DEPARTMENT OF ENERGY & CLIMATE CHANGE

Appraisal of Sustainability for the revised draft National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2): Non-Technical Summary

Planning For New Energy Infrastructure

October 2010

Preface

Appraisal of Sustainability of the revised draft Overarching National Policy Statement for energy

A key objective of Government energy and climate change policy is to ensure the UK has a diverse, safe, secure and affordable energy system that incentivises investment in and deployment of low carbon energy technologies. As regards the nationally significant energy infrastructure with which this document is concerned, that means that the UK needs new power stations, electricity networks and other nationally significant infrastructure if it is to continue to enjoy secure, safe and affordable supplies of energy and drastically reduce the amount of greenhouse gases (particularly carbon dioxide (CO_2)) that it emits.

Building and operating new nationally significant energy infrastructure has a range of environmental, social and economic impacts: some beneficial (such as satisfying demand for electricity and creating jobs), others detrimental (such as construction noise and adverse landscape and visual effects). A new planning regime has been set up to facilitate the rapid development of major energy projects and other important infrastructure which Government believes we need while at the same time ensuring that their benefits outweigh their detriments.

This document presents a summary, for non-specialists, of what constructing a new generation of nationally significant energy infrastructure in accordance with the requirements of the new regime is likely to mean for the environment, society and the economy. It is set out as follows:

- **Part 1** (Introduction) sets out relevant legal, factual and policy background;
- **Part 2** (Assessment of Alternatives) shows how the proposed policies of the new regime compare against other combinations of policies which could be used to support the delivery of secure, safe and affordable supplies of increasingly low-carbon energy;
- **Part 3** (Summary of Appraisal) summarises the likely effect of development taking place in accordance with the policies of the new regime in terms of various environmental, social and economic impacts; and
- **Part 4** (Next steps) outlines the process of monitoring the actual effects of the new regime.

This document is about the revised draft Overarching Energy National Policy Statement (NPS) and the Appraisal of Sustainability for it, which are subject to public consultation for 14 weeks from 18th October 2010. For more information on this consultation and how you may give us your views please see:

Consultation Document (www.energynpsconsultation.decc.gov.uk).

Further details are included below in Part 4

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Introduction

The Planning Act 2008 and National Policy Statements

1.1 The Planning Act 2008 changed the way in which a number of different categories of nationally important planning decisions, including those relating to nationally significant energy infrastructure, are made in England and Wales.

1.2 At the heart of the new regime, National Policy Statements (NPSs) produced by Government will provide a blueprint for decision-making on individual applications for development consent by those wishing to build new infrastructure. The Department of Energy and Climate Change (DECC) is responsible for preparing the NPSs relating to energy projects. These are:

- Overarching NPS for Energy (EN-1, setting out the need for new infrastructure and dealing with a range of issues common to more than one type of nationally significant energy infrastructure);
- Fossil Fuel Electricity Generating Infrastructure (EN-2, covering power stations with a capacity of more than 50MW, fuelled by coal or gas);
- Renewable Energy Infrastructure (EN-3, covering onshore wind farms and power stations fuelled by waste or biomass with a capacity of more than 50MW, and offshore wind farms with a capacity of more than 100MW);
- Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4, covering nationally significant gas storage projects, gas and oil pipelines, and facilities for handling liquefied natural gas);
- Electricity Network Infrastructure (EN-5, covering overhead electricity transmission and distribution lines with a voltage of 132kV or more); and
- Nuclear Power Generation (EN-6, covering nuclear power stations).

1.3 Before the NPSs can be designated, they must be the subject of public consultation, including the publication of an Appraisal of Sustainability (AoS). The NPSs are plans for granting development consent to proposals to develop new energy infrastructure – on a case by case basis, but in accordance with certain general principles which should be applied in all cases. The AoSs are evaluations of the effects of the environmental and other effects of such plans – in so far as these can be assessed given that the NPSs indicate how applications will be dealt with, but not what applicationswill come forward, or (except in the case of EN-6) which sites they will relate to – which Government is required to carry out under both UK and EU law (the Planning Act 2008 and the Strategic Environmental Assessment (SEA) Directive (2001/42/EC)).

1.4 The energy NPSs were first published for consultation in November 2009. That consultation closed in February 2010. As a result of comments received in response to it, a number of which were critical of the approach taken in the AoSs produced for them, changes have been made to the draft NPSs and the draft AoSs. The changes to the AoSs are quite radical in some respects. Revised versions of both the NPSs and the AoSs are now being consulted on again (for 14 weeks from 18th October 2010), with a view to their being finally "designated" (i.e. coming into effect) following approval by Parliament in 2011.

