

Keadby

Keadby 2

Existing National Grid Substation Keadby 3 Proposed Power and Carbon Capture Site

Indicative appearance of Keadby 3 in the context of Keadby 2 and the Keadby Windfarm

KEADBY 3 LOW CARBON CCGT Power station project

Welcome

Keadby 3 will be a highly efficient combined cycle gas turbine power station located on land at and near the Keadby Power Station site in North Lincolnshire. It will use natural gas as its fuel and will be fitted with a carbon capture plant to remove carbon dioxide from its emissions. The carbon capture plant would connect into infrastructure being developed through the Zero Carbon Humber Partnership and the Northern Endurance Partnership.

Following our initial (Stage 1) consultation in Summer 2020, we are holding a further Stage 2 Consultation to seek views of the local community and other stakeholders on our more developed

proposals for Keadby 3. The Stage 2 consultation for the Keadby 3 project will run until **5pm on** Wednesday 20th January 2021.

In addition to these information banners, also available to view as part of this virtual exhibition are the following materials:

- Our Statement of Community Consultation ('SoCC')
- Our Preliminary Environmental Information Report ('PEIR') and its Non-Technical Summary ('NTS')
- A plan showing the location of the Proposed Development Site
- A 'Frequently Asked Questions' ('FAQ') document
- A leaflet about the Zero Carbon Humber Partnership
- A video showing in the theatre with drone video footage and an illustration of how Keadby 3 might look
- Details of how to join our upcoming webinars; and
- The Project's online feedback form.

The same information is also available to download from our Project Website: www.ssethermal.com/ keadby3.

About SSE Thermal

SSE Thermal, part of the FTSE-listed SSE plc, is a leading developer, owner and operator of electricity generation and energy storage assets. Its portfolio includes five of the most flexible and efficient gas-fired power stations across the UK and Ireland.

The business has a strategy to create value for shareholders and society by developing, owning and operating low-carbon energy infrastructure in a sustainable way. Its vision is to become the leading provider of flexible thermal energy in a net-zero world. As part of this ambition, it has a core focus on further decarbonising its energy generation through emerging carbon capture and hydrogen solutions. SSE plc employs 12,000 people directly across the UK and Ireland and is proud to be a real Living Wage and Fair Tax Mark accredited company.

Providing Feedback

We encourage you to provide feedback on our proposals. There are a number of different methods you can use:

- The feedback form –available as part of this virtual exhibition and the Project Website
- By post to Freepost Keadby 3
- By email at consultation@keadby3.co.uk
- Leave a message on 0800 211 8194 If you would like us to call you back, please include your name and number as part of your message.

Postal services may take longer at present due to coronavirus. Please observe all relevant precautions. We cannot guarantee consideration of feedback provided via methods not listed above (such as on social media).

What is Keadby 3?

The Keadby 3 Low Carbon Gas Power Station Project is a high efficiency combined cycle gas turbine (CCGT) power station with a capacity of up to 910MW electrical output, including a post combustion carbon capture plant to be built on land adjacent to Keadby 1 and 2 near Scunthorpe.



Schematic of CCGT Power Plant and Carbon Capture Plant

The inclusion of a carbon capture plant in the project means that the carbon dioxide emissions from the power station can be captured and directed via a pipeline to an offshore geological store. The pipeline and geological store will be developed through the Zero Carbon Humber Partnership and Northern Endurance Partnership respectively. SSE Thermal is part of the Zero Carbon Humber Partnership, working with other leading companies in the Humber area to decarbonise industry and power generation in the region. Please see the leaflet as part of this consultation for more information on Zero Carbon Humber. The Northern Endurance Partnership has been established to develop offshore carbon dioxide storage facilities in the UK North Sea, which projects in the Humber will seek to use.

The Project also includes natural gas, electricity and cooling water connections and associated development required to construct and operate the power station.

