



Powering the journey to net zero

Let's make
hydrogen happen



We're committed to helping our customers work towards net zero

Climate Transition Plan:

be a net zero business by 2045 and help our customers be net zero by 2050

Our Business Climate Plan:

- Reduce our property emissions in the UK by 50% by 2030
- Grow low carbon asset portfolio up to 1GW in operation (solar, batteries, gas peakers and hydrogen) by 2027
- Build a zero emission fleet by 2025

Our Customer Climate Plan:

- Roll out energy efficiency management solutions
- Deliver low carbon technologies (EV charging, heat pumps and hydrogen as an alternative to natural gas heating)
- Supply cleaner energy from renewable assets, biomethane and hydrogen

Centrica Group existing H2 fuel switching demand:

Easington Terminal



Barrow Terminal



c.1200 x CHPs



Brigg Gas Peaker



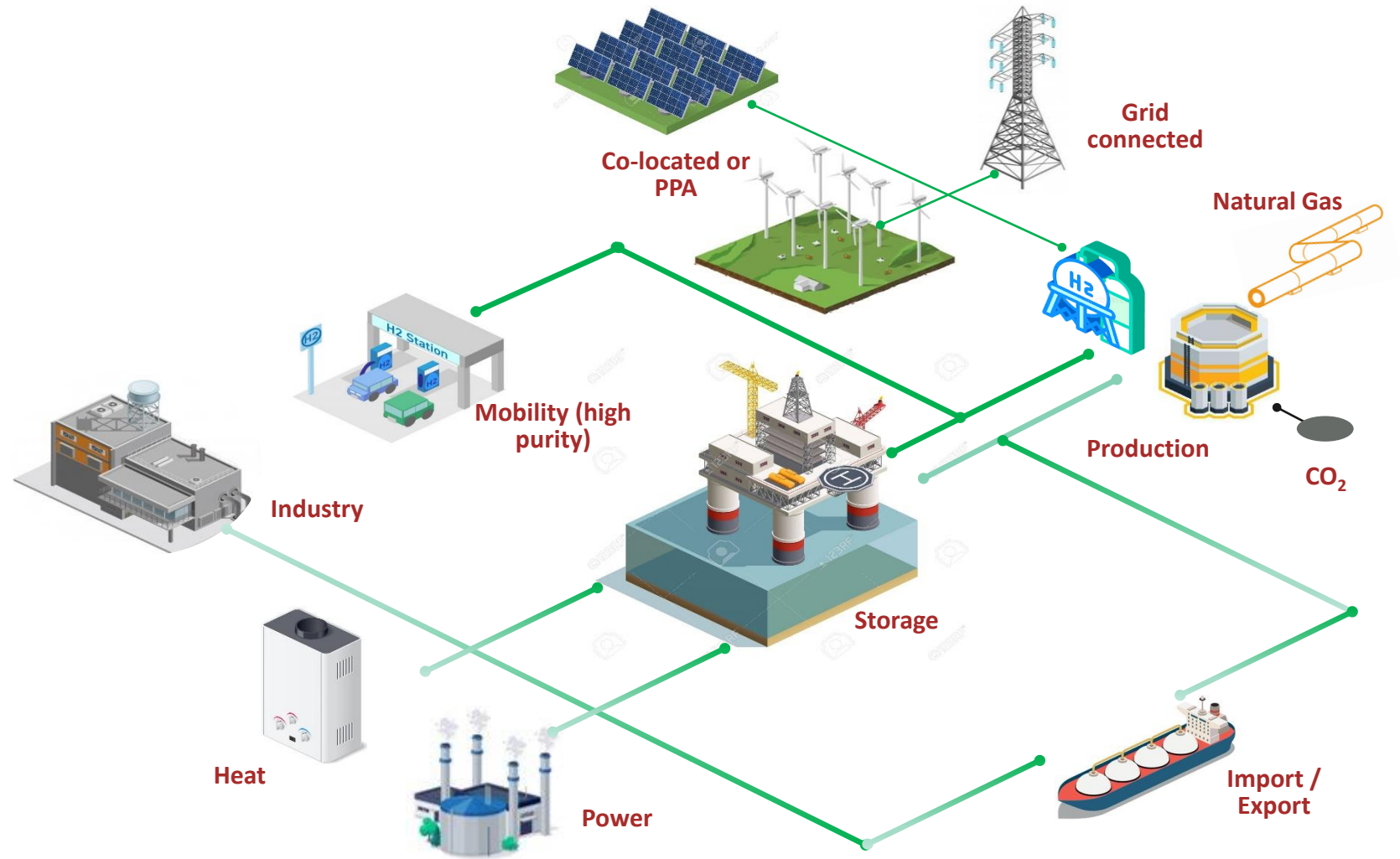
Whitegate CCGT



Additional demand

- BG fleet
- Domestic heating
- Planned peaking generation

We're taking a whole system approach to hydrogen



10_m

I&C and residential customers in UK

16_{GW}

of renewable assets managed across Europe with our in-house optimisation platform

