

ESSAR ENERGY TRANSITION



FUELS

Roadmap to decarbonisation

EET will host one of the largest energy transition hubs in Europe

- EET Fuels is a leading player in the decarbonisation of the UK economy and is transforming its Stanlow Manufacturing Complex into one of Europe's largest energy transition hubs
- The combination of hydrogen, refinery decarbonisation, e-fuels and biofuels with unrivalled infrastructure, expertise and EET's large land bank (c.900 acres) will facilitate the process
- EET has signed a sale and purchase agreement to acquire Thornton Science Park

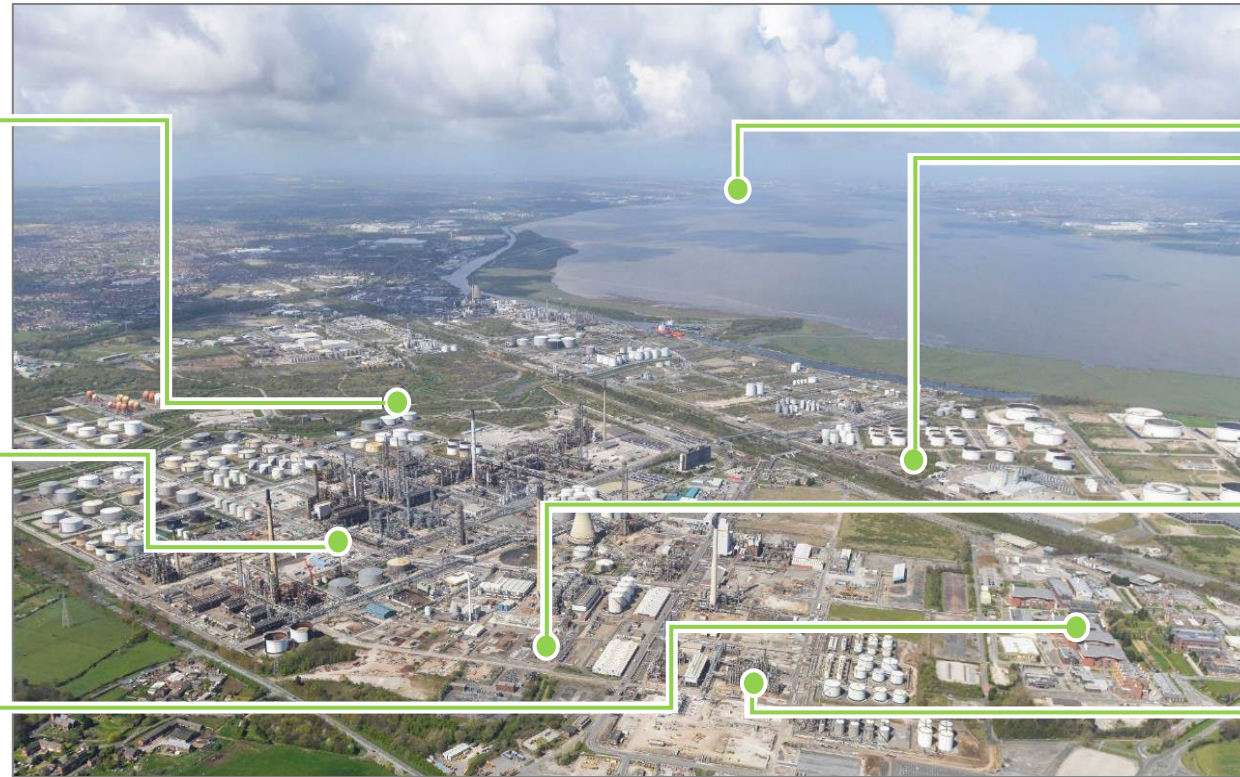
E-fuels & biofuels



EET Fuels Refinery



Thornton Science Park



STL/
Storage Sites



EET
Hydrogen/
Production



EET
Hydrogen
Power



At the heart of HyNet, one of the two Track-1 UK CCUS clusters selected by UK Government to progress to negotiation phase