1.5 EN-2 to EN-6 are known as the "technology-specific" NPSs. They set out policies and background which are relevant only to decision-making on the particular types of infrastructure to which they relate. EN-1 sets out matters of relevance to more than one type (if not all types) of nationally significant energy infrastructure. Each application will need to be considered in the light of both EN-1 and any relevant technology-specific NPS, which need to be read together. Similarly, the AoS for EN-1 (AoS-1) considers the impacts of approving the construction of all the required types of new nationally significant energy infrastructure, while the AoSs for EN-2 to EN-6 focus on impacts and policies specific to the specific technologies with which they are concerned.

Need for new energy infrastructure

1.6 Government believes that the need for new nationally significant energy infrastructure is so acute, for a variety of reasons, that it will not be necessary to consider in detail whether there is a demonstrable need for each individual proposed development. One of the functions of EN-1 is to establish this "need case", which may be summarised as follows.

1.7 To meet its energy and climate change policy goals, the UK needs a new generation of energy infrastructure which will facilitate the supply of secure, safe and affordable energy generated to an increasing extent from low carbon sources (such as wind farms, nuclear power stations, and fossil fuel generating plant fitted with carbon capture and storage equipment – this last technology has yet to be demonstrated successfully at commercial scale) rather than on conventional coal- and gas-fired power stations (although the latter will continue to play a part for some time in support of the transition to a low carbon energy system).

1.8 Government policy takes as its starting point the principle that a market-based system is the most cost effective and efficient way of providing energy supply and that investment is best made by the private sector. The private sector bases decisions on investment on anticipated profitability. To ensure that investments in new nationally significant infrastructure support the objectives of reducing carbon emissions and so help to combat climate change, the Government seeks to provide incentives to the market to promote the development of more sustainable energy generation methods. While the policies in the NPSs are also designed to support the development of secure, safe, affordable and low carbon energy infrastructure, the Government has

decided not to set quotas or targets for each different technology type in the NPSs as it believes that, provided its other policies have put the right incentives in place,the NPSs will provide an appropriate framework for ensuring that the kinds of developments we need are consented in sufficient quantities to satisfy demand, while ensuring that they do not have unacceptable adverse effects.

1.9 As well as addressing more immediate needs, policies put in place now will result in the building of infrastructure which will in many cases still be in operation in 2050 and which in all cases will have some influence on whether we achieve the greenhouse gas reductions we are aiming to achieve by that date. But with such long time horizons come many uncertainties such as the future price of fuel, the price which operators will pay to emit greenhouse gases under the EU Emissions Trading Scheme, and the pace at which new technologies will evolve and be deployed. As a result our analysis shows that there are many different possible ways of achieving our energy and climate change policy objectives in relation to nationally significant energy infrastructure, but that it is impossible at this stage to identify a single “best” way to do so. The NPSs therefore aim to facilitate sensible levels of development of all the technologies which are currently being deployed at the relevant scale and may form part of a successful future energy infrastructure mix, rather than attempting to match a particular view of what the future should look like, based on imperfect information.

1.10 The NPSs sit alongside and draw on a very substantial body of existing legislation and policy (detailed in Annex B to AoS-1), much of it deriving from EU or internationally agreed rules and principles, all of which have a bearing on planning consents generally, or specific aspects of infrastructure consenting, such as ensuring that proper protection is given to conservation interests, while still permitting much needed development to go ahead. At least parts of England and Wales have been industrialised to a significant extent for over 200 years and are relatively densely populated. At the same time, considerable legislative, administrative and voluntary effort has gone into attempting to remedy the consequences of high levels of development, often (historically at least) not carried out in a particular sustainable way, with the Government participating in EU programmes such as the designation of protected “Natura 2000” sites, as well as adopting various national measures designed to protect the environment. (For information on the resulting “baseline” condition of the environment to which the NPSs will apply, see Annex F to AoS-1.) A particular challenge facing the development of the large quantities of new large-scale energy infrastructure which the Government has determined need to be constructed is that much of it will, for one reason or another, need to be located in areas which have hitherto seen relatively little large scale development of any kind and/or enjoy some kind of protective designation. In some cases, the need to take account of the increased risk of floods which comes with climate change (and which arises particularly in areas where some types of energy infrastructure may be located) provides an additional challenge.

