

# HyGreen Teesside

## Public consultation

1st June – 6th July 2023





# Welcome

At bp, we're taking action through transformative projects that will help us to achieve our net zero ambitions.

We're backing hydrogen and carbon capture and storage to help Teesside and the UK decarbonise power and industry. As part of this, we're proposing to construct HyGreen Teesside – a green hydrogen production facility in Redcar.

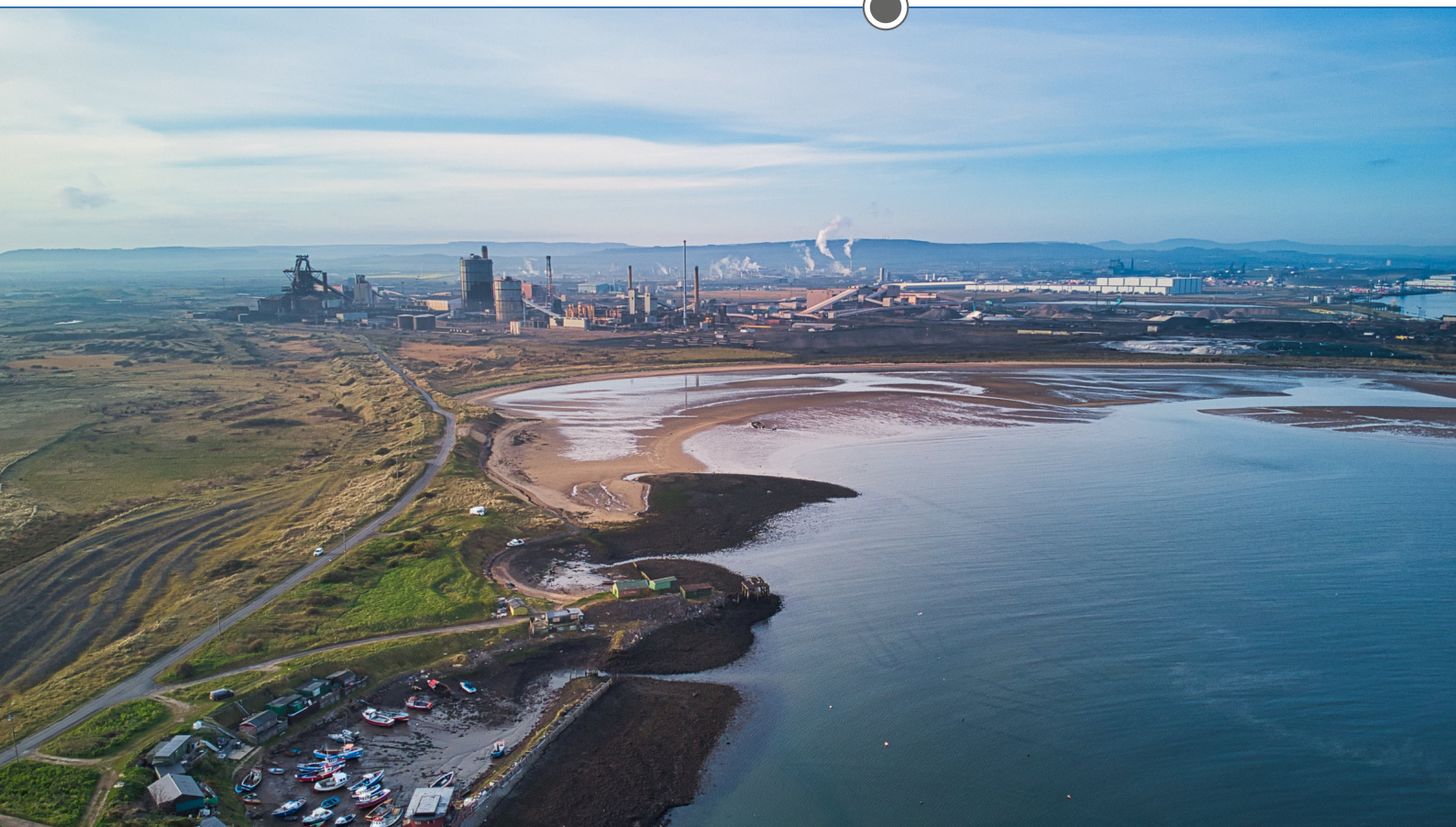
Hydrogen is set to play an essential role in decarbonising industries in the UK, particularly those that are difficult and expensive to electrify. Hydrogen can also be used for power generation, and as an alternative fuel source for mobility and transport, such as heavy-duty fleets, buses, rail and aviation. HyGreen Teesside aims to be one of the biggest green hydrogen production facilities in the UK, delivering economic growth for Teesside and the home-grown hydrogen that the UK needs.

