circumstances following the close of the examination but in most cases will be under no obligation to do so.

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009.

- 5.1.6 Sufficient relevant information is crucial to good decision making, particularly where formal assessments are required. To avoid delay, if in any doubt applicants should discuss what information is needed with the Planning Inspectorate, statutory bodies, and other relevant organisations as early as possible. Any assessment should be based on the most up to date data and guidance.

5.2 Air Quality and Emissions

- 5.2.1 Energy infrastructure development can have adverse effects on air quality. The construction, operation and decommissioning phases can involve emissions to air which could lead to adverse impacts on health, on protected species and habitats,¹⁶⁷ or on the wider countryside and species. Air emissions include particulate matter (for example dust) up to a diameter of ten microns (PM10) as well as gases such as sulphur dioxide, carbon monoxide and nitrogen oxides (NOx).
- 5.2.2 Levels for pollutants in ambient air are set out in the Air Quality Standards Regulations 2010¹⁶⁸ and reiterated in the Air Quality Strategy.¹⁶⁹ In addition, two new air quality targets – one for annual mean concentrations of PM_{2.5} and one further long-term target – have been set under the Environment Act 2021. The Secretary of State is required to make available up to date information on air quality to any relevant interested party.¹⁷⁰
- 5.2.3 A particular effect of air emissions from some energy infrastructure may be eutrophication, which is the excessive enrichment of nutrients in the environment. Eutrophication from air pollution results mainly from emissions of NOx and ammonia. The main emissions from energy infrastructure are from generating stations. Eutrophication can affect plant growth and functioning, altering the competitive balance of species and thereby damaging biodiversity. In aquatic ecosystems it can cause changes to algal composition and lead to algal blooms, which remove oxygen from the water, adversely affecting plants and fish. The effects on ecosystems can be short term or irreversible and can have a large impact on ecosystem services such as pollination, aesthetic services and water supply.
- 5.2.4 Emissions from combustion plants are generally released through exhaust stacks. Design of exhaust stacks, particularly height, is the primary driver for the delivery of optimal dispersion of emissions and is often determined by statutory requirements. The optimal stack height is dependent upon the local terrain and meteorological

¹⁶⁷ Impacts on protected species and habitats are covered in Section 5.4.

¹⁶⁸ See <https://www.legislation.gov.uk/ukxi/2010/1001/contents/made>

¹⁶⁹ See <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england-scotland-wales-and-northern-ireland-volume-1>

¹⁷⁰ Air Quality Standards Regulations 2010, No.2010/1001.

conditions, in combination with the emission characteristics of the plant. The EA or NRW will require the exhaust stack height of a thermal combustion generating plant, including fossil fuel generating stations and waste or biomass plant, to be optimised in relation to impact on air quality. The Secretary of State need not, therefore, be concerned with the exhaust stack height optimisation process in relation to air emissions, though the impact of stack heights on landscape and visual amenity will be a consideration (see Section 5.10).

- 5.2.5 Impacts of thermal combustion generating stations with respect to air emissions are set out in the technology specific NPSs.
- 5.2.6 Proximity to emission sources can have significant impacts on sensitive receptor sites for air quality, such as education or healthcare sites, residential use or sensitive or protected ecosystems. Projects near a sensitive receptor site for air quality should only be proposed in exceptional circumstances if no viable alternative site is available. In these instances, substantial mitigation of any expected emissions will be required (see para 5.2.10 below).

Applicant assessment

- 5.2.7 Where the project is likely to have adverse effects on air quality the applicant should undertake an assessment of the impacts of the proposed project as part of the ES.
- 5.2.8 The ES should describe:
- existing air quality levels and the relative change in air quality from existing levels;
 - any significant air emissions, their mitigation and any residual effects distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the project;
 - the predicted absolute emission levels of the proposed project, after mitigation methods have been applied; and
 - any potential eutrophication impacts.
- 5.2.9 Defra publishes future national projections of air quality based on estimates of future levels of emissions, traffic, and vehicle fleet. Projections are updated as the evidence base changes and the applicant should ensure these are current at the point of an application. The applicant's assessment should be consistent with this but may include more detailed modelling to demonstrate local impacts.
- 5.2.10 Where a proposed development is likely to lead to a breach of the air quality thresholds or affect the ability of a non-compliant area to achieve compliance within the timescales set out in the most recent relevant air quality plan at the time of the decision, the applicant should work with the relevant authorities to secure appropriate mitigation measures to ensure that those thresholds are not breached.

- 5.2.11 The Secretary of State should consider whether mitigation measures are needed both for operational and construction emissions over and above any which may form part of the project application. A construction management plan may help codify mitigation at this stage. In doing so the Secretary of State should have regard to the Air Quality Strategy¹⁷¹ or any successor to it and should consider relevant advice within Local Air Quality Management guidance.¹⁷²
- 5.2.12 The mitigations identified in Section 5.14 on traffic and transport impacts will help mitigate the effects of air emissions from transport.

Secretary of State decision making

- 5.2.13 Many activities involving air emissions are subject to pollution control. The considerations set out in Section 4.11 on the interface between planning and pollution control therefore apply. The SoS must also consider duties under other legislation including duties under the Environment Act 2021 in relation to environmental targets and have regard to policies set out in the Government's Environmental Improvement Plan.
- 5.2.14 The Secretary of State should generally give air quality considerations substantial weight where a project would lead to a deterioration in air quality in an area or leads to a new area where air quality breaches any national air quality limits or statutory air quality objectives. However, air quality considerations will also be important where substantial changes in air quality levels are expected, even if this does not lead to any breaches of national air quality limits or statutory air quality objectives.
- 5.2.15 The Secretary of State should give air quality considerations substantial weight where a project is proposed near a sensitive receptor site, such as an education or healthcare facility, residential use or a sensitive or protected habitat.
- 5.2.16 Where a project is proposed near to a sensitive receptor site for air quality, if the applicant cannot provide justification for this location, and a suitable mitigation plan, the Secretary of State should refuse consent.
- 5.2.17 In all cases, the Secretary of State must take account of any relevant statutory air quality limits and statutory air quality objectives. If a project will lead to non-compliance with a statutory limit the Secretary of State should refuse consent.

171 See <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england-scotland-wales-and-northern-ireland-volume-1>

172 See <https://laqm.defra.gov.uk/supporting-guidance.html>

5.3 Greenhouse Gas Emissions

- 5.3.1 Significant levels of energy infrastructure development are vital to ensure the decarbonisation of the UK economy. The construction, operation and decommissioning of that energy infrastructure will in itself, lead to GHG emissions.
- 5.3.2 In considering this section, applicants should also have regard to Part 2 of this NPS, which explains the current policy on climate change and how this NPS interacts with that policy, and Section 4.9 of this NPS, which deals with climate change adaptation.
- 5.3.3 As discussed in Part 2, energy infrastructure plays a vital role in decarbonisation. While all steps should be taken to reduce and mitigate climate change impacts, it is accepted that there will be residual emissions from energy infrastructure, particularly during the economy wide transition to net zero, and potentially beyond.

Applicant assessment

- 5.3.4 All proposals for energy infrastructure projects should include a GHG assessment as part of their ES (See Section 4.2). This should include:
- A whole life GHG assessment showing construction, operational and decommissioning GHG impacts.
 - An explanation of the steps that have been taken to drive down the climate change impacts at each of those stages.
 - Measurement of embodied GHG impact from the construction stage.
 - How reduction in energy demand and consumption during operation has been prioritised in comparison with other measures.
 - How operational emissions have been reduced as much as possible through the application of best available technology for that type of technology.
 - Calculation of operational energy consumption and associated carbon emissions.
 - Whether and how any residual GHG emissions will be (voluntarily) offset or removed using a recognised framework.
 - Where there are residual emissions, the level of emissions and the impact of those on national and international efforts to limit climate change, both alone and where relevant in combination with other developments at a regional or national level, or sector level, if sectoral targets are developed.

Mitigation

- 5.3.5 A GHG assessment should be used to drive down GHG emissions at every stage of the proposed development and ensure that emissions are minimised as far as possible for the type of technology, taking into account the overall objectives of ensuring our supply of energy always remains secure, reliable and affordable, as we transition to net zero.

- 5.3.6 Applicants should look for opportunities within the proposed development to embed nature-based or technological solutions to mitigate or offset the emissions of construction and decommissioning.
- 5.3.7 Steps taken to minimise and offset emissions should be set out in a GHG Reduction Strategy, secured under the development consent order. The GHG Reduction Strategy should consider the creation and preservation of carbon stores and sinks including through woodland creation, peatland restoration and through other natural habitats.

Secretary of State decision making

- 5.3.8 The Secretary of State must be satisfied that the applicant has as far as possible assessed the GHG emissions of all stages of the development.
- 5.3.9 The Secretary of State should be content that the applicant has taken all reasonable steps to reduce the GHG emissions of the construction and decommissioning stage of the development.
- 5.3.10 The Secretary of State should give appropriate weight to projects that embed nature-based or technological processes to mitigate or offset the emissions of construction and decommissioning within the proposed development. However, in light of the vital role energy infrastructure plays in the process of economy wide decarbonisation, the Secretary of State must accept that there are likely to be some residual emissions from construction and decommissioning of energy infrastructure.
- 5.3.11 Operational GHG emissions are a significant adverse impact from some types of energy infrastructure which cannot be totally avoided (even with full deployment of CCS technology). Given the characteristics of these and other technologies, as noted in Part 3 of this NPS, and the range of non-planning policies that can be used to decarbonise electricity generation, such as the UK ETS (see Sections 2.4 and 2.5 above), government has determined that operational GHG emissions are not reasons to prohibit the consenting of energy projects or to impose more restrictions on them in the planning policy framework than are set out in the energy NPSs (e.g. the CCR requirements). Any carbon assessment will include an assessment of operational GHG emissions, but the policies set out in Part 2, including the UK ETS, can be applied to these emissions.
- 5.3.12 Operational emissions will be addressed in a managed, economy-wide manner, to ensure consistency with carbon budgets, net zero and our international climate commitments. The Secretary of State does not, therefore need to assess individual applications for planning consent against operational carbon emissions and their contribution to carbon budgets, net zero and our international climate commitments.

5.4 Biodiversity and Geological Conservation

- 5.4.1 Biodiversity is the variety of life in all its forms and encompasses all species of plants and animals, the genetic diversity they contain and the complex ecosystems of which they are a part. Geological conservation relates to the sites that are designated for their geology and/or their geomorphological importance.¹⁷³
- 5.4.2 The government's policy for biodiversity in England is set out in the Environmental Improvement Plan¹⁷⁴, Biodiversity 2020¹⁷⁵, the National Pollinator Strategy¹⁷⁶ and the UK Marine Strategy¹⁷⁷. The aim is to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people. This aim needs to be viewed in the context of the challenge presented by climate change. Healthy, naturally functioning ecosystems and coherent ecological networks will be more resilient and adaptable to climate change effects. Failure to address this challenge will result in significant adverse impact on biodiversity and the ecosystem services it provides.
- 5.4.3 The wide range of legislative provisions at the international and national level that can impact on planning decisions affecting biodiversity and geological conservation issues are set out in a Government Circular.¹⁷⁸ The National Planning Policy Framework and Natural Environment PPG document sets out good practice in England in relation to planning for biodiversity and geological conservation.¹⁷⁹

Habitats Regulations

- 5.4.4 The highest level of biodiversity protection is afforded to sites identified through international conventions. The Habitats Regulations set out sites for which an HRA will assess the implications of a plan or project, including Special Areas of Conservation and Special Protection Areas.
- 5.4.5 As a matter of policy, the following should be given the same protection as sites covered by the Habitats Regulations and an HRA will also be required:

¹⁷³ A list of designated sites (including marine sites) is included in the Geological Conservation Review held by the Joint Nature Conservation Committee (JNCC)

¹⁷⁴ See <https://www.gov.uk/government/publications/environmental-improvement-plan>

¹⁷⁵ See <https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services>

¹⁷⁶ See <https://www.gov.uk/government/publications/national-pollinator-strategy-for-bees-and-other-pollinators-in-england>

¹⁷⁷ See <https://www.gov.uk/government/publications/marine-strategy-part-one-uk-updated-assessment-and-good-environmental-status>

¹⁷⁸ Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System (ODPM 06/2005, Defra 01/2005) available via TSO website www.tso.co.uk/bookshop. It should be noted that this document does not cover more recent legislative requirements, such as the Marine Strategy Regulations 2010.

¹⁷⁹ See <https://www.gov.uk/guidance/natural-environment>

- (a) potential Special Protection Areas and possible Special Areas of Conservation;
- (b) listed or proposed Ramsar sites; and
- (c) sites identified, or required, as compensatory measures for adverse effects on any of the other sites covered by this paragraph.

5.4.6 The British Energy Security Strategy¹⁸⁰ committed to establishing strategic compensation for offshore renewables NSIPs, to offset environmental effects but also to reduce delays for individual projects. See paragraphs 2.8.292 – 2.8.300 of EN-3 for further information.

Sites of Special Scientific Interest (SSSIs)

5.4.7 Many SSSIs are also designated as sites of international importance and will be protected accordingly. Those that are not, or those features of SSSIs not covered by an international designation, should be given a high degree of protection. Most National Nature Reserves are notified as SSSIs.

5.4.8 Development on land within or outside a SSSI, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits (including need) of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of SSSIs.

Marine Conservation Zones

5.4.9 Marine Conservation Zones (MCZs) (Marine Protected Areas in Scotland), introduced under the Marine and Coastal Access Act 2009, are areas that have been designated for the purpose of conserving marine flora or fauna, marine habitats or types of marine habitat or features of geological or geomorphological interest. The protected feature or features and the conservation objectives for the MCZ are stated in the designation order for the MCZ.

Marine Protected Areas

5.4.10 Marine Protected Area (MPA) is a term used to describe the network of HRA sites, SSSIs and MCZs in the English and Welsh marine environment.

5.4.11 It is important that relevant guidance on managing environmental impacts of infrastructure in marine protected areas is followed, and that equal consideration of the effect of proposals should be given to all MPAs regardless of the legislation they

¹⁸⁰ See <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

were designated under. This is because all sites contribute to the network of MPAs and therefore to overall network integrity.

Regional and Local Sites

- 5.4.12 Sites of regional and local biodiversity and geological interest, which include Regionally Important Geological Sites, Local Nature Reserves and Local Wildlife Sites, are areas of substantive nature conservation value and make an important contribution to ecological networks and nature's recovery. They can also provide wider benefits including public access (where agreed), climate mitigation and helping to tackle air pollution.
- 5.4.13 National planning policy expects plans to identify and map Local Wildlife sites, and to include policies that not only secure their protection from harm or loss but also help to enhance them and their connection to wider ecological networks.

Ancient woodland, veteran trees and other irreplaceable habitats

- 5.4.14 Irreplaceable habitats are habitats which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, taking into account their age, uniqueness, species diversity or rarity.
- 5.4.15 Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Ancient or veteran trees found outside ancient woodland are also particularly valuable. Other types of irreplaceable habitats include blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen.

Protection and enhancement of habitats and other species

- 5.4.16 Many individual wildlife species receive statutory protection under a range of legislative provisions.¹⁸¹ Other species and habitats have been identified as being of principal importance for the conservation of biodiversity in England and Wales, as well as for their continued benefit for climate mitigation and adaptation and thereby requiring conservation action.¹⁸²

Applicant assessment

- 5.4.17 Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally, and locally designated sites of ecological or geological conservation importance (including those outside

¹⁸¹ Certain plant and animal species, including all wild birds, are protected under the Wildlife and Countryside Act 1981. Certain plant and animal species are also protected under the Conservation of Habitats and Species Regulations 2010. Some other animals are protected under their own legislation, for example Protection of Badgers Act 1992.

¹⁸² Lists of habitats and species of principal importance for the conservation of biological diversity in England published in response to Section 41 of the Natural Environment and Rural Communities Act 2006 are available from the Biodiversity Action Reporting System website. See section 7 of the Environment (Wales) Act 2016 for a list of habitats and species of principle importance in Wales.

England), on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity, including irreplaceable habitats.

- 5.4.18 The applicant should provide environmental information proportionate to the infrastructure where EIA is not required to help the Secretary of State consider thoroughly the potential effects of a proposed project.
- 5.4.19 The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.¹⁸³
- 5.4.20 Applicants should consider wider ecosystem services and benefits of natural capital when designing enhancement measures.
- 5.4.21 As set out in Section 4.6, the design process should embed opportunities for nature inclusive design. Energy infrastructure projects have the potential to deliver significant benefits and enhancements beyond Biodiversity Net Gain, which result in wider environmental gains (see Section 4.5 on Environmental and Biodiversity Net Gain). The scope of potential gains will be dependent on the type, scale, and location of each project.
- 5.4.22 The design of Energy NSIP proposals will need to consider the movement of mobile / migratory species such as birds, fish and marine and terrestrial mammals and their potential to interact with infrastructure. As energy infrastructure could occur anywhere within England and Wales, both inland and onshore and offshore, the potential to affect mobile and migratory species across the UK and more widely across Europe (transboundary effects) requires consideration, depending on the location of development.
- 5.4.23 Energy projects will need to ensure vessels used by the project follow existing regulations and guidelines to manage ballast water.¹⁸⁴
- 5.4.24 In Wales, applicants should consider the guidance set out in Section 6.4 of Planning Policy Wales and the relevant policies in the Wales National Marine Plan.¹⁸⁵

Habitats Regulations

The government's "Nature Recovery Green Paper: Protected Sites and Species", consulted on changes to the Habitats Regulation Assessment (HRA) process. If changes are made, relevant plans and projects would have to comply with such relevant regulations. Until a new process is implemented, current legislation continues to apply.

¹⁸³ See, for example, the biodiversity planning toolkit created by the Association of Local Government Ecologists in partnership with NGOs, Defra, SNCB and the Environment Agency.