In order to develop Keadby 3 we must apply for a Development Consent Order (DCO) from the Secretary of State for Business, Energy and Industrial Strategy (BEIS). If granted, this DCO will permit the construction and operation of the Keadby 3 project and set out measures that must be adopted to minimise any potential environmental impacts or effects. The DCO if granted could also include other powers, such as the temporary acquisition of land or permanent easements within defined areas: these are called the Order Limits and we expect these to be similar to the red line boundary in the Location Plan (and in the figure on the next banner).

Needs and Benefits

The UK has legislated to cut national carbon emissions to Net Zero by 2050. This will require a major transition in how we generate and use energy.

We believe efficient gas-fired generation is essential to delivering Net Zero emissions by 2050, providing the flexibility needed to back up a system based on renewables.

This is also the view of the Committee on Climate Change, which identified in 2019 that to meet Net Zero by 2050 there is a need for new gas-fired electricity generation with Carbon Capture and Storage. The amount required has been estimated by the National Infrastructure Commission at more than 18GW - equivalent to building twenty Keadby 3 projects around the country by 2050.

Keadby 3 will only be built with a clear route to decarbonisation which will be achieved by including a carbon capture plant to connect into the carbon dioxide pipeline coming forward as part of the Zero Carbon Humber Partnership proposals.

Project Components

Keadby 3 Low Carbon Gas Power Station Project would comprise a low carbon gas fired power station with a gross electrical output capacity of up to 910 megawatts (MW) and associated buildings, structures and plant.

A carbon capture enabled power station including a Combined Cycle Gas Turbine plant with integrated cooling infrastructure, a carbon capture plant, carbon dioxide compression equipment, water treatment plant, wastewater treatment, firefighting equipment, emergency diesel generator, control room, workshops, stores and gatehouse, a permanent laydown area, chemical storage, pipework and auxiliaries, other minor infrastructure, and natural gas receiving facility along with a new surface water drainage system and above ground installation for connection to the carbon dioxide pipeline (all located in the **Proposed Power and Carbon Capture Site**). A natural gas pipeline connection within the Keadby Power Station site to connect the **Proposed Power and Carbon Capture Site** to the existing National Grid high pressure gas pipeline.

Electrical connection works between the **Proposed Power and Carbon Capture Site** and the existing National Grid 400kV Substation (Electrical Connection Area to National Grid 400kV Substation) and option to connect to the existing Northern Powergrid 132kV Substation (Electrical Connection to Northern Powergrid 132kV Substation)



Water Connection Corridors fincluding either a water intake for cooling and process purposes within the Stainforth and Keadby Canal (Canal Water Abstraction Option) or if not available an intake from the River Trent (River Water Abstraction Option), both fill ; Disposal of used cooling water to the River Trent (Water Discharge Corridor) ; and a mains water supply within the Keadby site.

Associated development including: temporary construction phase Laydown Areas ••••; the use of the existing Waterborne Transport Offloading Area and Additional Abnormal Indivisible Load Route used for the Keadby 2 project; site preparation works; pipeline and cable connections between parts of the site; landscaping and biodiversity provision, internal access roads, roadways and footpaths; gatehouses, security and fencing; and lighting.

How would the site be accessed?

We may improve the current Keadby 2 construction route to allow it to be used for both the construction phase and operational staff traffic for Keadby 3 (**Construction and Operational Access Route**) meaning that traffic relating to operations for Keadby 3 would not need access to Keadby. The use of the A18 access for operational traffic would involve constructing a new gatehouse and parking and may include junction works (**A18 Junction Improvement Option**) . There would also be a permanent **Emergency Vehicle Access Road** between the **Proposed Power and Carbon Capture Site** and Chapel Lane.

We welcome your feedback on the use of the A18 access for operational traffic as part of this consultation. You can use the survey form to the left of the table.

What has changed since your Stage 1 Consultation?

We have made a number of technical decisions about the project components since Stage 1 Consultation, including the layout, which avoids plant rich habitats on part of the SSE landholding, and the selection of hybrid cooling towers rather than air cooled condensers. Furthermore, hydrogen is not being progressed as an option for the fuel supply. Instead, natural gas with Post-combustion carbon capture will be deployed. The Project would connect to the existing natural gas pipeline supplying the Keadby site, and export carbon dioxide to third party pipeline infrastructure.

