

Lighthouse Green Fuels



Welcome

Introduction

Thank you for attending our consultation event today. We are developing proposals for Lighthouse Green Fuels – a new waste-to-sustainable aviation fuel (SAF) project in Billingham, Stockton-on-Tees.

The Project will convert non-recyclable waste that would otherwise go to landfill, and/or waste biomass, such as non-hazardous waste wood or forestry residues, into SAF.

SAF from waste and/or waste biomass sources have the potential to reduce lifecycle carbon emissions by up to 80% compared with conventional aviation fuel.

Our statutory consultation

We are 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**.

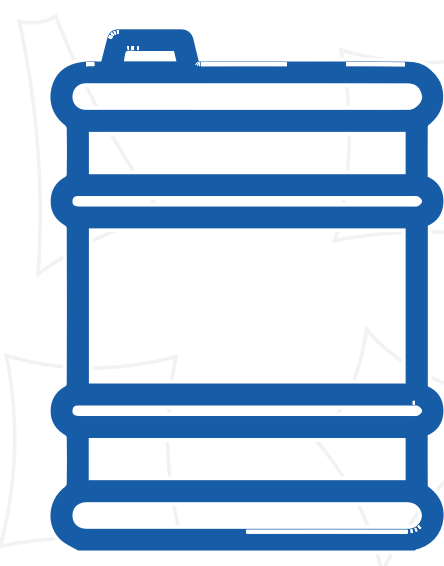
We encourage you to read the information on display today alongside our Consultation Information Booklet. You can provide your thoughts by completing a Feedback Questionnaire – in hard copy or online.

Our team are here today to answer any questions you have about the proposals.

Key project statistics



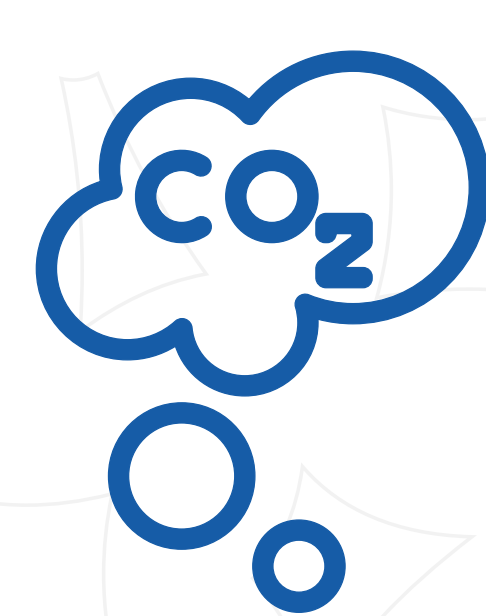
Over 1 million tonnes of waste and/or waste biomass will be processed per year



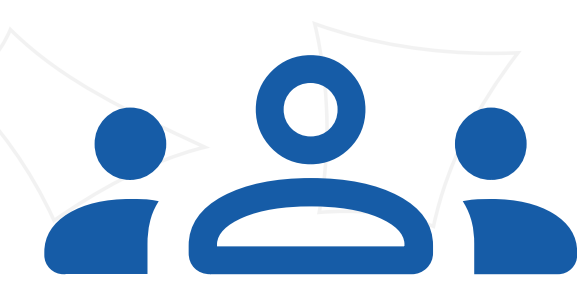
Over 175 million litres of SAF and **30 million litres** of green naphtha (a by-product of the SAF production process and excellent feedstock for sustainable chemical production processes) will be produced per year



25,000 short-haul or **2,500 long-haul flights** will be fuelled per year from the UK



Up to 350,000 tonnes of carbon dioxide emissions will be avoided per year compared with conventional aviation fuel. Up to **750,000 tonnes** would be avoided with access to carbon capture and storage infrastructure



Up to 2,600 jobs will be created during the construction phase and **840 full-time jobs** created in the UK once operational



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About us

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 of 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.

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 way



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Need for the Project

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.

By producing SAF, Lighthouse Green Fuels will help to decarbonise the aviation industry.

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 population¹.

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. Lighthouse 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?

