

RWE

Great Yarmouth Power Station

**Application for Section 36 Consent
Variation**

Updated Supporting Statement

Reference Number: ENV/723/2023

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Issue: Final



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Great Yarmouth Power Station
Application for Section 36 Consent Variation
Updated Supporting Statement

Prepared by:



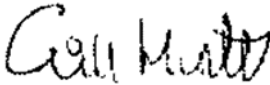
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Appendix B	Great Yarmouth – Section 36 Environmental Statement – April 1996
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1. Introduction

This updated supporting statement has been prepared in support of an application by RWE Generation UK plc to the Secretary of State for Energy Security and Net Zero (DESNZ) in respect of a variation to the existing Section 36 consent for Great Yarmouth Power Station and its deemed planning permission, to enable the power station to operate at a gross generation of up to 430 MWe. Details of the application can be found in Section 2.1.

This updated supporting statement accompanies the Section 36 variation application. The other documents submitted in support of the application are listed in Table 1.

Table 1 Documents included in Section 36 variation application.

Document title	Notes
Covering letter	Regulation 3 of the Electricity Generating Stations (Variation of Consents) (England and Wales) Regulations 2013 requires that applications be made in writing. The application is made via the covering letter and accompanying documents.
Updated Supporting statement	This document. Appendices to this document include: <ul style="list-style-type: none"> • Appendix A: Great Yarmouth Power Station – Section 36 Consent and Deemed Planning Conditions– October 1997 • Appendix B: Great Yarmouth – Section 36 Environmental Statement – April 1996 • Appendix C: Great Yarmouth Power Station – Section 36 variation – April 2001 • Appendix D: Great Yarmouth Power Station – Carbon Capture Readiness Assessment Report – December 2023 • Appendix E: Great Yarmouth Power Station – Ambient Conditions Report – February 2023 • Appendix F: Great Yarmouth Power Station – Environmental Permit (EPR/KP3531US) – January 2020 • Appendix G: Great Yarmouth Power Station – Preliminary Ecological Appraisal – June 2023 • Appendix H: Great Yarmouth Power Station – Air Quality Modelling Technical Report – February 2023 • Appendix I: Great Yarmouth Water Abstraction Licence (7/34/15/*T/0223) • Appendix J: Evidence of Historical Precedent on CCR from Spalding and Decision Letter
Section 36 Explanatory Memorandum	Document to explain the proposed amendments to the Section 36 consent and show the proposed tracked changes to the Section 36 consent and deemed planning permission.
'Clean version' of Proposed tracked changes to the Section 36 Consent and deemed planning permission	'Clean version' of proposed changes to the Section 36 consent and deemed planning permission.

Compliance with Regulation 3 of The Electricity Generating Stations (Variation of Consents) (England and Wales) Regulations 2013	Document to demonstrate compliance with Regulation 3 of The Electricity Generating Stations (Variation of Consents) (England and Wales) Regulations 2013. Document reference ENV/729/2023.
Associated authorisations	Copy is provided of: <ul style="list-style-type: none"> • Great Yarmouth Power Station Environmental Permit (EPR/KP3531US) (Appendix F of this document) • Appendix I: Great Yarmouth Water Abstraction Licence (7/34/15/*T/0223/R01).
Red line boundary drawing entitled 'Section 36 Boundary'	RWE/GTYRM/ENV/0002/A. Also provided in Figure 1 within this document.
Location plan entitled 'Section 36 Wider Location Plan'	RWE/GTYRM/ENV/0004/A. Also provided in Figure 2 within this document.

1.1. Purpose of this Document

This document has been prepared to provide details of the proposed Section 36 variation at Great Yarmouth Power Station to support an application under Section 36C of The Electricity Act 1989.

1.2. The Applicant

RWE is a leading energy company holding a diverse portfolio of wind, solar, hydro, nuclear, biomass and gas, with four main operating companies in the UK, including the Applicant, RWE Generation UK plc ('RWE Generation UK'). RWE Generation UK provides firm, flexible thermal gas-fired generation with around 7 GW of modern and efficient operational capacity.

1.3. Existing Section 36 Consent

The original Section 36 consent for the construction and operation of Great Yarmouth Power Station was granted under Section 36 of The Electricity Act 1989 by the Secretary of State on the 23rd of October 1997. The consent allowed the construction and operation of 'a combined cycle gas turbine generating station'. At the same time, a direction under Section 90(2) of The Town and Country Planning Act 1990 was made, meaning that planning permission for the development was deemed to be granted. A copy of the Section 36 consent dated October 1997 is provided in Appendix A.

The original Environmental Statement (Appendix B) for Great Yarmouth Power Station was dated 23 April 1996 and accompanied the original Section 36 consent application for a power station comprising a gas turbine nominally rated at 230 MW and a steam turbine generator rated at 120 MW, for a combined cycle output of 350 MW.

Following the grant of the original Section 36 consent, a variation to that consent was granted in April 2001 to allow for a gross generation 'from about 350 MW to about 400 MW'. A copy of the Section 36 consent variation dated April 2001 can be found in Appendix C.

The red line boundary for the Section 36 consent for Great Yarmouth Power Station is shown in Figure 1.