## Who we are

bp understands that tackling climate change cannot be achieved in isolation; it needs everyone to pull together. bp is collaborating with exceptional partners on the journey towards net zero, and are doing so on this project.

On HyGreen Teesside, bp is working with Masdar – the Abu Dhabi renewable energy company – to develop our plans.

Both bp and Masdar are committed to driving the project forward, and to establishing Teesside and the UK's position in pioneering hydrogen.



HyGreen Teesside is a proposed large-scale green hydrogen production facility, to be located on derelict industrial land in Redcar.

## Hydrogen Power

Hydrogen can help us get to net zero:

- Hydrogen can provide low carbon energy for activities and processes that are difficult to electrify – especially in industries, such as iron, steel and chemicals which need high temperature processes.
- Hydrogen can be used as a fuel for power generation.
- Hydrogen can be used as a low carbon source of energy for heating buildings.
- Hydrogen can also help to decarbonise long-distance transportation in marine, aviation and road transport.

However, pure hydrogen does not occur in sufficient quantities in nature for this purpose and must be produced through industrial practices.



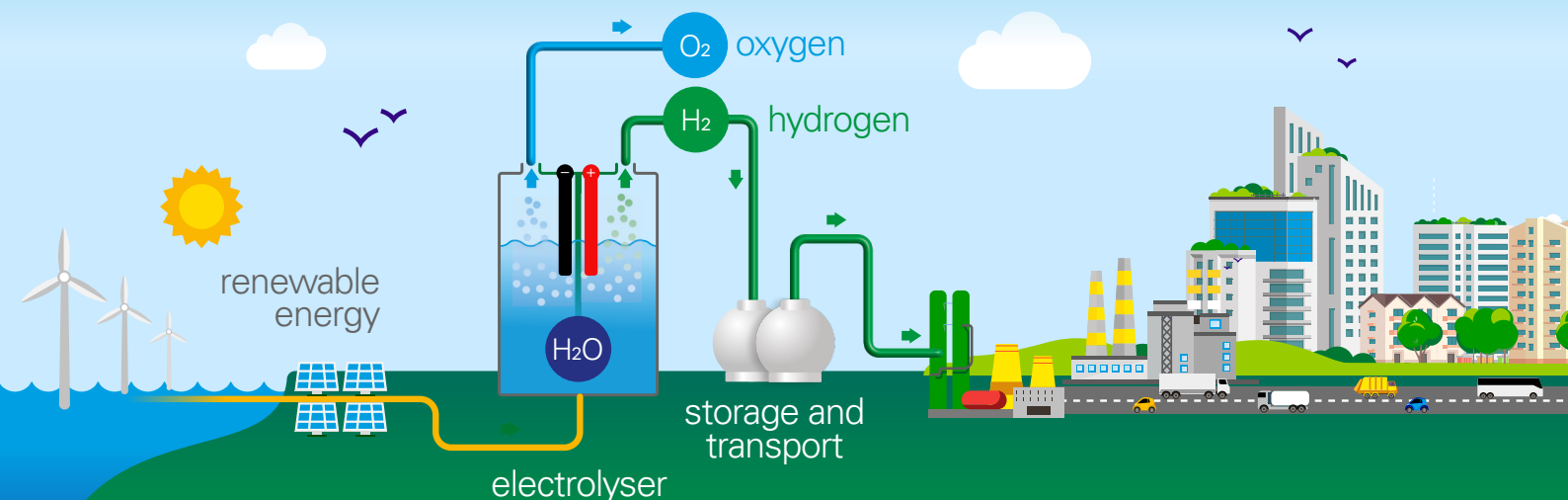
## What is Green Hydrogen?