The UK government has committed to decarbonising the UK aviation industry by 2050 when it is intended that the UK will be a carbon neutral 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.

¹ <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-zero-strategy.pdf>



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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



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Why SAF and how is it made?

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

How will the SAF be made?



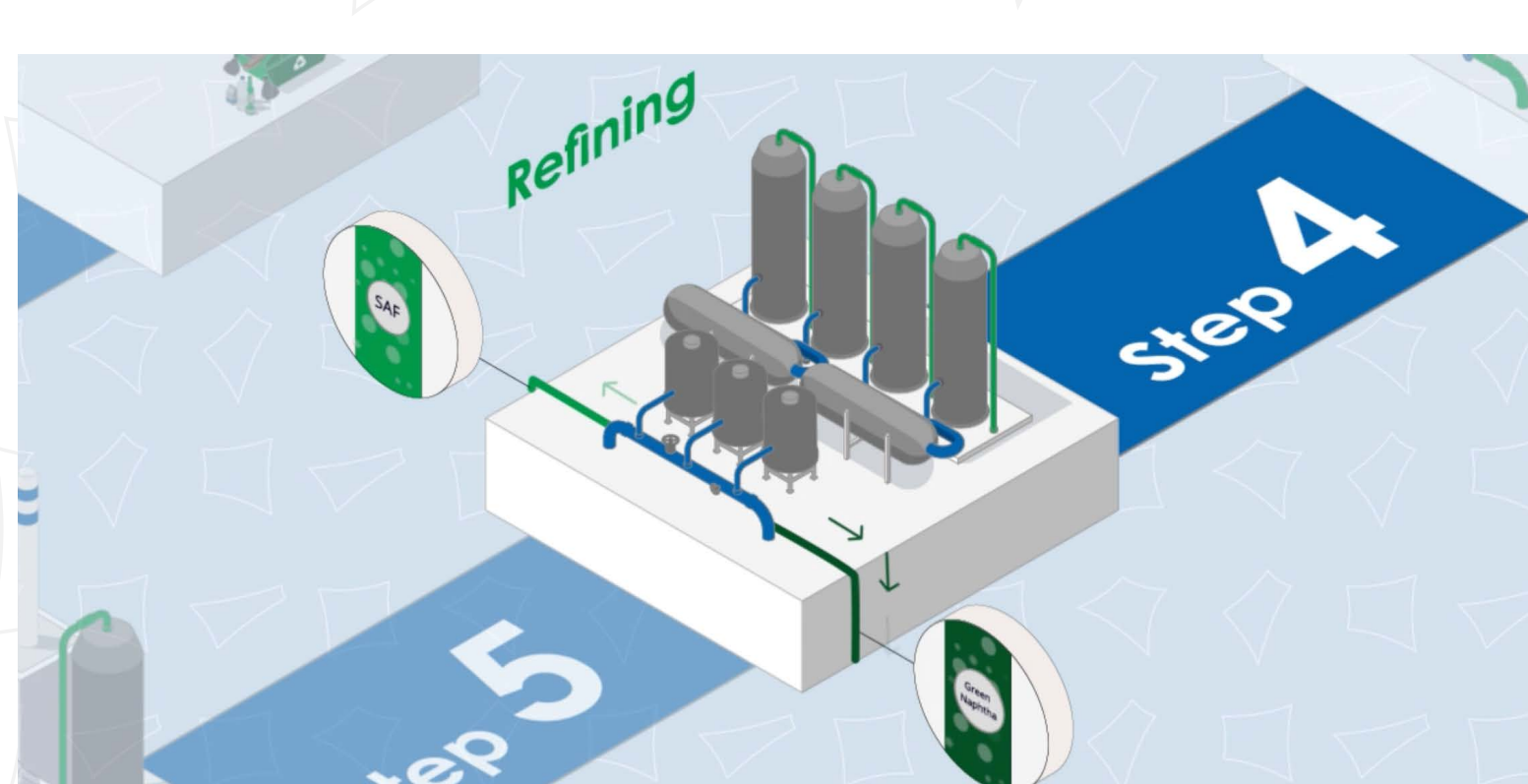
Step 1 - First, we process waste and/or waste biomass by thermal treatment, producing a high carbon content feedstock.



