DEPARTMENT OF ENERGY & CLIMATE CHANGE

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

Planning for new energy infrastructure

November 2009

Department of Energy and Climate Change

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

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Contents

Part 1. Introduction

1.1.1 This National Policy Statement (NPS) sets out national policy for the energy infrastructure defined in Section 1.3 below. It has effect, in combination with the relevant technology-specific NPS (see para 1.3.1) on the decisions by the Infrastructure Planning Commission (IPC) on applications for energy developments that fall within the scope of the NPSs. For such applications, this NPS, when combined with the relevant technology-specific energy NPS provides the primary basis for decisions by the IPC. Under the Planning Act 2008[1], the IPC must also have regard to any local impact report submitted by a relevant local authority, any relevant matters prescribed in regulations, any Marine Policy Statement (MPS) or marine plan, and any other matters which the IPC thinks are both important and relevant to its decision.

1.1.2 The Planning Act 2008 also requires that the IPC must decide an application for energy infrastructure in accordance with NPSs except to the extent it 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 IPC;
- be unlawful;
- result in adverse impacts from the development outweighing the benefits; or
- 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 this NPS, the relevant technology-specific NPS and any other NPSs that are relevant to the application in question.

1.2 Role of this NPS in the planning system

1.2.1 This NPS, and in particular the policy and guidance on generic impacts in Part 4, may be helpful to local planning authorities (LPAs) in preparing their local impact reports. In England and Wales this NPS may also be a material consideration in decision making on applications that fall under the Town and Country Planning Act 1990 (as amended). Where relevant, decision makers of such applications in England should apply the policy and guidance in this NPS as far as practicable.

1 Section 104(3) Planning Act 2008.

1.2.2 Subject to the Marine and Coastal Access Bill, the Marine Management Organisation (MMO), will determine applications under s.36 and s.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 Marine Policy Statement (MPS) and any applicable marine plans, unless relevant considerations indicate otherwise. This NPS may be a relevant consideration for the MMO when it is determining such applications. This NPS may also be a relevant consideration in the preparation of marine plans. The role of the MPS in relation to IPC decisions is set out at paragraph 4.1.3.

1.2.3 Further information on the relationship between NPSs and the town and country planning system, as well as background on the role of NPSs and the arrangements in the devolved administrations, will be issued by the Department for Communities and Local Government (CLG).

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 Energy and Climate Change. It sets out the Government's policy for delivery of major energy infrastructure. A further five technology-specific NPSs for the energy sector cover: fossil fuel 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). These should be read in conjunction with this NPS where they are relevant to an application.

1.3.2 The Planning Act 2008[2] sets out the thresholds for nationally significant infrastructure in the energy sector. The Act empowers the IPC to examine applications and make decisions on the following nationally significant energy developments:

- electricity generating stations generating more than 50 megawatts onshore and 100 megawatts offshore. This includes generation from fossil fuels, wind, biomass, waste and nuclear. For these types of infrastructure, the Overarching NPS (EN-1) in conjunction with the relevant technology-specific NPSs, as appropriate, will be the primary basis for IPC decision making;
- electricity lines at or above 132kV. For this infrastructure, EN-1 in conjunction with the Electricity Networks NPS (EN-5) will be the primary basis for IPC decision making;

2 Part 3 Planning Act 2008.

- large gas reception and liquefied natural gas (LNG) facilities and underground gas storage facilities (meeting the thresholds set out in the Planning Act, and explained in detail in Section 1.7 of the gas supply infrastructure and pipelines NPS (EN-4)). For this infrastructure EN-1 in conjunction with EN-4 will be the primary basis for IPC decision making;
- cross country gas and oil pipelines and Gas Transporter pipelines (meeting the thresholds and conditions set out in the Planning Act and Section 1.7 of EN-4). For this infrastructure EN-1 in conjunction with EN-4 will be the primary basis for IPC decision making.

1.3.3 The Planning Act 2008 enables the IPC to issue a development consent order including consent for development which is associated with the energy infrastructure listed above (subject to certain geographical and other restrictions set out in Section 115 of the Act). The Secretary of State has issued guidance to which the IPC must have regard in deciding whether development is associated development. EN-1, in conjunction with the relevant technology-specific NPS, will be the primary basis for IPC decision making on associated development. The IPC will not consent associated development in Wales, with the exception of certain development associated with underground gas storage facilities for the storage of gas in natural porous strata by a gas transporter (as set out in more detail in EN-4).

1.3.4 The Planning Act 2008 enables the IPC to issue a development consent order that can make provision relating to, or to matters ancillary to, the development of the energy infrastructure listed above. This may include, for example, the granting of wayleaves, the authorisation of tree lopping and the compulsory purchase of land. EN-1 in conjunction with the relevant technology-specific NPSs will be the primary basis for IPC decision making on such matters.

1.3.5 The generation of electricity from renewable sources other than wind, biomass or waste is not within the scope of this NPS. Insofar as this NPS relates to the development of new nuclear power stations, it only has effect in relation to applications for the development of new nuclear power stations on the sites listed in the Nuclear NPS.

1.4 Geographical coverage

1.4.1 The IPC will examine all applications (other than as specified in this paragraph) for nationally significant infrastructure projects in England and Wales and the offshore Renewable Energy Zone (REZ). In Wales, the IPC will not examine applications for LNG facilities, gas reception facilities or gas transporter pipelines. The IPC 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; precise details are set out in EN-4 and Section 17 of the Planning Act. It will remain possible for Welsh Ministers to consent offshore wind farms in territorial waters adjacent to Wales under the Transport and Works Act 1992 if applicants apply to them rather than the IPC.

1.4.2 In Scotland and in those areas of the Renewable Energy Zones where Scottish Ministers have functions, the IPC will not examine applications for nationally significant energy infrastructure projects except as set out in paragraph 1.4.3. 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.

1.4.3 The IPC 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.

1.4.4 In Northern Ireland, planning consents for all nationally significant energy infrastructure projects are devolved to the Northern Ireland Executive, so the IPC 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 for IPC decision making. Further information can be found in CLG's NPS guidance.

1.6 The Appraisal of Sustainability

1.6.1 All the energy NPSs have been subject to Appraisal of Sustainability (AoS), incorporating the requirements for Strategic Environmental Assessment (SEA). The AoS has informed the preparation of all the energy NPSs and the conclusions of the AoS for the non-nuclear energy NPSs are summarised below. The conclusions of the AoS for the nuclear power NPS are set out in that NPS. The main conclusions of the AoS for the non-nuclear NPSs were:

- current government policy promotes the delivery of low carbon energy. The energy NPSs are expected to speed up the transition to a low carbon economy thus prompting a positive effect on the AoS climate change objectives because UK climate change commitments may be realised sooner than continuation under the current planning system;
- the energy NPSs will contribute positively towards improving the vitality and competitiveness of the UK energy market. They will provide greater clarity for developers and so can help in terms of removing planning barriers associated with investment. Greater investment certainty would improve the UK's position for inward investment into energy infrastructure thereby creating opportunities for skilled workers. The energy NPSs/IPC intend to deliver faster and more transparent decisions on energy infrastructure which should improve the UK's security of supply. The UK economy will benefit from reliable energy supplies;

- the AoS does not identify any additional, more stringent requirements for applications (in terms of identifying, assessing or mitigating the effects) in the NPS, nor does it identify any requirements that have been relaxed. The development of new infrastructure, at the scale and speed required to meet the current need, may affect ecology as development may occur on previously undeveloped land. The AoS concludes that the significance of these effects remain uncertain at the strategic level;
- in light of the assumptions made the NPSs are envisaged to have a significant positive effect at the national policy level by contributing to the delivery of a low carbon economy and security of supply; and
- the energy NPSs do not include site or project specific information so the AoS does not attempt to be site or project specific. Energy proposals brought forward under the Energy NPSs are liable to require project level Environmental Impact Assessment and Habitats Regulations Assessment.

Part 2. Government Policy and Energy Infrastructure Development

2.1 Government's Energy and Climate Change Strategy

Summary of the Government's Energy and Climate Change Objectives for the Power Sector

- To help deliver the UK's obligation to reduce greenhouse gas emissions by 80% by 2050 and work to carbon budgets stemming from the Climate Change Act 2008, within the context of the EU Emissions Trading System.
- To ensure that investment provides security of energy supply through a diverse and reliable mix of fuels and low carbon technologies – renewables, nuclear and fossil fuel plants fitted with carbon capture and storage.
- To further ensure that investment delivers an electricity grid with greater capacity and the ability to manage larger fluctuations in supply and demand.
- To support the elimination of fuel poverty and protect the vulnerable through ensuring energy infrastructure is delivered in a cost effective way that keeps energy bills as low as possible.
- To contribute to sustainable development by seeking energy infrastructure development that helps reduce climate change while also minimising negative impacts on the local environment.

The Government believes these objectives are best delivered by a dynamic energy market operating within an effective regulatory framework with strategic Government interventions.

Introduction

2.1.1 This section outlines the policy context for the development of nationally significant energy infrastructure. It reflects the "UK Low Carbon Transition Plan – National strategy for climate and energy"[3], which sets out a detailed low carbon transition plan to 2020. It is important to note that the planning system is not the vehicle for delivering all aspects of Government energy and climate change policy; there are many aspects that will not be relevant to IPC decisions or decisions by local authorities.

2.1.2 As explained in Part 3, energy is vital to economic prosperity and social well-being and so it is important to ensure that we have secure and affordable energy. Producing the energy the UK requires and getting it to where it is needed necessitates a significant amount of infrastructure, both large and small scale. This NPS considers the large scale infrastructure vital to ensuring we have the secure energy supplies we need.

3 The UK Low Carbon Transition Plan, DECC (2009): http://decc.gov.uk/en/content/cms/publications/lc_trans_plan/lc_trans_plan.aspx

2.1.3 There will be significant change in our energy infrastructure over the coming years, primarily driven by the need to respond to the challenges that we face in tackling climate change and in ensuring security of energy supply. Delivering this change is a major challenge for energy providers, and Government is working to ensure their efforts produce the major, rapid change the UK needs including through an effective planning system. The UK Low Carbon Transition Plan sets out the UK's approach to becoming a low carbon country: cutting emissions, maintaining secure energy supplies, maximising economic opportunities and protecting the most vulnerable.

The transition to a low carbon economy

2.1.4 Continuation of global emissions, including greenhouse gases like carbon dioxide, at current levels could lead average global temperatures to rise by up to 6°C by the end of this century. This would make extreme weather events like floods and drought more frequent and increase global instability, conflict, public health-related deaths and migration of people to levels beyond any recent experience. Heat waves, droughts, and floods would affect the UK.

2.1.5 To avoid the most dangerous impacts of climate change, the increase in average global temperatures must be kept to 2°C, and that means global emissions must start falling before 2020. To drive the transition needed the Government has put in place the world's first ever legally binding target to cut emissions 80% by 2050, compared to 1990 levels, and a set of five year carbon budgets to 2022 to keep the UK on track. The Transition Plan includes the policies and proposals for how the first set of three carbon budgets, covering the period 2008 to 2022, will be met. Within the electricity generation sector, this is through the cap set under the EU Emissions Trading System, and a range of additional policies to incentivise the development and use of low carbon technologies. Given that the Government policies that underlie NPSs have been set in accordance with the Transition Plan and carbon budgets, the IPC does not need to assess individual applications in terms of carbon emissions against the budgets. The energy NPSs make very clear the terms on which new infrastructure can be approved by the IPC including the requirements on Carbon Capture Readiness and Carbon Capture and Storage.

2.1.6 The Government's five point plan to tackle climate change is:

- **Protecting the public from immediate risk:** tackling flood protection, developing a heat wave plan in the NHS and helping communities affected by coastal erosion;
- **Preparing for the future:** using the UK Climate Projections to help plan for a changing climate;
- **Limiting the severity of future climate change:** through international agreements;
- **Building a low carbon UK:** through legally binding 'carbon budgets' and investment in energy efficiency and clean energy technologies such as renewables, nuclear and carbon capture and storage;
- **Supporting individuals, communities and businesses to play their part.**

2.1.7 To prepare for the impacts of climate change, the Climate Change Act 2008 sets out a statutory framework for adapting to climate change with the Government committed to producing a statutory climate change adaptation programme in 2012 (which will be updated on five-yearly cycles). To lead and co-ordinate work in preparation for this, the Government has established the Adapting to Climate Change Programme, which includes:

- undertaking a national climate change risk assessment; and
- using the Adaptation Reporting Power to require public bodies and statutory undertakers to set out the risks to their work from a changing climate and what they are doing to manage these risks.

2.1.8 Alongside this, Government is committed to ensuring that adaptation needs to be built into planning and risk management now to ensure the continued and improved success of businesses and new nationally significant infrastructure. Consequently Section 4.8 of this NPS sets out clearly:

- how applicants should demonstrate to the IPC that they considered and planned for the impacts of climate change on their proposal (i.e. design, build and operation of the infrastructure); and
- how the IPC should determine whether or not an applicant has properly taken into account the future long-term impacts of climate change.

2.1.9 This NPS also sets out how the energy sector can help deliver the Government's climate change plan by clearly setting out the need for new low carbon energy infrastructure to contribute to climate change mitigation.

The power sector and carbon emissions

2.1.10 Within the power sector, it is the Government's view that the best way of incentivising the most cost effective mix of low carbon technologies is to put a limit or 'cap' on emissions. Since 2005, the European Union Emissions Trading System (EU ETS) has set a declining cap on emissions from the large industrial sectors.

2.1.11 The Government believes that the EU ETS is the single most important policy to reduce UK emissions (covering about half of the UK's carbon dioxide emissions) and it is expected to deliver reductions from the power sector and heavy industry of 22% on 2008 levels by 2020, underpinning the transition to low carbon electricity generation.

2.1.12 The EU ETS tackles emissions from large sources such as electricity generation and heavy industry[4]; it also allows the companies involved to trade the right to emit with each other, creating a carbon price and enabling emission cuts to be made where they are cheapest. As the carbon price generated by the EU ETS increases, it makes producing electricity from high carbon power stations less and less attractive and creates an incentive for power station operators to invest in cleaner electricity generation.

4 From 2012 aviation emissions will also be included in the EU ETS.

2.1.13 Introducing a carbon price as just described is critical to achieving clean electricity generation, but it is not the complete answer. This is because other barriers exist to the development and deployment of innovative technologies. These barriers include high development costs, uncertainties around volatile fuel prices and technology costs and the lack of an effective supply chain. The actions the Government is taking to remove these barriers are set out in the Transition Plan.

Security of energy supplies

2.1.14 It is critical that the UK continues to have secure and reliable supplies of electricity as we make the transition to a low carbon economy. To manage the risks to achieving security of supply:

- we need sufficient capacity (including a greater proportion of low carbon generation) to meet demand at all times. Electricity has a unique characteristic that at any point in time the demand for it must be met simultaneously by its supply. This requires a safety margin of spare capacity to accommodate fluctuations in supply or demand;
- capacity and any associated supply chains (e.g. for fuel for power stations) must be reliable enough to meet demand as it arises;
- we need a diverse mix of technologies and fuels, so that we do not rely on any one technology or fuel. Diversity can be through the use of different technologies and through geographic supply (primary fuels imported from a wide range of countries); and
- there should be effective price signals, so that market participants have sufficient incentive to react in a timely way to minimise imbalances between supply and demand.

2.1.15 In addition, during the transition to a low carbon economy, the UK must be able to access reliable supplies of gas and oil. This will support the transition by avoiding interruptions and reducing the risk of avoidable price rises. Gas and oil (which currently supply 75% of the UK's primary energy needs) will therefore remain key sources of energy in the UK during the transition. The Government's approach to security of gas and oil supplies includes:

- maximising the economic production of UK gas and oil – a large but declining proportion of our gas is produced from the UK Continental Shelf;
- improving our capacity to import and store gas by enabling new infrastructure to come forward, along with strategic reinforcement of the UK's gas and oil pipeline transmission networks; and
- having in place the strategic partnerships to source a diverse range of gas imports.

2.1.16 In the longer term the UK must reduce its dependence on fossil fuels. The Government plans to do this through reducing the need for gas by improving energy efficiency and pursuing its objectives for renewables and nuclear power.

2.1.17 Box 2.1 further explains the Government's approach to security of supply.

Box 2.1 Maintaining security of supply as we move to a low carbon economy

Great Britain has well developed electricity and gas markets, where suppliers compete to deliver energy to consumers. This is within a framework of strategic Government intervention and of effective regulation; the latter is managed by the independent regulator Ofgem. Ofgem's objectives are set out in statute. Its principal objective is to protect the interests of consumers, present and future, wherever appropriate by promoting effective competition.

In doing so, Ofgem must have regard among other things to the need for ensuring that all reasonable demands for electricity and gas are met. The Government is proposing legislative changes to clarify that protection of consumers includes security of supply and reducing carbon emissions.

In this context, one of Ofgem's key roles is to operate Government's framework for investment for the grid companies in order to ensure adequate and timely investment in our electricity and gas networks consistent with reducing carbon emissions.

Within the market, firms have strong incentives to ensure that they have enough supply to meet their customers' needs. Electricity suppliers who find themselves with more customer demand in a given half-hour than contracted supply must pay the System Buy Price for each MWh that they are short of electricity. These prices are much higher than the average prices in the same period. Prices signal a level of need for capacity and the evidence is that companies respond to these signals.

In deciding how much infrastructure to build, firms consider uncertainties about the future, such as risks associated with technology and the ability to secure fuel supplies at competitive rates. The nature of these risks means that firms tend to invest in a variety of types of capacity.

Price signals are complemented by regular forecasts from a number of bodies, including DECC and National Grid. They provide information to the market in a number of sources, including the annual Energy Markets Outlook from DECC, and National Grid's "Seven Year Statement" for electricity and the "Ten Year Statement" for gas. DECC also publishes projections of future demand in the Updated Energy Projections every year.

2.1.18 The UK faces two main security of supply challenges during our transition to a low carbon economy:

- increasing reliance on imports of oil and gas as North Sea reserves decline in a world where energy demand is rising and oil and gas production and supply is increasingly politicised; and
- the requirement for substantial and timely private sector investment over the next two decades in power stations and electricity networks and gas infrastructure.

2.1.19 The implications of these two issues for IPC decision making on energy infrastructure applications is set out in Part 3.