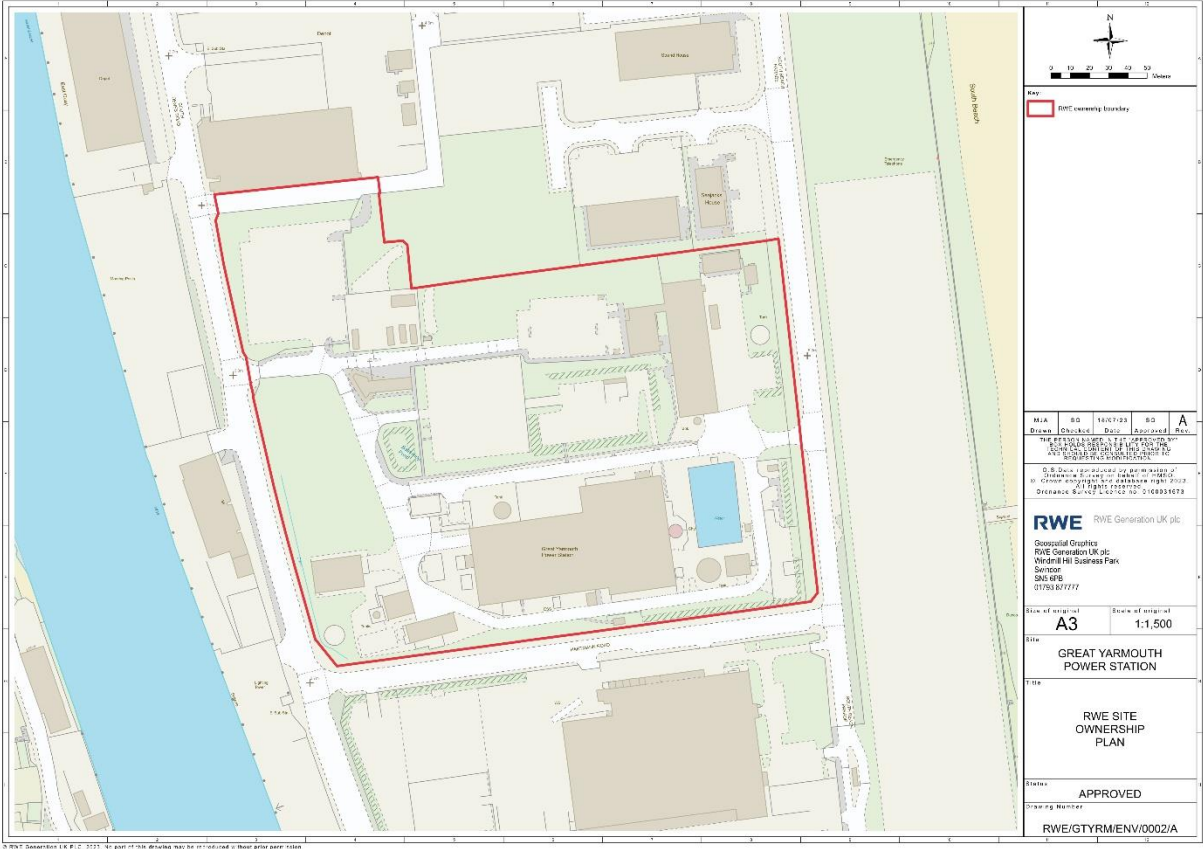


Figure 1 Red line boundary of the Great Yarmouth Power Station.

1.4. Section 36 Variation

RWE Generation UK is applying for a variation under Section 36C of The Electricity Act 1989 to authorise Great Yarmouth Power Station to operate at a gross generation of up to 430 MWe (‘the Proposed Development’).

The 2013 Department of Energy and Climate Change (DECC) guidance ‘Varying consents granted under section 36 of the Electricity Act 1989 (‘the 1989 Act’) for generating stations in England and Wales’ (‘the Guidance’) sets out the circumstances under which a variation can be sought. The Guidance states that the power conferred on the Secretary of State by section 36C of the 1989 Act is a broad and discretionary one to make ‘such variations...as appear to [the Secretary of State or the MMO] to be appropriate’. The Guidance also suggests that each application to vary section 36 consent will be considered on its merits on a case-by-case basis.

The Guidance also clarifies that the variation process is designed to apply to projects that have been consented under section 36, where the operator wishes to carry out development that is inconsistent with the existing section 36 consent, where the proposed development does not differ from the generating station to which the relevant section 36 consent refers to such an extent as that it requires development consent.

The Guidance identifies two major categories in which the Secretary of State can exercise the power to vary a Section 36 consent. The most relevant category for this context is (b), which pertains to *'the operation of a generating station (whether or not it is already operational) in a way that is different from that specified in the existing consent (this may sometimes involve making limited physical alterations to a generating station, but should not involve work that could be characterised as an 'extension' of an existing generating station which has been granted section 36 consent)'*.

The proposed Section 36 variation will not result in any changes to the character nor the configuration of the generating station as described in the existing Section 36 consent. Further, there will be no changes to the original red line boundary of the power station. The main purpose of the variation is to amend the existing consent to allow the operation of the station at an increased gross generation. The increase in gross generation is mainly attributable to ambient conditions after modest improvements to the power station, and not a result of expanded infrastructure. The main area of the power station, its external layout as well as its approved red line boundary will remain unaffected by the proposed variation. This variation also aims to remove redundant construction-related conditions which are part of the deemed planning permission granted under Section 90(2ZA) of the Town and Country Planning Act 1990 to ensure that the deemed planning permission is relevant to the continued operation of the power station. A new plan is also provided (Drawing RWE/GTYRM/ENV/0002/A) for better referencing but without any changes to the original red line boundary.

1.5. Environmental Permit

Great Yarmouth Power Station operates under an Environmental Permit (EPR/KP3531US) which was issued by the Environment Agency ('EA').

RWE Generation UK have notified the EA of its intention to apply to vary the Section 36 consent for Great Yarmouth Power Station. Further discussions will be held with the EA to understand whether a modification of the Great Yarmouth Environmental Permit is necessary to amend the description of the generating capacity in the introductory section of the environmental permit in line with the proposed increase on the Section 36 consent. It should be noted that the introductory section has no legal status and RWE Generation UK anticipates that such an update could be made in the next environmental permit review cycle. Other than the change to the introductory note, the proposed Section 36 variation will not result in amendments to any of the station's environmental limits within the permit or operating techniques.

1.6. Consultation

There have been two meetings (October 11th, 2022, and 22nd June 2023) with DESNZ regarding the possible changes at Great Yarmouth. Following those discussions, DESNZ indicated that, having considered all of the information provided, a Section 36 variation would be appropriate. It was agreed as part of these discussions that an Environmental Impact Assessment (EIA) Screening would not be necessary for the proposed Section 36 variation consent.

The local authority was also consulted on the proposed variation to the Section 36 Consent and deemed planning permission document. Following the consultation, no comments have been received.

Lastly, the local EA site inspector for Great Yarmouth Power Station has been orally informed of the Proposed Development and the Section 36 variation application, and no comments were offered on the matter.

2. Great Yarmouth Power Station

Great Yarmouth Power Station is a combined-cycle gas and steam turbine (CCGT) power station located in Great Yarmouth in Norfolk, on the east coast of England. The power station was commissioned in 2002.

RWE Generation UK plc (formerly named RWE Npower plc) acquired the power station from BP (UK) Power Holdings Limited in 2005 and has operated the station since.

Great Yarmouth is a CCGT power station comprising of one gas turbine (725 MW_{th}) and one steam generator. The turbine operates on a 1 + 1 configuration, with a single dedicated heat recovery steam generator, and an auxiliary gas-fired boiler (28 MW_{th}) to provide steam during start-up and warm the turbine. The power station has a once-through cooling water system fed with water from the River Yare

2.1. Proposed Development

The Great Yarmouth Power Station has been subject to modest improvements aimed at enhancing its efficiency, flexibility and reliability. Whilst these changes have resulted in small increases in generation capacity, the station's gross generation has remained consistent with the existing Section 36 consent under the Electricity Act of 1989. A variation of this consent is now sought to enable operation at an increased gross generation of up to 430 MWe to enable the station to operate at its maximum generation capacity.

This request for variation, together with modest improvements to the station over the years, also stems from technical findings indicating that lower temperatures and higher air pressures can boost the station's power output and thermal efficiency (see Appendix D for specifications). As a result of this Section 36C variation application, the station will be authorised to operate at a gross generation of up to 430 MWe. There will be no physical works associated with the Proposed Development and the Section 36 consent variation.

2.2. Great Yarmouth Power Station Location and Surrounding Areas

The Proposed Development site covers an area of 5.7 ha and is centred at National Grid Reference TG 52926 05093. The Proposed Development site, its layout and the Section 36 red line boundary are shown in Figure 1. There will be no physical works associated with the Section 36 consent variation and both layout and red line boundary will remain unaffected.