HyNet provides a **carbon capture & storage network**, and a **low carbon hydrogen transport & storage eco-system** across the North West of England and North Wales

EET is the only supplier of large-scale low carbon hydrogen within the cluster through its subsidiary EET Hydrogen

EET Fuels is the largest industrial CO₂ emitter in the region and is decarbonising its operations through energy efficiency, fuel switching and carbon capture



Delivering 95% decarbonisation this decade



UK's first large-scale low carbon hydrogen production facility



Europe's first hydrogen-ready power plant

Our unique location

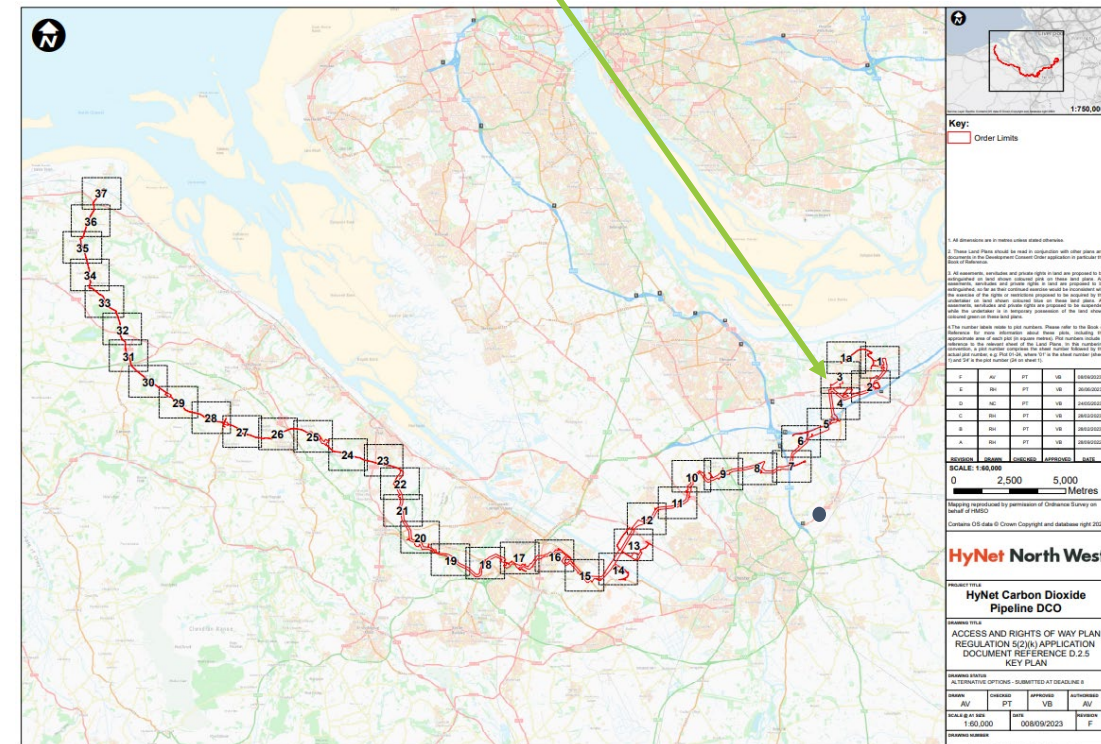


Key **EET companies**, part of the wider Essar Group, sit in Stanlow, Cheshire, at the heart of HyNet