¹⁸⁴ The UK regulations on Ballast Water Management can be found [here](#). Guidance has been published in MSN [1908](#) and MGN [675](#)

¹⁸⁵ See <https://gov.wales/marine-planning>

- 5.4.25 The applicant should seek the advice of the appropriate SNCB and provide the Secretary of State with such information as the Secretary of State may reasonably require, to determine whether an Appropriate Assessment (AA) is required. Applicants can request and agree 'Evidence Plans' with SNCBs, which is a way to agree and record upfront the information the applicant needs to supply with its application, so that the HRA can be efficiently carried out. If an AA is required, the applicant must provide the Secretary of State with such information as may reasonably be required to enable the Secretary of State to conduct the AA. This should include information on any mitigation measures that are proposed to minimise or avoid likely significant effects.
- 5.4.26 If, during the pre-application stage, the SNCB indicate that the proposed development is likely to adversely impact the integrity of HRA sites, the applicant must include with their application such information as may reasonably be required to assess a potential derogation under the Habitats Regulations.
- 5.4.27 If the SNCB gives such an indication at a later stage in the development consent process, the applicant must provide this information as soon as is reasonably possible and before the close of the examination. This information must include assessment of alternative solutions, a case for Imperative Reasons of Overriding Public Interest (IROPI) and appropriate environmental compensation.
- 5.4.28 Provision of such information will not be taken as an acceptance of adverse impacts and if an applicant disputes the likelihood of adverse impacts, it can provide this information as part of its application 'without prejudice' to the Secretary of State's final decision on the impacts of the potential development. If, in these circumstances, an applicant does not supply information required for the assessment of a potential derogation, there will be no expectation that the Secretary of State will allow the applicant the opportunity to provide such information following the examination.
- 5.4.29 It is vital that applicants consider the need for compensation as early as possible in the design process as 'retrofitting' compensatory measures will introduce delays and uncertainty to the consenting process.
- 5.4.30 Applicants should work closely at an early stage in the pre-application process with SNCB and Defra/Welsh Government to develop a compensation plan for all protected sites adversely affected by the development.
- 5.4.31 Before submitting an application, applicants should seek the views of the SNCB and Defra/Welsh Government as to the suitability, securability and effectiveness of the compensation plan to ensure the development will not hinder the achievement of the conservation objectives for the protected site. In cases where such views are provided, the applicant should include a copy of this information with the compensation plan in their application for further consideration by the Examining Authority.

Ancient woodland, veteran trees and other irreplaceable habitats

- 5.4.32 Applicants should include measures to mitigate the direct and indirect effects of development on ancient woodland, veteran trees or other irreplaceable habitats during both construction and operational phase.¹⁸⁶

Protection and enhancement of habitats and other species

- 5.4.33 Applicants should consider any reasonable opportunities to maximise the restoration, creation, and enhancement of wider biodiversity, and the protection and restoration of the ability of habitats to store or sequester carbon as set out under Section 4.5.
- 5.4.34 Consideration should be given to improvements to, and impacts on, habitats and species in, around and beyond developments, for wider ecosystem services and natural capital benefits, beyond those under protection and identified as being of principal importance. This may include considerations and opportunities identified through Local Nature Recovery Strategies, and national goals and targets set through the government's strategy for nature for example.

Mitigation

- 5.4.35 Applicants should include appropriate avoidance, mitigation, compensation and enhancement measures as an integral part of the proposed development. In particular, the applicant should demonstrate that:
- during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works
 - the timing of construction has been planned to avoid or limit disturbance
 - during construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements
 - habitats will, where practicable, be restored after construction works have finished
 - opportunities will be taken to enhance existing habitats rather than replace them, and where practicable, create new habitats of value within the site landscaping proposals. Where habitat creation is required as mitigation, compensation, or enhancement the location and quality will be of key importance. In this regard habitat creation should be focused on areas where the most ecological and ecosystems benefits can be realised.
- 5.4.36 Applicants should produce and implement a Biodiversity Management Strategy as part of their development proposals. This could include provision for biodiversity awareness training to employees and contractors so as to avoid unnecessary adverse impacts on biodiversity during the construction and operation stages.

¹⁸⁶ Applicants in Wales should consult PPW 6.4.26.

- 5.4.37 In the design of any direct cooling system the locations of the intake and outfall should be sited to avoid or minimise adverse impacts on the receiving waters, including their ecology. There should also be specific measures to minimise impact to fish and aquatic biota by entrainment and impingement or by excessive heat or biocidal chemicals from discharges to receiving waters.
- 5.4.38 To further minimise any adverse impacts on geodiversity, where appropriate applicants are encouraged to produce and implement a Geodiversity Management Strategy to preserve and enhance access to geological interest features, as part of relevant development proposals.

Secretary of State decision making

- 5.4.39 The government's 25 Year Environment Plan¹⁸⁷ and the Environment Act 2021 mark a step change in ambition for wildlife and the natural environment. The Secretary of State should have regard to the aims and goals of the government's Environmental Improvement Plan and any relevant measures and targets, including statutory targets set under the Environment Act or elsewhere.
- 5.4.40 In addition, in exercising functions in relation to Wales, the Secretary of State should consider Section 6 of the Environment (Wales) Act 2016¹⁸⁸ and seek to maintain and enhance biodiversity, and in so doing promote the resilience of ecosystems, so far as consistent with the proper exercise of the Secretary of State's functions.
- 5.4.41 The benefits of nationally significant low carbon energy infrastructure development may include benefits for biodiversity and geological conservation interests and these benefits may outweigh harm to these interests. The Secretary of State may take account of any such net benefit in cases where it can be demonstrated.
- 5.4.42** As a general principle, and subject to the specific policies below, development should, in line with the mitigation hierarchy, aim to avoid significant harm to biodiversity and geological conservation interests, including through consideration of reasonable alternatives (as set out in Section 4.2 above). Where significant harm cannot be avoided, impacts should be mitigated and as a last resort, appropriate compensation measures should be sought.
- 5.4.43** If significant harm to biodiversity resulting from a development cannot be avoided (for example through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then the Secretary of State will give significant weight to any residual harm and consent may be refused.

¹⁸⁷ See <https://www.gov.uk/government/publications/25-year-environment-plan>. An updated Environmental Improvement Plan 2023 has also been published in February 2023:

<https://www.gov.uk/government/publications/environmental-improvement-plan>

¹⁸⁸ See <https://www.legislation.gov.uk/anaw/2016/3/section/6/enacted>

- 5.4.44 The Secretary of State should consider what appropriate requirements should be attached to any consent and/or in any planning obligations entered into, in order to ensure that any mitigation or biodiversity net gain measures, if offered, are delivered and maintained. Any habitat creation or enhancement delivered including linkages with existing habitats for compensation or biodiversity net gain should generally be maintained for a minimum period of 30 years, or for the lifetime of the project, if longer.
- 5.4.45 The Secretary of State will need to take account of what mitigation measures may have been agreed between the applicant and the SNCB and the MMO/NRW (where appropriate), and whether the SNBC or the MMO/NRW has granted or refused, or intends to grant or refuse, any relevant licences, including protected species mitigation licences
- 5.4.46 Development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design. The Secretary of State should give appropriate weight to environmental and biodiversity enhancements, although any weight given to gains provided to meet a legal requirement (for example under the Environment Act 2021) is likely to be limited.
- 5.4.47 When considering proposals, the Secretary of State should maximise such reasonable opportunities in and around developments, using requirements or planning obligations where appropriate. This can help towards delivering biodiversity net gain as part of or in addition to the approach set out at Section 4.5.
- 5.4.48 In taking decisions, the Secretary of State should ensure that appropriate weight is attached to designated sites of international, national, and local importance; protected species; habitats and other species of principal importance for the conservation of biodiversity; and to biodiversity and geological interests within the wider environment.

Habitats Regulations

- 5.4.49 The Secretary of State must consider whether the project may have a likely significant effect on a protected site which is part of the National Site Network (an HRA Site), a Marine Protected Area (MPA), or on any site to which the same protection is applied as a matter of policy, either alone or in combination with other plans or projects.

Sites of Special Scientific Interest (SSSIs)

- 5.4.50 The Secretary of State should use requirements and/or planning obligations to mitigate the harmful¹⁸⁹ aspects of the development and, where possible, to ensure the conservation and enhancement of the site's biodiversity or geological interest.

¹⁸⁹ In line with the principle in paragraph 4.2.8, the term 'harm' should be understood to mean 'significant harm'.

Marine Conservation Zones

- 5.4.51 The Secretary of State is bound by the duties in relation to MCZs imposed by sections 125 and 126 of the Marine and Coastal Access Act 2009.

Marine Protected Areas

- 5.4.52 The Secretary of State should assess the impact, either alone or in combination, on all designated MPA sites when making any decision on development consent.

Regional and Local Sites

- 5.4.53 The Secretary of State should give due consideration to such regional or local designations. However, given the need for new nationally significant infrastructure, these designations should not be used in themselves to refuse development consent. Development will still be expected to comply with the biodiversity and geological conservation requirements set out in this NPS.

Ancient woodland, veteran trees and other irreplaceable habitats

- 5.4.54 The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of any irreplaceable habitats, including ancient woodland, and ancient or veteran trees unless there are wholly exceptional reasons¹⁹⁰ and a suitable compensation strategy exists.

Protection and enhancement of habitats and other species

- 5.4.55 The Secretary of State should ensure that species and habitats identified as being of importance for the conservation of biodiversity are protected from the adverse effects of development by using requirements, planning obligations, or licence conditions where appropriate.
- 5.4.56 The Secretary of State should refuse consent where harm to the habitats or species and their habitats would result, unless the benefits (including need) of the development outweigh that harm. In this context the Secretary of State should give substantial weight to any such harm to the detriment of biodiversity features of national or regional importance or the climate resilience and the capacity of habitats to store carbon, which it considers may result from a proposed development.

¹⁹⁰ For example where the public benefits (including need) of the nationally significant energy infrastructure would clearly outweigh the loss or deterioration of the habitat.

5.5 Civil and Military Aviation and Defence Interests

- 5.5.1 All aerodromes, covering civil and military activities, as well as aviation technical sites, meteorological radars and other types of defence interests (both onshore and offshore) can be affected by new energy development.
- 5.5.2 Collaboration and co-existence between aviation and energy industry stakeholders should strive for scenarios such that neither is unduly compromised.
- 5.5.3 Whilst energy infrastructure, such as wind turbines, are an established part of the expected built energy environment, issues such as the cumulative impact, location and increasing geographical spread and height of offshore windfarms, can all potentially have a bearing on aviation safety, defence capabilities and weather warnings and forecasts.

Aviation

- 5.5.4 UK airspace is important for both civilian and military aviation interests. It is essential that new energy infrastructure is developed collaboratively alongside aerodromes, aircraft, air systems and airspace so that safety, operations and capabilities are not adversely affected by new energy infrastructure.
- 5.5.5 Aerodromes can have important economic and social benefits, particularly at the regional and local level, but there is also an urgent need for new energy developments, which bring about a wide range of social, economic and environmental benefits.
- 5.5.6 Commercial civil aviation is largely confined to designated corridors of controlled airspace and set approaches to airports. However, other aircraft often fly outside of 'controlled air space'.
- 5.5.7 The approaches and flight patterns to aerodromes can be irregular owing to a variety of factors including the performance characteristics of the aircraft concerned and the prevailing meteorological conditions. It may be possible to adapt flight patterns to work alongside new energy infrastructure without impacting on aviation safety.

Safeguarding

- 5.5.8 Certain civil aerodromes, and aviation technical sites, selected on the basis of their importance to the national air transport system, are officially safeguarded in order to ensure that their safety and operation are not compromised by new development.
- 5.5.9 A similar official safeguarding system applies to all military aerodromes, defence surveillance sites, and other defence assets.
- 5.5.10 Areas of airspace around aerodromes used by aircraft, including taking off or on approach and landing are described as "obstacle limitation surfaces" (OLS). All civil aerodromes licensed by the Civil Aviation Authority (CAA) and all military aerodromes

must comply with the OLS. These are defined according to criteria set out in relevant CAA guidance¹⁹¹ for licensed civil aerodromes and according to MOD criteria, as set by the Military Aviation Authority, which is part of the Defence Safety Authority (DSA), for military aerodromes.

- 5.5.11 Aerodromes that are officially safeguarded will have officially produced plans that show the OLS. Care must be taken to ensure that new developments do not infringe these protected OLS, as these encompass the critical airspace within which key air traffic associated with the aerodrome operates.
- 5.5.12 The CAA's CAP 738¹⁹² sets out that all licensed aerodromes are required to ensure they have a system in place to safeguard their aerodrome against the growth of obstacles or activities that may present a hazard to aircraft operations.
- 5.5.13 It is considered best practice for the LPA to include the safeguarded area and explanatory notes on its planning 'constraints' plan so that potential applicants can be aware of the presence of the aerodrome and the extent and nature of the safeguarding relevant to a particular aerodrome. DfT/ODPM Circular 01/2003¹⁹³ provides advice to planning authorities on the official safeguarding of aerodromes and includes a list of the civil aerodromes which are officially safeguarded.
- 5.5.14 The DfT/ODPM Circular 01/2003¹⁹⁴ and CAA guidance also recommends that the operators of aerodromes which are not officially safeguarded should take steps to protect their aerodrome from the possible effects of development by establishing an agreed consultation procedure between themselves and the LPAs.
- 5.5.15 The certified Safeguarding maps for all aerodromes (both licensed and unlicensed) depicting the OLS and other criteria (for example to minimise "birdstrike" hazards) are deposited with the relevant LPAs.
- 5.5.16 The CAA makes clear that the responsibility for the safeguarding of General Aviation aerodromes lies with the aerodrome operator.
- 5.5.17 There are also "Public Safety Zones" (PSZs) at the end of runways of the busiest airports in the UK, within which development is restricted to minimise risks to people on the ground in the event of an aircraft accident on take-off or landing. Maps showing the PSZs are deposited with the relevant LPAs. DfT Circular 01/2010 provides advice to local planning authorities on Public Safety Zones.¹⁹⁵

¹⁹¹ CAA CAP 168: Licensing of Aerodromes: See

<https://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=6114>

¹⁹² See <https://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=576>

¹⁹³ DfT/ODPM Circular 01/2003: Safeguarding, Aerodromes, Technical Sites and Military Explosives Storage Areas.

¹⁹⁴ DfT/ODPM Circular 01/2003: Safeguarding, Aerodromes, Technical Sites and Military Explosives Storage Areas.

¹⁹⁵ DfT circular 01/2010: Control of Development in Airport Public Safety Zones: See

<https://www.gov.uk/government/publications/control-of-development-in-airport-public-safety-zones>

- 5.5.18 The military Low Flying system covers the whole of the UK and enables low flying activities as low as 75m (mean separation distance). A considerable amount of military flying for training purposes is conducted at as low as 30m in designated Tactical Training Areas (TTAs) in mid Wales, Cumbria, the Scottish Border region and in the Electronic Warfare Range in the Scottish Border area. In addition, military helicopters may operate down to ground level.
- 5.5.19 New energy infrastructure may cause obstructions in Ministry of Defence (MOD) low flying areas. A balance must be struck between defence and energy needs in these areas.
- 5.5.20 Sufficient air training space and space for civil operations will be required and operation around structures such as wind turbines will become increasingly important as the number of these structures increase.

Communications, navigation and surveillance (CNS) infrastructure

- 5.5.21 Safe and efficient operations within UK airspace is dependent upon CNS infrastructure, including radar (often referred to as ‘technical sites’).
- 5.5.22 Energy infrastructure development may interfere with the operation of CNS systems such as radar. This is a particular problem for wind turbines as they can act as a reflector or diffractor of radio signals upon which Air Traffic Control Services rely (an effect which is particularly likely to arise when large structures, such as wind turbines, are near Communications and Navigation Aids and technical sites). Wind turbines may also cause false returns and other technical issues when built in line of sight to radar installations.
- 5.5.23 Windfarms are an integral part of the plan to achieve Net Zero, as well as delivering affordable clean energy to consumers. The government has an official ambition to deliver up to 50GW of offshore wind by 2030 and the Committee on Climate Change’s 6th Carbon Budget (CB6) views offshore wind as the backbone of electricity generation across all its scenarios. The Offshore Wind Sector Deal confirmed that government will work collaboratively with the energy sector and wider stakeholders to address strategic deployment issues including aviation and surveillance systems including radar.
- 5.5.24 Whilst it is hoped that future surveillance technologies will enable civil and military aviation, defence and meteorological surveillance providers and offshore windfarms to meet coexistence challenges, it should not be assumed, however, that there will be sufficient advancement in surveillance technologies to meet all future requirements.
- 5.5.25 A “system of systems” approach may help address the impacts on air surveillance and routine air traffic control operations for those windfarms that exist when radar or other surveillance systems are procured, however this can add complexity to aviation safety assurance and operating practices.

- 5.5.26 Surveillance methods that rely on cooperation alone, such as Automatic Dependent Surveillance – Broadcast (ADS-B) or Secondary Surveillance Radar transponders, are not sufficient to meet the UKs security and national defence requirements nor would they assure the flight safety of air traffic from non-cooperative threats.
- 5.5.27 MOD recognises that the environmental baseline includes existing windfarms and any mitigation solutions that have been established to support them when procuring future radar systems.
- 5.5.28 As existing CNS infrastructure reaches the end of its operational life, replacement options that are more tolerant of wind turbines, if available, should be installed by CNS owners/operators to futureproof aerodromes against possible future turbine installations in order to maintain or enhance aviation safety. This should be considered on a case-by-case basis, so that the correct solution(s) are identified which strike the balance between surveillance quality/needs and reasonableness of costs being achieved, whilst maintaining safety.
- 5.5.29 Applicants should provide relevant information on proposed developments to enable CNS owners/operators to consider upgrades appropriately.