The postal address of the Proposed Development site is Great Yarmouth Power Station, South Denes Road, Great Yarmouth, Norfolk, NR30 3PY Figure 2 shows the wider site location of Great Yarmouth Power Station.

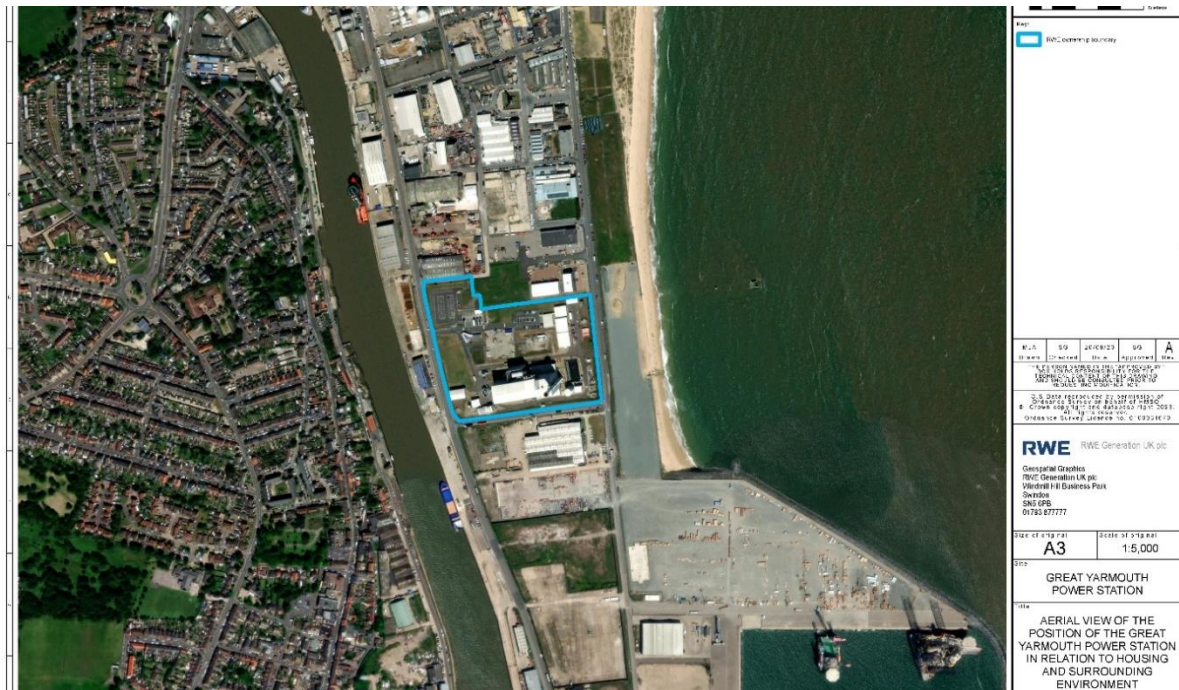


Figure 2 Aerial view of the position of the Great Yarmouth Power Station in relation to housing and surrounding environment.

The nearest residential areas are located 250 m to the west of the site, on Riverside Road, and the site is bordered, to the west, by the River Yare and, to the east Pleasure Beach and the North Sea. Figure 3 shows a closer aerial image of the Proposed Development site.



Figure 3 Aerial photograph of Great Yarmouth Power Station.

Two Ramsar sites are within 10 km of the site – Broadland and Breydon Water, which are approximately 8 km to the east of the power station. However, there are no Local Nature Reserves or Local Wildlife sites within 2 km of the site. Breydon Water is also the nearest Site of Special Scientific Interest (SSSI), which is sided by another SSSI at approximately 6 km to the east of the power station – i.e., Halvergate Marshes.

There are three European Protected Sites within 10 km of Great Yarmouth Power Station: eastward, adjacent to the station, are the Outer Thames Estuary Special Protection Area and Southern North Sea Special Area of Conservation (SAC); to the west, at about 8 km, are the Broads SAC, which are also part of the nearest National Park.

The Proposed Development sought via this Section 36 variation has been assessed and determined to have no adverse impact on these environmentally sensitive sites, ensuring no significant impacts on the preservation of their ecological integrity (see Appendices G and H).

No scheduled monuments or heritage features are to be found within 10 km of the power station site.

Great Yarmouth Borough Council currently has not declared an Air Quality Management Area (AQMA) within their jurisdiction. The Council undertakes both automatic (continuous) and non-automatic (passive) monitoring of NO₂. A summary of these data is presented in Appendix H.

3. Planning Policy

3.1. Overarching National Policy Statement for Energy EN-1

The Overarching National Policy Statement for Energy EN-1 ('NPS EN-1') sets out the Government's policy for the delivery of major energy infrastructure in England.

Section 2.2.20 states *'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 electricity capacity (including a greater proportion of low carbon generation) to meet demands at all times... This requires a safety margin of spare capacity to accommodate unforeseen fluctuations in supply or demand.'* Therefore NPS EN-1 makes it clear that sufficient electricity capacity is critical to maintaining secure and reliable electricity supplies.

Section 3.1.1 states *'The UK needs all the types of energy infrastructure covered by this NPS in order to achieve energy security at the same time as dramatically reducing greenhouse gas emissions'*.

Section 3.3.11 states *'An increase in renewable electricity is essential to enable the UK to meet its commitments under the EU Renewable Energy Directive...However, some renewable sources (such as wind, solar and tidal) are intermittent and cannot be adjusted to meet demand. As a result, the more renewable generating capacity we have the more generating capacity we will require overall, to provide back-up at times when the availability of intermittent renewable sources is low. If fossil fuel plant remains the most cost-effective means of providing such back-up, particularly at short notice, it is possible that even when the UK's electricity supply is almost entirely decarbonised we may still need fossil fuel power stations for short periods when renewable output is too low to meet demand, for example when there is little wind'*.

Section 3.6.2 states *'Fossil fuel generating stations contribute to security of energy supply by using fuel from a variety of suppliers and operating flexibly. Gas will continue to play an important role in the electricity sector – providing vital flexibility to support an increasing amount of low-carbon generation and to maintain security of supply [...]'* and paragraph 3.6.3 goes on to state *'Some of the new conventional generating capacity needed is likely to come from new fossil fuel generating capacity in order to maintain security of supply, and to provide flexible back-up for intermittent renewable energy from wind [...]'*.

The Overarching NPS was reviewed in 2021 and in March 2023. The revised NPSs, including EN-1 and EN-2, were published in November 2023 and came into force following parliamentary approval on 17th January 2024. The revised EN-1 continues to recognise and support the crucial role of conventional generation in the transition to Net Zero. The revised EN-1, in section 3.3.17 provides; *"... new unabated natural gas generating capacity will also be needed as it currently plays a critical role in keeping the electricity system secure and stable. It will continue to be needed during the transition to net zero while we develop and deploy the low carbon alternatives that can replicate its role in the electricity system"*.