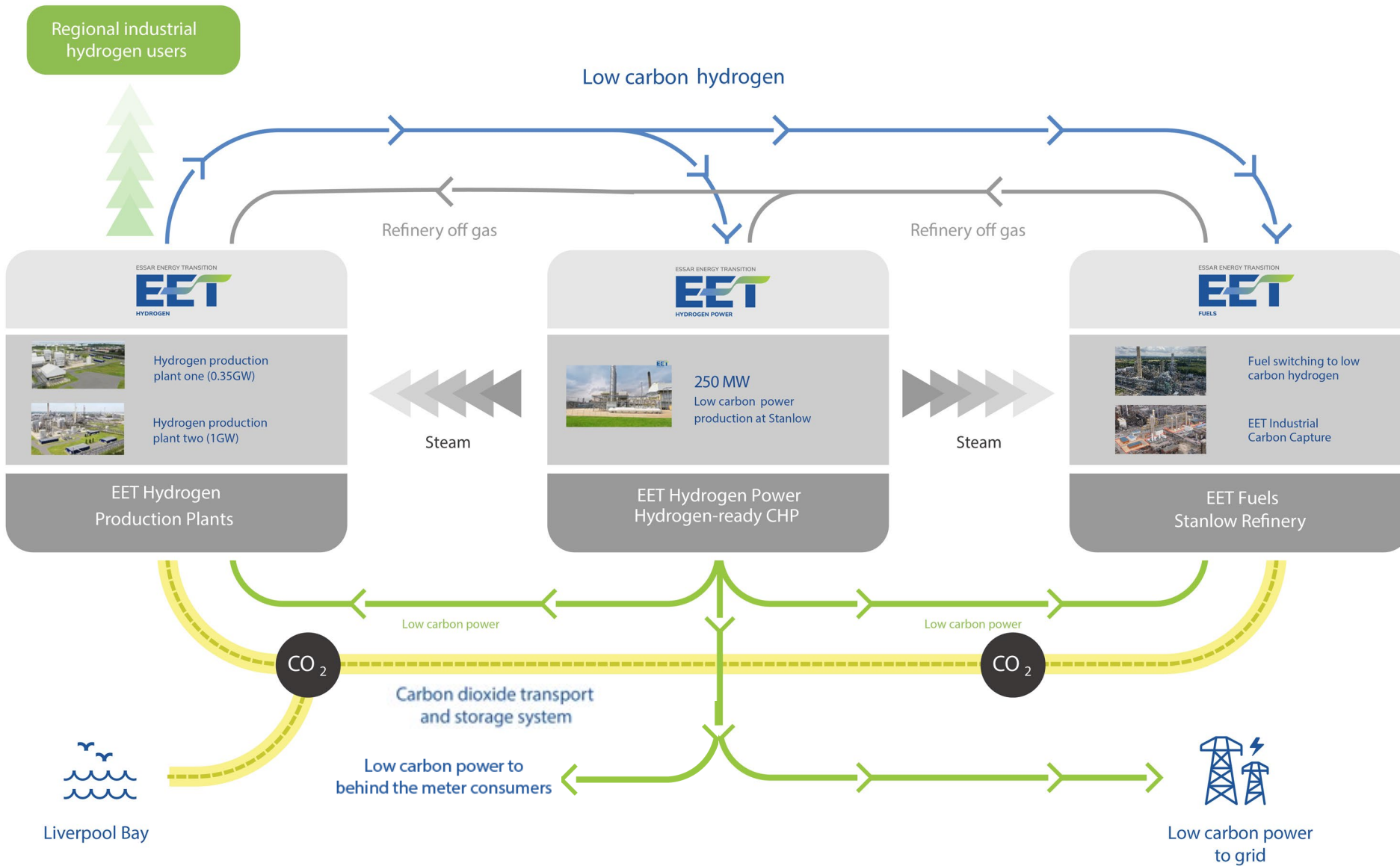


The HyNet CO₂ pipeline:

- Connection point at the Above Ground Installation (AGI) located within the physical boundary of the site (*no need for additional spur lines*)
- Utilises repurposed natural gas pipelines and offshore depleted oil & gas fields in Liverpool Bay
- Consented under development consent order (DCO)