300

physical LNG cargos traded globally each year

Our hydrogen activities sit across the full value chain



Hydrogen ready solutions for customers and decentralised production

- Partnership with HiiROC – pilot project to blend H2 into peaker
- Partnership with 2G on H2-ready CHPs
- Building 1GW of solar, batteries and peakers with H2 synergies



Conversion of Rough into a hydrogen storage facility and large scale production

- Fuel switching to H2 at Easington Terminals
- Co-op agreement with Equinor for 1GW H2 production ambition



Developing hydrogen ready power stations

- Transitioning the Whitegate 450MW CCGT to H2
- Developing 200MW of H2-ready gas peakers



Electrolyser PPAs and optimisation, GoO, and ammonia shipping

- Electrolyser optimisation services – first 20MW site in operation in Denmark
- Demonstrating H2 injection into the NTS and the role of green gas certificates



Building expertise to install and service hydrogen boilers

- Supporting Hydrogen Village Trials
- Exploring hydrogen vans to help achieve decarbonisation of 9,000 BG vans – MoU established with Ryze Hydrogen



100% hydrogen Combined Heat and Power (CHP)

Our partnership with 2G

- Centrica Business Solutions is partnering with 2G Energy AG to provide customers with **100% hydrogen ready Combined and Heat Power (CHP) systems**
- The partnership with 2G for hydrogen powered CHP engines strengthens the range of technologies we already offer to help organisations on the path to decarbonisation
- The move is in response to the growing need for integrated hydrogen solutions which are a key tool in the decarbonisation of decentralised energy. As the hydrogen network develops, the highly efficient units can continue to run on traditional fuel sources, helping future proof investments by ensuring an extended life for the assets
- The partnership also adds the capability to offer biogas and LPG engines in addition to conventional natural gas. With a **return on investment of less than 12 months** for some projects, hydrogen ready CHP remains an energy saving quick-win, while simultaneously increasing business resilience and reducing operating costs.



Hydrogen production

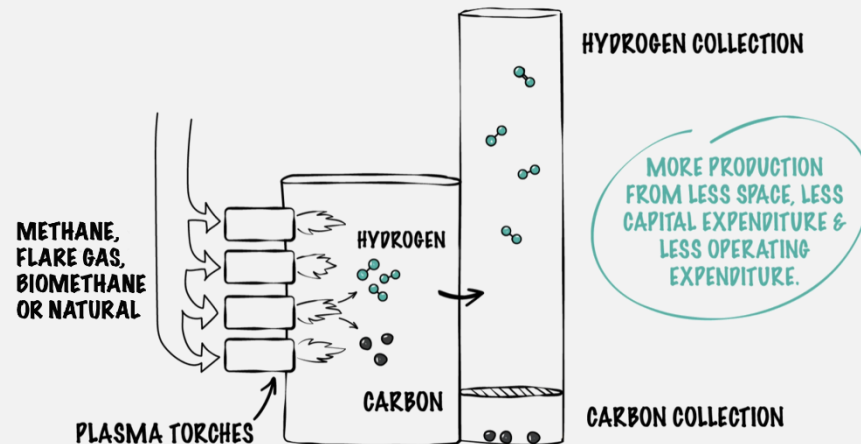
Centrica has taken a minority stake in HiiROC

What does HiiROC do?

- HiiROC proprietary technology converts biomethane, flare gas or natural gas into clean hydrogen and carbon black, through an innovative electrolysis process using thermal plasma.
- This results in zero CO₂ “turquoise hydrogen” at a comparable cost to steam methane reforming but without the emissions and using only **one fifth of the energy required by water electrolysis**.

How does it work?

- HiiROC technology produces **low-cost, zero emission hydrogen**, delivered to customers on a modular, scalable basis at the point of demand.
- The HiiROC technology can be placed where hydrogen is needed, thereby using existing infrastructure and avoiding storage and transport costs.



HiiROC benefits:



World leading

An innovative new patented technology for zero CO₂ emission Hydrogen



Versatile

Suitable for all sectors from power generation and blending to industrial decarbonisation



Economical

As cheap as SMR without needing CCUS and a fraction of the energy/cost of water electrolysis



Efficient

Centralised or local production at pressure saving transport, storage & compression costs



Scalable

From industrial scale (hundreds of tonnes/day) down to small modular units (hundred kg/day)