In addition, the revised EN-1 specifies at section 3.4.5: “*The Energy White Paper signals a decisive shift away from unabated natural gas to clean energy. **This transformation, as reiterated in the British Energy Security Strategy, cannot be instantaneous without jeopardising a secure, reliable, and affordable energy system.** 3.4.6 Security of supply is a top priority as the UK moves to decarbonise gas supply. The gas system is expected to continue to function well, as it has done to date, with a highly diverse range of supply sources and sufficient delivery capacity to more than meet demand.*”

The Proposed Development is therefore fully aligned with national policy and will support the transition to Net Zero by providing firm generation when required and by enabling Great Yarmouth Power Station to be operated more efficiently.

3.2. The National Policy Statement for Fossil Fuel Energy Generating Infrastructure EN-2

The National Policy Statement for Fossil Fuel Electricity Generating Infrastructure EN-2 (‘NPS EN-2’) provides the basis for decisions on applications relating to nationally significant fossil fuel electricity generating stations.

Section 2.3 of NPS EN-2 sets out the requirements on applicants to demonstrate that the possibilities for CHP have been fully explored and to keep control over adequate space for the installation of carbon capture equipment.

EN-2 was revised in November 2023 and such revision came into force on 17th of January 2024. The revised EN-2, section 2.4.1, also refers to the Decarbonisation Readiness (DR) policy set out in Section 4.9 of EN-1. Section 4.9.25 of EN-1 provides that “*To ensure that no foreseeable barriers exist to retrofitting CCS equipment on combustion generating stations, all applications for **new** combustion plant which are of generating capacity at or over 300MW and of a type covered by The Carbon Capture Readiness (Electricity Generating Stations) Regulations 2013 should demonstrate that the plant is “Carbon Capture Ready” (CCR) before consent may be given.*” It is noted that Great Yarmouth Power Station was consented in 1997 and constructed soon after.

A comprehensive account of the CCR of the Great Yarmouth Power Station is provided as a report in Appendix D of this report.

3.3. The National Planning Policy Framework

The revised National Planning Policy Framework (NPPF) was last updated in December 2023. The NPPF sets out the Government’s planning policies for England and how these are expected to be applied.

At the heart of the NPPF is a presumption in favour of sustainable development (Chapter 2, Paragraph 11). It requires Local Plans to be consistent with the principles and policies set out in the Frameworks with the objective of contributing to the achievement of sustainable development. Chapter 2 of the NPPF focuses on achieving sustainable development and includes an environmental objective which includes actions such as ‘*making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy*’.

Chapter 14 of the NPPF states the planning system should support the transition to a low-carbon future. This objective is supported by the proposed S36 variation which will enable Great Yarmouth Power Station to provide increased efficient capacity to support the transition.

Chapter 15 of the NPPF includes objectives relating to minimising impacts on biodiversity, and preventing new and existing development from contributing to unacceptable levels of soil, air, water or noise pollution or land stability, both of which are supported by the proposed Section 36 variation. The Proposed Development would operate within existing water abstraction and noise limits at an increased generation capacity, making therefore better use of natural resources. There are no significant impacts arising from the Proposed Development.

3.4. Local Planning Policy

Great Yarmouth Power Station is located within the administrative area of Great Yarmouth Borough Council. The current Local Plan, which aims to plan for Great Yarmouth borough's growth needs to achieve, is made up of two parts: the Core Strategy ('CS') was adopted on the 29th of January 2015 and the Local Plan Part 2 was adopted on the 17th of March 2021. Currently, both plans are used when assessing planning applications.

Some of the objectives of the current Local Plan in relation to the protection of natural resources are:

- To promote eco-friendly, inclusive and prosperous developments that respect local characteristics, support sustainable growth, and are resilient to changes in climate (CS1);
- To minimise the loss of agricultural land (CS6);
- To conserve biodiversity and reduce greenhouse gas emissions (CS9);
- To conserve heritage assets and their surroundings, which may include natural elements (CS10);
- To conserve designated nature sites, and protected species, mitigate development impacts on wildlife, and restore degraded valuable landscapes (CS11);
- To ensure sustainable use and protection of natural resources, including protecting agricultural land and safeguarding mineral resources (CS12);
- To mitigate future flooding and coastal change risks heightened by changes in climate and to enhance conservation and biodiversity through the design of sustainable drainage systems and coastal measures (CS13);
- To prevent the loss of important community facilities and green assets (CS15);
- To protect biodiversity in the development of the Waterfront area in Great Yarmouth and the sustainable urban extension to Beacon Park in Bradwell (CS17 and CS18).

Further to the above, the following policies within the Local Plan support the proposal to increase the generating capacity of Great Yarmouth Power Station:

- To promote eco-friendly developments that are resilient to changes in climate, contributing to long-term sustainability (CS1);
- To increase energy efficiency and encourage the incorporation of renewable or low-carbon¹ energy schemes, thereby favouring developments that could demonstrate an increase in energy efficiency, such as improving the output of an existing power station (CS12).

4. Environmental Information

The Electricity Works (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') provide in Regulation 6 that where an application is made for a Section 36 variation, EIA is required for 'EIA Development'. 'EIA Development' means a development of a description set out in Schedule 1 of the EIA Regulations, or a development of a description set in Schedule 2 where an EIA report is provided or the relevant authority makes a decision that the development requires EIA or any other development where the relevant authority makes such decision.

Schedule 1 of EIA Regulations specifies the types of projects where EIA is mandatory, as follows:

1. *Development to provide any of the following—*
 - (a) *a nuclear generating station;*
 - (b) *a thermal generating station with a heat output of 300 megawatts or more;*
 - (c) *an electric line installed above ground with—*
 - (i) *a voltage of 220 kilovolts or more; and*
 - (ii) *a length of more than 15 kilometres.*
2. *Development to provide a change to or extension of a generating station, or an electric line, of a description set out in paragraph 1 where the change or extension in itself meets the thresholds, if any, or description set out in that paragraph.*

Schedule 2 of the EIA Regulations specifies the developments requiring screening if no EIA report is provided. The following extract is relevant to the Proposed Development:

3. *Development to provide a change to or extension of—*
 - (a) *a generating station (other than a change or extension set out in paragraph 2 of Schedule 1); or*
 - (b) *an electric line of a description set out—*
 - (i) *in paragraph 1 of Schedule 1 (other than a change or extension set out in paragraph 2 of that Schedule); or*
 - (ii) *in paragraph 2 of this Schedule,*

¹ Low-carbon technologies are defined in the Local Plan document as 'those that can help reduce carbon emissions but are not from renewable sources'.

where the generating station or electric line is already authorised, executed or in the process of being executed and the change or extension may have significant adverse effects on the environment.

The Proposed Development does not fall into paragraphs 1 or 2 of Schedule 1 of the EIA Regulations as the proposed increase in generating capacity at Great Yarmouth is below the specified threshold of 300 MW and therefore the development does not constitute EIA development under Schedule 1. The Proposed Development consists of an operational change to an existing and already authorised generation station, meeting therefore the description set out in Schedule 2, paragraph 3 (a) of the EIA Regulations.

