

Glossary of terms

| Word | Definition |
|--|---|
| Biogenic carbon dioxide | Biogenic carbon dioxide emissions are defined as carbon dioxide emissions related to the natural carbon cycle, as well as those resulting from the combustion, harvest, gasification, digestion, fermentation, decomposition, or processing of biologically based materials. |
| Fischer-Tropsch process | The main gas-to-liquid conversion technology to be used by Lighthouse Green Fuels to create sustainable aviation fuel (SAF). |
| Flare | A safety device used to burn off flammable gas released during start-up or shutdown events or abnormal plant operations. |
| Feedstock | Raw materials to supply or fuel a process or machine. The feedstock for Lighthouse Green Fuels will be waste and/or waste biomass. |
| Gasification | The gasification facilities convert solid waste and/or waste biomass feedstocks into synthesis gas (syngas). |
| Green naphtha | A by-product of the sustainable aviation fuel (SAF) production process. Green naphtha is an excellent feedstock for sustainable chemical production processes. |
| Preliminary Environmental Information Report (PEIR) | An in-depth description of the Project, the effects the Project would have on the environment and the measures proposed to reduce the impacts. |
| Sustainable aviation fuel (SAF) | SAFs are renewable or waste-derived aviation fuels that meet strict sustainability criteria. SAF is a safe, proven fuel. SAF derived from waste and/or waste biomass sources such as municipal solid waste or waste wood have the potential to reduce lifecycle carbon emissions by up to 80% compared with conventional aviation fuel. |
| Synthesis gas (syngas) | A mixture of carbon monoxide and hydrogen generated from the gasification process, where solid feedstocks are turned into gases. Syngas is cleaned and used as the input feed gas stream for the Fischer-Tropsch unit. |

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Introduction

Lighthouse Green Fuels is a waste-tosustainable aviation fuel (SAF) project, which will convert waste and/or waste biomass into aviation fuel at the Project Site, Billingham, Stockton-on-Tees, UK.

The Project will be the largest of its kind in Europe, converting over 1 million tonnes of waste and/or waste biomass into over 175 million litres of advanced SAF and approximately 30 million litres o green naphtha each year.

This is equivalent to the fuel required for over 25,000 short-haul flights to Europe, or over 2,500 long-haul flights to destinations such as the Americas or Australia, per year.

It is also the equivalent of saving approximately 350,000 tonnes of carbon dioxide emissions per year compared with conventional aviation fuel.

With future plans to connect Lighthouse Green Fuels into local carbon capture and storage infrastructure, this could increase to 750,000 tonnes of carbon dioxide emissions saved per year.

Our statutory consultation – May to June 2024

We are now carrying out a statutory consultation on our proposals for Lighthouse Green Fuels. Our consultation is running from **Thursday 16 May to Thursday 20 June 2024**. This will be your opportunity to view our plans, ask questions to members of the project team and provide feedback on our proposals.

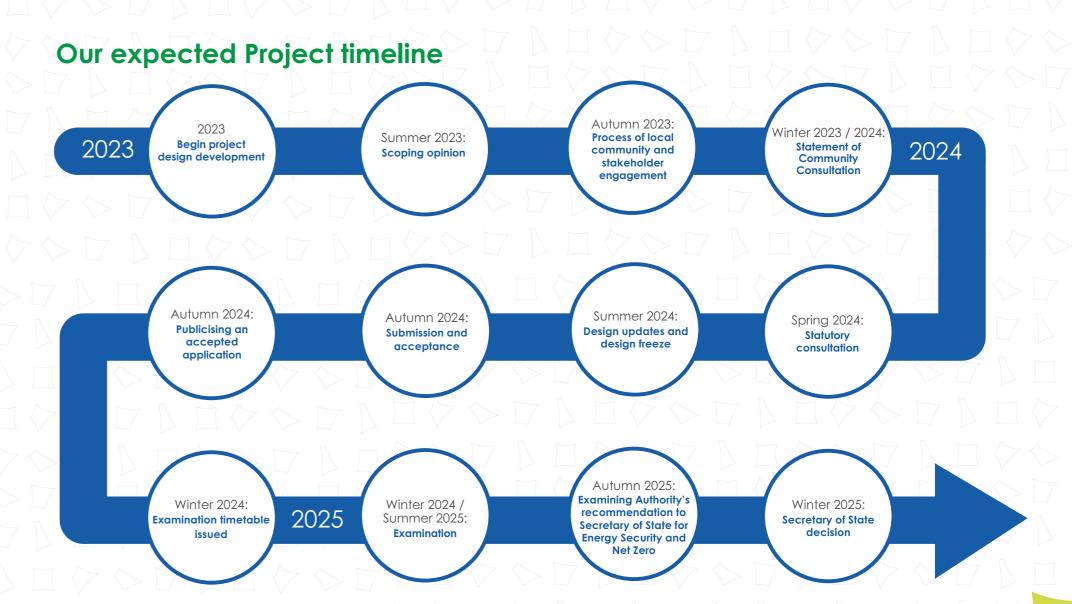
This booklet provides information on how you can get involved and have your say. Your feedback will be important in helping us to finalise the detailed proposals for the Project, which we are expecting to submit to the Planning Inspectorate later this year.

Consenting timeline

The Project is classified as a Nationally Significant Infrastructure Project (NSIP). We are therefore required to submit an application for development consent to the Secretary of State, in accordance with the Planning Act 2008.

More information on the national infrastructure planning process can be found here: https://infrastructure.planninginspectorate.gov.uk/application-process/the-process/

This includes details on what comes next in the process, once our application is submitted and through to a decision by the Secretary of State.



Who we are

Lighthouse Green Fuels Ltd is owned by Alfanar, a global project development, manufacturing and engineering company. Alfanar has a presence in 24 countries across the Middle East, Asia, Africa and Europe.

With a global renewable power development portfolio of 1.75 GW, Alfanar's Global Development division has significantly contributed to the decarbonisation the power sector.

Now the division is focused on decarbonising the transportation sector. This includes the 'hard-to-decarbonise' sectors such as aviation, marine and heavy goods vehicles. It currently has renewable fuels projects, including SAF projects, under development across the world.

In 2018, Alfanar acquired rights and infrastructure for the Project Site, which is located in Billingham, Stockton-on-Tees. Alfanar is investing over £1 billion to advance the UK's domestic SAF production through the development of Lighthouse Green Fuels.





Background



In a rapidly decarbonising world, where other forms of transport have easier paths to decarbonise, the aviation industry has the potential to become the largest emitter of carbon dioxide globally by 2050. Passenger numbers are set to quadruple compared with pre-pandemic levels to 16 billion passengers per year. Reducing the amount of carbon dioxide emitted by the aviation industry is therefore one of the most significant challenges we must overcome to meet the UK's Net Zero ambitions.

Following the successful development of large-scale renewable energy projects globally (i.e. wind and solar), Alfanar is now focusing on projects in 'hard-to-decarbonise industries' such as aviation. By producing SAF, Lighthouse Green Fuels will help to decarbonise the aviation industry.