Appraisals of Sustainability

1.11 As part of the planning process, each application for development consent for nationally significant energy infrastructure will be subject to detailed analysis of its environmental impacts. The AoS process does not substitute the need for that analysis. This AoS has two primary functions.

- EU law requires, in the Strategic Environmental Assessment Directive (2001/42/EC), that before a plan or programme which establishes the framework for development consent is adopted, it should be subject to consultation alongside an environmental report which identifies, describes and evaluates the significant effects which its implementation is likely to have on the environment. Amongst other things, the NPSs are a plan or programme for the purposes of the Directive, and so the AoSs fulfil the function of an environmental report under the Directive.

- The Planning Act requires that NPSs must be the subject of an appraisal of sustainability before they are designated. The scope of such an appraisal is similar to that of an environmental report under the SEA Directive, but with more emphasis on social and economic impacts, and informed overall with the principles of sustainable development (often summarised as ensuring that development meets the needs of the present without compromising the ability of future generations to meet their own needs).

1.12 By requiring the AoS to be produced alongside the NPSs while they are still in draft form, the Directive and Act aim to ensure that consultees are able to review and comment on the NPSs with a sense of what it would mean in environmental and other terms for a new generation of nationally significant energy infrastructure to be built in accordance with decisions made on Planning Act applications for development consent which were decided on the basis of the energy NPSs.

1.13 This Appraisal of Sustainability report for EN-2 is organised as follows:

Table 1 – Layout of the Appraisal of Sustainability report on Fossil Fuel Electricity Generating Infrastructure

Introduction An Introduction to AoS and a summary of the content and policies of EN-2.
Appraisal Findings Identifies, develops and assesses strategic alternatives to the NPS and compares the significant sustainability effects of the strategic alternatives. The findings of the appraisal of the likely significant effects of the NPS policies. Potential ways of mitigating adverse effects are presented.
Monitoring and Next Steps Proposals for monitoring the actual impacts of implementing the NPSs.

1.14 Just as individual applications will have to be assessed in accordance with EN-1 as well as any relevant technology-specific NPS, so the Appraisal of Sustainability report on Fossil Fuel Electricity Generating Infrastructure, AoS-2, must be read in conjunction

with the Overarching AoS report, AoS-1. The Overarching AoS includes general background material and a discussion of the methodology of the AoSs, as well as considering the impacts of implementing the suite of energy NPSs as a whole, and a number of possible strategic alternatives to the policies set out in EN-1. The relevant technology-specific AoSs (EN-2 to EN-6) focus on alternatives, issues and recommendations which are additional to those already in the Overarching AoS report.

Assessment of Alternatives

2.1 The SEA Directive requires the identification, description and evaluation of the likely significant effects of implementing NPSs (which constitute a "plan or programme" for the purposes of the Directive) and any reasonable alternatives to them. In this context, an alternative is reasonable if it may be expected to achieve the ultimate objectives of the plan it is being compared against. Here, that plan is set out in the NPSs and the objectives are those of using the NPS framework to facilitate the development of a new generation of nationally significant energy infrastructure that will produce secure, safe and affordable supplies of increasingly low carbon energy (recognising that the NPSs are not the only policy tool available to Government to achieve this objective).

2.2 The AoS published with the draft EN-2 for public consultation in November 2009 contained an assessment of alternatives. However, following comments received during the original consultation that the range of alternatives considered was too narrow and that other alternatives should have been considered more fully, a decision was taken to reassess the alternatives.

2.3 The approach taken in assessing the alternatives to EN-2 for the revised AoS has been a two stage process: 1) Development and initial screening to establish a series of reasonable strategic alternatives to the plan. 2) Assessment of the selected reasonable alternatives against the AoS objectives.

2.4 A wide range of strategic alternatives have been considered in the initial screening. Those alternatives that appear capable of fulfilling the objectives of the plan and of representing genuinely strategic-level choices have been tested against the AoS objectives. The strategic alternatives proposed and considered by the appraisal team in the initial screening are discussed in the AoS for EN-1 (AoS-1), together with the reasons for those options not taken forward to the second stage of the alternatives assessment. AoS-1 also details the assessment of the selected reasonable alternatives against the AoS objectives, the methodology used for the assessment of alternatives and the methodology for grouping of these objectives into high-level themes.

