

**Steve Beel
Freeport East CEO**

Suffolk Chamber Net Zero Group

April 2023

- **Introduction to Freeport East**
- **Freeport East & Net Zero**
- **The Freeport East Green Hydrogen Hub**
- **Our work on local demand**

Introduction to Freeport East

Aspiring to be the UK's leading centre for global trade, green energy, innovation and technology.

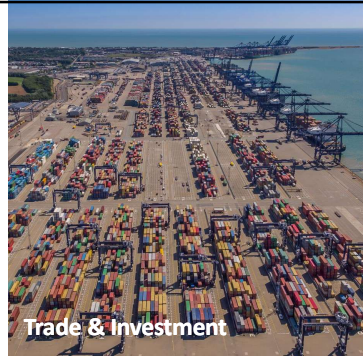
Freeport East offers unique opportunities for investment, business-led growth and levelling up that will deliver benefits at the local and national level.



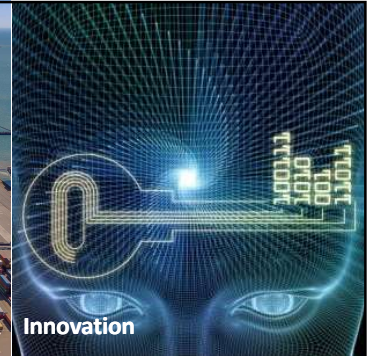
Freeport East

Headlines:

- UK's only global Top 50 largest port
- Springboard into Europe via RoRo ferries
- Links to leading innovation ecosystem with Cambridge high-tech cluster and BT Adastral Park research centre
- At the heart of the East region's clean energy cluster
- Huge potential and strong national links to create new jobs, opportunities and skills for deprived communities
- Working closely on research and skills with further and higher education providers including Universities of Essex and Suffolk and skills institutes
- Access to existing centres of innovation
- Enhancing environment and biodiversity are central to our character and vision
- < 90 minutes to City of London, Cambridge & Norwich & associated tech/finance/research clusters