Why sustainable aviation fuel?

Decarbonising the UK aviation industry is a greater challenge than decarbonising other forms of transport. Several decarbonisation routes have been proposed, but SAF is currently the only option that presents a viable, immediate and long-term solution. This is for three main reasons:

- SAF offers significant greenhouse gas savings compared with conventional aviation fuel
- SAF can use the existing distribution, storage and refuelling infrastructure traditionally used by fossil fuels
- SAF is a safe alternative and already used to fuel flights today

The UK and energy security

The UK is ideally placed as a key global aviation hub. It operates almost 8.4% of global aviation capacity, despite representing just 0.8% of the global population.

Recent world events have highlighted the importance of domestic energy security in an increasingly uncertain global economy. An important aspect of this will be the provision of domestically-produced fuel for the UK aviation industry. Lighthouse Green Fuels will have the largest SAF production capacity among all advanced SAF facilities in Europe, which signifies the Project's vital role in ensuring the future of the UK's energy security.

The UK also has access to permanent offshore geological stores (i.e. depleted oil and gas fields) which can be used to store carbon, Liahthouse Green Fuels intends to connect into these, and store the carbon emissions generated by the SAF production process via the local carbon capture and storage infrastructure.

What is Jet Zero?

Reducing our carbon emissions will be a collective effort by individuals, businesses and governments across the world. The UK government has committed to decarbonising the UK aviation industry by 2050 when it is intended that the UK will be a carbonneutral country. As part of this commitment, the government announced a strategy for the aviation industry in 2022, known as the Jet Zero Strategy².

The Jet Zero Strategy states that SAFs are key in accelerating the transition to Jet Zero and represent an industrial leadership opportunity for the UK.

Within the Strategy, the government has also committed to at least five SAF production plants being under construction by 2025 and for SAF to represent 10% of the UK aviation fuel mix by 2030.

Lighthouse Green Fuels represents one of the five identified SAF plants and was awarded funding, totalling over £22 million, from the Department for Transport's Green Fuels, Green Skies (GFGS) and Advanced Fuels Fund (AFF) competitions.

The challenge is to meet Net Zero with four times as many aviation passengers. The solution is SAF, the Jet Fuel for Net Zero.

Our vision for Lighthouse Green Fuels

Our vision for Lighthouse Green Fuels is to develop a flagship project for the UK, helping to deliver the sustainable future of the UK's aviation industry while setting the standard for production outputs, carbon dioxide savings and job creation.

The objectives for Lighthouse Green Fuels are to:

Contribute to the UK and Teesside's Net Zero ambitions



Lead the way in UK SAF production to achieve Jet Zero



Support the local economy

Provide national energy security





Increase biodiversity and enhance existing ecology to achieve biodiversity net gain



Develop the Project in a responsible and considerate

The Project in numbers:



Over 1 million tonnes

of waste and/or waste biomass processed per year





Over 175 million litres

of SAF and 30 million litres of green naphtha produced per year



25.000 short-haul

or 2,500 long-haul flights fuelled per year from the



Up to 350,000 tonnes of carbon dioxide

emissions avoided per year compared with conventional aviation fuel. Up to **750,000** tonnes with access to carbon capture

and storage infrastructure



Up to 2,600 jobs

created during the construction phase



created in the UK once operational, including 240 full-time jobs on the Project Site



https://www.sustainableaviation.co.uk/wp-content/uploads/2023/04/Sustainable-Aviation SAF-Roadmap-Final.pdf

² https://assets.publishing.service.gov.uk/media/62e931d48fa8f5033896888a/jet-zerostrategy.pdf

Statutory consultation – our proposals for Lighthouse Green Fuels

Site selection

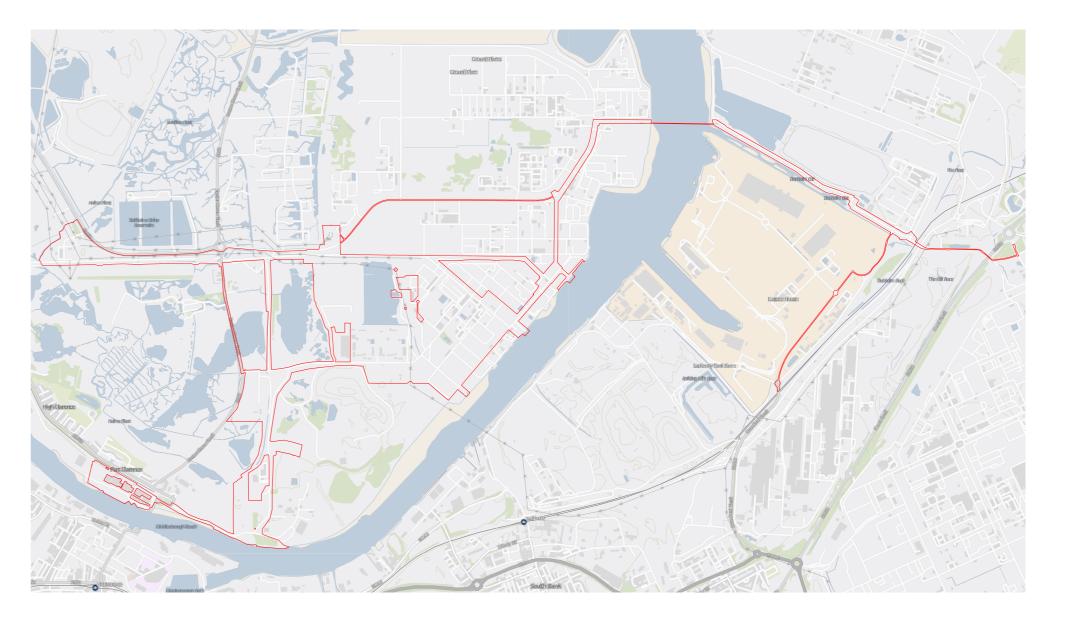
Before Alfanar acquired any interest in the Project Site, it was partially developed for energy generation. In 2018, Alfanar acquired rights and infrastructure for the Project Site and a plan was made to redevelop it to create a facility capable of producing liquid fuels from waste and/or waste biomass.

The waste would be non-recyclable waste that would otherwise go to landfill. The waste biomass could come from non-hazardous waste wood or forestry residues.