Environmental Impact Assessment

A Preliminary Environmental Impact Report (the PEIR) has been produced, along with a Non Technical Summary (the PEI Report NTS). This sets out the findings to date of our Environmental Impact Assessment (EIA) work.

We have carried out a number of surveys, including habitat and species surveys, water monitoring and landscape and visual impact baseline photography.

The PEIR has considered the potential adverse and beneficial environmental impacts and effects of the Project. Worst case assessments have been carried out, and further evaluation is ongoing. Based upon the preliminary findings, a summary of the potential effects is provided below:

Topic	Construction	Operation
Air quality	Through the use of a Construction Environmental Management Plan (CEMP) and construction traffic management plans, no significant adverse effects are predicted.	The majority of pollutants released would result in negligible adverse impacts at human health and ecological receptors. Based on screening assessments, potentially significant air impacts could occur from the release or formation of amine degradation products although no air quality standards or guidelines are predicted to be exceeded. Ammonia emissions from the process cannot at this stage be screened out as insignificant although no significant adverse effects are considered likely. Work is ongoing to determine the level of significance of effect and whether additional mitigation is required. This will be established prior to submission of the DCO application.
Noise and Vibration	If not properly managed, construction effects at certain residential receptors may be significant adverse for certain noisier activities, particularly at night-time should such works be required. However, through appropriate scheduling of construction activities, and restrictions on those activities taking place outside core working hours so they do not exceed the relevant limits, significant adverse effects can be avoided.	Significant adverse daytime and night-time operational noise effects are predicted at certain noise sensitive receptors unless additional mitigation measures are applied. Potential design mitigation options are being considered to reduce effects such that they are considered not significant. These will be determined prior to submission of the DCO and presented in the ES.
Landscape and Visual Amenity	During construction, temporary significant adverse effects are expected to occur at a number of nearby visual receptors including residential properties and users of the canal and towpath.	During opening and operation, significant adverse effects on a small number of visual receptors including residential properties and users of the canal and towpath are predicted. The design of the Project will aim to minimise adverse effects through optimised design and layout as well as appropriate use of materials and finishes.
Flood Risk and Water Resources	Through the use of a Construction Environmental Management Plan (CEMP), no significant adverse effects are predicted.	Two small drainage ditches will be lost as a result of the Project. Through the implementation of habitat creation opportunities, including use of sustainable urban drainage systems (SuDS) within the surface water collection system, no significant effects are predicted.
Biodiversity and Nature Conservation	Through the use of a Construction Environmental Management Plan (CEMP), and adherence to relevant protected species legislation, no significant adverse effects are predicted.	No direct effects on protected species or designated sites are predicted for the Project. There is some potential for adverse air quality effects on habitats containing species sensitive to ammonia, where levels at these sites are already above relevant thresholds. Ongoing assessments will determine whether additional mitigation is required and what biodiversity enhancement measures can be included within the DCO application.
Cultural heritage	Significant adverse effects could occur from piling and any ground remediation required, which may result in the partial removal of prehistoric peat deposits in areas of the Proposed Power and Carbon Capture Site. However, further appraisal of the likely presence of these assets will be undertaken with the aim of defining impact avoidance measures. With appropriate mitigation, residual effects are likely to be not significant.	There will be no significant effects on archaeology and cultural heritage during operation.

Socio-economics	A significant beneficial effect related to direct and indirect employment created by the construction phase of the Project is predicted on the economy.	No significant effects are predicted.
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Where can I find out more about the full PEIR or the PEIR NTS?

The PEIR NTS has been designed as an easy to read digital document and can be viewed by clicking on the PEIR document on the table in the centre of this virtual exhibition room. The full PEIR and its figures and appendices can also be viewed by clicking on the PEIR document. The virtual exhibition room will be open until the close of Stage 2 Consultation at 5pm on Wednesday 20th January 2021. Alternatively, PDF versions of the PEIR documents and NTS are available on the Project Website and will remain available after the close of Stage 2 Consultation.