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.



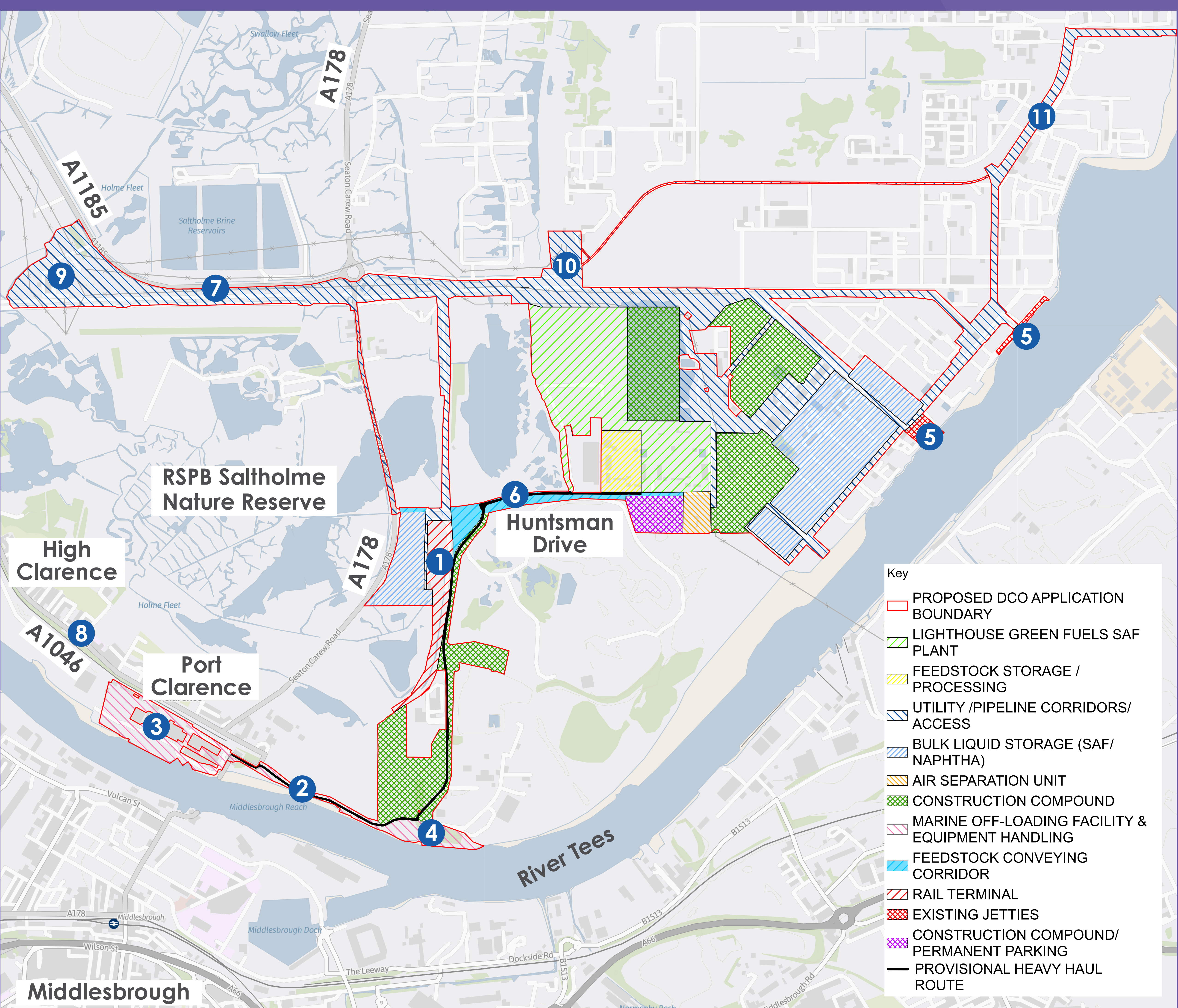
Step 6 - Following export of the SAF from the facility it will be blended with conventional jet fuel, distributed to UK airports and used to power flights around the world.



