



Department for
Business, Energy
& Industrial Strategy

Draft Overarching National Policy Statement for Energy (EN-1)

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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. 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. Under the Planning Act 2008 the Secretary of State must also have regard to any local impact report 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.
- 1.1.2 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
- 1.1.3 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.
- 1.1.4 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 reports¹.

1.2 Role of this NPS in the wider planning system

- 1.2.1 In England and Wales this NPS may be a material consideration in decision making on applications that fall under the Town and Country Planning Act 1990 (as amended). Whether, and to what extent, this NPS is a material consideration will be judged on a

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

case by case basis and will depend upon the extent to which the matters are already covered by applicable planning policy.

- 1.2.2 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.
- 1.2.3 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 waters adjacent to England and Wales or in a Renewable Energy Zone (except any part in relation to which Scottish Ministers have functions) provided that the application does not exceed the capacity threshold set out in the Planning Act 2008. The MMO will determine applications in accordance with the MPS and any applicable marine plans, unless relevant considerations indicate otherwise. This NPS, in combination with any relevant technology specific NPSs, may be a relevant consideration for the MMO when it is determining such applications. 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. They may also be a relevant consideration in the preparation of relevant marine plans. The role of the MPS and marine plans in relation to Secretary of State decisions is set out in Section 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 for Business, Energy and Industrial Strategy. It sets out the Government's policy for delivery of major energy infrastructure. 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). 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.

1.3.2 The Planning Act 2008² 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 NSIP³:

- electricity generating stations, (meeting the thresholds set out in the Planning Act 2008). This includes onshore generating stations (but not onshore wind) generating more than 50 megawatts in England and 350 megawatts in Wales. It also includes offshore generating stations generating more than 100 megawatts offshore in territorial waters adjacent to England and within the English part of the Renewable Energy Zone and those generating more than 350 megawatts 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 pipelines and Gas Transporter pipelines (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

1.3.3 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 will have effect alone and will be the primary basis for Secretary of State's decision making. This will be the case for, but is not limited to, hydrogen pipeline and storage infrastructure, Carbon Capture Storage

2 Part 3 Planning Act 2008.

3 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.

(CCS) pipeline infrastructure and other forms of low carbon generation infrastructure not included in EN-2 or EN-3.

- 1.3.4 As set out in the Written Ministerial Statement of 7 December 2017⁴, 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 effect⁵ 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.
- 1.3.5 In addition to these specific categories of NSIP, section 35 of the Planning Act 2008 allows the Secretary of State to give a direction that a particular development that does not meet one of the statutory NSIP categories, should nonetheless be treated as development for which development consent is required. The Secretary of State may give a direction, on receipt of a qualifying request, in relation to a proposed development in England or English waters. The Secretary of State must be satisfied that the proposed development is or forms part of a project in the field of energy and that it is nationally significant either by itself or in combination with one or more other developments in the field of energy. 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.
- 1.3.6 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 development⁶. EN-1, in conjunction with any relevant technology specific NPS, will be the primary policy for Secretary of State decision making on associated development.
- 1.3.7 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 granting of wayleaves, the authorisation of tree lopping and the compulsory acquisition of land. EN-1 in conjunction with any relevant technology-specific NPSs will be the primary policy for Secretary of State decision making on such matters.

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

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

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

1.4 Geographical coverage

- 1.4.1 The Secretary of State will decide all applications (other than as specified in this paragraph) for nationally significant infrastructure projects in England and Wales, adjacent territorial waters and the offshore Renewable Energy Zone (REZ) (except any part in relation to which Scottish Ministers have functions).
- 1.4.2 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. 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.
- 1.4.3 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 paragraph 1.4.4. However, energy policy is generally a matter reserved to UK Ministers and this NPS may therefore be a relevant consideration in planning decisions in Scotland.
- 1.4.4 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.
- 1.4.5 In Northern Ireland, planning consents for all nationally significant infrastructure projects, 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 NPS 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. Information on the review process is set out in paragraphs 10 to 12 of the Annex to CLG's letter of 9 November 2009⁷ and the MHCLG guidance on Review of NPSs.⁸

⁷ <https://www.gov.uk/guidance/planning-guidance-letters-to-chief-planning-officers>

⁸ <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 Paper⁹ a review of the NPS was announced under section 6 of the Planning Act. That review resulted in a number of amendments to the NPSs. [Those amendments were designated in [X]].
- 1.6.2 Applications for development consent will have been prepared, and may already be in examination, in reliance upon the 2011 suite of NPSs (or for nuclear development based on the position set out in the Written Ministerial Statement of 7 December 2017¹⁰). The Secretary of State has decided that for any application accepted for examination before designation of the 2021 amendments, the 2011 suite of NPSs should have effect in accordance with the terms of those NPS. The 2021 amendments will therefore have effect only in relation to those applications for development consent accepted for examination after the designation of those amendments.
- 1.6.3 However, any emerging draft NPSs (or those designated but not 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 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 energy NPSs have been subject to an Appraisal of Sustainability (AoS), as required by the Planning Act 2008. The AoSs also incorporate the analysis of likely significant environmental effects required by the Environmental Assessment of Plans and Programmes Regulations 2004 (the SEA Regulations).
- 1.7.2 The purposes and methods of the AoSs are explained in the draft of the AoS for EN-1 (AoS-1) which is published alongside this document. Their primary function is to inform consultation on the draft NPSs by providing an analysis of the environmental, social and economic impacts of implementing the energy NPSs.
- 1.7.3 The AoS process has provided a series of recommendations which have been addressed where appropriate and incorporated into the NPS to ensure that they remain in line with current considerations of sustainability.

⁹ <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

¹⁰ <https://questions-statements.parliament.uk/written-statements/detail/2017-12-07/HCWS321>

AoS assessment of EN-1

1.7.4 Some key points from the assessment of EN-1 (AoS-1) are set out below:

- The energy NPSs will be transformational in enabling England and Wales to transition to a low carbon economy and thus help to realise UK climate change commitments sooner than continuation under the current planning system. However, there is also some uncertainty as it is difficult to predict the mix of technology that will be delivered by the market against the framework set by the government.
- It is important to recognise that the energy NPSs will still generate residual carbon emissions which will need to be addressed if the government target of net zero by 2050 is to be met. It should also be recognised that some climate change is inevitable and as such, there is a need for energy infrastructure to be resilient to climate change – the NPS sets out a clear and robust approach for ensuring this is done.
- The energy NPSs are likely to contribute positively towards improving the vitality and competitiveness of the UK energy market by providing greater clarity for developers. This should improve the UK's security of supply and, less directly through increased economic opportunities for local communities, have positive effects for health and well-being.
- Due to the nature and size of potential schemes (as well as likely potential locations in areas such as coastal areas), opportunities for landscape mitigation will be limited and while the energy NPS sets out a robust approach to addressing impacts on landscape, townscape and seascape across the short, medium and long timeframes, significant adverse effects are likely to remain.
- There is potential from construction and operation activities for significant negative effects on biodiversity as a result of the energy NPS implementation in the short, medium and long term. However, due to the possibility of enhancement of the natural environment and biodiversity net gains, there is also potential for minor positive effects in the medium to long term.
- There may also be cumulative negative effects on biodiversity, landscape, water and air quality, water resources, flood risk, coastal change and health at the regional or sub-regional levels depending upon location and the extent of clustering of new energy and other infrastructure. Proposed energy developments will still be subject to project level assessments, including Environmental Impact Assessment (EIA), and this will address locationally specific effects. The energy NPSs set out mitigation for cumulative negative effects by requiring the Secretary of State to consider accumulation of effects as a whole in their decision-making on individual applications for development consent.

1.7.5 The AoS assessments of EN-2 to EN-5 (AoS-2 to AoS-5) noted additional specific adverse effects related to individual technologies, over and above those noted within EN-1. For example, in relation to EN-2 it was noted that natural gas electricity

generating infrastructure development will have additional considerations in respect of air quality, the water environment, carbon and biodiversity. Similar additional considerations are noted in respect of EN-3, EN-4 and EN-5 (which also noted issues in relation to landscape and health and wellbeing). In all cases, each technology specific NPS (EN-2 to EN-5) notes a range of mitigation measures, which will act to bolster the approaches outlined in EN-1, to reduce the adverse effects of these technology specific issues.

Assessment of alternatives to EN-1

As required by the SEA Regulations, AoS-1 also includes an assessment of reasonable alternatives to the policies set out in EN-1 at a strategic level. Four alternatives to the plan have been considered as set out in the table below.

Plan	Overview of technologies
EN-1	EN-1 combines infrastructure set out in Part 3 of this NPS. In summary: generation from Renewables (including Biomass and Energy from Waste with or without CCS), Natural Gas-fired electricity generation with or without CCS, Hydrogen-fired electricity generation, Pumped Hydro Storage and Nuclear; associated electricity network infrastructure; and transport and storage infrastructure for natural gas, oil, hydrogen and CCS.
Alternative 1 (A1)	As EN-1 without Nuclear and Unabated Natural Gas.
Alternative 2 (A2)	As EN-1 without Unabated Natural Gas.
Alternative 3 (A3)	As EN-1 without Nuclear.
Alternative 4 (A4)	As EN-1 but with an even stricter protection of the marine environment.

1.7.6 The key differences between the different alternatives and the plan are highlighted below:

1.7.7 Alternative A1, which is the same as EN-1 but without Nuclear and Unabated Natural Gas, would be:

- materially beneficial for the achievement of Net Zero due to no emissions from unabated gas, although reliant on smaller group of low carbon technologies for delivery

- materially adverse on Security of Supply as reliant on technologies still under development such as Hydrogen and Energy Storage at scale to ensure peak supply and maintain the stability and security of the electricity system
- have a mix of beneficial and adverse effects on the built and natural environment due to positive environment effects through, for example, mitigation of climate change, and negative due to larger areas of land and sea required for renewables and natural gas with CCS to meet the same energy output as EN-1

1.7.8 Alternative A2, which is the same as EN-1 but without Unabated Natural Gas, would be:

- materially beneficial for the achievement Net Zero due to no emissions from unabated gas
- adverse on Security of Supply, as although it would be less reliant (than alternative A1) on yet to be fully proven technologies such as Hydrogen and Energy Storage at scale, there would still be a need for them to ensure peak supply and maintain the stability and security of the electricity system

1.7.9 Alternative A3, which is the same as EN-1 but without Nuclear, would be:

- adverse for the achievement of Net Zero due to greater ongoing emissions from unabated gas
- adverse on Security of Supply as reliant on a smaller range of electricity generating technologies
- adverse for the Natural Environment as emphasis on renewables and natural gas with CCS would require larger areas of land and sea to meet the same energy output as EN-1

1.7.10 Alternative A4, which is the same as EN-1 but with an even stricter protection of the marine environment, would be:

- materially adverse for the achievement of Net Zero as reliant on a smaller range of low carbon technologies
- adverse on Security of Supply as reliant on a smaller range of electricity generating technologies
- adverse on the Built Environment due to increased pressure on land.

1.7.11 None of these alternatives are as good as, or better than, the proposals set out in EN-1 and therefore the government's preferred option is to take forward the proposals set out herein. The assessments of technology-specific alternatives to EN-2 to EN-5 are given in the AoS reports for these NPSs.

Habitats Regulation Assessments

1.7.12 Habitats Regulation Assessment (HRA) has also been carried out under the Conservation of Habitats and Species Regulations 2017 and the Conservation of

Offshore Marine Habitats and Species Regulations 2017 (the Habitats Regulations) and published for NPSs EN-1 to EN-5. As EN-1 to EN-5 do not specify locations for energy infrastructure, the HRA is a high-level strategic overview. Although the lack of spatial information within EN-1 to EN-5 made it impossible to reach certainty on the effect of the plan on the integrity of any HRA site, the potential for proposed energy infrastructure projects of the kind contemplated by EN-1 to EN-5 to have adverse effects on the integrity of such sites cannot be ruled out, following the precautionary principle. The HRA explains why the government considers that EN-1 to EN-5 are, nevertheless, justified by imperative reasons of overriding public interest, while noting that its conclusions are only applicable at the NPS level and are without prejudice to any project-level HRA, which may result in the refusal of consent for a particular application.

2 Government policy on energy and energy infrastructure development

2.1 Introduction

- 2.1.1 This Part outlines the policy context for the development of nationally significant energy infrastructure. The Energy White Paper, published in December 2020¹¹, 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.
- 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 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) 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.

2.2 Net zero by 2050

- 2.2.1 The UK has continually demonstrated its global leadership on climate change mitigation through robust and ambitious targets to reduce carbon emissions. Through the Climate Change Act 2008 (CCA), the UK became the first country to set a legally binding emissions reduction target for 2050 and carbon budgets which limit the amount of Greenhouse Gas (GHG) the UK emits over successive five-year periods. These carbon budgets are set to ensure the UK keeps to a trajectory consistent with meeting its 2050 target.

¹¹ <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

- 2.2.2 The original iteration of EN-1 was drafted when the UK had a GHG emission reduction target of at least 80 per cent by 2050, set following advice from the Committee on Climate Change – (now known as the Climate Change Committee (CCC)) - to ensure the UK played its role in limiting global warming to 2 degrees.
- 2.2.3 In 2016, the UK ratified the Paris Agreement under which Parties agreed to hold the increase in global average temperature to well below 2 degrees above pre-industrial levels, and to pursue efforts to limit this to 1.5 degrees. Within the Agreement each Party is required to prepare, communicate and maintain successive Nationally Determined Contributions (NDCs), which will reflect the highest possible ambition of the Party.
- 2.2.4 In June 2019, the UK became the first major economy to legislate for a 2050 net zero GHG emissions target through the Climate Change Act 2008 (2050 Target Amendment) Order 2019. In December 2020, the UK set out its NDC to reduce GHG emissions by at least 68 per cent from 1990 levels by 2030. In April 2021, the Government announced the sixth carbon budget (CB6) and as a result will legislate to reduce GHG emissions by ~78% by 2035 compared to 1990 levels.
- 2.2.5 Building on last Autumn’s Energy White Paper and the Prime Minister’s Ten Point Plan for a Green Industrial Revolution, we will publish a Net Zero Strategy ahead of COP26. This will set out the Government’s vision for transitioning to a net zero economy, and raise ambition as we outline our path to meet net zero by 2050, making the most of new growth and employment opportunities across the UK.

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 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 NDC. This will require a step change in the decarbonisation of our energy system.
- 2.3.3 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 them 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.

- 2.3.4 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 79 per cent of energy supply in 2019¹². We will need to dramatically increase the volume of energy supplied from low carbon sources and reduce the amount provided by fossil fuels.
- 2.3.5 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 processes¹³ (low carbon hydrogen) and, where we still emit carbon, developing the industry and infrastructure to capture, transport and store it.
- 2.3.6 Decarbonisation also 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 electricity¹⁴. Low carbon hydrogen is also likely to play an increasingly significant role.
- 2.3.7 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. 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.
- 2.3.8 The 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. The UK's oil and gas sector recognises the demand for oil and gas will be much reduced in

12 <https://www.gov.uk/government/statistics/energy-trends-march-2021>

13 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)

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

the future, but also recognise 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.