Weather warnings and forecasts

- 5.5.30 The UK weather radar network is composed of 15 weather radars that are operated and maintained by the Met Office. Each radar provides data out to 255km that underpin the Public Weather Service and the provision of critical meteorological information to a range of stakeholders including aviation, defence, civil contingencies, and the wider UK population, and in the case of severe weather, through the National Severe Weather Warning Service (NSWWS).
- 5.5.31 Weather radars are currently the only means of detecting the presence and location of precipitation in real time. The main hazard from precipitation is flooding and assessment of the potential flood impacts are carried out in consultation with the UKs authoritative flood agencies.
- 5.5.32 Some energy structures, such as wind turbines, have the potential to adversely impact weather radar signals, even beyond 100km from the radar. This can lead to downstream impacts in meteorological and hydrological warning systems that use radar data, which in turn decreases the credibility of warning systems. For example, when the size of the affected area exceeds the typical size of storms, warning systems may miss the initial stages of a significant rainfall event, which can cause delays in issuing warnings.

- 5.5.33 The Met Office protects its weather radars by engaging in the formal planning consultation process. Met Office weather radars are officially safeguarded¹⁹⁶ and as per Secretary of State direction will be consulted directly on all relevant applicable planning applications within safeguarded zones by local planning authorities.¹⁹⁷

Other defence interests

- 5.5.34 The MOD operates military training areas, military danger zones (offshore Danger and Exercise areas), military explosives storage areas and TTAs. There are extensive Danger and Exercise Areas across the UKCS for military firing and highly surveyed routes to support government shipping that are essential for national defence.
- 5.5.35 Other operational defence assets may be affected by new development, for example the Seismological Monitoring Station at Eskdalemuir and maritime acoustic facilities used to test and calibrate noise emissions from naval vessels, such as at Portland Harbour. The MOD also operates Air Defence radars which have wide coverage over the UK (onshore and offshore).
- 5.5.36 It is important that new energy infrastructure does not unacceptably impede or compromise the safe and effective use of any defence assets.
- 5.5.37 The Joint industry and government Air Defence and Offshore Wind Mitigation Task Force was set up to enable the co-existence of UK Air Defence and offshore wind. The Strategy and Implementation Plan¹⁹⁸ sets the direction for that collaboration. The recommendations generated from this Task Force should be referred to by both aviation and energy stakeholders.

Applicant assessment

- 5.5.38 Where the proposed development may affect the performance of civil or military aviation CNS, meteorological radars and/or other defence assets an assessment of potential effects should be set out in the ES (see Section 4.2).
- 5.5.39 The requirement for ATC and non-cooperative surveillance – i.e. radar/tracking technologies - forms part of the environmental baseline for proposed developments.
- 5.5.40 The applicant should consult the MOD, Met Office, Civil Aviation Authority (CAA), NATS and any aerodrome – licensed or otherwise – likely to be affected by the

¹⁹⁶ Town & Country Planning (Safeguarded Meteorological Sites) (England) Direction 2014, The Town and Country Planning (Safeguarded Aerodromes, Technical Sites, Meteorological Technical Sites and Military Explosives Storage Areas) (Scotland) Direction 2016), Town and Country Planning (Crug-yGorllwyn) Technical Site Direction (2016), Town and Country Planning (Safeguarded Meteorological Sites) Order 2014, Meteorological (Castor Bay) Technical Sites Direction

¹⁹⁷ See <https://www.gov.uk/guidance/consultation-and-pre-decision-matters#safeguarding-directions>

¹⁹⁸ See <https://www.gov.uk/government/publications/air-defence-and-offshore-wind-working-together-towards-net-zero/air-defence-and-offshore-wind-working-together-towards-net-zero>

proposed development in preparing an assessment of the proposal on aviation, meteorological or other defence interests.

- 5.5.41 Any assessment of effects on aviation, meteorological or other defence interests should include potential impacts of the project upon the operation of CNS infrastructure, flight patterns (both civil and military), generation of weather warnings and forecasts, other defence assets (including radar) and aerodrome operational procedures. It should also assess the demonstratable cumulative effects¹⁹⁹ of the project with other relevant projects in relation to aviation, meteorological and defence.
- 5.5.42 In addition, consideration of developments near aerodromes should take into account the following factors:
- Bird Strike Risk - Aircraft are vulnerable to wildlife strike, in particular bird strike. Birds and other wildlife may be attracted to the vicinity of an aerodrome by various types of development, for example, large buildings with perching/roosting opportunities for birds. It is therefore important that infrastructure, buildings and other elements from energy installations, as well as environmental mitigation are designed in such a way so as not to increase the bird strike risk to the airport for developments within 13km (this can vary)²⁰⁰.
 - Building Induced Turbulence - If a significant building or structure is proposed close to the airport/runways, there is potential for building induced turbulence/wind shear to be created which has the potential to impact on aircraft on take-off and landing. Studies may be required to identify the extent of any turbulence resulting from the energy infrastructure.
 - Thermal Plume Turbulence - This is caused under certain conditions by the release of hot air from a power plant equipped with a dry cooling system. The plumes generated by these facilities have the potential to create invisible turbulence that can affect the manoeuvrability of aircraft.
- 5.5.43 If any relevant changes are made to proposals during the pre-application and determination period, it is the responsibility of the applicant to ensure that the relevant aviation, meteorological and defence consultees are informed as soon as reasonably possible.

Mitigation

- 5.5.44 The applicant should include appropriate mitigation measures as an integral part of the proposed development.

¹⁹⁹ It may not always be appropriate to share the detailed bases of defence asset assessments on security grounds, to avoid exposing vulnerabilities that could be exploited by potential adversaries.

²⁰⁰ CAP 772 Wildlife Hazard Management at Aerodromes

5.5.45 Mitigation for infringement of OLS may include²⁰¹:

- agreed changes to operational procedures of the aerodromes in accordance with relevant guidance, provided that safety assurances can be provided by the operator that are acceptable to the CAA where the changes are proposed to a civilian aerodrome (and provided that it does not result in an unreasonable reduction of capacity or unreasonable constraints on the operation of the aerodrome against pre-COVID-19 levels); or
- installation of obstacle lighting and/or by notification in Aeronautical Information Service publications

5.5.46 For CNS infrastructure, the UK military Low Flying system (including TTAs) and designated air traffic routes, mitigation may also include:

- operational airspace changes
- agreement to upgrade CNS infrastructure, the cost of which the applicant may reasonably be required to contribute in part or in full until the end of the life of the surveillance equipment if subsequently replaced by a fully windfarm tolerant system. If an appropriate system upgrade cannot be identified at the point of application, the applicant may be required to contribute in part or in full to any future upgrade for the lifetime of the wind farm. Costs should be reflective of need and impact of the energy installation on the monitoring equipment
- introducing radar mitigation technology to the development, e.g. by using non-radar reflecting materials to manufacture wind turbine blades

5.5.47 Mitigation for effects on meteorological radar and CNS systems may include reducing the scale of a project, although it is likely to be unreasonable for the Secretary of State to require mitigation by way of a reduction or alteration in the scale of development.

5.5.48 There may be exceptional circumstances where a small reduction in the scale of a development and any associated reduction in generating capacity, will result in proportionately greater mitigation for radar and CNS systems. In these cases, the Secretary of State may consider that the benefits to CNS and radar mitigation outweighs this loss of capacity.

5.5.49 Consideration from energy stakeholders should also be given to the possibility of introducing radar mitigation technology as windfarm assets are renewed and replaced e.g., by using non-radar reflecting materials to manufacture turbine blades.

²⁰¹ Where mitigation is required using a condition or planning obligation, the tests set out at paragraphs 4.1.5 – 4.1.7 in EN-1 should be applied.

Secretary of State decision making

- 5.5.50 The Secretary of State should be satisfied that the effects on meteorological radars, civil and military aerodromes, aviation technical sites and other defence assets have been addressed by the applicant and that any necessary assessment of the proposal on aviation, NSWWS or defence interests has been carried out.
- 5.5.51 In particular, the Secretary of State should be satisfied that the proposal has been designed, where possible, to minimise adverse impacts on the operation and safety of aerodromes and that realistically achievable mitigation is carried out on existing surveillance systems such as radar / tracking technologies. It may also be appropriate for operators of the aerodrome to examine the possibility of agreeing to make reasonable changes to operational procedures.
- 5.5.52 When assessing the necessity, acceptability, and reasonableness of operational changes to aerodromes, the Secretary of State should be satisfied that they have the necessary information regarding the operational procedures along with any demonstrable risks or harm of such changes, taking into account the cases put forward by all parties. When making such a judgement in the case of military aerodromes, the Secretary of State should have regard to interests of defence and national security.
- 5.5.53 In the case of meteorological radars, the Secretary of State should consider the extent to which the provision of weather and flood warnings is compromised.
- 5.5.54 If there are conflicts between the government's energy and transport policies and military interests in relation to the application, the Secretary of State should expect the relevant parties to have made appropriate efforts to work together to identify realistic and pragmatic solutions to the conflicts. In so doing, the parties should seek to protect the aims and interests of the other parties as far as possible, recognising simultaneously the evolving landscape in terms of the UK's energy security and the need to tackle climate change, which necessitates the installation of wind turbines and the need to maintain air safety and national defence and the national weather warning service.
- 5.5.55 There are statutory requirements concerning lighting to tall structures.²⁰² Where lighting is requested on structures that goes beyond statutory requirements by any of the relevant aviation and defence consultees, the Secretary of State should be satisfied of the necessity of such lighting taking into account the case put forward by the consultees. The effect of such lighting on the landscape and ecology may be a relevant consideration.
- 5.5.56 Lighting must also be designed in such a way as to ensure that there is no glare or dazzle to pilots and/or ATC, aerodrome ground lighting is not obscured and that any

²⁰² Articles 222 and 223. Air Navigation Order 2016.

lighting does not diminish the effectiveness of aeronautical ground lighting and cannot be confused with aeronautical lighting.

- 5.5.57 Where new technologies to mitigate the adverse effects of wind farms on surveillance systems, such as radar, are concerned, the Secretary of State should have regard to any government guidance which emerges from the joint government/Industry Aviation Management Board and the Joint Air Defence and Offshore Wind Task Force.
- 5.5.58 Where suitable technological solutions have not yet been developed or proven, the Secretary of State will need to consider the likelihood of a solution becoming available within the time limit for implementation of the development consent.
- 5.5.59 Where a proposed energy infrastructure development would significantly impede or compromise the safe and effective use of civil or military aviation, meteorological radars, defence assets and/or significantly limit military training, the Secretary of State may consider the use of ‘Grampian conditions’²⁰³, or other forms of requirement which relate to the use of current or future technological solutions, to mitigate impacts on legacy CNS equipment.
- 5.5.60 Where, after reasonable mitigation, operational changes, obligations and requirements have been proposed, the Secretary of State should consider that:
- a development would prevent a licensed aerodrome from maintaining its licence and the operational loss of the said aerodrome would have impacts on national security and defence, or result in substantial local/national economic loss, or emergency service needs
 - it would cause harm to aerodromes’ training or emergency service needs,
 - the development would impede or compromise the safe and effective use of defence assets or unacceptably limit military training
 - the development would have a negative impact on the safe and efficient provision of en-route air traffic control services for civil aviation, in particular through an adverse effect on CNS infrastructure
 - the development would compromise the effective provision of weather warnings by the NSWWS, or flood warnings by the UKs flood agencies
- 5.5.61 Provided that the Secretary of State is satisfied that the impacts present risks to national security and physical safety, such that they outweigh the urgent need for an acceleration in the deployment of offshore wind, or other technology; and provided that the Secretary of State is satisfied that all efforts have been made by the parties

²⁰³ As set out on See <https://www.gov.uk/guidance/use-of-planning-conditions>, a Grampian condition refers to a condition worded in a negative form, i.e. prohibiting development authorised by the planning permission or other aspects linked to the planning permission (e.g. occupation of premises) until a specific action has been taken (such as the provision of supporting infrastructure).

to find an acceptable mitigation of the impact, and that such mitigation is not available, consent should not be granted.

5.6 Coastal Change

- 5.6.1 The government's Flood and Coastal Erosion Risk Management Policy Statement²⁰⁴ sets out our ambition to create a nation more resilient to future flood and coastal erosion risk. It outlines policies and actions which will accelerate progress to better protect and better prepare the country against flooding and coastal erosion.
- 5.6.2 The government's aim is to ensure that our coastal communities continue to prosper and adapt to coastal change. This means planning should:
- ensure that policies and decisions in coastal areas are based on an understanding of coastal change over time
 - prevent new development from being put at risk from coastal change by:
 - i. avoiding inappropriate development in areas that are vulnerable to coastal change or any development that adds to the impacts of physical changes to the coast
 - ii. directing development away from areas vulnerable to coastal change
 - ensure that the risk to development which is, exceptionally, necessary in coastal change areas because it requires a coastal location and provides substantial economic and social benefits to communities, is managed over its planned lifetime
 - ensure that plans are in place to secure the long-term sustainability of coastal areas
- 5.6.3 For the purpose of this section, coastal change means physical change to the shoreline, i.e. erosion, coastal landslip, permanent inundation and coastal accretion.
- 5.6.4 Where onshore infrastructure projects are proposed on the coast, coastal change is a key consideration as well as a vital element of climate change adaptation (see Section 4.9).
- 5.6.5 Some kinds of coastal change happen very gradually, others over shorter timescales. Some are the result of purely natural processes others, including potentially significant modifications of the coastline or coastal environment resulting from climate change, are wholly or partly man-made. This section is concerned both with the impacts which energy infrastructure can have as a driver of coastal change and with how to ensure that developments are resilient to ongoing and potential future coastal change.

²⁰⁴ See <https://www.gov.uk/government/publications/flood-and-coastal-erosion-risk-management-policy-statement>

- 5.6.6 The construction of an onshore energy project on the coast may involve, for example, dredging, dredge spoil deposition, cooling water, culvert construction, marine landing facility construction and flood and coastal protection measures which could result in direct effects on the coastline, seabed and marine ecology and biodiversity.
- 5.6.7 Additionally, indirect changes to the coastline and seabed might arise as a result of a hydrodynamic response to some of these direct changes. This could lead to localised or more widespread coastal erosion or accretion and changes to offshore features such as submerged banks and ridges, marine biodiversity and heritage assets.
- 5.6.8 This section only applies to onshore energy infrastructure projects situated on the coast. The impacts of offshore renewable energy projects on marine life and coastal geomorphology are considered in EN-3.
- 5.6.9 Section 5.4 on biodiversity and geological conservation, Section 5.8 on flood risk and Section 4.9 on adaptation to climate change, including the increased risk of coastal erosion, are also relevant, as is advice on access to coastal recreation sites and features in Section 5.11 on land use.
- 5.6.10 Advice on the historic environment in Section 5.9 may also be relevant.

Applicant assessment

- 5.6.11 Where relevant, applicants should undertake coastal geomorphological and sediment transfer modelling to predict and understand impacts and help identify relevant mitigating or compensatory measures.
- 5.6.12 The ES (see Section 4.2) should include an assessment of the effects on the coast, tidal rivers and estuaries. In particular, applicants should assess:
- the impact of the proposed project on coastal processes and geomorphology, including by taking account of potential impacts from climate change. If the development will have an impact on coastal processes the applicant must demonstrate how the impacts will be managed to minimise adverse impacts on other parts of the coast
 - the implications of the proposed project on strategies for managing the coast as set out in Shoreline Management Plans (SMPs)²⁰⁵ (which provide a large-scale assessment of the physical risks associated with coastal processes and present a long term policy framework to reduce these risks to people and the developed, historic and natural environment in a sustainable manner), any relevant Marine Plans, River Basin Management Plans, and capital programmes for maintaining flood and coastal defences and Coastal Change Management Areas

²⁰⁵ See <https://www.gov.uk/government/publications/shoreline-management-plans-smps>

- the effects of the proposed project on marine ecology, biodiversity, protected sites and heritage assets
- how coastal change could affect flood risk management infrastructure, drainage and flood risk
- the effects of the proposed project on maintaining coastal recreation sites and features
- the vulnerability of the proposed development to coastal change, taking account of climate change, during the project's operational life and any decommissioning period

5.6.13 For any projects involving dredging or deposit of any substance or object into the sea, the applicant should consult the MMO and Historic England, or the NRW in Wales. Where a project has the potential to have a major impact in this respect, this is covered in the technology specific NPSs. For example, EN-4 looks further at the environmental impacts of dredging in connection with Liquefied Natural Gas (LNG) tanker deliveries to LNG import facilities.

5.6.14 The applicant should be particularly careful to identify any effects of physical changes on the integrity and special features of Marine Protected Areas (MPAs). These could include MCZs, HRA Sites including Special Areas of Conservation and Special Protection Areas with marine features, Ramsar Sites, Sites of Community Importance, and SSSIs with marine features. Applicants should also identify any effects on the special character of Heritage Coasts²⁰⁶.

5.6.15 Applicants must demonstrate that full account has been taken of the policy on assessment and mitigation in paragraphs 4.2.1 to 4.2.9 of this NPS, taking account of the potential effects of climate change on these risks.

Mitigation

5.6.16 Applicants should propose appropriate mitigation measures to address adverse physical changes to the coast, in consultation with the MMO, the EA or NRW, LPAs, other statutory consultees, Coastal Partnerships and other coastal groups, as it considers appropriate. Where this is not the case, the Secretary of State should consider what appropriate mitigation requirements might be attached to any grant of development consent.

Secretary of State decision making

5.6.17 The Secretary of State should be satisfied that the proposed development will be resilient to coastal erosion and deposition, taking account of climate change, during the project's operational life and any decommissioning period. Proposals that aim to facilitate the relocation of existing energy infrastructure from unsustainable locations

²⁰⁶ See <https://www.gov.uk/government/publications/heritage-coasts-protecting-undeveloped-coast/heritage-coasts-definition-purpose-and-natural-englands-role>

which are at risk from coastal change, should be supported where it would result in climate resilient infrastructure.