Green hydrogen, commonly defined as electrolytic low carbon hydrogen, is made by water electrolysis using renewable and low-carbon electrical power sources, such as solar and wind.

Electrolysis is a process by which an electric current is passed through a substance to effect a chemical change.

In this case, splitting water molecules ( $H_2O$ ) into hydrogen ( $H_2$ ) and oxygen ( $O_2$ )

## The electrolysis of water using renewable power to create $H_2$







## Why Teesside?

Teesside has a long and proud history of industrial activity, ranging from steelmaking to chemicals. The region continues to play a key role in UK industry today, with Teesside's leading industrial businesses contributing millions of pounds to the local and UK economy each year.

Key to achieving the UK government's commitment to net zero by 2050 will be ensuring carbon intensive sectors in areas like Teesside, which accounts for 5.6% of the UK's industrial emissions, are able to decarbonise.

The Teesside industrial cluster is a tightly packed area, making it a great location to decarbonise effectively and efficiently. Low carbon green hydrogen produced at HyGreen Teesside will help surrounding industrial companies meet their commitments to reducing their greenhouse gas emissions, and support the decarbonisation of Teesside's industry, mobility and heating.

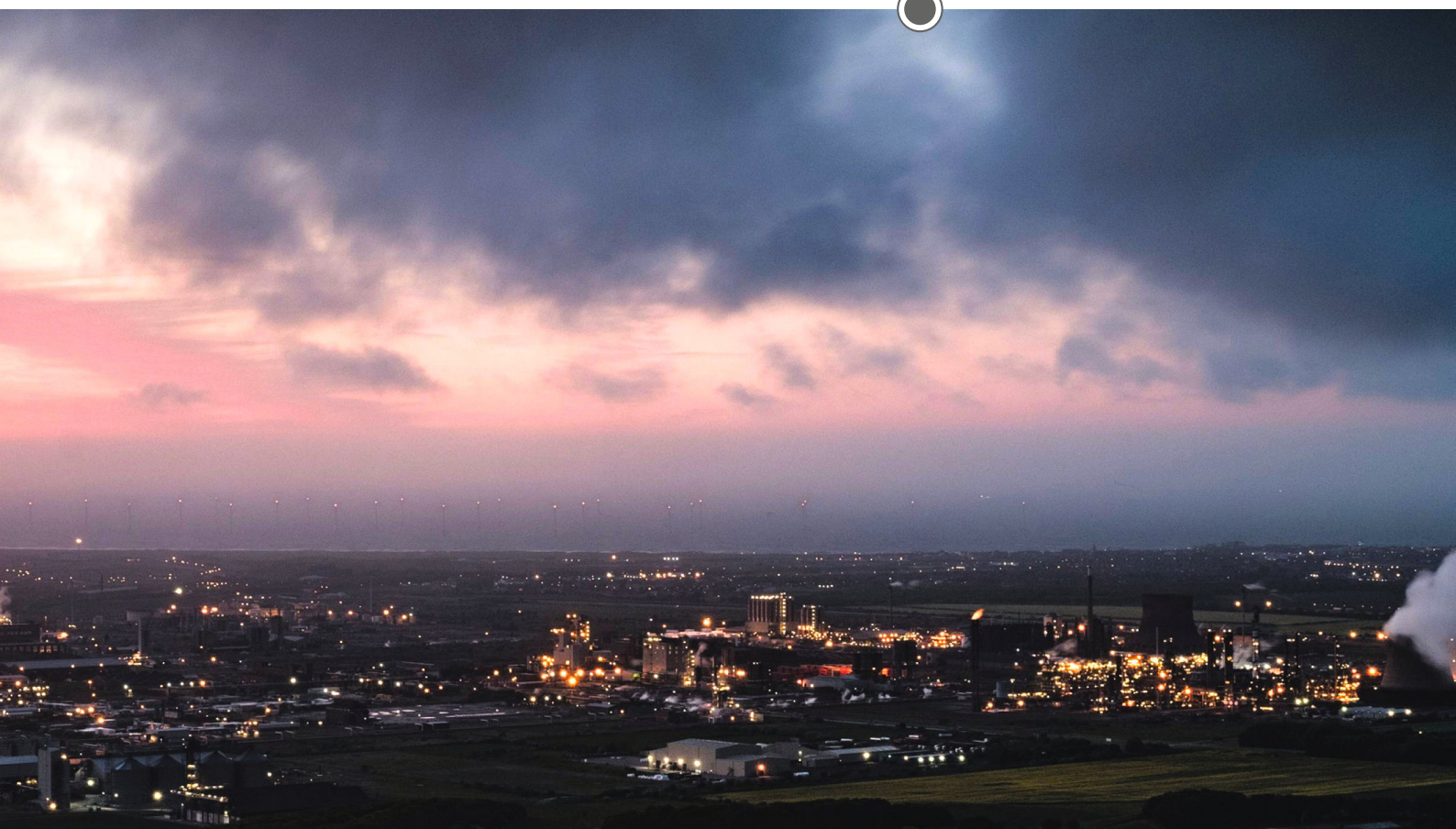
We're currently engaging with potential offtakers for HyGreen Teesside. Offtakers are businesses who would purchase the hydrogen produced by the project and could include companies in the energy and petrochemical industries. HyGreen Teesside, alongside H2Teesside and a number of other proposed projects in the area, can strengthen Teesside's development into the UK's leading hydrogen hub, creating new high-quality jobs, supporting local education and skills development and kick-starting a highly-skilled UK-based hydrogen supply chain.