2.5 AoS-1 contains a strategic-level analysis of alternatives to the policies in EN-1 and describes the process of identifying and evaluating alternatives in more detail. The AoS for EN-2 (AoS-2) is concerned with the analysis of alternatives to those policies which are of most direct relevance to fossil fuel plant: Carbon Capture Readiness (CCR) and Carbon Capture and Storage (CCS). Although EN-2 contains information on the fossil-fuel-specific aspects of issues and impacts which are considered in EN-1, such as land use or noise, the key points of policy on these are all laid down at a generic level in EN-1 and alternatives to them are considered in AoS-1. AoS-2 concentrates on different approaches to reducing or eliminating the impacts of fossil fuel generating

stations which experience shows are most objectionable. Accordingly, the focus of AoS-2 is on CO2 emissions.

2.6 The reasonable alternatives for consideration in the AoS for the Fossil Fuel Generating Infrastructure NPS are the following:

a) a stricter approach to CCS (e.g. no new coal without full CCS, or no new fossil fuel plants without a substantial amount of CCS from the outset);

b) a stricter approach to CCR (i.e. more demanding criteria set for demonstrating that retrofit of CCS will be economically feasible).

2.7 The findings of the assessment of alternatives, grouped according to six key sustainable development themes, are summarised in the following table. Broadly speaking, the analysis showed that while it is possible that either of these alternatives could, in certain circumstances, help to contribute towards a more rapid or effective decarbonisation of UK electricity generation, there could be no certainty that these circumstances would occur, and there was a risk that the alternatives would have more negative impacts than those of the NPS policies – including as regards security of supply and some cumulative environmental effects (arising from clustering of developments in the same location) as well as potentially in terms of delay in successful demonstration and deployment of CCS. However, it was noted in respect of alternative (a) that the Electricity Market Reform project, because it would be concerned with the wider framework of incentives in which developers operate, would provide a better platform for further consideration of options to impose stricter CO_2 emimssions requirements, for example through an emissions performance standard regime.

Table 2 – Summary of Alternatives Assessment Findings

Headline SD themes	EN-2	No NPS	Alternative A	Alternative B
Climate Change		**-?**	**0**	**+**
Security of Energy Supply		**-?**	**-**	**-**
Health & Well-Being		**0**	**+/-**	**-?**
The Economy		**0?**	**+**	**-**
The Built Environment		**0?**	**0**	**-**
The Natural Environment		**0?**	**+/-**	**-**

2.8 Therefore the Government's preferred option is to take forward the policies on fossil fuel plants set out in EN-1 and EN-2.

Summary of Appraisal

Findings for individual sustainability topics

3.1 The appraisal of the impacts of implementing EN-2 was undertaken in a topic by topic manner, with the Revised Draft Fossil Fuel Electricity Generating Infrastructure National Policy Statement tested against a series of "AoS objectives" based on the topics listed in Table 3 (section 2 of AoS-1 explains in more detail what each of these topics covers). Many issues and effects for sustainability are cross-cutting and effects are reported where they are most relevant to avoid duplication of appraisal.

Table 3 – Appraisal of Sustainability topics

Climate Change
Ecology (Flora and Fauna)
Resources and Raw Materials
Economy and Skills
Flood Risk
Water Quality
Traffic and Transport
Noise
Landscape, Townscape and Visual
Archaeology and Cultural Heritage
Air Quality
Soil and Geology
Health and Well Being
Equality

3.2 The likely short, medium and long-term effects of EN-2 on each of these AoS objectives was evaluated and recorded using the following key.

Table 4 – Key to Appraisal Significance of Predicted Effects

Likely Significant Effects:		
Major Positive	++	Policy would resolve an existing sustainability problem; major effect considered to be of national/ international significance
Minor Positive	+	No major sustainability constraints or effects ; minor effect considered to be of regional/ national/ international significance
Neutral	0	Neutral effect ie no overall effects or not-applicable
Minor Negative	-	Potential sustainability issues, mitigation possible; effect considered to be of regional/ national/ international significance
Major Negative	--	Policy would exacerbate known sustainability issues; mitigation difficult and/or expensive; major effect considered to be of national/ international significance
Uncertainty	?	Where the significance of an effect is particularly uncertain, e.g. insufficient information is available at the plan stage to fully appraise the effects of the policy or the potential for successful mitigation, the significance category is qualified by the addition of the symbol?

3.3 Inter-relationships between topics and likely interactions between different impacts, as well as the overlapping impacts of different projects (so-called “cumulative effects”), are also reported where appropriate in each topic. Where significant adverse effects are predicted, possibilities for mitigation are suggested.