2.3.9 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 GHG Removal 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 ~145MtCO_{2e} in 2011 to ~60MtCO_{2e} in 2019 (see figure 1). This can be mainly attributed to the proportion of renewable generation quadrupling from 9% to 37% between 2011 and 2019 whilst the share of electricity generation from coal reduced from 27% to 2% over the same period.¹⁵

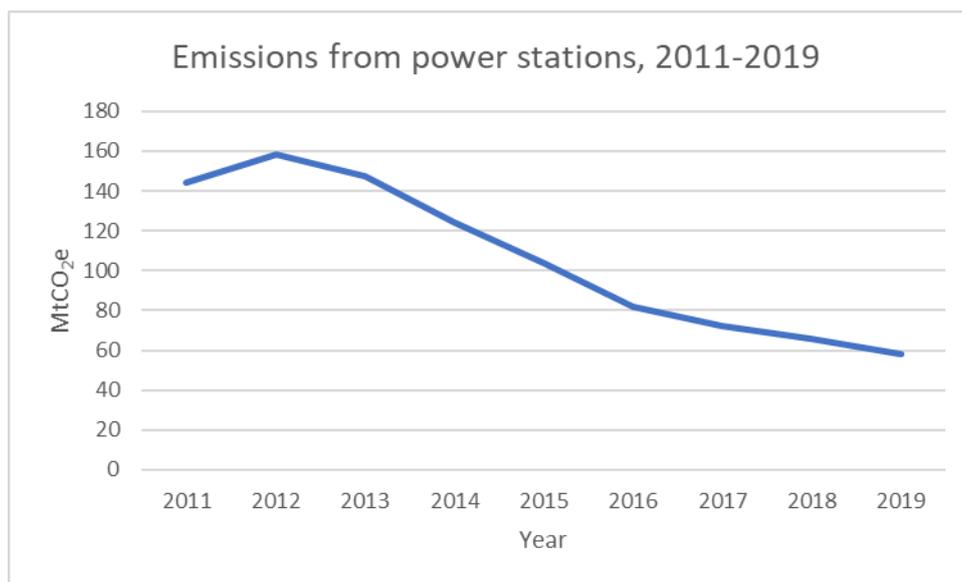


Figure 1: GHG emissions from power stations 2011-2019¹⁶

2.4.2 A key mechanism for increasing deployment of low carbon generation has been the implementation of Contracts for Difference (CfD). The CfD scheme allows generators to be paid the difference between the ‘strike price’ – a price for electricity reflecting the cost of investing in a particular low carbon technology – and the ‘reference price’ – a cost measure of the average Great Britain (GB) market price for electricity. If the market value of electricity is higher than the ‘strike price’, the generator returns the difference and likewise, if the market value is below the ‘strike price’, the consumer

¹⁵ BEIS (2021), Energy Trends, Table 5.1, <https://www.gov.uk/government/statistics/energy-trends-march-2021>

¹⁶ BEIS (2020), Provisional UK greenhouse gas emissions national statistics, Table 1, <https://www.gov.uk/government/statistics/provisional-uk-greenhouse-gas-emissions-national-statistics-2020>

tops up the value to the ‘strike price’. In this way, the CfD scheme incentivises investment by giving greater certainty and stability of revenues to electricity generators by reducing their exposure to volatile wholesale prices, whilst protecting consumers from paying for higher support costs when electricity prices are high.

2.4.3 There have been 3 CfD allocation rounds to date (the first having opened in October 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 very successful in driving substantial deployment of renewable electricity capacity at scale whilst rapidly reducing costs. The clearing prices achieved in the third allocation round (which opened in May 2019) were well below the Administrative Strike Prices for each of the successful technologies (Administrative Strike Prices representing the maximum strike price, presented on a price per megawatt hour basis, a project of a particular technology type in a given delivery year can receive during an allocation round). For example, the costs of offshore wind have fallen by around 30% from the previous allocation round in 2017, with prices falling from £150 per megawatt hour in 2014 to £40 per megawatt hour in 2019.

2.4.4 Government is developing business models to incentivise the deployment of Carbon, Capture, Utilisation and Storage (CCUS) facilities and hydrogen in the UK. We will put in place a commercial framework which will enable developers to finance the construction and operation of power and Industrial CCUS facilities, stimulating a pipeline of projects and building a UK supply chain. For Power CCUS, we will introduce a business model based on the existing CfD framework, adapted so that price signals incentivise power CCUS to play a role in the system which complements renewables. In addition, for Industrial CCUS, 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 could include Energy from Waste facilities. We will be providing updates on CCUS business models throughout 2021. We will also be consulting in 2021 on our preferred hydrogen business model, or models, to bring through private sector investment and support jobs in low carbon hydrogen projects.¹⁷

2.4.5 In addition, the Government has other levers to encourage further decarbonisation within the power sector:

- UK Emissions Trading Scheme (UK ETS) - The UK ETS will promote cost-effective decarbonisation, allowing businesses to cut carbon where it is cheapest to do so and thereby promote innovation and growth for UK businesses. The government is developing the scheme to expand its remit to help support the UK’s negative emissions capacity. The UK ETS replaces the UK’s participation in the EU Emissions Trading System (EU ETS) and is a crucial step in achieving the UK’s net zero target.

¹⁷ See <https://www.gov.uk/government/consultations/design-of-a-business-model-for-low-carbon-hydrogen>

- Carbon Price Support (CPS) – The CPS is a tax on power sector CO₂ emissions that was established to accelerate decarbonisation by strengthening the price signal from the EU ETS allowance price. Currently, the CPS is added to the level of the UK ETS allowance price and HMT announced at the Budget 2021 that it would remain at £18/tCO₂ until 2022/23.
- Emissions Performance Standard (EPS) - The EPS is a regulatory backstop to ensure that new fossil fuel-fired electricity generation contributes to electricity security of supply in a manner consistent with the UK's decarbonisation objectives. It places a limit on the carbon dioxide emissions produced by fossil-fuel generation plants, which is currently set at of 450gCO₂/kWh for those plants above 50MWe operating at baseload and which received development consent after 18 February 2014.

Security of energy supplies

- 2.4.6 Given the vital role of energy to economic prosperity and social well-being, it is important that our supply of energy remains secure, reliable and affordable.
- 2.4.7 The Capacity Market (CM) 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 deliver during periods of electricity system stress, for example during cold, still periods where demand is high and wind generation is low.
- 2.4.8 The CM works by allowing eligible Capacity Providers to bid into competitive, annual auctions – either four years (T-4) or one year (T-1) ahead of delivery. Capacity Providers who are awarded an agreement in an auction receive a steady payment intended to ensure sufficient reliable capacity is in place to meet demand at times of system stress. Revenue from Capacity Payments incentivises the necessary investment to maintain and refurbish existing capacity, and to finance new capacity. Capacity Providers face penalties if they fail to deliver when needed.
- 2.4.9 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. 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.
- 2.4.10 In July 2019 the Government introduced CO₂ emissions limits to the Capacity Market. 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 from 2020 onwards. 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. Plants unable to comply with these requirements will be excluded from holding Capacity Market agreements from the Delivery Year 2024 onwards. This will ensure the CM is aligned with broader decarbonisation objectives by preventing the most polluting plants from participating.

2.5 Sustainable development

- 2.5.1 The government's wider objectives for energy infrastructure include contributing to sustainable development¹⁸ and ensuring that our energy infrastructure is safe. 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 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.
- 2.5.2 The government was at the forefront of negotiating the UN's 2030 Agenda for Sustainable Development, which included seventeen Sustainable Development Goals, and is committed to being at the forefront of delivering them. Among the Sustainable Development Goals are goals to "take urgent action to combat climate change and its impacts", to "ensure access to affordable, reliable, sustainable and modern energy for all" and to "build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation"¹⁹.
- 2.5.3 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. 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.
- 2.5.4 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.

18 As defined in 1987 by the World Commission on Environment and Development report Our Common Future - <https://sustainabledevelopment.un.org/milestones/wced>

19 <https://www.gov.uk/government/publications/implementing-the-sustainable-development-goals/implementing-the-sustainable-development-goals--2>

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. 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.
- 3.1.2 This Part also shows why the government considers that the need for such infrastructure will often be urgent. The Secretary of State should give substantial weight to considerations of need. 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 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 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.
- 3.2.4 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 therefore assess all applications for development consent for the types of infrastructure covered by the energy NPSs on the basis that the government has demonstrated that there is a need for those types of infrastructure, as described for each of them in this Part.

- 3.2.6 In this Part, the Secretary of State identifies the level of need for new energy infrastructure. In relation to the weight to be given to that identified need, 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 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.
- 3.2.8 Other novel technologies or processes may emerge during the life of this NPS, which are covered by sections 15-21 of the Planning Act and can help deliver our energy objectives. Where these contribute towards our objectives, such contribution should be given substantial weight.
- 3.2.9 Where an energy infrastructure project is not covered by sections 15-21 of the Planning Act but is considered to be nationally significant, there is a power under section 35 of the Planning Act 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. This could include novel technologies or processes which may emerge during the life of this NPS. 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 3.3.20 to 3.3.47 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 3.3.46 to 3.3.58 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 3.4.11 to 3.4.15 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

3.3 The need for new nationally significant electricity infrastructure

Replacing retiring plants and meeting increased demand

- 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 2050²⁰.

Delivering on affordable decarbonisation

- 3.3.4 The Prime Minister's Ten Point Plan for a Green Industrial Revolution and the Energy White Paper set out the government's ambition for increasing the deployment of low carbon infrastructure consistent with delivering our carbon budgets and the 2050 net zero target. The white paper made clear the commitment that the cost of the transition to net zero is fair and affordable. Value for money assessments are not required on applications for development consent for specific 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.
- 3.3.5 If demand doubles by 2050, we may need a fourfold increase in low carbon generation. This means that the majority of new generating capacity needs to be low carbon. However, electricity generated from unabated natural gas 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. This will ensure that the system remains reliable and affordable.

²⁰ <https://www.legislation.gov.uk/ukdsi/2021/9780348222616/impacts>

- 3.3.6 Although we are aiming for a fully decarbonised²¹, reliable, and low-cost power system by 2050, our understanding of precisely what this looks like, and the level of demand it will need to meet, will evolve over time. This will be informed by the approach to decarbonising other sectors, and what we learn about the cost and achievability of those approaches. It will also be informed by the costs and availability of GHG Removal technologies, such as Bioenergy with Carbon Capture and Storage (BECCS) and Direct Air Carbon Capture and Storage (DACCS). Any emissions from the power sector in 2050 can be consistent with net zero, as long as these are balanced by negative emissions from GHG Removal technologies.
- 3.3.7 In addition, our understanding of the type of electricity infrastructure that can deliver this system, in line with our energy objectives, will also evolve over time. This will be affected by the different characteristics of existing and new technologies, their relative costs and deliverability.
- 3.3.8 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 in 2050 for a wide range of demand, decarbonisation, and technology scenarios.

Alternatives to new electricity infrastructure

- 3.3.9 The government has considered alternatives to the need for new large-scale electricity infrastructure²² 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.
- 3.3.10 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 will lead to a reduction in final energy demand from around 1750 TWh in 2019 to 1200 TWh in 2050²³. However, decarbonisation is likely to require an increased use of electricity in domestic and industrial heating and transport, which is expected to outweigh increases in energy efficiency (see paragraph 3.3.3), potentially leading to a doubling or more of electricity demand by 2050.
- 3.3.11 The precise level of electricity demand in 2050 as the energy system transitions is uncertain and could be affected by alternative means of decarbonising these sectors, such as the use of low carbon hydrogen. However, it is prudent to plan on a

²¹ A system where all our power comes from low carbon sources and where the only residual operational emissions are due to a carbon capture rate of <100% from gas, biomass or waste generation with CCS.

²² This included considering alternatives in the Appraisal of Sustainability

²³ Energy White Paper: Powering Our Net Zero Future, Figure 1.4 Illustrative UK Final Energy Use in 2050, p.9. <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

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.

- 3.3.12 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. 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.
- 3.3.13 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.
- 3.3.14 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.

Different types of electricity infrastructure

- 3.3.15 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. The following paragraphs explain how the government has come to this conclusion.
- 3.3.16 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 above) to reduce costs in support of an affordable supply²⁴.
- 3.3.17 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.
- 3.3.18 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)²⁵. Storage can also reduce the need for new

²⁴ See section 2.1. in “Modelling 2050: Electricity System Analysis”, <https://www.gov.uk/government/publications/modelling-2050-electricity-system-analysis>

²⁵ Ibid

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.

- 3.3.19 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.

The need for new electricity generating capacity.

- 3.3.20 There is an urgent need for new electricity generating capacity to meet our energy objectives.

The role of wind and solar

- 3.3.21 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 solar²⁶.
- 3.3.22 As part of delivering this, government announced a target of 40GW of offshore wind by 2030, including 1GW of floating wind, and the requirement for sustained growth in the capacity of onshore wind²⁷ and solar in the next decade.
- 3.3.23 However, ensuring affordable system reliability, today and in the future, means wind and solar need to be complemented with technologies which supply electricity, or reduce demand, when the wind is not blowing, or the sun does not shine. 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. Applications for offshore wind or solar 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 storage

- 3.3.24 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. 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.
- 3.3.25 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. Storage can provide various services, locally and at the national

²⁶ <https://www.gov.uk/government/publications/modelling-2050-electricity-system-analysis>

²⁷ Applications for onshore wind should be considered by the relevant local planning authority.

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.

- 3.3.26 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.
- 3.3.27 We have launched a £68m innovation competition, to accelerate the commercialisation of first-of-a-kind longer duration energy storage technologies. The competition encompasses electrical storage, thermal storage and power-to-x technologies which can provide novel grid services and demonstrate cost reductions and improvement in technology performance.
- 3.3.28 Electricity storage is treated as a form of electricity generation under the Planning Act 2008. However, government has made legislation to amend the way that electricity storage is treated in the planning system. Applications for electricity storage facilities (except pumped hydro with a capacity above 50MW in England, or 350MW in Wales) 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.
- 3.3.29 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 2008.²⁸ 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

- 3.3.30 Interconnection facilitates a secure, low carbon electricity system at the lowest cost. The UK recognises the benefits of increasing levels of interconnection and has an ambition to realise at least 18GW of existing and planned interconnector capacity by

²⁸ A development consent order may still be required where the extension also involves non-storage development. Developers proposing storage-based extensions will need to consider whether any new planning permission granted under the TCPA regime would be compatible with existing consent(s) and/or whether an amendment or variation of the existing consent(s) may be required.

2030. At present our interconnection capacity consists of 6 GW: 2 GW and 1 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) and 1 GW to Belgium. Further interconnectors are under construction to France, Norway and Denmark, with a pipeline of further projects in 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.

- 3.3.31 However, there are limitations on the amount of capacity that can be deployed 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.