## The need for HyGreen Teesside

The UK government has made a legally binding commitment to reaching net zero greenhouse gas emissions by 2050. The critical role that low carbon hydrogen will play in achieving this commitment has been stated in a number of recent UK policy documents.

Additionally, the area of HyGreen Teesside's Production Facility, the Foundry Site, is identified in Redcar and Cleveland's Local Plan for industrial and innovative energy-related developments.

HyGreen Teesside, along with other proposed developments in the Teesside area, is expected to support development and regeneration within Teesside.



# HyGreen Teesside

## The site

### The main site

The Foundry contains the main hydrogen production facility, where the electrolysis process would take place, along with on-site storage and some ancillary infrastructure.

### The pipeline and connection corridors

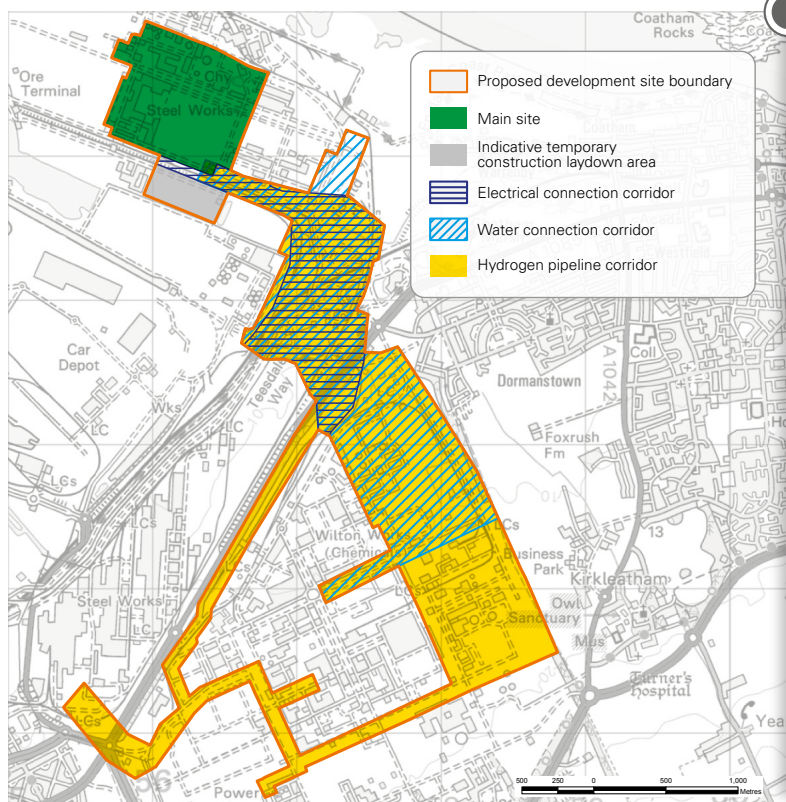
These consist of three main elements:

**Hydrogen export pipeline corridor:** This pipeline network would be used to transport hydrogen to offtakers and potential fuel storage sites, south of the River Tees.