Trade & Investment



Innovation

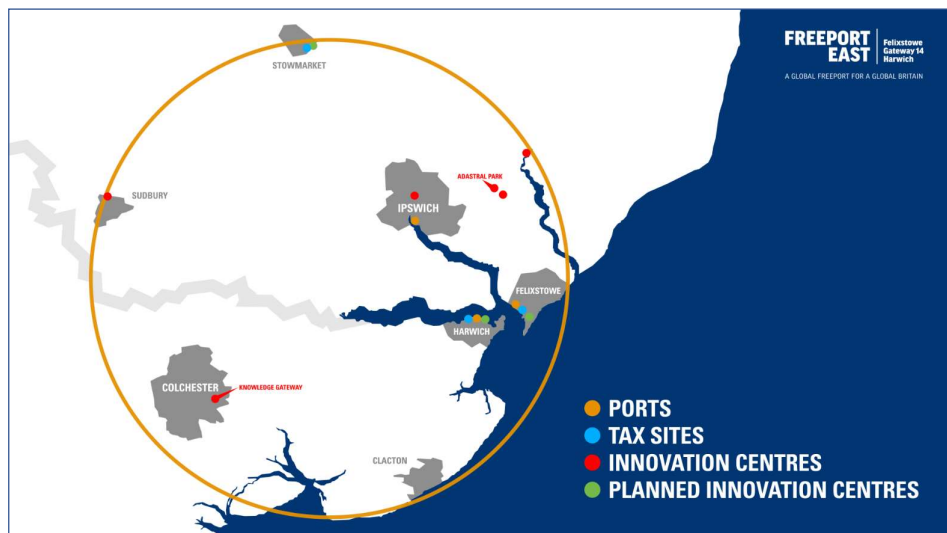
Jobs, Skills & Levelling Up

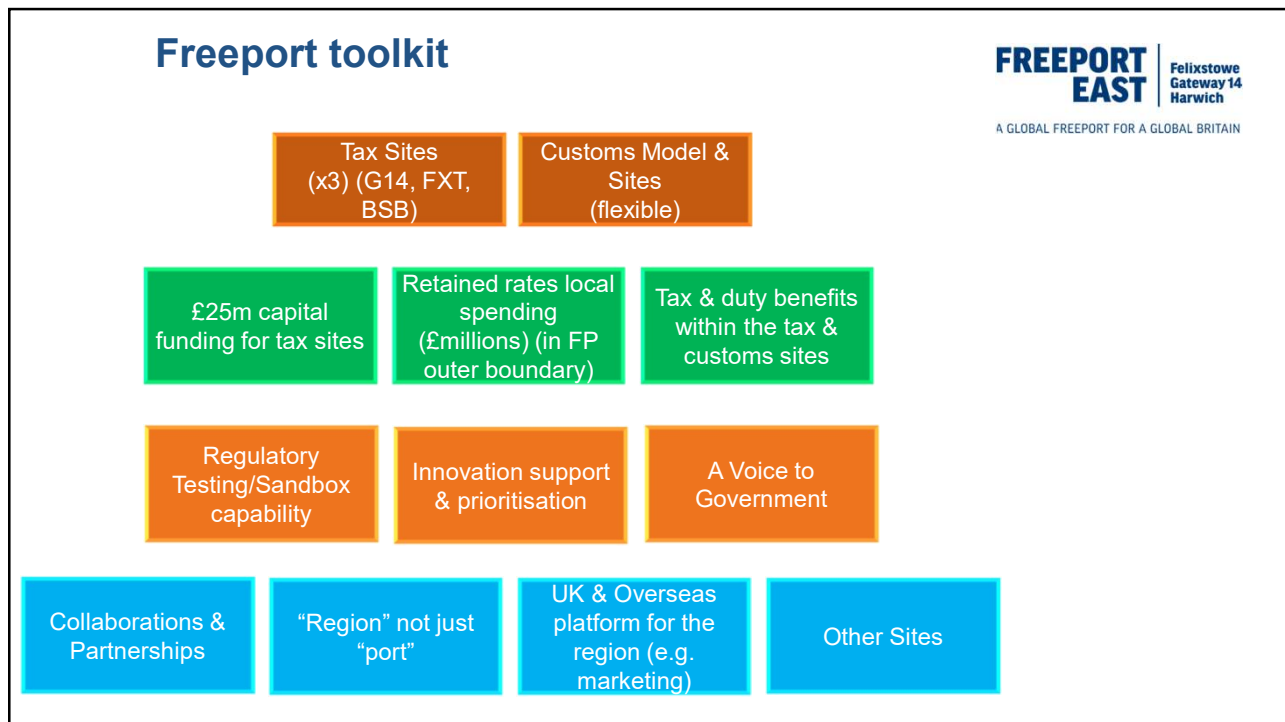


Freeport East

FREEPORT EAST Felixstowe Gateway 14 Harwich

A GLOBAL FREEPORT FOR A GLOBAL BRITAIN





Freeport East and Net Zero

Vision (draft)

- Deliver a net zero Freeport East (economic area) by 2050
- Deliver net zero in sub-components of the Freeport East (economic area) from 2030 onwards
- Deliver the economic basis to support net zero delivery beyond the Freeport East economic area (e.g. support for offshore wind; nurturing new technology & innovation)
- Deliver a nationally recognised model for place-based net zero industrial and economic development that creates jobs and builds strong and inclusive local economies
- Position Freeport East and the surrounding region as a globally significant hub for innovation and delivery in net zero

11

DRAFT A pathway to Net Zero for Freeport East (Under development)

Interim outcomes for Freeport East to target on journey to net zero:

- 200MW of Green Hydrogen production by [2027]
- 500MW of Green Hydrogen production by [2030]
- X% new EV public charging points by [date]
- X% increase in solar PV roof capacity by [date]
- X% increase in battery storage capacity by [date]
- At least one green corridor partnership in place by 2025
- Net increase in biodiversity across economic area
- X% increase in modal shift of inward containers from road to rail or coastal shipping
- X% shift in road freight to cleaner fuels
- X% reduction in diesel consumption across Freeport East ports by [date]

12

How we will get there?