The Project Site is considered to be suitable for SAF production for a number of reasons, including that it:

- Is located within an existing industrial area
- Is a brownfield site, with no development proposed on green belt land
- Is broadly flat land with limited vegetation
- Was previously permitted to process household and commercial waste via an energy-from-waste gasification facility
- Has existing utility connections, including electricity, natural gas and oxygen supplies

- Is close to local carbon capture and storage infrastructure
- Has access to nearby rail terminals for transportation and storage of the fuel and/or feedstock; and
- Is located next to the River Tees for the potential transportation of construction materials and fuel



Project Site

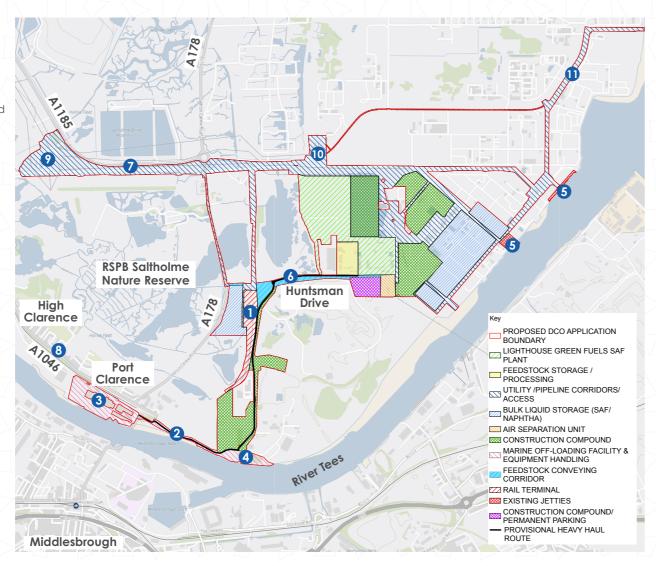
The Project Site comprises approximately 274.49 hectares (ha) in area, as shown in the site boundary plan above. This is around the size of 385 football pitches.

Indicative Project Site layout plan

The Project Site layout is subject to ongoing refinement and further design development. We would welcome your views on our indicative Project Site layout plan. If you have any suggestions, please respond to question 5 in our feedback questionnaire. Potential areas for biodiversity net gain and flood mitigation are currently being identified. The requirement for and the extent of these areas will be confirmed in our application for development consent.

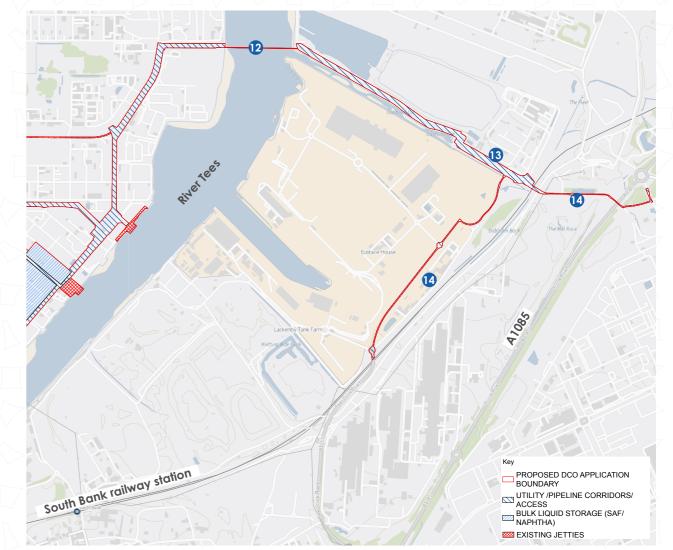
Site Plan 1

- 1 Existing rail terminal operated by Navigator Terminals, to transport feedstock to the Project Site and transport SAF and green naphtha offsite
- 2 Heavy haul road on existing private road infrastructure, used during construction to transport construction components and equipment from the chosen marine landing facilities to the Project Site
- 3 Wilton Engineering Wharf, an option being considered to transport construction components and equipment to the Project Site
- Clarence Wharf, an option being considered to transport construction components and equipment to the Project
- 5 During operation, two existing jetties off Riverside Road (Navigator Wharf) will be used to transport SAF and green naphtha offsite via ships/vessels
- 6 Primary construction vehicle access to the Project Site from Huntsman Drive
- A1185, a route option to the north being considered to transport smaller equipment and materials to the Project Site via the highway network
- 8 A1046, a route option to the south being considered to transport smaller equipment and materials to the Project Site via the highway network
- 9 Utility connection to the National Grid Saltholme substation, to provide primary source of power to the Project Site
- 10 Carbon dioxide created during the SAF production process could connect into the local Net Zero Teesside carbon capture and storage infrastructure, subject to that project's availability
- 11) Wastewater will be treated on site and discharged via a pipeline to Northumbrian Water's Bran Sands wastewater



Site Plan 2

- 2 Existing underground wastewater pipeline from the Project Site up to the east of the River Tees
- 13 New wastewater pipeline connection required from east of the River Tees to Bran Sands wastewater treatment plant
- Wastewater pipeline temporary construction access



Project Site main infrastructure

Lighthouse Green Fuels will use gasification and Fischer-Tropsch processes to create SAF. Both processes are proven and in use around the world. Several processing steps are required to synthesise SAF and green naphtha from sustainable feedstocks on an industrial scale.

Within our application for development consent, we will be applying for the rights to construct, operate and maintain the following main Project elements. More information on the Project infrastructure and proposed activities can be found in Chapter 2 of the Preliminary Environmental Information Report (PEIR): Site and Proposed Scheme Description.

| Element | Definition |
|--|--|
| Feedstock storage and pre-processing area | Facilities for the storage of waste and/or waste biomass. Feedstock pre-processing equipment may also be installed in this area. |
| Gasification plant | The gasification facilities convert solid waste and/or waste biomass feedstocks into syngas. |
| Syngas clean-up | Facilities to clean the crude syngas from the gasification process. Syngas from the gasification unit(s) is passed through multiple processing steps to remove contaminants resulting in an ultra-clean syngas ready for further processing. Carbon dioxide is also removed from the syngas in this section of the plant and sent to the local Net Zero Teesside carbon capture and storage infrastructure, subject to availability. |
| Fischer-Tropsch unit and Product upgrading unit | Facilities to convert syngas into liquid fuels. Ultra-clean syngas from the syngas clean-up section is converted into hydrocarbon waxes in the Fischer-Tropsch unit. Waxes are refined in the product upgrading unit to produce SAF and green naphtha. |
| Flare area | Flare systems used to combust process gas during plant start-up and shutdown, or for safety reasons. We expect there to be three flare stacks up to 130 metres in height. |
| Auxiliary boiler | Steam created for use in the SAF production process, and to be used for on-site power generation, if required. Includes a stack up to 60 metres in height. |
| Wastewater treatment plant | Facilities to treat process wastewater. All process wastewater generated on Site will be treated in the wastewater treatment plant to maximimse water re-use and minimise wastewater discharge. Residual wastewater that needs to be discharged is intended to be sent to Northumbrian Water's Bran Sands Wastewater Treatment Plant. |
| Utilities | Utility connections across the SAF plant. These include water, demineralised water, wastewater, natural gas, power, oxygen and nitrogen. |
| Existing combined-cycle gas turbine (CCGT) power plant | The existing 49.9MW CCGT power plant will be recommissioned, modified or rebuilt. No additional capacity is proposed. |
| Temporary equipment storage | The Project would require space for the storage and assembly of parts and equipment used in construction, either as open storage or within a building. |
| Administration facilities | Offices, welfare, control room, stores, maintenance building, laboratories, garages, parking and security for the permanent operation of the site. |



Sustainable Aviation Fuel (SAF) production process

Once all the components on our site are built, we will receive our first delivery of waste and/or waste biomass and be ready to start producing SAF. So, how does it work?