- 5.6.18 The Secretary of State should not normally consent new development in areas of dynamic shorelines where the proposal could inhibit sediment flow or have an adverse impact on coastal processes at other locations. Impacts on coastal processes must be managed to minimise adverse impacts on other parts of the coast. Where such proposals are brought forward, consent should only be granted where the Secretary of State is satisfied that the benefits (including need) of the development outweigh the adverse impacts.
- 5.6.19 The Secretary of State should ensure that applicants have restoration plans for areas of foreshore disturbed by direct works and will undertake pre- and post-construction coastal monitoring arrangements with defined triggers for intervention and restoration.
- 5.6.20 The Secretary of State should examine the broader context of coastal protection around the proposed site, and the influence in both directions, i.e. coast on site, and site on coast.
- 5.6.21 The Secretary of State should consult the MMO on projects which could impact on coastal change in England, or NRW for projects in Wales, since the MMO or NRW may also be involved in considering other projects which may have related coastal impacts.
- 5.6.22 In addition to this NPS, the Secretary of State must have regard to the appropriate marine policy documents, as provided for in the Marine and Coastal Access Act 2009, in taking any decision which relates to the exercise of any function capable of affecting any part of the UK marine area. The Secretary of State should also have regard to any relevant Shoreline Management Plans²⁰⁷.
- 5.6.23 Substantial weight should be attached to the risks of flooding and coastal erosion and the Secretary of State should be satisfied that the applicant has taken full account of the policy on assessment and mitigation in paragraphs 4.2.1 to 4.2.9 of this NPS, taking account of the potential effects of climate change on these risks.

²⁰⁷ Shoreline management plans are developed by Coastal Groups with members mainly from local councils and the Environment Agency. They identify the most sustainable approach to managing the flood and coastal erosion risks to the coastline in the short term (0 to 20 years), medium term (20 to 50 years) and the long term (50 to 100 years). The Shoreline Management Plan is available online at: <https://www.gov.uk/government/publications/shoreline-management-plans-smpls>

5.7 Dust, Odour, Artificial Light, Smoke, Steam, and Insect Infestation

- 5.7.1 During the construction, operation and decommissioning of energy infrastructure there is potential for the release of a range of emissions such as odour, dust, steam, smoke, artificial light and infestation of insects. All have the potential to have a detrimental impact on amenity or cause a common law nuisance or statutory nuisance under Part III, Environmental Protection Act 1990²⁰⁸. However, they are not regulated by the environmental permitting regime, so mitigation of these impacts will need to be included in the DCO.
- 5.7.2 Note that pollution impacts from some of these emissions (for example dust, smoke) are covered in the Section 5.2 on air emissions.
- 5.7.3 Because of the potential effects of these emissions and infestation, and in view of the availability of the defence of statutory authority against nuisance claims described in Section 4.14, it is important that the potential for these impacts is considered by the applicant and Secretary of State.
- 5.7.4 For energy NSIPs of the type covered by this NPS, some impact on amenity for local communities is likely to be unavoidable. The aim should be to keep impacts to a minimum, and at a level that is acceptable.

Applicant assessment

- 5.7.5 The applicant should assess the potential for insect infestation and emissions of odour, dust, steam, smoke, and artificial light to have a detrimental impact on amenity, as part of the ES.
- 5.7.6 In particular, the assessment provided by the applicant should describe:
- the type, quantity and timing of emissions
 - aspects of the development which may give rise to emissions
 - premises or locations that may be affected by the emissions
 - effects of the emission on identified premises or locations
 - measures to be employed in preventing or mitigating the emissions
- 5.7.7 The applicant is advised to consult the relevant local planning authority and, where appropriate, the EA about the scope and methodology of the assessment.

Mitigation

- 5.7.8 Mitigation measures may include one or more of the following:

²⁰⁸ See <https://www.legislation.gov.uk/ukpga/1990/43/part/III>

- engineering: prevention of a specific emission at the point of generation; control, containment and abatement of emissions if generated
- lay-out: adequate distance between source and sensitive receptors; reduced transport or handling of material
- administrative: limiting operating times; restricting activities allowed on the site; implementing management plans

5.7.9 Construction should be undertaken in a way that reduces emissions, for example the use of low emission mobile plant during the construction, and demolition phases as appropriate, and consideration should be given to making these mandatory in DCO requirements.

5.7.10 Demolition considerations should be embedded into designs at the outset to enable demolition techniques to be adopted that remove the need for explosive demolition.

5.7.11 A construction management plan may help clarify and secure mitigation.

Secretary of State decision making

5.7.12 The Secretary of State should satisfy itself that:

- an assessment of the potential for artificial light, dust, odour, smoke, steam and insect infestation to have a detrimental impact on amenity has been carried out
- that all reasonable steps have been taken, and will be taken, to minimise any such detrimental impacts

5.7.13 If development consent is granted for a project, the Secretary of State should consider whether there is a justification for all of the authorised project (including any associated development) to be covered by a defence of statutory authority against nuisance claims. If the Secretary of State cannot conclude that this is justified, the Secretary of State should disapply in whole or in part the defence through a provision in the development consent order.

5.7.14 Where the Secretary of State believes it appropriate, the Secretary of State may consider attaching requirements to the development consent, to secure certain mitigation measures.

5.7.15 In particular, the Secretary of State should consider whether to require the applicant to abide by a scheme of management and mitigation concerning insect infestation and emissions of odour, dust, steam, smoke, and artificial light from the development. The Secretary of State should consider the need for such a scheme to reduce any loss to amenity which might arise during the construction, operation and decommissioning of the development. A construction management plan may help codify mitigation at that stage.

5.8 Flood Risk

- 5.8.1 Flooding is a natural process that plays an important role in shaping the natural environment. However, flooding threatens life and causes substantial disruption and damage to property.
- 5.8.2 The effects of weather events on the natural environment, life and property can be increased in severity both as a consequence of decisions about the location, design and nature of settlement and land use, and as a potential consequence of future climate change. Having resilient energy infrastructure not only reduces the risk of flood damages to the infrastructure, it also reduces the disruptive impacts of flooding on those homes and businesses that rely on that infrastructure. Although flooding cannot be wholly prevented, its adverse impacts can be avoided or reduced through good planning and management.
- 5.8.3 The government's Flood and Coastal Erosion Risk Management Policy Statement²⁰⁹ sets out our ambition to create a nation more resilient to future flood and coastal erosion risk. It outlines policies and actions which will accelerate progress to better protect and better prepare the country against flooding and coastal erosion. The industry should consider any updates to government policy and apply updated approaches as a matter of priority.
- 5.8.4 All buildings in flood risk areas can improve their preparedness to reduce costs and disruption to key public services when a flood happens. Where infrastructure is not better protected as part of a wider community scale flood defence scheme, those who own and run infrastructure sites – whether in public or private hands – are expected to take action to keep water out, minimise the damage if water gets in through flood-resilient materials, and reduce the disruption caused. This includes effective contingency planning to mitigate the impacts of flooding on the delivery of important services.
- 5.8.5** Climate change is already having an impact and is expected to have an increasing impact on the UK throughout this century. The UK Climate Projections 2018²¹⁰ show an increased chance of milder, wetter winters and hotter, drier summers in the UK, with more intensive rainfall causing flooding. Sea levels will continue to rise beyond the end of the century, increasing risks to vulnerable coastal communities. Within the lifetime of energy projects, these factors will lead to increased flood risks in areas susceptible to flooding, and to an increased risk of the occurrence of floods in some areas which are not currently thought of as being at risk. A robust approach to flood risk management is a vital element of climate change adaptation; the applicant and

²⁰⁹ See <https://www.gov.uk/government/publications/flood-and-coastal-erosion-risk-management-policy-statement-progress-updates/flood-and-coastal-erosion-risk-management-policy-statement-progress-update-2021>

²¹⁰ See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69257/pb13274-uk-climate-projections-090617.pdf

the Secretary of State should take account of the policy on climate change adaptation in Section 4.9.

- 5.8.6 The aims of planning policy on development and flood risk are to ensure that flood risk from all sources of flooding is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to steer new development to areas with the lowest risk of flooding.
- 5.8.7 Where new energy infrastructure is, exceptionally, necessary in flood risk areas (for example where there are no reasonably available sites in areas at lower risk), policy aims to make it safe for its lifetime without increasing flood risk elsewhere and, where possible, by reducing flood risk overall. It should also be designed and constructed to remain operational in times of flood.
- 5.8.8 Proposals that aim to facilitate the relocation of existing energy infrastructure from unsustainable locations which are or will be at unacceptable risk of flooding, should be supported where it would result in climate-resilient infrastructure.
- 5.8.9 If, following application of the Sequential Test²¹¹, it is not possible, (taking into account wider sustainable development objectives), for the project to be located in areas of lower flood risk the Exception Test can be applied, as required by Annex 3 of the Planning Practice Guidance.²¹² The test provides a method of allowing necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available.
- 5.8.10 The Exception Test²¹³ is only appropriate for use where the Sequential Test alone cannot deliver an acceptable site. It would only be appropriate to move onto the Exception Test when the Sequential Test has identified reasonably available, lower risk sites appropriate for the proposed development where, accounting for wider sustainable development objectives, application of relevant policies would provide a clear reason for refusing development in any alternative locations identified. Examples could include alternative site(s) that are subject to national designations such as landscape, heritage and nature conservation designations, for example Areas of Outstanding Natural Beauty (AONBs), SSSIs and World Heritage Sites (WHS) which would not usually be considered appropriate.
- 5.8.11 Both elements of the Exception Test will have to be satisfied for development to be consented. To pass the Exception Test it should be demonstrated that:
- the project would provide wider sustainability benefits to the community²¹⁴ that outweigh flood risk; and

²¹¹ See <https://www.gov.uk/guidance/flood-risk-and-coastal-change#the-sequential-approach-to-the-location-of-development>

²¹² See <https://www.gov.uk/guidance/flood-risk-and-coastal-change#Table-3-Flood-risk-vulnerability>

²¹³ See <https://www.gov.uk/guidance/flood-risk-and-coastal-change#the-exception-test>

²¹⁴ These would include the benefits (including need), for the infrastructure set out in Part 3.

- the project will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible will reduce flood risk overall.

5.8.12 Development should be designed to ensure there is no increase in flood risk elsewhere, accounting for the predicted impacts of climate change throughout the lifetime of the development. There should be no net loss of floodplain storage and any deflection or constriction of flood flow routes should be safely managed within the site. Mitigation measures should make as much use as possible of natural flood management techniques.

Applicant assessment

5.8.13 A site-specific flood risk assessment should be provided for all energy projects in Flood Zones 2 and 3 in England or Zones B and C in Wales. In Flood Zone 1 in England or Zone A in Wales, an assessment should accompany all proposals involving:

- sites of 1 hectare or more
- land which has been identified by the EA or NRW as having critical drainage problems
- land identified (for example in a local authority strategic flood risk assessment) as being at increased flood risk in future
- land that may be subject to other sources of flooding (for example surface water)
- where the EA or NRW, Lead Local Flood Authority, Internal Drainage Board or other body have indicated that there may be drainage problems.

5.8.14 This assessment should identify and assess the risks of all forms of flooding to and from the project and demonstrate how these flood risks will be managed, taking climate change into account.

5.8.15 The minimum requirements for Flood Risk Assessments (FRA) are that they should:

- be proportionate to the risk and appropriate to the scale, nature and location of the project;
- consider the risk of flooding arising from the project in addition to the risk of flooding to the project;
- take the impacts of climate change into account, across a range of climate scenarios, clearly stating the development lifetime over which the assessment has been made²¹⁵;

²¹⁵ Refer to Flood risk assessments: climate change allowances - See <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

- be undertaken by competent people, as early as possible in the process of preparing the proposal;
- consider both the potential adverse and beneficial effects of flood risk management infrastructure, including raised defences, flow channels, flood storage areas and other artificial features, together with the consequences of their failure and exceedance;
- consider the vulnerability of those using the site, including arrangements for safe access and escape;
- consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and include information on flood likelihood, speed-of-onset, depth, velocity, hazard and duration;
- identify and secure opportunities to reduce the causes and impacts of flooding overall, making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management;
- consider the effects of a range of flooding events including extreme events on people, property, the natural and historic environment and river and coastal processes;
- include the assessment of the remaining (known as 'residual') risk after risk reduction measures have been taken into account and demonstrate that these risks can be safely managed, ensuring people will not be exposed to hazardous flooding;
- consider how the ability of water to soak into the ground may change with development, along with how the proposed layout of the project may affect drainage systems. Information should include:
 - i. Describe the existing surface water drainage arrangements for the site
 - ii. Set out (approximately) the existing rates and volumes of surface water run-off generated by the site. Detail the proposals for restricting discharge rates
 - iii. Set out proposals for managing and discharging surface water from the site using sustainable drainage systems and accounting for the predicted impacts of climate change. If sustainable drainage systems have been rejected, present clear evidence of why their inclusion would be inappropriate
 - iv. Demonstrate how the hierarchy of drainage options has been followed.²¹⁶

²¹⁶ Refer to Planning Practice Guidance Sustainable Drainage Systems section – See <https://www.gov.uk/guidance/flood-risk-and-coastal-change#sustainable-drainage-systems>

- v. Explain and justify why the types of SuDS²¹⁷ and method of discharge have been selected and why they are considered appropriate. Where cost is a reason for not including SuDS, provide information to enable comparison with the lifetime costs of a conventional public sewer connection
- vi. Explain how sustainable drainage systems have been integrated with other aspects of the development such as open space or green infrastructure, so as to ensure an efficient use of the site
- vii. Describe the multifunctional benefits the sustainable drainage system will provide
- viii. Set out which opportunities to reduce the causes and impacts of flooding have been identified and included as part of the proposed sustainable drainage system
- ix. Explain how run-off from the completed development will be prevented from causing an impact elsewhere
- x. Explain how the sustainable drainage system been designed to facilitate maintenance and, where relevant, adoption. Set out plans for ensuring an acceptable standard of operation and maintenance throughout the lifetime of the development

- detail those measures that will be included to ensure the development will be safe and remain operational during a flooding event throughout the development's lifetime without increasing flood risk elsewhere;
- identify and secure opportunities to reduce the causes and impacts of flooding overall during the period of construction; and
- be supported by appropriate data and information, including historical information on previous events.

5.8.16 Further guidance can be found in the Planning Practice Guidance Flood Risk and Coastal Change section²¹⁸ which accompanies the NPPF²¹⁹, TAN15 for Wales²²⁰ or successor documents.

5.8.17 Development (including construction works) will need to account for any existing watercourses and flood and coastal erosion risk management structures or features, or any land likely to be needed for future structures or features so as to ensure:

- Access, clearances and sufficient land are retained to enable their maintenance, repair, operation, and replacement, as necessary
- Their standard of protection is not reduced

²¹⁷ See <https://www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards>

²¹⁸ See <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

²¹⁹ See <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

²²⁰ See <https://gov.wales/technical-advice-note-tan-15-development-and-flood-risk-2004>

- Their condition or structural integrity is not reduced

- 5.8.18 Applicants for projects which may be affected by, or may add to, flood risk should arrange pre-application discussions before the official pre-application stage of the NSIP process with the EA or NRW, and, where relevant, other bodies such as Lead Local Flood Authorities, Internal Drainage Boards, sewerage undertakers, navigation authorities, highways authorities and reservoir owners and operators.
- 5.8.19 Such discussions should identify the likelihood and possible extent and nature of the flood risk, help scope the FRA, and identify the information that will be required by the Secretary of State to reach a decision on the application when it is submitted. The Secretary of State should advise applicants to undertake these steps where they appear necessary but have not yet been addressed.
- 5.8.20 If the EA, NRW or another flood risk management authority²²¹ has reasonable concerns about the proposal on flood risk grounds, the applicant should discuss these concerns with the EA or NRW and take all reasonable steps to agree ways in which the proposal might be amended, or additional information provided, which would satisfy the authority's concerns.
- 5.8.21 The Sequential Test²²² ensures that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account. Where it is not possible to locate development in low-risk areas, the Sequential Test should go on to compare reasonably available sites with medium risk areas and then, only where there are no reasonably available sites in low and medium risk areas, within high-risk areas.
- 5.8.22 The technology specific NPSs set out some exceptions to the application of the Sequential Test. However, when seeking development consent on a site allocated in a development plan through the application of the Sequential Test, informed by a strategic flood risk assessment, applicants need not apply the Sequential Test, provided the proposed development is consistent with the use for which the site was allocated and there is no new flood risk information that would have affected the outcome of the test.
- 5.8.23 Consideration of alternative sites should take account of the policy on alternatives set out in Section 4.2 above. All projects should apply the Sequential Test to locating development within the site.

Mitigation

- 5.8.24 To satisfactorily manage flood risk, arrangements are required to manage surface water and the impact of the natural water cycle on people and property.

²²¹ See <https://www.gov.uk/government/collections/flood-and-coastal-erosion-risk-management-authorities>

²²² See <https://www.gov.uk/guidance/flood-risk-and-coastal-change#the-sequential-approach-to-the-location-of-development>

- 5.8.25 In this NPS, the term SuDS refers to the whole range of sustainable approaches to surface water drainage management including, where appropriate:
- source control measures including rainwater recycling and drainage
 - infiltration devices to allow water to soak into the ground, that can include individual soakaways and communal facilities
 - filter strips and swales, which are vegetated features that hold and drain water downhill mimicking natural drainage patterns
 - filter drains and porous pavements to allow rainwater and run-off to infiltrate into permeable material below ground and provide storage if needed
 - basins ponds and tanks to hold excess water after rain and allow controlled discharge that avoids flooding
 - flood routes to carry and direct excess water through developments to minimise the impact of severe rainfall flooding
- 5.8.26 Site layout and surface water drainage systems should cope with events that exceed the design capacity of the system, so that excess water can be safely stored on or conveyed from the site without adverse impacts.
- 5.8.27 The surface water drainage arrangements for any project should, accounting for the predicted impacts of climate change throughout the development's lifetime, be such that the volumes and peak flow rates of surface water leaving the site are no greater than the rates prior to the proposed project, unless specific off-site arrangements are made and result in the same net effect.
- 5.8.28 It may be necessary to provide surface water storage and infiltration to limit and reduce both the peak rate of discharge from the site and the total volume discharged from the site. There may be circumstances where it is appropriate for infiltration facilities or attenuation storage to be provided outside the project site, if necessary through the use of a planning obligation.
- 5.8.29 The sequential approach should be applied to the layout and design of the project. Vulnerable aspects of the development should be located on parts of the site at lower risk and residual risk of flooding. Applicants should seek opportunities to use open space for multiple purposes such as amenity, wildlife habitat and flood storage uses. Opportunities should be taken to lower flood risk by reducing the built footprint of previously developed sites and using SuDS.
- 5.8.30 Where a development may result in an increase in flood risk elsewhere through the loss of flood storage, on-site level-for-level compensatory storage, accounting for the predicted impacts of climate change over the lifetime of the development, should be provided.
- 5.8.31 Where it is not possible to provide compensatory storage on site, it may be acceptable to provide it off-site if it is hydraulically and hydrologically linked. Where

development may cause the deflection or constriction of flood flow routes, these will need to be safely managed within the site.