Decarbonisation plans - integrated strategy to reduce emissions

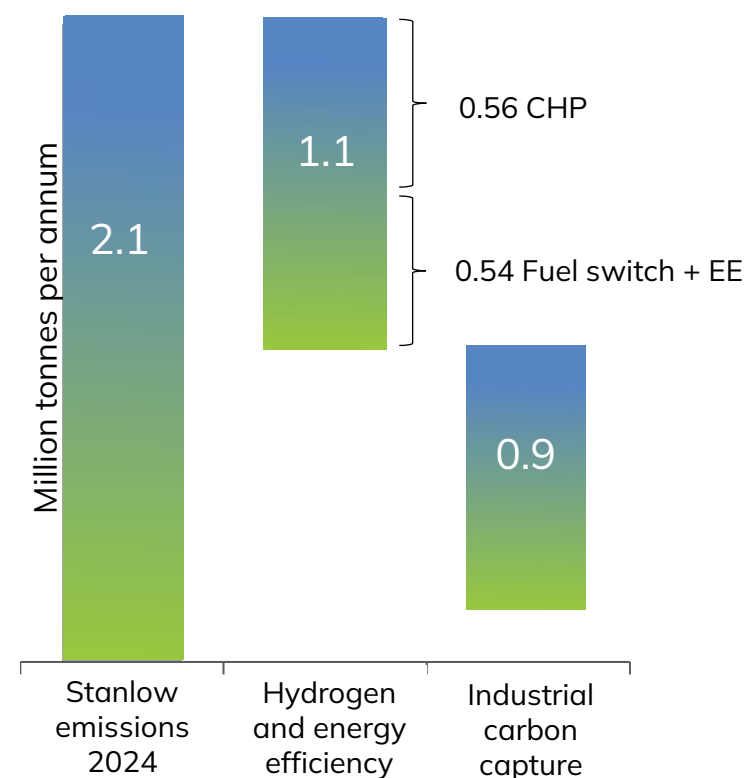


EET Fuels to deliver the UK's first low carbon process refinery

Leading decarbonisation plans amongst global refiners, will achieve a 95% reduction on emissions before 2030

 <p>Hydrogen & Energy Efficiency 1.1 Mtpa of CO₂ savings</p>	<ul style="list-style-type: none"> Hydrogen from EET Hydrogen to replace fossil hydrocarbons across EET Fuels' furnaces and combined heat and power (CHP) plant More low carbon power enables "electrification based" energy efficiency (EE) projects Investments are already underway with the hydrogen-ready crude distiller furnace being commissioned in 2025
 <p>Industrial Carbon Capture 0.9 Mtpa of CO₂ savings</p>	<ul style="list-style-type: none"> 43% contribution to total site's CO₂ reduction ICC project investment to be backed with Government support under the UK's industrial carbon capture business model

Carbon emissions to reduce from 2.1 MTPA to 0.05 MTPA



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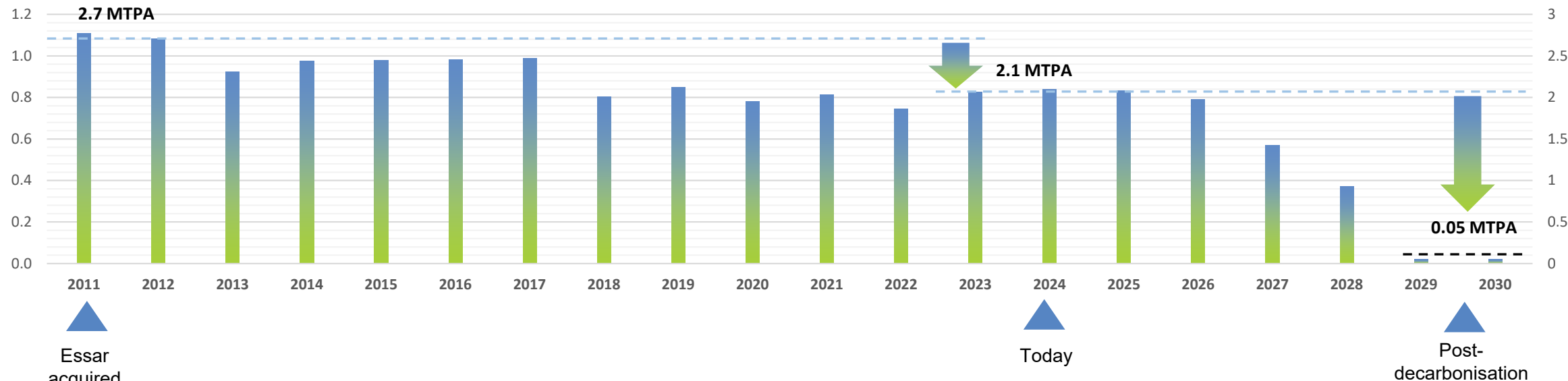
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First hydrogen-ready crude distiller furnace being commissioned in 2025, awaiting low carbon hydrogen production from EET Hydrogen