The role of combustion power stations

- 3.3.32 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 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 the CCR requirements is set out in Section 4.8²⁹.
- 3.3.33 Energy from Waste (EfW) plants operate at 90%+ availability but also produce residual carbon emissions. 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 Hierarchy³⁰ 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. Energy recovery from residual waste has a lower GHG impact than landfill³¹. 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 as a result of government policy³².
- 3.3.34 Bioenergy could provide either baseload or dispatchable low carbon generation. The need for negative emissions to offset residual emissions through BECCS, might

²⁹ The Energy White Paper, published in December 2020, committed to consult on proposals to update the Carbon Capture Readiness requirements to reflect technological advances, such as conversion to low carbon hydrogen and apply them more broadly, by removing the 300MW threshold. That separate process, on new proposals for Decarbonisation Readiness, is running in parallel to the review of the national policy statements. If that leads to changes in the relevant legal or policy framework then those new requirements will apply and this NPS will be updated to reflect any revised requirements ahead of designation. In the meantime, CCR policy remains as set out in this section.

³⁰ Waste Hierarchy as set out in regulation 12 of the Waste (England and Wales) Regulations 2011.

³¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/284612/pb14_130-energy-waste-201402.pdf

³² <https://www.gov.uk/government/publications/circular-economy-package-policy-statement>

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.

- 3.3.35 Natural gas-fired plants without CCS can provide dispatchable generation, and when used in an Open Cycle Gas Turbine (OCGT), or reciprocating engine, is currently the only way of providing generation that can be turned on, off or adjusted at very short notice to provide 'peaking capacity' at scale, which is essential for system reliability. However, without CCS, the emissions it produces means that its role will need to be reduced over time and it is expected to be replaced by low-carbon options by 2050, such as low carbon hydrogen and long-duration storage.
- 3.3.36 Dispatchable peaking capacity is designed to be used infrequently, but when it is required may need to produce large amounts of electricity for short periods. Therefore, whilst the annual output (and therefore any associated emissions) of peaking capacity is expected to be small, and may reduce over time, there will be a requirement for significant amounts of capacity to be dispatched at short notice to ensure a secure, reliable, and affordable electricity system. 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 but this can still be net zero consistent if the emissions from their use are balanced by negative emissions from GHG Removal technologies.
- 3.3.37 Gas-fired plants with CCS can provide reliable low carbon generation capacity and are intended to reduce emissions compared to unabated gas-fired plants by 90% or more. Plants equipped with post-combustion CCS could provide flexible generation that is able to ramp up or down to meet demand, however, the technology is not currently suited to providing fast-start peaking capacity and has not been deployed in the UK to date. Although the barriers to deployment are commercial rather than technical, deployment of power CCS is reliant on the availability of infrastructure for the transportation and storage of CO₂. Its potential will become clearer by 2030 by which time we expect at least one power CCS plant to be operational.
- 3.3.38 Hydrogen could be a low carbon alternative for natural gas if production of that hydrogen is coupled with CCS, or through electrolysis powered by low carbon electricity. This would be capable of replicating the role of natural gas in the electricity system, providing low carbon 'peaking capacity' in the future. However, the supply of low carbon hydrogen for electricity generation is uncertain, and the operability of turbines fuelled solely by 100% hydrogen (rather than blended with natural gas), needs to be developed and demonstrated at commercial scale.

The role of nuclear power

- 3.3.39 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 off-shore wind. Power stations with an estimated lifetime of 60 years provide large amounts of low carbon electrical power, using a relatively small amount of land³³. 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.

- 3.3.40 Our analysis suggests additional nuclear beyond Hinkley Point C will be needed to meet our energy objectives. Nuclear technology is developing and opportunities for flexible use may grow as the energy landscape evolves. The role of nuclear power could be fulfilled by large-scale nuclear, Small Modular Reactors, Advanced Modular Reactors, and fusion power plants.

The role of hydropower and marine technologies

- 3.3.41 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. 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.
- 3.3.42 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 scope of this NPS for electricity generating capacity

- 3.3.43 All the generating technologies mentioned above are urgently needed to meet the Government's energy objectives by:
- providing security of supply (by 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)

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

- 3.3.44 Known technologies that are included within the scope of this NPS are: 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. The need for all these types of infrastructure is established by this NPS and is urgent. New coal or large-scale oil-fired electricity generation are not consistent with the transition to net zero due to their high specific emissions and so are not included within the need case of this NPS and we are taking active steps to phase them out of the energy system.
- 3.3.45 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 contribute towards our objectives, such contribution should be given substantial weight.

The need for new electricity networks

- 3.3.46 As described above electricity networks are needed to connect the output of other types of electricity infrastructure with consumers and with each other. Therefore, as new generation, storage and interconnection facilities are built, we will also need electricity networks that connect these sources of electricity with each other, and with centres of consumer demand.
- 3.3.47 However, 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 above will be necessary to preserve and guarantee the robust and reliable operation of the whole electricity system.
- 3.3.48 The need for onshore reinforcement works of this kind 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 generation.³⁴

³⁴ National Grid ESO, Electricity Ten Year Statement (October 2020)

- 3.3.49 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.
- 3.3.50 Of particular strategic importance this decade is the role of offshore wind in our generation mix. The Government expects that offshore wind (including floating wind) will play a significant role in decarbonising the energy system and has set an ambitious target to have 40GW of offshore wind capacity (including 1GW floating wind) by 2030, with an expectation that there will be a need for substantially more installed offshore capacity beyond this to achieve net-zero by 2050. This presents the challenge of connecting a large volume of generation located beyond the periphery of the existing transmission network.
- 3.3.51 The current approach to connecting offshore wind has 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 adopted wherever possible. For these areas, such an 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.
- 3.3.52 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. Due to the time required to plan, approve and construct the required new onshore transmission infrastructure, the completion of these onshore reinforcements can take 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 40GW of offshore wind by 2030. It is likely to be most efficient if the network planning of offshore transmission is done in coordination with necessary reinforcement works to the onshore transmission network.
- 3.3.53 The final Phase 1 report for National Grid ESO's Offshore Coordination Project³⁵ found that a more integrated approach to offshore transmission, which included efficient planning of the onshore network, could deliver consumer benefits of up to £6bn 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% over the same period, significantly reducing environmental impacts and impacts on coastal communities.

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

- 3.3.54 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.
- 3.3.55 In light of paragraphs 3.3.46-3.3.49 the Secretary of State should consider that the need for a new connection or network reinforcement has been 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.
- 3.3.56 Moreover, given the crucial role of networks in connecting all of the other kinds of electricity infrastructure described in paragraph 3.3.15, it is especially important that the Secretary of State consider 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.
- 3.3.57 Correlatively, and in light of the potential for unwarranted and avoidable disruption, inefficiency, and visual blight along the onshore - offshore boundary, where possible 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.
- 3.3.58 The importance of accelerating such developments does not, however, mitigate against the need for standalone electricity networks projects, and these projects should continue to be assessed on their own merits.

The urgency of need for new electricity infrastructure

- 3.3.59 Paragraphs 3.3.1-3.3.15 set out the need for additional electricity required over the coming decades with 3.3.15 to 3.3.19 setting out the electricity infrastructure needed to support this.
- 3.3.60 Government has committed to reduce GHG emissions by ~78% by 2035 under carbon budget 6. According to the Impact Assessment for CB6. this could lead to a 40-60% increase in demand from electricity by 2035, most of which will need to be low carbon.

- 3.3.61 Given this 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.
- 3.3.62 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. It is not the role of the planning system to deliver specific amounts or limit any form of electricity infrastructure covered by this NPS. 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.
- 3.3.63 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.
- 3.3.64 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.
- 3.3.65 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 act in accordance with the policy set out in Section 3.2 when assessing proposals for new electricity NSIPs.

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 38% of primary energy demand in 2019³⁶. 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

36 From table 1.1 of Digest of United Kingdom Energy Statistics (DUKES) 2020: main chapters and annexes A to D dataset, available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/924593/DUKES_2020_dataset.xls

capacity. In this section gas, unless otherwise specified, includes natural gas, biomethane and hydrogen.

- 3.4.2 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

- 3.4.3 Based on recent evidence, there is a downwards trend in the demand for natural gas. Total natural gas demand fell by about a fifth (around 22 per cent) in the period between 2000 and 2019, with industrial demand shrinking by almost 45% and demand for power generation and domestic demand by around 17% and 16% respectively.³⁷
- 3.4.4 While the Energy White Paper³⁸ signals a decisive shift away from unabated natural gas to clean energy, this transformation cannot be instantaneous without jeopardising a secure, reliable, and affordable energy system. As illustrated in Fig 3.1, BEIS latest published reference scenario, based on 2019 assumptions, projects that the UK’s demand for natural gas will continue to fall to 2025 but will stabilise after that to 2035³⁹. There will continue to be demand for natural gas, and therefore a need for the gas infrastructure that supports it, during the transition to a net zero system in 2050 and potentially beyond, as we develop the means to address the carbon dioxide and other greenhouse gases associated with its use, including through the development and deployment of low carbon alternatives.

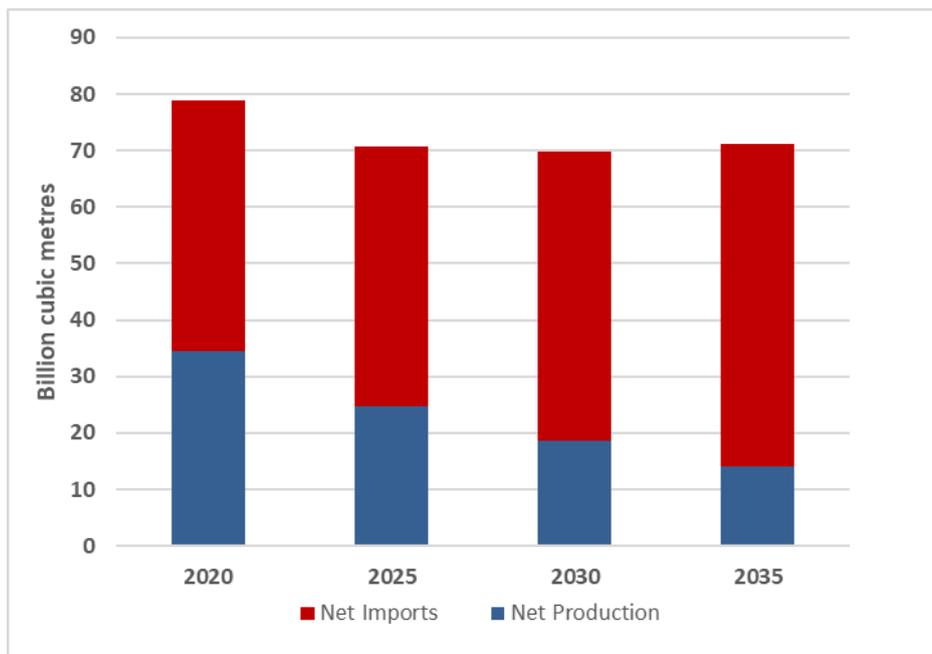
37 From Data table 4.1 of BEIS Energy Trends: December 2020, available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/946775/ET_4.1_DEC_20.xls

38 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/945899/201216_BEIS_EWP_Command_Paper_Accessible.pdf

39 From, BEIS Updated Energy and Emissions Projections, 2020 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/931204/Annex-E-primary-energy-demand_EEP2019_ods

3.4.5 The UK Continental Shelf (UKCS) is a key source of natural gas for the UK, accounting for almost 46% of supplies in 2019⁴⁰ but the longer-term trend is one of reducing supply. UK natural gas production in 2019 decreased by almost 3% compared with 2018 and remained two-thirds below the peak levels seen in 2000⁴¹. This reduction in domestic production will need to be replaced with increased imports, with net gas imports expected to account for ~80% of demand in 2035, partly dependent on energy prices and rates of economic growth (see figure 3.1 below, comprising net domestic production plus net imports).

Figure 3.1: Projected net annual UK Gas Production and Imports, 2020 to 2035⁴²



3.4.6 There is evidence that the natural gas market is robust to a range of possible adverse events. However, the risk of shortfalls in supply cannot be ruled out, nor the risk that

40 From table 4.1 of Digest of United Kingdom Energy Statistics (DUKES) 2020: main chapters and annexes A to D dataset, available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/924593/DUKES_2020_dataset.xls

41 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/912021/DUKES_2020_Chapter_4.pdf chart 4.1

42 Chart derived from BEIS analysis OGA Data and BEIS updated energy emissions.

<https://www.ogaauthority.co.uk/media/6950/copy-of-oga-production-and-beis-demand-projections-september-2020.xlsx> and

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/931204/Annex-E-primary-energy-demand_EEP2019 ods. Net gas imports calculated as the difference between net gas demand and net UK domestic production. To convert Million Tonnes of Oil Equivalent into Billion Cubic Metres, we have used the BP Approximate conversion factors: Statistical Review of World Energy, Natural Gas and LNG conversions table, available at: <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2019-approximate-conversion-factors.pdf>

there may need to be significant rises in wholesale natural gas prices to balance the market.

- 3.4.7 As UKCS production declines, and reliance on imports increases, the availability of necessary gas infrastructure will be needed to reduce the potential for supply shortfalls or price risks to consumers. This includes having the necessary import infrastructure in place, both in terms of gas reception facilities and LNG import facilities. It also includes having adequate gas storage capacity to provide close-to-market 'swing supply' to help meet peak demand.
- 3.4.8 Gas supply infrastructure, including pipelines, will also need to keep pace with any changes in the regional demand for gas across the UK – which may vary due to changes in location of population, commercial or industrial demand, and overall strategies adopted to achieve our net zero target.

Delivering affordable decarbonisation

- 3.4.9 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.
- 3.4.10 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.

The need for low carbon hydrogen infrastructure

- 3.4.11 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. The Impact Assessment for CB6 shows an illustrative range for low carbon hydrogen of 85-125TWh in 2035 and 250-460TWh in 2050⁴³.
- 3.4.12 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.

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

- 3.4.13 Blending hydrogen into the current natural gas distribution networks (potentially up to 20% by volume) can help support the near-term growth in the supply and demand of low carbon hydrogen. It can also deliver some emission reductions from heat use without requiring changes to domestic appliances. Although trials of up to 20% hydrogen (by volume) in the natural gas network are underway, confirming the specific levels of hydrogen blends that can be used in the natural gas networks requires further work. The Prime Minister's Ten Point Plan published on 18 November 2020 includes a target milestone for government to work with industry to complete all necessary testing to allow an up to 20% blend into the gas distribution network by 2023.
- 3.4.14 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% low carbon hydrogen. BEIS is currently working with industry stakeholders to ensure that all necessary research and development, testing and trialling work required is carried out. The hydrogen strategy also provides further information on our approach.⁴⁴
- 3.4.15 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.
- 3.4.16 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. 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.