- 5.8.32 Where development may contribute to a cumulative increase in flood risk elsewhere, the provision of multifunctional sustainable drainage systems, natural flood management and green infrastructure can also make a valuable contribution to mitigating this risk whilst providing wider benefits.
- 5.8.33 The receipt of and response to warnings of floods is an essential element in the management of the residual risk of flooding. Flood Warning and evacuation plans should be in place for those areas at an identified risk of flooding.
- 5.8.34 The applicant should take advice from the local authority emergency planning team, emergency services and, where appropriate, from the local resilience forum when producing an evacuation plan for a manned energy project as part of the FRA. Any emergency planning documents, flood warning and evacuation procedures that are required should be identified in the FRA.
- 5.8.35 Flood resistant and resilient materials and design should be adopted to minimise damage and speed recovery in the event of a flood.

Secretary of State decision making

- 5.8.36 In determining an application for development consent, the Secretary of State should be satisfied that where relevant:
- the application is supported by an appropriate FRA
 - the Sequential Test has been applied and satisfied as part of site selection
 - a sequential approach has been applied at the site level to minimise risk by directing the most vulnerable uses to areas of lowest flood risk
 - the proposal is in line with any relevant national and local flood risk management strategy²²³
 - SuDS (as required in the next paragraph on National Standards) have been used unless there is clear evidence that their use would be inappropriate
 - in flood risk areas the project is designed and constructed to remain safe and operational during its lifetime, without increasing flood risk elsewhere (subject to the exceptions set out in paragraph 5.8.18)
 - the project includes safe access and escape routes where required, as part of an agreed emergency plan, and that any residual risk can be safely managed over the lifetime of the development
 - land that is likely to be needed for present or future flood risk management infrastructure has been appropriately safeguarded from development to the extent

²²³ As provided for in section 9(1) of the Flood and Water Management Act 2010.

that development would not prevent or hinder its construction, operation or maintenance

- 5.8.37 For energy projects which have drainage implications, approval for the project's drainage system, including during the construction period, will form part of the development consent issued by the Secretary of State. The Secretary of State will therefore need to be satisfied that the proposed drainage system complies with any National Standards published by Ministers under paragraph 5(1) of Schedule 3 to the Flood and Water Management Act 2010.²²⁴
- 5.8.38 In addition, the development consent order, or any associated planning obligations, will need to make provision for appropriate operation and maintenance of any SuDS throughout the project's lifetime. Where this is secured through the adoption of any SuDS features, any necessary access rights to property will need to be granted.
- 5.8.39 Where relevant, the Secretary of State should be satisfied that the most appropriate body is being given the responsibility for maintaining any SuDS, taking into account the nature and security of the infrastructure on the proposed site. Responsible bodies could include, for example the landowner, the relevant lead local flood authority or water and sewerage company (through the Ofwat-approved Sewerage Sector Guidance²²⁵), or another body, such as an Internal Drainage Board.
- 5.8.40 If the EA, NRW or another flood risk management authority continues to have concerns and objects to the grant of development consent on the grounds of flood risk, the Secretary of State can grant consent, but would need to be satisfied before deciding whether or not to do so that all reasonable steps have been taken by the applicant and the authority to try to resolve the concerns.
- 5.8.41 Energy projects should not normally be consented within Flood Zone 3b²²⁶, or Zone C2 in Wales, or on land expected to fall within these zones within its predicted lifetime. This may also apply where land is subject to other sources of flooding (for example surface water). However, where essential energy infrastructure has to be located in such areas, for operational reasons, they should only be consented if the development will not result in a net loss of floodplain storage, and will not impede water flows.
- 5.8.42 Exceptionally, where an increase in flood risk elsewhere cannot be avoided or wholly mitigated, the Secretary of State may grant consent if they are satisfied that the increase in present and future flood risk can be mitigated to an acceptable and safe level and taking account of the benefits of, including the need for, nationally significant energy infrastructure as set out in Part 3 above. In any such case the Secretary of State should make clear how, in reaching their decision, they have weighed up the increased flood risk against the benefits of the project, taking account

²²⁴ See <https://www.legislation.gov.uk/ukpga/2010/29/schedule/3>

²²⁵ Sewerage Sector Guidance: See <https://www.water.org.uk/sewerage-sector-guidance-approved-documents/>

²²⁶ The Functional Floodplain where water has to flow or be stored in times of flood.

of the nature and degree of the risk, the future impacts on climate change, and advice provided by the EA or NRW and other relevant bodies.

5.9 Historic Environment

- 5.9.1 The construction, operation and decommissioning of energy infrastructure has the potential to result in adverse impacts on the historic environment above, at and below the surface of the ground.
- 5.9.2 The historic environment includes all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, landscaped and planted or managed flora.
- 5.9.3 Those elements of the historic environment that hold value to this and future generations because of their historic, archaeological, architectural or artistic interest are called ‘heritage assets’. Heritage assets may be buildings, monuments, sites, places, areas or landscapes, or any combination of these. The sum of the heritage interests that a heritage asset holds is referred to as its significance.²²⁷ Significance derives not only from a heritage asset’s physical presence, but also from its setting.²²⁸
- 5.9.4 Some heritage assets have a level of significance that justifies official designation. Categories of designated heritage assets are:
- World Heritage Sites²²⁹
 - Scheduled Monuments
 - Protected Wreck Sites
 - Protected Military Remains
 - Listed Buildings
 - Registered Parks and Gardens
 - Registered Battlefields

²²⁷ Terms used in this section, including the term “Designated Heritage Asset” are defined in Annex 2 of the National Planning Policy Framework.

²²⁸ The setting of a heritage asset is the surroundings in which it is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset and may affect the ability to appreciate that significance or may be neutral.

²²⁹ The Department of Digital Culture, Media and Sport is responsible for consultation with UNESCO but Historic England generally deal with the issues at a project level.

- Conservation Areas²³⁰
- Registered Historic Landscapes (Wales only).

5.9.5 There are heritage assets that are not currently designated, but which have been demonstrated to be of equivalent significance to designated heritage assets of the highest significance. These are:

- those that the Secretary of State has recognised as being capable of being designated as a Scheduled Monument or Protected Wreck Site but has decided not to designate
- those that the Secretary of State has recognised as being of equivalent significance to Scheduled Monuments or Protected Wreck Sites but are incapable of being designated by virtue of being outside the scope of the related legislation.

5.9.6 Non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to Scheduled Monuments should be considered subject to the policies for designated heritage assets²³¹. The absence of designation for such heritage assets does not indicate lower significance.

5.9.7 The Secretary of State should also consider the impacts on other non-designated heritage assets (as identified either through the development plan making process by plan-making bodies, including 'local listing', or through the application, examination and decision making process). This is on the basis of clear evidence that such heritage assets have a significance that merits consideration in that process, even though those assets are of lesser significance than designated heritage assets.

5.9.8 Impacts on heritage assets specific to types of infrastructure are included in the technology specific NPSs.

Applicant assessment

5.9.9 The applicant should undertake an assessment of any likely significant heritage impacts of the proposed development as part of the EIA and describe these in the ES (see Section 4.2). This should include consideration of heritage assets above, at, and below the surface of the ground. Consideration will also need to be given to the possible impacts, including cumulative, on the wider historic environment. The assessment should include reference to any historic landscape or seascape character assessment and associated studies as a means of assessing impacts relevant to the proposed project.

²³⁰ The issuing of licences to undertake works on Protected Wreck Sites in English waters is the responsibility of the Secretary of State for Digital, Culture, Media and Sport and does not form part of development consents issued by the Secretary of State for BEIS. In Wales it is the responsibility of Welsh Ministers. The issuing of licences for Protected Military Remains is the responsibility of the Secretary of State for Defence.

²³¹ There will be archaeological interest in a heritage asset if it holds, or may potentially hold, evidence of past human activity worthy of expert investigation at some point.

- 5.9.10 As part of the ES the applicant should provide a description of the significance of the heritage assets affected by the proposed development, including any contribution made by their setting. The level of detail should be proportionate to the importance of the heritage assets and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum, the applicant should have consulted the relevant Historic Environment Record²³² (or, where the development is in English or Welsh waters, Historic England or Cadw) and assessed the heritage assets themselves using expertise where necessary according to the proposed development's impact.
- 5.9.11 Where a site on which development is proposed includes, or the available evidence suggests it has the potential to include, heritage assets with an archaeological interest, the applicant should carry out appropriate desk-based assessment and, where such desk-based research is insufficient to properly assess the interest, a field evaluation. Where proposed development will affect the setting of a heritage asset, accurate representative visualisations may be necessary to explain the impact.²³³
- 5.9.12 The applicant should ensure that the extent of the impact of the proposed development on the significance of any heritage assets affected can be adequately understood from the application and supporting documents. Studies will be required on those heritage assets affected by noise, vibration, light and indirect impacts, the extent and detail of these studies will be proportionate to the significance of the heritage asset affected.
- 5.9.13 The applicant is encouraged, where opportunities exist, to prepare proposals which can make a positive contribution to the historic environment, and to consider how their scheme takes account of the significance of heritage assets affected. This can include, where possible:
- enhancing, through a range of measures such a sensitive design, the significance of heritage assets or setting affected
 - considering where required the development of archive capacity which could deliver significant public benefits
 - considering how visual or noise impacts can affect heritage assets, and whether there may be opportunities to enhance access to, or interpretation, understanding and appreciation of, the heritage assets affected by the scheme

²³² Historic Environment Records (HERs) are information services maintained by local authorities and National Park Authorities with a view to providing access to comprehensive and dynamic resources relating to the historic environment of an area for public benefit and use. Details of Historic Environment Records in England are available from the Heritage Gateway website. For Wales, HERs can be obtained through the Historic Wales Portal at See <https://historic-wales-rcahmw.hub.arcgis.com/> Historic England and Cadw hold additional information about heritage assets in English or Welsh waters. Historic England or Cadw should also be consulted, where relevant.

²³³ Relevant guidance is given in the Historic England publication, The Setting of Heritage Assets See <https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/>

- 5.9.14 Careful consideration in preparing the scheme will be required on whether the impacts on the historic environment will be direct or indirect, temporary, or permanent.
- 5.9.15 Applicants should look for opportunities for new development within Conservation Areas and World Heritage Sites, and within the setting of heritage assets, to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably.

Mitigation

- 5.9.16 A documentary record of our past is not as valuable as retaining the heritage asset, and therefore the ability to record evidence of the asset should not be a factor in deciding whether such loss should be permitted, and whether or not consent should be given.
- 5.9.17 Where the loss of the whole or part of a heritage asset's significance is justified, the Secretary of State will require the applicant to record and advance understanding of the significance of the heritage asset before it is lost (wholly or in part). The extent of the requirement should be proportionate to the asset's importance and significance and the impact. The applicant should be required to publish this evidence and to deposit copies of the reports with the relevant Historic Environmental Record. They should also be required to deposit the archive generated in a local museum or other public repository willing to receive it.
- 5.9.18 Where appropriate, the Secretary of State will impose requirements on the Development Consent Order to ensure that the work is undertaken in a timely manner, in accordance with a written scheme of investigation that complies with the policy in this NPS and which has been agreed in writing with the relevant local authority, and to ensure that the completion of the exercise is properly secured.
- 5.9.19 Where there is a high probability (based on an adequate assessment) that a development site may include, as yet undiscovered heritage assets with archaeological interest, the Secretary of State will consider requirements to ensure appropriate procedures are in place for the identification and treatment of such assets discovered during construction.

Secretary of State decision making

- 5.9.20 In determining applications, the Secretary of State should seek to identify and assess the particular significance of any heritage asset that may be affected by the proposed development, including by development affecting the setting of a heritage asset (including assets whose setting may be affected by the proposed development), taking account of:

- relevant information provided with the application and, where applicable, relevant information submitted during the examination of the application
- any designation records, including those on the National Heritage List for England²³⁴
- historic landscape character records
- the relevant Historic Environment Record(s), and similar sources of information
- representations made by interested parties during the examination process
- expert advice, where appropriate, and when the need to understand the significance of the heritage asset demands it

5.9.21 The Secretary of State must also comply with the requirements on listed buildings, conservation areas and scheduled monuments, set out in Regulation 3 of the Infrastructure Planning (Decisions) Regulations 2010²³⁵.

5.9.22 In considering the impact of a proposed development on any heritage assets, the Secretary of State should consider the particular nature of the significance of the heritage assets and the value that they hold for this and future generations. This understanding should be used to avoid or minimise conflict between their conservation and any aspect of the proposal.

5.9.23 The Secretary of State should consider the desirability of sustaining and, where appropriate, enhancing the significance of heritage assets, the contribution of their settings and the positive contribution that their conservation can make to sustainable communities, including to their quality of life, their economic vitality, and to the public's enjoyment of these assets.²³⁶

5.9.24 The Secretary of State should also consider the desirability of the new development making a positive contribution to the character and local distinctiveness of the historic environment. The consideration of design should include scale, height, massing, alignment, materials, use and landscaping (for example, screen planting).

5.9.25 When considering the impact of a proposed development on the significance of a designated heritage asset, the Secretary of State should give great weight to the asset's conservation. The more important the asset, the greater the weight should be. This is irrespective of whether any potential harm amounts to substantial harm, total loss, or less than substantial harm to its significance.

²³⁴ See <https://historicengland.org.uk/listing/the-list/>

²³⁵ See <https://www.legislation.gov.uk/ukxi/2010/305/regulation/3/made>

²³⁶ This can be by virtue of: heritage assets having an influence on the character of the environment and an area's sense of place; heritage assets having a potential to be a catalyst for regeneration in an area, particularly through leisure, tourism and economic development; heritage assets being a stimulus to inspire new development of imaginative and high quality design; and the mixed and flexible patterns of land use in historic areas that are likely to be, and remain, sustainable.

- 5.9.26 The Secretary of State should give considerable importance and weight to the desirability of preserving all heritage assets. Any harm or loss of significance of a designated heritage asset (from its alteration or destruction, or from development within its setting) should require clear and convincing justification.
- 5.9.27 Substantial harm to or loss of significance of a grade II Listed Building or a grade II Registered Park or Garden should be exceptional.
- 5.9.28 Substantial harm to or loss of significance of assets of the highest significance, including Scheduled Monuments; Protected Wreck Sites; Registered Battlefields; grade I and II* Listed Buildings; grade I and II* Registered Parks and Gardens; and World Heritage Sites, should be wholly exceptional.
- 5.9.29 Where the proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset the Secretary of State should refuse consent unless it can be demonstrated that the substantial harm to, or loss of, significance is necessary to achieve substantial public benefits that outweigh that harm or loss, or all the following apply:
- the nature of the heritage asset prevents all reasonable uses of the site
 - no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation
 - conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible
 - the harm or loss is outweighed by the benefit of bringing the site back into use
- 5.9.30 Where the proposed development will lead to less than substantial harm to the significance of the designated heritage asset, this harm should be weighed against the public benefits of the proposal, including, where appropriate securing its optimum viable use.
- 5.9.31 In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.
- 5.9.32 Not all elements of a Conservation Area or World Heritage Site will necessarily contribute to its significance. Loss of a building (or other element) which makes a positive contribution to the significance of the Conservation Area or World Heritage Site should be treated either as substantial harm or less than substantial harm under paragraph 5.9.29 or less than substantial harm under paragraph 5.9.30, as appropriate, considering the relative significance of the element affected and its contribution to the significance of the Conservation Area or World Heritage Site as a whole.

- 5.9.33 Where there is evidence of deliberate neglect of, or damage to, a heritage asset, the Secretary of State should not take its deteriorated state into account in any decision.²³⁷
- 5.9.34 When considering applications for development affecting the setting of a designated heritage asset, the Secretary of State should give appropriate weight to the desirability of preserving the setting such assets and treat favourably applications that preserve those elements of the setting that make a positive contribution to, or better reveal the significance of, the asset. When considering applications that do not do this, the Secretary of State should give great weight to any negative effects, when weighing them against the wider benefits of the application. The greater the negative impact on the significance of the designated heritage asset, the greater the benefits that will be needed to justify approval.²³⁸

5.10 Landscape and Visual

- 5.10.1 The landscape and visual effects of energy projects will vary on a case by case basis according to the type of development, its location and the landscape setting of the proposed development. In this context, references to landscape should be taken as covering seascape and townscape where appropriate.
- 5.10.2 Among the features which are common to a number of different thermal combustion technologies, cooling towers and exhaust stacks and their plumes have the most obvious impact on landscape and visual amenity. Visual impacts may be not just the physical structures but also visible steam plumes from cooling towers.²³⁹
- 5.10.3 Other types of cooling system, for example direct throughput where water is abstracted, used for cooling then returned to source, or air-cooled condensers, will have less visible impacts as the structures are considerably lower than natural draught cooling towers and exhibit no visible steam plumes. Further, modern hybrid cooling systems – for example mechanical draught – do not generally exhibit visible steam plumes except in exceptional adverse weather conditions. These systems are normally considered as the “Best Available Techniques” (BAT). However there may be losses of electricity output owing to the need for energy to operate hybrid cooling or air-cooled condenser systems.