Decarbonisation progress and plan ahead

CO₂ emissions in MTPA

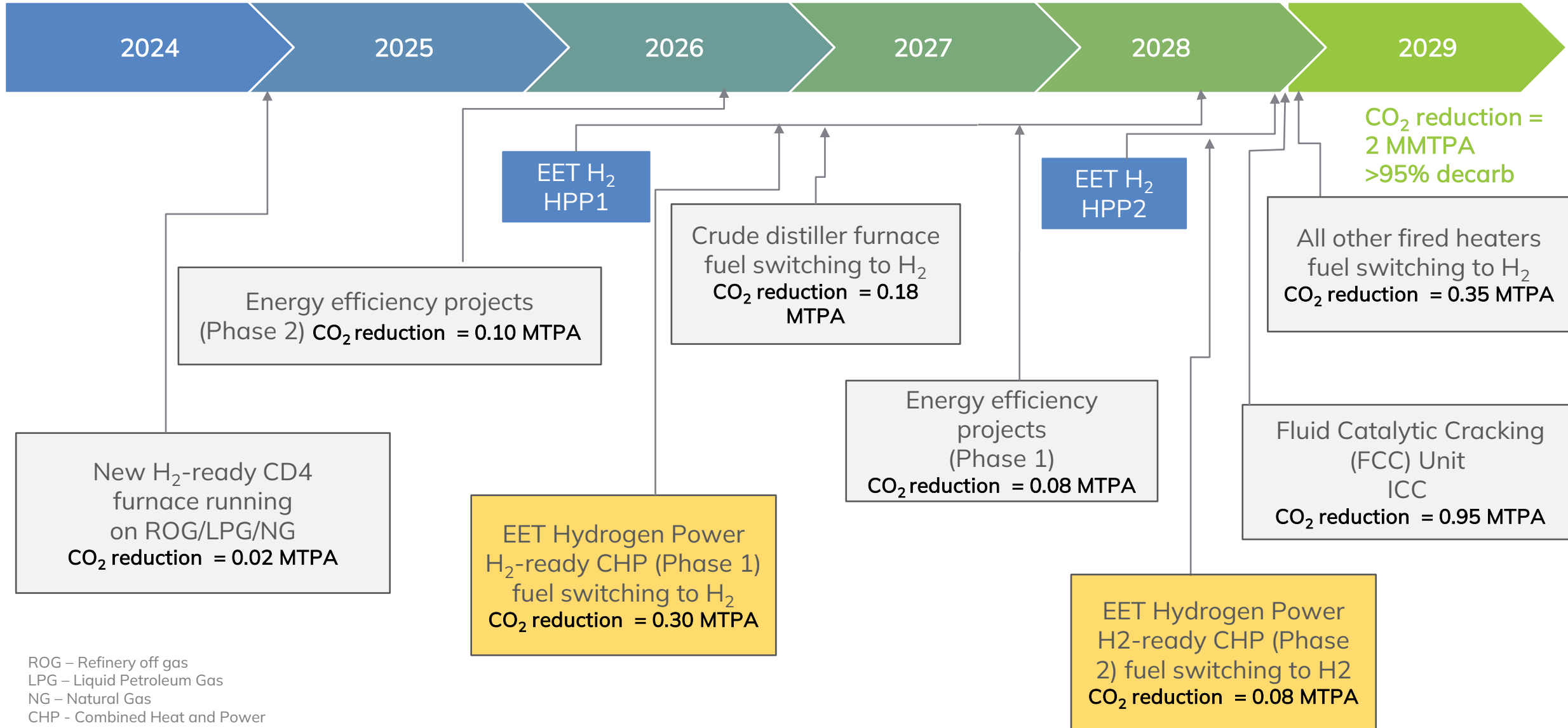


Essar acquired Stanlow refinery