3.4 For the purposes of the AoS the short term has been defined as the effects arising generally during the infrastructure construction period of between 2-7 years; the medium term as between 5 and 25 years (varying with the characteristics of different technologies); and the long term as beyond 25 years (and including decommissioning where relevant).

Climate Change

Objective: To minimise detrimental effects on the climate from greenhouse gases and ozone depleting substances and maximise resilience to climate change.

AoS Objective 1. Climate Change	Assessment (by timescale)		
	S	M	L
	0 ?	+ ?	+ ?

3.5 Adoption of NPS EN-2 facilitates the implementation of Combined Heat and Power (CHP) and CCR for all fossil fuel generating stations and CCS specifically for coal fired generating stations. In the short term, this is considered to have a neutral effect, given the development of CCS coal fired generating station demonstration projects. However, in the medium to long term, the climate change effects are considered to be

positive and strategic, but uncertain, given that CCS technology has yet to be demonstrated as both technically and economically viable.

Ecology (Flora and Fauna)

Objective: To protect and enhance protected habitats, species, valuable ecological networks and ecosystem functionality.

AoS Objective 2. Ecology (Flora and Fauna)	Assessment (by timescale)		
	S	M	L
	-?	- ?	- ?

3.6 Adoption of EN-2 to facilitate the development of fossil fuel generating capacity is likely to have negative effects with respect to ecology in the short, medium and long term (during construction, operation and later the decommissioning / demolition of fossil fuel powered facilities and associated CCS infrastructure), the significance of which will vary depending upon the technology adopted and location. However, there is a range of mitigation measures, including those proposed in EN-2 for aquatic ecology, that can minimise these effects, but the extent of the mitigation is uncertain. Therefore, the likely residual significance of the effects is considered to be potentially negative at a strategic level in the short, medium and longer term but with uncertainty across these timescales, given uncertainty associated with footprint and location of fossil fuel plant.

Resources and Raw Materials

Objective: To promote the sustainable use of resources and natural assets and to deliver secure, clean and affordable energy.

AoS Objective 3. Resources and Raw Materials	Assessment (by timescale)		
	S	M	L
	-?	-?	-?

3.7 The development of fossil fuel generating stations, CCR and CCS facilitated by the adoption of EN-2 will have potentially negative impacts on resources and raw materials. These are related to the development of large infrastructure, with associated resource requirements for construction of fossil fuel generating stations including CCS, water demands for process and cooling waters, including additional water and energy needs associated with CCS, and the management of residues from coal fired generating stations. A range of mitigation measures are available, while the residual effects are likely to remain negative but uncertain and will vary depending upon generating technology and location and in relation to timing through construction, operation and decommissioning / demolition.

Economy and Skills

Objective: To promote a strong and stable economy with opportunities for all.

AoS Objective 4. Economy and Skills	Assessment (by timescale)			
	S		M	L
	+	-	+	+

3.8 The development of fossil fuel generating capacity and Carbon Capture Storage (CCS) as facilitated with the adoption of EN-2 potentially has significant positive effects on economy and skills. The magnitude of these effects is uncertain, and is conditional on the adoption of CCS technology, which has yet to be demonstrated to be economically and technically viable. Nevertheless, the economic impacts are likely to be positive at local, regional and national scale given the magnitude of investment likely to take place. There are potentially negative effects associated with potential skill shortages, but these can be relatively easily mitigated through a range of measures.

Flood Risk

Objective: To avoid, reduce and manage flood risk (including coastal flood risk) from all sources and coastal erosion risks by locating infrastructure in lower risk areas and ensuring it is resilient over its lifetime without increasing risks elsewhere.

AoS Objective 5. Flood Risk	Assessment (by timescale)		
	S	M	L
	-?	0?	0?

3.9 The development of fossil fuel generating capacity with Carbon Capture Storage (CCS) as facilitated by EN-2 is likely to have negative effects with respect to flood risk during construction, operation and decommissioning / demolition, the significance of which will vary depending upon the technology adopted (foot print) and location. Following decommissioning, the effect is likely to be neutral. There is a range of mitigation measures that can minimise these effects, but the extent of the mitigation is uncertain. Therefore, the likely residual effects are considered to be negative, relatively minor in the short and medium terms, neutral in the longer term but with uncertainty across all these timescales.

Water Quality

Objective: To protect and enhance surface (including coastal) and groundwater quality (including distribution and flow).