Delivering Government's wider objectives

2.1.20 Government's wider objectives for energy infrastructure include contributing to sustainable development 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 example, provision of new energy infrastructure contributes to the Government's policies for reducing fuel poverty (alongside other mechanisms such as winter fuel allowances and a regulatory framework which encourages the energy industry to protect the more vulnerable). This is because the availability of appropriate infrastructure supports the efficient working of the market so as to ensure competitive prices for consumers.

2.1.21 The framework set out in this NPS takes full account of the objective of contributing to the achievement of sustainable development and this has been tested through the Appraisal of Sustainability (AoS). The AoS has examined whether the NPS framework for control of new energy infrastructure 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.

Part 3. Need for New Energy Infrastructure

3.1 Summary of need

The 2009 Low Carbon Transition Plan sets out how we intend to meet Britain's energy needs in the coming decades. The Government believes that it must set the strategic framework within which developers of energy infrastructure operate and that private companies should come forward with specific proposals within this context. The UK faces a major challenge in moving to a low carbon economy and the Government is clear that industry needs to be able to deliver significant amounts of new energy infrastructure over the next 10-15 years because:

- Demand for electricity generation in 2020 is likely to be at levels similar to now (around 60 GW) with the possibility of increases beyond then due to factors such as greater use of electricity to decarbonise heat and transport.
- There will be a significant change in the nature of the power sector over the coming decades, as:
  - a large number of existing power stations (oil, coal and nuclear) close[5]; and
  - we switch to low-carbon forms of electricity generation based around renewable energy (particularly wind power in the short to medium term), nuclear power and fossil fuels with carbon capture and storage.
- Net additional electricity generating infrastructure (i.e. above the current UK capacity of around 80 GW) will also be needed to ensure adequate supplies because of the changes in the nature of generating capacity as we move towards low carbon forms of energy. Specifically:
  - under central assumptions we will need about 43 GW net of new capacity by 2020 and about 60 GW by 2025[6], much of which has yet to be consented;
  - around 30% of electricity generation will be from renewable sources by 2020. This will come primarily in the form of large amounts of onshore and offshore wind generation with smaller amounts of bioenergy, although more of the latter is possible and desirable;
  - within the context of the overall strategic framework set by Government, in principle, new nuclear power should be free to contribute as much as possible towards meeting the need for 25 GW of new non-renewable capacity. The Government expects that under this approach a significant proportion of the 25 GW will in practice be filled by nuclear power;

5 Projections indicate that some 22 GW of existing electricity generating capacity will close within the next 10-15 years.
6 Projections from Redpoint modelling for the Renewable Energy Strategy (RES).

  - new fossil fuel generating capacity will be needed to provide additional and flexible supply. All new fossil fuel generating stations must be constructed carbon capture ready, new coal generating stations must, in addition, demonstrate the full CCS chain, and it is the Government's expectation that new conventional coal power stations consented under the policy framework described here will retrofit CCS to their full capacity by 2025; and
  - a 'smarter' electricity grid will be needed to support a more complex system of electricity supply and demand with generation occurring in a greater diversity of locations along with the need to facilitate demand management in the medium to long term.

- While the UK will reduce its dependence on fossil fuels in the longer term, demand for gas and oil will remain high in the foreseeable future, with new infrastructure essential to ensure that we have security of supply as we move to a low carbon economy. In particular:
  - new gas infrastructure (import, storage and transmission) will be needed to manage the growing proportion of gas that will be imported (expected to be 45% of net gas demand by 2020) as the production from the gas fields in the North Sea declines; and
  - new oil pipeline infrastructure will be needed to ensure the continuing distribution of oil products to accommodate anticipated changes in demand for petroleum products and to meet international obligations.

Conclusion on need

Government has therefore concluded that there is a significant need for new major energy infrastructure which will have to be met by projects coming through quickly given that developments such as nuclear power stations have very long lead in times. Government is confident that industry can deliver what is required subject to the right framework, including quick and effective planning decisions which recognise the national need for new energy infrastructure. In the light of these considerations the IPC should start its assessment of applications for infrastructure covered by the energy NPSs on the basis that need has been demonstrated. The IPC does not need to consider the relative advantages of one technology over another given the Government's view that companies should be permitted to determine the individual projects to bring forward within the strategic framework set by the Government, taking account of the clear benefits of a diverse energy mix.

3.2 Need for energy supply

3.2.1 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, around the country and the world. Our businesses and jobs rely on the use of energy. And energy is essential for the critical services we rely on – from hospitals to traffic lights and cash machines. It is difficult to overestimate the extent to which our quality of life is dependent on adequate energy supplies. The major types of energy that we use are: fossil fuels, renewable energy and nuclear for generating electricity; fossil fuels used directly for heating and industry; and oil-based fuels used for transport. As we move towards 2050 the ways in which we use energy will be transformed: we should become less dependent on some forms of energy, as new and innovative low carbon technologies and energy efficiency measures are taken up. However, we could become more dependent on others – for example, demand for electricity will increase if electric vehicles are widely deployed. This means that over the next decades there will be significant change in the energy sector, but an adequate energy supply will continue to be critical. The implications of this for the different types of energy infrastructure covered by this NPS are set out below.

3.3 Need for new electricity generation capacity

Electricity Supply

3.3.1 Sufficient generating capacity needs to be available to meet demand at all times, with a safety margin or spare capacity to accommodate peak demand (which typically occurs at meal times on a winter's evening) to mitigate risks including unexpected plant closures and extreme weather events. The larger the difference between available capacity and demand (i.e. the larger the safety margin), the more resilient the system is in dealing with unexpected events, and consequently the lower the risk of a supply interruption. This helps protect businesses and also consumers, including vulnerable households, from rising and volatile prices and, eventually, from physical interruptions to supplies that would result from inadequate supply that might impact on essential services.

3.3.2 Interruptions to supply impose significant economic and social costs, both direct and indirect. The latter can include medical, fire and police costs. Even these indirect costs are not the full impact since the complete extent of a significant disruption to people's lives caused by electricity supply interruptions is very difficult to cost.

3.3.3 Total available capacity needs to exceed estimated demand by a sufficient margin of spare capacity. The level of spare capacity that the market will regard as sufficient to secure supply will depend on the composition of the generation mix and the varying contributions that each of the different technologies make to security of supply. Since there is no form of electricity generation that is always available, it is important to consider the level of de-rated capacity[7] and not total capacity when looking at future supply and demand.

7 De-rating is a way of taking account of the fact that no power station is always available, for example because of the need for maintenance, or because of intermittent supply. When calculating the amount of capacity that will be available, the derated capacity, like for like, will be lower for wind than, for example, gas powered generation.

Drivers of the need for new electricity supply

3.3.4 There are three key factors that drive the need for additional electricity infrastructure: the need to replace existing capacity that will close; the need to move to a low carbon generation mix; and changes in demand.

Replacement needs

3.3.5 How future supplies will need to be maintained will be affected by the fact that there will be significant closure of existing generating capacity over the coming years, particularly to 2020, as a result of tightening environmental regulation and aging power stations.

3.3.6 The power station closures over the next decade are driven in large part by the Large Combustion Plant Directive (LCPD). This regulates emissions of sulphur and nitrogen oxides. Generating companies who chose to "opt out" coal and oil power stations (amounting to about 12 GW) under the terms of the Directive are only able to operate for a maximum of 20,000 hours over the period 2008-2015 and will have to close by the end of 2015. In addition, based on their published lifetimes, about 10 GW of nuclear power stations are scheduled to close over the next 2 decades.

3.3.7 Further power station closures will be driven by the Industrial Emissions (Integrated Pollution Prevention and Control) Directive (IED) which will replace the regulatory framework established by the LCPD. This new Directive establishes stricter limits on the emissions of sulphur and nitrogen oxide. The Directive is expected to affect the remaining coal power stations as well as gas-fired power stations built before 2002. The closed facilities will need to be replaced if a level of security of supply comparable to today is to be maintained as we make the transition to a low carbon economy.

Move to low carbon generation

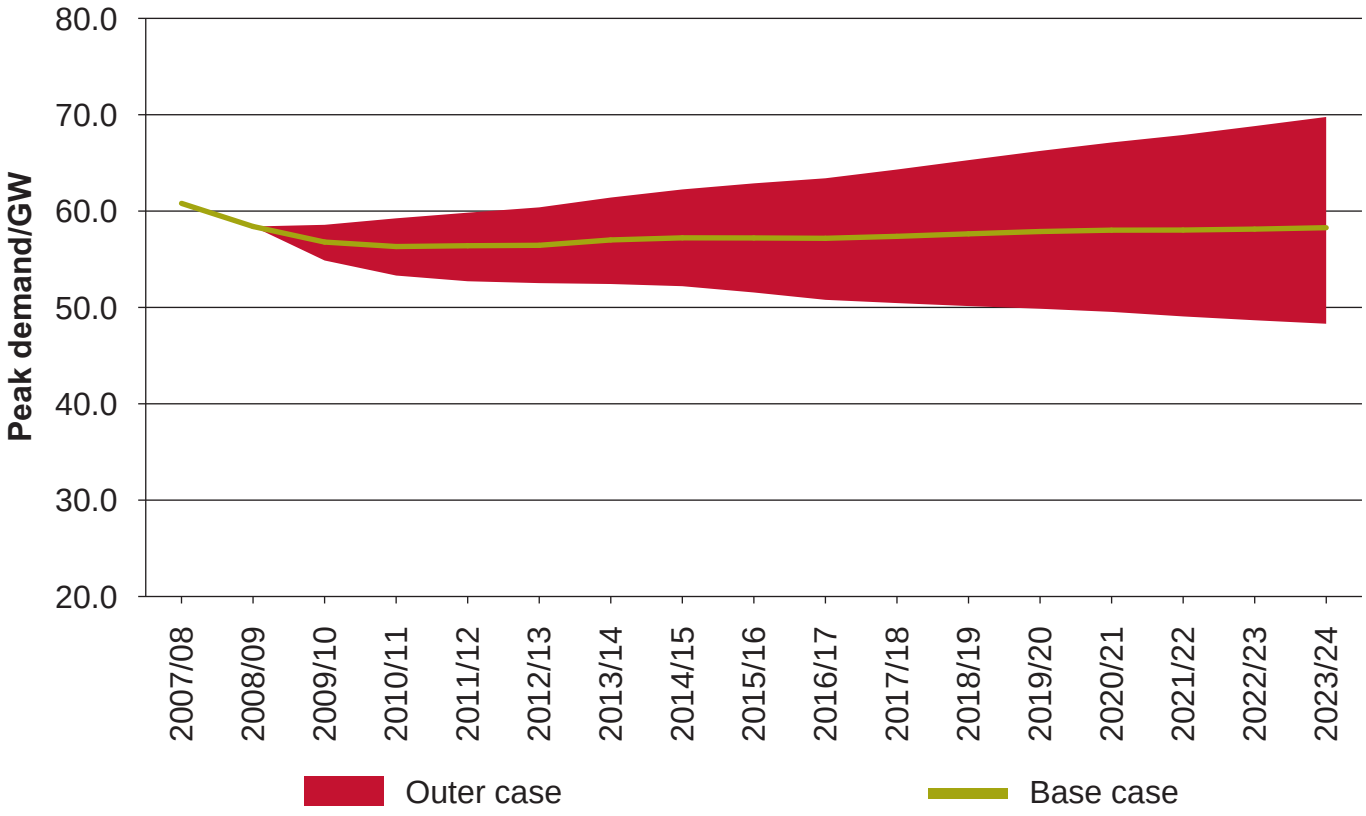
3.3.8 The move to a low carbon generation system will create a need for a higher total generating capacity than we have now because of the different generation characteristics of renewable energy. The Government's policies in its Renewable Energy Strategy (RES), designed to meet its EU target for significant increases in the proportion of energy supply from renewable sources, mean that a very large amount of new renewable generation capacity will be needed. Much of this capacity is likely to be onshore and offshore wind but increasingly it will include plant powered by combustion of biomass and waste. Any future international agreements on combating climate change are likely to increase the need for low carbon forms of energy rather than reduce it.

3.3.9 Higher levels of renewable electricity affect electricity security in a number of ways; they can reduce our dependence on imported fossil fuels, but can be both intermittent and unpredictable. This results in an increasing system requirement for flexible power stations to provide back-up (or for more demand side flexibility) to ensure that demand can be met during periods when wind output is low. Even when the UK's electricity supply is almost entirely decarbonised, it could still be necessary to use fossil fuel power stations (and supporting infrastructure) for short periods of time when renewable output is too low to meet demand e.g. when there is little wind. That said, the Government's expectation is that fossil fuel generation would be subject to carbon capture and storage from the 2020s onwards.

Demand for electricity

3.3.10 Figure 3.1 below illustrates National Grid's projections of demand for electricity. The central estimate suggests that peak electricity demand will remain at around 60 GW by 2020 taking account of the combined impacts of factors such as economic growth and energy efficiency. However, there is some uncertainty about the level of peak demand in the future, particularly over longer time horizons. Over these longer time horizons demand is likely to rise, particularly as a result of increased demand which is likely to drive the need for additional capacity to be available in the 2020s and beyond.

Figure 3.1 Projected peak demand for electricity, showing central range



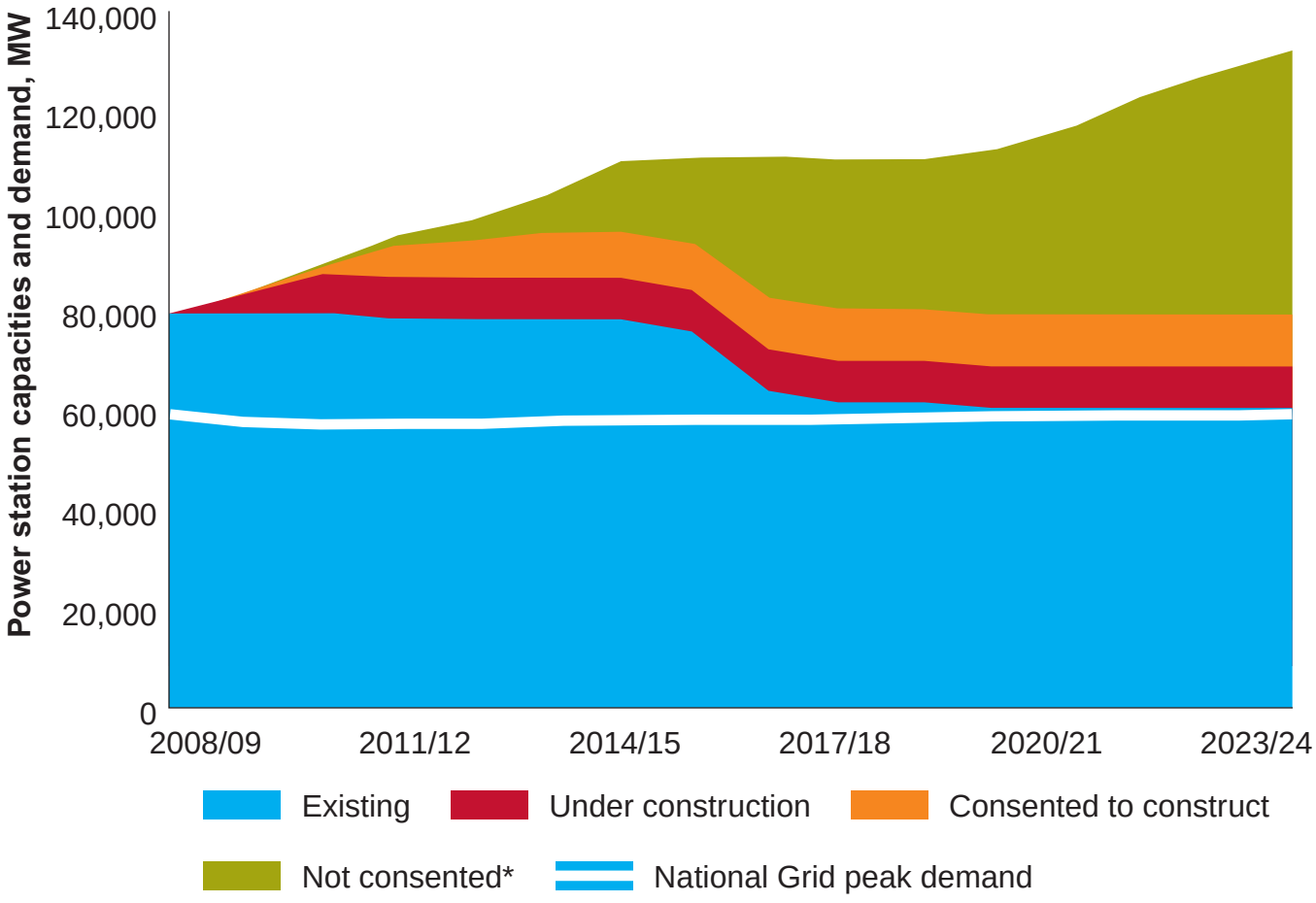
3.3.11 There are a number of factors that are likely to influence how demand develops. For example, higher economic growth and lower electricity prices would be expected to lead to increased levels of demand. In contrast, increased energy efficiency as a result of Government policies, and warmer temperatures, particularly in the winter, should reduce demand; although a combination of increasing summer temperatures and greater penetration of air-conditioning could eventually lead to the development of higher demand during summer.

Estimates of future infrastructure development

3.3.12 Figure 3.2, which sets out the expected overall impact of plant closures on electricity supply (available capacity), compared to the National Grid's projection of demand, shows how the market is responding to the need to replace closing plant with over 20 GW of investment under construction or with planning consent:

- 2 GW of generating capacity has recently completed construction and will be commissioned this year;
- 8 GW of new generating capacity is currently under construction; and
- an additional 10.5 GW has both planning consent and agreement to connect to the grid, although it has not yet started construction.

Figure 3.2: National Grid projections of peak demand and supply



*Transmission contracted

Source: National Grid Seven Year Statement extrapolated to 2023; Department of Energy and Climate Change

3.3.13 This means that industry is taking timely action to ensure we have sufficient generating capacity in the next decade.

