

# **Appraisal of Sustainability for the revised draft National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4): Non-Technical Summary**

# Preface

## Appraisal of Sustainability for the revised draft National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines

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<sub>2</sub>)) 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 18<sup>th</sup> 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](http://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 National Policy Statement 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 applications will 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 18<sup>th</sup> 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 focuses on impacts and policies specific to the specific technologies with which they are concerned.

## Need for new energy infrastructure

- 1.6 The 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 purposes 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, 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 including 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 to achieve our energy and climate change policy objectives in relation to nationally significant energy structure, 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 is in no sense a substitute for that analysis, just as policies set out in the NPSs provide a framework, rather than a substitute for the exercise of the decision-maker’s judgment about the acceptability of the impacts of individual developments. Instead, the AoSs are, in essence a means of assessing whether the NPSs themselves, which will largely determine how individual applications are handled, are fit for purpose: whether they will deliver the required results in energy policy terms without undermining Government’s sustainable development goals (i.e. ensuring that development meets the needs of the present without compromising the ability of future generations to meet their own needs). Sustainable development analysis involves looking at the environmental, social and economic impacts of new development. The SEA Directive, in particular, prescribes a particular process for doing this.

1.12 The AoS are designed to satisfy the sustainable development analysis requirements of the Directive and of the Planning Act 2008, which requires that an appraisal of the sustainability of the policy set out in each NPS is carried out. The purpose of the AoSs, which have been prepared alongside the NPSs, is to contribute to the development of NPS policies and enable those who respond to the consultation on the draft NPSs to do so with an appropriate level of information about the likely environmental and other consequences of implementing them in the short, medium and long term (i.e. whether as a result of the process of constructing new nationally significant infrastructure, its operation, or its eventual decommissioning).

1.13 This Appraisal of Sustainability report for EN-4 is organised as follows:

*Table 1 – Layout of the Revised Draft Appraisal of Sustainability report (AoS) for Gas Supply Infrastructure and Gas and Oil Pipelines*

<p><b><u>Introduction</u></b>                  An Introduction to Appraisal of Sustainability (AoS) and a summary of the content and policies of EN-3.</p>
<p><b><u>Appraisal Findings</u></b>                  Identifies, develops and assesses strategic alternatives to the National Policy Statement and comparison of the significant sustainability effects of the strategic alternatives.                  The findings of the appraisal of the likely significant effects of the National Policy Statement Policies. Potential ways of mitigating adverse effects are presented.</p>
<p><b><u>Monitoring and Next Steps</u></b>                  Proposals for monitoring the actual impacts of implementing the NPSs.</p>

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 Revised Draft Appraisal of Sustainability report (AoS) for Gas Supply Infrastructure and Gas and Oil Pipelines, AoS-4, 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-4 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-4 for the revised AoS has been a two stage process:
- Development and initial screening to establish a series of reasonable strategic alternatives to the plan.
  - 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-4 (AoS-4) is concerned with the analysis of alternatives to those policies in the NPS suite which are of most direct relevance to gas supply infrastructure and gas and oil pipelines.
- 2.6 In the case of the types of infrastructure covered by EN-4, consultation has not revealed similar levels of concern about the impacts associated with its development, to those seen in responses to EN-2, EN-3 and EN-5. In addition, this technology-specific NPS does not set out any policies which are distinct from those set out at a generic level in EN-1. Alternatives such as setting development policies on the assumption that new gas supply infrastructure or gas and oil pipelines are not needed, or setting development policies on a generally more restrictive basis for environmental



protection reasons, are therefore sufficiently covered in the generic treatment of alternatives in AoS-1. However, one specific alternative to EN-4 is considered in relation to EN-4, that the Government would take a strategic view on locations where it is best to develop new oil and gas infrastructure (based on geology, cost etc) and limit consenting to those areas.

- 2.7 The findings of the assessment of alternatives, grouped according to six key sustainable development themes, are summarised in the following table 2. Broadly speaking, the conclusion was that the alternative could be difficult to implement and it was not clear that it would bring significant benefits as compared with the approach set out in the NPSs, and its potential. The geographical constraints on underground storage and LNG facilities are likely in practice to dictate their location whether or not the alternative is adopted, and it is not clear that a more centrally planned approach to gas and oil pipeline development would be advantageous.

*Table 2 – Summary of Alternatives Assessment Findings*

<b>Headline SD themes</b>	EN-4	No NPS	Alternative
Climate Change		-?	-
Security of Energy Supply		-?	-
Health & Well-Being		0	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 gas supply infrastructure and gas and oil pipelines set out in EN-1 and EN-4.