AoS Objective 6. Water Quality	Assessment (by timescale)		
	S	M	L
	- ?	0?	0 ?

3.10 The development of fossil fuel generating capacity and associated CCS as facilitated with the adoption of EN-2 is likely to have negative effects on water quality during construction, operation and decommissioning / demolition (short, medium and long term) of fossil fuel powered facilities, the significance of which will vary depending upon the technology adopted and location. However, there are ranges of mitigation measures, including those proposed in EN-2, that can minimise these effects, but the extent of the mitigation is uncertain. Therefore, the residual effects are likely to be negative, significant, but minor, in the short, medium and longer term but with uncertainty across these timescales.

Traffic and Transport

Objective: To minimise the detrimental impacts of travel and transport on communities and the environment, whilst maximising positive effects.

AoS Objective 7. Traffic and Transport	Assessment (by timescale)		
	S	M	L
	0	0	0

3.11 The development of fossil fuel generating capacity and CCS as facilitated with the adoption of EN-2 potentially has negative effects with respect to traffic and transport, which are likely to be mainly associated with coal fired (and biomass co-fired) power stations (as opposed to those purely fuelled by gas, whose fuel can all be supplied by pipeline). Mitigation measures are likely to result indirectly from a range of location drivers that include the need to meet high water demands, and to be close to ports that receive imports of coal and biomass fuel, and thus favour bulk transport by water and rail. However, residual negative effects are likely to remain, the magnitude of which are uncertain, but are likely to be localised on the communities closest to the generating stations, as well as along transport delivery and removal routes.

Noise

Objective: To protect both human and ecological receptors from disturbing levels of noise.

AoS Objective 8. Noise	Assessment (by timescale)		
	S	M	L
	0	0	0

3.12 The development of fossil fuel generating capacity and CCR and CCS as facilitated with the adoption of EN-2 is likely to have negative effects with respect to noise and vibration, and this is likely to be mainly associated with coal fired (and biomass co-fired) power stations. Mitigation measures can be adopted to reduce the magnitude of these effects, but are likely to be limited in extent, and to vary depending upon the

generation technology proposed for the site of interest. Therefore residual effects are likely to remain negative and localised.

Landscape, Townscape and Visual

Objective: To protect and enhance landscape quality, townscape quality and to enhance visual amenity.

AoS Objective 9. Landscape, Townscape and Visual	Assessment (by timescale)		
	S	M	L
	-?	-?	-??

3.13 The development of fossil fuel generating capacity and CCS as facilitated with the adoption of EN-2 potentially has negative effects on landscape, townscape and visual amenity. The magnitude of these negative effects will vary, depending on the generating technology associated with each application, as well as the proposed location and receptor landscape. Mitigation measures are possible, but negative potentially strategic residual effects are likely to remain through construction and operation phases of the development (short to medium term), but less so for the longer term following decommissioning and demolition.

Archaeology and Cultural Heritage

Objective: Protect and where appropriate enhance the historic environment including heritage resources, historic buildings and archaeological features.

AoS Objective 10. Archaeology and Cultural Heritage	Assessment (by timescale)		
	S	M	L
	-?	-?	-?

3.14 The development of fossil fuel generating capacity and CCR/CCS as facilitated with the adoption of EN-2 is likely to have negative effects on archaeology and cultural heritage. The magnitude of these effects will vary, and is therefore uncertain, depending on the proposed location and on the generating technology, the footprint associated with each application, and therefore the risk of disturbance or damage to heritage assets. There are opportunities for mitigation during the planning stage, construction phase (short term), very limited for the medium term during operations, with possibly the potential for positive effects from restoration during decommissioning / demolition at the site of interest, although the net effect is likely to remain negative for the site, but associated with uncertainty if regionally or nationally important assets are at risk.

Air Quality

Objective: To protect and enhance air quality on local, regional, national and international scale.

AoS Objective 11. Air Quality	Assessment (by timescale)		
	S	M	L
	0	-?	0

3.15 The development of fossil fuel generating capacity with CCR/CCS as proposed with the adoption of EN-2 is likely to have negative effects with respect to air quality, mainly during plant operation. The adoption of CCS with coal-fired generating stations is associated with an "energy penalty", which means that to maintain releases of SO_x (sulphur oxide) and NO_x (nitrogen oxide) within statutory limits, net energy inputs to the electricity grid will be less than would be the case without CCS, for the same total capacity coal-fired generating station. The significance of the effects varies between different fossil fuel sources and technologies, between different releases to atmosphere, and also whether there is an Air Quality Management Area (AQMA) within proximity to the development. For example, the release of SO_x and NO_x could be strategic in nature where these releases cross international borders on prevailing winds, or more regional and local in terms of impact on receptors from particulate and dust releases from power stations.