3.3.14 However, we need new infrastructure that reflects the need for security of supply on the basis of diverse and low carbon sources. For example it is clear that there will be a requirement for significant new build of renewable electricity generation. The Government's lead scenario for the RES suggests that around 30% of electricity could be generated from renewable sources by 2020. Taking into account planned closures and other factors as well as the renewable targets, the lead RES scenario suggests that we might need around 100 GW of total capacity in 2020 of which 43 GW will be new generating capacity (26 GW of renewables against 17 GW of other generating capacity). By 2025, there could be a need for around 110 GW of total capacity with cumulative new generation capacity of approximately 60 GW (35 GW of renewables and about 25 GW of other capacity). (This is only one scenario, based on the Redpoint report[8] and the modelling results are dependent on a number of input assumptions.)

3.3.15 This means:

- having made progress in building new infrastructure, we need to continue this progress with further capacity of different kinds needing to be consented to ensure security of supply; the need for new build in the central scenario in 2020 is more than 20 GW over that which has already obtained planning consent and close to another 20 GW by 2025;
- because energy infrastructure typically takes some years to build, there is a need for applications for projects that will meet this need to be consented in sufficient time; and
- that the precise mix to be deployed will depend on specific decisions made by energy companies operating within an effective regulatory framework with strategic Government interventions.

Alternatives to new large scale electricity generation capacity

Reducing demand

3.3.16 Reducing demand for electricity wherever possible is fundamental to the Government's low carbon strategy, particularly because in many cases it saves money for households and businesses, whilst maintaining or improving our standards of living. The Transition Plan sets out a range of policies for reducing electricity demand including:

- introducing minimum energy efficiency standards for new products on sale (for example on white goods and televisions where there is the "A-G" energy label ratings system);
- a UK voluntary initiative to phase out energy-wasting incandescent light bulbs by 2011;

8 Redpoint/Trilemma 2009: Implementation of the EU 2020 renewables target in the UK electricity sector: RO Reform – http://decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/res/res.aspx

- rolling out smart meters in every home by the end of 2020 to enable people to understand their energy use and thereby make energy savings; and
- putting in place financial rewards for small-scale low carbon electricity generation with Feed-in Tariffs (see para 3.3.18 below).

3.3.17 However, while these policies will reduce electricity demand in certain areas, the savings are likely to be limited by certain factors and offset by increases in other areas. This is because:

- as part of the move to a low carbon energy economy, more of the energy for heating and travel could come from electricity. Developments such as an increased reliance on electric heating and electric vehicles may increase the demand for electricity. The Low Carbon Transition Plan suggested that it was possible that demand for electricity could be 50% higher than current levels between 2030 and 2050 as a result of electrifying much of the UK's transport and heating;
- the commercial and lifestyle changes that businesses and people are willing to make, including the scale of change people are prepared to see in the way their homes look and are built, may also limit the scope for demand reductions; and
- growth in the number of households will be a key driver of electricity demand in the residential sector.

3.3.18 Decentralised and community energy systems could also lead to some reduction in demand on the main generation and transmission system. They can offer significant economic and efficiency benefits, particularly where heat as well as electricity can be put to commercial use, and reduce pressure for expansion of the national transmission system. However, decentralised and community energy systems are unlikely to lead to significant replacement of larger-scale infrastructure. This is because interconnection 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. The lead scenario in the UK's Renewable Energy Strategy contains around 4 GW of small scale electricity generation.

3.3.19 The Government's view is that taking all these factors into account, demand management opportunities will not be sufficient to affect the need for bulk generation; the UK will still need new large energy infrastructure.

More intelligent use of electricity

3.3.20 In addition to the above measures aimed at reducing overall demand, the potential also exists for being more intelligent about when electricity is used. For instance, there is around 80 GW of total generation capacity in the UK, but average demand across a year is only for around half[9] of it. This is because a high proportion of the total capacity is used only at times of peak demand. Moving some demand from a

9 DUKES table 5.2. 2007, Total demand for UK: 400 TWh, divided by 8766 hours (no. of hours in a year) gives 45.6 GW average demand.

peak to an off-peak time or moving demand when the system is under stress allows opportunities to help balance supply and demand. This "smart demand management" may avoid power stations being built that only run for a few hours during the year and enable more efficient use of existing stations.

3.3.21 Reductions in peak demand may only lead to a corresponding increase in demand at a later time when there is sufficient power available to meet it, and because of some of the reasons given in para 3.3.17. there could be limited opportunities for this to happen. In addition, while electrical energy storage allows energy production to be decoupled from its supply, and provides a contribution to meeting peak demand, currently the only viable utility-scale energy storage technology is pumped storage[10]. The UK currently has four pumped storage facilities with a maximum capacity of approximately 3 GW (less than 3% of total generation capacity). There is limited further potential in the UK. Other than pumped storage, there is little large-scale storage technology capable of commercial deployment above 5 MW level.

Interconnection of electricity systems

3.3.22 The GB electricity system is largely isolated from the systems in other countries; we have only a 2 GW link to France, and a 450 MW link between Northern Ireland and Scotland. Additional interconnection is planned to help balance supply with demand but, even if all these links were built (and this cannot be assumed), the UK's level of interconnection would still be less than 10% of installed generation capacity, and would depend on EU-wide availability of power. Going significantly beyond these levels of interconnection would not be either economically or technically realistic, so interconnectors cannot significantly reduce the need for new infrastructure.

Conclusions on alternatives to new large electricity generation

3.3.23 Government believes that although increased energy efficiency, smart demand management and opportunities for increased storage and interconnection are being actively pursued, their effect on the need for new large scale energy infrastructure will be limited, particularly given the prospect of increased need for electricity for heating and transport.

Need for a diverse mix of electricity generation and fuels

3.3.24 By 2050 the UK may need to produce more electricity than today, but must do so largely without emitting greenhouse gases. The UK Low Carbon Transition Plan sets out how the energy system will be transformed so that electricity is generated from clean sources such as:

- renewables;
- nuclear; and
- fossil fuel plants fitted with carbon capture and storage technology (CCS).

10 Using a temporary surplus of electricity to pump water to a high reservoir, and generating hydroelectric power when needed.

3.3.25 However, no one type has all the characteristics needed to deliver the UK's climate change and energy security objectives on its own:

- nuclear power is able to provide reliable base-load generation and reduce the UK's dependence on imports of fossil fuels, but it is slow to start or shut down and cannot respond rapidly to peaks and troughs in demand or supply;
- renewables offer a low carbon fuel source but many renewable technologies only provide intermittent generation; and
- fossil fuel generation can be brought on line quickly when there is high demand and shut down when demand is low thus complementing base-load generation from nuclear and the intermittent generation from renewables, but fossil fuel generation with CCS is still at the demonstration stage.

We therefore need a diverse mixture of all types of power generation.

3.3.26 The winter of 2005/06 serves as a useful illustration of the importance of diversity and how the market reacts to cope with security of supply problems (see box 3.1).

Box 3.1 Case study – value of a diverse generation mix in Winter 2005/06

In the winter of 2005/06, as a result of concerns about gas supplies, gas prices doubled compared to the previous year and were highly volatile. This led to substantial amounts of electricity being generated by coal. Coal generation peaked at 50% of total electricity generated and averaged 42% for the duration of the winter, compared to 20% in the winter of 2004/05 and 37% in the winter of 2006/07. Had there not been the flexibility in the electricity generation sector to switch from gas- to coal-fired generation in response to changes in relative fuel prices, the total demand for gas would have been higher, putting more pressure on wholesale gas prices. In turn, this higher wholesale gas price would have fed through to even higher wholesale electricity prices, with higher retail prices.

3.4 Renewable electricity generation

3.4.1 The UK has committed to sourcing 15% of its total energy from renewable sources by 2020. The Government's lead scenario[11] suggests that by 2020 about 30% or more of our electricity (about 117 TWh) – both centralised and small-scale generation – could come from renewable sources, compared to around 5.5% today.

3.4.2 Large scale deployment of renewables will help the UK tackle climate change, reducing the UK's emissions of carbon dioxide by over 750 million tonnes by 2030. It will bring business opportunities and help the UK to restructure into a low carbon economy, providing around £100 billion of new investment with the potential to bring up to 500,000 new jobs in the UK renewable energy sector. Renewable electricity generation is supported in the UK through the Renewables Obligation (RO), which is a market-based support mechanism to encourage investment.

11 It is important to recognise that we may reach our renewable energy goals in different ways, depending on how the drivers to investment, supply chain and non-financial barriers evolve. As a result, the lead scenario presented in the Renewable Energy Strategy should not be seen as a sector or technology target.

3.4.3 The UK has the potential to develop a wide range and large volume of renewable energy resources. Future, large-scale renewable energy generation is likely to come from the following sources:

- Onshore Wind – Onshore wind is the most well-established and economically viable source of renewable electricity available for future large-scale deployment in the UK.
- Offshore Wind – Offshore wind is expected to provide the largest single contribution towards the 2020 renewable energy generation targets.
- Biomass – Biomass is becoming increasingly important. It involves the combustion of renewable fuel, such as wood, returning the CO_2 which the plant absorbed during its life to the atmosphere. Whilst energy is required to grow, harvest and transport the biomass it is considered to be a renewable fuel and its combustion displaces emissions of carbon dioxide ordinarily released using fossil fuels.
- Energy from Waste – The principal purpose of burning waste is to reduce the amount of waste going to landfill in accordance with the Waste Hierarchy[12]. However, electricity can also be generated from the combustion of waste. The biomass fraction of waste burned in an energy-from-waste plant is renewable, and is in some circumstances eligible for Renewables Obligation Certificates (ROCs), although the arrangements vary from plant to plant.
- Wave and tidal – the UK has significant potential for wave and tidal energy, but many of the technologies for making use of the wave resource and tidal currents are still at the prototype or demonstration stage, although proven technology exists for tidal range generation. Para 1.3.5 explains how this NPS relates to wave and tidal generation.

3.4.4 The RES presented an illustrative breakdown of the final shares of different types of renewables technology in 2020 based on the analysis for the 'lead scenario'. This envisages that by 2020 nearly 15 GW of total capacity could come from onshore wind, 12 GW from offshore wind, and around 4 GW from bioenergy. These are not targets – as the next decade progresses, the position on costs, benefits and potential of different technologies may look different and the 2020 target may be delivered differently across the sectors. Therefore, there is nothing to stop development beyond these levels if supply and technological barriers can be overcome; for example, the Strategic Environmental Assessment of offshore wind identified potential for an additional 25 GW of generation by 2020.

12 Waste hierarchy as set out in Article 16 of the Waste Framework Directive.

3.5 Nuclear power generation

3.5.1 Nuclear power stations are low carbon and have an operating life in the region of 40 – 60 years, so any new nuclear power stations constructed by the end of 2025 will play a vitally important role in the decarbonisation of electricity and therefore contribute towards our 2050 target.

3.5.2 Given the urgent need for low carbon forms of electricity to contribute to the energy system it is important that new nuclear power stations are constructed and start generating from 2018 with increasing numbers over the following years building up to 2025. This date represents a realistic timeframe within which a number of new nuclear power stations might reasonably be expected to be constructed, taking a staged approach based on the availability of, amongst other things, construction materials, skills, investment, the timescale for licensing, and related investment in transmission and distribution infrastructure.

3.5.3 Unlike the other technology-specific NPSs, the nuclear NPS contains a list of potentially suitable sites for new nuclear power stations. This different approach to nuclear was taken because of the level of national interest associated specifically with the siting of nuclear power stations. The Government therefore thought it appropriate to lead a debate at national level on the siting of new nuclear power stations, and a policy decision was taken in 2006 to conduct a Strategic Siting Assessment (SSA). More information on the SSA process and outcome is in EN-6.

3.6 Fossil fuel electricity generation

3.6.1 Fossil fuel power stations play a vital role in providing reliable electricity supplies: they can be operated flexibly in response to changes in supply and demand, and provide diversity in our energy mix. They will continue to play an important role in our energy mix as the UK makes the transition to a low carbon economy, and Government policy is that they must be constructed, and operate, in line with climate change goals.

3.6.2 Fossil fuel generating stations contribute to security of energy supply by using fuel from a variety of suppliers. The UK gas market has diversified its sources of supply of gas in recent years, so that as the UK becomes more import dependent, companies supplying the market are not reliant on one source of supply. This protects the UK market from disruptions to supply. UK natural gas supplies come from the producing fields on the UK Continental Shelf (UKCS), by pipeline direct from Norway, and from continental Europe through links to Belgium and the Netherlands. Liquefied natural gas (LNG) is imported by tanker, supported by ongoing investment in LNG facilities such as those on the Isle of Grain and at Milford Haven. Similarly, although a proportion of coal used in British generating stations is imported, the UK still has its own reserves. Further, coal is available globally and most generating station operators will already have alternative suppliers depending on prevailing market conditions. This ability to source fuel from alternative suppliers helps to give stability to the UK's generating capacity. In addition, unlike renewable energy sources such as wind power, fossil fuels may be stockpiled in anticipation of future energy demands.

3.6.3 CCS offers the potential to reduce emissions from fossil fuel power stations by around 90% and would enable fossil fuels to continue contributing to energy security in a low carbon future. However, the complete chain of CCS has not yet been demonstrated at commercial scale on a power station. For more on CCS see Section 4.7.

3.6.4 The UK is leading international efforts to develop CCS and on 23 April 2009 the Government announced that all new coal and gas plant (300 MWe or above) will have to be built carbon capture ready. Coal power stations have higher carbon emissions for a unit of electricity than any other fuel, including gas, so the Government subsequently announced further requirements for CCS on coal power stations, including that all new coal power stations must demonstrate the full CCS chain.

3.6.5 Some of the 17 GW of new conventional generating capacity envisaged by 2020 under the central set of modelling assumptions is likely to need to come from fossil fuel generating stations in order to maintain security of supply and provide flexible back-up to intermittent renewable energy from wind. The Government has said that it will support up to four coal CCS demonstration projects, to be operational in the UK by 2020. All other new fossil fuel generating capacity must be carbon capture ready, but, with the exception of new coal-fired plant, is not required to have any CCS capability installed at this stage, as the technology is at a relatively early stage of development. Government policy on CCR and CCS is set out in Section 4.7 below.

3.7 Electricity generation applications

3.7.1 The IPC should expect to receive applications for all types of electricity generation. It should start its assessment of them from a basis that there is a significant need for all types of generation.

3.8 Electricity network infrastructure

3.8.1 Under the Government's objectives for energy and climate change, further diversification of the UK's energy sources and much greater use of renewable and other low carbon forms of generation will require substantial changes in the type and location of the electricity generating infrastructure by 2020. This will create a significant national need for expansion and reinforcement of the UK's transmission and distribution networks, including extension into areas that have not previously seen such developments. These changes are therefore crucial to ensure the ready flow of electricity from the location of the generation (which could be sparsely populated areas) to the big centres of demand, ensuring that electricity supply meets demand.

3.8.2 New electricity network infrastructure projects provide crucial national benefits, which all localities share. In particular, projects will usually add to the reliability of national energy supply, from which every user of the system benefits.

3.8.3 Failure to put necessary electricity network infrastructure in place will, immediately, or over time, reduce the reliability of energy systems, with potentially damaging consequences for local, regional and national communities and economies. Lack of sufficiently robust electricity networks can cause, or contribute to large scale interruptions. Such infrastructure projects often have long lead times and/or cater for longer-term needs, based on careful forward planning by energy companies.

3.8.4 Whilst the existing network needs to be maintained and upgraded to safeguard ongoing supply and accommodate new generation, it will also need to respond to the expected increases in demand due to the development of new housing and business premises (the number of households in the UK is projected to grow by 31% by 2031) as well as technological shifts such as the greater use of electric cars. Electricity networks need to evolve on an ongoing basis to ensure a reliable supply of energy is maintained.

3.8.5 Following the publication of the July 2008 Government consultation on the UK Renewable Energy Strategy, the Government and Ofgem, through its jointly chaired industry body, the Electricity Networks Strategy Group (ENSG) requested the three GB transmission companies, supported by an industry working group, to:

- develop electricity generation and demand scenarios consistent with the EU target for 15% of the UK's energy to be produced from renewable sources by 2020; and
- identify and evaluate a range of possible electricity transmission networks solutions that would be required to accommodate these scenarios.

3.8.6 The subsequent Report[13] identified the transmission reinforcements likely to be needed, based on a range of scenarios that take into account the significant changes anticipated in the generation mix to 2020. In particular, the scenarios examined the potential new transmission infrastructure needed to connect the large volumes of onshore and offshore wind generation required to meet the 2020 renewables target and other essential new generation, such as new nuclear. An addendum published in July 2009[14] examined whether likely reinforcements required to 2030 under a range of scenarios impacted on the reinforcements identified to meet the 2020 vision.

3.8.7 Under the scenarios considered by the ENSG significant potential increases in generation and changes in direction of net electricity flows to 2020 were considered likely to be:

- from north to south, with between 6.6 GW and 11.4 GW of renewables in Scotland;
- from Eastern England to centres of demand in the Midlands and South East England, accommodating around 8 GW of offshore wind, along with 3.3 GW of nuclear;
- from South West England and South Wales eastwards to centres of demand in the Midlands and South East England, with up to 2-3 GW of wind along with 3.3 GW of new nuclear;
- from the North West and North Wales, to accommodate some 5-7 GW of wind, along with 3.3 GW of nuclear.

13 http://www.ensg.gov.uk/assets/ensg_transmission_pwg_full_report_final_issue_1.pdf
14 http://www.ensg.gov.uk/assets/ensg__2030_transmission_addendum_final_issue_1.pdf

3.8.8 Government believes this work represents the best available view of the optimum strategy for reinforcing electricity network infrastructure in order to achieve the UK's renewable energy and security of supply targets, and will therefore be relevant to the IPC's consideration of electricity network proposals. However this report is not exhaustive and only includes network investment needed in advance of the generation plant so other applications will come forward. Therefore the fact that a project is not covered should not preclude the IPC from granting consent for other electricity network projects.

3.8.9 Other information is published by National Grid in its role as National Electricity System Operator (NETSO):

- an annual Seven Year Statement, which presents a wide range of information relating to the transmission system in GB, including forward investment plans under a range of scenarios showing both the amount of infrastructure that is likely to be needed and its location; and
- an Offshore Development Information Statement, which presents potential scenarios and NETSO's best view of the development of the transmission network offshore to help ensure a coordinated and informed approach to the offshore transmission network.

3.8.10 In light of the above, this NPS shows that there is a significant need for the electricity transmission and distribution infrastructure to be provided.