If you have technical questions about the PEIR we encourage you to join one of our webinars and ask the project team, and if you have feedback this can be provided via the feedback form.

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Construction

Construction of the Project could potentially start as early as Quarter 3 2022, with construction activities to be completed within three years followed by commissioning. The figure below shows an indicative programme.



Haul Routes and Laydown Areas

Where possible, facilities used for the construction of Keadby 2 will be reused to minimise disruption. For example, the principal access during construction would be via the existing road access from the A18 used for Keadby 2. This road passes over the Stainforth and Keadby Canal and the Scunthorpe to Doncaster rail line via Pilfrey Bridge. It then links to Bonnyhale Road and onwards towards to the Project Site along existing private access roads

Abnormal Indivisible Loads (AIL) would arrive at the Waterborne Transport Off-Loading Area and be offloaded using retained lifting equipment. AIL would enter the site via the Keadby 2 Additional AIL Route. It may also be necessary to bring a small number of AIL through Ealand, via Bonnyhale Road, as has been the case with the construction Keadby 2. The routing of AIL would be subject to controls as part of a Construction Traffic Management Plan, which will be a requirement of the DCO.

Laydown areas required will depend upon the final choice of technology and contractor. At this stage, laydown requirements have been estimated and assessed using worst-case assumptions. The figure displayed on banner 3 shows the areas of land



under consideration for construction laydown and contractors' compounds. Subject to final selection, the laydown areas would be secured by fencing and gates, levelled and underlain by a permeable membrane.

Earthworks and Connections

Some earthworks may be required to reprofile the site. As far as practicable, excess spoil will be reused as part of the construction works although some movement of materials to and from the site may necessary. Soils will be stored away from watercourses and areas of higher flood risk.

All gas connection works would be located within the Keadby Power Station site on SSE land. The water abstraction point would either be on the Stainforth and Keadby Canal adjacent to the Keadby 2 abstraction point or on the River Trent as an upgrade or renewal of the Keadby 1 abstraction point. In either instance, a temporary cofferdam would be built in the waterway to provide safe and ecologically appropriate working conditions and allow the construction of a concrete apron extending from the bank of the waterway. Whichever abstraction option is selected, a pipeline would be constructed using open cut methods from the intake to the Proposed Power and Carbon Capture Site. If the River Water Abstraction Option is selected, some of the existing pipework may be able to be reused but this will need to be extended to the Proposed Power and Carbon Capture Site.



Construction Phase Mitigation

We would require our contractor to produce and maintain a Construction Environmental Management Plan to control construction activities to minimise, as far as reasonably practicable, impacts on the environment and amenity. This would include industry best practice measures and specific measures set out in our Environmental Statement. A Framework Construction Environmental Management Plan will be produced in support of our DCO Application and will set out the core working hours, key management and monitoring activities to be carried out by the contractor.

A phase of commissioning would be required following construction to test the performance and installation of the process equipment.

Design

We are considering how the appearance of the site and the larger buildings could be enhanced through the use of alternative forms or materials, appropriate colours, and boundary treatments.

Technical and functional requirements

The key influences and constraints on the design are:

Scale

The largest buildings and structures are the CCGT and its heat recovery steam generator, the carbon capture plant, and the hybrid cooling towers. Some ducting, supports and ancillary structures are placed on the surface of the CCGT building. The hybrid cooling towers are lesser in scale than the air cooled condensers shown in the imagery at Stage 1 consultation. Additional overhead line towers ('pylons') are unlikely to be required.

This is determined by the availability of land, proximity to electrical and cooling infrastructure, environmental considerations such as existing habitats, the location of existing structures and plant such as the existing National Grid sub-station and gas supply pipeline, and the anticipated location of the carbon dioxide export pipeline. The CCGT and carbon capture plant and their hybrid cooling towers are close-coupled for efficiency. Different types of hardstanding are installed between items of plant, to provide good visibility and safe working conditions in normal and 'outage' situations.