In order to ascertain whether the development requires environmental impact assessment, Regulation 15 of the EIA Regulations provides that the relevant authority must make a screening decision on the basis of the information provided by the Applicant, taking account of (as relevant): the criteria in Schedule 3, the results of assessments of the effects of the environment of the development (undertaken in accordance with implemented or retained EU law) and the views (if any) of every local planning authority consulted. The purpose of this report is to demonstrate that there are no likely significant effects arising from the Proposed Development.

4.1. Description of the Aspects of the Environment Likely to be Affected by the Proposed Development

The Proposed Development involves the operation of the existing Great Yarmouth Power Station at a slightly increased generation capacity. This is not expected to result in environmental effects and impacts that are materially different from the ones associated with the power station as currently consented and operated. There are no new physical works associated with the proposed variation and therefore there are no potential construction impacts.

In terms of potential operational impacts, air quality is the main aspect of the environment which has the potential to be affected by the Proposed Development. A full Air Quality Impact Assessment has been undertaken (see Appendix H) to assess the potential impact.

The potential environmental effects foreseen as a result of the proposed Section 36 variation are not significant and are summarised in the sections below.

4.1.1 Noise and Vibration

Noise arising from the operation of Great Yarmouth Power Station is controlled by operational noise limits which were originally imposed under Condition 24 of paragraph 4 of the original Section 36 consent for the power station granted in October 1997 (Appendix A) but later removed by the variation of the section 36 Consent in 2001. Great Yarmouth existing operational noise levels are regulated by the station's Environmental Permit EPR/KP3531/US and managed through the site Environmental Management System which is certified to ISO 14001. No changes are proposed to the noise and vibration levels as a result of the Proposed Development. Following the proposed Section 36 consent variation, Great Yarmouth will continue to carry out routine noise surveys to assess and manage the impact of their operation on noise levels in the local area in accordance with their Environmental Management System.

Following the proposed Section 36 consent variation, Great Yarmouth will continue to operate in compliance with the existing noise limits. It is not proposed to seek to vary any of these limits; any potential increase in noise resulting from the Proposed Development will therefore remain within the permitted limits. Consequently, the environmental impact of noise and vibration from the Proposed Development is negligible.

The proposed Section 36 consent variation at Great Yarmouth will not necessitate any new physical works on the power station site. Therefore, there will be no effects arising from noise or vibration associated with construction works.

4.1.2 Water Resources

The proposed variation to the Section 36 consent will not require any additional abstraction of water beyond the existing limits of the current abstraction licence for Great Yarmouth Power Station.

The station's Environmental Permit contains limits for emissions to water for a number of parameters including total suspended solids, oil and grease, flow, pH, temperature, and a number of specific chemical parameters. These limits are subject to prescribed reference periods, monitoring frequencies and agreed monitoring standards or methods. It is not proposed to seek to vary any of the limits on the Environmental Permit as a consequence of the proposed Section 36 variation.

There are no likely significant effects arising from the Proposed Development on water resources.

4.1.3 Flood Risk

There are no new physical works associated with the proposed Section 36 variation at Great Yarmouth Power Station and therefore there are no changes to flood risk potential at the power station.

A flood risk assessment (FRA) has not been provided as the Proposed Development is an increase in consented capacity at an existing power station and therefore an FRA is not necessary. The National Planning Policy Framework states that the aim of a sequential test (the main component of an FRA) is to steer development to the lowest risk of flooding. The Proposed Development in this case is a change in the authorised capacity of an existing power station and therefore the sequential test is not necessary nor appropriate.

4.1.4 Climate Change

4.1.4.1 Effects on the global climate

By being able to operate when sufficient renewable energy is unavailable to satisfy demand, efficient gas-fired power stations are projected to undertake an important role in preserving security of supply during the transition to a future energy system with low-carbon emissions. This will support the increasing size of the UK renewables portfolio.

Consequently, the proposed capacity increase will contribute to addressing climate change by ensuring that, when gas-fired generation is required, this will be preferentially delivered by efficient plants.

The additional capacity created by the Proposed Development will generally be used to displace less efficient capacity from the electricity system. In the UK, the electricity system is driven by robust commercial incentives that align with efficiency. Consequently, more efficient plants are usually dispatched before their less efficient counterparts. By replacing less efficient generation, the added capacity at Great Yarmouth will aid in reducing overall emissions from power generation.

The grant of the Section 36 variation, as detailed herein, will enable Great Yarmouth to generate in its most efficient way, while still operating within the existing limits imposed by relevant consents (environmental permit, abstraction licence, etc.), and with immaterial changes to the use of natural resources.

4.1.4.2 Climate Change Adaptation

Section 4.10 of the Overarching National Policy Statement for Energy (EN-1) makes a reference to climate change adaptation including a requirement on reporting authorities (including energy utilities) to assess the risks to their organisation presented by climate change.

The proposed capacity increase is not expected to affect in any way the risks associated with the effects of Climate Change on Great Yarmouth Power Station. These were analysed in the Climate Change Adaptation Report (CCAR), submitted by RWE npower in compliance with the Adaptation Reporting Power in the Climate Change Act 2008². The CCAR assessment adopted the methodology developed by the Association of Electricity Producers (Working Group on Resilience and Adaptation), where the Climate Change risk is determined based on the 'likelihood' (estimated probability of occurrence of an event in a specific time period) and 'consequence' (impact if an event occurs) of an extensive range of Climate Change hazards. To conservatively estimate risk, the CCAR assessment made use of the 'high' emission scenario (i.e., that causing the highest change on future climate and hence highest impacts) specified under the UK Climate Projections 2009 (UKCP09), the best information available at the time. Based on the assessment it can be concluded that the climate-related risks would be 'very low' and that, although Climate Change is expected to affect the probability of occurrence and potentially the intensity of forms of risk (generally related to the occurrence of extreme events of a wide range of types and duration) over the remaining lifespan of Great Yarmouth Power Station, natural short term variation in weather patterns (already considered and managed by the station) still remain more significant, as a source of risk, than the trend to a changed mean climate.

Although the hazards of Climate Change still remain the same as the ones considered in the first CCAR, understanding of climate change amongst the science community has significantly increased since the time of the first CCAR. In particular, from later in 2018, the UKCP09 projections were superseded by the UK Climate Projections 2018 (UKCP18). The release of UKCP18 climate projections provided an opportunity to reassess the resilience of power stations to Climate Change.

A screening analysis, based on a like-for-like comparison of probability distributions released, for the relevant climate variables, under UKCP09 and UKCP18 shows - over the time scale of interest for the remaining lifespan of Great Yarmouth Power Station - a reasonable level of consistency between the two projections with regard to all the main climatic parameters of interest (air temperature, precipitation change, sea level rise, river flow change) (Existing Assets: Climate Change Risk Assessment - UKCP18 vs UKCP09, prepared for JEP (JEP19AIB03).