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Indicative Project Site layout plan



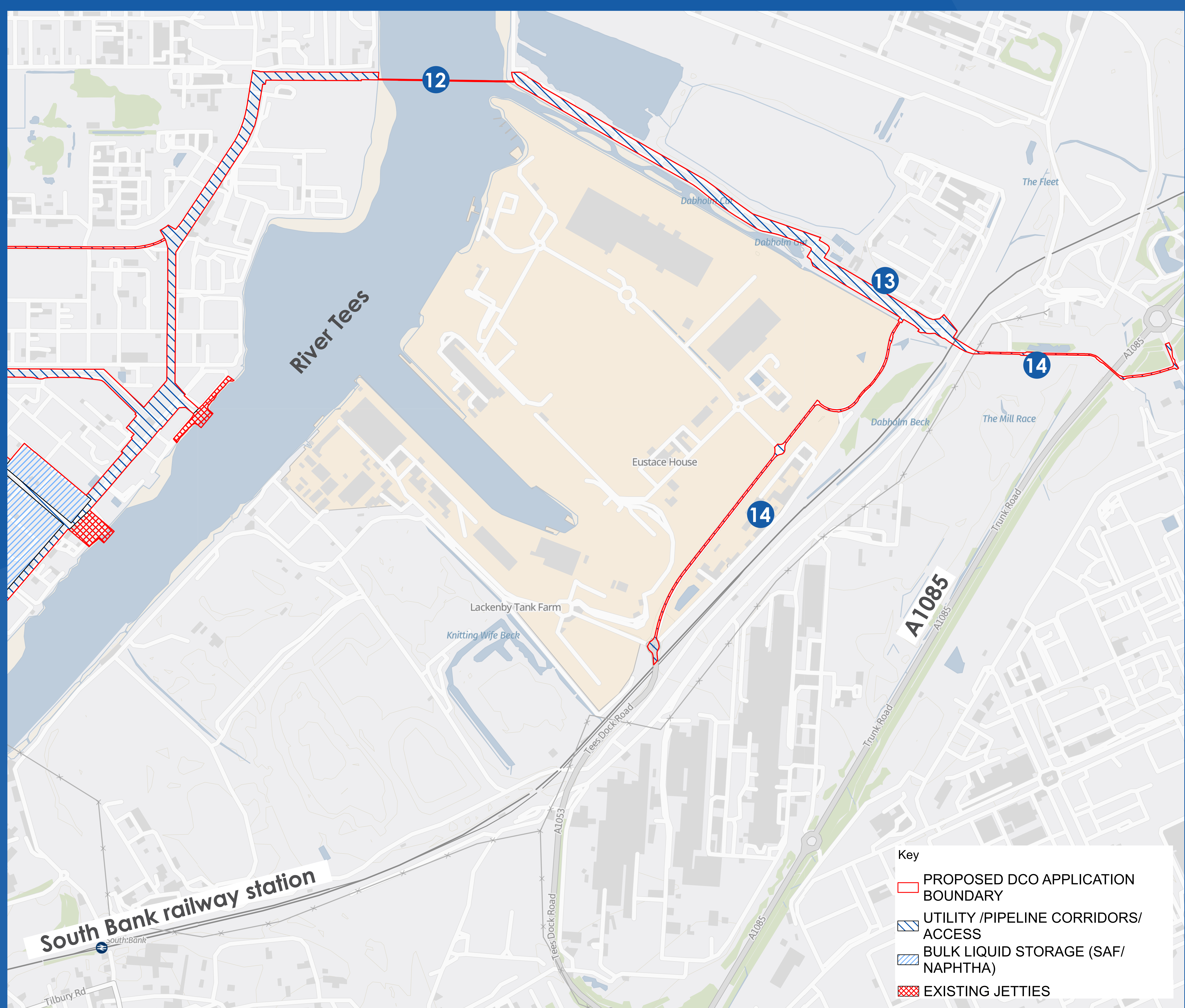
Site Plan 1

- 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
- 4 Clarence Wharf, an option being considered to transport construction components and equipment to the Project Site
- 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
- 7 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 treatment plant

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Indicative Project Site layout plan



Site Plan 2

- 12** 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
- 14** Wastewater pipeline temporary construction access roads

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Landscape and visual impacts

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 integrate 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 below. These include illustrative views from RSPB Saltholme and the Middlesbrough Transporter Bridge. These show largest expected 'envelopes' or blocks for the proposed plant buildings and structures. These will be refined further as the project design develops.