- Build the most effective and productive collaborations and partnerships across the public and private sectors
- Be evidence-based in our approach and focus on the “place” as framework for solutions
- Build local and national support for our vision through communicating clearly how a net zero future can deliver stronger local economies, new jobs and tackle inequalities
- Articulate clear development plans to Government, investors and partners in order to secure the funding and investment required to deliver on the vision
- Embrace innovation in technologies, processes, business models and more
- Maximise the value of UK skills, technologies, knowledge and SMEs whilst welcoming inward investment and strong international partnerships

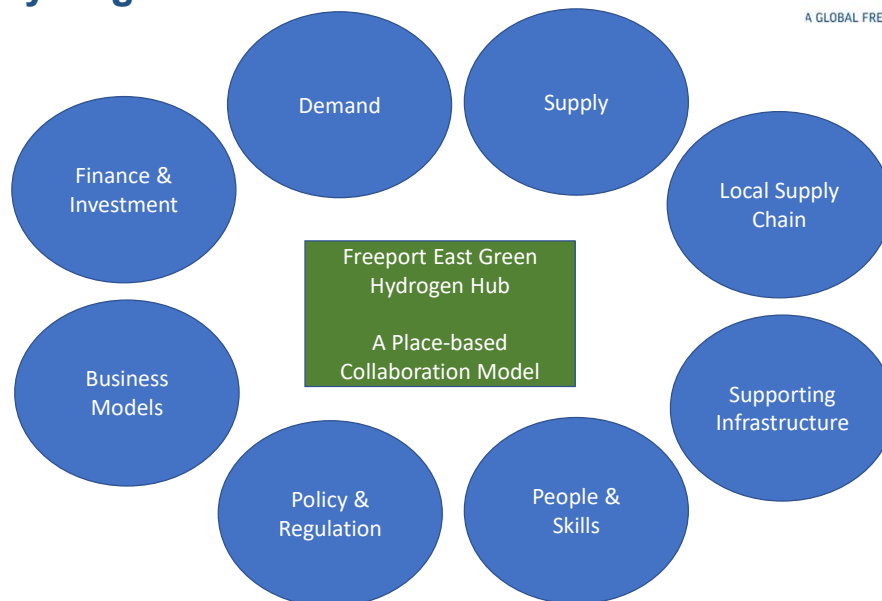
13

The Freeport East Green Hydrogen Hub

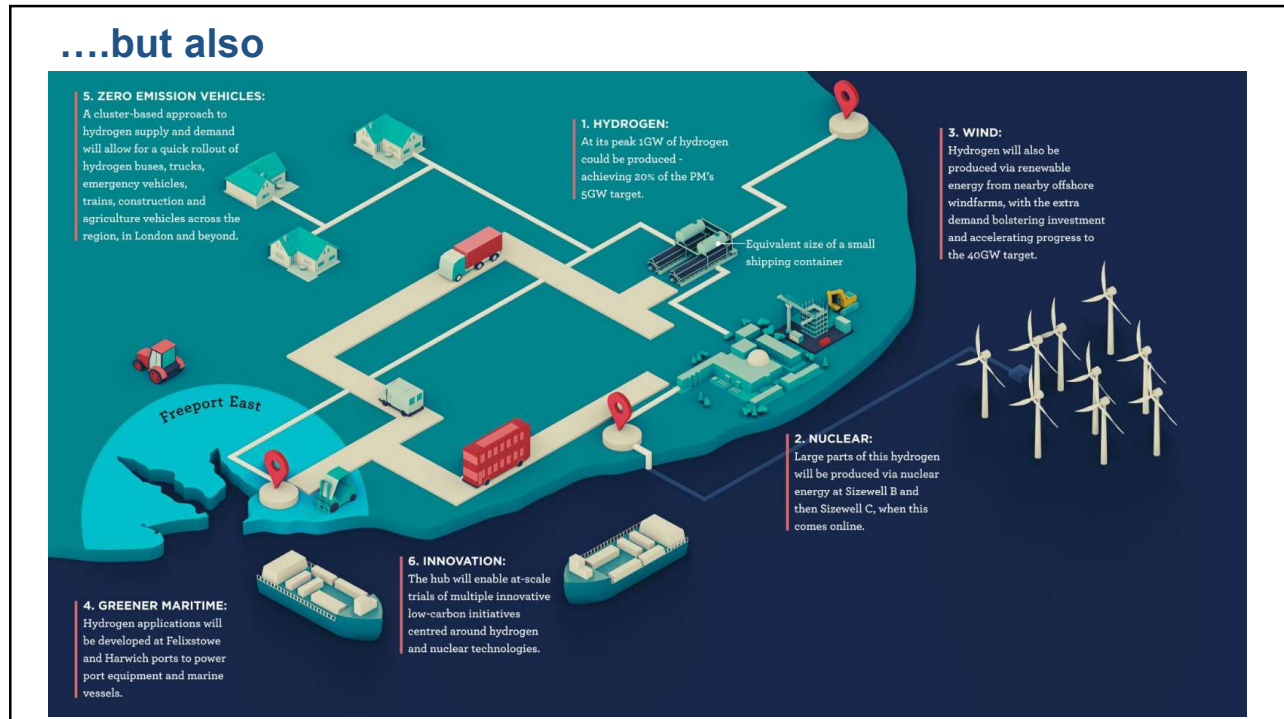
Why Green Hydrogen?