**Electrical connection corridor:** These connections would bring power to the production facility.

**Water connection corridor:** These connections would be used to supply water to the production facility and discharge water from the production facility.

Please note that these corridors are indicative areas, and the pipelines and connections would be placed within these areas. As we continue to engage with stakeholders, and we progress our design, we will refine and reduce the areas as they are shown on the map.



## Making green hydrogen

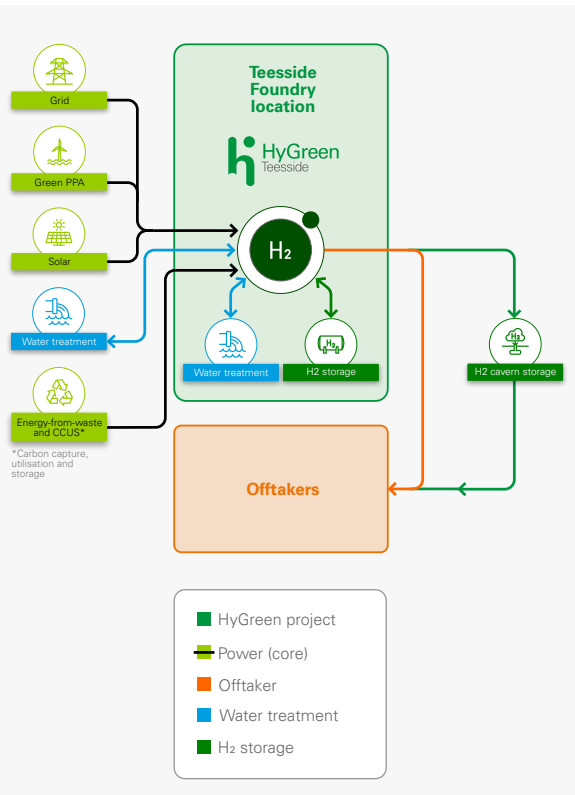
**Step 1.** Water would be transported to the Main Site via the new water pipelines.

**Step 2.** Depending on the source of the water, it may be necessary to treat the water as it arrives to the production facility, so it meets an appropriate quality.

**Step 3.** The water would then be supplied to the electrolyser modules at the production facility – this is where separation of the water into hydrogen and oxygen would take place.

**Step 4.** This electrolysis process would be powered by a number of energy sources. These would be predominantly renewable and low carbon sources, including onshore or offshore wind, solar PV, and carbon-capture enabled generation. As seen in the diagram, the production facility would also be connected to the standard electricity grid; a small amount of power may be used to top-up production facility power, as required.

**Step 5.** The hydrogen produced during this process would then either be stored at the Main Site, or transported to potential offtakers and fuel storage locations, via the new hydrogen pipelines.





## Environment

At bp we understand our responsibility to consider and minimise the impact that our projects have on the environment.

### Environmental Impact Assessment

As part of the development of our plans for HyGreen Teesside, we are undertaking a comprehensive Environmental Impact Assessment (EIA). The EIA process allows us to understand and assess the potential effects of the construction and operation of HyGreen Teesside on local communities and the environment, and identify the ways in which these can be avoided or reduced.

The findings of the EIA will be presented in a document known as an Environmental Statement (ES) which will be submitted as part of our planning application to Redcar and Cleveland Borough Council (RCBC).

### Where are we in the process?

We are currently undertaking our EIA, having received an EIA Scoping Opinion from RCBC. The council consulted with a number of key stakeholders when providing their Scoping Opinion. bp will be undertaking its EIA in accordance with the scope agreed with stakeholders.