3.9 Gas supply infrastructure and pipelines

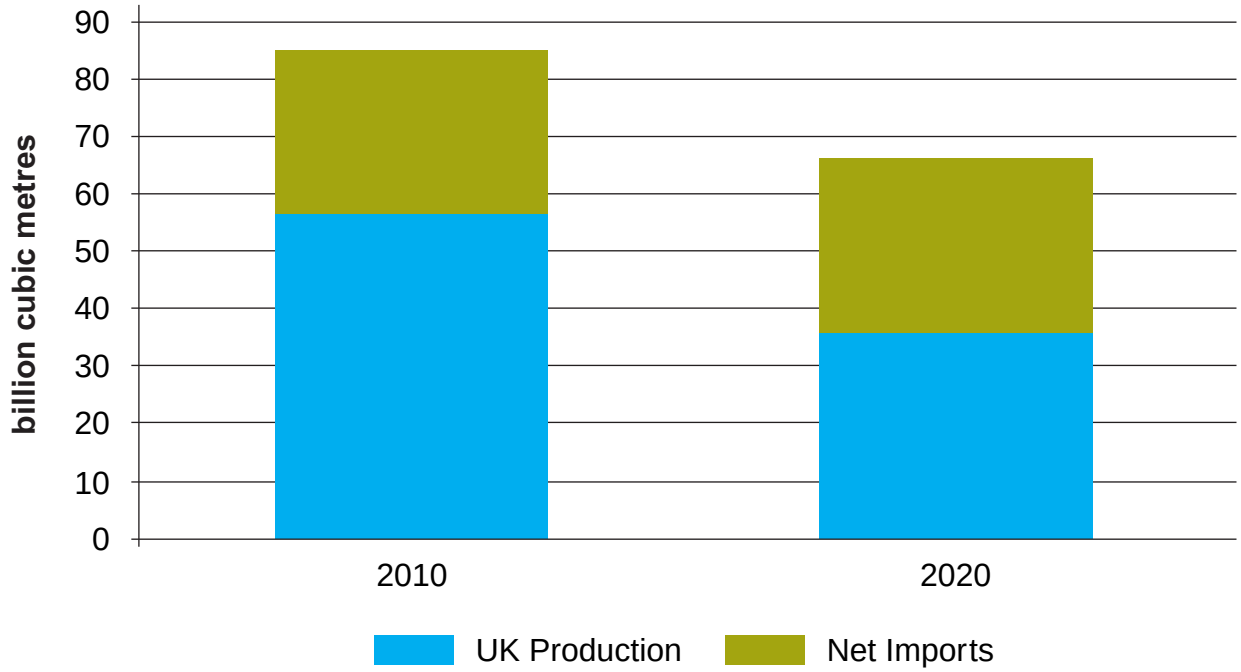
3.9.1 The UK is highly dependent on natural gas, which is used in roughly equal quantities in domestic households (largely for space heating purposes), for electricity generation (generating over two fifths of electricity in 2008) and across a range of businesses. Although we plan to reduce our reliance on fossil fuels, transition will take a significant time, and gas will continue to play an important part in the UK's fuel mix for years to come.

3.9.2 The UK is one of the largest gas consumers in Europe with demand representing close to a fifth of the EU total and 3% of the global total. In addition to meeting domestic gas demand, supplies to Great Britain are also needed to meet demand from Northern Ireland and the Republic of Ireland and for (gross) exports to the Continent through the Bacton-Zeebrugge Interconnector. Irish gas import demand is currently met through pipelines from Scotland; in future some Irish import demand might be met by direct importation of Liquid Natural Gas (LNG).

The UK Gas Market

3.9.3 Secure gas supplies have been assured over the last thirty years because of indigenous gas supplies from the UK Continental Shelf (UKCS). Production of gas from the UKCS is, like oil, now in decline. In 2004 Britain again became a net importer of gas and, by early 2009, it was estimated that Britain was importing just under 30% of its annual gas demand. Through measures such as better home insulation and improved energy efficiency, the Low Carbon Transition Plan is expected to reduce UK gas demand across the economy by around 30% by 2020. On the basis of these measures, net gas imports are forecast to remain broadly constant during the next decade. Nevertheless, we will continue to import gas from increasingly diverse sources, so that consumers have access to the most competitive supplies, and to spread the supply risk. There must also be sufficient gas supplies to meet peak demand, which is a much more stretching requirement than meeting annual demand. 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 if, for instance, it is under maintenance at the critical time. Consequently new gas infrastructure will be required during the next decade. Figure 3.3 below takes account of the expected fall in demand for gas by 2020 under the Low Carbon Transition Plan.

Figure 3.3: Projected net annual UK Gas Production and Imports, 2010 and 2020



3.9.4 Gas storage and supply infrastructure and pipelines will need to keep pace with the pattern of demand. There is a strong seasonal element to gas demand. Demand is higher in the winter months and also varies considerably throughout the day. Peak demand is considerably higher than average demand over the year. In the past so-called 'swing supply' to meet seasonal changes in demand has been provided by highly responsive gas fields in the North Sea. However, as these fields age and become depleted, and even where they may still contain considerable gas reserves, they react more slowly, and therefore cannot release gas at the speed they previously did. The UK needs a diverse mix of gas storage and supply infrastructure (including strategic pipelines) to respond effectively to daily and seasonal changes in demand and to provide endurance capacity during a cold winter.

3.9.5 Over the last ten years the private sector has invested to increase import capacity and, to a lesser extent, storage capacity. This investment has helped to ensure gas security of supply, for example while there have been periods when supplies of gas have been very tight as in 2005/6. The increasing diversity of our gas supplies helped the UK to remain largely unaffected by the Russia-Ukraine dispute in January 2009. To maintain this position, it is important that the further investment that is required can be made in a timely fashion.

3.9.6 A range of infrastructure is required to substitute the contributions of nearby gas fields that can no longer fulfil their previous functions:

- new import infrastructure, both in terms of conventional import pipelines, gas reception facilities and LNG import facilities. These will be necessary in order to provide import capacity for the increasingly import dependent UK gas market;
- new gas storage facilities, whether in underground strata, or in LNG tanks above ground, are required to provide the close-to-source 'swing supply' which can help meet peak demand. Demand varies considerably throughout the day and it is necessary for some sources to be close to the market so that gas is quickly available. Gas supply infrastructure will also need to keep pace with any changes in the regional demand for gas across the UK – which may change due to changes in location of population and/or commercial and industrial demand.

3.9.7 Despite the additional gas import and gas storage capacity already provided, there are a number of reasons why market participants may seek to provide more and these are principally that:

i. there must be sufficient *physical* gas supply capacity to meet peak demand. This is a much more demanding requirement than meeting annual demand. 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 (e.g. if undergoing maintenance);

ii. there must be sufficiently diverse supply capacity to provide access to the most *competitive* gas supplies. Because price relativities will vary through time, this also implies some "redundancy" in gas supply infrastructure. Market participants may see distinct value in having access to gas imports by pipeline, to gas imports by LNG, and to gas from storage (especially close-to-market storage that can be accessed rapidly); and

iii. the large uncertainties around the evolution of Great Britain's demand for gas, in annual and in peak terms, also present risks that market participants will seek to manage.

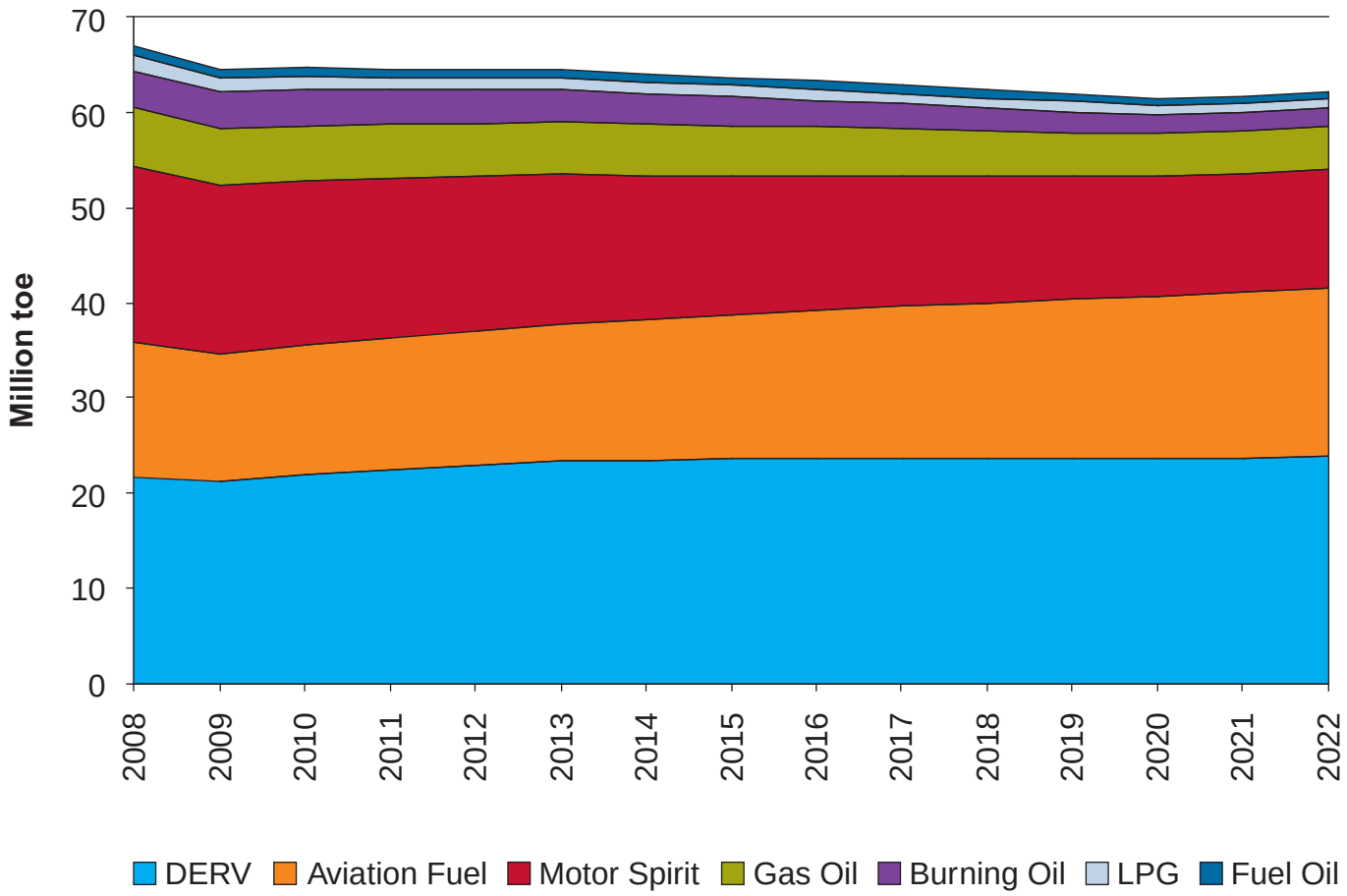
3.9.8 In the light of the above, the IPC should expect to receive a small number of significant applications for supply, storage and transmission of gas and start its assessment from the basis that as the North Sea supplies decline there is a significant need for this infrastructure to be provided.

3.10 Oil pipelines

3.10.1 Oil products play an important role in the UK economy, providing around 33% of the primary energy used. We currently rely on oil for almost all of our motorised transport needs. Transport accounted for 75% of final consumption of oil products in the UK in 2008, amounting to 51.9 million tonnes of oil. In the longer term we need to reduce our dependence on oil by improving vehicle efficiency and using new alternative fuelled vehicles, but demand is projected to increase in the short to medium term because although consumption of petrol in the UK is forecast to fall, demand for diesel and aviation fuel is expected to continue to rise.

3.10.2 Over time, technology changes including electric vehicles and generation of more heat from renewables, together with Government energy efficiency policies such as seeking to encourage greater use of public transport, will reduce demand for oil. But as Figure 3.4 illustrates, significant reductions are not expected over the next 10-15 years. This is primarily because the transport sector is the main consumer of oil and will continue to be heavily dependent on it for the foreseeable future. Viable alternatives to oil are currently limited and demand remains relatively inelastic in the face of price changes.

Figure 3.4: Forecast UK oil demand by petroleum product type



Source: EMO Oil projection 2009

3.10.3 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.

Petroleum product distribution

3.10.4 Finished petroleum products are distributed from the refineries to around 50 major distribution terminals in the UK by pipeline (51%), sea via coastal tankers (34%) or rail (15%). Some of the coastal terminals also import finished products from abroad. Onward distribution to customers is mostly by road tanker, but some of the larger customers have pipeline connections.

3.10.5 There is an extensive network of private and Government owned pipelines in the UK, with around 4,800km of pipeline currently in use. The 2,400km of privately owned UK pipeline network 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. The Government also operates a separate oil pipeline system – the Government Pipeline and Storage System (GPSS), supplying a number of MoD airfields and with connections to some non-MoD sites (for example, Stansted Airport).

3.10.6 The drivers for new downstream oil infrastructure such as pipelines include:

- meeting increasing demand by end users, particularly for diesel and aviation fuel;
- compliance with EU and IEA obligations for compulsory oil stocking, which are set to increase as North Sea resources decline;
- meeting requirements for sulphur-free diesel and petrol blended with biofuels (including ethanol distribution), which are set to increase;
- increasing imports of refined products (due to changing demand patterns);
- emerging planning, safety and environmental protection requirements; and
- market requirements to improve supply resilience in order to meet demand in full in a timely fashion, under credible emergency scenarios.

3.10.7 New pipeline infrastructure could have 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.

3.10.8 In the light of the above, the IPC should expect to receive a small number of significant applications for oil pipelines and start its assessment from the basis that there is a significant need for this infrastructure to be provided.

Part 4. Assessment Principles and Generic Impacts

4.1 Introduction

4.1.1 The IPC should adhere to the following key principles when examining and determining applications for energy infrastructure:

i. Given the level of need for energy infrastructure as set out in Part 3 of this NPS, if the development proposal is in accordance with this NPS and any relevant technology-specific NPS, then the IPC should operate on the basis that consent should be given, except to the extent that any of the exceptions set out in the Planning Act apply (see paragraph 1.1.2 above).

ii. The Planning Act requires the IPC to have regard to the following, in addition to any relevant NPS: any local impact report submitted by a relevant local authority before the deadline for its receipt by the IPC; any matters prescribed in relation to development of the description to which the application relates; any Marine Policy Statement (MPS) or marine plan; and any other matters which the IPC considers to be both important and relevant to its decision.

iii. The IPC should take into account the national, regional and local benefits (environmental, social and economic) including the contribution to the need for energy infrastructure, job creation and any long-term or wider benefits. These may be identified in this NPS, the relevant technology-specific NPS, in the application or elsewhere.

iv. The IPC should take into account adverse impacts – environmental, social and economic – including those identified in this NPS and the relevant technology-specific NPS, as well as local impacts identified in the application or otherwise. The IPC should ensure it takes account of any longer-term adverse impacts that have been identified and any cumulative adverse impacts.

v. If the IPC is satisfied that the adverse impacts identified (including any cumulative adverse impacts) outweigh the benefits of the proposed development (taking into account measures to avoid, reduce or compensate for those adverse impacts) consent should be refused.

4.1.2 This NPS and the technology-specific energy NPSs have taken account of relevant Planning Policy Statements (PPSs) and older-style Planning Policy Guidance Notes (PPGs) in England and Technical Advice Notes (TANs) in Wales where appropriate. Although these NPSs provide the main policy context for the IPC, there may be occasions when the IPC will also need to refer to these other documents and to development plans (including regional strategies) where it finds them important and relevant to its decisions. In the event of a conflict between any of these other documents or a development plan and a NPS, the NPS prevails for purposes of IPC decision making given the national significance of the infrastructure. The policy set out in this NPS is, for the most part, intended to reflect and clarify existing policy and practice of the Secretary of State in consenting nationally significant energy infrastructure. Where necessary the application of existing policy to major infrastructure has been clarified. The intention is not to use this NPS 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) but rather to make those policies clearer and more transparent.

4.1.3 The Marine and Coastal Access Bill will provide for the preparation of a Marine Policy Statement (MPS) and a number of marine plans. The IPC must have regard to the MPS and applicable marine plans in taking any decision which relates to the exercise of any function capable of affecting the whole or any part of the UK marine area. In the event of a conflict between any of these marine planning documents and an NPS, the NPS prevails for purposes of IPC decision making given the national significance of the infrastructure.

4.1.4 The IPC should only impose conditions[15] in relation to a development consent that are necessary, relevant to planning, relevant to the development to be consented, enforceable, precise, and reasonable in all other respects.

4.1.5 Equally, when the IPC requires the applicant to enter into development consent obligations[16], 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.

4.1.6 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 financial and technical viability of the proposal has been properly assessed by the applicant it is unlikely to be of relevance in IPC decision-making (any exceptions to this principle are dealt with where they arise in this or other energy NPSs and the reasons why financial or technical viability is likely to be of relevance explained).

15 Where the word "conditions" is used in this NPS they refer to "planning requirements" under section 120 of the Planning Act 2008.

16 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.

4.2 Environmental Statement

4.2.1 All proposals for projects that are subject to the European Environmental Impact Assessment Directive[17] must be accompanied by an Environmental Statement (ES) describing the aspects of the environment likely to be significantly affected by the project[18]. The Directive specifically refers to effects on human beings[19], fauna and flora, soil, water, air, climate, the landscape, material assets and cultural heritage, and the interaction between them. The Directive requires a description of the likely significant effects of the proposed project on the environment, covering the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects at all stages[20] of the project, and also of the measures envisaged for avoiding or mitigating significant adverse effects[21]. When considering a proposal, the IPC should satisfy itself that likely significant effects have been adequately assessed, and should request further information where necessary.

4.2.2 While not required by the EIA Directive, the IPC will find it helpful if the applicant also sets out information on the likely significant social and economic effects of the development, and shows how any likely significant negative effects would be avoided or mitigated. This information could include matters such as employment, equality, community cohesion and well-being.

4.2.3 When considering cumulative effects, the ES should provide information on how the effects of the applicant's proposal would combine and interact with the effects of other development (including projects for which consent has been sought or granted, as well as those already in existence)[22]. The IPC may also have other evidence before it, e.g. from appraisals of sustainability of relevant NPSs or development plans, on such effects and potential interactions. Any such information may assist the IPC in reaching decisions on proposals and on mitigation measures that may be required.