² <https://www.gov.uk/government/publications/adaptation-reporting-power-received-reports>

Differences between UKCP18 and UKCP09 become particularly notable over extended time scales, especially concerning projected sea level rises and coastal or riverine flood risks. However, these time scales far exceed the expected lifespan of existing plants such as Great Yarmouth Power Station. Given its proximity to the coastline, the risk of sea level rise might pose potential impacts on the station. Nonetheless, it is important to note that UKCP18 projections diverge significantly from UKCP09 after the year 2040, a period that extends beyond the operational lifespan of Great Yarmouth Power Station. Therefore, while coastal risks are acknowledged, their relevance to the station diminishes when considering its remaining operational years.

Moreover, the sector's adaptation assessments typically utilise the 'high' emissions scenario, which is meant to represent a situation where temperatures rise by approximately 4°C by the end of the century. Under current energy policies and international agreements for mitigating greenhouse gas emissions, these scenarios represent an extreme 'worst-case' scenario. Even under these conservative assumptions, analysis based on the updated UKCP18 Climate Projections affirms that the Climate Change risks for Great Yarmouth, considering its remaining operational lifespan, can still be categorised as 'very low'. This assessment remains unchanged irrespective of the proposed capacity increase at the station.

4.1.5 Ecology and Biodiversity

The proposed Section 36 variation at Great Yarmouth Power Station will not necessitate new physical works to the power station site. Therefore, there will be no effects on ecology or biodiversity arising from construction works. The Air Quality Impact Assessment (AQIA) (Appendix H), detailed in Sections 4.2.8 and 4.2.9 of this report, evaluates both the potential impacts on air quality and its implications for local habitats and designated sites within a 10km radius of the power station. This assessment indicates that ecological impacts resulting from air concentrations of NO_x, associated acid, and nutrient nitrogen deposition are insignificant, with no likely significant effects, either alone or in combination with other sources. Moreover, the AQIA considered potential cumulative effects arising from nearby developments. It concluded that even when accounting for additional contributions from surrounding projects and activities, the combined impact on local air quality and ecological habitats remains minimal. The analysis included current and foreseeable emissions from other sources within the vicinity and determined that the cumulative effect, in conjunction with the proposed operational changes at Great Yarmouth Power Station, would not exceed critical environmental thresholds. Thus, even under the worst-case scenario of continuous 430 MWe operation, the contributions of NO_x and other pollutants are not expected to significantly alter air quality or negatively affect the ecological integrity of nearby coastal and grazing habitats. In summary, the Proposed Development, both individually and in combination with other local sources, is unlikely to have a significant impact on air quality or ecological habitats in the surrounding area.

Additionally, the Preliminary Ecological Appraisal (Appendix G), also presented in Section 4.2.9, specifically addresses the impacts on local ecology. This appraisal includes the two Ramsar sites – Broadland and Breydon Water – and three European Protected Sites: the Outer Thames Estuary Special Protection Area (SPA), the Southern North Sea Special Area of Conservation (SAC), and the Broads SAC, all within 10 km of the power station. It concludes that the Proposed Development will have no adverse impact on these environmentally sensitive areas, thus preserving their ecological integrity.

Noise arising from the power station is regulated by the station's Environmental Permit EPR/KP3531/US and managed through the site Environmental Management System which is certified to ISO 14001. Following the proposed Section 36 consent variation, Great Yarmouth will continue to carry out routine noise surveys to assess and manage the impact of their operation on noise levels in the local area in accordance with their Environmental Management System. Therefore, there will be no significant effects on ecology or biodiversity arising from noise emissions as a result of the Proposed Development.

4.1.6 Landscape and Visual Effects

The proposed Section 36 variation at Great Yarmouth will not require any new physical works on the site and therefore the physical appearance of the power station will not change. Therefore, there will be no landscape and visual effects arising from the Proposed Development.

The proposed Section 36 consent variation will not result in direct impacts on cultural heritage or archaeology, as there are no planned alterations to the power station's layout, dimensions, or appearance, and no fundamental changes will be made to its character or scale beyond what has already been consented. Consequently, there will also be no indirect impacts on cultural heritage or archaeology.

4.1.7 Social Economics, Traffic/Transport and Safety Effects

There will be no new physical construction works on site associated with the proposed Section 36 consent variation and therefore there will be no effect on employment or transport arising from construction. The power station will continue to provide social economic benefits from its existing employment in the area.

The Section 36 variation will not affect the number of personnel required to operate and maintain Great Yarmouth Power Station. The power station is fuelled by natural gas which is delivered to the site by an existing pipeline and therefore the proposal will have no effect on transport.

Great Yarmouth Power Station will continue to be operated in line with already established site health and safety procedures.

4.1.8 Atmospheric Emissions, Human Health and Ecology

This document is accompanied by an Air Quality Impact Assessment, which was undertaken to analyse the potential air quality impacts arising from the Proposed Development on human health and ecology.

The Air Quality Impact Assessment (Appendix H) demonstrated that the impacts of the Proposed Development to be authorised by this Section 36C variation relative to the baseline are insignificant by comparing modelling results for the baseline and the proposed change over a 10 km radius around the plant. Specifically, the assessment investigates three scenarios: Scenario (1) the current 420 MWe baseline operation;

Scenario (2) a 'worst-case' scenario where the plant operates at 430 MWe throughout the year; Scenario (3) and a more realistic scenario where the plant largely maintains 420 MWe but switches to 430 MWe during colder ambient temperatures.

From a human health perspective, modelling indicated that the NO₂ and CO contributions, under all scenarios, would be below 10% of the EA stage 1 screening criteria and thus deemed insignificant. While annual mean NO₂ concentrations would slightly exceed 1% of the EA stage 1 criteria, they would remain significantly below the 70% threshold set by the EA stage 2 assessment criteria. Furthermore, if the plant were to operate at 430 MWe throughout the year there would be negligible effects on local air quality and human health receptors.

Ecologically, the annual mean concentrations resulting from the Proposed Development, even under the worst-case Scenario (2) would remain insignificant. However, while maximum daily NO_x concentrations would exceed 10% of the Environmental Acceptance Level, they were still predicted to be under 100% of the Critical Load at each assessed ecological site. Even when considering that NO_x's primary effect is to increase nitrogen and acid deposition, these depositions are anticipated to remain less than 1% of the relevant thresholds. Furthermore, changes in NO_x concentrations due to altered operations (comparing Scenarios (2) or (3) to the baseline Scenario (1) are expected to result in an inconsequential rise of less than 0.1% of their respective critical levels.

In summary, the Air Quality Impact Assessment determined that the predicted changes in air quality, from allowing the facility to operate at a gross generation of 430 MWe under the worst case of continuous operation (Scenario 2), would be unlikely to have a significant impact on local air quality.

4.1.9 Habitats Assessment

RWE Generation UK commissioned an Air Quality Impact Assessment (AQIA) (Appendix H) that was prepared to consider direct and indirect impacts of airborne pollutants on surrounding habitats – namely, coastal saltmarsh in Breydon Water, coastal sand dunes in Great Yarmouth North Denes, and coastal and floodplain grazing marshes in Broadland. The study assessed impacts resulting from changes in atmospheric pollutant concentrations and ground surface deposition. Critical Loads and Levels, specific to the identified habitat types and ecological receptor locations, were included in the assessment.