First, we process waste and/or waste biomass by thermal treatment, producing a high carbon content feedstock.



Step 2

Feedstock is transferred to the gasification unit where it is heated to a high temperature, producing a crude syngas made up of carbon monoxide, hydrogen, carbon dioxide and contaminants.



Step 3

Next, the syngas is 'scrubbed' to remove contaminants and carbon dioxide, leaving an ultra-clean syngas. We then adjust the composition of the syngas to ensure the correct hydrogen to carbon ratio.



Step 4

Clean syngas is converted into hydrocarbon waxes and refined into the final SAF and green naphtha products.

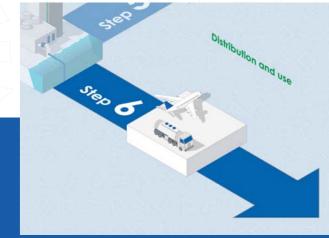


Step 5

SAF has the potential to reduce lifecycle carbon emissions by up to 80% compared with conventional fossil-derived jet fuel.

In the future, we plan for the Project to use local carbon capture and storage (CCS) infrastructure which has the potential to reduce the greenhouse gas emissions of our SAF by up to 200%.

With access to CCS technology, it will be possible to prevent carbon dioxide from entering the atmosphere and produce a negative-emission fuel.



Step 6

Following export of the SAF from the facility it will be blended with conventional jet fuel, distributed to UK airports and used to power flights around the world.

Step 1

Connecting to local carbon capture and storage (CCS) infrastructure

In the future, we plan for Lighthouse Green Fuels to connect into the local CCS infrastructure - Net Zero Teesside. Captured carbon dioxide from the SAF production process would be transported and permanently stored safely offshore in geological stores, subject to availability of access to carbon dioxide storage capacity in the CCS network.

We have allocated space within our current site for CCS infrastructure and a pipeline route to Net Zero Teesside to be constructed. This would be developed once Lighthouse Green Fuels has confirmation it can connect into the CCS infrastructure.

Alternative scenarios are also being investigated while the connection to Net Zero Teesside is being secured, such as exporting the carbon dioxide offsite via a pipeline to another Teesside facility, rail or marine vessel. These will be confirmed in our application for development consent.

Without access to Net Zero Teesside CCS infrastructure or an alternative solution, the biogenic carbon dioxide generated would be released into the atmosphere. In this scenario, Lighthouse Green Fuels would still reduce lifecycle carbon emissions by up to 80% compared with conventional aviation fuel.

Alternative technology considered

Lighthouse Green Fuels will use gasification and Fischer-Tropsch technologies to convert waste and/or waste biomass feedstocks into SAF and green naphtha. Alternatives for SAF production are available which still use gasification, but with different conversion and refinement processes.

We believe the proposed technologies offer the greatest benefits. Gasification and Fischer-Tropsch technologies have a higher potential to produce very low carbon intensity SAF compared to other production routes (as outlined in studies referenced in Chapter 2 of the PEIR). The combination of technologies unlocks the use of solid feedstocks, such as waste and biomass. Routes to produce SAF from oils and fats are limited by the availability of suitable feedstocks.

Alternative pathways to produce SAF, such as alcohol-to-jet, typically require more processing steps and are more expensive, resulting in higher cost SAF for the aviation industry.

Whilst developing our early Project design, we also considered alternative fuel products which can be produced from waste feedstocks, such as methanol, bio-synthetic natural gas and green hydrogen. SAF was considered to be the most viable due to the significant demand for it and the use of established process technologies.

Potential use of hydrogen

We are currently exploring options with local projects to use hydrogen produced offsite within the operational production of SAF. This opportunity recognises the prospects of local hydrogen production and transport projects in proximity to Lighthouse Green Fuels, which could provide multiple benefits if implemented within the SAF production process.

Using hydrogen would rely on these local projects being constructed. Based on their proposed completion dates, this may not occur until post-2030. Discussions are ongoing and will be described further in our application for development consent.





Landscape and visual impacts

The area surrounding the Project Site is mostly comprised of urban development and industrial facilities. Major industrial buildings, including an oil refinery, oil storage and a chemical works, form part of the skyline. To the west and north of the site, there are nearby ponds, wetlands, mudflats, sand dunes and salt marshes and the River Tees and marine wharf facilities lie to the south. The nearest residential area is Port Clarence to the south west.

Views of Lighthouse Green Fuels from Billingham, Port Clarence, neighbouring RSPB Saltholme, the wider River Tees and wetland landscape have been taken into consideration in developing the design of the Project Site. This will help shape the scale, layout and orientation of the new SAF plant and selection of materials and finishes. Tree and shrub planting will also help to screen lower level elements of Lighthouse Green Fuels and assimilate these into the landscape as much as possible. Opportunities to retain and enhance existing landscape elements within the site will also be explored.

Visualisations of the Project showing the expected layout and orientation of onsite infrastructure can be seen on the next page. These include illustrative views from RSPB Saltholme and the Middlesbrough Transporter Bridge. These show worst-case 'envelopes' or blocks for the proposed plant buildings and structures. These will be refined further as the project design develops.

Throughout the design phase of the Project, we will continue developing mitigation measures to reduce visual and landscape impacts where possible, alongside potential biodiversity enhancements which will form part of a wider landscape strategy. Further information on Landscape and Visual Impacts are included within Chapter 10 of the PEIR: Landscape and Visual. A more detailed description of visual impact mitigation measures will be provided in the Environmental Statement, which will form part of our application for development consent.



Proposed 53.5° view from RSPB Saltholme (the maximum parameters for every element are shown to illustrate the worst-case scenario).



Proposed 53.5° view from the Middlesbrough Transporter Bridge (the maximum parameters for every element are shown to illustrate the worst-case scenario).

Biodiversity

The Project lies within an area of nationally and locally important marine and terrestrial habitats, including the Teesmouth and Cleveland Coast Special Protection Area (SPA), Ramsar site and Site of Special Scientific Interest (SSSI), part of which include the River Tees, and the RSPB Saltholme Nature Reserve.

We will seek to avoid potential impacts on these protected habitats and species, and the loss of vegetation where possible across the Project Site. Where losses are unavoidable, compensation and enhancement measures (such as creation of new habitats) will be provided, for a range of species. Offsite options will also be explored, alongside opportunities to provide additional biodiversity enhancements.

Information on Ecology impacts are included within Chapter 7: Terrestrial Ecology, and Chapter 8: Freshwater & Marine Ecology, of the PEIR. Further details on the proposed ecological mitigation and enhancement measures will be provided in the Environmental Statement, which will form part of our application for development consent.



Construction, operation and decommissioning

Construction

Should the Project be granted development consent, the construction phase is likely to be approximately three years in duration, lasting from Q4 2025 to Q3 2028. Some preparation works at the Project Site will be undertaken under a separate planning consent to enable smooth delivery of the construction phase, including the demolition of existing infrastructure. These works are expected to take place over approximately nine months, starting in Q4 2024 and finishing in 2025. It is currently expected that Lighthouse Green Fuels will begin operation in 2028.