4.2.4 The IPC should consider how the accumulation of 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 cases where the EIA Directive does not apply to a project, and an ES is not therefore required, the applicant should instead provide information proportionate to the project on the likely significant environmental, social and economic effects. References to an Environmental Statement in this NPS should be taken as including a statement which provides this information, even if the EIA Directive does not apply.

17 Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, amended by Directives 97/11/EC and 2003/35/EC.

18 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (SI 2009/2263).

19 The effects on human beings includes effects on health.

20 All stages includes construction, operation and decommissioning.

21 See Circular 02/99: *Environmental impact assessment* for further information on the preparation and content of an Environmental Statement.

22 For guidance on the assessment of cumulative effects, see, for example, Circular 02/99, *Environmental impact assessment*, or *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions* (http://ec.europa.eu/environment/eia/eia-studies-and-reports/guidel.pdf).

4.2.6 In this NPS, the terms 'effects', 'impacts' or 'benefits' should accordingly be understood to mean likely significant effects, impacts or benefits.

4.3 Habitats regulations assessment

4.3.1 Prior to granting a development consent order, the IPC must, under the Habitats Regulations[23], consider whether the project is likely to have a significant effect on a European site, 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. Further information on the requirements of the Habitats Regulations can be found in a Government Circular[24]. Applicants should also refer to Section 4.18 of this NPS on biodiversity and geological conservation. The applicant should seek the advice of Natural England and/or the Countryside Council for Wales, and provide the IPC with such information as it may reasonably require to determine whether an appropriate assessment is required. In the event that appropriate assessment is required, the applicant must provide the IPC with such information as may reasonably be required to enable it to conduct the appropriate assessment. This should include information on any mitigation measures that are proposed to minimise likely effects.

4.4 Alternatives

4.4.1 While this NPS does not contain any general policy requirement to consider alternatives or to establish whether the proposed project represents the best option, in the impact sections of this NPS and the technology-specific NPSs there are policy requirements for the IPC to consider or to compare alternatives in certain circumstances.

4.4.2 There are also legal requirements to consider alternatives in some circumstances (for example, under the Habitats Directive). These should normally have been identified in the ES. The ES should in any case include an outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant's choice, taking into account the environmental, social and economic effects, and including, where relevant, technical and commercial feasibility.

4.4.3 When such a policy or legal requirement to consider alternatives does arise the IPC should frame any consideration of alternatives as follows (subject to any specific legal requirements such as under the Habitats and Water Framework Directives):

- given the urgency of the need for energy infrastructure as set out in this NPS, the consideration of alternatives should be carried out in a proportionate manner;
- in view of the level of need for energy infrastructure set out in this NPS, the IPC should be guided in considering alternative proposals by whether there is a realistic prospect of the alternative delivering the necessary infrastructure in line with the urgency of the need;

23 The Conservation (Natural Habitats, &c) Regulations 1994 (as amended), and the Offshore Marine Conservation (Natural Habitats &c) Regs 2007 (as amended).

24 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 tso.co.uk/bookshop. It should be noted that this document does not cover more recent legislative requirements. Where this circular has been superseded, reference should be made to the latest successor document.

- given the level of need for energy infrastructure as set out in this NPS, the IPC should have regard to the possibility that all suitable sites may be needed;
- alternatives not among the main alternatives studied by the applicant (as reflected in the ES) should only be considered to the extent that the IPC thinks they are both important and relevant to its decision;
- as the IPC must decide an application in accordance with the relevant NPS (subject to the exceptions set out in the Planning Act), it should be reasonable for the IPC to conclude that alternative proposals which are not in accordance with the relevant NPS cannot be important and relevant to its decision. In particular where, as is the case with the nuclear NPS, locations have been identified which are potentially suitable for the infrastructure, the IPC should be guided in considering alternative sites by whether they are in the locations identified in the NPS;
- in view of the level of need for energy infrastructure set out in this NPS, it should be reasonable for the IPC to conclude that alternative proposals which mean the necessary development could not proceed, for example because the alternative proposals are not commercially viable or physically suitable, may be excluded on the grounds that they are not important and relevant to its decision;
- it should be reasonable for the IPC to conclude that alternative proposals which are vague or inchoate may be excluded on the grounds that they are not important and relevant to its decision; and
- where an alternative is put forward by a third party it may be reasonable for the IPC to place the onus on the person proposing the alternative to provide the evidence for it and the IPC should not necessarily expect the applicant to have assessed it.

4.5 Criteria for "good design" for energy infrastructure

4.5.1 Good design[25] is about ensuring attractive, usable, durable and adaptable places and contributing to sustainable development. The expectation should be that good aesthetic and functional design can go together although 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.

4.5.2 Nevertheless the IPC 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 so doing, the IPC should satisfy itself that the applicant has taken into account both aesthetics and functionality (including fitness for purpose).

25 PPS1 "Delivering Sustainable Development" paragraphs 33-36.

4.5.3 The development should be as visually attractive as possible as a result of good architecture and appropriate landscaping. Whilst the applicant may not have any or very limited choice in the physical appearance of some energy infrastructure, such as electricity pylons, there may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, landform 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.

4.5.4 Further advice on what the IPC should expect applicants to demonstrate by way of good design is provided in the technology-specific NPSs where relevant.

4.5.5 Applicants should set out the main alternatives to the design that they have considered and the reasons why the favoured choice has been selected. In considering applications the IPC 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.

4.6 Consideration of Combined Heat and Power (CHP)

4.6.1 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. In conventional thermal generating stations (including biomass and energy from waste), 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 waste heat, such as district heating networks, can reduce the overall amount of fuel needed to meet the equivalent energy requirements compared to separate generation of heat and power. CHP is technically feasible for all types of thermal generating stations, including nuclear, energy from waste and biomass.

4.6.2 Using less fuel for the same amount of power reduces emissions, particularly CO_2. The Government has therefore committed to promoting Good Quality CHP, which denotes CHP that has been certified as highly efficient under the CHP Quality Assurance programme. In accordance with the EU Cogeneration Directive, schemes need to achieve at least 10% primary energy savings compared to the separate generation of heat and power in order to qualify for Government support associated with the programme.

4.6.3 In 2008, there was 5.6 GW of Good Quality CHP in the UK, providing over 7% of electricity and saving an estimated 10.2 $MtCO_2$ per annum. There is a recognised cost-effective potential for a further 10 GW of Good Quality CHP, estimated to offer a further saving of 175 $MtCO_2$ by 2015[26].

26 http://www.defra.gov.uk/environment/climatechange/uk/energy/chp/pdf/potential-report.pdf

4.6.4 To be viable as a CHP plant, a generating station needs to be located close to industrial or domestic customers with heat demands. This is likely to mean within a distance of up to 15 km. 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 hot water and space heating, including for district heating networks, and for light industrial users such as commercial greenhouses. A 2009 report for DECC[27] on district heating networks concluded that cost effective district heating networks would be where there was a demand for 200 MW of heat within 15 km of a generating station. Additionally, the provision of CHP is most likely to be cost-effective and practical where it is included as part of the initial design of the customer's facilities. For example, adding a district heating network to an existing housing estate may not be efficient.

4.6.5 Under guidelines issued by BIS (then DTI) in 2006[28], any application to develop a thermal generating station under Section 36 of the Electricity Act 1989 must either include CHP or contain evidence that the possibilities for CHP have been fully explored. This should be through an audit trail of dialogue between the applicant and prospective customers. The IPC should have regard to this guidance, or any successor to it, when considering applications for thermal generating stations.

4.6.6 In developing proposals for new thermal generating stations, developers should consider the opportunities for CHP from the very earliest point and it should be adopted as a locational criterion. Given how important liaison with potential customers for heat is, the IPC should expect applicants to have consulted not only those potential customers they have identified themselves but also to have contacted bodies such as the Homes and Communities Agency (HCA), Regional Development Agencies and Local Authorities and to have obtained their advice on opportunities for CHP. Further advice is contained in the 2006 BIS guidelines and applicants should also consider relevant information in regional and local energy and heat demand mapping.

4.6.7 Utilisation of waste 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. Substantial additional positive weight should therefore be given by the IPC to applications incorporating CHP. If the proposal is for thermal generation without CHP, the applicant should explain the following:

- why CHP is not economically feasible or practical for other reasons e.g. if there are more energy efficient means of satisfying domestic heat demand;
- any potential future heat requirements in the area that the station could meet; and
- the provisions in the proposed scheme for ensuring any potential heat demand in the future can be exploited.

4.6.8 The material provided by applicants on this latter point should explain how the development can both be ready to provide CHP in the future and also be Carbon Capture Ready (see Section 4.7) or set out any constraints (for example space restrictions) which would prevent this.

27 "The Potential and Costs of District Heating Networks", Pöyry and Faber Maunsell, April 2009.

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

4.6.9 If the IPC is not satisfied with the evidence that has been provided, it may wish to investigate this with one or more of the bodies such as the Homes and Communities Agency, Regional Development Agencies and Local Authorities.

4.6.10 If the IPC, in considering an application for a thermal generating station, identifies a potential customer for CHP heat that is not explored in the application (for instance, on the advice of the HCA or Local Authorities), it 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.

4.6.11 The IPC 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 e.g. planned housing, and which is due to be built within a timeframe that would make the supply of heat cost-effective. If so, the IPC may wish to impose conditions to ensure that the generating station is CHP-ready unless the IPC is satisfied that the applicant has demonstrated that the need to comply with the requirement to be Carbon Capture Ready will preclude any provision for CHP.

4.7 Carbon Capture Readiness (CCR) and Carbon Capture and Storage (CCS)

CCR

4.7.1 To ensure that no foreseeable barriers exist to retrofitting carbon capture and storage (CCS) equipment on combustion generating stations, all applications for new combustion plant which are of generating capacity at or over 300 MW[29] and of a type covered by the EU's Large Combustion Plant Directive (LCPD)[30] should demonstrate that the plant is "Carbon Capture Ready" (CCR) before consent may be given. The IPC must not grant consent unless this is the case. In order to assure the IPC that a proposed development is CCR, applicants will need to demonstrate:

- 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 CO_2 from the proposed combustion station;
- the technical feasibility of transporting the captured CO_2 to the proposed storage area; and
- the economic feasibility within the combustion station's lifetime of the full CCS chain, covering retrofitting, transport and storage.

29 The threshold set for this CCR requirement is capacity measured in MW electricity (MWe) for combustion plants which are covered by the LCPD, consistent with the requirements of Article 9a of the LCPD, as inserted by Article 33 of the EU Directive on the Geological Storage of Carbon Dioxide (2009/31/EC). This article requires applicants to carry out CCR assessments, and it requires Member State authorities (in this case, the IPC) to ensure that suitable space for the capture equipment is set aside. The policy set out here represents the implementation of Article 9a as regards Great Britain, but it also goes beyond what the Directive requires, as explained in **[insert reference to response to consultation]**.

30 2001/80/EC. Energy from waste plants are not covered by the LCPD.

4.7.2 Applicants must make clear in their CCR assessments which CCS retrofit, transport and storage technology options are considered the most suitable for their proposed development.

4.7.3 If the IPC, having considered these assessments and other available information, 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.

4.7.4 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 DECC. 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.

4.7.5 Further information on CCR assessments and the information to be supplied in CCR update reports is available in the guidance issued by DECC in 2009[31]. The IPC must follow this CCR guidance, or any successor to it, when considering applications for combustion generating stations. The IPC should also have regard to advice from EA as to the suitability of the space set aside on or near the site for CCS equipment and the technical feasibility of retrofitting CCS equipment.

CCS

4.7.6 Carbon Capture and Storage (CCS) is an emerging technology that enables the reduction of CO_2 emissions to the atmosphere from fossil fuel, biomass or energy from waste electricity generating stations (through pre- or post-combustion processes). CCS has the potential to reduce CO_2 emissions from power stations by around 90% and offers the opportunity for fossil fuels to continue to be an important element of a secure and diverse low carbon energy mix and to reduce the costs of tackling climate change.

4.7.7 The chain of CCS has three links: capture of carbon, transport, and storage. There are three types of capture technology:

i. 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 CO_2. The CO_2 is then separated and the hydrogen is used as fuel in a combined cycle gas turbine generating station. For coal, this method is based on integrated coal gasification combined cycle (ICGCC) technology.

31 Guidance on Carbon Capture Readiness and Applications under Section 36 of the Electricity Act 1989 is available on the DECC website via http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/consents_planning/guidance.aspx

ii. Post-combustion capture: this uses solvents to scrub CO_2 out of flue gases. The CO_2 is then released as a concentrated gas stream by a regeneration process. Post-combustion capture is applicable to pulverised coal generating stations.

iii. Oxy-fuel combustion: in this process, fuel is burnt in an oxygen/CO_2 mixture rather than air to produce a flue gas that is predominantly CO_2. With coal the technology would be deployed with a suitably modified pulverised coal combustion system, whilst with gas it could be used with a combined cycle system.

4.7.8 The captured CO_2 is compressed, transported, then stored securely and permanently as dense phase CO_2 in deep geological formations. The Government has made its view clear that at present only storage projects offshore are to be considered[32].

4.7.9 Technologies for capture, transport and storage of CO_2 have been successfully used in other industries (e.g. the chemicals industry), but the chain has not been used end-to-end for CCS on large-scale commercial generating stations. The Government is therefore funding development of up to four commercial scale demonstration projects.

4.7.10 Government is focusing policy to drive development and deployment of CCS on coal-fired generating stations because: the emissions from coal generation are substantially higher than from other fuels, including gas; the projected increase in coal use globally creates a greater urgency to tackling emissions from coal; tackling emissions from coal first makes most economic sense because of the greater emissions intensity; and new coal power stations would contribute to the diversity and security of UK energy supplies as we make the transition to a low carbon mix.

4.7.11 In addition to satisfying the CCR criteria, new coal-fired generating stations in England or Wales must have Carbon Capture and Storage on at least 300 MW net of the proposed generating capacity. Coal-fired generating stations of less than 300 MW net capacity should show that the proposed generating station will be able to capture CO_2 from their full capacity.

4.7.12 Given this requirement to fit a technology which is at a relatively early stage of development, and therefore very costly, it is unlikely that any coal-fired plants will be built without financial support. However, any decision on a planning application for a new coal-fired generating station should be made independently of any decision on allocation of funding for CCS demonstration. This may mean, therefore, that planning consent could be given to more applications than will be able to secure financial support for CCS demonstration.

4.7.13 To construct a coal power station with the full CCS chain, applicants will need a range of consents from different bodies. These include a CO_2 storage licence and (if appropriate) consent for both on and offshore pipeline construction. An environmental permit will be required from the EA which incorporates conditions for operation of the CCS chain.

32 The Energy Act 2008 creates the legal framework for regulation of CO_2 storage.

4.7.14 The Government will maintain a rolling review of progress of CCS technologies, with demonstration projects in the UK, EU and globally providing a vital source of evidence on the performance of CCS across technical, economic, environmental and safety matters. By 2018 the Government plans to publish a report that will consider the status of CCS technologies in the light of progress with the demonstration projects in the UK and globally, drawing on expert advice from the Environment Agency, the Committee on Climate Change and others; and consider the appropriate regulatory and financial framework to drive the move to clean coal within the context of wider progress on the move to a decarbonised electricity system.

4.7.15 As part of this work, the question of CCS retrofit to demonstration projects will be considered: while the speed at which CCS technology will develop is uncertain, based on the need for and global commitment to CCS it is the Government's expectation that new conventional coal power stations consented under the policy framework described here will retrofit CCS to their full capacity by 2025. The review will also consider the framework within which new coal power stations would be constructed beyond the CCS demonstration phase: it is the Government's expectation that new coal power stations will be fully CCS from day one once CCS has been shown to be economically and technically viable, and that this will be possible from 2020. In the event that CCS is not on track to become technically or economically viable, preventing retrofit, an appropriate regulatory approach for managing emissions will be needed. The review will consider what additional measures, consistent with and complementary to the EU ETS and any other market interventions that are in place, are necessary – for example an emissions performance standard by way of a plant level cap. All of this work will be developed in the light of continuing advice from the independent Climate Change Committee and in a way that is consistent with the need for a clear UK emissions reduction pathway through to 2030 and beyond to 2050. Depending on the outcome of the review, it may be necessary to revise this NPS in the light of its conclusions.

4.7.16 Further information on the CCS obligations to be imposed on new coal-fired power stations is available in the guidance issued by DECC in 2009. The IPC must follow this CCS guidance, or any successor to it, when considering applications for combustion generating stations.

4.8 Climate change adaptation

4.8.1 Part 2 of this NPS covers the Government's energy and climate change strategy, including policies for mitigating climate change. This part of the NPS sets out how applicants and the IPC 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 greenhouse gas emissions have already committed us to some degree of continued climate change for at least the next 30 years.

4.8.2 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, intense rainfall events and other extreme events such as storms, as well as rising sea levels. Adaptation is therefore necessary to deal with the potential impacts of these changes that are already happening.

4.8.3 To support planning decisions, the Government produces a set of UK Climate Projections and is developing a statutory National Adaptation Programme[33]. In addition, the Government's Adaptation Reporting Power[34] 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 IPC may take into account energy utilities' reports to the Secretary of State when considering adaptation measures proposed by an applicant for new energy infrastructure.

4.8.4 In certain circumstances, measures implemented to ensure a scheme can adapt to climate change may give rise to additional impacts, e.g. as a result of protecting against flood risk, there may be consequential impacts on coastal change (see 4.20).

4.8.5 New energy infrastructure will typically be long-term investments which 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. While not required by the EIA Directive, this information will be needed by the IPC.

4.8.6 Applicants should use the latest set of UK Climate Projections[35] to ensure they have identified appropriate measures to adapt to the risks to the proposed infrastructure. Applicants should apply as a minimum, the emissions scenario that the Independent Committee on Climate Change suggests the world is currently most closely following – and the 10%, 50% and 90% estimate ranges. These results should be considered alongside relevant research which is based on the climate change projections.

33 s.58 of the Climate Change Act 2008.
34 s.62 of the Climate Change Act 2008.
35 See http://ukclimateprojections.defra.gov.uk

4.8.7 In addition, where energy infrastructure has safety critical elements (e.g. parts of new fossil fuel power stations or some electricity sub-stations), the applicant should apply the high emissions scenario (high impact, low likelihood) to those elements critical to the safe operation of the infrastructure.