The AQIA demonstrates that, when considering the worst-case scenario (Scenario 2), the ecological impacts from air concentrations of NO_x and nutrient nitrogen and acid deposition from the Proposed Development are below the threshold of significance. The assessment also demonstrates that there will be no likely significant effects on the habitat sites and any of its sensitive features or on any other protected conservation areas arising from the Proposed Development, either alone or in combination with other plans and projects.

In addition, RWE commissioned a preliminary ecological appraisal for the Great Yarmouth site (Appendix G). The report has identified that the site itself appears to hold little ecological value and has not identified any protected species or habitats within the Proposed Development site.

For the purposes of habitats assessment, it should be noted that there are no other possible impacts or likely significant effects from the Proposed Development on the surrounding habitats, as there are no new physical works associated with the Proposed Development and therefore there will be no construction impacts. The power station will continue to operate in line with its operational noise limits and the environmental impact of noise and vibration from the Proposed Development is, therefore, negligible.

There are no proposed changes to the site's Environmental Permit or Water Abstraction license and the site will continue to operate in line with these permit requirements. There are no other new consents or authorisations required for the purposes of the Proposed Development. It can be concluded therefore, there would be no likely significant effects from the Proposed Development on the designated habitat sites.

4.1.10 Waste

The proposed Section 36 variation implicates no additional waste generation, as it involves no construction activities or alterations to the existing infrastructure. Accordingly, this prevents any adverse influences on land, geology, and hydrology. Continuous operation under the variation will adhere to existing waste management protocols, ensuring no adverse effects on the surrounding environment or its management.

4.1.11 Potential Cumulative Impacts.

Potential cumulative impacts with other developments either proposed, consented, or in the development pipeline within 5km of Great Yarmouth Power Station have been assessed. For noise, the proposed Section 36 consent variation necessitates no new physical construction works, so there are no construction noise or vibration impacts, there will be no effects arising from operational noise. On this basis, there will be no cumulative noise impacts.

From an ecological perspective, as the Proposed Development involves no alterations or physical changes to the site, it inherently ensures that there will be no cumulative ecological impacts. This absence of impact is further supported by the fact that the Preliminary Ecological Appraisal did not identify any such cumulative impacts.

In terms of air quality, the AQIA incorporated considerations for the Third River Crossing in Great Yarmouth. Recent monitoring data, reflecting the Great Yarmouth power station's current operations, demonstrate no exceedance of Air Quality Strategy (AQS) objective values. Baseline air quality data used by other developments already account for the power station's existing operational conditions. Hence, the Proposed Development, both on its own and in combination with other authorised developments, will not lead to significant cumulative impacts on local air quality, ecology, or noise.

4.1.11 Conclusion

The proposed Section 36 variation will have no impact on other consents which regulate environmental emissions from Great Yarmouth Power Station. The station will continue to operate in line with the parameters of its current Environmental Permit and abstraction licence.

The alternative to the Proposed Development would be to continue to operate Great Yarmouth Power Station in a less efficient way.

This updated supporting statement also demonstrates that the Proposed Development will not have likely significant effects on the environment and is therefore not considered to be EIA Development for the purposes of the Electricity Works (Environmental Impact

5. Carbon Capture Readiness (CCR)

Section 6 (1) (b) of The Carbon Capture Readiness (Electricity Generating Stations) Regulations 2013 states that *'The appropriate authority must not – vary a relevant section 36 consent in such a way as to enable a combustion plant to increase its rated electrical output, unless the appropriate authority has determined whether the CCR conditions are met in relation to the combustion plant, as constructed or extended in accordance with the section 36 consent as to varied'*.

Paragraph 4.7.10 of NPS EN-1 states *'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 MWe and of a type covered by the EU's Large Combustion Plant Directive should demonstrate that the plant is 'Carbon Capture Ready' before consent may be given'*. The revised NPSs, in particular, revised EN-2, section 2.4.1 contain similar policy.

A CCR assessment for Great Yarmouth Power Station has been produced by RWE Generation UK's consultants AECOM in line with the above policy and regulations. The assessment is included within this variation application and is provided as Appendix D.

The findings of the carbon capture readiness assessment for Great Yarmouth Power Station can be summarised as follows:

- Regarding potential CO₂ storage areas/sites, it is considered that there are no major barriers to demonstrating potential CO₂ storage sites are available. The report proposed that the Barque gas field, the current CO₂ storage location for the Proposed Development, has sufficient storage capacity for the anticipated carbon output over the station's operational life. However, the site layout for the Proposed Development shows that there is insufficient space for the CCS technology and necessary auxiliary equipment within the existing red line boundary of the Proposed Development site.
- RWE Generation UK does not currently own any other land near Great Yarmouth Power Station except the land within the red line boundary of the Proposed Development site. Consequently, there is currently insufficient land available at Great Yarmouth Power Station site to install carbon capture technology.
- An economic assessment conducted within the report demonstrated that retrofitting a Carbon Capture Plant to an existing CCGT plant would be economically viable, subject to future carbon pricing and government support under the CCS Infrastructure Fund and the Dispatchable Power Agreement. However, in reaching such a conclusion, the assessment has not considered the potential costs associated with purchasing the land required to locate the carbon capture equipment.

RWE Generation UK have carried out a review of other Section 36 variations where, similarly, it was established that there was not sufficient space to install carbon capture technology. This review shows that there are several other cases where the CCR conditions could not be met. These are set out below:

Seal Sands/Thor CoGeneration - Both the Seal Sands and Thor CoGeneration consents were granted prior to the entry into force of the 2009 CCS Directive. However, both consents were granted at a time when there was consideration of CCR during the consent determination and, where applicable, the inclusion of preliminary CCR conditions within consents granted for CCGT generating stations. During both consent determinations, it was noted that there was insufficient space on the respective sites of those developments, and therefore there was no inclusion of CCR conditions within the consents.

Spalding Energy applied for a variation to the existing consent in January 2021, the variation to the existing consent was granted even though there was no suitable space on site for the inclusion of carbon capture equipment. Further detail on this application is set out below (see Appendix J).