The role of biomethane

- 3.4.17 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 January 2020, the Renewable Heat Incentive (RHI) had supported the deployment of 94 biomethane plants⁴⁵ and in 2018 3.3TWh⁴⁶ of biomethane was injected into the grid. The reasons for this small uptake include the high capital required for biomethane plants, access to gas injection points and lack of feedstock availability.
- 3.4.18 The government's soon to be launched Green Gas Support Scheme (GGSS)⁴⁷ 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

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

45 BEIS (2020) Renewable Heat Incentive Deployment Statistics, table 1.1

46 BEIS (2019) Digest of UK Energy Statistics (DUKES) 2019

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

9.7MtCO_{2e} of carbon savings over Carbon Budgets 4 and 5, and 21.6MtCO_{2e} of carbon savings over its lifetime.

- 3.4.19 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 heat decarbonisation.

Alternatives to new gas infrastructure

Heat networks

- 3.4.20 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.
- 3.4.21 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 rivers 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 (see Section 4.7).
- 3.4.22 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 networks or to transport gas for the other purposes set out in this section. Heat networks currently supply around 2% of the UK's heat supply.

Electrification and Energy Efficiency Measures

- 3.4.23 As discussed in paragraph 3.3.3, increased electrification of heat 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

- 3.4.24 Demand side response can temporarily reduce gas demand during times of system stress. It allows large gas consumers to reduce the amount of gas they use during times of system stress in exchange for a payment. This reduces the need for additional infrastructure. 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

- 3.4.25 Paragraphs 3.4.1-3.4.19 set out the ongoing need for gas infrastructure over the coming decades. 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.
- 3.4.26 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.
- 3.4.27 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 New carbon capture and storage infrastructure will be needed to ensure the transition to a net zero economy. The Committee on Climate Change states CCS is a necessity not an option.⁴⁸ As well as its role in reducing emissions associated with generating electricity from natural gas (see paragraph 3.3.38), CCS infrastructure will also be needed to capture and store carbon dioxide from hydrogen production from natural gas, industrial processes, the use of bioenergy (BECCS) and from the air (DACCS). CCS infrastructure could be new or repurposed infrastructure.
- 3.5.2 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. New onshore CO₂ pipelines over 16.093 kilometres in length are within scope of this NPS.

Alternatives to new CCS infrastructure

- 3.5.3 There do not appear to be any realistic alternatives to new CCS infrastructure for delivering net zero by 2050. Some possibilities are set out below but, given the changing nature of the energy landscape, we cannot be certain of these outcomes and need CCS infrastructure to remain consistent with delivering our energy objectives.

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

- 3.5.4 CCS is needed to enable domestic production of low carbon hydrogen from natural gas ('blue' hydrogen) as well as unlocking the potential use of biomass for low carbon hydrogen production with negative emissions. As discussed above producing hydrogen through water electrolysis with low carbon power ('green' hydrogen) does not rely on CCS but the government's view is that both are needed to achieve the scale of low carbon hydrogen production required for net zero, alongside further innovation to support other novel technologies.
- 3.5.5 CCS is fundamental to the deep decarbonisation of energy intensive industries such as chemical and cement plants and refineries. 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 of the emissions are process emissions and, as a result, CCS is essential for decarbonising energy intensive industry, either on its own or in combination with measures such as electrification and fuel switching.
- 3.5.6 BEIS analysis suggests that gas-fired electricity generation with CCS is required to deliver an affordable, reliable electricity system that is consistent with our climate change targets. If large volumes of low cost, low carbon hydrogen are available for electricity generation then it may be possible to decarbonise the electricity system without gas with CCS, but we cannot be certain of that outcome and, as noted above, the production of low carbon hydrogen may itself be reliant on CCS infrastructure.
- 3.5.7 It will be difficult to completely decarbonise all sectors of the economy, with aviation and agriculture viewed as particularly challenging. Where sectors are not completely decarbonised, we will need negative emissions to offset the residual emissions in those sectors. Capturing and storing emissions from bioenergy or directly from the air using CCS infrastructure provides a source of negative emissions. There are other sources of negative emissions, such as afforestation, but all of these are limited in some way and negative emissions using CCS infrastructure are viewed as essential for delivering our net zero target.

Bringing forward CCS infrastructure projects

- 3.5.8 Paragraphs 3.5.1-3.5.7 set out the need for CCS infrastructure over the coming decades. 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.
- 3.5.9 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 38% of the primary energy used. We currently rely on oil for over 95% of our motorised transport needs. Transport accounted for more than 70% of final consumption of oil products in the UK in 2019, amounting to 49.5 million tonnes of oil.⁴⁹ 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.
- 3.6.2 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.
- 3.6.3 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.
- 3.6.4 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, clean hydrogen and low carbon fuels, still being developed.
- 3.6.5 Although analysis from the CCC suggests that demand for petroleum could reduce by 50% 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.
- 3.6.6 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.
- 3.6.7 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

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and supply adjust during the transition to a net zero carbon economy over forthcoming decades.

Petroleum product distribution

- 3.6.8 There are about thirty sites which receive oils by sea, these are either refineries or import terminals, and oil products originate either from overseas or UK refineries by coastal shipping. Finished petroleum products are distributed from the refineries and a few major coastal import terminals to around twenty major inland distribution terminals by pipeline or rail. Onward distribution to customers from either coastal or inland sites is mostly by road tanker, but some of the larger airports and military airfields have pipeline connections.
- 3.6.9 There is an extensive network of privately owned pipelines in the UK, with around 4,800km of pipeline currently in use. This carries a variety of oil products from road transport fuels to heating oil and aviation fuel. The network provides an efficient and robust distribution system across the UK and directly provides jet fuel for some of the UK's main airports.
- 3.6.10 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
- 3.6.11 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.
- 3.6.12 In light of the above, the Secretary of State should expect to receive a small number of significant applications for oil pipelines and should start its assessment from the basis that there is a significant need for this infrastructure to be provided.

4 Assessment Principles

4.1 General Policies and Considerations

- 4.1.1 The statutory framework for deciding applications for development consent under the Planning Act is summarised in Section 1.1 of this NPS. The need for new energy infrastructure is covered in Part 3, and guidance regarding the particular physical impacts of construction and operation are set out in Part 5 of this NPS and Part 2 of each technology specific NPS. 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 Paper emphasises the importance of the Government's net zero commitment and efforts to fight climate change. 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. The presumption is also subject to the provisions of the Planning Act 2008 referred to at paragraph 1.1.2 of this NPS.
- 4.1.3 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, ecological enhancements, and any long-term or wider benefits
 - its potential adverse impacts, including any long-term and cumulative adverse impacts, as well as any measures to avoid, reduce, mitigate or compensate for any adverse impacts
- 4.1.4 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). 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, those residual effects should be weighed against the benefits of the proposed development.
- 4.1.5 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, rather than to

change the underlying policies against which applications are assessed (or therefore the “benchmark” for what is, or is not, an acceptable nationally significant energy development). 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. In the event of a conflict between these or any other documents and an NPS, the NPS prevails for the purpose of Secretary of State decision making given the national significance of the infrastructure. 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.⁵⁰

- 4.1.6 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 what weight to give to the plan for the purposes of determining the planning significance of what is replaced, prevented or precluded. 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.
- 4.1.7 The Secretary of State should only impose requirements⁵¹ 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. The Secretary of State should take into account the guidance in the NPPF, the PPG: Use of Planning Conditions, and TANs, or any successor documents, where appropriate.
- 4.1.8 The Secretary of State may take into account any development consent obligations⁵² 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.
- 4.1.9 Early engagement at the pre-application stage with key stakeholders, including public regulators, Statutory Nature Conservation Bodies (SNCBs), and those likely to have an interest in a proposed energy infrastructure application, is strongly encouraged. The benefits of early engagement with key stakeholders are numerous. Early engagement can aid in ensuring that all relevant information can be properly assessed by the Examining Authority at the examination stage of the project and in the subsequent report.

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

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

52 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.

- 4.1.10 Applicants need to consider the importance of ‘good design’ criteria. Such consideration of ‘good design’ criteria should be demonstrated when submitting applications for energy infrastructure projects to the Secretary of State. 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 to maximise the value provided by the infrastructure. Design principles⁵³ should be established from the outset of the project to guide the development from conception to operation.
- 4.1.11 Further information on the criteria for ‘good design’ for energy infrastructure is set out at Section 4.6 of this part of this NPS.
- 4.1.12 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. Where the Secretary of State considers, on information provided in an application, 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

- 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.⁵⁴ The Regulations specifically refer to effects on population, human health,⁵⁵ biodiversity, land, soil, water, air, climate, the landscape, material assets and cultural heritage, and the interaction between them. 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 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.⁵⁶
- 4.2.2 To consider the potential effects, including benefits, of a proposal for a project, the applicant should set out information on the likely significant social and economic

⁵³ 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. <https://nic.org.uk/studies-reports/design-principles-for-national-infrastructure/>

⁵⁴ The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

⁵⁵ The effects on human beings includes effects on health

⁵⁶ For guidance on the assessment of cumulative effects, see, for example, PINS Advice Note 17 regarding Cumulative Effects Assessment (August 2019) <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/12/Advice-note-17V4.pdf>

effects of the development, and show how any likely significant negative effects would be avoided, reduced, or mitigated. This information could include matters such as employment, equality, biodiversity net gain, community cohesion and well-being.

- 4.2.3 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. In the absence of any additional information on additional assessments, the principles set out in this Section will apply to all assessments.
- 4.2.4 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.
- 4.2.5 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 elements of the proposal have yet to be finalised, and the reasons why this is the case.
- 4.2.6 Where some details are still to be finalised, the ES should set out to the best of the applicant's knowledge, what the likely worst-case environmental, social and economic effects of the proposed development may be and assess, on that basis, to ensure that the impacts of the project as it may be constructed have been properly assessed.⁵⁷
- 4.2.7 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. 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.
- 4.2.8 In this NPS and the technology specific NPSs, the terms 'effects', 'impacts' or 'benefits' should be understood to mean likely significant effects, likely significant impacts or likely significant benefits.

⁵⁷ Case law (for example Rochdale MBC Ex. Parte C Tew 1999) provides a legal principle that indicative sketches and layouts cannot provide the basis for determining applications for EIA development. The "Rochdale Envelope" is a series of maximum extents of a project for which the significant effects are established. The detailed design of the project can then vary within this 'envelope' without rendering the ES inadequate.

Habitats Regulations

- 4.2.9 The Secretary of State must, under the Habitats Regulations, consider whether the project may have a significant effect on a protected site which is part of the National Site Network, 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. 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. 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 effects.
- 4.2.10 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. 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. Applicants must have discussed with SNCB whether any proposed compensation is appropriate, and the compensation must be secured, or an indication given as to how it can be secured. 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 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.

Alternatives

- 4.2.11 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, detailed guidance on which falls outside the scope of this NPS. From a policy perspective this NPS does not contain any general requirement to consider alternatives or to establish whether the proposed project represents the best option.
- 4.2.12 However:
- 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

- in some circumstances, the NPSs may impose a policy requirement to consider alternatives (see below in Sections 5.4, 5.8 and 5.10)

4.2.13 Where there is a policy or legal requirement to consider alternatives, the applicant should describe the alternatives considered in compliance with these requirements. 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 be considered
- 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
- 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
- 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
- as the Secretary of State must assess an application in accordance with the relevant NPS (subject to the exceptions set out in 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
- 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
- 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

- 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

4.3 Health

- 4.3.1 Energy production 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 production, distribution and use of energy may have negative impacts on some people’s health.
- 4.3.2 As described in the relevant sections of this NPS and in the technology specific NPSs, where the proposed project has an effect on human beings, 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. 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.
- 4.3.3 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.
- 4.3.4 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.
- 4.3.5 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. However, not all potential sources of health impacts will be mitigated in this way and the Secretary of State will want to take account of health concerns when setting requirements relating to a range of impacts such as noise. Opportunities should also 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

within society which may be differentially impacted by a development compared to wider society as a whole.

4.4 Marine Considerations

English Marine Area

- 4.4.1 Marine plans apply in the ‘marine area’, 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 of this NPS. 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). Individual Marine Plans should be consulted to understand marine relevant specific considerations.
- 4.4.3 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.⁵⁸ This will include any Marine Plan which is in effect for the relevant area.
- 4.4.4 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. In the event of a conflict between an NPS and any marine planning documents, the NPS prevails for purposes of decision making.
- 4.4.5 Applicants for a development consent order will need to take account of any relevant Marine Plans. There is an expectation that applicants will complete a Marine Plan assessment as part of their project development and this information should be used to support an application for development consent. Applicants are encouraged to refer to Marine Plans at an early stage, such as in advance of pre-application stage, to inform project planning, for example to avoid less favourable locations as a result of other uses or environmental constraints.

⁵⁸ 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.

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. Applicants should therefore not just look to mitigate direct harms, but also consider whether there are opportunities for enhancements. Biodiversity net gain is an essential component of environmental net gain. Projects 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.
- 4.5.2 Although achieving biodiversity net gain is not an obligation for projects under the Planning Act 2008, energy NSIP proposals should seek opportunities to contribute to and enhance the natural environment by providing net gains for biodiversity where possible⁵⁹. Applicants are encouraged to use the most current version of the Defra biodiversity metric⁶⁰ to calculate their biodiversity baseline and inform their biodiversity net gain outcomes and to present this data as part of their application. Biodiversity net gain should be applied in conjunction with the mitigation hierarchy and does not change or replace existing environmental obligations.
- 4.5.3 In addition to delivering biodiversity net gain, developments may also deliver wider environmental gains 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, or increased access to natural greenspace. The scope of potential gains will be dependent on the type, scale, and location of specific projects. 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 the design (including any relevant operational aspects) of the project. Applicants should make use of available guidance and tools for measuring natural capital assets and ecosystem services, such as the Natural Capitals Committee's 'How to Do it: natural capital workbook' and Defra's guidance on Enabling a Natural Capital Approach (ENCA). Where environmental net gain considerations have featured as part of the strategic options appraisal process to select a project, the statement should reference that information to supplement the site-specific details.

⁵⁹ Although achieving biodiversity net gain is not currently an obligation on applicants, a proposed amendment to the Environment Bill (see <https://bills.parliament.uk/bills/2593/stages/15298/amendments/87948>), would mean the Secretary of State may not grant an application for Development Consent Order unless satisfied that a biodiversity gain objective is met in relation to the development to which the application relates. The biodiversity gain objective will be set out in a biodiversity gain statement. Normally these statements will be included within NPS but the amendment allows for the statement to be published separately where a review of an NPS has begun before the proposed amendment comes into force. This would be the case with the energy NPS, should the amendment come into force.

⁶⁰ The Biodiversity Metric can be found at <http://publications.naturalengland.org.uk/publication/5850908674228224>

- 4.5.4 Part 5 of this NPS provides guidance on the impacts of new energy infrastructure. Opportunities are identified in a number of sections relating to environmental, social and economic enhancements, protection and mitigation measures.

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. Applying “good design” to energy projects should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources 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 much energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of the area.
- 4.6.2 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. 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. Design principles⁶¹ should be established from the outset of the project to guide the development from conception to operation.
- 4.6.3 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. In doing so, the Secretary of State should be satisfied that the applicant has taken into account both functionality (including fitness for purpose and sustainability) and aesthetics (including its contribution to the quality of the area in which it would be located, any potential amenity benefits, and visual impacts on the landscape or seascape) as far as possible. 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

⁶¹ 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. <https://nic.org.uk/studies-reports/design-principles-for-national-infrastructure/>

as is possible, seek to embed opportunities for nature inclusive design within the design process.