4.8.8 The IPC should satisfy itself that applicants for new energy infrastructure have taken into account the potential impacts of climate change using the latest UK Climate Projections 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 become available after the preparation of the ES, the IPC should consider whether they need to request further information from the applicant.

4.8.9 If any adaptation measures give rise to consequential impacts the IPC should consider the impact of the latter in relation to the application as a whole and the impacts guidance set out in Part 4 of this NPS (e.g. on flooding, water resources and coastal change).

4.8.10 The IPC should satisfy itself that there are not critical features of the design of new energy infrastructure 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 (e.g. 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.

4.8.11 Any adaptation measures should be based on the latest set of UK Climate Projections, the Government's latest national Climate Change Risk Assessment, when available[36] and in consultation with the EA.

4.8.12 Adaptation measures can be required to be implemented at the time of construction where necessary and appropriate to do so.

4.8.13 Where adaptation measures 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 (e.g. coastal processes), the IPC 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 (e.g. increasing height of existing, or requiring new, sea wall).

4.8.14 The generic impacts advice in this NPS and the technology specific advice on impacts in the other NPSs provide additional information.

36 s.56 of the Climate Change Act 2008.

4.9 Grid connection

4.9.1 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, it is 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. The applicant will liaise with National Grid who own and manage the transmission network in England and Wales or the relevant regional Distribution Network Operator (DNO) 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 IPC will want to be satisfied that there is no obvious reason why a grid connection would not be possible.

4.9.2 The Planning Act 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 IPC or in separate applications submitted in tandem which have been prepared in an integrated way. However this may not always 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 (e.g. grid companies operate within OFGEM controls). So the level of information available on the different elements may vary. In some cases applicant(s) 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.

4.9.3 If this option is pursued, the applicant(s) accept the implicit risks involved in doing so, and must ensure they provide sufficient information to comply with the EIA Directive including the indirect, secondary and cumulative effects, which will encompass information on grid connections. The IPC must refuse consent if it is satisfied that the adverse impacts outweigh the benefits of the scheme. It must also 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 IPC has decided to consent one project should not in any way fetter its subsequent decisions on any related projects.

4.9.4 Further guidance on the considerations for the IPC is contained in EN-5.

4.10 Pollution control and other environmental consenting regimes

4.10.1 Issues relating to discharges or emissions from a proposed project and to air quality, water quality, the marine environment, noise and vibration may be subject to separate regulation under the pollution control framework or other consenting regimes.

4.10.2 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 mitigating 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 and water quality meet standards that guard against impacts to the environment or human health.

4.10.3 In considering an application for development consent, the IPC should focus on whether the development itself is an acceptable use of the land, and on the impacts of that use, rather than the control of processes, emissions or discharges themselves. The IPC should work on the assumption that the relevant pollution control regime will be properly applied and enforced. It should act to complement but not seek to duplicate it.

4.10.4 These considerations apply in an analogous way to other consenting regimes, including those on land drainage, water abstraction and biodiversity.

4.10.5 For projects taking place in the marine area the IPC should consult the Marine Management Organisation (MMO). The IPC and MMO should cooperate closely to ensure that nationally significant infrastructure projects are licensed in accordance with environmental legislation, including European directives.

4.10.6 Many projects covered by this NPS will be subject to the Environmental Permitting (EP) regime, which, since April 2008, also incorporates operational waste management requirements for certain activities. When a developer applies for an Environmental Permit, the relevant regulator (usually the Environment Agency 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 IPC may wish to consult the regulator on any management plans that would be included in an Environmental Permit application. Wherever possible, applicants are encouraged to submit applications for Environmental Permits and other necessary consents at the same time as applying to the IPC for development consent.

4.10.7 The IPC should be satisfied that development consent can be granted taking full account of environmental impacts. This will require close cooperation with the Environment Agency (EA) and/or the pollution control authority, and other relevant bodies, such as the MMO, Natural England, the Countryside Council for Wales, Drainage Boards, and water and sewerage undertakers, to ensure that in the case of potentially polluting developments:

- the relevant pollution control authority is satisfied that potential releases can be adequately regulated under the pollution control framework; and

- 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 and protection against deterioration in environmental quality.

4.10.8 The IPC should not refuse consent unless it has good reason to believe that any relevant necessary operational pollution control permits or licences or other consents will not subsequently be granted.

4.10.9 Applicants are advised to make early contact, at or before the pre-application stage, with relevant regulators, including the Environment Agency, to discuss their requirements for environmental permits and other consents. This will help 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 IPC.

4.11 Safety

4.11.1 The IPC should consult with the Health and Safety Executive (HSE) on matters relating to safety. HSE is responsible for enforcing a range of health and safety legislation applying to the construction, operation and decommissioning of energy infrastructure. Compliance with this legislation is not, therefore, likely to be relevant in the determination of development consent by the IPC.

4.11.2 Some technologies, e.g. the use of salt caverns for underground gas storage, will give rise to specific safety considerations as set out in the technology-specific NPSs.

4.11.3 Some energy infrastructure will be subject to the Control of Major Accident Hazards (COMAH) Regulations 1999. These are enforced by HSE and the Environment Agency in England and Wales. The same principles apply here as for those set out in the previous section on Pollution Control and other Environmental Permitting Regimes.

4.12 Hazardous Substances

4.12.1 The IPC is the Hazardous Substances Authority for the infrastructure included in this NPS. Where hazardous substances consent is applied for, the IPC 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. The IPC should consult HSE about this.

4.12.2 HSE will assess the risks based on the development consent application. Where HSE does not advise against the IPC granting the consent, it will also recommend whether the consent should be granted subject to any conditions.

4.12.3 Where development consent is granted, HSE will set a consultation zone around the major hazard site and notify the IPC (and other planning authorities). Whenever a development is proposed within the consultation zone, HSE is consulted for its advice on locating the particular development there.

4.13 Health

4.13.1 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.

4.13.2 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 adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate. These impacts may affect people simultaneously, so the applicant and the IPC should consider the cumulative impact on health.

4.13.3 The direct impacts on health may include increased traffic, air pollution, dust, odour, polluting water, hazardous waste and substances, noise, exposure to radiation, and increases in pests.

4.13.4 New energy infrastructure may also affect the composition, size and proximity 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.

4.14 Common law nuisance and statutory nuisance

4.14.1 Applicants may include in their application, a request for the grant of a defence of statutory authority against nuisance claims. In particular, the application may make reference to the provisions of Section 158(1) and (2) of the Planning Act 2008, which confers a defence of statutory authority for the purpose of providing a defence in any civil or criminal proceedings for nuisance arising from infrastructure for which development consent has been granted. For the purpose of Section 158 the term 'nuisance' takes its common law definition. This defence is also available for statutory nuisances under Part III, Environmental Protection Act 1990.

4.14.2 The availability of the defence of statutory authority means that it is very important that possible sources of nuisance and how they may be mitigated are considered by the IPC so that appropriate conditions can be included in any subsequent order granting development consent.

4.14.3 The IPC should note that this defence is subject to any contrary provision it may make in any particular development consent order (Section 158(3)). Therefore, the IPC can disapply the defence of statutory authority in a particular case.

4.15 Security considerations

4.15.1 National security considerations apply across all national infrastructure sectors including energy. DECC has lead responsibility for security of the energy sector. It works closely with Government security services including the Centre for the Protection of National Infrastructure (CPNI) to reduce the vulnerability of the most 'critical' infrastructure assets in the sector to terrorism and other national security threats. The Office for Civil Nuclear Security (OCNS) is the security regulator for the UK's civil nuclear industry.

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 The IPC should ensure that DECC is notified of non-nuclear applications for development consent for energy infrastructure so that any national security implications can be identified and appropriately managed. This includes ensuring (in consultation with relevant security experts) that security measures have been adequately considered in the design process; and that adequate consideration has been given to the management of security risks.

4.16 Generic Impacts

4.16.1 Some impacts will be relevant to any energy infrastructure, whatever the type. Those impacts are considered here. However, in some cases the technology-specific NPSs provide more detail on these impacts specific to the technology in question and address some impacts not covered in this NPS.

4.16.2 The list of impacts, and the detailed information in this section and in the technology-specific NPSs, covers the most significant issues and those which arise most frequently; it is not a comprehensive list of all possible effects. There may therefore be other impacts, for which policy is not set out in this NPS or in the technology-specific NPSs, which the IPC will wish to consider where they determine that the impact is relevant and important to their decision. The fact that an impact or other consideration is not covered in the NPS should not in itself be a reason for giving less weight to that impact or consideration and should not be taken to imply that the impact or other consideration may not be significant or a key impact or consideration in the circumstances of a particular application.

4.17 Air Emissions

Introduction

4.17.1 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. Impacts on protected species and habitats are covered in Section 4.18.

4.17.2 A particular effect may be eutrophication, which is the excessive build-up of nutrients (mainly phosphorus and nitrogen derived from human activities) in bodies of water and exposure of plants to gases, such as NOx. Eutrophication can lead to algal blooms and changes to aquatic life. Atmospheric eutrophication may affect plant growth and development. These can have both temporary and irreversible effects on ecosystems, affecting the health of exposed mammals, fish and shellfish and may also adversely affect a wider variety of water uses such as water supply, livestock watering, irrigation, navigation, angling, and water sports.

Applicant's Assessment

4.17.3 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 Environmental Statement (ES).

4.17.4 The ES should describe:

- any significant air emissions, their mitigation and any residual effects distinguishing between the construction and operation stages, and taking account of any significant emissions from any road traffic generated by the project. These should cover not only the absolute emission levels of the proposed project during construction and operation, after mitigation methods have been applied, but also the relative change in air quality from existing levels; and
- any potential eutrophication impacts.

IPC Decision Making

4.17.5 Many activities involving air emissions are subject to pollution control. The considerations set out in Section 4.10 on the interface between planning and pollution control therefore apply.

4.17.6 The IPC will generally need to give air quality considerations more weight where a project would have an impact on air quality inside, or adjacent to, an Air Quality Management Area (AQMA). But air quality considerations can also be important even where existing levels of air pollution are not sufficient to justify AQMA designation.

4.17.7 In all cases it is important that the IPC takes account of any relevant statutory air quality limits. Where, after mitigation, the IPC considers that any air quality limits are likely to be exceeded as a consequence of the project the IPC should refuse consent unless it is satisfied that measures are or will be in place to ensure that the project will not cause the air quality limits to be exceeded[37].

Mitigation

4.17.8 The IPC 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 that stage.

4.17.9 In doing so the IPC may refer to the conditions and advice in the Air Quality Strategy[38] or any successor to it.

4.17.10 The mitigations identified in the transport section will help mitigate against the effects of air emissions from transport.

37 This does not preclude developments that would help reduce emissions in areas where air quality limits are already, or already likely to be, exceeded.

38 http://www.defra.gov.uk/environment/quality/air/airquality/strategy/index.htm

4.18 Biodiversity and Geological Conservation

Introduction

4.18.1 Biodiversity is the variety of life in all its forms and encompasses all species of plants and animals 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.

4.18.2 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[39]. A separate guide sets out good practice in England in relation to planning for biodiversity and geological conservation[40].

Applicant's assessment

4.18.3 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 IPC should also expect the applicant to provide environmental information proportionate to the infrastructure where EIA is not required.

4.18.4 The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.

IPC decision making

Key principles

4.18.5 The Government's biodiversity strategy is set out in 'Working with the grain of nature'[41]. Its aim is to ensure:

- a halting, and if possible a reversal, of declines in priority habitats and species, with wild species and habitats as part of healthy, functioning ecosystems; and
- the general acceptance of biodiversity's essential role in enhancing the quality of life, with its conservation becoming a natural consideration in all relevant public, private and non-governmental decisions and policies.

4.18.6 This aim needs to be viewed in the context of the challenge of climate change: failure to address this challenge will result in significant impact to biodiversity. The policy set out in the following sections recognises the need to protect the most important biodiversity and geological conservation interests. It also acknowledges that the benefits of nationally significant infrastructure development may include benefits for biodiversity and geological conservation interests and that these benefits may outweigh harm to these interests.

39 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 Framework Directive.

40 Planning for Biodiversity and Geological Conservation: A Guide to Good Practice (March 2006).

41 'Working with the grain of nature' applies in England only.

4.18.7 As a general principle, and subject to the specific policies below, development should aim to avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives[42]; where significant harm cannot be avoided, then appropriate compensation measures should be sought.

4.18.8 In taking decisions, the IPC 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.

International Sites

4.18.9 The most important sites for biodiversity are those identified through international conventions and European Directives. The Habitats Regulations provide statutory protection for these sites but do not provide statutory protection for potential Special Protection Areas (pSPAs) before they have been classified as a Special Protection Area. For the purposes of considering development proposals affecting them, as a matter of policy the Government wishes pSPAs to be considered in the same way as if they had already been classified. Listed Ramsar sites should, also as a matter of policy, receive the same protection[43].

Sites of Special Scientific Interest (SSSIs)

4.18.10 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. All National Nature Reserves are notified as SSSIs.

4.18.11 Where a proposed development on land within or outside an SSSI is likely to have an adverse effect on an SSSI (either individually or in combination with other developments), development consent should not normally be granted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits (including need) of the development at this site,[44] clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of SSSIs. The IPC will also need to be satisfied that the development cannot reasonably be located on any alternative sites across the country (taking account of the policy on alternatives set out in Section 4.4 above) that would result in less or no harm. The IPC should use conditions and/or planning obligations to mitigate the harmful[45] aspects of the development and, where possible, to ensure the conservation and enhancement of the site's biodiversity or geological interest. Where it is not possible to mitigate the harmful aspects of the development on the site's notified special interest features adequately, compensation measures should be sought.

42 As set out in Section 4.4 above

43 See http://www.jncc.gov.uk/page-161

44 'At this site' applies the language in PPS9: *Biodiversity and Geological Conservation*. The benefits of the development 'at this site' should be interpreted as including any benefits which are not dependent on a particular location.

45 In line with the principle in para 4.2.6., the term 'harm' should be understood to mean 'significant harm'.

Marine Conservation Zones

4.18.12 Marine Conservation Zones (MCZs) (Marine Protected Areas in Scotland) 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 Marine and Coastal Access Bill will provide statutory protection for these areas through the MMO (see paragraph 1.2.2).

Regional and Local Sites

4.18.13 Sites of regional and local biodiversity and geological interest, which include Regionally Important Geological Sites, Local Nature Reserves and Local Sites, have a fundamental role to play in meeting overall national biodiversity targets; contributing to the quality of life and the well-being of the community; and in supporting research and education. The IPC should give due consideration to such regional or local designations. However, given the need for new infrastructure, these designations should not be used in themselves to refuse development consent.

Ancient Woodland and Veteran Trees

4.18.14 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 IPC 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[46] 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 avoided[47]. The IPC should encourage the conservation of such trees as part of development proposals.

Biodiversity within Developments

4.18.15 Development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design. When considering proposals, the IPC should maximise such opportunities in and around developments, using conditions or planning obligations where appropriate.

Protection of Habitats and Other Species

4.18.16 Many individual wildlife species receive statutory protection under a range of legislative provisions[48].

46 "in that location" applies the language in PPS9: *Biodiversity and Geological Conservation*. The benefits of the development in that location should be interpreted as including any benefits which are not dependent on a particular location.

47 This does not prevent the loss of such trees where the IPC is satisfied that their loss is unavoidable.

48 Certain plant and animal species, including all wild birds, are protected under the Wildlife and Countryside Act 1981. European plant and animal species are protected under the Conservation (Natural Habitats, &c) Regulations 1994. Some other animals are protected under their own legislation, for example Protection of Badgers Act 1992.

4.18.17 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[49]. The IPC should ensure that these species and habitats are protected from the adverse effects of development, where appropriate, by using conditions or planning obligations. The IPC 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.

Mitigation

4.18.18 The IPC should expect the applicant to have included appropriate mitigation measures as an integral part of the proposed development. In particular, the IPC should expect the applicant to demonstrate that:

- during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works;
- 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; and
- opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals.

4.18.19 Where the applicant cannot demonstrate that appropriate mitigation measures will be put in place the IPC should consider what appropriate conditions should be attached to any consent and/or planning obligations entered into.

4.18.20 The IPC will need to take account of what mitigation measures may have been agreed between the applicant and Natural England (or the Countryside Council for Wales) or the Marine Management Organisation (MMO), and whether Natural England (or the Countryside Council for Wales) or the MMO has granted or refused or intends to grant or refuse, any relevant licences, including protected species mitigation licences.

49 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://www.ukbap-reporting.org.uk/news/details.asp?X=45

4.19 Civil and Military Aviation and Defence Interests

Introduction

4.19.1 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

4.19.2 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.

4.19.3 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 operation is not inhibited 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) guidance[50] and for military aerodromes according to MoD criteria. Aerodromes that are officially safeguarded will have officially produced plans that show the OLS.

4.19.4 The certified Safeguarding maps depicting the OLS and other criteria (e.g. to minimise "birdstrike" hazards) are deposited with the relevant local planning authorities. Circular 1/2003[51] 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.

4.19.5 There are also "Public Safety Zones" 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. Advice is provided on Public Safety Zones in Circular 01/2002[52].

50 CAA (Dec 2008) CAP 168: Licensing of Aerodromes.
51 DfT/ODPM Circular 01/2003: Safeguarding, Aerodromes, Technical Sites and Military Explosives Storage Areas.
52 DfT/ODPM Circular 01/2002: Control of Development in Airport Safety Zones.

4.19.6 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. New energy infrastructure may cause obstructions in Ministry of Defence (MoD) low flying areas.

4.19.7 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 radar by limiting the capacity to handle air traffic, and aircraft landing systems. It may also act as a reflector or diffractor of radio signals on which navigational aids rely (an effect which is particularly likely to arise when large structures, such as wind turbines, are located close to radar installations).

Other defence interests

4.19.8 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 UK Continental Shelf Area (UKCS) for military firing and highly surveyed routes to support Government shipping that are essential for national defence.

4.19.9 Other operational defence assets may be affected by new development, e.g. 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

4.19.10 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 carried out.

4.19.11 The applicant should consult the MoD, 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.

4.19.12 Any assessment on aviation or other defence interests should include potential impacts during construction and operation 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.