1. Clearly a Fuel of the Future and part of any decarbonisation/net zero strategy for Freeport East as an economy
2. Local Comparative Advantage for Green Hydrogen
3. Clear opportunity to support local economic growth in partnership with others
4. Inward Investment & Skills Opportunity for Freeport tax sites

What do we mean by a Green Hydrogen Hub?



....but also



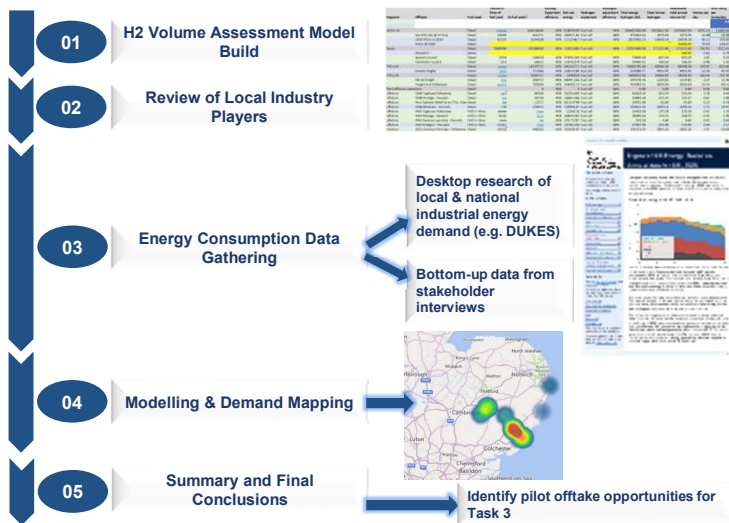
Our role in delivering the Hub

FREEPORT EAST | Felixstowe
Gateway 14
Harwich
A GLOBAL FREEPORT FOR A GLOBAL BRITAIN

1. Creation and sponsorship of a vision
2. Facilitating market interactions in relation to a specific geography
3. Help to bring skills, regulation and public sector participants along as market builds
4. Provide intelligence and analysis to support the market
5. Potentially utilising our own funds to support ventures
6. A non-commercial actor open to collaborating with all.....

Our mapping of local demand

Local Demand - Our Approach



Due to the time constraints of the project, the stakeholder interviews were conducted after the initial volume assessment had been completed and were used to verify our models.

1. **Repurposing, for the Freeport Area, our proprietary model** for converting energy demand from various industrial and transportation requirements into hydrogen and electrolysis requirements.[23].
2. **Review of the key players within the 11 identified industrial segments** by means of both desktop research, our internal databases and stakeholder engagement and interviews.
3. If available, **bottom-up estimates of energy demand** from potential local offtakers were obtained. In absence of this data, **national data was gathered and scaled** to the local area according to our model & the methodology on the next slide.
4. **Volumes** for each offtaker were **plotted as heatmaps** on the local area to identify clusters, aiding infrastructure definition.
5. Further analysis of the offtakers, volumes and time-to-market assessment from task 1 was completed to define **3-4 use cases which could be deployed in the short term as pilot** proof of concepts.