- 4.6.4 For the Secretary of State to consider the proposal for a project, applicants should be able to 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. 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. The Secretary of State will 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.
- 4.6.5 Applicants and 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 and applicants are encouraged to use this service.⁶²
- 4.6.6 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. 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.
- 4.7.3 Using less fuel to generate the same amount of heat and power reduces emissions, particularly CO₂. The Government has therefore committed to promoting Good Quality

⁶² The Chief Planner's 2011 Letter about design and planning can be found here: 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: <https://www.designcouncil.org.uk/>

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

- 4.7.4 In 2019, there was 6.1GW of Good Quality CHP in the UK, providing over 7.3% of electricity and saving an estimated 10.5 MtCO₂ per annum. There is a recognised cost-effective potential for Good Quality CHP to continue to provide benefits due to efficiencies inherent in cogeneration.
- 4.7.5 To be economically viable as a CHP plant, a generating station needs to be located close to industrial or domestic customers with heat demands. The distance will vary according to the size of the generating station and the nature of the heat demand. 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.
- 4.7.6 Guidance issued by the then Department for Trade and Industry (DTI) in 2006⁶³ 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 that the possibilities for CHP have been fully explored to inform the Secretary of State's consideration of the application. This should be through an audit trail of dialogue between the applicant and prospective customers. 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.
- 4.7.7 In developing proposals for new thermal generating stations, applicants should consider the opportunities for CHP from the very earliest point, and it should be adopted as a criterion when considering locations for a project. 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 and obtain their advice on opportunities for CHP. Further advice is contained in the 2006 DTI guidance and applicants should also consider relevant information in regional and local energy and heat demand mapping.
- 4.7.8 Utilisation of useful heat that displaces conventional heat generation from fossil fuel sources is to be encouraged where, as will often be the case, it is more efficient than the alternative electricity/heat generation mix. To encourage proper consideration of CHP, substantial additional positive weight should therefore be given to applications

⁶³ 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.

incorporating CHP. If the proposal is for thermal generation without CHP, the applicant should:

- explain why CHP is not economically or practically feasible for example if there is a more energy efficient means of satisfying a nearby domestic heat demand
- provide details of any potential future heat requirements in the area that the station could meet
- detail the provisions in the proposed scheme for ensuring any potential heat demand in the future can be exploited
- Given the importance which government attaches to CHP, if an application does not demonstrate that CHP has been considered the Secretary of State should seek further information from the applicant. 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. For non-CHP stations, where there is reason to believe that opportunities to supply heat through CHP may arise in the future, the Secretary of State may also require that developers ensure that their stations are 'CHP ready' and are designed in order to allow heat supply at a later date

4.7.9 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.

4.7.10 If the Secretary of State is not satisfied with the evidence that has been provided, the Secretary of State may wish to investigate this with one or more of the bodies such as LEPs and Local Authorities.

4.7.11 Furthermore, if the Secretary of State, 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 should request that the applicant pursues this. Should the applicant not be able to reach an agreement with a potential customer, it should provide evidence demonstrating why it was not possible.

4.7.12 The Secretary of State may 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. If so, the Secretary of State may wish to impose requirements to ensure that the generating station is CHP-ready unless the Secretary of State is satisfied that the applicant has demonstrated that the need to comply with the requirement to be CCR will preclude any provision for CHP.

4.8 Carbon Capture and Storage (CCS)

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. Carbon capture rates achieved will depend on the application and a minimum capture rate may be required. Carbon capture technologies offer the opportunity to decarbonise the electricity system whilst maintaining security of supply, providing reliable low carbon generation capacity.
- 4.8.2 The government has made its ambitions for CCS clear⁶⁴ - 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 by 2030. 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. 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.
- 4.8.3 The types of 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. 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. The carbon capture plant required for a new build power CCS plant can be included as associated development in the application for development consent for the relevant thermal generating station, and will then be considered as part of that application. A supply of water will be needed for CCS processes and the volumes required will depend on the carbon capture technology used. Power CCS facilities will have an impact on the surrounding landscape and visual amenity. As set out in Section 2.6 of EN-2, the main structures of a 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. As set out in Section 2.7 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. Planning applications for generating stations with CCS should provide evidence that shows technically feasible plans for the CO₂ capture plant, an ES that addresses impacts arising from the project and documentation to ensure compliance with all other existing policy, including that

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

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). 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.

4.8.4 There are several different capture techniques which might have slightly different environmental impacts and considerations. These should be set out in the planning application. For example, some capture technologies may require hazardous substances consent for solvents required during the capture process. The Secretary of State should have regard to advice from the EA or NRW as to the technical feasibility of the proposed carbon capture technology. The Secretary of State may also seek further independent advice, but is not required to do so.

4.8.5 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.

4.8.6 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). 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.

4.8.7 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. The operation of the CCS chain will require permits from the EA or NRW. 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. In considering applications, the Secretary of State should therefore, take into account that the government will expect applicants to take into account foreseeable future demand when considering the size and route of their investments and applicants may therefore propose pipelines with a greater capacity than demand at the time of consenting might suggest. Existing legislation (The Pipeline Safety Regulations 1996) already provides powers to require modification of pipelines where this would reduce the need for additional pipelines to be constructed in the future. 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 carbon dioxide 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 Ports, but the need for CCS infrastructure set out in this NPS is likely to be a relevant consideration.

4.8.8 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/CO₂⁶⁵ enough to store the equivalent of current total UK annual emissions for over 200 years. 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. As the global CCS market increases, the UK can capture £4.3 billion of GVA per annum from exports by 2050⁶⁶. We do not currently envisage an onshore CO₂ storage industry developing against this backdrop. 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. Offshore CO₂ transport and storage infrastructure 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 a Demonstration of Safety. 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.

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

66 Energy Innovation Needs Assessment Sub-theme report: Carbon capture, utilisation and storage; <https://www.gov.uk/government/publications/energy-innovation-needs-assessments>

Carbon Capture Readiness⁶⁷

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 2013 should demonstrate that the plant is “Carbon Capture Ready” (CCR) before consent may be given. The Secretary of State must not grant consent unless this is the case. In order to assure the Secretary of State that a proposed development is CCR, applicants will need to demonstrate that their proposal complies with guidance issued by the Secretary of State in November 2009⁶⁸ 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
- the economic feasibility within the combustion station’s lifetime of the full CCS chain, covering retrofitting, transport and storage

4.8.10 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

4.8.11 The assessment of technological feasibility could be against either:

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

⁶⁷ The Energy White Paper, published in December 2020, committed to consult on proposals to update the Carbon Capture Readiness requirements to reflect technological advances, such as conversion to low carbon hydrogen, and apply them more broadly, by removing the 300MW threshold and including all combustion technologies within scope. If that consultation leads to changes in the relevant legal or policy framework then those new requirements will apply and this NPS will be updated to reflect any revised requirements ahead of designation. In the meantime, CCR policy remains as set out in this section.

⁶⁸ Carbon Capture Readiness. A guidance note for Section 36 Applications:

<https://www.gov.uk/government/publications/carbon-capture-readiness-ccr-a-guide-on-consent-applications>

- 4.8.12 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.
- 4.8.13 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 need to be the case to allow operational CCS to be economically feasible during the lifetime of the proposed new station.
- 4.8.14 A model assessment structure is suggested in CCR guidance⁶⁹, although this is not the only way which the assessment could be addressed. It is the responsibility of applicants to justify the capture, transport and storage options chosen for their proposed development.
- 4.8.15 The Secretary of State should consult the EA or NRW on the technical and economic feasibility assessments. 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. 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.
- 4.8.16 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 BEIS. These reports will be required within 3 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

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

4.9 Climate Change Adaptation

- 4.9.1 Part 2 of this NPS covers the government's energy and climate change strategy, including policies for mitigating climate change and its impacts. This part of the NPS sets out how applicants and the Secretary of State should take the effects of climate change into account when developing and consenting infrastructure. While climate change mitigation is essential to minimise the most dangerous impacts of climate change, previous global GHG emissions have already committed us to some degree of continued climate change for at least the next 30 years. 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 likely to mean that the UK will experience hotter, drier summers and warmer, wetter winters. There is a likelihood of increased flooding, drought, heatwaves, and intense rainfall events, as well as rising sea levels and coastal change. Adaptation is therefore necessary to deal with the potential impacts of these changes that are already happening. Renewable and low carbon development is an adaptive measure to address climate change.
- 4.9.3 To support planning decisions, the government produces a set of UK Climate Projections⁷⁰ and has developed a statutory National Adaptation Programme⁷¹. In addition, the government's Adaptation Reporting Power⁷² 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. 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.
- 4.9.4 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).
- 4.9.5 In preparing measures to support climate change adaptation applicants should consider whether nature-based solutions could provide a basis for such adaptation. In addition to avoiding further GHG emissions when compared with some more traditional adaptation approaches, nature based solutions can also result in biodiversity benefits as well as increasing absorption of carbon dioxide from the atmosphere (see also Section 5.11 on the role of green infrastructure).

70 The UKCP18 key results can be found here:

<https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/key-results>

71 s.58 of the Climate Change Act 2008.

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

- 4.9.6 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 impacts of climate change when planning the location, design, build, operation and, where appropriate, decommissioning of new energy infrastructure. The ES should set out how the proposal will take account of the projected impacts of climate change, in accordance with the EIA Regulations. This information will be needed by the Secretary of State.
- 4.9.7 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 Projections and associated research and expert guidance (such as the EA's Climate Change Allowances for Flood Risk Assessments) 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. Should a new set of UK Climate Projections or associated research become available after the preparation of the ES, the Secretary of State should consider whether they need to request further information from the applicant.
- 4.9.8 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. Applicants should be able to demonstrate that proposals have a high level of climate resilience built-in from the outset. They should also be able to 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.
- 4.9.9 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.
- 4.9.10 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 the high emissions scenario to those elements. Although the likelihood of this scenario is thought to be low, it is appropriate to take a more risk-averse approach with elements of infrastructure which are critical to the safety of its operation.
- 4.9.11 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.

- 4.9.12 Any adaptation measures should be based on the latest set of UK Climate Projections, the Government's latest UK Climate Change Risk Assessment, when available⁷³ and in consultation with the EA's Climate Change Allowances for Flood Risk Assessments.⁷⁴
- 4.9.13 Adaptation measures can 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).
- 4.9.14 The generic impacts advice in this NPS and the technology specific advice on impacts in the other NPSs provide additional information on climate change adaptation. In particular, this section should be read alongside the sections in Part 5 on coastal change (Section 5.6) and flood risk (Section 5.8).

4.10 Grid 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. 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. 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. Applicants should consider co-ordinating their proposals for the onshore-offshore connection, as outlined at Section 3.3.
- 4.10.2 The applicant will 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. It may be the case that the applicant has not received or accepted a formal offer of a grid connection from the relevant network operator at the time of the application, although it is likely to have applied for one and discussed it with them. This is a commercial risk the applicant may wish to take for a variety of reasons, although the Secretary of State will want to be satisfied that there is no obvious reason why a grid connection would not be possible.

⁷³ s.56 of the Climate Change Act 2008.

⁷⁴ <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

- 4.10.3 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. The government therefore envisages that wherever 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. This is particularly encouraged to ensure development of more co-ordinated transmission overall. However, for some new co-ordinated offshore transmission projects it is recognised that these will be brought forward for consenting separate to (though planned with) the applications for the wind farms⁷⁵ as outlined in EN-5.
- 4.10.4 Co-ordinated applications typically bring economic efficiencies and reduced environmental impact. On some occasions it may not be possible, nor the best course in terms of delivery of the project in a timely way, as different aspects 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), so the level of information available on the different elements may vary. In some cases, applicants may therefore decide to put in an application that seeks consent only for one element but contains some information on the second. Where this is the case, the applicant should explain the reasons for the separate application.
- 4.10.5 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. The Secretary of State must be satisfied that there are no obvious reasons why the necessary approvals for the other element are likely to be refused. The fact that the Secretary of State has decided to grant consent for one project should not in any way fetter the Secretary of State's subsequent decisions on any related projects.
- 4.10.6 Further guidance on the considerations for the Secretary of State is contained in EN-5.

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

⁷⁵ 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.

regulation under the pollution control framework or other consenting and licensing regimes.

- 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). 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.
- 4.11.5 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 on the impacts of that use, rather than the control of processes, emissions or discharges themselves⁷⁶. 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.
- 4.11.6 Applicants should consult the MMO 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. 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. The Secretary of State and MMO should cooperate closely to ensure that energy NSIPs are licensed in accordance with environmental legislation.

⁷⁶ See paragraph 183 of section 15 of the NPPF

- 4.11.7 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. 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.
- 4.11.8 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 will 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. 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.
- 4.11.9 The Secretary of State should be satisfied that development consent can be granted taking full account of environmental impacts. 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 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
- 4.11.10 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.

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. Applicants should consult with the HSE on matters relating to safety.
- 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. 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 of the facility, i.e. from the design and build stage through to decommissioning. They are enforced by the Competent Authority comprising HSE 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. The same principles apply here as for those set out in the previous section on pollution control and other environmental permitting regimes.
- 4.12.4 Applicants seeking to develop infrastructure subject to the COMAH regulations should make early contact with the Competent Authority. 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. The Secretary of State should be satisfied that an 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. Applicants must consult the Hazardous Substances Authority and the HSE at pre-application stage⁷⁷ if the project is likely to need hazardous substances consent. Where hazardous substances consent is applied for, the Secretary of State will consider whether to make an order directing that hazardous substances consent shall be deemed to be granted alongside making an order granting development consent.⁷⁸ The Secretary of State should consult HSE about this.
- 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.
- 4.13.3 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

⁷⁷ Further information is available at the HSE's website: [HSE: Land use planning - Hazardous substances consent](#)

⁷⁸ 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

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.

4.14 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. 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) but only to the extent that the nuisance is the inevitable consequence of what has been authorised. 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. The defence is not intended to extend to proceedings where the matter is "prejudicial to health" and not a nuisance.
- 4.14.2 At the application stage of an energy NSIP, possible sources of nuisance under section 79(1) of the 1990 Act 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).
- 4.14.3 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)). Therefore, subject to Section 5.7, 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.

4.15 Security Considerations

- 4.15.1 National security considerations apply across all national infrastructure sectors. BEIS 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. In the UK's civil nuclear industry, security is also independently regulated by the Office for Nuclear Regulation (ONR).
- 4.15.2 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.

- 4.15.3 BEIS will be notified at pre-application stage about every likely future application for energy NSIPs, so that any national security implications can be identified. Where national security implications have been identified, the applicant should consult with relevant security experts from CPNI, ONR (for civil nuclear) and/or BEIS 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. If CPNI, ONR (for civil nuclear) and/or BEIS 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.
- 4.15.4 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.
- 4.15.5 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 Secretary of State may direct that examination of that evidence take place in closed session.