²³⁷ Historic Environment Good Practice Advice in Planning 2 provides further advice on managing significance in decision-taking in the historic environment, available online at: See <https://historicengland.org.uk/images-books/publications/gpa2-managing-significance-in-decision-taking/>

²³⁸ See the Infrastructure Planning (Decisions) Regulations 2010

²³⁹ Cooling towers and exhaust stacks can form part of projects covered by EN-2, EN-3 and EN-6. Other features of energy infrastructure which can be similarly prominent are associated with particular technologies and so are considered in the technology-specific NPSs (see e.g. Section 2.9 of EN-5).

- 5.10.4 Landscape effects arise not only from the sensitivity of the landscape but also the nature and magnitude of change proposed by the development, whose specific siting and design make the assessment a case-by-case judgement.
- 5.10.5 Virtually all nationally significant energy infrastructure projects will have adverse effects on the landscape, but there may also be beneficial landscape character impacts arising from mitigation.
- 5.10.6 Projects need to be designed carefully, taking account of the potential impact on the landscape. Having regard to siting, operational and other relevant constraints the aim should be to minimise harm to the landscape, providing reasonable mitigation where possible and appropriate.
- 5.10.7 National Parks, the Broads and AONBs have been confirmed by the government as having the highest status of protection in relation to landscape and natural beauty. Each of these designated areas has specific statutory purposes which help ensure their continued protection and which the Secretary of State should have regard to in their decisions.²⁴⁰
- 5.10.8 The duty to have regard to the purposes of nationally designated areas also applies when considering applications for projects outside the boundaries of these areas which may have impacts within them. The aim should be to avoid harming the purposes of designation or to minimise adverse impacts on designated areas, and such projects should be designed sensitively given the various siting, operational, and other relevant constraints. This should include projects in England which may have impacts on National Scenic Areas in Scotland or National Parks and AONBs in Wales, as well as projects in Wales which may have impacts on National Parks and AONBs in England.
- 5.10.9 Heritage Coasts are defined areas of undeveloped coastline which are managed to conserve their natural beauty and, where appropriate, to improve accessibility for visitors.
- 5.10.10 Development within a Heritage Coast (that is not also a National Park, The Broads or an AONB) is unlikely to be appropriate, unless it is compatible with the natural beauty and special character of the area.
- 5.10.11 Outside nationally designated areas, there are local landscapes that may be highly valued locally. Where a local development document in England or a local development plan in Wales has policies based on landscape or waterscape character assessment, these should be paid particular attention. However, locally valued

²⁴⁰ For an explanation of the duties which will apply to the Secretary of State, see 'Duties on relevant authorities to have regard to the purposes of National Parks, AONBs and the Norfolk and Suffolk Broads' at https://landscapesforlife.org.uk/application/files/2015/8928/8605/Duty_of_Regard_Guide_Defra_2005.pdf

landscapes should not be used in themselves to refuse consent, as this may unduly restrict acceptable development.

5.10.12 All proposed energy infrastructure is likely to have visual effects for many receptors around proposed sites.

5.10.13 The Secretary of State will have to judge whether the visual effects on sensitive receptors, such as local residents, and other receptors, such as visitors to the local area, outweigh the benefits of the project.

5.10.14 Coastal areas are particularly vulnerable to visual intrusion because of the potential high visibility of development on the foreshore, on the skyline and affecting views along stretches of undeveloped coast.

Applicant assessment

5.10.15 The applicant should carry out a landscape and visual impact assessment and report it in the ES, including cumulative effects (see Section 4.2). Several guides have been produced to assist in addressing landscape issues.²⁴¹

5.10.16 The landscape and visual assessment should include reference to any landscape character assessment and associated studies as a means of assessing landscape impacts relevant to the proposed project. The applicant's assessment should also take account of any relevant policies based on these assessments in local development documents in England and local development plans in Wales.

5.10.17 For seascapes, applicants should consult the Seascape Character Assessment and the Marine Plan Seascape Character Assessments, and any successors to them.²⁴²

5.10.18 The applicant should consider landscape and visual matters in the early stages of siting and design, where site choices and design principles are being established. This will allow the applicant to demonstrate in the ES how both negative effects have been minimised and opportunities for creating positive benefits or enhancement have been recognised.

5.10.19 The assessment should include the effects on landscape components and character during construction and operation. For projects which may affect a National Park,

²⁴¹ The Landscape Institute and Institute of Environmental Management and Assessment: Guidelines for Landscape and Visual Impact Assessment (2013, 3rd edition); Landscape and Seascape Character Assessments – see <https://www.gov.uk/guidance/landscape-and-seascape-character-assessments>; Countryside Council for Wales/Cadw (2007) Guide to Good Practice on Using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process; or any successor documents.

²⁴² The Seascape Character Assessments Guidance: See <https://www.gov.uk/government/publications/seascape-character-assessments-identify-and-describe-seascape-types>; Marine plan seascape character assessments: see <https://www.gov.uk/government/publications/seascape-assessments-for-north-east-north-west-south-east-south-west-marine-plan-areas-mmo1134>, See <https://www.gov.uk/government/publications/seascape-assessment-for-the-south-marine-plan-areas-mmo-1037> and see <https://www.gov.uk/government/publications/east-marine-plan-areas-seascape-character-assessment-for-england> and See <https://naturalresources.wales/evidence-and-data/maps/marine-character-areas/?lang=en> for Wales

The Broads or an Areas of Outstanding Natural Beauty the assessment should include effects on the natural beauty and special qualities of these areas’.

- 5.10.20 The assessment should include the visibility and conspicuousness of the project during construction and of the presence and operation of the project and potential impacts on views and visual amenity. This should include light pollution effects, including on local amenity, and nature conservation.
- 5.10.21 The assessment should also demonstrate how noise and light pollution, and other emissions (see Section 5.2 and Section 5.7), from construction and operational activities on residential amenity and on sensitive locations, receptors and views, will be minimised.
- 5.10.22 Applicants are expected to justify BAT for the use of a cooling system that involves visible steam plumes or has a high visible structure, such as a natural draught cooling tower explaining why the application of modern hybrid cooling technology or other technologies is not reasonably practicable.
- 5.10.23 Applicants should consider how landscapes can be enhanced using landscape management plans, as this will help to enhance environmental assets where they contribute to landscape and townscape quality.
- 5.10.24 In considering visual effects it may be helpful for applicants to draw attention, in the supporting evidence to their applications, to any examples of existing permitted infrastructure they are aware of with a similar magnitude of impact on sensitive receptors. This may assist the Secretary of State in judging the weight they should give to the assessed visual impacts of the proposed development.

Mitigation

- 5.10.25 Reducing the scale of a project can help to mitigate the visual and landscape effects of a proposed project. However, reducing the scale or otherwise amending the design of a proposed energy infrastructure project may result in a significant operational constraint and reduction in function - for example, the electricity generation output. There may, however, be exceptional circumstances, where mitigation could have a very significant benefit and warrant a small reduction in function. In these circumstances, the Secretary of State may decide that the benefits of the mitigation to reduce the landscape and/or visual effects outweigh the marginal loss of function.
- 5.10.26 Within a defined site, adverse landscape and visual effects may be minimised through appropriate siting of infrastructure within that site, design including colours and materials, and landscaping schemes, depending on the size and type of the proposed project. Materials and designs of buildings should always be given careful consideration.

5.10.27 Depending on the topography of the surrounding terrain and areas of population it may be appropriate to undertake landscaping off site. For example, filling in gaps in existing tree and hedge lines may mitigate the impact when viewed from a more distant vista.

Secretary of State decision making

5.10.28 The Secretary of State should take into consideration the level of detailed design which the applicant has provided and is secured in the DCO, and the extent to which design details are subject to future approvals.

5.10.29 The Secretary of State should be satisfied that local authorities will have sufficient design content secured to ensure future consenting will meet landscape, visual and good design objectives.

5.10.30 When considering visual impacts of thermal combustion generating stations, the Secretary of State should presume that the adverse impacts would be less if a hybrid or direct cooling system is used. The Secretary of State should therefore expect information in the application justifying BAT for the use of a cooling system that involves visible steam plumes or has a high visible structure, such as a natural draught cooling tower, and be satisfied that the application of modern hybrid cooling technology or other technologies is not reasonably practicable before giving consent to a development with natural draught cooling towers.

5.10.31 When considering applications for development within National Parks, the Broads and Areas of Outstanding Natural Beauty the conservation and enhancement of the natural beauty of the landscape and countryside should be given substantial weight by the Secretary of State in deciding on applications for development consent in these areas. The Secretary of State may grant development consent in these areas in exceptional circumstances. Such development should be demonstrated to be in the public interest and consideration of such applications should include an assessment of:

- the need for the development, including in terms of national considerations²⁴³, and the impact of consenting or not consenting it upon the local economy;
- the cost of, and scope for, developing all or part of the development elsewhere outside the designated area or meeting the need for it in some other way, taking account of the policy on alternatives set out in Section 4.2; and
- any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.

²⁴³ National considerations should be understood to include the national need for the infrastructure as set out in Part 3 of this NPS and the contribution of the infrastructure to the national economy.

- 5.10.32 The Secretary of State should ensure that any projects consented in these designated areas should be carried out to high environmental standards, including through the application of appropriate requirements where necessary.
- 5.10.33 The duty to have regard to the purposes of nationally designated areas also applies when considering applications for projects outside the boundaries of these areas which may have impacts within them. The fact that a proposed project will be visible from within a designated area should not in itself be a reason for the Secretary of State to refuse consent.
- 5.10.34 The scale of energy projects means that they will often be visible within many miles of the site of the proposed infrastructure. The Secretary of State should judge whether any adverse impact on the landscape would be so damaging that it is not offset by the benefits (including need) of the project.
- 5.10.35 In reaching a judgment, the Secretary of State should consider whether any adverse impact is temporary, such as during construction, and/or whether any adverse impact on the landscape will be capable of being reversed in a timescale that the Secretary of State considers reasonable.
- 5.10.36 The Secretary of State should consider whether the project has been designed carefully, taking account of environmental effects on the landscape and siting, operational and other relevant constraints, to minimise harm to the landscape, including by appropriate mitigation.
- 5.10.37 The Secretary of State should consider whether requirements to the consent are needed requiring the incorporation of particular design details that are in keeping with the statutory and technical requirements for landscape and visual impacts.

5.11 Land Use, Including Open Space, Green Infrastructure, and Green Belt

- 5.11.1 An energy infrastructure project will have a direct effect on the existing use of the proposed site and may have indirect effects on the use, or planned use, of land in the vicinity for other types of development. Given the likely locations of energy infrastructure projects there may be particular effects on open space²⁴⁴ including green and blue infrastructure.²⁴⁵

²⁴⁴ Open space is defined in the Town and Country Planning Act 1990 as land laid out as a public garden, or used for the purposes of public recreation, or land which is a disused burial ground. However, in applying the policies in this section, open space should be taken to mean all open space of public value, including not just land, but also areas of water such as rivers, canals, lakes and reservoirs which offer important opportunities for sport and recreation and can also act as a visual amenity.

²⁴⁵ Green infrastructure is a network of multi-functional green and blue spaces and other natural features, both rural and urban, which is capable of delivering a wide range of environmental, economic, health and wellbeing benefits for nature, climate, local and wider communities and prosperity

- 5.11.2 Green Belts, defined in a local authority's development plan²⁴⁶ in England or regional strategic development plans in Wales, are situated around certain cities and large built-up areas. The fundamental aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open; the essential characteristics of Green Belts are their openness and permanence. For further information on the purposes of Green Belt policy see chapter 13 of the NPPF, or any successor to it.²⁴⁷
- 5.11.3 Although the re-use of previously developed land for new development can make a major contribution to sustainable development by reducing the amount of countryside and undeveloped greenfield land that needs to be used, it may not be possible for many forms of energy infrastructure.
- 5.11.4 Development of land will affect soil resources, including physical loss of and damage to soil resources, through land contamination and structural damage. Indirect impacts may also arise from changes in the local water regime, organic matter content, soil biodiversity and soil process.
- 5.11.5 Where pre-existing land contamination is being considered within a development, the objective is to ensure that the site is suitable for its intended use. Risks would require consideration in accordance with the contaminated land statutory guidance as a minimum.²⁴⁸
- 5.11.6 The government's policy is to ensure there is adequate provision of high quality open space and sports and recreation facilities to meet the needs of local communities. Connecting people with open spaces, sports and recreational facilities all help to underpin people's quality of life and have a vital role to play in promoting healthy living.
- 5.11.7 Green and blue infrastructure²⁴⁹ can also enable developments to provide positive environmental, social, health and economic benefits. Green infrastructure includes green space such as parks and woodlands but also other environmental features such as street trees, hedgerows and green walls and roofs. It also includes blue infrastructure such as canals, rivers, streams, ponds lakes and their borders. Well designed and managed green and blue infrastructure provides multiple benefits at a range of scales. It can contribute to biodiversity recovery, sequester carbon, absorb surface water, cleanse pollutants, absorb noise and reduce high temperatures.

Applicant assessment

²⁴⁶ Or else so designated under The Green Belt (London and Home Counties) Act 1938.

²⁴⁷ Further information on Wales can be found in PPW 3.64-3.78.

²⁴⁸ <https://www.gov.uk/government/publications/contaminated-land-statutory-guidance>

²⁴⁹ Green infrastructure is a network of multi-functional green spaces, both new and existing, both rural and urban, which supports the natural and ecological processes and is integral to the health and quality of life of sustainable communities. Blue infrastructure relates to features which incorporate the water environment.

- 5.11.8 The ES (see Section 4.2) should identify existing and proposed²⁵⁰ land uses near the project, any effects of replacing an existing development or use of the site with the proposed project or preventing a development or use on a neighbouring site from continuing. Applicants should also assess any effects of precluding a new development or use proposed in the development plan. The assessment should be proportionate to the scale of the preferred scheme and its likely impacts on such receptors. For developments on previously developed land, the applicant should ensure that they have considered the risk posed by land contamination and how it is proposed to address this.
- 5.11.9 Applicants will need to consult the local community on their proposals to build on existing open space, sports or recreational buildings and land. Taking account of the consultations, applicants should consider providing new or additional open space including green and blue infrastructure, sport or recreation facilities, to substitute for any losses as a result of their proposal.
- 5.11.10 Applicants should use any up-to-date local authority assessment or, if there is none, provide an independent assessment to show whether the existing open space, sports and recreational buildings and land is surplus to requirements.
- 5.11.11 During any pre-application discussions with the applicant the LPA should identify any concerns it has about the impacts of the application on land use, having regard to the development plan and relevant applications and including, where relevant, whether it agrees with any independent assessment that the land is surplus to requirements.
- 5.11.12 Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5).
- 5.11.13 Applicants should also identify any effects and seek to minimise impacts on soil health and protect and improve soil quality taking into account any mitigation measures proposed.
- 5.11.14 Applicants are encouraged to develop and implement a Soil Management Plan which could help minimise potential land contamination. The sustainable reuse of soils needs to be carefully considered in line with good practice guidance where large quantities of soils are surplus to requirements or are affected by contamination.²⁵¹
- 5.11.15 Developments should contribute to and enhance the natural and local environment by preventing new and existing developments from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.

²⁵⁰ For example, where a planning application has been submitted.

²⁵¹ For guidance, see the Defra Code of practice for the sustainable use of soils on construction sites

- 5.11.16 Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.
- 5.11.17 Applicants should ensure that a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination.
- 5.11.18 For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination, and where contamination is present, applicants should consider opportunities for remediation where possible. It is important to do this as early as possible as part of engagement with the relevant bodies before the official pre-application stage.²⁵²
- 5.11.19 Applicants should safeguard any mineral resources on the proposed site as far as possible, taking into account the long-term potential of the land use after any future decommissioning has taken place.
- 5.11.20 The general policies controlling development in the countryside apply with equal force in Green Belts but there is, in addition, a general presumption against inappropriate development within them. Such development should not be approved except in very special circumstances. Applicants should therefore determine whether their proposal, or any part of it, is within an established Green Belt and if it is, whether their proposal may be inappropriate development within the meaning of Green Belt policy (see paragraph 5.11.35 below).
- 5.11.21 However, infilling or redevelopment of major developed sites in the Green Belt, if identified as such by the local planning authority, may be suitable for energy infrastructure. It may help to secure jobs and prosperity without further prejudicing the Green Belt or offer the opportunity for environmental improvement. Applicants should refer to relevant criteria²⁵³ on such developments in Green Belts.
- 5.11.22 Moreover an applicant may be able to demonstrate that particular energy infrastructure, such as an underground pipeline, may be considered an “engineering operation” and regarded as not inappropriate in Green Belt. This is provided it preserves the openness of the Green Belt and does not conflict with the purposes of Green Belt designation. It may also be possible for an applicant to show that the physical characteristics of a proposed overhead line in a particular location would not have so harmful an impact as to conflict with the purposes of Green Belt designation, or with other protections of rural landscape

Mitigation

- 5.11.23 Although in the case of most energy infrastructure there may be little that can be done to mitigate the direct effects of an energy project on the existing use of the

²⁵² See <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

²⁵³ See Section 13 of the NPPF, or any successor to it.

proposed site (assuming that some of that use can still be retained post project construction) applicants should nevertheless seek to minimise these effects and the effects on existing or planned uses near the site by the application of good design principles, including the layout of the project and the protection of soils during construction.