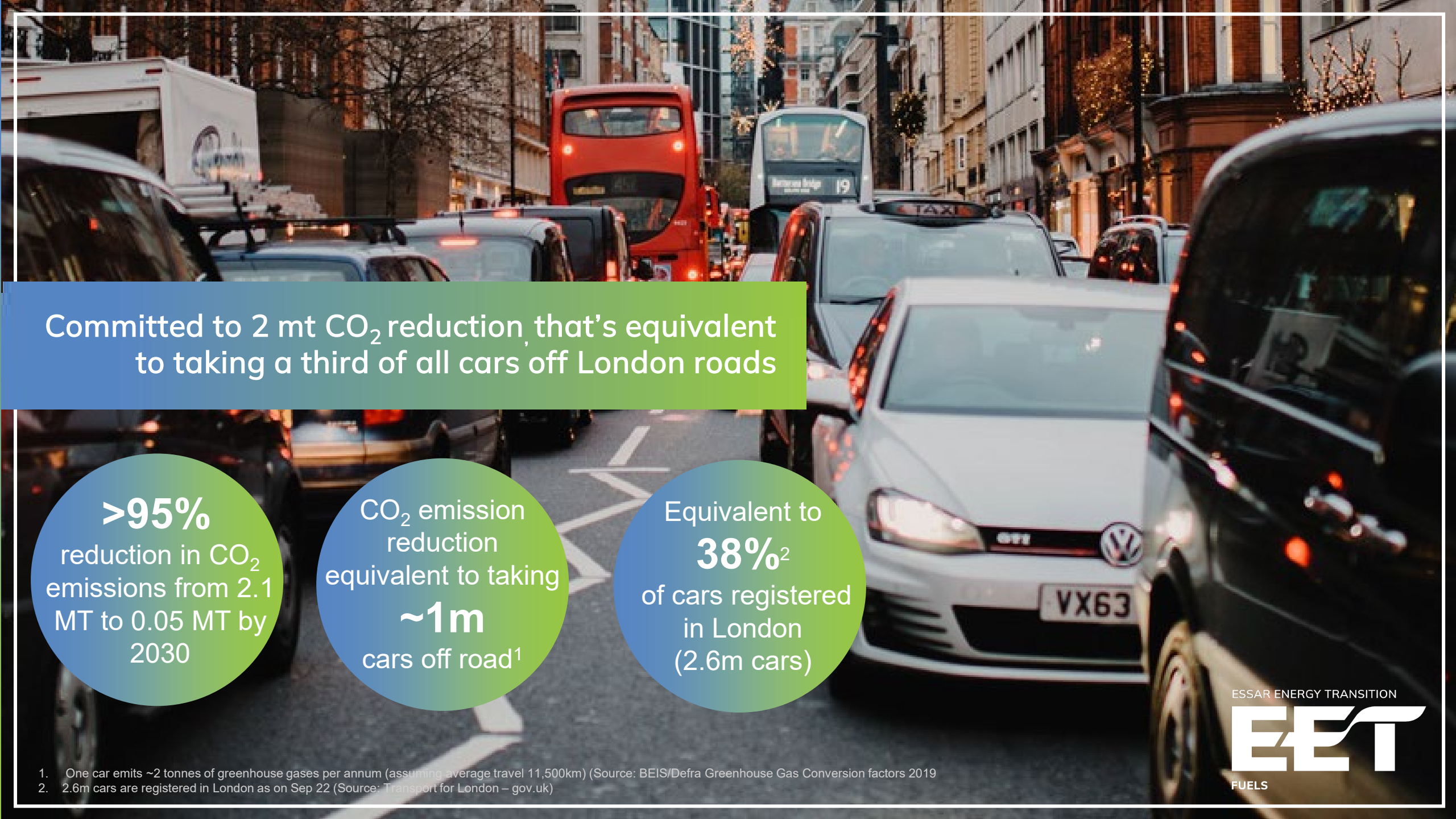
~ \$120m invested in refinery decarbonisation projects over the last four years and estimated £1.2bn by 2030