5 Generic Impacts

5.1 Introduction

- 5.1.1 Some impacts (such as landscape and visual impacts) arise from the development of any of the types of energy infrastructure covered by the energy NPSs. Other impacts may not be relevant to all types of energy infrastructure but nevertheless can arise in similar ways from the development of the types of energy infrastructure covered in at least two of the energy NPSs. Both these classes of impacts are considered in this Part. These impacts are referred to as “generic impacts”. 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 which is 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. The technology specific NPSs may state that certain impacts should be given a particular weight. Where they do not do so, the Secretary of State should follow any policy set out 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.
- 5.1.3 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.
- 5.1.4 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.⁷⁹ Applicants must also ensure they consult the relevant bodies about their proposed applications in

⁷⁹ 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.

accordance with section 42 to 44 of the Planning Act 2008 and the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009.

5.2 Air Quality and Emissions

Introduction

- 5.2.1 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, or on the wider countryside and species. Impacts on protected species and habitats are covered in Section 5.4. 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). Levels for pollutants in ambient air are set out in the Air Quality Standards Regulations 2010 and reiterated in the Air Quality Strategy.⁸⁰ The Secretary of State for Environment, Food and Rural Affairs is required to make available up to date information on air quality to any relevant interested party.⁸¹
- 5.2.2 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.
- 5.2.3 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 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).

⁸⁰ <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england-scotland-wales-and-northern-ireland-volume-1>

⁸¹ Air Quality Standards Regulations 2010, No.2010/1001.

- 5.2.4 Impacts of thermal combustion generating stations with respect to air emissions are set out in the technology specific NPSs.

Applicant's assessment

- 5.2.5 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.
- 5.2.6 The ES should describe:
- 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
 - existing air quality levels and the relative change in air quality from existing levels
 - any potential eutrophication impacts

Secretary of State decision making

- 5.2.7 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.
- 5.2.8 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. 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.
- 5.2.9 In all cases, the Secretary of State must take account of any relevant statutory air quality limits. Where a project is likely to lead to a breach of such limits the applicant should work with the relevant authorities to secure appropriate mitigation measures to allow the proposal to proceed. In particular, where a project is located within, or in close proximity to, a Local Air Quality Management Area or Clean Air Zone, applicants should engage with the relevant local authority to ensure the project is compatible with the local air quality plan. In the event that a project will lead to non-compliance with a statutory limit the Secretary of State should refuse consent.

Mitigation

- 5.2.10 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.

- 5.2.11 In doing so the Secretary of State should have regard to the Air Quality Strategy⁸² or any successor to it and should consider relevant advice within Local Air Quality Management guidance.⁸³
- 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.

5.3 Greenhouse Gas Emissions

Introduction

- 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's assessment

- 5.3.4 All proposals for energy infrastructure projects should include a carbon assessment as part of their ES (See Section 4.2). This should include:
- A whole life carbon assessment showing construction, operational and decommissioning carbon 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 carbon 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

⁸² <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england-scotland-wales-and-northern-ireland-volume-1>

⁸³ <https://laqm.defra.gov.uk/supporting-guidance.html>

- Whether and how any residual carbon 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

Secretary of State decision making

- 5.3.5 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.
- 5.3.6 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. The Secretary of State should also give positive 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 accepts that there are likely to be some residual emissions from construction and decommissioning of energy infrastructure.
- 5.3.7 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 aimed at decarbonising electricity generation such as 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 including those which use these technologies 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, apply to these emissions. 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.

Mitigation

- 5.3.8 A carbon 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.

- 5.3.9 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.
- 5.3.10 To be taken into account in Secretary of State decision making, steps taken to minimise and offset emissions should be set out in a GHG Reduction Strategy, secured under the development consent order.

5.4 Biodiversity and Geological Conservation

Introduction

- 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.
- 5.4.2 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.⁸⁴ The MHCLG Natural Environment PPG document sets out good practice in England in relation to planning for biodiversity and geological conservation.⁸⁵

Applicant's assessment

- 5.4.3 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, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity. 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.
- 5.4.4 The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests. As set out in Section 4.6, the design process should embed opportunities for nature inclusive design. The applicant is encouraged to consider how their proposal can contribute towards Biodiversity Net Gain in line with the ambition set out in the 25 Year Environment Plan. Energy infrastructure projects have the potential to deliver significant benefits and enhancements beyond Biodiversity Net Gain, which result in

⁸⁴ 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.

⁸⁵ The MHCLG Natural Environment Guidance can be found at <https://www.gov.uk/guidance/natural-environment>

wider environmental gains. The scope of potential gains will be dependent on the type, scale, and location of each project.

Secretary of State decision making

- 5.4.5 The government's 25 Year Environment Plan marked 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 25 Year Environment Plan and any relevant measures and targets. In doing so, the Secretary of State should also take account of the context of the challenge of climate change: failure to address this challenge will result in significant adverse impacts to biodiversity. The policy set out in the following sections recognises the need to protect and enhance biodiversity and geological conservation interests. 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.
- 5.4.6 As a general principle, and subject to the specific policies below, development should at the very least aim to avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives (as set out in Section 4.2 above); where significant harm cannot be avoided, then appropriate compensation measures should be sought. If significant harm to biodiversity resulting from a development cannot be avoided (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.
- 5.4.7 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.

HRA Sites

- 5.4.8 Important sites for biodiversity are those identified through international conventions and the Habitats Regulations. 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. As a matter of policy, the following should be given the same protection as sites covered by the Habitats Regulations: (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 other HRA sites.

Sites of Special Scientific Interest (SSSIs)

- 5.4.9 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.
- 5.4.10 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. The Secretary of State should use requirements and/or planning obligations to mitigate the harmful⁸⁶ aspects of the development and, where possible, to ensure the conservation and enhancement of the site's biodiversity or geological interest.

Marine Conservation Zones

- 5.4.11 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. 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.

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. 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. 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.

⁸⁶ In line with the principle in paragraph 4.2.8, the term 'harm' should be understood to mean 'significant harm'.

Ancient Woodland and Veteran Trees

5.4.13 Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Once lost it cannot be recreated. The Secretary of State should not grant development consent for any development that would result in its loss or deterioration unless the benefits (including need) of the development, in that location clearly outweigh the loss of the woodland habitat. Aged or 'veteran' trees found outside ancient woodland are also particularly valuable for biodiversity and their loss should be avoided⁸⁷. Where such trees would be affected by development proposals the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons why. Applicants should provide a suitable compensation strategy in instances where proposals would result in the loss or deterioration of ancient woodland and ancient or veteran trees.

Biodiversity within Developments

5.4.14 Development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design. When considering proposals, the Secretary of State should maximise such opportunities in and around developments, using requirements or planning obligations where appropriate. This can help towards delivering biodiversity net gain. Wider ecosystem services and benefits of natural capital should also be considered when designing enhancement measures.

Protection and Enhancement of Habitats and Other Species

5.4.15 Many individual wildlife species receive statutory protection under a range of legislative provisions.⁸⁸

5.4.16 Other species and habitats have been identified as being of principal importance for the conservation of biodiversity in England and Wales and thereby requiring conservation action.⁸⁹ The Secretary of State should ensure that these species and habitats are protected from the adverse effects of development by using requirements, planning obligations, or licence conditions. 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

⁸⁷ This does not prevent the loss of such trees where the Secretary of State is satisfied that their loss is unavoidable.

⁸⁸ 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.

⁸⁹ 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 at: <http://ukbap-reporting.org.uk/our-biodiversity-reporting-system>

detriment of biodiversity features of national or regional importance which it considers may result from a proposed development.

5.4.17 Proposals should also consider any opportunities to maximise the restoration, creation, and enhancement of wider biodiversity. 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

5.4.18 The applicant should include appropriate mitigation 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 to birds during the breeding season⁹⁰
- 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
- mitigation measures should take into account existing habitats and should generally seek opportunities to enhance them, rather than replace them. Where practicable, mitigation measures should seek to create new habitats of value within the site landscaping proposals

5.4.19 Applicants should consider producing and implementing 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.

5.4.20 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.

⁹⁰ See guidance on the protection of wild birds here: <https://www.gov.uk/guidance/wild-birds-protection-surveys-and-licences>

- 5.4.21 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.
- 5.4.22 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 for biodiversity net gain should generally be maintained for a minimum period of 30 years.
- 5.4.23 The Secretary of State will need to take account of what mitigation measures may have been agreed between the applicant and the SNCB or the MMO, and whether the SNBC or the MMO has granted or refused or intends to grant or refuse, any relevant licences, including protected species mitigation licences.

5.5 Civil and Military Aviation and Defence Interests

Introduction

- 5.5.1 Civil and military aerodromes, aviation technical sites, and other types of defence interests (both onshore and offshore) can be affected by new energy development.

Aviation

- 5.5.2 UK airspace is important for both civilian and military aviation interests. It is essential that the safety of UK aerodromes, aircraft and airspace is not adversely affected by new energy infrastructure. Similarly, aerodromes can have important economic and social benefits, particularly at the regional and local level. Commercial civil aviation is largely confined to designated corridors of controlled airspace and set approaches to airports. However, civilian leisure and military aircraft may often fly outside of 'controlled air space'. The approaches and flight patterns to aerodromes are not necessarily routine and can be irregular owing to a variety of factors including the performance characteristics of the aircraft concerned and the prevailing meteorological conditions.
- 5.5.3 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. A similar official safeguarding system applies to certain military aerodromes and defence assets, selected on the basis of their strategic importance. Areas of airspace around aerodromes used by aircraft taking off or on approach and landing are described as "obstacle limitation surfaces" (OLS). OLS for civil aerodromes are defined according to

criteria set out in relevant Civil Aviation Authority (CAA) guidance⁹¹ and for military aerodromes according to MoD criteria. Aerodromes that are officially safeguarded will have officially produced plans that show the OLS.

- 5.5.4 The certified Safeguarding maps depicting the OLS and other criteria (for example to minimise “birdstrike” hazards) are deposited with the relevant local planning authorities. DfT/ODPM Circular 01/2003⁹² provides advice to planning authorities on the official safeguarding of aerodromes and includes a list of the aerodromes which are officially safeguarded. The Circular and CAA guidance also recommends that the operators of aerodromes which are not officially safeguarded should take steps to protect their aerodrome from the effects of possible adverse development by establishing an agreed consultation procedure between themselves and the local planning authority or authorities.
- 5.5.5 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 local planning authorities. DfT Circular 01/2010 provides advice to local planning authorities on Public Safety Zones.⁹³
- 5.5.6 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. New energy infrastructure may cause obstructions in Ministry of Defence (MoD) low flying areas.
- 5.5.7 Safe and efficient operations within UK airspace is dependent upon communications, navigation and surveillance (CNS) infrastructure, including radar (often referred to as ‘technical sites’). Energy infrastructure development may interfere with the operation of CNS systems such as radar. It can also 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 located in close proximity to Communications and Navigation Aids and technical sites). Wind turbines may also cause false returns when built in line of sight to Primary or Secondary Surveillance radar installations.

Other defence interests

91 CAA CAP 168: Licensing of Aerodromes:

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

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

93 DfT Circular 01/2010: Control of Development in Airport Public Safety Zones:

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

- 5.5.8 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.
- 5.5.9 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 and Meteorological radars which have wide coverage over the UK (onshore and offshore). It is important that new energy infrastructure does not significantly impede or compromise the safe and effective use of any defence assets.

Applicant's assessment

- 5.5.10 Where the proposed development may have an effect on civil or military aviation and/or other defence assets an assessment of potential effects should be set out in the ES (see Section 4.2).
- 5.5.11 The applicant should consult the MoD, Civil Aviation Authority (CAA), NATS and any aerodrome – licensed or otherwise – likely to be affected by the proposed development in preparing an assessment of the proposal on aviation or other defence interests.
- 5.5.12 Any assessment of aviation or other defence interests should include potential impacts of the project upon the operation of CNS infrastructure, flight patterns (both civil and military), other defence assets and aerodrome operational procedures. It should also assess the cumulative effects of the project with other relevant projects in relation to aviation and defence.
- 5.5.13 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 and defence consultees are informed as soon as reasonably possible.

Secretary of State decision making

- 5.5.14 The Secretary of State should be satisfied that the effects on 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 or defence interests has been carried out. In particular, the Secretary of State should be satisfied that the proposal has been designed to minimise adverse impacts on the operation and safety of aerodromes and that reasonable mitigation is carried out. It may also be appropriate to expect operators of the aerodrome to consider making reasonable changes to operational procedures. 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.

- 5.5.15 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.
- 5.5.16 There are statutory requirements concerning lighting to tall structures.⁹⁴ 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.
- 5.5.17 Where, after reasonable mitigation, operational changes, obligations and requirements have been proposed, the Secretary of State considers that:
- a development would prevent a licensed aerodrome from maintaining its licence
 - the benefits of the proposed development are outweighed by the harm to aerodromes serving business, training or emergency service needs, taking into account the relevant importance and need for such aviation infrastructure
 - the development would significantly impede or compromise the safe and effective use of defence assets or significantly limit military training
 - the development would have an impact on the safe and efficient provision of en-route air traffic control services for civil aviation, in particular through an adverse effect on the infrastructure required to support communications, navigation or surveillance systems
- consent should not be granted.

Mitigation

- 5.5.18 Where a proposed energy infrastructure development would significantly impede or compromise the safe and effective use of civil or military aviation or defence assets and or significantly limit military training, the Secretary of State may consider the use of 'Grampian conditions'⁹⁵, or other forms of requirement which relate to the use of future technological solutions, to mitigate impacts. Where technological solutions have not yet been developed or proven, the Secretary of State will need to consider the

⁹⁴ Articles 222 and 223. Air Navigation Order 2016.

⁹⁵ As set out on <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)..

likelihood of a solution becoming available within the time limit for implementation of the development consent. In this context, where new technologies to mitigate the adverse effects of wind farms on radar are concerned, the Secretary of State should have regard to any government guidance which emerges from the joint government/industry Aviation Plan.

5.5.19 Mitigation for infringement of OLS may include⁹⁶:

- amendments to layout or scale of infrastructure to reduce the height, provided that it does not result in an unreasonable reduction of capacity or unreasonable constraints on the operation of the proposed energy infrastructure
- 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)
- installation of obstacle lighting and/or by notification in Aeronautical Information Service publications

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

- lighting
- operational airspace changes
- upgrading of existing CNS infrastructure, the cost of which the applicant may reasonably be required to contribute in part or in full

5.5.21 Mitigation for effects on radar, communications and navigational systems may include reducing the scale of a project, although in some cases it is likely to be unreasonable for the Secretary of State to require mitigation by way of a reduction in the scale of development, for example, where reducing the tip height of wind turbines in an offshore wind farm would result in a material reduction in electricity generating capacity or operation would be severely constrained. However, there may be exceptional circumstances where a small reduction in such function will result in proportionately greater mitigation. In these cases, the Secretary of State may consider that the benefits of the mitigation outweighs the marginal loss of function.