We are anticipating that construction would last for up to three years. This is being assessed as a 'worst-case scenario' in terms of environmental impacts as a continuous period of works. Therefore, a worst-case scenario has been applied in our assessments, including the daily number of construction vehicle movements.

We are proposing to use large modular units to construct Lighthouse Green Fuels. The modular units and other equipment would be constructed offsite and then fitted together at the Project Site to reduce the length of the construction period and the number of construction deliveries using local roads.

Primary construction vehicle access to the Project Site would be from Huntsman Drive, which connects to the A178 Seaton Carew Road.

Smaller equipment and materials will be delivered directly to the Project Site via the highway network. Two routes are currently being considered, including one from the north, the A1185 Seal Sands Road, and a second from the south, the A1046 Port Clarence Road.

In addition to the primary construction access from the public highway, there is another existing access to the Wilton Engineering Wharf, which is one of the marine transport infrastructure options being considered.

We intend to use existing marine infrastructure for transport during construction and operation phases and potentially during the decommissioning phase. For the construction phase, this would involve transporting construction equipment and components to the Project Site, and during operation this would involve transporting the SAF and green naphtha products offsite.

For the construction phase, two marine options are being considered at Wilton Engineering Wharf and Clarence Wharf. We are considering the use of a heavy haul road to transport construction components and equipment from the chosen marine landing facilities to the Project Site. This would use existing private road infrastructure and work would be needed to enable the heavy haul road to be suitable for use during construction.

During the operation phase, two existing jetties off Riverside Road (Navigator Wharf) would be used for transporting the created SAF and green naphtha offsite via ships/vessels.

We are also looking to use the existing rail terminal operated by Navigator Terminals to transport feedstock to the Project Site, and transport the SAF and green naphtha created at the plant offsite. The existing rail terminal is located to the south west of the Project Site and is already used for the export of bulk liquids.

We are currently undertaking logistics studies to determine the feasibility of several transport options, including new infrastructure. These studies have not been completed at the time of the PEIR's preparation but will be fully explained and assessed in the Environmental Statement as appropriate.

We will be preparing a Construction Traffic Management Plan, which would manage the impacts of construction traffic associated with the Project. An outline version of this document will form part of our application for development consent. In addition, an outline Code of Construction Practice will also be prepared and form part of the Environmental Statement.

It is anticipated that up to 2,600 temporary construction staff will be required at peak times during the construction phase.

Construction working hours are expected to be from 7am to 7pm Monday to Friday and from 7am to 2:30pm on Saturdays. For some activities, working over weekends and for 24 hours may be required.

More information on construction, operation and decommissioning can be found in Chapter 2 of the PEIR: Site and Proposed Scheme Description



What would construction involve?

Construction of the Project would take place in a number of stages, including:

- Site preparation, including construction of any access roads, preparation of construction compounds and the import of construction materials and construction equipment to site
- 2 Construction of Project structures and installation of utilities
- Commissioning of the Project, which would include testing and inspecting all of the equipment; and
- A Reinstatement, where required, and habitat creation

Operation and decommissioning

The operational lifespan of the Project is estimated to be 50 years. For the Environmental Impact Assessment, it is assumed that most elements of Lighthouse Green Fuels will be decommissioned at the end of its operational lifespan, either prior to or at 50 years.

When the Project is decommissioned, most or all above ground structures at the Project Site would be demolished and removed at ground level or just below. Any concrete materials would be crushed, with other materials such as metal, sorted and recycled where possible. Some removal of materials off site is likely by road and possibly via rail and by the River Tees.

Any below ground structures will be left in-situ, including piles, pipework and cables. It is anticipated that the decommissioning phase would take approximately 15 to 18 months.

Local community benefits

Once operational, Lighthouse Green Fuels is expected to create 840 full time jobs in the UK. This would be the highest number of jobs for a project of this kind in Europe and would include:

- 240 full time jobs on the Project Site: approximately 120 employees at the SAF Plant and approximately 120 staff at other facilities forming part of the Project; and
- approximately 600 full time employees from indirect jobs at other locations in the UK.

We are also looking to setup or facilitate local apprenticeship schemes to support staffing requirements for the Project Site operations, which would help to upskill the local workforce.





Environmental Impact Assessment (EIA)

Overview of the EIA Process

The Environmental Impact Assessment (EIA) is a process to identify and fully understand the potential effects that a proposed development may have on the environment, people and local communities. This process involves consultation with affected local people, wider communities and other stakeholders to ensure that the EIA has identified the relevant effects of the proposed Lighthouse Green Fuels Project.

Throughout the design process we have attempted to reduce impacts in the local area and considered how we can provide enhancements as part of the Project.

The initial findings for the EIA can be read in the Preliminary Environmental Information Report (PEIR) and its Non-Technical Summary (NTS).

The PEIR and NTS provide information about the proposed Project that reflects the emerging design and the preliminary results of the environmental assessment, to seek feedback from members of the public, consultation bodies and other stakeholders on the proposed approach to the EIA, and mitigation measures and to obtain baseline data.

It is important to note that the consultation is taking place before we finalise the design as part of our application for development consent. This means we will update the Project proposals in response to feedback where possible. As part of this application, we will provide a full Environmental Statement, which will report the outcome of the EIA process.

The PEIR is presented in 20 chapters across three volumes (1: Main Text; 2: Figures; and 3: Technical Appendices).

Accessing the PEIR

The PEIR documentation can be found on the Project website and will be available at the consultation events. One printed copy of the PEIR is also available to view (but not take away) at the local information point. If you would like a hard copy of the PEIR, a reasonable charge to cover printing and postage costs of £0.35 per page will apply. We can also provide this free of charge on a USB device. Please use the contact details at the end of this booklet to request a copy.

To help you easily access and read the information on impacts and topic areas of interest to you, the PEIR has been divided into the following chapters:

- Chapter 1 Introduction
- Chapter 2 Site and Proposed Scheme Description
- Chapter 3 Approach to EIA
- Chapter 4 Energy and Planning Policy
- Chapter 5 Air Quality
- Chapter 6 Noise and Vibration
- Chapter 7 Terrestrial Ecology
- Chapter 8 Marine and Freshwater Ecology
- Chapter 9 Water and Environmental Flood Risk
- Chapter 10 Landscape and Visual
- Chapter 11 Greenhouse Gasses

- Chapter 12 Climate Change Resilience
- Chapter 13 Materials and Waste
- Chapter 14 Socioeconomics
- Chapter 15 Population and Human Health
- Chapter 16 Traffic and Transport
- Chapter 17 Major Accidents and Disasters
- Chapter 18 Marine Navigation
- Chapter 19 Cumulative Effects
- Chapter 20 Summary of Likely Significant Effects

An NTS of the PEIR is also available to view on our consultation website. A hard copy of the NTS can be sent free of charge on request.