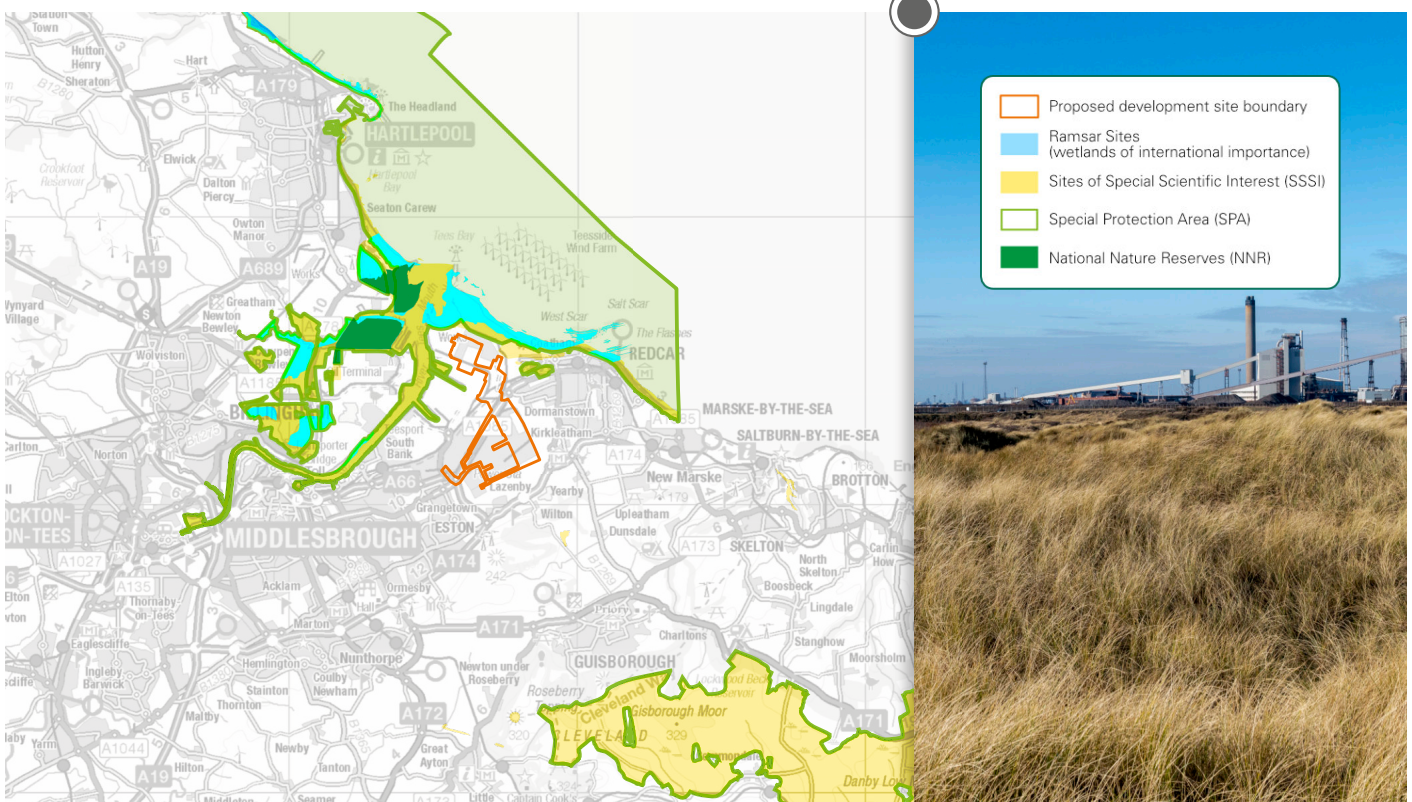
As we continue to develop our plans for HyGreen Teesside, we are continuing to consult with RCBC and statutory environmental bodies, at the same time as undertaking baseline environmental surveys. This will ensure the preparation of robust assessments, informed by the most up-to-date data and knowledge available.

### Environmental constraints

As part of our work, we have identified a number of local constraints around the HyGreen Teesside project boundary, including designated environmental sites and dwellings, which we have carefully considered as we've developed our plans.

A number of the key environmental constraints are shown on the plan below.

Our continued EIA work will help us to better understand the potential environmental impacts of HyGreen Teesside, and how we can eliminate, reduce or mitigate these impacts and deliver benefits as part of our proposals.







## Environmental Impact Assessment

Some of the topics our EIA will consider include:

### Ecology and biodiversity

We're currently undertaking ecological surveys in the vicinity of HyGreen Teesside, which survey local wildlife habitats and species. The aim of these surveys is to get a better understanding of existing environmental and ecological conditions in the local area, which will help to inform our environmental assessments for the project and our final designs.