The application documents submitted by Spalding Energy Company Limited included a CCR assessment, titled "Spalding Energy Project Carbon Capture Readiness Assessment Variation Application under Section 36C of the Electricity Act 1989" (ref 1396982-3) (see Appendix J). This document sets out the CCR assessment for the Spalding energy project, and one of the key sections includes paragraphs 1.3.10 and 1.3.11:

- *1.3.10 The CCR Screening Assessment also, under Regulation 6(1)(b), requested clarification on whether the Secretary of State for BEIS, as the appropriate authority, could vary the existing consent for SEP (i.e. could vary a relevant section 36 consent) in respect of the Proposed Development to allow an increase in the permitted electricity generation output of SEP to up to 950 MW (i.e. in such a way as to enable a combustion plant (with a rated electrical output of 300 MW or more) to increase its rated electrical output) should he determine that the CCR conditions are not met. In recognition of previous UK precedence where CCR conditions were not applied / the CCR conditions are not met, the request for clarification was made with regard to the Proposed Development improving both the environmental performance and electricity market competitiveness of SEP by, in particular, allowing for an improvement (increase) in the electrical generation efficiency, thus also reducing the specific CO₂ emissions associated with electricity generation.*
- *1.3.11 Subsequently, on 23 December 2020, BEIS confirmed, via e-mail⁵, that the: "in principle' position is that, in the particular circumstances where a section 36 consent issued under the Electricity Act had been granted before the [2009 CCR Guidance⁶] was issued, the Secretary of State would be able to grant a consent for a variation of that section 36 consent in a situation where the development that is the subject of the application has not met the Carbon Capture Readiness conditions". BEIS further confirmed that they: "did not see, on the basis the section 36 consent for the Spalding Energy [Project] was granted in 2000, that the [2009 CCR Guidance] would apply to any application to vary the consent".*

Spalding Energy's CCR assessment Annex C-1 also includes information on previous decisions taken on the grant of consents or S36 variations in relation to CCR requirements³.

³ <https://www.intergen.com/media/e1ppfq0c/document-10-appendix-d-supporting-ccr-assessment-information.pdf>.

Great Yarmouth Power Station obtained its original Section 36 consent in 1997, with a further variation in 2001. As both the original application and the subsequent variation were granted prior to 2009 it would appear reasonable to assume that, as in the case of Spalding Energy Centre, the 2009 CCR guidance would not apply retrospectively to Great Yarmouth in relation to this variation.

In addition to the 2009 CCR guidance, the Carbon Capture Readiness (Electricity Generating Stations) Regulations 2013 ('the 2013 CCR Regulations'), Regulation 6(1)(b) requires the consenting authority to assess the CCR conditions in relation to section 36C variations that would enable a combustion plant to increase its rated electrical output to 300MWs or more. Regulation 2(2) of the 2013 CCR Regulations sets out the CCR conditions in respect of the CO₂ emissions of a combustion plant:

- (a) suitable storage sites are available;
- (b) it is technically and economically feasible to retrofit the plant with the equipment necessary to capture that CO₂; and
- (c) it is technically and economically feasible to transport such captured CO₂ to the storage sites referred to in subparagraph (a)".

Taking into consideration the precedents set by the application submitted by Spalding Energy Centre and others, it is understood that a CCR Assessment is required to determine whether the CCR conditions in Regulation 2(2) are suitably considered. Through the Carbon Capture Readiness Assessment carried out by AECOM, RWE Generation UK have demonstrated that the CCR conditions have been fully considered. Therefore, it is our understanding that the Secretary of State for Energy Security and Net Zero, as the appropriate authority, can agree to the proposed variation without imposing a requirement for land to be reserved for CCR, as currently, there is no sufficient land available for such purposes.

5.1. Alternatives to Carbon Capture

Whilst the CCR Assessment has demonstrated that the CCR conditions are not fully met at the present time, this does not mean that an alternative decarbonisation option for Great Yarmouth Power Station would not be technically and economically feasible. DESNZ in March 2023 carried out a consultation into expanding the Decarbonisation readiness requirements with a possibility of updating the 2009 Carbon Capture Readiness requirements. This consultation set out additional decarbonisation measures and possible changes to the CCR requirements. The consultation included the possibility of combustion power plants to demonstrate decarbonisation readiness through conversion to hydrogen firing. The consultation recognised providing decarbonisation options will also ensure combustion power plants can develop a viable decarbonisation plan which best suits their individual circumstances. Hydrogen conversion could be a viable decarbonisation pathway for Great Yarmouth Power Station at some point in future, subject to detailed assessments and funding pathways.

6. Combined Heat and Power Readiness

NPS EN-1, states that '*Under guidelines issued by DECC (then DTI) in 2006, 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 [...]. The revised EN-1 published in November 2023 in section 4.8 also refers to the 2006 guidance.

The possibility of integrating CHP technology at the Great Yarmouth Power Station has been considered as part of this variation application.

Information regarding heat loads within the Great Yarmouth area has been taken from the DESNZ UK CHP Development Map. Using the information from this map, it has been concluded that:

- There are no large industrial sites near Great Yarmouth. There is no immediate opportunity for heat supply from Great Yarmouth power station to the surrounding area.
- The power station is located near a number of smaller industrial consumers. However, the size of these possible consumers varied, spread across a wide area and unlikely to match the output of the power plant.
- The vast majority of potential consumers are residential and given the intermittent operation of the power station means that it is not currently favourable to operate as a CHP, as heat may be required by consumers at times when the power station is not generating (this would also be the case for industrial users).
- The power station's intermittent operating regime would not allow for a reliable, year-round heat supply, making CHP economically unviable.
- Furthermore, the Great Yarmouth Power Station site has limited space to install equipment required for a CHP.

In light of the above circumstances, and there being no immediate opportunity for heat supply from Great Yarmouth Power Station to the surrounding area, the incorporation of CHP technology at the Great Yarmouth Power Station is not financially viable, practical or necessary.

7. Conclusion

This report accompanies an application for a variation under Section 36C of the Electricity Act 1989 to authorise the operation of Great Yarmouth Power Station at an increased gross generation of up to 430 MWe.

This report demonstrates that the Proposed Development supports the aims of the relevant planning policy in providing increased electrical capacity to maintain secure and reliable electricity supplies. The Proposed Development also supports the transition to a low carbon future in line with the National Policy Statements and their revised versions and with the increased energy efficiency of existing infrastructure as outlined in the NPPF as well as several policies in Great Yarmouth Council's Local Plan.

In conclusion, it is requested that a Section 36 consent variation and deemed planning permission be granted for the Proposed Development in the terms set out in the Proposed

Section 36 consent and revised deemed planning permission, as set out in the explanatory memorandum which accompanies the application.

Figures

- Figure 1 Red line boundary of the Great Yarmouth Power Station.
- Figure 2 Aerial view of the position of the Great Yarmouth Power Station in relation to housing and surrounding environment.
- Figure 3 Aerial image of Great Yarmouth Power Station.

Appendices

- Appendix A Great Yarmouth Power Station – Section 36 Consent Variation and Planning Conditions – October 1997
- Appendix B Great Yarmouth – Section 36 Environmental Statement – April 1996
- Appendix C Great Yarmouth Power Station – Section 36 variation – April 2001
- Appendix D Great Yarmouth Power Station – Carbon Capture Readiness Assessment – December 2023
- Appendix E Great Yarmouth Power Station – Technical Information to demonstrate impacts of ambient conditions on gross power generation – February 2023
- Appendix F Great Yarmouth Power Station – Environmental Permit (EPR/KP3531US) – January 2020
- Appendix G Great Yarmouth Power Station – Preliminary Ecological Appraisal – June 2023
- Appendix H Great Yarmouth Power Station – Air Quality Modelling Technical Report – February 2023
- Appendix I Great Yarmouth Water Abstraction Licence (7/34/15/*T/0223)
- Appendix J Evidence of Historical Precedent on CCR from Spalding and Decision Letter