Summary of PEIR findings

Transport of abnormal loads

The following table outlines the potential effects that have been identified in the preliminary assessment based on the proposed Project as it is currently understood. The preliminary effects and mitigation measures vary in detail depending on the level of assessments that has been undertaken to date. The preliminary mitigation measures presented below are an example of those identified in the PEIR and may change and/or be supplemented as a result of further work in preparing the Environmental Statement. You can find more information on the anticipated environmental impacts in each of the relevant chapters within the PEIR.

| Chapter 5: Air Quality | | |
|--|---|---|
| Construction Phase - Potential Effects Identified in the PEIR: Dust emissions from excavations, earthworks and construction plant and equipment movements Emissions from construction plant and equipment | Construction Phase – Mitigation: Adherence to Code of Construction Practice (CoCP) and good practice guidance from the Institute of Air Quality Management including dust avoidance and monitoring measures to be implemented through a Dust Management Plan | For more information see PEIR Chapter 5: Air Quality |
| Operational Phase - Potential Effects Identified in the PEIR: Effects for ecological receptors from emissions of pollutants arising from the SAF production process. Significant effects on human receptors are unlikely Fugitive emissions of dust and vapours during product transfer and transport Emissions of pollutants from associated operations | Operational Phase - Mitigation: Enclosed feedstock handling and storage to prevent dust emissions Enclosed units to contain odour Sealed systems to prevent emissions from Syngas Clean-up and Oxidation Reactor or escape of ash/dust Carbon capture Design to include tank venting and vapour recovery to reduce risks of SAF/naphtha vapour evaporation In stack, ambient and personal monitoring Stack height to be optimised Adherence to Environmental Permit conditions and emissions limits | |
| Chapter 6: Noise and Vibration | | |
| Construction Phase - Potential Effects Identified in the PEIR: Noise and vibration effects for residents in the Port Clarence area - from construction traffic and use of heavy haul route Noise and vibration effects from other construction plant and equipment unlikely Construction and construction traffic noise and vibration effects on protected ecological areas including RSPB Nature Reserve | Construction Phase - Mitigation: Best Practicable Means (BPM) and adherence to a CoCP, including noise control/limits and monitoring Localised screening and careful siting of compounds Restrictions on delivery routes and times Restrictions on working outside of core hours | For more information see PEIR Chapter 6: Noise and Vibration |

| Operational Phase - Potential Effects Identified in the PEIR: Rail traffic noise effects, including for residents in the Port Clarence area Noise and vibration effects for residents in the Port Clarence area – due to operation of the rail terminal Noise effects for ecological receptors from the SAF plant and feedstock handling. Significant effects on residential receptors unlikely | Operational Phase - Mitigation: Siting noise generating activities away from sensitive receptors Use of acoustic enclosures, screening and cladding Adherence to specified noise limits for fixed plant and equipment Careful selection of plant with low sound power levels | For more information see PEIR Chapter 6: Noise and Vibration |
|--|--|--|
| Chapter 7: Terrestrial Ecology | | |
| Construction Phase - Potential Effects Identified in the PEIR: Habitat loss and fragmentation, including from designated ecological sites (SPA, Ramsar, SSSI) Noise and vibration disturbance to species, such as birds, bats, badgers, otters, water vole, reptiles, Great Crested Newts and invertebrates Visual disturbance to species such as birds and bats Water pollution (site drainage and marine vessel movements) affecting wintering birds, fish and aquatic invertebrates Artificial lighting impacts on birds, bats and other species Air quality impacts on ecological sites from construction activities | Construction Phase - Mitigation: Provision of new or enhanced habitat areas to offset impacts Biodiversity Net Gain across the Project Adherence to a CoCP detailing best practice measures, including pollution control, habitat protection, noise and dust reduction measures and site lighting strategy Carefully timing works to reduce disturbance to overwintering birds Provision of visual and acoustic screening | For more information see PEIR Chapter 7: Terrestrial Ecology |
| Operational Phase - Potential Effects Identified in the PEIR: Noise and vibration disturbance to fauna from SAF plant, feedstock handling and rail terminal operations Visual disturbance to fauna from lighting and flares Risk of bird strike due to presence of tall buildings and structures Dust deposition on ecological sites from the transport of waste Artificial lighting disturbance to birds and mammals Air pollution/deposition impacts on habitats from road traffic/marine vessel and SAF plant emissions | Operational Phase - Mitigation: | |

Construction Phase - Potential Effects Identified in the PEIR:

- Loss or disturbance of habitat due to marine works and/or due to increased navigation within the Tees Estuary
- Noise, vibration and visual disturbance to species, including fish, grey seals and harbour seals from marine works and increased navigation
- Artificial lighting disturbance
- Increased risk of vessel strike for marine mammals due to increased naviaation
- Potential changes to water quality due to suspension of sediment bound contaminants associated with increased navigation, marine works or from surface run-off
- Increased pollution risk from spillages and dust

Construction Phase – Mitigation:

- Designing layout to avoid or minimise disturbance
- Delineating exclusion zones
- Adherence to CoCP good practice measures, including timing of certain works to avoid sensitive periods, as well as mitigating noise and vibration generation
- Selection of appropriate piling methods or construction techniques within marine and freshwater environments
- Pollution control measures
- Limiting marine vessel speeds
- Lighting Strategy

For more information see PFIR Chapter 8: Marine and Freshwater Ecology

Operational Phase - Potential Effects Identified in the PEIR:

- Increased pollution risk from spillages and marine transport
- Noise disturbance to species, including grey seals and harbour seals from marine transport
- Increased risk of vessel strike for marine mammals due to increased navigation

Operational Phase - Mitigation:

- Implementation of a Landscape and Biodiversity Strategy incorporating habitat compensation and enhancement to achieve Biodiversity Net Gain
- Good practice measures to be implemented through the Operation Environmental Management Plan including pollution control measures

- Limiting marine vessel speeds

Chapter 9: Water and Environmental Flood Risk

Construction Phase - Potential Effects Identified in the PEIR:

- Increased pollution risk, for the River Tees, Holme Fleet and, Dabholm
- Effects due to increased flood risk
- Effects on groundwater quality, levels and flow, potentially affecting, designated ecological sites
- Effects on private abstractions

Construction Phase – Mitigation:

- Adherence to a CoCP referencing industry-standard best practice and guidance, including construction site drainage arranaements
- Potential Flood Risk Activity Permit

For more information see PEIR Chapter 9: Water and Environmental Flood Risk

Operational Phase - Potential Effects Identified in the PEIR:

- Increased pollution risk
- Impacts on watercourses within the Site due to modifications such as
- Risk of deterioration of water quality due to discharge of foul and effluent water
- Impacts to groundwater aguifer quality
- Increased flood risk due to changes in flood flow conveyance and storage or development in high risk areas (as mitigation has yet to be confirmed)

Operational Phase - Mitigation:

- Siting operations with greatest pollution risk away from surface water bodies as far as practicable
- Drainage strategy and other design / operational procedures, including pollution prevention controls
- Designing the proposed Project to withstand a 1 in 200 annual probability flood event, incorporating suitable flood defence
- Incorporation of drainage attenuation measures, such as flood plain compensation if required
- Discharging all foul and effluent drainage to a wastewater treatment plant • Designing the proposed Project to maintain watercourse

hydraulic form and function

For more information see PEIR Chapter 9: Water and Environmental Flood Risk

Chapter 10: Landscape and Visual

Construction Phase - Potential Effects Identified in the PEIR:

Operational Phase - Potential Effects Identified in the PEIR:

- Change in site character and vegetation cover
- Changes to the East Billingham to Teesmouth Landscape Character
- Change in visual amenity for visitors to the RSPB Saltholme Nature Reserve and users of the King Charles III England Coast Path
- Change in views from residential properties in the Port Clarence area

Adherence to a CoCP referencing industry-standard best

Construction Phase – Mitigation:

- practice and guidance Lighting Strategy
- Retention and protection measures for existing mature vegetation
- Screening of site working areas and siting of construction compound

Operational Phase - Mitigation:

- Changes to the East Billingham to Teesmouth Landscape Character
- Changes in visual amenity for visitors to the RSPB Saltholme Nature Reserve and users of the King Charles III England Coast Path
- Taller structures visible in views from residential properties in the Port Clarence area and Transporter Bridge

• Avoidance of loss and replacement of any lost vegetation with

- new plantina
- Implementation of a Landscape and Biodiversity Strategy incorporating habitat compensation and enhancement to achieve Biodiversity Net Gain, screening of lower levels of SAF plant and additional green/blue infrastructure
- Sensitive lighting design
- Plant configuration and layout and choice of surface materials and finishes

For more information see PEIR Chapter 10: Landscape and Visual

| Chapter 11: Greenhouse Gases | | |
|--|--|--|
| Construction Phase - Potential Effects Identified in the PEIR: Potential increase of greenhouse gas (GHG) emissions during construction from the operation of plant and equipment and the transport of materials and waste | Construction Phase - Mitigation: Adherence to a CoCP to reduce construction plant related emissions Adherence to a Construction Traffic Management Plan and Construction Workforce Travel Plan to reduce construction traffic emissions Materials Management Plan (MMP) to promote reuse and recycling of materials and use of lower-carbon elements in the build | For more information see PEIR Chapter 11: Greenhouse Gases |
| Operational Phase - Potential Effects Identified in the PEIR: Potential increase of GHG emissions during operation, from plant operation and the storage and transport of products and materials | Operational Phase - Mitigation: Selection of best available techniques for equipment and technology – energy efficiency Incorporate on-site renewables generation Carbon capture measures Measures to be determined through the GHG assessment to be presented as part of the Environmental Statement | |
| Chapter 12: Climate Change Resilience | | |
| Construction Phase - Potential Effects Identified in the PEIR: Scoped out of the assessment in accordance with the Planning Inspectorate's Scoping Opinion | Construction Phase – Mitigation: Scoped out of the assessment in accordance with the Planning Inspectorate's Scoping Opinion Output Description: | For more information see PEIR Chapter 12: Climate |
| Extreme temperature, precipitation, drought or storm events related to climate change risks | Operational Phase - Mitigation: Design proposed Project to protect against a 1 in 200 year flood event Design buildings and structures to withstand extreme wind and storm events and increasing temperatures Compliance with relevant Building Regulations and Codes Covering of materials to protect from weather exposure Ensuring adequate emergency access Provision of emergency standard power generators A Flood Risk Assessment to inform drainage design and appropriate flood mitigation A Drainage Strategy incorporating allowance for climate change A Controlled Waters Risk Assessment Fire and Emergency Plans Adherance to Health & Safety Executive protocols associated with extreme weather events | Change Resilience |

| Chapter 13: Materials and Waste | | |
|---|--|---|
| Construction Phase - Potential Effects Identified in the PEIR: Depletion of construction material supply Reduction in regional or national landfill void capacity Generation of construction wastes | Construction Phase – Mitigation: Adherence to CoCP Reuse of existing materials on site and recycling of construction wastes to the extent practicable Incorporate recycled materials in construction Site Waste Management Plan Materials Management Plan Waste recovery standards/targets | For more information see PEIR Chapter 13: Materials and Waste |
| Operational Phase - Potential Effects Identified in the PEIR: Reduction in regional or national landfill void capacity Production of process wastes, air and water treatment residues | Operational Phase - Mitigation: Site Waste Management Plan Adherence to Environmental Permit requirements for managing and handling of operational waste Recycling or recovery of wastes | |
| Chapter 14: Socioeconomics | | |
| Construction Phase - Potential Effects Identified in the PEIR: Creation of up to 2,600 jobs during construction with local and regional economic benefits Increased demand for accommodation for temporary construction workers | Construction Phase – Mitigation: Fair recruitment practices, with employment opportunities for local people Supporting access to training Skills and Employment Plan Implement site security arrangements and continue engagement throughout evolving design | For more information see PEIR Chapter 14: Socioeconomics |
| Operational Phase - Potential Effects Identified in the PEIR: Scoped out of the assessment in accordance with the Planning Inspectorate's Scoping Opinion Inspectorate's Scoping Opinion | Operational Phase - Mitigation: Scoped out of the assessment in accordance with the Planning Inspectorate's Scoping Opinion | |

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| Chapter 15: Population and Human Health | | |
|---|---|--|
| Construction Phase - Potential Effects Identified in the PEIR: Loss of amenity for visitors to the RSPB Saltholme Nature Reserve Loss of amenity for walkers and cyclists on Charles III England Coast Path/North Tees Trail Effects on human health Effects on community services including construction worker accommodation | Construction Phase – Mitigation: Adherence to CoCP measures Construction Traffic Management Plan Ongoing engagement with the local community via Stockton-on-Tees Borough Council, including users of recreational areas and businesses that rely on the River Tees Embedded design features to reduce impacts on amenity, such as landscape planting, noise attenuation and site layout Engagement with local accommodation providers to secure provision | For more information see PEIR Chapter 15 Population and Human Health |
| Operational Phase - Potential Effects Identified in the PEIR: Effects on businesses that rely on the River Tees Loss of amenity for people visiting the RSPB Saltholme Nature Reserve Effects on human health | Operational Phase - Mitigation: Ongoing maintenance of Mitigation Areas as identified in the Environmental Statement Operation Environmental Management Plan Adherence to Environmental Permit requirements Navigation management measures Ongoing engagement with local community and other stakeholders | |
| Chapter 16: Traffic and Transport | | |
| Construction Phase - Potential Effects Identified in the PEIR: Increased traffic movements on highway network Severance effects, delay and loss of amenity for pedestrians and cyclists Driver delay Effects on public transport users Increased accidents and safety risk Disruption due to transport of hazardous or abnormal loads | Construction Phase – Mitigation: Construction Traffic Management Plan Restricting construction/HGV traffic routes Construction Workforce Travel Plan Adherence to a CoCP Maintaining Public Rights of Way routes where practicable and accessible (or provide suitable diversionary routes) | For more information see PEIR Chapter 16: Traffic and Transport |