Should any significant environmental effects be identified in our assessments, mitigation measures will be included in our ES to minimise these effects. HyGreen Teesside is aiming to attain an overall 10% net gain in biodiversity.

### Landscape and visual amenity

The Main Site for HyGreen Teesside is heavily influenced by large industrial structures within Teesside. A number of residential settlements are also located in the wider area.

We're undertaking a Landscape and Visual Assessment to assess any temporary or permanent changes to landscape character and views from sensitive receptors (such as residents) in the vicinity of the HyGreen Teesside.

Where our assessment indicates the need for mitigation, this will be outlined in the ES and included as part of our application. These measures typically include things such as designing external surfaces to be in-keeping with those of the local area.

### Flooding and the water environment

We're undertaking a Flood Risk Assessment to understand HyGreen Teesside's potential flood risks and whether our proposals would increase flood risk in the area. However, we don't anticipate any additional risk of flooding associated with HyGreen Teesside. A Flood Risk Assessment will be submitted as part of our planning application and will inform the ES and the final design of HyGreen Teesside.

We're also undertaking an impact assessment to understand any potential effects on the water environment, including inland, transitional and coastal surface waters.

Where our assessments indicate the need for mitigation, this will be outlined in the ES and included as part of our application. Typically, mitigation would include measures in the Construction and Environmental Management plan during the construction phase, and an appropriate Surface Water Drainage Strategy during the operational phase.







## Environmental Impact Assessment

Some of the topics our EIA will consider include:

### Noise and vibration

The site is remote from residential areas, with the nearest homes being over 1km away. We are currently assessing the operational noise impacts from the Main Site, to understand any potential effects this could have on nearby sensitive receptors. We do not expect any significant noise effects during operation of HyGreen Teesside, however we are currently undertaking an assessment to check. If any significant effects are identified, these will be mitigated where possible. We're also undertaking an assessment of construction noise and vibration.

### Air quality

We do not expect there to be impacts on air quality once HyGreen Teesside is operational, that require assessment.

We are currently assessing any potential construction emissions from vehicles and construction dust, to understand any potential effects that this could have on local air quality.

### Traffic and transport

We're currently undertaking a Transport Assessment and Environmental Assessment to understand any impact on local traffic flows.

We do not expect any significant effects on traffic flows once HyGreen Teesside is operational. To reduce our impact during the construction period, we will develop a Construction Traffic Management Plan and a Construction Worker Travel Plan to reduce the impact during the construction period.



## Minimising disruption

As with any large project, we understand there may be some disruption during the construction stage, and we'll be seeking to minimise this wherever possible.

A Construction Environmental Management Plan (CEMP) will be produced in advance of any construction works, which aims to ensure that any adverse effects of construction on the environment and local communities are minimised. The CEMP establishes a framework, within which an appointed contractor will plan, implement, and deliver environmental management, mitigation and monitoring requirements during construction.

Examples of controls and procedures in the CEMP could include:

- ⊙ Measures to minimise noise and vibration, such as using quiet and low vibration equipment, acoustic barriers and considering construction methodology to reduce noise levels where possible.
- ⊙ Measures for any sensitive/protected species that may be encountered during construction works, to ensure compliance with relevant legislation and best practice.
- ⊙ Measures to control and limit dust, such as using wheel washing for vehicles entering and leaving construction sites, and the use of road sweepers to remove any material from local roads.
- ⊙ Minimising visual disturbance by ensuring temporary site lighting is only used where necessary for safety and security.
- ⊙ Creating a Construction Traffic Management Plan which will set out measures to reduce the impact of traffic during the more critical construction period, such as specifying haulage routes to keep construction traffic on the most suitable roads.





## Creating low carbon energy in Teesside

We believe our proposals have the potential to deliver significant benefits to Teesside and the local community.

HyGreen Teesside will support economic development and regeneration in the Teesside area, strengthening Teesside's development into the UK's leading hydrogen hub.

HyGreen Teesside will help to fuel the development of Teesside into the UK's first major hydrogen transport hub, leading the way for large-scale decarbonisation of heavy transport, airports and rail in the UK.

HyGreen Teesside aims to kick-start the development of a highly skilled UK-based hydrogen supply chain.