4.19.13 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.

IPC Decision Making

4.19.14 The IPC should be satisfied that effects on civil and military aviation 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, it 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 IPC should satisfy itself that it fully understands the operational procedures along with any 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 IPC should have regard to interests of defence and national security.

4.19.15 If there are conflicts between the Government's energy and transport policies and military interests in relation to the application, the IPC 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.

4.19.16 There are statutory requirements concerning lighting to tall structures[53]. Where lighting is requested on structures that goes beyond statutory requirements by any of the relevant aviation and defence consultees, the IPC should satisfy itself 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.

4.19.17 Where, after reasonable mitigation, operational changes, obligations and conditions have been proposed, the IPC 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; or
- the development would significantly impede or compromise the safe and effective use of defence assets or significantly limit military training,

consent should not be granted.

53 Article 133 and 134 Air Navigation Order 2005.

Mitigation

4.19.18 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 IPC may consider the use of 'Grampian[54]' or other forms of condition which relate to the use of future technological solutions to mitigate impacts. Where technological solutions have not yet been developed or proven, the IPC will need to consider the 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 IPC should have regard to any Government guidance which emerges from the joint Government/Industry Aviation Plan.

4.19.19 Mitigation for infringement of OLS may include[55]:

- 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); and
- installation of obstacle lighting and/or by notification in Aeronautical Information Service publications.

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

- lighting; and
- upgrading of existing CNS infrastructure, the cost of which the applicant may reasonably be required to contribute in part or in full.

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

54 A negative condition that prevents the start of a development until specific actions, mitigation or other development have been completed.

55 Where mitigation is required using a condition or planning obligation, the tests set out at 4.1.1.4 – 4.1.1.5 in EN-1 should be applied.

4.20 Coastal Change

Introduction

4.20.1 Coastal change, as exacerbated by climate change, has implications for development on the coast and is, therefore, a major consideration in ensuring that proposed new onshore infrastructure projects are resilient to climate change. Where onshore infrastructure projects are proposed on the coast, coastal change is a key consideration alongside others specifically relevant to coastal environments.

4.20.2 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.

4.20.3 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.

4.20.4 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 the Renewable Energy NPS. The generic impact advice on flood risk and the earlier guidance in this Part 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 4.25 on land use.

Applicant's Assessment

4.20.5 Where relevant, applicants should undertake coastal geomorphological and sediment transfer modelling to predict and understand impacts and help identify relevant mitigating or compensatory measures.

4.20.6 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, any relevant marine plans, and capital programmes for maintaining flood defences;
- the effects of the proposed project on marine ecology, biodiversity and protected sites;
- the effects of the proposed project on maintaining coastal recreation sites and features; and
- the vulnerability of the proposed development to coastal change, taking account of climate change, during the project's operational life and any decommissioning period.

4.20.7 For any projects involving dredging or disposal into the sea, the applicant should consult the Marine Management Organisation (MMO)[56] at an early stage. Where this is usually a major impact this is covered in the technology-specific NPSs e.g. EN-4 looks further at the environmental impacts of dredging in connection with Liquified Natural Gas (LNG) tanker deliveries to LNG import facilities.

4.20.8 The applicant should be particularly careful to identify any effects on the integrity and special features of Marine Nature Reserves and their proposed successor Marine Conservation Zones, 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 sites of Special Scientific Interest.

IPC Decision Making

4.20.9 The IPC 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.

4.20.10 The IPC 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 IPC is satisfied that the benefits (including need) of the development outweigh the adverse impacts.

4.20.11 The IPC 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.

4.20.12 The IPC 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.

4.20.13 The IPC should consult the MMO on projects which could impact on coastal change, particularly those requiring a marine licence, since the MMO may also be involved in considering other projects which may have coastal impacts.

4.20.14 In addition to this NPS the IPC must have regard to the appropriate marine policy documents (if any), as provided for in the Marine and Coastal Access Bill. The IPC may also have regard to any relevant Shoreline Management Plans.

56 Prior to establishment of the MMO, applicants should consult the MFA (Marine Fisheries Agency).

4.20.15 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 Section 4.22 of this NPS, taking account of the potential effects of climate change on these risks as discussed above.

Mitigation

4.20.16 The IPC should expect applicants to be taking appropriate mitigation measures to address adverse effects on marine biodiversity and coastal geomorphology, in consultation with the MMO, the EA, LPAs, other statutory consultees, Coastal Partnerships and other coastal groups, as it considers appropriate. Where this is not the case the IPC should consider what appropriate mitigation conditions might be attached to any grant of development consent.

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

Introduction

4.21.1 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 for 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 (e.g. dust, smoke) are covered in the section on air emissions.

4.21.2 Because 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 IPC.

4.21.3 For nationally significant infrastructure projects 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

4.21.4 The applicant should submit its assessment of 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 Environmental Statement.

4.21.5 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; and
- measures to be employed in preventing or mitigating the emissions.

4.21.6 The applicant is advised to consult the relevant local planning authority and, where appropriate, the Environment Agency (EA) about the scope and methodology of the assessment.

IPC Decision Making

4.21.7 The IPC 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.

4.21.8 The IPC should satisfy itself that all reasonable steps have been taken, and will be taken, to minimise detrimental impact on amenity from insect infestation and emissions of odour, dust, steam, smoke, and artificial light.

Mitigation

4.21.9 Where it believes it appropriate, the IPC may consider attaching conditions to the development consent, in order to secure certain mitigation measures.

4.21.10 In particular, the IPC 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 IPC 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.

4.21.11 The IPC should expect the mitigation measures for the project to be proportionate and reasonable; 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; and
- administrative: restricting activities allowed on the site; implementing management plans.

4.22 Flood Risk

Introduction

4.22.1 Flooding from rivers and coastal waters is a natural process that plays an important role in shaping the natural environment. However, flooding threatens life and causes substantial damage to property. The effects of weather events can be increased in severity both as a consequence of previous decisions about the location, design and nature of settlement and land use, and as a potential consequence of future climate change. Although flooding cannot be wholly prevented, its adverse impacts can be avoided and reduced through good planning and management.

4.22.2 Climate change over the next few decades is likely to mean milder wetter winters and hotter drier summers in the UK, while sea levels will continue to rise. These factors will lead to increased and new risks of flooding within the lifetime of energy projects. The applicant and the IPC should take account of the policy on climate change adaptation in Section 4.8.

4.22.3 The aims of planning policy on development and flood risk are to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk. Where new energy infrastructure is, exceptionally, necessary in such areas, policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall.

Applicant's Assessment

4.22.4 Applications for energy projects of 1 hectare or greater in Flood Zone 1 in England or Zone A in Wales[57] and all proposals for energy projects located in Flood Zones 2 and 3 should be accompanied by a flood risk assessment (FRA). An FRA will also be required where an energy project less than 1 hectare may be subject to sources of flooding other than rivers and the sea (e.g. surface water), or where the Environment Agency, 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.

4.22.5 The minimum requirements for flood risk assessments 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 clearly stating the development lifetime over which the assessment has been made;

57 The Flood Zones refer to the probability of flooding from rivers, the sea and tidal sources and ignore the presence of existing defences, because these can be breached, overtopped and may not be in existence for the lifetime of the project. The definition of Flood Zones can be found in PPS25 (in England), TAN 15 (in Wales), or their relevant successor documents.

- 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;
- consider the vulnerability of those using the site, including arrangements for safe access;
- consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and identify flood risk reduction measures, so that assessments are fit for the purpose of the decisions being made;
- 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 this is acceptable for the particular project;
- 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;
- consider if there is a need to be safe and remain operational during a worst case flood event over the development's lifetime; and
- be supported by appropriate data and information, including historical information on previous events.

4.22.6 Further guidance can be found in the Practice Guide which accompanies Planning Policy Statement 25 (PPS25), or successor documents.

4.22.7 Applicants for projects which may be affected by, or may add to, flood risk should arrange pre-application discussions with the IPC and the Environment Agency, and, where relevant, other bodies such as Internal Drainage Boards, sewerage undertakers, highways authorities and reservoir owners and operators. Such discussions should identify the likelihood and possible extent and nature of the flood risk, to assist in scoping the FRA, and identify the information that will be required by the IPC to reach a decision on the application when it is submitted. The IPC should advise intending applicants to undertake these steps where they appear necessary, but have not yet been addressed.

IPC Decision Making

4.22.8 In determining an application for development consent, the IPC should be satisfied that:

- the application is supported by site-specific flood risk assessments (FRAs) as appropriate;
- 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;
- priority has been given to the use of sustainable drainage systems (SUDs);
- the sequential test has been applied as part of site selection; and
- in flood risk areas the project is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed.

4.22.9 The IPC should not consent development in Flood Zone 2 in England or Zone B in Wales unless it is satisfied that the sequential test requirements have been met. It should not consent development in Flood Zone 3 or Zone C unless it is 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.

The Sequential Test

4.22.10 Preference should be given to locating projects in Flood Zone 1 in England or Zone A in Wales. If there is no reasonably available site in Flood Zone 1 or Zone A, then projects can be located in Flood Zone 2 or Zone B. If there is no reasonably available site[58] in Flood Zones 1 or 2 or Zones A & B, then nationally significant energy infrastructure projects can be located in Flood Zone 3 or Zone C subject to the Exception Test. Consideration of alternative sites should take account of the policy on alternatives set out in Section 4.4 above.

The Exception Test

4.22.11 If, following application of the sequential test, it is not possible, consistent with wider sustainability objectives, for the project to be located in zones of lower probability of flooding than Flood Zone 3 or Zone C, the exception test can be applied. The test provides a method of managing flood risk while still allowing necessary development to occur.

58 When making the application, the applicant should justify with evidence what area of search has been used in examining whether there are reasonably available sites. This will allow the IPC to consider whether the Sequential Test has been met as part of site selection.

4.22.12 The exception test is only appropriate for use where the sequential test alone cannot deliver an acceptable site, taking into account the need for energy infrastructure to remain operational during floods. It may also be appropriate to use it where restrictive national designations such as landscape, heritage and nature conservation designations, e.g. Areas of Outstanding Natural Beauty (AONBs), Sites of Special Scientific Interest (SSSIs) and World Heritage Sites (WHS), prevent the availability of a suitable site in lower risk areas.

4.22.13 All three elements of the test will have to be passed for development to be consented. For the exception test to be passed:

a) it must be demonstrated that the project provides wider sustainability benefits to the community[59] that outweigh flood risk;

b) the project should be on developable, previously developed land[60] or, if it is not on previously developed land, that there are no reasonable alternative sites on developable previously developed land subject to any exceptions set out in the technology-specific NPSs; and

c) a FRA must demonstrate that the project will be safe, without increasing flood risk elsewhere subject to the exception below and, where possible, will reduce flood risk overall.

4.22.14 Exceptionally, where an increase in flood risk elsewhere cannot be avoided or wholly mitigated, the IPC may grant consent if it is 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 IPC should make clear how, in reaching its decision, it has 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 Environment Agency and other relevant bodies.

4.22.15 If the Environment Agency objects to an application on flood risk grounds, all parties (the IPC, the Environment Agency and the applicant), should discuss and agree the course of action which would need to be taken to enable the Environment Agency to withdraw its objection.

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

60 Previously developed land is that which is or was occupied by a permanent structure, including the curtilage of the developed land and any associated fixed surface infrastructure. This definition includes defence buildings, but excludes (a) land that is or has been occupied by agricultural or forestry buildings (b) land that has been developed for minerals extraction or waste disposal by landfill purposes where provision for restoration has been made through development control procedures (c) land in built up areas such as parks, recreation grounds and allotments, which, although it may feature paths, pavilions and other buildings, has not been previously developed (d) land that was previously developed but where the remains of the permanent surface structure or fixed surface structure have blended into the landscape in the process of time (to the extent that it can reasonably be considered as part of the natural surroundings).

4.22.16 Where the Environment Agency has not withdrawn its objection, the IPC will need to be satisfied, before deciding whether to grant consent, that all reasonable steps have been taken by the Environment Agency and the applicant through discussions to consider ways in which the application might be amended, or additional information provided, which would allow the Environment Agency's objection to be withdrawn.

Mitigation

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

4.22.18 The term Sustainable Drainage Systems (SUDs) is frequently used and taken in this NPS to cover the whole range of sustainable approaches to surface water drainage management including:

- 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; and
- basins and ponds to hold excess water after rain and allow controlled discharge that avoids flooding.

4.22.19 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.

4.22.20 The surface water drainage arrangements for any project should 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.

4.22.21 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 attenuation storage to be provided outside the project site, if necessary through the use of a planning obligation.

4.22.22 The sequential approach should be applied to the layout and design of the project. More vulnerable uses should be located on parts of the site at less probability and residual risk of flooding. Applicants should seek opportunities to use multi-purpose open space for 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.

4.22.23 Essential energy infrastructure which has to be located in flood risk areas should be designed to remain operational when floods occur. In addition, any energy projects proposed in Flood Zone 3b or Zone C2, the Functional Floodplain (where water has to flow or be stored in times of flood), should only be permitted if the development will not result in a net loss of floodplain storage, and will not impede water flows.

4.22.24 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 emergency services 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.

4.23 Historic Environment

Introduction

4.23.1 The construction, operation and decommissioning of energy infrastructure has the potential to result in adverse impacts on the historic environment.

4.23.2 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, and deliberately planted or managed flora. Those elements of the historic environment – buildings, monuments, sites or landscapes – that have significance due to their historic, archaeological, architectural or artistic interest are called 'heritage assets'.

4.23.3 Some heritage assets have a level of interest that justifies official designation.

4.23.4 The purpose of designation is to ensure that our most important heritage assets are protected and conserved for the benefit of this and future generations. Categories of designated heritage assets are:

- World Heritage Sites;
- Scheduled Monuments;
- Protected Wreck Sites[61];
- Listed Buildings (Grades I, II* and II);
- Conservation Areas;
- Registered Parks and Gardens (Grades I, II* and II);
- Registered Historic Battlefields (England only); and
- Registered Historic Landscapes (Wales only).

4.23.5 Due to the discretionary approach taken to the scheduling of monuments and the statutory limitations on what can be designated as a monument, many heritage assets with significant archaeological interest are not designated at present. Non-designated assets of archaeological interest equal in significance to that of Scheduled Monuments should be treated by applicants and the IPC as if they were Scheduled Monuments[62].

4.23.6 Impacts on heritage assets specific to the construction, operation and/or decommissioning of specific types of infrastructure are included in the technology-specific NPSs.

61 The issuing of licenses to undertake works on Protected Wreck Sites in English waters is the responsibility of the Secretary of State for Culture, Media and Sport and does not form part of development consents issued by the IPC. In Wales it is the responsibility of Welsh Ministers.

62 Advice and information about the significance of known, but non-designated heritage assets with archaeological interest may be obtained from County Archaeologists in England and historic environment records and Welsh Archaeological Trusts, respectively. For areas subject to development outside local authority planning boundaries (below mean low water) all such requests for information are to be directed towards the respective national heritage agencies in England (English Heritage) and Wales (CADW).

Applicant's Assessment

4.23.7 The applicant should provide as part of the ES a description of the significance[63] of the heritage assets affected and the contribution of their setting to that significance. This should set out the information that has been considered and the expertise that has been consulted. As a minimum the relevant Historic Environment Record[64] and any relevant historic landscape characterisation should have been consulted and the assets themselves should have been assessed.

4.23.8 Evaluation is required where there is a need to discover the extent and nature of significance in order to inform a decision. Where a development site includes heritage assets with an archaeological interest, the applicant should carry out appropriate desk-based assessment as part of any application for consent. In some circumstances, it may also be necessary for the applicant to undertake field-based surveys where there is a significant risk of disturbance to potential unknown archaeology from the proposed development. In these circumstances it will be necessary to determine whether field surveys are necessary at the EIA stage and the type of field survey which should be employed. They should refer to the results of these evaluations when determining the design of the proposed development. Applicants should deposit a copy of the outcomes of such evaluations with the relevant Historic Environment Record.

4.23.9 Representative visualisations may be required, in some specific circumstances, to demonstrate the effects of proposed energy infrastructure on settings of historic features.

4.23.10 The IPC should not approve applications for consent where the extent of the impact of the proposed development on the significance of any heritage assets affected cannot be understood from the application and supporting documents.

IPC Decision Making

4.23.11 In considering applications, the IPC should seek to identify and assess the significance of any heritage asset that may be affected by the proposed development, including through development within its setting, drawing on the evidence provided by any relevant designation records, the relevant Historic Environment Record, the assets themselves, and the outcome of consultations with interested parties and specialist advice. The applicant's assessment of the historic significance of the heritage assets affected by the development should also be considered by the IPC, alongside the outcome of any consultation with the local community and advice from professional experts and/or statutory consultees as required. This should include the results of any desk-based or field evaluations undertaken by the applicant.

63 Its value to people now and in the future because of its heritage interest.

64 Available from the Heritage Gateway website at http://www.heritagegateway.org.uk/Gateway/CHR/

4.23.12 In considering the significance of any heritage assets affected by the proposed development, the IPC should take into account the particular nature of the interest in the assets and the value that they hold for this and future generations. This understanding should be used to avoid or minimise conflict between conservation of that significance and proposals for development.

4.23.13 The IPC should take into account the desirability of enhancing the significance of heritage assets and securing their conservation for the longer term.

4.23.14 The IPC should not accept material harm to or removal of significance in relation to a heritage asset, unless it can be demonstrated that the material harm or removal of significance is outweighed by the wider social, economic and environmental benefits that will be delivered by the proposed development. In doing so the IPC should be guided by the following principles:

- the greater the harm to the significance of a heritage asset, the greater the justification that will be needed for any loss;
- the more significant the heritage asset, the greater the presumption in favour of its conservation; and
- material loss of heritage assets of the highest significance should be wholly exceptional.

4.23.15 In considering the significance of heritage assets the IPC should bear in mind that not all elements of a World Heritage Site or Conservation Area will necessarily contribute to its significance. Those elements that do contribute to the significance should be considered as designated assets in themselves (whether subject to separate statutory designation or not). When considering applications for development, the IPC should take into account the significance of such individual elements and their contribution to the significance of the World Heritage Site or Conservation Area as a whole.