- Hydrogen fuel switching project
- Targeted energy efficiency projects
- EET Hydrogen Power's CHP project
- ICC project

Delivery of our energy transition projects – next steps



ROG – Refinery off gas
 LPG – Liquid Petroleum Gas
 NG – Natural Gas
 CHP - Combined Heat and Power
 HPP - Hydrogen Production Plant



Committed to 2 mt CO₂ reduction, that's equivalent to taking a third of all cars off London roads

>95%
reduction in CO₂
emissions from 2.1
MT to 0.05 MT by
2030

CO₂ emission
reduction
equivalent to taking
~1m
cars off road¹

Equivalent to
38%²
of cars registered
in London
(2.6m cars)

1. One car emits ~2 tonnes of greenhouse gases per annum (assuming average travel 11,500km) (Source: BEIS/Defra Greenhouse Gas Conversion factors 2019)
2. 2.6m cars are registered in London as on Sep 22 (Source: Transport for London – gov.uk)

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Project details

Crude distiller furnace switch to hydrogen fuel

First hydrogen-ready furnace installed at any UK refinery

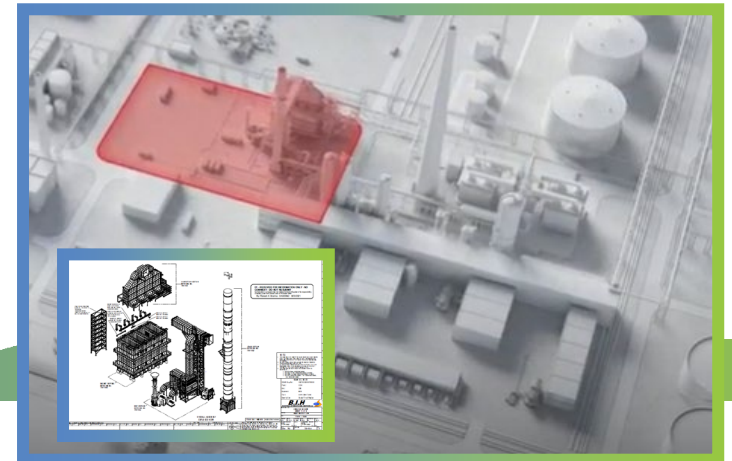
Capable of running on 100% H₂ or a fuel gas mix. Reduced carbon emissions by 0.02 MTPA from start-up with standard refinery fuel

Further reduction of CO₂ emissions by 0.18 MTPA, once running on hydrogen from EET Hydrogen's Production Plant

Hydrogen is then available to **enable the fuel switching** of all fired-heaters on site and the new set of EET Hydrogen Power'S CHP modules

Other process fired-heaters will require retrofit, but not replacement. Project saves an additional 0.4 MTPA of CO₂