⁹⁶ Where mitigation is required using a condition or planning obligation, the tests set out at paragraphs 4.1.7 – 4.1.8 in EN-1 should be applied.

5.6 Coastal Change

Introduction

- 5.6.1 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
- 5.6.2 For the purpose of this section, coastal change means physical change to the shoreline, i.e. erosion, coastal landslip, permanent inundation and coastal accretion. 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). 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.
- 5.6.3 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.
- 5.6.4 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 and marine biodiversity.
- 5.6.5 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. 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. Advice on the historic environment in Section 5.9 may also be relevant.

Applicant's assessment

- 5.6.6 Where relevant, applicants should undertake coastal geomorphological and sediment transfer modelling to predict and understand impacts and help identify relevant mitigating or compensatory measures.
- 5.6.7 The ES (see Section 4.2) should include an assessment of the effects on the coast. 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) (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
 - the effects of the proposed project on marine ecology, biodiversity and protected sites
 - 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
- 5.6.8 For any projects involving dredging or disposal into the sea, the applicant should consult the MMO at an early stage. Where the 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.
- 5.6.9 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, candidate marine Special Areas of Conservation (SACs), coastal SACs

and candidate coastal SACs, coastal Special Protection Areas (SPAs) and potential coastal SPAs, Ramsar sites, Sites of Community Importance (SCIs) and potential SCIs and SSSIs.

Secretary of State decision making

- 5.6.10 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 which are at risk from coastal change, should be supported where it would result in climate resilient infrastructure.
- 5.6.11 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.
- 5.6.12 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.
- 5.6.13 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.
- 5.6.14 The Secretary of State should consult the MMO on projects which could impact on coastal change, since the MMO may also be involved in considering other projects which may have related coastal impacts.
- 5.6.15 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. The Secretary of State may also have regard to any relevant SMPs.
- 5.6.16 Substantial weight should be attached to the risks of flooding and coastal erosion. The applicant must demonstrate that full account has been taken of the policy on assessment and mitigation in paragraphs 4.2.1 to 4.2.8 of this NPS, taking account of the potential effects of climate change on these risks as discussed above.

Mitigation

- 5.6.17 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.

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

Introduction

- 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 1990. Note that pollution impacts from some of these emissions (for example dust, smoke) are covered in the Section 5.2 on air emissions.
- 5.7.2 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 Secretary of State.
- 5.7.3 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's assessment

- 5.7.4 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.
- 5.7.5 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
- 5.7.6 The applicant is advised to consult the relevant local planning authority and, where appropriate, the EA about the scope and methodology of the assessment.

Secretary of State decision making

- 5.7.7 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

5.7.8 If the Secretary of State does grant development consent for a project, the Secretary of State should consider whether there is a justification for all of the authorised project (including any associated development) being 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.

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

5.7.10 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.

Mitigation

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

- 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

5.8 Flood Risk

Introduction

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. 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.

- 5.8.2 The government's Flood and Coastal Erosion Risk Management Policy Statement 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.
- 5.8.3 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.
- 5.8.4 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 2018 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 the Secretary of State should take account of the policy on climate change adaptation in Section 4.9.
- 5.8.5 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. Where new energy infrastructure is, exceptionally, necessary in such areas, policy aims to make it safe 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. 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.

Applicant's assessment

- 5.8.6 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. This 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.
- 5.8.7 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 made⁹⁷;
 - 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

⁹⁷ Refer to Flood risk assessments: climate change allowances - <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

- 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 (refer to PPG Sustainable Drainage Systems section) has been followed. Explain and justify why the types of Sustainable Drainage Systems and method of discharge have been selected and why they are considered appropriate. Where cost is a reason for not including Sustainable Drainage Systems, provide information to enable comparison with the lifetime costs of a conventional public sewer connection
 - v. 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
 - vi. Describe the multifunctional benefits the sustainable drainage system will provide
 - vii. 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
 - viii. Explain how run-off from the completed development will be prevented from causing an impact elsewhere
 - ix. 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
- be supported by appropriate data and information, including historical information on previous events.

5.8.8 Further guidance can be found in the Planning Practice Guidance Flood Risk and Coastal Change section which accompanies the NPPF, TAN15 for Wales or successor documents.

5.8.9 Applicants for projects which may be affected by, or may add to, flood risk should arrange pre-application discussions 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. 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.

5.8.10 If the EA or NRW has 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 EA's or NRW's concerns.

Secretary of State decision making

5.8.11 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 strategy⁹⁸
- sustainable drainage systems (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 5.8.18)

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

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

5.8.12 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. 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. 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 Guidance⁹⁹), or another body, such as an Internal Drainage Board.

5.8.13 If the EA or NRW 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 EA or NRW to try to resolve the concerns.

5.8.14 Energy projects should not normally be consented within Flood Zone 3b the Functional Floodplain (where water has to flow or be stored in times of flood), or Zone C2 in Wales, or on land expected to fall within these zones within its predicted lifetime. 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.

The Sequential Test

5.8.15 Preference should be given to locating projects in areas of lowest flood risk. The Secretary of State should not consent development in flood risk areas (Flood Zone 2 in England or Zone B in Wales), accounting for all sources of flooding and the predicted impacts of climate change unless they are satisfied that the sequential test

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

requirements have been met. The Secretary of State should not consent development in Flood Zone 3 or Zone C unless they are satisfied that the Sequential and Exception Test requirements have been met. 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. 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 approach to locating development within the site.

The Exception Test

- 5.8.16 If, following application of the sequential test, 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 table 3 of the Planning Practice Guidance. 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.
- 5.8.17 The Exception Test 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.
- 5.8.18 Both elements of the test will have to be satisfied for development to be consented. To pass the Exception Test it should be demonstrated that:
- the project provides wider sustainability benefits to the community¹⁰⁰ that outweigh flood risk
 - the project reduces flood risk overall, where possible
- 5.8.19 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 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

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

should make clear how, in reaching their decision, they have weighed up the increased flood risk against the benefits of the project, taking account 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.

Mitigation

- 5.8.20 To satisfactorily manage flood risk, arrangements are required to manage surface water and the impact of the natural water cycle on people and property.
- 5.8.21 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
- 5.8.22 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.
- 5.8.23 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.
- 5.8.24 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.
- 5.8.25 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.

- 5.8.26 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. 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.

5.9 Historic Environment

Introduction

- 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.¹⁰¹ Significance derives not only from a heritage asset's physical presence, but also from its setting.¹⁰²
- 5.9.4 Some heritage assets have a level of significance that justifies official designation. Categories of designated heritage assets are: World Heritage Sites; Scheduled Monuments; Protected Wreck Sites; Protected Military Remains; Listed Buildings;

¹⁰¹ Terms used in this section, including the term "Designated Heritage Asset" are defined in Annex 2 of the National Planning Policy Framework.

¹⁰² 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.

Registered Parks and Gardens; Registered Battlefields; Conservation Areas; and Registered Historic Landscapes (Wales only).¹⁰³

- 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 There are also heritage assets with archaeological interest that have yet to be formally assessed by the Secretary of State but which have potential to demonstrate equivalent significance to Scheduled Monuments or Protected Wreck Sites.
- 5.9.7 Non-designated heritage assets that have been recognised by the Secretary of State as being of equivalent significance to Scheduled Monuments or Protected Wreck Sites, or that have yet to be formally assessed but have archaeological interest¹⁰⁴ and have potential to demonstrate equivalent significance to Scheduled Monuments or Protected Wreck Sites, should be considered subject to the same policy considerations as those that apply to designated heritage assets.
- 5.9.8 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 local authorities, 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.
- 5.9.9 Impacts on heritage assets specific to types of infrastructure are included in the technology specific NPSs.

Applicant's assessment

- 5.9.10 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

¹⁰³ 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.

¹⁰⁴ There will be archaeological interest in a heritage asset if it holds, or potentially may hold, evidence of past human activity worthy of expert investigation at some point.

(see Section 4.2). This should include consideration of heritage assets above, at, and below the surface of the ground.

- 5.9.11 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 Record¹⁰⁵ (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.
- 5.9.12 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.¹⁰⁶
- 5.9.13 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.
- 5.9.14 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 as sensitive design, the significance of heritage assets or setting affected
 - considering measures that address those heritage assets which are at risk or which may become at risk, as a result of the scheme

105 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 <https://historic-wales-rcahmw.hub.arcgis.com/> English Heritage and Cadw hold additional information about heritage assets in English or Welsh waters. Historic England or Cadw should also be consulted, where relevant.

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

- 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
- 5.9.15 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.
- 5.9.16 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.

Secretary of State decision making

- 5.9.17 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 England
 - 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
- 5.9.18 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 2010.
- 5.9.19 In considering the impact of a proposed development on any heritage assets, the Secretary of State should take into account 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.
- 5.9.20 The Secretary of State should take into account 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 assets¹⁰⁷. The Secretary of State should also take into account 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).

- 5.9.21 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.
- 5.9.22 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. Substantial harm to or loss of significance of a grade II listed building park or garden should be exceptional. 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.
- 5.9.23 The Secretary of State should give considerable importance and weight to the desirability of preserving all designated heritage assets. Any harmful impact on the significance of a designated heritage asset should be given significant weight when weighed against the public benefit of development, recognising that the greater the harm to the significance of the heritage asset the greater the justification will be needed for any loss.
- 5.9.24 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 of 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

¹⁰⁷ 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.

- 5.9.25 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.
- 5.9.26 The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. 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.
- 5.9.27 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 5.9.24 or less than substantial harm under paragraph 5.9.25, as appropriate, taking into account the relative significance of the element affected and its contribution to the significance of the Conservation Area or World Heritage Site as a whole.
- 5.9.28 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.¹⁰⁸
- 5.9.29 When considering applications for development affecting the setting of a designated heritage asset, the Secretary of State should give considerable importance and 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 significant 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.¹⁰⁹

Recording

- 5.9.30 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 is not an adequate mitigation of any harm and should not be a factor in deciding whether consent should be given.
- 5.9.31 Where the loss of the whole or a material part of a heritage asset's significance is justified, the Secretary of State should require the applicant to record and advance

¹⁰⁸ Historic Environment Good Practice Advice in Planning 2 provides further advice on managing significance in decision-taking in the historic environment, available online at: <https://historicengland.org.uk/images-books/publications/gpa2-managing-significance-in-decision-taking/>

¹⁰⁹ See the Infrastructure Planning (Decisions) Regulations 2010

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 nature and level of the asset's significance. Applicants should be required to publish this evidence and deposit copies of the reports with the relevant Historic Environment Record. They should also be required to deposit the archive generated in a local museum or other public depository willing to receive it.

Requirements

- 5.9.32 The Secretary of State may add requirements to the development consent order to ensure that this is undertaken in a timely manner in accordance with a written scheme of investigation that meets the requirements of this Section and has been agreed in writing with the relevant Local Authority (or, where the development is in English waters, the MMO and Historic England, or where it is in Welsh waters, the MMO and Cadw) and that the completion of the exercise is properly secured¹¹⁰.
- 5.9.33 Where the loss of significance of any heritage asset has been justified by the applicant on the merits of the new development and the significance of the asset in question, the Secretary of State should consider:
- imposing a requirement in the development consent order
 - requiring the applicant to enter into an obligation
- 5.9.34 That will prevent the loss occurring until the relevant part of the development has commenced, or it is reasonably certain that the relevant part of the development is to proceed.
- 5.9.35 Where there is a high probability that a development site may include as yet undiscovered heritage assets with archaeological interest, the Secretary of State should consider imposing requirements to ensure that appropriate procedures are in place for the identification and treatment of such assets discovered during construction.

5.10 Landscape and Visual

Introduction

- 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.

¹¹⁰ Guidance on the contents of a written scheme of investigation is set out in Historic Environment Good Practice Advice in Planning: 2 – Managing Significance in Decision-Taking in the Historic Environment <https://historicengland.org.uk/images-books/publications/gpa2-managing-significance-in-decision-taking/> or any successor documents.

- 5.10.2 Among the features of energy infrastructure which are common to a number of different technologies, cooling towers and exhaust stacks and their plumes have the most obvious impact on landscape and visual amenity for thermal combustion generating stations.¹¹¹ Some natural draught cooling towers may be up 200 metres, although this would be exceptional. Visual impacts may be not just the physical structures but also visible steam plumes from cooling towers.
- 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.
- 5.10.4 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 and that applicants will use BAT. The Secretary of State should therefore expect the applicant 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. The Secretary of State should 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.

Applicant’s assessment

- 5.10.5 The applicant should carry out a landscape and visual assessment and report it in the ES (see Section 4.2). A number of guides have been produced to assist in addressing landscape issues.¹¹² 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. For seascapes, applicants should consult the Seascape Character

¹¹¹ 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 2.11 of EN-5).

¹¹²The Landscape Institute and Institute of Environmental Management and Assessment: Guidelines for Landscape and Visual Impact Assessment (2013, 3rd edition); Landscape and Seascape Character Assessments – <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.

Assessment and the Marine Plan Seascape Character Assessments, and any successors to them.¹¹³

- 5.10.6 The applicant's assessment should include the effects during construction of the project and the effects of the completed development and its operation on landscape components and landscape character.
- 5.10.7 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.
- 5.10.8 The assessment should also demonstrate how noise and light pollution from construction and operational activities on residential amenity and on sensitive locations, receptors and views, will be minimised.

Secretary of State decision making

Landscape impact

- 5.10.9 Landscape effects of the project depend on the existing character of the local landscape, its current quality, how highly it is valued and its capacity to accommodate change. All of these factors need to be considered in judging the impact of a project on landscape. Virtually all nationally significant energy infrastructure projects will have effects on the landscape. 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.
- 5.10.10 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.

Development proposed within nationally designated landscapes

- 5.10.11 National Parks, the Broads and AONBs have been confirmed by the government as having the highest status of protection in relation to landscape and scenic 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.¹¹⁴ The conservation of the natural beauty of the landscape and

113 The Seascape Character Assessments Guidance: <https://www.gov.uk/government/publications/seascape-character-assessments-identify-and-describe-seascape-types>; Marine plan seascape character assessments: <https://www.gov.uk/government/publications/seascape-assessments-for-north-east-north-west-south-east-south-west-marine-plan-areas-mmo1134> and <https://www.gov.uk/government/publications/seascape-assessment-for-the-south-marine-plan-areas-mmo-1037> and <https://www.gov.uk/government/publications/east-marine-plan-areas-seascape-character-assessment>

114 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

countryside should be given substantial weight by the Secretary of State in deciding on applications for development consent in these areas.

5.10.12 Nevertheless, the Secretary of State may grant development consent in these areas in exceptional circumstances. The development should be demonstrated to be in the public interest¹¹⁵ and consideration of such applications should include an assessment of:

- the need for the development, including in terms of national considerations¹¹⁶, and the impact of consenting or not consenting it upon the local economy
- the cost of, and scope for, developing 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
- any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated

5.10.13 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.

Developments outside nationally designated areas which might affect them

5.10.14 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 compromising the purposes of designation 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.