HyGreen Teesside will safeguard jobs in existing local industries and create new high-quality jobs, during both construction and operation of the project.

As part of bp's commitment to ensuring local people benefit from near-term job opportunities, HyGreen Teesside technician apprentices will be hired and skilled through planned bp-supported technician training schemes for Teesside.

This project will create opportunities for local education and skills development, with HyGreen Teesside's proposed skills programme aiming to provide up to £4.7 million in funding for investment in green skills initiatives for local people over the life of the project.

## Working with the community

We're working with local authorities and educational institutions to create a legacy in the region and support social mobility. bp are:

- 📍 Establishing a community fund for net zero-focused community projects.
- 📍 Offering scale and business development services to local businesses focused on net zero.
- 📍 We're going to launch a low carbon community hub.
- 📍 Partnering with Redcar & Cleveland College to support green skills and education initiatives in Teesside.

This includes providing £60,000 in funding for the development of the new Clean Energy Education Hub at the College.





The Hub will specialise in clean energy and renewable industry training for school leavers, apprentices and adult learners.





## Let us know your views

We want to hear your views on our proposals for HyGreen Teesside. You can respond to our consultation in the following ways:

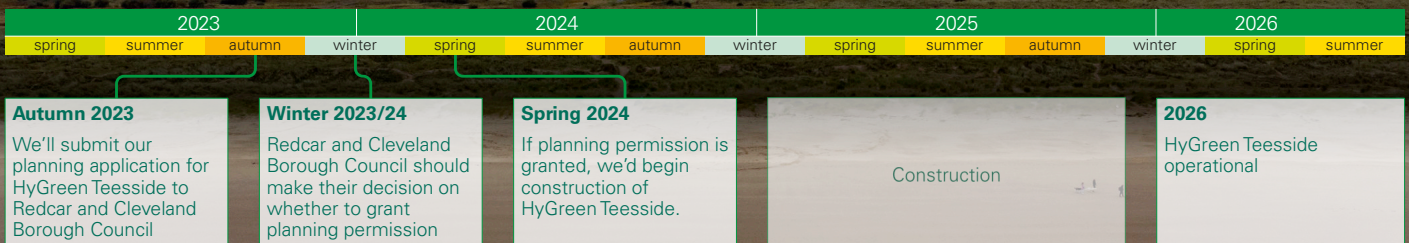
-  **Online** Fill in our online response form at [www.hygreenteesside.co.uk](http://www.hygreenteesside.co.uk)
-  **In person** Fill in a response form at this consultation event.
-  **Post** Write to us or send your response form to **FREEPOST HYGREEN Teesside**
-  **Email** Write to us or send your completed response form to [info@hygreenteesside.net](mailto:info@hygreenteesside.net)

The deadline for consultation feedback is 23:59 on 6th July 2023

## Next steps

Following this consultation, we'll review all feedback and use it to finalise our proposals and prepare our planning application.

We've outlined the anticipated milestones for HyGreen Teesside below.







## Our planned blue hydrogen facility

Alongside HyGreen Teesside, we are also proposing a large-scale blue hydrogen production facility in the Teesside area. This blue hydrogen project could also support the UK's decarbonisation aims by producing over 10% of the UK's low-carbon hydrogen target by 2030.

Blue hydrogen, also referred to as Carbon Capture and Storage-enabled low carbon hydrogen, is extracted from natural gas. H2Teesside will convert methane ( $\text{CH}_4$ ) in natural gas into hydrogen ( $\text{H}_2$ ) and carbon dioxide ( $\text{CO}_2$ ).

The vast majority of  $\text{CO}_2$  produced during this process is captured and stored permanently, preventing it from entering the atmosphere. H2Teesside will capture approximately 2 million tonnes of  $\text{CO}_2$  per year, equivalent to capturing the emissions from the heating of one million UK households.

### When can I hear more about H2Teesside?

The H2Teesside project is separate to HyGreen Teesside, and requires a different type of consent granted in the form of a Development Consent Order.

We're still developing our plans for H2Teesside, but we'll be coming out to consult with the local community shortly, and look forward to sharing more information with you, and hearing your views.

In the meantime, if you'd like to read more about H2Teesside, you can visit the project website: [www.h2teesside.co.uk](http://www.h2teesside.co.uk)