- 5.11.24 Where green infrastructure is affected, the Secretary of State should consider imposing requirements to ensure the functionality and connectivity of the green infrastructure network is maintained in the vicinity of the development and that any necessary works are undertaken, where possible, to mitigate any adverse impact and, where appropriate, to improve that network and other areas of open space including appropriate access to National Trails and other public rights of way and new coastal access routes.
- 5.11.25 The Secretary of State should also consider whether any adverse effect on green infrastructure and other forms of open space is adequately mitigated or compensated by means of any planning obligations, for example exchange land and provide for appropriate management and maintenance agreements. Any exchange land should be at least as good in terms of size, usefulness, attractiveness and quality, and accessibility.
- 5.11.26 Alternatively, where sections 131 and 132 of the Planning Act 2008 apply, replacement land provided under those sections will need to conform to the requirements of those sections.
- 5.11.27 Existing trees and woodlands should be retained wherever possible. The applicant should assess the impacts on, and loss of, all trees and woodlands within the project boundary and develop mitigation measures to minimise adverse impacts and any risk of net deforestation as a result of the scheme. Mitigation may include the use of buffers to enhance resilience, improvements to connectivity, and improved woodland management. Where woodland loss is unavoidable, compensation schemes will be required, and the long-term management and maintenance of newly planted trees should be secured.
- 5.11.28 Where a proposed development has an impact upon a Mineral Safeguarding Area (MSA), the Secretary of State should ensure that appropriate mitigation measures have been put in place to safeguard mineral resources.
- 5.11.29 Where a project has a sterilising effect on land use (for example in some cases under transmission lines) there may be scope for this to be mitigated through, for example, using or incorporating the land for nature conservation or wildlife corridors or for parking and storage in employment areas.
- 5.11.30 Public Rights of way, National Trails, and other rights of access to land are important recreational facilities for example for walkers, cyclists and horse riders. The Secretary of State should expect applicants to take appropriate mitigation measures to address adverse effects on coastal access, National Trails, other rights of way and open

access land and, where appropriate, to consider what opportunities there may be to improve or create new access. In considering revisions to an existing right of way, consideration should be given to the use, character, attractiveness, and convenience of the right of way.

- 5.11.31 The Secretary of State should consider whether the mitigation measures put forward by an applicant are acceptable and whether requirements or other provisions in respect of these measures should be included in any grant of development consent.

Secretary of State decision making

- 5.11.32 The Secretary of State should not grant consent for development on existing open space, sports and recreational buildings and land unless an assessment has been undertaken either by the local authority or independently, which has shown the open space or the buildings and land to be surplus to requirements or the Secretary of State determines that the benefits of the project (including need), outweigh the potential loss of such facilities, taking into account any positive proposals made by the applicant to provide new, improved or compensatory land or facilities.
- 5.11.33 The loss of playing fields should only be allowed where applicants can demonstrate that they will be replaced with facilities of equivalent or better quantity or quality in a suitable location.
- 5.11.34 The Secretary of State should ensure that applicants do not site their scheme on the best and most versatile agricultural land without justification. Where schemes are to be sited on best and most versatile agricultural land the Secretary of State should take into account the economic and other benefits of that land. Where development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality.
- 5.11.35 In considering the impact on maintaining coastal recreation sites and features, the Secretary of State should expect applicants to have taken advantage of opportunities to maintain and enhance access to the coast. In doing so the Secretary of State should consider the implications for development of the creation of a continuous signed and managed route around the coast, as provided for in the Marine and Coastal Access Act 2009.²⁵⁴
- 5.11.36 When located in the Green Belt, energy infrastructure projects may comprise 'inappropriate development'.²⁵⁵ Inappropriate development is by definition harmful to the Green Belt. The NPPF makes clear that most new building is inappropriate in Green Belt and should be refused permission unless in very special circumstances.

²⁵⁴ See <https://www.legislation.gov.uk/ukpga/2009/23/contents>

²⁵⁵ Referred to in paragraphs 147-151 of section 13 of the NPPF – https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

- 5.11.37 Very special circumstances are not defined in national planning policy as it is for the individual decision maker to assess each case on its merits and give relevant circumstances their due weight. However, when considering any planning application affecting Green Belt land, the Secretary of State should ensure that substantial weight is given to any harm to the Green Belt when considering any application for such development, while taking account, in relation to renewable and linear infrastructure, of the extent to which its physical characteristics are such that it has limited or no impact on the fundamental purposes of Green Belt designation. Very special circumstances may include the wider environmental benefits associated with increased production of energy from renewables and other low carbon sources.
- 5.11.38 In England, Local Green Spaces may be designated locally in Local Plans and Neighbourhood Plans. These enjoy the same protection as Green Belt in England and the Secretary of State should adopt a similar approach.
- 5.11.39 In Wales, 'green wedges' may be designated locally.²⁵⁶ These enjoy the same protection as Green Belt in Wales and the Secretary of State should adopt a similar approach.
- 5.11.40 Green wedges do not convey the same level of permanence of a Green Belt and should be reviewed by the local authority as part of the development plan review process.

5.12 Noise and Vibration

- 5.12.1 Excessive noise can have wide-ranging impacts on the quality of human life, health (for example owing to annoyance or sleep disturbance), the environment, and the use and enjoyment of areas of value such as quiet places and areas with high landscape quality.
- 5.12.2 The Government's policy on noise is set out in the Noise Policy Statement for England.²⁵⁷ It promotes good health and good quality of life through effective noise management. Similar considerations apply to vibration, which can also cause damage to buildings. In this section, in line with current legislation, references to "noise" below apply equally to the assessment of impacts of vibration.
- 5.12.3 The Welsh Government's overarching policy is set out in its Noise and Soundscape Action Plan 2018 to 2023.²⁵⁸ Its focus is on creating appropriate soundscapes for

²⁵⁶ See Managing Settlement Form - Green Belts and Green Wedges, in Planning Policy Wales (Edition 11, February 2021), or any successor to it See https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf

²⁵⁷ See <https://www.gov.uk/government/publications/noise-policy-statement-for-england>

²⁵⁸ See <https://gov.wales/noise-and-soundscape-action-plan-2018-2023-0>

communities. This includes not only managing noise but also considering what sounds are appropriate in each time and place.

5.12.4 Noise resulting from a proposed development can also have adverse impacts on wildlife and biodiversity. Noise effects of the proposed development on ecological receptors should be assessed by the Secretary of State in accordance with the Biodiversity and Geological Conservation section of this NPS at Section 5.4. This should consider underwater noise and vibration especially for marine developments. Underwater noise can be a significant issue in the marine environment, particularly in regard to energy production.

5.12.5 Factors that will determine the likely noise impact include:

- the inherent operational noise from the proposed development, and its characteristics
- the proximity of the proposed development to noise sensitive premises (including residential properties, schools and hospitals) and noise sensitive areas (including certain parks and open spaces)
- the proximity of the proposed development to quiet places and other areas that are particularly valued for their soundscape or landscape quality
- the proximity of the proposed development to sites where noise may have an adverse impact on protected species or other wildlife

Applicant assessment

5.12.6 Where noise impacts are likely to arise from the proposed development, the applicant should include the following in the noise assessment:

- a description of the noise generating aspects of the development proposal leading to noise impacts, including the identification of any distinctive tonal, impulsive, low frequency or temporal characteristics of the noise
- identification of noise sensitive receptors and noise sensitive areas that may be affected
- the characteristics of the existing noise environment
- a prediction of how the noise environment will change with the proposed development
 - in the shorter term, such as during the construction period
 - in the longer term, during the operating life of the infrastructure
 - at particular times of the day, evening and night (and weekends) as appropriate, and at different times of year

- an assessment of the effect of predicted changes in the noise environment on any noise-sensitive receptors, including an assessment of any likely impact on health and well-being where appropriate, and noise-sensitive areas
- if likely to cause disturbance, an assessment of the effect of underwater or subterranean noise
- measures to be employed in mitigating the effects of noise using best available techniques to reduce noise impacts

- 5.12.7 The nature and extent of the noise assessment should be proportionate to the likely noise impact.
- 5.12.8 Applicants should consider the noise impact of ancillary activities associated with the development, such as increased road and rail traffic movements, or other forms of transportation.
- 5.12.9 Operational noise, with respect to human receptors, should be assessed using the principles of the relevant British Standards²⁵⁹ and other guidance. Further information on assessment of particular noise sources may be contained in the technology specific NPSs. In particular, for renewables (EN-3) and electricity networks (EN-5) there is assessment guidance for specific features of those technologies. For the prediction, assessment and management of construction noise, reference should be made to any relevant British Standards²⁶⁰ and other guidance which also give examples of mitigation strategies.
- 5.12.10 Some noise impacts will be controlled through environmental permits and parallel tracking is encouraged where noise impacts determined by an environmental permit interface with planning issues (i.e. physical design and location of development). The applicant should consult EA and/or the SNCB, as necessary, and in particular regarding assessment of noise on protected species or other wildlife. The results of any noise surveys and predictions may inform the ecological assessment. The seasonality of potentially affected species in nearby sites may also need to be considered.
- 5.12.11 In the marine environment, applicants should consider noise impacts on protected species, both at the individual project level and in-combination with other marine activities.
- 5.12.12 Applicants should submit a detailed impact assessment and mitigation plan as part of any development plan, including the use of noise mitigation and noise abatement technologies during construction and operation.

²⁵⁹ For example BS 4142, BS 6472 and BS 8233.

²⁶⁰ For example BS 5228.

Mitigation

5.12.13 The Secretary of State should consider whether mitigation measures are needed both for operational and construction noise over and above any which may form part of the project application. In doing so the Secretary of State may wish to impose mitigation measures. Any such mitigation measures should take account of the NPPF or any successor to it and planning practice guidance on noise.

5.12.14 Mitigation measures may include one or more of the following:

- engineering: reducing the noise generated at source and/or containing the noise generated
- lay-out: where possible, optimising the distance between the source and noise-sensitive receptors and/or incorporating good design to minimise noise transmission through the use of screening by natural or purpose-built barriers, or other buildings
- administrative: using planning conditions/obligations to restrict activities allowed on the site at certain times and/or specifying permissible noise limits/ noise levels, differentiating as appropriate between different times of day, such as evenings and late at night, and taking into account seasonality of wildlife in nearby designated sites
- insulation: mitigating the impact on areas likely to be affected by noise including through noise insulation when the impact is on a building.

5.12.15 The project should demonstrate good design through selection of the quietest or most acceptable cost-effective plant available; containment of noise within buildings wherever possible, taking into account any other adverse impacts that such containment might cause (e.g. on landscape and visual impacts; optimisation of plant layout to minimise noise emissions; and, where possible, the use of landscaping, bunds or noise barriers to reduce noise transmission).

5.12.16 A development must be undertaken in accordance with statutory requirements for noise. Due regard must be given to the relevant sections of the Noise Policy Statement for England²⁶¹, the NPPF, and the government's associated planning guidance on noise. In Wales the relevant policy will be PPW and the TANs, as well as the Welsh Government's Noise and Soundscape Action Plan.

²⁶¹ See <https://www.gov.uk/government/publications/noise-policy-statement-for-england>

Secretary of State decision making

5.12.17 The Secretary of State should not grant development consent unless they are satisfied that the proposals will meet the following aims, through the effective management and control of noise:

- avoid significant adverse impacts on health and quality of life from noise
- mitigate and minimise other adverse impacts on health and quality of life from noise
- where possible, contribute to improvements to health and quality of life through the effective management and control of noise

5.12.18 When preparing the development consent order, the Secretary of State should consider including measurable requirements or specifying the mitigation measures to be put in place to ensure that noise levels do not exceed any limits specified in the development consent. These requirements or mitigation measures may apply to the construction, operation, and decommissioning of the energy infrastructure development.

5.13 Socio-Economic Impacts

5.13.1 The construction, operation and decommissioning of energy infrastructure may have socio-economic impacts at local and regional levels. Parts 2 and 3 of this NPS set out some of the national level socio-economic impacts.²⁶²

Applicant assessment

5.13.2 Where the project is likely to have socio-economic impacts at local or regional levels, the applicant should undertake and include in their application an assessment of these impacts as part of the ES (see Section 4.2).

5.13.3 The applicant is strongly encouraged to engage with relevant local authorities during early stages of project development so that the applicant can gain a better understanding of local or regional issues and opportunities.

5.13.4 The applicant's assessment should consider all relevant socio-economic impacts, which may include:

- the creation of jobs and training opportunities. Applicants may wish to provide information on the sustainability of the jobs created, including where they will help to develop the skills needed for the UK's transition to Net Zero

²⁶² For infrastructure in Wales see Wales' socio-economic duty (referenced in the Wales Policy Considerations).

- the contribution to the development of low-carbon industries at the local and regional level as well as nationally
- the provision of additional local services and improvements to local infrastructure, including the provision of educational and visitor facilities
- any indirect beneficial impacts for the region hosting the infrastructure, in particular in relation to use of local support services and supply chains
- effects on tourism
- the impact of a changing influx of workers during the different construction, operation and decommissioning phases of the energy infrastructure. This could change the local population dynamics and could alter the demand for services and facilities in the settlements nearest to the construction work (including community facilities and physical infrastructure such as energy, water, transport and waste). There could also be effects on social cohesion depending on how populations and service provision change as a result of the development
- cumulative effects - if development consent were to be granted to for a number of projects within a region and these were developed in a similar timeframe, there could be some short-term negative effects, for example a potential shortage of construction workers to meet the needs of other industries and major projects within the region

5.13.5 Applicants should describe the existing socio-economic conditions in the areas surrounding the proposed development and should also refer to how the development's socio-economic impacts correlate with local planning policies.

5.13.6 Socio-economic impacts may be linked to other impacts, for example visual impacts considered in Section 5.10 but may also have an impact on tourism and local businesses. Applicants are encouraged, where possible, to demonstrate that local suppliers have been considered in any supply chain.

5.13.7 Applicants should consider developing accommodation strategies where appropriate, especially during construction and decommissioning phases, that would include the need to provide temporary accommodation for construction workers if required.

Mitigation

5.13.8 The Secretary of State should consider whether mitigation measures are necessary to mitigate any adverse socio-economic impacts of the development. For example, high quality design can improve the visual and environmental experience for visitors and the local community alike.

Secretary of State decision making

- 5.13.9 The Secretary of State should have regard to the potential socio-economic impacts of new energy infrastructure identified by the applicant and from any other sources that the Secretary of State considers to be both relevant and important to its decision.
- 5.13.10 The Secretary of State may conclude that limited weight is to be given to assertions of socio-economic impacts that are not supported by evidence (particularly in view of the need for energy infrastructure as set out in this NPS).
- 5.13.11 The Secretary of State should consider any relevant positive provisions the applicant has made or is proposing to make to mitigate impacts (for example through planning obligations) and any legacy benefits that may arise as well as any options for phasing development in relation to the socio-economic impacts.
- 5.13.12 The Secretary of State may wish to include a requirement that specifies the approval by the local authority of an employment and skills plan detailing arrangements to promote local employment and skills development opportunities, including apprenticeships, education, engagement with local schools and colleges and training programmes to be enacted.

5.14 Traffic and Transport

- 5.14.1 The transport of materials, goods and personnel to and from a development during all project phases can have a variety of impacts on the surrounding transport infrastructure and potentially on connecting transport networks, for example through increased congestion. Impacts may include economic, social and environmental effects.
- 5.14.2 Environmental impacts may result particularly from trips generated on roads which may increase noise and air pollution as well as greenhouse gas emissions.
- 5.14.3 Disturbance caused by traffic and abnormal loads generated during the construction phase will depend on the scale and type of the proposal.
- 5.14.4 The consideration and mitigation of transport impacts is an essential part of Government's wider policy objectives for sustainable development as set out in Section 2.6 of this NPS.

Applicant assessment

- 5.14.5 If a project is likely to have significant transport implications, the applicant's ES (see Section 4.2) should include a transport appraisal. The DfT's Transport Analysis

Guidance (TAG)²⁶³ and Welsh Governments WelTAG²⁶⁴ provides guidance on modelling and assessing the impacts of transport schemes.

- 5.14.6 Applicants should consult National Highways and Highways Authorities as appropriate on the assessment and mitigation.
- 5.14.7 The applicant should prepare a travel plan including demand management and monitoring measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by active, public and shared transport to:
- reduce the need for parking associated with the proposal;
 - contribute to decarbonisation of the transport network;
 - reduce the need to travel; and
 - secure behavioural change and modal shift through an offer of genuine modal choice and to mitigate transport impacts.
- 5.14.8 The assessment should also consider any possible disruption to services and infrastructure (such as road, rail and airports).
- 5.14.9 If additional transport infrastructure is needed or proposed, it should always include good quality walking, wheeling and cycle routes, and associated facilities (changing/storage etc) needed to enhance active transport provision.
- 5.14.10 Applicants should discuss with network providers the possibility of co-funding by government for any third-party benefits. Guidance has been issued²⁶⁵ which explains the circumstances where this may be possible, although the government cannot guarantee in advance that funding will be available for any given uncommitted scheme at any specified time.

Mitigation

- 5.14.11 Where mitigation is needed, possible demand management measures must be considered. This could include identifying opportunities to:
- reduce the need to travel by consolidating trips,
 - locate development in areas already accessible by active travel and public transport,
 - provide opportunities for shared mobility,

²⁶³ Guidance on transport assessments is at See <https://www.gov.uk/guidance/transport-analysis-guidance-tag#full-publication-update-history>

²⁶⁴ See <https://gov.wales/welsh-transport-appraisal-guidance-weltag>

²⁶⁵ See <https://www.gov.uk/government/publications/transport-investment-strategy>, For Wales, refer to the guidance note regarding Transport Grants or any successor to it: see <https://gov.wales/sites/default/files/publications/2020-01/local-transport-grants-guidance-2020-to-2021.pdf>

- re-mode by shifting travel to a sustainable mode that is more beneficial to the network,
- retime travel outside of the known peak times,
- reroute to use parts of the network that are less busy.

5.14.12 If feasible and operationally reasonable, such mitigation should be required, before considering requirements for the provision of new inland transport infrastructure to deal with remaining transport impacts. All stages of the project should support and encourage a modal shift of freight from road to more environmentally sustainable alternatives, such as rail, cargo bike, maritime and inland waterways, as well as making appropriate provision for and infrastructure needed to support the use of alternative fuels including charging for electric vehicles.

5.14.13 Regard should always be given to the needs of freight at all stages in the construction and operation of the development including the need to provide appropriate facilities for HGV drivers as appropriate.²⁶⁶

5.14.14 The Secretary of State may attach requirements to a consent where there is likely to be substantial HGV traffic that:

- control numbers of HGV movements to and from the site in a specified period during its construction and possibly on the routing of such movements
- make sufficient provision for HGV parking,²⁶⁷ and associated high quality drive facilities either on the site or at dedicated facilities elsewhere, to support driver welfare, avoid ‘overspill’ parking on public roads, prolonged queuing on approach roads and uncontrolled on-street HGV parking in normal operating conditions
- ensure satisfactory arrangements for reasonably foreseeable abnormal disruption, in consultation with network providers and the responsible police force.