Perimeter

A secure perimeter is required, without overhanging trees or obscured visibility, along with suitable access and emergency egress points.

Durability

The project will be constructed using engineering components and materials that will ensure that Keadby 3 operates safely, cost effectively and efficiently for at least 25 years.

Design Opportunities

We are considering how to improve the appearance of the larger structures compared to a more functional design, considering the appearance in long distance views. Nearer to the site, we are looking at how to soften the appearance of smaller structures, reinforcing local character through material selection and finish, and design attractive and welcoming gateways.

Building Finish

Boundary Treatments and Accesses

On the CCGT building the metal cladding could use banding, 'fading' from dark at ground floor to light at roof level to reduce the apparent mass. Colour or texture (such as mesh panel) could alternatively be used to highlight certain areas, or ancillary structures, to create focal points and add depth. The existing Keadby 1 power station uses a mixture of cladding and colour: grey lower sections, white upper sections, between which a red band encircles all the buildings. Keadby Bridge (King George V Bridge) and Pilfrey Bridge have a dark green finish which could be considered for bridges and lower sections of buildings. Alternative materials and uplighting are not considered appropriate for larger buildings, noting the unlit metal finish of other power infrastructure in the area.

The security perimeter can incorporate amenity planting to provide visual interest and a degree of screening of lower structures. Wildlife features such as native species hedgerow, earth bunds, and drainage ditches or ponds can also have visual benefits and where space allows the boundary treatment will deliver on multiple objectives. Perimeter lighting and CCTV columns can be integrated into the fence construction and signage will also be grouped to minimise clutter and aid wayfinding. Open areas such as visibility splays, entrance gateways and areas of parking will use a mix of hard and soft surfacing, and accessibility will be maximised through surfacing, contrasting materials, lighting and wayfinding.

Smaller structures at edge locations could adopt a similar shape or roofline as the larger buildings, to

signify the link with the power station site, but could be finished in traditional materials that relate to its surroundings. For example the potential new gatehouse on the access road could echo the form of the larger buildings while using red bricks as seen on the nearby farm access and in the villages.



We would encourage you to provide your feedback on the design ideas above. We will take this into account in finalising our DCO application, which will include written guidance ("design principles") to guide building finish and boundary treatments at the detailed design stage and ensure that the project will be both functional and attractive.

Further information and Next Steps

The DCO Application Process

Before Keadby 3 can be built, we need to apply for a Development Consent Order ('DCO') from the Secretary of State for Business, Energy and Industrial Strategy ('SoS') under the Planning Act 2008. Consultation is a key part of the DCO application process. Following our Stage 1 Consultation in Summer 2020, this Stage 2 consultation represents the next opportunity in the process for the local community and other stakeholders to comment on our proposals for the Keadby 3 Project. The DCO application process and our expected timescales for obtaining consent are summarised below.



As required by the Planning Act 2008, we will prepare a Consultation Report showing how we have considered the comments received during our consultation on the proposals.

The DCO application will be submitted to the Planning Inspectorate ('PINS'), which will administer the application process for the SoS. Following submission of the application PINS will first decide, on behalf of the SoS and within a prescribed period of 28 days, whether to accept the application for examination. If accepted, PINS will then appoint an independent inspector or panel of inspectors, also known as the Examining Authority ('ExA'), who will examine the application on behalf of the SoS.

Following an examination process of up to six months, the ExA will have three months to write a report setting out a recommendation as to whether development consent should be granted. The report is then sent to the SoS who has three months to consider it and to make a final decision on whether to grant development consent. If the SoS grants consent this will be in the form of a DCO.

What happens next?