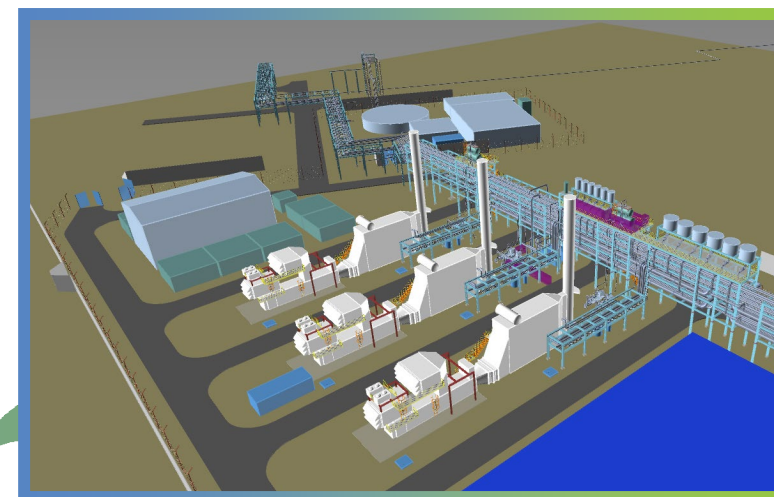
MTPA = million tons per annum



EET Hydrogen Power Combined Heat and Power plant

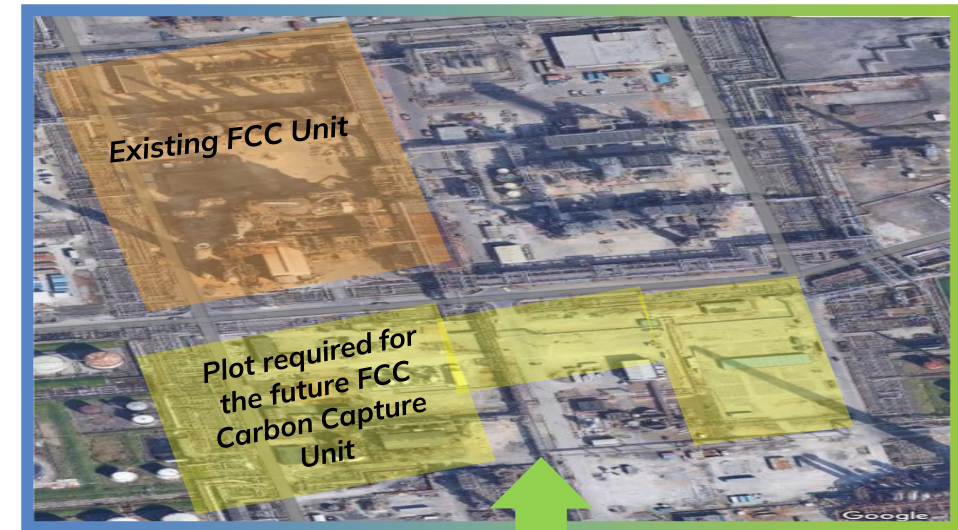
Low carbon CHP will replace existing CHP to rebalance future steam & power needs

- Stanlow refinery generates its own steam & power from its existing CHP, but imports a small amount of grid power
- Existing CHP modules are to be phased out and new EET Hydrogen Power CHP modules brought online
- Generation of power will come from high efficiency 100% H₂ gas turbines, instead of inefficient steam turbines
- CO₂ savings from CHP is 0.4 MTPA
- The first phase of EET Hydrogen Power CHP project with the new hydrogen-ready crude distiller furnace will enable the full offtake of hydrogen from EET Hydrogen's HPP1 plus some energy efficiency projects



EET ICC & Storage to reduce ~45% of total CO₂ emissions fuel

- Stanlow has one of the largest Full Residue Fluid Catalytic Cracker (FCC) in Europe
- Now investing in a new EET Industrial Carbon Capture plant to capture CO₂ from the FCC unit
- CO₂ captured will be transported and stored through HyNet transport and storage infrastructure being developed by ENI
- Positive environmental impact (significant reduction in particulate matter, SO_x and NO_x to single digit ppm levels)
- Project scouting, pre-front end engineering and design and licensor selection has been completed. Now progressing to Licensors Basic Engineering Design Packages and FEED
- FID expected in 2025



Large land parcel required for the FCC carbon capture plant has been identified within Stanlow refinery complex

EET Fuels is leading the industry with a clear target to decarbonise manufacturing operations before the turn of the decade...





and setting a global benchmark for high emitting industries by developing the UK's first low carbon process refinery.

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