# Summary of Appraisal

## Findings for individual sustainability topics

- 3.1 The appraisal of the impacts of implementing EN-4 was undertaken in a topic by topic basis, with the revised draft Gas Supply Infrastructure and Gas and Oil Pipelines 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-4 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 i.e. 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 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 Climate change resilience is an important consideration for liquefied natural gas (LNG) facilities and gas reception facilities. EN-4 provides guidance for applicants on the consideration of the effects of climate change such as an increase in the risk of

flooding, damage from the effects of wind, higher temperatures and earth movement or subsidence.

- 3.6 It is assessed that the expansion of oil and gas network infrastructure, as promoted through EN-4, will have neutral effects on climate change in the short-term, and potentially negative effects in the medium and longer term, as it will continue to support a reliance on fossil fuel based energy production, although the replacement of old, less efficient infrastructure with new, more efficient infrastructure will contribute positively to the climate change objective.

### 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
	?	?	?

- 3.7 There are a number of generic effects on ecology that are applicable to all energy infrastructure development, including gas supply infrastructure and gas and oil pipelines. There are also several effects on ecology specific to gas and oil supply infrastructure. The dredging requirements of liquefied natural gas (LNG) facilities may have specific effects on the biodiversity of local marine, coastal and estuarine environments, including the smothering of nearby habitats and benthic communities, increased suspended solids and contaminant release. The creation of underground gas storage caverns within salt strata has the potential for aquatic ecological impacts from the disposal of large quantities of brine. This saltwater is denser than seawater and freshwater and will sink to the bottom impacting on benthic communities and bottom feeding fish and other species.
- 3.8 Through promoting the expansion of the oil and gas infrastructure network, EN-1 and EN-4 have the potential for increased strategic negative effects on ecology across England and Wales, particularly in coastal and estuarine locations which are often heavily protected and in the short-term. Both EN-1 and EN-4 include robust and effective mitigations which will help to avoid or minimise negative effects (positive effects may even be possible through the implementation of enhancement opportunities). However, it is considered that the overall effects are uncertain as their significance is dependent on the location of the development and the sensitivity of the receiving environment.

## 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
	0	-?	-?

- 3.9 EN-4 is not anticipated to generate notable volumes of waste or impact on the sustainable use of raw materials and resources. Exceptions to this include the disposal of dredging spoil associated with LNG facilities and the disposal of brine associated with the solution mining of underground gas storage caverns.
- 3.10 Through promoting the expansion of the oil and gas infrastructure network, EN-4 with EN-1 has the potential for increased strategic negative effects on resources and raw materials across England and Wales, particularly associated with disposal of dredging spoil and the disposal of large volumes of brine. Whilst both EN-1 and EN-4 contain mitigation measures which will help to avoid or minimise negative effects, it is considered that effects of minor negative significance may arise particularly in the short-term, however, these effects will be experienced at a local level and are, therefore, assessed as of neutral significance. In general, no effects are considered likely in the medium and longer-term.

## 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
	0	+	+

- 3.11 Through promoting the expansion of the oil and gas infrastructure network, EN-4 with EN-1 has the potential to promote an increased certainty to developers, facilitate the planning process and provide for strategic positive effects on the economy of England and Wales at local to national levels through the provision of a secure supply of energy which is recognised as vital to economic prosperity and social well-being. EN-4 has the potential to have minor negative effects on the local rural economy through the temporary loss of agricultural production associated with long distance pipelines, although compensation removes these effects. As such, it is assessed that EN-4 will have no effects to economy and skills in the short-term, and minor positive effects in the medium and long-term as the effects are considered to be of national significance.

## 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	0

3.12 Through promoting the expansion of the oil and gas infrastructure network, EN-1 and EN-4 have the potential for limited negative effects on flood risk at local levels, particularly through changes to hydrological flow regimes and increased surface runoff associated with above ground facilities. However, it is likely that these impacts can be effectively mitigated such that no effects arise in the short, medium or long-term.

## 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	0

3.13 There are a number of generic effects on the water environment that are applicable to all energy infrastructure development, including gas supply infrastructure and gas and oil pipelines. The significance of the effects and effectiveness of mitigation depends on the location of development and will need to be evaluated during studies for project level environmental impact assessments (EIAs). The mitigation measures outlined in EN-1 with regard to water quality and resources, including the requirement for an assessment of the impacts of new development on the water environment, should help to minimise negative effects on the water environment.