| Operational Phase - Potential Effects Identified in the PEIR: Increased traffic movements on highway network Severance effects, and delay and loss of amenity for pedestrians and cyclists Driver Delay Effects on public transport users Increased accidents and safety risk Disruption due to transport of hazardous loads | Operational Phase - Mitigation: • Workplace Travel Plan | For more information see PEIR Chapter 16: Traffic and Transport |
|--|---|---|
| Chapter 17: Major Accidents and Disasters | | |
| Construction Phase - Potential Effects Identified in the PEIR: Industrial and Urban Accidents Pollution Accidents Accidental damage to third party installations, such as pipelines Transport Accidents | Construction Phase - Mitigation: Programme of hazard studies Environment, Health & Safety Management systems CDM Health & Safety Plan Supplier management environmental, health & safety standards Risk management systems Adherence to a CoCP | For more information see PEIR Chapter 17: Major Accidents and Disasters |
| Operational Phase - Potential Effects Identified in the PEIR: Industrial and Urban Accidents Pollution Accidents - spillage risks Transport Accidents | Operational Phase - Mitigation: • Emergency Preparedness and Response Plan (EPRP) • Compliance with Health and Safety regulations • Mitigation to be determined at the ES stage | |
| Chapter 18: Marine Navigation | | |
| Construction Phase - Potential Effects Identified in the PEIR: Obstruction of the navigation channel Vessel grounding Vessel contact Vessel breakout Collision with third party vessel | Construction Phase – Mitigation: Measures to be determined through a Navigation Risk Assessment and presented as part of the Environmental Statement Possible amendments to the Harbour Authority Safety Management System and processes for managing marine emergencies Marine Concept Plan Application of marine regulations and guidelines | For more information see PEIR Chapter 18: Marine Navigation |
| Operational Phase - Potential Effects Identified in the PEIR: • Scoped out of the assessment at this stage | Operational Phase - Mitigation: Vessel traffic management Application of marine regulations and guidelines | |

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Consultation and next steps

How to have your say

The consultation is taking place between Thursday 16 May and Thursday 20 June 2024, please provide any feedback by 11:59pm on Thursday 20 June 2024. Your feedback will help us to shape our proposals before we submit our application for development consent later this year.

We would like your feedback on:

- The need for the Project
- The Project Site, including indicative locations of equipment and infrastructure within this area
- Measures we are proposing to reduce the impacts associated with the Project, as detailed in the PEIR and NTS
- The consultation
- Any other feedback on local issues or sensitivities of which we should be aware.

How to take part in the consultation

Anyone who is interested in this Project is welcome to take part in the consultation. We welcome all views and will take them into account before our application for development consent is submitted. We will use a range of methods to ensure the consultation is inclusive and accessible for all audiences.

We are hosting three face-to-face events and three webinar events:

Online webinar (Please get in touch to register)
28 May 2024 6:30pm to 8pm

Billingham Forum,

Town Centre, The Causeway, Stockton-on-Tees, Billingham TS23 2LJ

1 June 2024 12pm to 5pm

Online webinar (Please get in touch to register)

4 June 2024 10am to 11:30am

High Clarence Primary School,

Port Clarence Road, Middlesbrough TS2 1SY

5 June 2024 3pm to 8pm

Billingham Rugby Club,

Greenwood Rd, Billingham, Stockton-on-Tees TS23 4BA

6 June 2024 10am to 5pm

Online webinar (Please get in touch to register)

12 June 2024 10am to 11:30am

View more information

We will be hosting our consultation materials at the local information point close to the Project Site:

Billingham Library, Kingsway, Billingham TS23 2LN (opening hours Mon-Tue 8:30am-7pm, Wed-Fri 8:30am-5pm, Sat 9:30am-4pm, Sun closed).

Materials available to take away at these locations include this Consultation Information Booklet, Feedback Questionnaire and Non-Technical Summary of the PEIR. Printed copies of the Statement of Community Consultation (SoCC) and full PEIR will be available at this location to view only.

All statutory consultation documents will be available online to view on the Project website (www.lighthousegreenfuels.co.uk), and in hard copy at no extra charge (except the PEIR, a hard copy of which can be requested for a charge of £0.35 per page to cover printing and posting costs). Upon request, all documents can be made available in alternative formats, such as large print, braille, audio and alternative languages.

Navigating our consultation documents

The following documents will be made available as part of the consultation:

| Document | Description |
|---|--|
| Consultation Newsletter | Provides high-level information on the Project, the consultation events and how to provide feedback. |
| Consultation Information Booklet | Provides detailed information on the Project, the planning process and what we are consulting on. |
| Feedback Questionnaire | A questionnaire-style form to gain your feedback on our proposals. |
| Preliminary Environmental Information Report (PEIR) | An in-depth description of the Project, the effects the Project would have on the environment and the measures proposed to reduce the impacts. |
| Non-Technical Summary (NTS) of the PEIR | A NTS of the PEIR can also be downloaded from the Project website and will be available in printed format on request, free of charge. |
| Maps and plans | Maps and plans showing the site and location of the Project. |
| Statement of Community Consultation (SoCC) | A document which sets out how we intend to consult people ahead of our application for development consent for the Project. |

Have your say

You can provide your feedback to us either online or in writing, by:



Going to the 'Consultation' page of the Project website (www.lighthousegreenfuels.co.uk) and completing an online feedback questionnaire.



Collecting a feedback questionnaire from one of our consultation events, the local information point, or on request.



Returning your completed feedback questionnaire to us at one of our consultation events, by email (info@lgf.co.uk) or by post (by writing 'FREEPOST LIGHTHOUSE GREEN FUELS') on a blank envelope (no stamp required).



Providing your free form comments by email or post. Please note that we will not accept comments over the phone, however we will assist you wherever possible.

The deadline for providing feedback is 11:59pm on Thursday 20 June 2024.



How we will use your feedback and next steps

We will have regard to all comments received during the statutory consultation, as well as ongoing engagement with communities and stakeholders. All feedback is important to us and will help to influence the design of the Project.

The feedback received during statutory consultation will be reviewed and analysed to understand key themes and issues of importance.

We will set out a summary of the responses that you have provided in a Consultation Report, which will detail how we have had regard to your feedback and how your feedback has influenced the proposals. This report will form part of our application for development consent which we expect to submit later this year.

Once our application for development consent has been accepted, the Planning Inspectorate (acting on behalf of the Secretary of State) will examine the application.

You will be able to register your interest in our proposals directly with the Planning Inspectorate, who will then inform you about the progress of our application during the examination process, and let you know about further opportunities you will have to inform and contribute to the planning process.



Lighthouse Green Fuels

Contact details

Please do not hesitate to get in touch if you have any questions about the Project. You can get in contact with members of our community relations team using the details below:



Email us at info@lgf.co.uk



Call us on **0800 157 7346**



Write to us at **FREEPOST LIGHTHOUSE GREEN FUELS** (no stamp required)



For more information on the Project please visit www.lighthousegreenfuels.co.uk

Should you require any documents in an alternative format such as large print, braille, audio, or alternative languages, please contact us using the details provided. All graphs and maps included in this document are for illustrative purposes only.