4.23.16 When considering applications for development within the setting of a heritage asset, the IPC should treat favourably applications that preserve those elements of the setting that enhance the significance of the asset. When considering applications that do not do this, the IPC should weigh any loss of enhancement of the asset against the wider benefits of the application. The greater the negative impact on the significance of the asset, the greater the benefits that will be needed to justify approval.

4.23.17 Where an aspect of a heritage asset's setting does not positively contribute to its significance, the IPC should take into account the desirability of enhancing or better revealing the significance, including through high quality design of the development.

Recording

4.23.18 A documentary record of our past is not as valuable as retaining the asset. Where consent for development would result in a heritage asset's destruction, the ability to record evidence of the asset should not be a factor in deciding whether consent should be given.

4.23.19 Where a decision has been made that will result in the loss of the whole or a material part of a heritage asset's significance, the IPC should ensure that developers maximise opportunities to advance understanding of the asset's significance before this is lost. Developers should publish the outcomes of such investigations and the advancement in understanding that those results bring. They should deposit copies of the reports with the relevant Historic Environment Record. They should also offer the archive generated to a local museum or other public depository.

4.23.20 Where appropriate, the IPC should impose conditions on a consent that such work is carried out before commencement of the development and should ensure that it is implemented in accordance with a written scheme of investigation.

4.23.21 Where the IPC considers there to be a high probability that a development site may include as yet undiscovered heritage assets with archaeological interest, the IPC should ensure that appropriate procedures are in place for the identification and treatment of such assets discovered during construction.

4.24 Landscape and Visual impacts

Introduction

4.24.1 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.

Applicant's Assessment

4.24.2 The applicant should carry out a landscape and visual assessment and report it in the ES. A number of guides have been produced to assist in addressing landscape issues[65]. 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.

4.24.3 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.

4.24.4 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.

IPC Decision Making

Landscape impact

4.24.5 Landscape effects 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. 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.

65 Landscape Institute and Institute of Environmental Management and Assessment (2002, 2nd edition): *Guidelines for Landscape and Visual Impact Assessment*; and Land Use Consultants (2002): *Landscape Character Assessment – Guidance for England and Scotland*: 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*.

Development proposed within nationally designated landscapes

4.24.6 National Parks, the Broads and Areas of Outstanding Natural Beauty (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 IPC should have regard to in its decisions[66]. The conservation of the natural beauty of the landscape and countryside should be given great weight by the IPC in deciding on applications for development consent in these areas.

4.24.7 Nevertheless, the IPC may, exceptionally grant consent to development in these areas, if the development is demonstrated to be in the public interest[67]. Consideration of such applications should include an assessment of:

- the need for the development, including in terms of national considerations[68] 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 4.4; and
- any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.

4.24.8 The IPC should ensure that any projects consented in these designated areas should be carried out to high environmental standards including through the application of appropriate conditions where necessary.

Developments outside nationally designated areas which might affect them

4.24.9 A project that lies outside but relatively close to a nationally designated landscape should be designed sensitively given the various siting, operational, and other relevant constraints. Its potential impact on that landscape should be taken into account by the IPC and the aim should be to avoid compromising the objectives of designation.

4.24.10 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

4.24.11 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 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.

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66 For an explanation of the duties which will apply to the IPC, see 'Duties on relevant authorities to have regard to the purposes of National Parks, AONBs and the Norfolk and Suffolk Broads' at *defra.gov.uk/wildlife-countryside/pdf/protected-areas/npaonb-duties-guide.pdf*

67 PPS7 applies a public interest test for major development in these designated areas.

68 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, and in some cases regional, economy.

4.24.12 Virtually all nationally significant energy infrastructure will have effects on the landscape. The scale of such projects means that they will often be visible within many miles of the site of the proposed infrastructure. The IPC should judge whether any adverse impact on the landscape would be so damaging that it is not offset by the benefits (including need) of the project.

4.24.13 In reaching a judgment, the IPC should consider whether any adverse impact is temporary, such as during construction, and/or whether any adverse impact on the landscape is capable of being reversed; for example if conditions can be attached to development consent which require decommissioning at a specified date (such as for onshore wind farm time-limited consents).

4.24.14 The IPC 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

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

4.24.16 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 IPC in judging the weight it should give to the assessed visual impacts of the proposed development.

Mitigation

4.24.17 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 – making the project unfeasible. 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 IPC may decide that the benefits of the mitigation to reduce the landscape and/or visual effects outweigh the marginal loss of function.

4.24.18 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.

4.25 Land Use including open space, green infrastructure & green belt

Introduction

4.25.1 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 space[69] including green infrastructure[70].

4.25.2 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. The green infrastructure component of open space, in particular, will also play an increasingly important role in mitigating or adapting to the impacts of climate change.

4.25.3 Although the re-use of previously developed land for new development can make a major contribution to sustainable development by reducing the amount of countryside and undeveloped greenfield land that needs to be used, it may not be possible for many forms of energy infrastructure.

4.25.4 Green Belts, defined in the development plan, 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.

Applicant's Assessment

4.25.5 The ES should identify existing and planned 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 may also be able to assess any effects of precluding a new development or use proposed in the development plan.

4.25.6 Applicants should seek to re-use previously developed land and buildings for new development. However, for many energy infrastructure projects it is unlikely to be possible to re-use existing buildings. Some of the technology-specific infrastructure NPSs provide for exceptions to the policy of seeking to re-use previously developed land.

4.25.7 Where such sites on previously developed land have significant biodiversity or geological interest of recognised local importance, applicants should aim to retain this interest or incorporate it into any development of the site.

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69 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.

70 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.

4.25.8 Applicants will need to consult the local community on their proposals to build on open space, sports or recreational buildings and land. Applicants may want to take the opportunity to provide new or additional open space, sport or recreation facilities, to substitute for any such similar 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.

4.25.9 The IPC should expect the LPA, during any pre-application discussions with the applicant, to identify any concerns it has about the impacts of the application on land use, having regard to the development plan and relevant applications.

4.25.10 Applicants should seek to avoid the loss of 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. The ES should identify any loss of the best and most versatile agricultural land as a result of the proposed project.

4.25.11 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.

4.25.12 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 criteria[71] on such developments in Green Belts. In addition an applicant may be able to demonstrate that a particular type of energy infrastructure, such as an overhead line or an underground pipeline, is not in the circumstances of the application inappropriate development and has no adverse effects which conflict with the purposes of Green Belt designation.

IPC Decision Making

4.25.13 The IPC should take into account any comments made with regard to the impacts on existing land use, including areas of open space, sport and recreation facilities, from the statutory bodies and in representations from the local community.

4.25.14 The IPC should ensure that applicants have prioritised the reuse of previously developed land and buildings and where this is not possible to have made efficient use of any greenfield application site.

71 See Annex C to Planning Policy Guidance 2: Green belts, or any successor to it.

4.25.15 The IPC should ensure that applicants do not site their scheme on the best and most versatile agricultural land without justification. The IPC should give little weight to the loss of 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. The IPC should also take into account any loss of high quality soil and whether the proposal gives rise to any risk of soil contamination. Where this is subject to a separate pollution control regime the IPC should refer to the principles set out in Section 4.10 above.

4.25.16 In considering the impact on maintaining coastal recreation sites and features, the IPC should expect applicants to have taken advantage of opportunities to maintain and enhance access to the coast. In doing so the IPC should consider the implications for development of the creation of a continuous signed and managed route around the coast, as proposed in the Marine and Coastal Access Bill.

4.25.17 The IPC 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 IPC 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.

4.25.18 The regional Leaders' Board, the Regional Development Agency (RDA) and the Government Office (GO) may be able to advise the IPC on the regional significance of any use or development which is replaced, prevented or precluded. Similarly the GO and/or Government Department in England and the Welsh Assembly Government may be able to advise on any national significance of what is replaced, prevented or precluded.

4.25.19 Where the project conflicts with a proposal in a development plan, the IPC should take account of the stage which the regional strategy or 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 regional strategy is to being agreed by the Secretary of State or 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.

4.25.20 When located in the Green Belt, energy infrastructure projects may comprise 'inappropriate development'[72]. Inappropriate development is by definition harmful to the Green Belt and there is a presumption against it. The IPC 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 outweighed by other considerations. In view of the presumption against inappropriate development, the IPC will attach substantial weight to the harm to the Green Belt when considering any application for such development.

4.25.21 In Wales, 'green wedges' may be designated locally[73]. These enjoy the same protection as Green Belt in Wales and the IPC should adopt a similar approach.

Mitigation

4.25.22 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.

4.25.23 Where green infrastructure is affected, the IPC should consider imposing conditions to ensure the connectivity of the green infrastructure network is maintained and, 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.

4.25.24 The IPC should also consider whether mitigation of any adverse effects on green infrastructure and other forms of open space is adequately provided for 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 equivalent in size, usefulness, attractiveness and quality and, where possible, at least as accessible. 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.

4.25.25 Where a project has a sterilising effect on land use (e.g. in some cases under transmission lines) there may be scope for this to be mitigated through, for example, using the land for nature conservation or wildlife corridors or for parking and storage in employment areas.

4.25.26 Rights of way are an important recreational facility e.g. for walkers, cyclists and horse riders. The IPC should expect applicants to take appropriate mitigation measures to address adverse effects on coastal access, national trails and other rights of way. Where this is not the case the IPC should consider what appropriate mitigation conditions might be attached to any grant of development consent.

72 Referred to in section 3 of PPG2: Green Belts.

73 See section 2.6 of Planning Policy Wales.

4.26 Noise

Introduction

4.26.1 Excessive noise can have wide-ranging impacts on the quality of human life, health (e.g. owing to annoyance or sleep disturbance) and use and enjoyment of areas of value such as quiet places and areas with high landscape quality. It is therefore considered essential that its impact is carefully considered and managed within the context of sustainable development. In this section, in line with current legislation, "noise" includes vibration.

4.26.2 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 IPC in accordance with the Biodiversity and Geological Conservation section of this NPS.

4.26.3 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 acoustic environment or landscape quality; and
- 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

4.26.4 The nature and extent of the noise assessment should be proportionate to the likely noise impact.

4.26.5 The noise assessment should also consider noise impacts during the construction and decommissioning phases of the development, and 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 or low frequency characteristics of the noise;
- identification of noise sensitive premises 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, both temporarily during the construction period and permanently during the operating life of the infrastructure;

- an assessment of the effect of predicted changes in the noise environment on any noise sensitive premises and noise sensitive areas; and
- a description of the measures that will be applied to control the effects of noise.

4.26.6 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.

4.26.7 Operational noise, with respect to human receptors, should be assessed using the principles of the relevant British Standards[74] and other guidance where relevant as set out in the technology-specific NPSs. For the prediction, assessment and management of construction noise, reference should be made to the relevant British Standards[75] and other guidance which also give examples of mitigation strategies for construction noise.

4.26.8 The applicant should consult EA and Natural England (NE), or the Countryside Council for Wales (CCW), 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.

IPC Decision Making

4.26.9 The IPC should expect a noise assessment to have been undertaken, where appropriate, which considers noise impacts during the construction, operational phases of the development, as well as from any associated transportation infrastructure.

4.26.10 The IPC should expect the project to demonstrate good design through quiet plant selection (where available), containment of noise within buildings wherever possible, optimisation of plant layout to minimise noise emissions and, where possible, the use of landscaping, bunds or noise barriers to reduce noise radiation to outlying areas.

4.26.11 When determining the application the IPC should be satisfied that the proposals will:

- 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; and
- where possible, contribute to improvements to health and quality of life through the effective management and control of noise.

4.26.12 The IPC should not grant development consent unless it is satisfied that all reasonable steps have been taken, and will be taken, to minimise noise impacts.

74 BS 4142:1997 and BS 8233:1999.
75 BS 5228:2009 Parts 1 and 2; BS 6472:2008.

4.26.13 When preparing the development consent order, the IPC should consider including measurable conditions (for example, limits on noise levels) or specifying the mitigation measures to be put in place to ensure that noise levels do not exceed limits specified in a condition on the development consent.

Mitigation

4.26.14 The IPC 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 IPC may refer to the conditions and advice on specifying noise limits in Annexes 4 and 5 of PPG24: Planning and Noise in England, or TAN 11 in Wales, or any successor to it.

4.26.15 Mitigation measures should be proportionate and reasonable and 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 radiation 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.

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

4.27 Socio-economic

Introduction

4.27.1 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

4.27.2 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 during the construction, operation and decommissioning phases.

4.27.3 This assessment could consider the following impacts, however these suggestions are not exhaustive and other socio-economic impacts should be assessed if appropriate for the proposed development:

- regional and local socio-economic impacts associated with new energy infrastructure may include the creation of jobs and training opportunities; the provision of educational and visitor facilities; and effects on tourism. The application should have taken into account the location of public rights of way, including footpaths, bridleways and byways and minimised hindrance to them where possible; and
- the changing influx of workers during the different construction, operation and decommissioning phases of the energy infrastructure may alter the demand for services and facilities in the areas surrounding the proposed development.

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

4.27.5 Socio-economic impacts may be linked to other impacts, for example the visual impact of a development is considered in Section 4.24 but may also have an impact on tourism and local businesses.

IPC Decision Making

4.27.6 The IPC should have regard to the potential socio-economic impacts of new energy infrastructure identified by the applicant and from any other sources that the IPC considers to be both relevant and important to its decision. It should be reasonable for the IPC to conclude that little weight is to be given to assertions of socio-economic impacts not supported by evidence (particularly in view of the need for energy infrastructure as set out in this NPS).

Mitigation

4.27.7 The IPC 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.

4.28 Traffic and Transport Impacts

Introduction

4.28.1 The transport of materials, goods and personnel to and from a development during both the construction and operational phases can have a variety of impacts on the surrounding transport infrastructure and potentially on connecting transport networks, e.g. 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.

Applicant's Assessment

4.28.2 If a project is likely to have significant transport implications, the applicant's ES should include a transport assessment, using the NATA/WebTAG methodology stipulated in Department for Transport guidance[76], or any successor to such methodology.

4.28.3 If additional transport infrastructure is proposed, applicants should discuss with network providers the possibility of co-funding by Government for any third-party benefits.

IPC Decision Making

4.28.4 A new nationally significant infrastructure project may give rise to substantial impacts on the surrounding transport infrastructure and the IPC 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 IPC should normally expect applicants to accept conditions and/or obligations for funding infrastructure and otherwise mitigating adverse impacts on transport networks arising from the development, as set out below.

4.28.5 Provided that the applicant is willing to enter into planning obligations or to accept conditions to mitigate transport impacts identified in the NATA/WebTAG transport assessment, with attribution of costs calculated in accordance with the Department for Transport's guidance, then development consent should not be withheld, and appropriately limited weight should be applied to residual effects on the surrounding transport infrastructure.

Mitigation

4.28.6 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.

76 Guidance on transport assessments is at http://dft.gov.uk/prg/regional/transportassessments/guidanceonta

4.28.7 The IPC should avoid proposing demand management requirements where a 100% contribution to infrastructure would be more cost effective for the applicant.

4.28.8 Water-borne or rail transport is preferred over road transport, where cost-effective.

4.28.9 The IPC may attach conditions to a consent where there is likely to be substantial HGV traffic that:

- 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; and
- ensure satisfactory arrangements for reasonably foreseeable abnormal disruption, in consultation with network providers and the responsible police force.

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

4.29 Waste Management

4.29.1 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 environmentally damaging and encourages reclamation of waste wherever possible.

4.29.2 Sustainable waste management is implemented through the "waste hierarchy":

- prevention;
- preparing for reuse;
- recycling;
- other recovery, including energy recovery;
- disposal.

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

4.29.4 All large infrastructure projects are likely to generate hazardous and non-hazardous waste during the construction, operation and decommissioning phases. The EA's Environmental Permitting (EP) regime incorporates operational waste management requirements for certain activities. When an applicant applies to the EA for an Environmental Permit, the EA will require the application to demonstrate that processes are in place to meet all relevant EP requirements.

Applicant's Assessment

4.29.5 The applicant should set out the arrangements that are proposed for managing any waste produced. This 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 waste management facilities to deal with other waste arising in the area for at least five years of operation. The applicant 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.

IPC Decision Making

4.29.6 The IPC 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. It 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; and
- 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.

4.29.7 Where necessary, the IPC should use conditions or obligations to ensure that appropriate measures for waste management are applied. The IPC may wish to include a condition on revision of waste management plans at reasonable intervals when giving consent.

4.29.8 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 4.10 will apply.

4.30 Water Quality and Resources

Introduction

4.30.1 Infrastructure development can have adverse effects on the water environment, including groundwater, inland surface water, transitional waters[77] 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 4.18) and could, in particular, result in surface waters, groundwaters or protected areas[78] failing to meet environmental objectives established under the Water Framework Directive[79].

Applicant's Assessment

4.30.2 Where the project is likely to have adverse 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.

4.30.3 The ES should in particular describe:

- the existing quality of waters affected by the proposed project and the impacts of the proposed project on water quality, noting any relevant existing discharges, proposed new discharges and proposed changes to discharges;
- existing water resources[80] 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);
- 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; and
- any impacts of the proposed project on water bodies or protected areas under the Water Framework Directive;

77 As defined in the Water Framework Directive (2000/60/EC), 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.

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

79 2000/60/EC.

80 See Environment Agency document *Water resources strategy for England and Wales: water for people and the environment (2009)*.

IPC Decision Making

4.30.4 Activities that discharge to the water environment are subject to pollution control. The considerations set out in Section 4.10 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[81].

4.30.5 The IPC 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 Framework Directive.

4.30.6 The IPC should satisfy itself that a proposal has regard to the River Basin Management Plans and the requirements of the Water Framework Directive (including Article 4.7) and its daughter directives, including those on priority substances and groundwater. The specific objectives for particular river basins are set out in River Basin Management Plans.

4.30.7 The IPC should consider whether appropriate conditions should be attached to any development consent and/or planning obligations entered into to mitigate adverse effects on the water environment.

Mitigation

4.30.8 The IPC should consider whether mitigation measures are needed for operational, construction and decommissioning phases over and above any which may form part of the project application. A construction management plan may help codify mitigation at that stage.

4.30.9 The risk of impacts on the water environment can be reduced through careful design to facilitate adherence to good pollution control practice. For example, designated areas for storage and unloading, with appropriate drainage facilities, should be clearly marked.

4.30.10 The impact on local water resources can be minimised through planning and design for the efficient use of water, including water recycling.

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

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