Proposed 53.5° view from RSPB Saltholme (the maximum parameters for every element are shown to illustrate the largest expected extent).



Proposed 53.5° view from the Middlesbrough Transporter Bridge (the maximum parameters for every element are shown to illustrate the largest expected extent).

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.



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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 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.

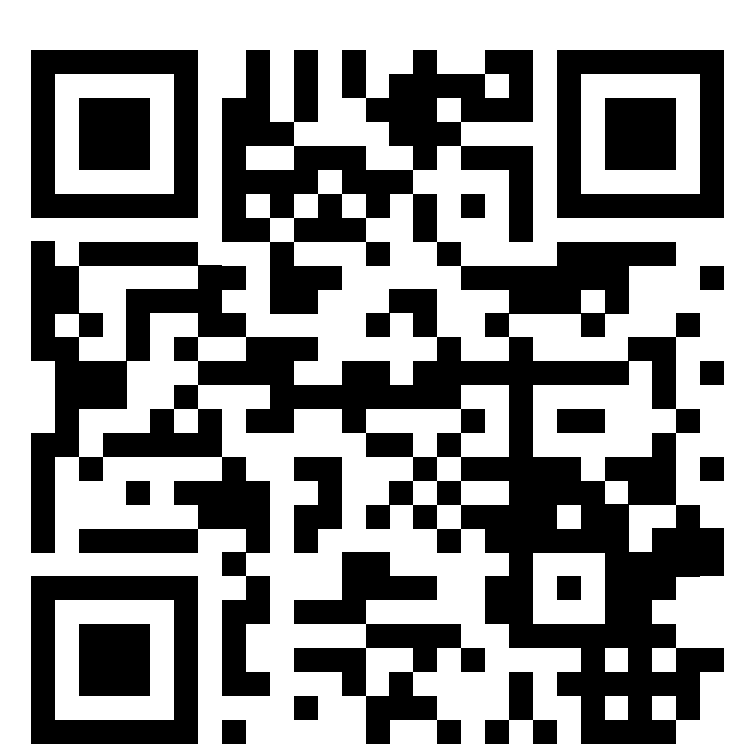
Throughout the design process we have attempted to reduce impacts in the local area and considered how we can provide enhancements as part of the Project. The initial findings for the EIA can be read in the Preliminary Environmental Information Report (PEIR) and its Non-Technical Summary (NTS).

The PEIR and NTS provide information about the proposed Project that reflects the emerging design and the preliminary results of the environmental assessment.

To 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

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 full suite of PEIR documentation, including NTS, can be found in the room today and on our project website: www.lighthousegreenfuels.co.uk

A summary of the PEIR findings can also be found in our Consultation Information Booklet.



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Consultation

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.

Please complete a feedback questionnaire

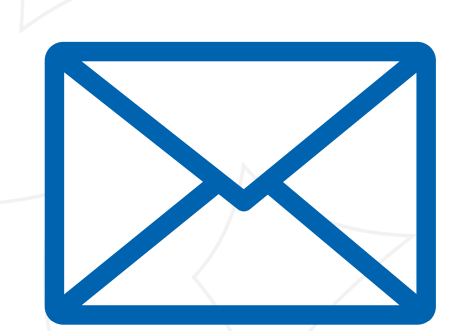
You can provide your feedback to us either online or in writing, by:



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



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.



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Next steps

How we will use your feedback

Once the consultation has closed at **11:59pm on Thursday 20 June 2024**, we will review all comments and suggestions that have been received during the consultation period.

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.

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

If you have any further questions, please contact us by:



Email us at info@lgf.co.uk



Call us on **0800 157 7346**

Thank you for attending our consultation event.



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