3.16 These effects are therefore considered to be potentially significant in nature and strategic in magnitude during the operational phase of the power plant, but remain uncertain, given the technical and economic uncertainty associated with the adoption of CCS technology. For construction and decommissioning, negative effects are likely to be local in extent through these periods, and following decommissioning air quality impacts from the development will be neutral. However, technology does exist to mitigate the magnitude of these negative effects, which will need to account for potentially additional emissions of NO_x and SO_x from the adoption of CCS in order to comply with air quality permitting, licensing and emissions performance standards. These measures are therefore likely to reduce the negative impact on air quality, but some uncertainty remains associated with location and technology.

Soil and Geology

Objective: To promote the use of brownfield land and where this is not possible to prioritise the protection of geologically important sites and agriculturally important land.

AoS Objective 12. Soil and Geology	Assessment (by timescale)		
	S	M	L
	0 ?	0 ?	0 ?

3.17 The development of fossil fuel generating capacity and CCR/CCS as facilitated with the adoption of EN-2 is likely to have negative effects on soils and geology. The magnitude of any such effects will vary depending on the proposed location of fossil fuel plant and the routes selected for CO_2 pipelines, the generating technology associated with each application, the footprint, and therefore the risk of disturbance or damage to geologically important sites or agriculturally important land. Nevertheless, it is considered that that the effects overall are likely to be site specific during the construction and operation phases, but with uncertainty reflecting specific siting and routing of the infrastructure, with an uncertain potential for land restoration following demolition and decommissioning.

Health and Well-Being

Objective: To protect and enhance the physical and mental health of the population.

AoS Objective 13. Health and Well-Being	Assessment (by timescale)		
	S	M	L
	-?	+	+

3.18 The development of fossil fuel generating capacity as proposed with the adoption of EN-2 does potentially have negative effects on health and well being through impacts on air quality, mainly associated with plant operation. Air quality impacts are primarily related to generation by coal-fired power stations, and are likely to be more local and regional in extent, although strategic effects are possible with a greater number of coal-fired power stations. Other potential local negative effects result from noise and vibration. There are potentially positive effects on health and well-being associated with increased employment opportunities locally, regionally and nationally with the implementation of EN-2. A range of mitigation measures are available to reduce the negative effects on health and well being, principally driven by statutory emission limits, the choice of technology and associated reduced emissions with fossil fuel energy generation. However, given the ongoing scientific debate on the link between emissions and health effects, it is considered that overall, these effects on health and well being will remain negative, but associated with uncertainty.

Equality

Objective: To encourage equality and sustainable communities.

AoS Objective 14. Equality	Assessment (by timescale)		
	S	M	L
	0	0	0

3.19 The development of fossil fuel generating capacity and CCR/CCS as facilitated with the adoption of EN-2 is likely to have local effects on equality. There are potentially

negative effects through negative impacts on health and well-being and the environment, but these can be mitigated through the planning approvals and pollution control process.

Cumulative Effects

3.20 Cumulative effects associated with the adoption of EN-2 are likely to arise from the development of CCS infrastructure and coal fired and biomass co-fired power stations. Given the likely costs associated with the development of this infrastructure and the off-shore location for the storage of the captured CO_2, there is likely to be a clustering of new fossil fuel, and especially coal-fired and biomass co-fired stations, around strategically located land-based transfer stations prior to onward pumping of the CO_2 to offshore head works. Given this driver, the promotion of four CCS demonstration projects by the Government will make the locations of these projects initially favourable in the siting of future fossil fuel generating capacity, which may reduce as the costs associated with CCS decline in the future.

3.21 Cumulative effects are likely to be initially associated with the construction of the CCS infrastructure with fossil fuel plant and other power stations with reasons to be located in similar areas. These effects may actually be more sustained than would be the case with the construction of a single power station with CCS infrastructure as new fossil fuel generating capacity develops around CCS infrastructure clusters as highlighted earlier.

3.22 Potential cumulative effects will be felt across a number of AoS objectives in an adverse manner including air quality, water quality, resource use, ecology and traffic and transport amongst others. These may be difficult to mitigate, where the location of suitable CCS storage reservoirs will be a key driver.