5.14.15 The Secretary of State should have regard to the cost-effectiveness of demand management measures compared to new transport infrastructure, as well as the aim to secure more sustainable patterns of transport development when considering mitigation measures.

5.14.16 Applicants should consider the DfT policy guidance “Water Preferred Policy Guidelines for the movement of abnormal indivisible loads” when preparing their application.²⁶⁸

²⁶⁶ See Future of Freight, DfT, June 2022 at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1085917/future-of-freight-plan.pdf

²⁶⁷ See DfT WMS on planning reforms for lorry parking at: See

<https://www.gov.uk/government/speeches/planning-reforms-for-lorry-parking>

²⁶⁸ See <https://www.gov.uk/government/publications/movement-of-abnormal-loads-by-water>

5.14.17 If an applicant suggests that the costs of meeting any obligations or requirements would make the proposal economically unviable this should not in itself justify the relaxation by the Secretary of State of any obligations or requirements needed to secure the mitigation.

Secretary of State decision making

5.14.18 A new energy NSIP may give rise to substantial impacts on the surrounding transport infrastructure and the Secretary of State should therefore ensure that the applicant has sought to mitigate these impacts, including during the construction phase of the development and by enhancing active, public and shared transport provision and accessibility.

5.14.19 Where the proposed mitigation measures are insufficient to reduce the impact on the transport infrastructure to acceptable levels, the Secretary of State should consider requirements to mitigate adverse impacts on transport networks arising from the development, as set out below.

5.14.20 Development consent should not be withheld provided that the applicant is willing to enter into planning obligations for funding new infrastructure or requirements can be imposed to mitigate transport impacts.²⁶⁹ In this situation the Secretary of State should apply appropriately limited weight to residual effects on the surrounding transport infrastructure.

5.14.21 The Secretary of State should only consider refusing development on highways grounds if there would be an unacceptable impact on highway safety, residual cumulative impacts on the road network would be severe, or it does not show how consideration has been given to the provision of adequate active public or shared transport access and provision.

5.15 Resource and Waste Management

5.15.1 Government policy on hazardous and non-hazardous waste is intended to protect human health and the environment by producing less waste and by using it as a resource wherever possible. Where this is not possible, waste management regulation ensures that waste is disposed of in a way that is least damaging to the environment and to human health.

5.15.2 Sustainable waste management is implemented through the waste hierarchy²⁷⁰, which sets out the priorities that must be applied when managing waste. These are (in order):

- prevention

²⁶⁹ With attribution of costs calculated in accordance with the DfT's guidance.

²⁷⁰ The Waste Hierarchy is set out in The Waste (England and Wales) Regulations 2011.

- preparing for reuse
- recycling
- other recovery, including energy recovery
- disposal

5.15.3 Disposal of waste should only be considered where other waste management options are not available or where it is the best overall environmental outcome.

5.15.4 All large infrastructure projects are likely to generate some hazardous and non-hazardous waste. The EA's EP regime incorporates operational waste management requirements for certain activities. When an applicant applies to the EA for an EP, the EA will require the application to demonstrate that processes are in place to meet all relevant EP requirements.

5.15.5 Specific considerations regarding radioactive waste are set out in Section 2.11 and Annex B of EN-6.²⁷¹ The present section will apply to non-radioactive waste for nuclear infrastructure as for other energy infrastructure.

Applicant assessment

5.15.6 Applicants must demonstrate that development proposals are in line with Defra's policy position on the role of energy from waste in treating municipal waste.

5.15.7 The proposed plant must not compete with greater waste prevention, re-use, or recycling, or result in over-capacity of EfW or similar processes for the treatment of waste at a national or local level.

5.15.8 The applicant should set out the arrangements that are proposed for managing any waste produced and prepare a report that sets out the sustainable management of waste and use of resources throughout any relevant demolition, excavation and construction activities.

5.15.9 The arrangements described and a report setting out the sustainable management of waste and use of resources should include information on how re-use and recycling will be maximised in addition to the proposed waste recovery and disposal system for all waste generated by the development. They should also include an assessment of the impact of the waste arising from development on the capacity of waste management facilities to deal with other waste arising in the area for at least five years of operation.

5.15.10 The applicant is encouraged to refer to the 'Waste Prevention Programme for England'²⁷² and 'Towards Zero Waste: Our Waste Strategy for Wales'²⁷³ and should

²⁷¹ see

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47859/2009-nps-for-nuclear-volumel.pdf

²⁷² See <https://www.gov.uk/government/consultations/waste-prevention-programme-for-england-2021>

²⁷³ See <https://gov.wales/towards-zero-waste-our-waste-strategy>

seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that this is the best overall environmental outcome.

- 5.15.11 If the applicant's assessment includes dredged material, the assessment should also include other uses of such material before disposal to sea, for example through re-use in the construction process.
- 5.15.12 The UK is committed to moving towards a more 'circular economy'. Where possible, applicants are encouraged to source materials from recycled or reused sources and use low carbon materials, sustainable sources and local suppliers. Construction best practices should be used to ensure that material is reused or recycled onsite where possible.
- 5.15.13 Applicants are also encouraged to use construction best practices in relation to storing materials in an adequate and protected place on site to prevent waste, for example, from damage or vandalism. The use of Building Information Management tools (or similar) to record the materials used in construction can help to reduce waste in future decommissioning of facilities, by identifying materials that can be recycled or reused.

Secretary of State decision making

- 5.15.14 The Secretary of State should consider the extent to which the applicant has proposed an effective system for managing hazardous and non-hazardous waste arising from the construction, operation and decommissioning of the proposed development.
- 5.15.15 The Secretary of State should be satisfied that:
- any such waste will be properly managed, both on-site and off-site.
 - the waste from the proposed facility can be dealt with appropriately by the waste infrastructure which is, or is likely to be, available. Such waste arisings should not have an adverse effect on the capacity of existing waste management facilities to deal with other waste arisings in the area.
 - adequate steps have been taken to minimise the volume of waste arisings, and of the volume of waste arisings sent to disposal, except where that is the best overall environmental outcome.
- 5.15.16 Where necessary, the Secretary of State should use requirements or obligations to ensure that appropriate measures for waste management are applied.
- 5.15.17 The Secretary of State may wish to include a condition on revision of waste management plans at reasonable intervals when giving consent.

- 5.15.18 Where the project will be subject to the EP regime, waste management arrangements during operations will be covered by the permit and the considerations set out in Section 4.11 will apply.
- 5.15.19 The Secretary of State should have regard to any potential impacts on the achievement of resource efficiency and waste reduction targets set under the Environment Act 2021 or wider goals set out in the government's Environmental Improvement Plan.

5.16 Water Quality and Resources

- 5.16.1 Infrastructure development can have adverse effects on the water environment, including groundwater, inland surface water, transitional waters²⁷⁴ coastal and marine waters.
- 5.16.2 During the construction, operation, and decommissioning phases, development can lead to increased demand for water, involve discharges to water and cause adverse ecological effects resulting from physical modifications to the water environment. There may also be an increased risk of spills and leaks of pollutants to the water environment. These effects could lead to adverse impacts on health or on protected species and habitats (see Section 4.2) and could result in surface waters, groundwaters or protected areas²⁷⁵ failing to meet environmental objectives established under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and the Marine Strategy Regulations 2010.²⁷⁶

Applicant assessment

- 5.16.3 Where the project is likely to have effects on the water environment, the applicant should undertake an assessment of the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment, and how this might change due to the impact of climate change on rainfall patterns and consequently water availability across the water environment, as part of the ES or equivalent (see Section 4.2 and 4.9).

²⁷⁴ As defined in the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, transitional waters are bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows.

²⁷⁵ Protected areas are areas which have been designated as requiring special protection under specific legislation for the protection of their surface water and groundwater or for the conservation of habitats and species directly depending on water.

²⁷⁶ See <https://www.gov.uk/government/publications/marine-strategy-part-one-uk-updated-assessment-and-good-environmental-status>; See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/522426/LIT_10_445.pdf; see PINS advice: See https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/06/advice_note_18.pdf

- 5.16.4 The applicant should make early contact with the relevant regulators, including the local authority, the Environment Agency and Marine Management Organisation, where appropriate, for relevant licensing and environmental permitting requirements.
- 5.16.5 Where possible, applicants are encouraged to manage surface water during construction by treating surface water runoff from exposed topsoil prior to discharging and to limit the discharge of suspended solids e.g. from car parks or other areas of hard standing, during operation.
- 5.16.6 Applicants are encouraged to consider protective measures to control the risk of pollution to groundwater beyond those outlined in River Basin Management Plans and Groundwater Protection Zones - this could include, for example, the use of protective barriers.
- 5.16.7 The ES should in particular describe:
- the existing quality of waters affected by the proposed project and the impacts of the proposed project on water quality, noting any relevant existing discharges, proposed new discharges and proposed changes to discharges
 - existing water resources²⁷⁷ affected by the proposed project and the impacts of the proposed project on water resources, noting any relevant existing abstraction rates, proposed new abstraction rates and proposed changes to abstraction rates (including any impact on or use of mains supplies and reference to Abstraction Licensing Strategies) and also demonstrate how proposals minimise the use of water resources and water consumption in the first instance
 - existing physical characteristics of the water environment (including quantity and dynamics of flow) affected by the proposed project and any impact of physical modifications to these characteristics
 - any impacts of the proposed project on water bodies or protected areas (including shellfish protected areas) under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and source protection zones (SPZs) around potable groundwater abstractions
 - how climate change could impact any of the above in the future
 - any cumulative effects

Mitigation

- 5.16.8 The Secretary of State should consider whether mitigation measures are needed over and above any which may form part of the project application. A construction management plan may help codify mitigation at that stage.

²⁷⁷ See the Water Resources planning guideline: See <https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline>

- 5.16.9 The risk of impacts on the water environment can be reduced through careful design to facilitate adherence to good pollution control practice. For example, designated areas for storage and unloading, with appropriate drainage facilities, should be clearly marked.
- 5.16.10 The impact on local water resources can be minimised through planning and design for the efficient use of water, including water recycling. If a development needs new water infrastructure, significant supplies or impacts other water supplies, the applicant should consult with the local water company and the EA or NRW.

Secretary of State decision making

- 5.16.11 Activities that discharge to the water environment are subject to pollution control. The considerations set out in Section 4.11 on the interface between planning and pollution control therefore apply. These considerations will also apply in an analogous way to the abstraction licensing regime regulating activities that take water from the water environment, and to the control regimes relating to works to, and structures in, on, or under controlled waters.²⁷⁸
- 5.16.12 The Secretary of State will need to give impacts on the water environment more weight where a project would have an adverse effect on the achievement of the environmental objectives established under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.²⁷⁹
- 5.16.13 The SoS must also consider duties under other legislation including duties under the Environment Act 2021 in relation to environmental targets and have regard to the policies set out in the Government's Environmental Improvement Plan.
- 5.16.14 The Secretary of State should be satisfied that a proposal has regard to current River Basin Management Plans and meets the requirements of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (including regulation 19). The specific objectives for particular river basins are set out in River Basin Management Plans. The Secretary of State must refuse development consent where a project is likely to cause deterioration of a water body or its failure to achieve good status or good potential, unless the requirements set out in Regulation 19 are met. A project may be approved in the absence of a qualifying Overriding Public Interest test only if there is sufficient certainty that it will not cause deterioration or compromise the achievement of good status or good potential.
- 5.16.15 The Secretary of State should also consider the interactions of the proposed project with other plans such as Water Resources Management Plans and Shoreline/Estuary Management Plans.

²⁷⁸ Controlled waters include all watercourses, lakes, lochs, coastal waters, and water contained in underground strata.

²⁷⁹ See <https://www.legislation.gov.uk/uksi/2017/407/contents/made>

5.16.16 The Secretary of State should consider proposals to mitigate adverse effects on the water environment and any enhancement measures put forward by the applicant and whether appropriate requirements should be attached to any development consent and/or planning obligations are necessary.

6 Glossary

This glossary sets out the most frequently used terms in this NPS. There is a glossary in each of the energy NPSs. The glossary set out in each of the technology specific NPS may also be useful when reading this NPS.

AA	Appropriate Assessment
ACTs	Advanced Conversion Technologies
AD	Anaerobic Digestion
AoS	Appraisal of Sustainability
Associated development	Associated development as defined in Section 115 of the Planning Act 2008
BAT	Best Available Technique
BECCS	Bioenergy with Carbon Capture and Storage
BEIS	Department for Business, Energy and Industrial Strategy
Biomass	Material of recent biological origin derived from plant or animal matter
CAA	Civil Aviation Authority
CCA	Climate Change Act 2008
CCC	Climate Change Committee
CCGT	Combined Cycle Gas Turbine
CCS	Carbon Capture and Storage
CCR	Carbon Capture Readiness
CCUS	Carbon, Capture, Utilisation and Storage
CfD	Contracts for Difference
CHP	Combined Heat and Power
CM	Capacity Market
CNS	Communications, navigation and surveillance infrastructure
Co-firing	Use of two fuel types (e.g. coal and biomass) in a thermal generating station
CO ₂	Carbon dioxide
COMAH	Control of Major Accident Hazards

Critical national priority/CNP	A policy set out at 2.8.8 to 2.8.13 of EN-3 which applies a policy presumption that, subject to any legal requirements, the urgent need for CNP Infrastructure to achieving our energy objectives, together with the national security, economic, commercial, and net zero benefits, will in general outweigh any other residual impacts not capable of being addressed by application of the mitigation hierarchy. CNP Infrastructure is defined as nationally significant new offshore wind development and supporting onshore and offshore network infrastructure and related network reinforcements.
CPS	Carbon Price Support
DACCS	Direct Air Carbon Capture and Storage
DESNZ	Department for Energy Security and Net Zero (established in February 2023) focussing on the energy portfolio from the former Department for Business, Energy and Industrial Strategy (BEIS).
DECC	Department of Energy and Climate Change, replaced by BEIS in 2016
Defra	Department of Environment, Food and Rural Affairs
DfT	Department for Transport
“Dispatchable” power	Sources of electricity that can be supplied (turned on or off) by operators at the request of power grid operators, in contrast to intermittent power sources that cannot be similarly controlled.
DLUHC	Department for Levelling Up, Housing & Communities
DNO	Distribution Network Operator
EA	Environment Agency
EEZ	Exclusive Economic Zone
EfW	Energy from Waste – combustion of waste material to provide electricity and/or heat
EIA	Environmental Impact Assessment
English Waters	Waters adjacent to England up to the 12nm seaward limits of the territorial sea and in a REZ, except the Welsh zone or any part of a REZ in relation to which the Scottish Ministers have functions
EP	Environmental Permit
EPR	Environmental Permitting Regulations
EPS	Emissions Performance Standards

ES	Environmental Statement
ESO	Electricity Systems Operator
FRA	Flood Risk Assessment
GB	Great Britain
Generic Impacts	Potential impacts of any energy infrastructure projects, the general policy for consideration of which is set out in Part 5 of EN-1
GGSS	Green Gas Support Scheme
GHG	Greenhouse Gas
Gt	Gigatonne = one billion tonnes
GVA	Gross Value Added
GW	Gigawatt = one billion watts
Habitats Regulations	The Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017
HRA	Habitats Regulations Assessment
HSE	Health and Safety Executive
LNG	Liquefied Natural Gas
LPAs	Local Planning Authorities
MCZs	Marine Conservation Zone: areas that protect a range of nationally important, rare or threatened habitats and species. MCZs are established under section 116(1) of the Marine and Coastal Access Act 2009
Mitigation hierarchy	A term to incorporate the avoid, reduce, mitigate, compensate process that applicants need to go through to protect the environment and biodiversity
MMO	Marine Management Organisation established under the Marine and Coastal Access Act 2009
MoD	Ministry of Defence
MPA	Marine Protected Area (MPA) is a term used to describe the network of HRA sites, SSSIs and MCZs in the English and Welsh marine environment.
MPS	Marine Policy Statement

MW	Megawatt = one million watts
Nameplate capacity	The rated output of the unit/station at the generator, and therefore includes station own use (parasitic power), and any other consumption/loss prior to despatch to the grid, local network, industrial site or similar transmission system
NDC	Nationally Determined Contribution
NETSO	National Electricity Transmission System Operator
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRW	Natural Resources Wales
NSIP	Nationally Significant Infrastructure Project
OCGT	Open Cycle Gas Turbine
OHL	Overhead electricity line carried on poles or pylons
OLS	Obstacle Limitation Surfaces
PPG	Planning Practice Guidance issued by DLUHC
PSZs	Public Safety Zones
REZ	The Renewable Energy Zone
RHI	Renewable Heat Incentive
SEA	Strategic Environmental Assessment (under the Environmental Assessment of Plans and Programmes Regulations 2004)
SMPs	Shoreline Management Plans
SNCBs	Statutory Nature Conservation Bodies: bodies responsible for advising the government on, and the administration of, nature conservation. Bodies include Natural England (NE, England), Natural Resources Wales (NRW, Wales), NatureScot (NS, Scotland) and the Joint Nature Conservation Committee (JNCC, UK wide).
Substation	An assembly of equipment in an electric power system through which electric energy is passed for transmission, transformation, distribution, or switching
TAN	Technical Advice Notes regarding planning in Wales

Technical feasibility	Whether it is possible to build and operate a proposed development according to its design parameters
Thermal Generating Station	Electricity generating station that uses a heat source (combustion of fuel or nuclear) to create steam that drives a generating turbine or which uses gas directly to drive a generating turbine
TSO	Transmission System Operator
TTAs	Tactical Training Areas
UKCS	United Kingdom Continental Shelf
UK ETS	UK Emissions Trading Scheme
Weight	Within this NPS the hierarchy of weight is 1) limited 2) moderate 3) great 4) significant 5) substantial
Welsh Waters	Waters adjacent to Wales up to the 12nm seaward limits of the territorial sea and the Welsh Zone of the REZ as defined by section 158 of the Government of Wales Act 2006

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