3.14 Through promoting the expansion of the oil and gas infrastructure network, EN-4 has the potential for increased negative effects on local water quality and resources, particularly associated with disposal of large quantities of highly saline water, as a result of operational dredging and during the construction and testing stages of long distance pipelines. Both EN-1 and EN-4 contain mitigation measures which will help to avoid or minimise negative effects, and as effects are largely local, it is considered that the overall effects are of neutral significance in the short, medium and long-term.

## 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

3.15 Other than for some minor negative effects during construction associated with the installation of long distance pipelines, which will be temporary in nature, and impacts associated with the operation of large liquefied natural gas (LNG) tankers within existing shipping lanes, EN-4 with EN-1 is considered to have very little to no effect in terms of travel and transport in the short, medium and long-term. In addition, these effects can be effectively managed through generic traffic management measures.

## 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

3.16 EN-4 has the potential for increased negative noise effects on both human and ecological receptors at a local level, associated with the drilling of new boreholes to create underground gas storage caverns, with the brine pumping during the solution mining process, and with the operational plant. Noise may also arise at a local level during the operation of the plant associated with liquefied natural gas (LNG) facilities and gas reception facilities. Temporary construction noise may also arise during the installation of oil and gas pipelines, resulting in effects to particularly sensitive rural communities, landscapes and biodiversity. However, both EN-1 and EN-4 include robust mitigations which will help to reduce negative effects to acceptable levels throughout most stages of the development. It is considered that the overall effects are likely to be of neutral significance, with no significant effects beyond the local level in the short, medium to long-term.

## 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
	-	-	?

3.17 EN-4 includes negative landscape and visual effects from permanent above ground infrastructure associated with each element. This is particularly pertinent to liquefied natural gas (LNG) facilities. Whilst mitigation measures are available to reduce the

effects, full mitigation of large scale structures can be difficult. EN-4 also identifies temporary (short-term) construction effects to specific elements of the landscape within or adjacent to pipeline routes. In most instances it is possible to fully mitigate for these effects.

- 3.18 Through promoting the expansion of the oil and gas infrastructure network, EN-4 with EN-1 has the potential for increased strategic negative visual effects on landscape across England and Wales. Although both EN-1 and EN-4 include robust mitigations which will help to minimise negative effects, it is considered that the overall effects are likely to be of minor negative significance for the short and medium-term and unknown for the longer-term, as effects will be dependent on decommissioning and remediation.

### 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
	0?	0?	0?

- 3.19 With regard to archaeology and cultural heritage EN-4 is considered to have no effects in addition to the generic potential negative effects, identified in EN-1, of nationally significant energy infrastructure on the historic environment, largely associated with the footprints of development and with the settings of assets within surrounding areas. The generic mitigation measures identified in EN-1 are applicable to all elements of gas supply infrastructure, including pipelines, and largely involve avoidance of assets through careful siting. Therefore, it is considered that EN-4 will have no significant effects in the short, medium and long-term; however, as with all energy infrastructure, instances will arise where proximity to an historic asset cannot be avoided altogether, and full mitigation to the setting of the asset may be difficult to achieve. As the significance is dependent on the location of the development and the sensitivity of the receiving environment, some uncertainty exists with regard to the overall significance.

### 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	0

- 3.20 EN-4, with EN-1, has the potential for increased strategic negative air quality effects on both human and ecological receptors, and the wider countryside. However, generic and robust mitigation measures are available which will help to reduce negative effects to acceptable levels, particularly on a local to regional scale, that are applicable to gas supply infrastructure of EN-4. As such, EN-4 is considered to have no additional effects to the generic effects identified within EN-1 in the short, medium and long-term, throughout all stages of the development.



## 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?

3.21 Through promoting the expansion of the oil and gas infrastructure network, EN-1 has the potential for negative effects on soils and geology across England and Wales, with specific limited negative effects identified in EN-4 associated with long distance pipelines and the effects on and of the underlying ground conditions. However, both EN-1 and EN-4 include robust mitigations which will help to reduce negative effects, principally through avoidance of sensitive areas, areas of high risk, areas of mineral resources, etc. However, in some instances it may be difficult or impossible to avoid these areas, although alternative mitigation measures are available to address the issues. It is, therefore, considered that the overall effects of EN-4 are likely to be of neutral significance in the short, medium and long-term, throughout all stages of the development. As the significance is dependent on the location of the development and the sensitivity of the receiving environment, some uncertainty exists with regard to the overall significance.

## 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
	0	0	0

3.22 Through promoting the expansion of the oil and gas infrastructure network, EN-1 has the potential for effects on health and well-being, both negative and positive, the majority of which are applicable to EN-4. It is, therefore, considered that the overall effects of EN-4 are likely to be of neutral significance in the short, medium and long-term, throughout all stages of the development.