3.23 However, there is also the potential for positive cumulative effects at a regional scale associated with spatial clustering in a number of the regions identified above. These are across the AoS objectives economy and skills, health and well being and equality, and all relate to direct and indirect employment creation within these regions associated with development of CCS infrastructure with fossil fuel and other generating stations.

Overall findings and conclusions

3.24 Fossil fuel generating infrastructure development has similar effects to other types of energy infrastructure. These result from impacts associated with large facilities at single sites as well as those associated with linear features linked with the potential development of CCS infrastructure. The effects are likely to be more concentrated around these single large facilities, as well as spread across wider areas, but likely to be preferentially located within the eastern regions of England with respect to CCS. For the majority of the AoS objectives, the strategic effects of EN-2 were considered to be neutral or negative but uncertain.

3.25 However, through facilitating and enabling the fossil fuel generating infrastructure necessary to support the transition to a low carbon economy and ensure security of supply, EN-2 is considered likely to have positive effects on the economy and skills, and health and well being as secondary benefits, in the short, medium and long term, and positive effects in the medium to long term on the AoS objective climate change. However, uncertainty is also associated with these benefits given the need to demonstrate the economic and technical viability of CCS.

3.26 Effects on a range of AoS objectives viz. Ecology, Resources and Raw Materials, Flood Risk, Water Quality and Landscape, Townscape and Visual are considered to be generally negative across short, medium and long terms. Again uncertainty is associated with this assessment, as at this level of appraisal, actual effects are dependent on the sensitivity of the environment and the location and design of infrastructure.

3.27 The appraisal also concludes that there are likely to be negative effects on AoS topics for both Air Quality and Health and Well-being. These are considered to be linked, given the association between emissions from fossil fuel generating plants and public health. A range of mitigation measures are expected, related to tighter emissions standards and are also proposed which can address both, but given the ongoing debate on this association, residual effects are considered to remain negative, but uncertain.

3.28 EN-2 contains a range of technology specific mitigation measures, along with those proposed in EN-1, which seek to address the range of negative effects identified.

3.29 A summary of the likely significant effects arising specifically from fossil fuel generating infrastructure is set out in the following table:

Table: Summary of Key AoS Findings Specific to Fossil Fuel Generating Infrastructure

AoS Objective	Assessment (by timescale)		
	S	M	L
1. Climate Change	0	+?	+?
2. Ecology (Flora and Fauna)	-?	-?	-?
3. Resources and Raw Materials	-?	-?	-?
4. Economy and Skills	+?	+?	+?
5. Flood Risk	-?	-?	0?
6. Water Quality	-?	-?	-?
7. Traffic and Transport	0	0	0
8. Noise	0	0	0
9. Landscape, Townscape and Visual	-?	-?	0?
10. Archaeology and Cultural Heritage	0?	0?	0?
11. Air Quality	0	-?	0
12. Soil and Geology	0?	0?	0?
13. Health and Well-Being	-?	-?	-?
	+?	+?	+?
14. Equality	0	0	0

Next Steps

Consultation

4.1 The Appraisal of Sustainability and the Revised Draft Fossil Fuel Electricity Generating Infrastructure NPS are subject to public consultation.

4.2 The public consultation commences on the 18th October 2010 and continues until the 21st January 2011.

4.3 For more information on this consultation and how you may give us your views please see the Consultation Document (www.energynpsconsultation.decc.gov.uk).

4.4 Alternatively you may contact nps.consultation@decc.gsi.gov.ukfor further details.

4.5 The Government will consider any further comments received during the public re-consultation in the decision making on finalising the energy NPSs. On designation of the NPS, an AoS Post Adoption Statement will be published and this will summarise how the AoS and the consultation responses have been taken into account, including how sustainability and environmental considerations have been integrated into EN-1.

The monitoring process

4.6 Monitoring should be focussed upon likely significant effects that may give rise to irreversible damage, with a view to identifying trends before such damage is caused and likely significant effects where there was uncertainty in the AoS such that monitoring would enable preventative or mitigation measures to be undertaken.

4.7 A draft Monitoring Strategy for the Energy NPSs and AoSs will be published alongside the main consultation documents. The Government will further develop the monitoring strategy during the re-consultation period to take into account responses received on the revised draft NPSs and AoSs. The Strategy sets out the proposed indicators for monitoring together with agreed responsibilities and frequencies of monitoring during the implementation of the NPSs. This will be summarised in the Post- Adoption Statement that will be published with the designated NPSs.

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