The comments and responses received to this consultation will be used to help us finalise our proposals for the Keadby 3 Project prior to submitting the DCO application. If you are looking for information as to how the Keadby 3 Project is progressing, please visit the Project website www.ssethermal.com/keadby3 for periodic updates. The Project also has a dedicated page on the PINS National Infrastructure Planning Portal: https://infrastructure.planninginspectorate.gov.uk/projects/yorkshire-and-the-humber/keadby-3-low-carbon-gas-power-station-project_

Don't forget that you can submit your comments on the Stage 2 Consultation via the following means:

- The feedback form –available as part of this virtual exhibition and the Project website (www.ssethermal.com/keadby3)
- By post to Freepost Keadby 3
- By email at consultation@keadby3.co.uk
- Leave a message on 0800 211 8194 If you would like us to call you back, please include your name and number as part of your message.

Comments must be received no later than 5pm on Wednesday 20th January 2021.

Meet the Team

SSE Thermal

Andrew Underwood - Development Manager

As SSE Thermal's Project Development Manager for the Keadby 3 project, Andrew leads all activity relating to the engineering and development of the proposed power station. Andrew has over 20 years power project experience and has spent 11 years working on SSE project developments including engineering lead for the Keadby 2 project.

Jayne Collings - Stakeholder Manager

Jayne is a Communications professional, with extensive experience of managing stakeholder engagement across SSE Thermal's assets in development, construction and operation. Jayne's role involves liaising with numerous stakeholders, including local political representatives, the media and residents to ensure they are well informed, able to provide feedback on projects and have any questions or concerns listened to.

Jade Fearon - Stakeholder Manager

Jade has worked for SSE for over 8 years and manages communications and stakeholder engagement for SSE Thermal projects in England and Wales. Jade is leading the communications and engagement for the Keadby 3 development as well as the Keadby 2 construction project. Locally based, Jade has first hand knowledge of the area in which the development is taking place.









AECOM **Richard Lowe - Project Director**

Richard works for AECOM and leads the environmental assessment work to support Development Consent Order (DCO) applications for a number of power schemes like this Keadby 3 application, including the Net Zero Teesside CCS project. Richard is based in Leeds and specialises in air quality impact assessments.



Susan Evans - Project Manager

Susan is an AECOM EIA Manager in the Environment and Planning team in the Leeds Office. Susan has 20 years of EIA practice experience, including scoping and managing EIAs for developments throughout the UK within the manufacturing, power, waste, nuclear, land development and transportation sectors for a range of public and private sector clients.

Rupert Wilson - EIA Coordination



Rupert is a Senior Environmental Consultant, with experience in a range of infrastructure projects in the UK. Rupert's primary role is in Environmental Impact Assessment (EIA) coordination, where he regularly project manages technical inputs to large-scale planning applications. He has been the EIA coordinator on several high-profile projects across the power sector, including The Eggborough CCGT Project, which gained consent in 2018.



Ed Walker - EIA Coordination

Ed is a Senior Environmental Consultant with specific experience in the assessment, consenting and development of marine-based Nationally Significant Infrastructure Projects. Ed has worked on several DCO applications within the power sector and has experience of consenting and EIA within the emerging Carbon Capture, Utilisation and Storage (CCUS) sector.

DWD **Geoff Bullock - Planning**

Geoff is a chartered town planner with over 20 years' experience and has led the planning for power, renewables and other infrastructure including Keadby 2 CCGT, Ferrybridge Multifuel, and White Rose Carbon Capture and Storage Power Station. He leads on engagement with the local planning authority and Planning Inspectorate and will represent the project during its public examination.

Colin Turnbull - Planning

Colin is a chartered town planner and has worked on plans for power stations, battery storage and industrial projects including at Hatfield, South Humber Bank, Drax, and Ferrybridge and has fifteen years' experience. His role includes writing and carrying out the project's consultation strategy and applying the requirements of planning policy to the project design.







Ardent

Greg Eacock – Senior Land Referencer

Greg is a Senior Land Referencer at Ardent based in Leeds. Greg has worked on an array of infrastructure projects, predominantly on transport and power plants, which include High Speed Two (HS2) and VPI Immingham OCGT. His primary roles on projects include land referencing, stakeholder engagement and survey access.