## Equality

Objective: To encourage equality and sustainable communities.)

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

3.23 Through promoting the expansion of the oil and gas infrastructure network, EN-1 has the potential for positive effects on equality, through the distribution of power, the provision of security of supply and access to locally generated community facilities, services, employment opportunities, transport, education and training, public areas and

other potential community benefits. Although EN-4 will contribute to achieving this, it is considered that the overall effects of EN-4 are likely to be of neutral significance throughout all stages of the development.

## Cumulative Effects

- 3.24 Cumulative effects of construction (e.g. air quality, dust, noise, visual, traffic, socio-economic, etc.) may arise with the development of the elements within EN-4 as most will not be developed in isolation, i.e. liquefied natural gas (LNG) facility + pipeline, gas receptor facility + pipeline, underground storage facility + pipeline. It is likely that both elements would be constructed within the same timeframe and connecting to each other, resulting in cumulative effects of a temporal and spatial nature. Such effects would be temporary. Similarly, cumulative effects of construction may arise in conjunction with the development of other energy technologies, particularly those contained in EN-2 where pipeline connections may be required to supply new gas or oil-fired power stations.
- 3.25 Cumulative effects may also arise due to location/proximity. LNG facilities and gas reception facilities within EN-4 require coastal locations, as may other energy technologies within EN-2, EN-3, EN-5 and EN-6. Cumulative effects on coastal landscapes and coastal change may arise should energy developments be concentrated in areas that provide the specific requirements of that development. Such effects would be permanent and long-term (until decommissioned), and also difficult to mitigate due to the scale of the energy developments, particularly where LNG facilities are involved.
- 3.26 Cumulative effects of location/proximity may also arise with the underground storage of gas, particularly those within solution mined salt caverns. The presence of suitable rock salt strata is restricted to a small number of areas within England and Wales and, as such, underground gas storage facilities may be concentrated in specific locations.

## Overall findings and conclusions

- 3.27 Generally, the development of gas supply infrastructure and gas and oil pipelines has similar effects to other types of energy infrastructure, although due to the linear nature of cross-country, long distance pipelines, effects are often more dispersed and spread across a wider area. Therefore, for the majority of the AoS objectives, the strategic effects of EN-4 were considered to be neutral.
- 3.28 Through facilitating and enabling the gas supply infrastructure necessary to support the transition to a low carbon economy and ensure security of supply, which is recognised as vital to economic prosperity and social well-being, EN-4 is considered likely to have significant positive effects of national importance on the economy and skills AoS objective in the medium-term. In the long-term, it is anticipated that the effects of EN-4 will reduce to minor positive significance as advancements in other energy technologies are likely to reduce the reliance on gas and oil and security of supply will not be of such importance. However, it is recognised that gas and oil will continue to play an important role within the UK's energy mix for some time to come.
- 3.29 Negative effects were identified for the short and medium-term for the landscape, townscape and visual AoS objective due to the visual nature of the above ground

structures associated with gas supply infrastructure and gas and oil pipeline that EN-4 will facilitate, particularly those associated with LNG facilities which include large scale storage tanks. The NPSs (particularly EN-1 and EN-4) include robust mitigations and considerations which will help to minimise negative effects, however the residual effect may remain of some significance. Long-term effects are uncertain.

- 3.30 Short-term negative effects were identified for the ecological, resources and raw materials and water quality AoS objectives largely associated with the dredging requirements of liquefied natural gas (LNG) facilities and the disposal of the large quantities of brine generated during the solution mining of underground gas storage caverns. Short-term negative effects were also identified for the noise AoS objective associated with cross-country pipelines, where construction can lead to effects on sensitive rural communities, landscapes and biodiversity throughout the length of the pipeline.
- 3.31 EN-4 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.
- 3.32 A summary of the likely significant effects arising specifically from gas supply infrastructure and gas and oil pipelines development is set out in the following table 5:

**Table 5: Summary of Key AoS Findings Specific to Gas Supply Infrastructure and Gas and Oil Pipelines**

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

# Next Steps

## Consultation

- 4.1 The Appraisal of Sustainability and the revised draft of the NPS for Gas Supply Infrastructure and Gas and Oil Pipelines National Policy Statement are subject to public consultation.
- 4.2 The public consultation commences on 18 October 2010 and continues until 21 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](http://www.energynpsconsultation.decc.gov.uk)).
- 4.4 Alternatively you may contact [nps.consultation@decc.gsi.gov.uk](mailto:nps.consultation@decc.gsi.gov.uk) for further details.
- 4.5 The Government will consider any further comments received during the public re-consultation making on the revised draft 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.



URN 10D/849

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