5.10.15 The fact that a proposed project will be visible from within a designated area should not in itself be a reason for refusing consent.

Developments in other areas

5.10.16 Outside nationally designated areas, there are local landscapes that may be highly valued locally and protected by local designation. 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, local landscape designations should not be used in themselves to refuse consent, as this may unduly restrict acceptable development.

5.10.17 The scale of such 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

115 Section 15 of the NPPF applies a public interest test for major development in these designated areas.

116 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.

any adverse impact on the landscape would be so damaging that it is not offset by the benefits (including need) of the project.

5.10.18 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.

5.10.19 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 reasonable mitigation.

Visual impact

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

5.10.21 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.

5.10.22 The Secretary of State should ensure applicants have taken into account the landscape and visual impacts of visible plumes from chimney stacks and/or the cooling assembly. It may be necessary to attach requirements to the consent requiring the incorporation of particular design details that are in keeping with the statutory and technical requirements.

Mitigation

5.10.23 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.

- 5.10.24 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.
- 5.10.25 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 would mitigate the impact when viewed from a more distant vista.

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

Introduction

- 5.11.1 An energy infrastructure project will have direct effects 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 space¹¹⁷ including green infrastructure¹¹⁸.
- 5.11.2 The government's policy is to ensure there is adequate provision of high quality open space (including green infrastructure) and sports and recreation facilities to meet the needs of local communities. 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. Well designed and managed green infrastructure in particular, provides multiple benefits at a range of scales. It can contribute to health, wellbeing, biodiversity recovery, absorb surface water, cleanse pollutants and absorb noise and reduce high temperatures. It will also play an increasingly important role in mitigating or adapting to the impacts of climate change. The provision and enhancement of green infrastructure can improve air quality, particularly in urban areas. Applicants are therefore encouraged to consider how new green infrastructure can be provided, or how existing green infrastructure can be enhanced, as part of their application.
- 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

117 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.

118 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.

and undeveloped greenfield land that needs to be used, it may not be possible for many forms of energy infrastructure.

- 5.11.4 Green Belts, defined in a local authority's development plan¹¹⁹, 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 most important attribute of Green Belts is their openness. Green Belt land can play a positive role in providing access to sport and recreation facilities or access to the open countryside. For further information on the purposes of Green Belt policy see chapter 13 of the NPPF, or any successor to it.

Applicant's assessment

- 5.11.5 The ES (see Section 4.2) should identify existing and proposed¹²⁰ 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.
- 5.11.6 Applicants will need to consult the local community on their proposals to build on open space, sports or recreational buildings and land. Taking account of the consultations, applicants should consider providing new or additional open space including green infrastructure, sport or recreation facilities, to substitute for any losses as a result of their proposal. 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.
- 5.11.7 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.
- 5.11.8 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) except where this would be inconsistent with other sustainability considerations. Applicants should also identify any effects and seek to minimise impacts on soil quality taking into account any mitigation measures proposed. 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. Applicants are encouraged to develop and implement a Soil Management Plan which could help minimise potential land contamination.

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

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

- 5.11.9 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.
- 5.11.10 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 5.11.16 below).
- 5.11.11 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 criteria¹²¹ on such developments in Green Belts.
- 5.11.12 An applicant may be able to demonstrate that a particular type of energy infrastructure, such as an underground pipeline, which, in Green Belt policy terms, may be considered as an “engineering operation” rather than a building is not in the circumstances of the application inappropriate development. It may also be possible for an applicant to show that the physical characteristics of a proposed overhead line development are such that it has no adverse effects which conflict with the fundamental purposes of Green Belt designation.

Secretary of State decision making

- 5.11.13 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. 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.
- 5.11.14 The Secretary of State should ensure that applicants do not site their scheme on the best and most versatile agricultural land without justification. Little weight should be given to the loss of poorer quality agricultural land (in grades 3b, 4 and 5), except in areas (such as uplands) where particular agricultural practices may themselves contribute to the quality and character of the environment or the local economy.

¹²¹ See Section 13 of the NPPF, or any successor to it.

- 5.11.15 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.
- 5.11.16 When located in the Green Belt, energy infrastructure projects are likely to comprise 'inappropriate development'.¹²² Inappropriate development is by definition harmful to the Green Belt and the general planning policy presumption against it applies with equal force in relation to major energy infrastructure projects. The Secretary of State will need to assess whether there are very special circumstances to justify inappropriate development. Very special circumstances will not exist unless the harm by reason of inappropriateness, and any other harm, is clearly outweighed by other considerations. In view of the presumption against inappropriate development, the Secretary of State will attach substantial weight to the 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.
- 5.11.17 In Wales, 'green wedges' may be designated locally¹²³. These enjoy the same protection as Green Belt in Wales and the Secretary of State should adopt a similar approach. Green wedges give the same protection as Green Belt in Wales. 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. As with Green Belt, there is a presumption against inappropriate development and the Secretary of State should assess whether there are very special circumstances to justify any proposed inappropriate development.

Mitigation

- 5.11.18 Although in the case of much 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 proposed site (assuming that some at least 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.
- 5.11.19 Where green infrastructure is affected, the Secretary of State should consider imposing requirements to ensure the functionality and connectivity of the green

¹²² Referred to in paragraph 147 of section 13 of the NPPF.

¹²³ See Managing Settlement Form - Green Belts and Green Wedges, in Planning Policy Wales (Edition 11, February 2021), or any successor to it https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf

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.

- 5.11.20 The Secretary of State should also consider whether any adverse effects 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. 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.
- 5.11.21 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.
- 5.11.22 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.
- 5.11.23 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. 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.

5.12 Noise and Vibration

Introduction

- 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) and use and enjoyment of areas of value such as quiet places and areas with high landscape quality. The

Government's policy on noise is set out in the Noise Policy Statement for England.¹²⁴ 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 assessment of impacts of vibration.

5.12.2 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. This should consider underwater noise and vibration especially for marine developments.

5.12.3 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 designated sites where noise may have an adverse impact on protected species or other wildlife

Applicant's assessment

5.12.4 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

¹²⁴ <https://www.gov.uk/government/publications/noise-policy-statement-for-england>

- 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 - applicants should consider using best available techniques to reduce noise impacts
- 5.12.5 The nature and extent of the noise assessment should be proportionate to the likely noise impact.
- 5.12.6 The noise impact of ancillary activities associated with the development, such as increased road and rail traffic movements, or other forms of transportation, should also be considered.
- 5.12.7 Operational noise, with respect to human receptors, should be assessed using the principles of the relevant British Standards¹²⁵ 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 Standards¹²⁶ and other guidance which also give examples of mitigation strategies.
- 5.12.8 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 with regard to 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 taken into account.

Secretary of State decision making

- 5.12.9 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,

¹²⁵ For example BS 4142, BS 6472 and BS 8233.

¹²⁶ For example BS 5228.

bunds or noise barriers to reduce noise transmission. 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 England, the NPPF, and the government's associated planning guidance on noise.

5.12.10 The Secretary of State should not grant development consent unless it is satisfied that the proposals will meet the following aims:

- 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

5.12.11 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.

Mitigation

5.12.12 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 requirements. Any such requirements should take account of the guidance set out in the NPPF or any successor to it.

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

- engineering: reduction of noise at point of generation and containment of noise generated
- lay-out: adequate distance between source and noise-sensitive receptors; incorporating good design to minimise noise transmission through screening by natural barriers, or other buildings
- administrative: restricting activities allowed on the site; specifying acceptable noise limits; and taking into account seasonality of wildlife in nearby designated sites

5.12.14 In certain situations, and only when all other forms of noise mitigation have been exhausted, it may be appropriate for the Secretary of State to consider requiring noise mitigation through improved sound insulation to dwellings.

5.13 Socio-Economic Impacts

Introduction

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.

Applicant's 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 This 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
- 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

- 5.13.4 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.
- 5.13.5 Socio-economic impacts may be linked to other impacts, for example the visual impact of a development is considered in Section 5.10 but may also have an impact on tourism and local businesses. Applicants are encouraged, where possible, to ensure local suppliers are considered in any supply chain.
- 5.13.6 Applicants should also consider developing accommodation strategies where appropriate, especially during construction and decommissioning phases, that would include for the need to provide temporary accommodation for construction workers if required.

Secretary of State decision making

- 5.13.7 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.
- 5.13.8 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).
- 5.13.9 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. 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.

Mitigation

- 5.13.10 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.

5.14 Traffic and Transport

Introduction

- 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. Environmental impacts may result particularly from increases in noise and emissions from road transport. Disturbance caused by traffic and abnormal loads generated during the construction phase will depend on the scale and type of the proposal.

- 5.14.2 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's assessment

- 5.14.3 If a project is likely to have significant transport implications, the applicant's ES (see Section 4.2) should include a transport assessment, using the NATA/WebTAG¹²⁷ methodology stipulated in Department for Transport (DfT) guidance¹²⁸, or any successor to such methodology. Applicants should consult the Highways England and Highways Authorities as appropriate on the assessment and mitigation.
- 5.14.4 Where appropriate, the applicant should prepare a travel plan including demand management measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for parking associated with the proposal and to mitigate transport impacts. The assessment should also consider any possible disruption to services and infrastructure (such as road, rail and airports).
- 5.14.5 If additional transport infrastructure is proposed, applicants should discuss with network providers the possibility of co-funding by Government for any third-party benefits. Guidance has been issued¹²⁹ 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.

Secretary of State decision making

- 5.14.6 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. 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

127 WelTag in Wales: <https://gov.wales/welsh-transport-appraisal-guidance-weltag>

128 Guidance on transport assessments is at

<http://www.dft.gov.uk/pgr/regional/transportassessments/guidanceonta> and (for Wales) at:

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

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

arising from the development, as set out below. Applicants may also be willing to enter into planning obligations for funding infrastructure and otherwise mitigating adverse impacts.

- 5.14.7 Provided that the applicant is willing to enter into planning obligations or requirements can be imposed to mitigate transport impacts identified in the NATA/WebTAG transport assessment, with attribution of costs calculated in accordance with the DfT's guidance, then development consent should not be withheld, and appropriately limited weight should be applied to residual effects on the surrounding transport infrastructure.
- 5.14.8 The Secretary of State should only consider preventing or refusing development on highways grounds if there would be an unacceptable impact on highway safety, or residual cumulative impacts on the road network would be severe.

Mitigation

- 5.14.9 Where mitigation is needed, possible demand management measures must be considered and if feasible and operationally reasonable, required, before considering requirements for the provision of new inland transport infrastructure to deal with remaining transport impacts.
- 5.14.10 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.
- 5.14.11 Water-borne or rail transport is preferred over road transport at all stages of the project, where cost-effective. Applicants should consider the DfT policy guidance "Water Preferred Policy Guidelines for the movement of abnormal indivisible loads" when preparing their Application.¹³⁰
- 5.14.12 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, either on the site or at dedicated facilities elsewhere, to 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

¹³⁰ <https://www.gov.uk/government/publications/movement-of-abnormal-loads-by-water>

5.14.13 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.

5.15 Resource and Waste Management

Introduction

- 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 hierarchy”, which sets out the priorities that must be applied when managing waste¹³¹:
- a) prevention
 - b) preparing for reuse
 - c) recycling
 - d) other recovery, including energy recovery
 - e) 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 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 with regard to radioactive waste are set out in Section 2.11 and Annex B of EN-6. The present section will apply to non-radioactive waste for nuclear infrastructure as for other energy infrastructure.

Applicant’s assessment

- 5.15.6 The applicant should set out the arrangements that are proposed for managing any waste produced and prepare a Site Waste Management Plan. The arrangements described and Management Plan should include information on the proposed waste recovery and disposal system for all waste generated by the development, and an assessment of the impact of the waste arising from development on the capacity of

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

waste management facilities to deal with other waste arising in the area for at least five years of operation. The applicant is encouraged to refer to the Waste Prevention Programme for England, and should 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. 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.

- 5.15.7 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.
- 5.15.8 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

- 5.15.9 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. 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
- 5.15.10 Where necessary, the Secretary of State should use requirements or obligations to ensure that appropriate measures for waste management are applied. The Secretary of State may wish to include a condition on revision of waste management plans at reasonable intervals when giving consent.
- 5.15.11 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.

5.16 Water Quality and Resources

Introduction

5.16.1 Infrastructure development can have adverse effects on the water environment, including groundwater, inland surface water, transitional waters¹³² and coastal waters. During the construction, operation and decommissioning phases, it 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, in particular, result in surface waters, groundwaters or protected areas¹³³ failing to meet environmental objectives established under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and the Marine Strategy Regulations 2010¹³⁴.

Applicant's assessment

- 5.16.2 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 as part of the ES or equivalent (see Section 4.2).
- 5.16.3 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.
- 5.16.4 Applicants are encouraged to consider protective measures to control the risk of pollution to groundwater beyond those outlined in Water Resource Management Plans - this could include, for example, the use of protective barriers.
- 5.16.5 The ES should in particular describe:

132 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.

133 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.

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

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/522426/LIT_10_445.pdf; see PINS advice: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/06/advice_note_18.pdf

- 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 resources¹³⁵ 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 Catchment Abstraction Management 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

Secretary of State decision making

- 5.16.6 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 a controlled water.¹³⁶
- 5.16.7 The Secretary of State will generally 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.
- 5.16.8 The Secretary of State should be satisfied that a proposal has regard to the 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. In terms of Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 compliance, the overall aim of development should be to prevent deterioration in status of water bodies to support the achievement of the objectives in the River Basin Management Plans and not to jeopardise the future achievement of good status for any affected water bodies. If the development is considered likely to cause deterioration of water body status or to

¹³⁵ See the Water Resources planning guideline: <https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline>

¹³⁶ Controlled waters include all watercourses, lakes, lochs, coastal waters, and water contained in underground strata.

prevent the achievement of good groundwater status or of good ecological status potential compliance with regulation 19 of the Water Environment (Water Framework Directive) (England and Wales) 2017 must be demonstrated.

- 5.16.9 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.
- 5.16.10 The Secretary of State should consider whether appropriate requirements should be attached to any development consent and/or planning obligations entered into to mitigate adverse effects on the water environment.

Mitigation

- 5.16.11 The Secretary of State should consider whether mitigation measures are needed over and above any which may form part of the project application (see Sections 4.2 and 5.1). A construction management plan may help codify mitigation at that stage.
- 5.16.12 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.
- 5.16.13 The impact on local water resources can be minimised through planning and design for the efficient use of water, including water recycling. If an applicant 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.

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

CPS	Carbon Price Support
DACCS	Direct Air Carbon Capture and Storage
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.
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
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
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
HRA site	One of the sites set out in paragraph 5.4.8 for which an HRA will assess the implications of a plan or project
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
MHCLG	Ministry for Housing, Communities and Local Government
MMO	Marine Maritime Organisation established under the Marine and Coastal Access Act 2009
MoD	Ministry of Defence
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
pfa	Pulverised fuel ash; fine ash from the use of finely crushed coal in fossil fuel generating stations

PPG	Planning Practice Guidance issued by MHCLG
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
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

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