Executive Summary

FREEPORT EAST Felixstowe Gateway 14 Harwich

1. DEMAND SEGMENTATION AND TIME TO MATURITY ASSESSMENT

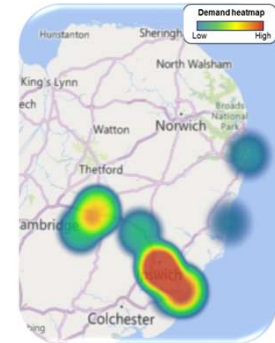
11 segments with potential hydrogen use cases within Freeport East area and the immediate region were identified as part of initial review



Key insights and commentary from our initial analysis:

- HGVs, Buses and FMCG can be early adopters in the region, making them attractive for pilot projects
- Maritime is a long term opportunity for derivatives, but port ops could come sooner if there is strong support from stakeholder groups
- Refining & fertilisers segments have credible offtakers who can benefit from fuel switching to hydrogen
- Rail at a national level has a weak case, but it's a viable alternative in East England due to preponderance of freight, & local electrification challenges.

A GLOBAL FREEPORT FOR A GLOBAL BRITAIN



2. DEMAND MAPPING

140 tonnes per day of hydrogen offtake potential could be accessible across the region by 2030. Based on high level estimates this would require circa 550MW of installed capacity using typical electrolyser efficiencies as of 2023.

Noteworthy potential offtaker segments identified from the modelling could include Buses & Off-highway (c. 4tns/day), Petro-chemical refining (c.7tns/day), Port operations, (c. 10tns/day) HGVs (10-70 tns/day), FMCG (c. 32tns/day) & Fertilisers, (c. 49tns/day).

Beyond 2030, technology development becomes less certain; there may be sizable volumes (>100 tns/day) needed by HGVs especially given the large number of movements in and out of the regional ports. But there is competition from other technologies, e.g. electrification. Shipping fuels in the form of hydrogen derivatives such as ammonia could drive huge demand, as emphasis on decarbonising deep-sea shipping sector gathers momentum.

Offtakers are hub-based within the Freeport & dispersed beyond. Infrastructure barriers exist for both

Hydrogen demand hubs could emerge within the ports for refuelling of port operations & goods transport vehicles entering site – e.g. HGVs & Rail. Further afield, potential offtakers such as FMCG plants, and major construction projects etc., are more dispersed and require different storage & transport solutions. Infrastructure is currently limited, both within the economic zone, and in Eastern England. Strong demand potential and a coordinated strategy (e.g. with Project Union, a National Gas venture, and the Bacton Hydrogen Hub) is a key pre-requisite to drive infrastructure investment and development.

Summary of possible pilots

PILOT 1 - HGV & PORT OPS REFUELLING HUB AT FELIXSTOWE

Proves concept of multi-modal handling and refuelling

PILOT 1A – ADDITIONAL MARITIME REFUELLING HUB AT FELIXSTOWE

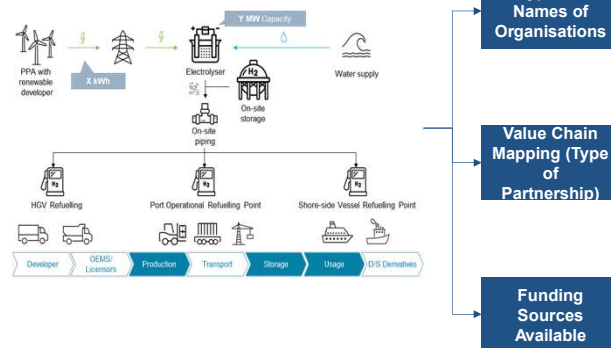
Proves concept of multi-modal refuelling of various sizes of vessels: CTVs, tugboats, service vessels etc.

PILOT 2 - PRODUCTION AND DELIVERY TO DEDICATED INDUSTRY WITHIN FREEPORT AREA

Proves concept of delivery to a dedicated local external offtaker via pipeline infrastructure

PILOT 3 - PRODUCTION AT PORT AND DELIVERY VIA TUBE TRAILER TO AN OFFSITE OFFTAKER

Proves concept of storage at production & offtake sites, along with tube trailer deliveries offsite



*Diagram is illustrative of the potential opportunities, but the specific elements need to be scoped in more detail following further studies

In summary



- Minimum of c. 140 tonnes per day or 550MW of forecastable Green Hydrogen demand through to 2030.....
 -excluding maritime, wider network demand, etc.
- A number of plausible pilot applications combining partners across the Freeport East area which we are looking to collaborate on
- Full report now on the Freeport East website
- Forms the basis for building out broader vision for the Freeport East Green Hydrogen Hub and collaboration with partners.....