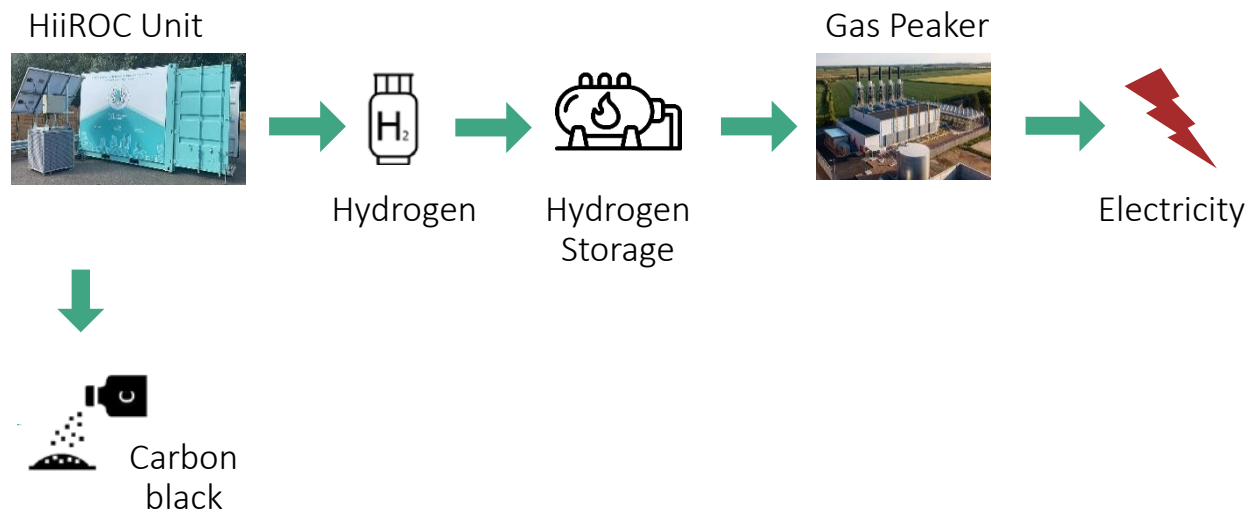
Hydrogen injection

Centrica Business Solutions delivered a UK-first of injecting hydrogen to a grid connected gas fired power plant

Injecting hydrogen into our gas peaking plant at Brigg

- We're set to inject hydrogen into our existing gas peaking plant at Brigg, Lincolnshire as part of a UK first trial to better understanding the role of hydrogen in power production.
- The 49MW gas fired plant is designed to meet demand during peak times or when generation from renewables is low. Mixing hydrogen in with natural gas reduces the overall carbon intensity.
- This will be the **first time hydrogen will be used within a grid connected gas fired power plant** in the UK, making this trial an important step forward towards realising the role hydrogen can play in decarbonising our energy system.

How it works:



Hydrogen mobility

Centrica and Ryze agree to develop hydrogen pathway

Building and operating hydrogen production facilities

- Centrica and Ryze Hydrogen are set to jointly **build and operate hydrogen production facilities** aimed at providing a reliable supply of hydrogen for industry and transportation.
- Ryze Hydrogen supply clean hydrogen and hydrogen infrastructure for transport, industry, domestic heating and other applications. They provide a complete hydrogen solution including hydrogen transportation, hydrogen distribution and hydrogen infrastructure.
- We will jointly develop hydrogen production projects on existing Centrica sites and work with third-parties to build production on their sites too.
- In addition, the partnership will **explore how the UK can work with international hydrogen production facilities** to move low-cost renewable power converted to hydrogen and hydrogen derivatives to areas of high demand.

Exploring hydrogen refuelling options

- We are looking to **develop a hydrogen refuelling facility** to help kick-start the use of hydrogen fuel cells to fully decarbonise our British Gas fleet
- This could then be used to **help provide customers with solutions for hydrogen fleet conversion** over the next 5-10 years, including refuelling infrastructure, locations, and van technology.

How it would work:



Renewable Electricity



Electrolyser



Mobile Refuelling Unit



Hydrogen Van

Hydrogen storage

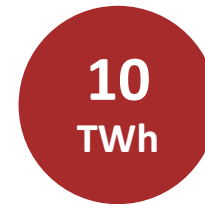
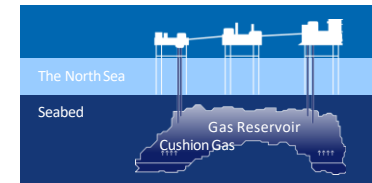
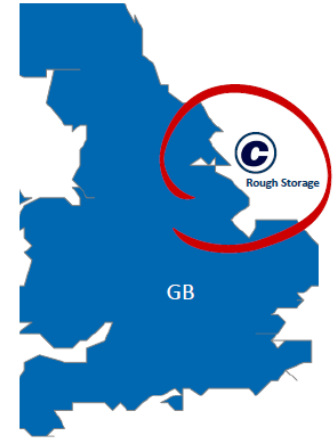
Easington Terminal and Rough

Hydrogen production at Easington Terminal

- Centrica and Equinor have signed a co-operation agreement to explore developing a **low-carbon hydrogen production hub** at Easington in East Yorkshire.
- Under the co-operation plan, the site could transition to a low carbon hydrogen production hub over the coming decade.
- Currently up to **one third of the UK's total gas supply enters via Easington**, much of it from Equinor's Norwegian facilities. Easington is also situated close to some of the world's largest offshore wind farm developments, offering huge potential for both blue and green hydrogen production.
- We expect that the conversion of the Easington Terminal **could produce an additional 1GW of low carbon hydrogen production** coupled with the around 200MW off-taker demand.

Hydrogen storage at Rough

- The Rough reservoir, located offshore in Humberside, stored natural gas safely for over three decades. Rough's vicinity to the Humber cluster places it strategically in an area where heating with hydrogen may become prevalent in the late 2020s
- We're advancing plans to **convert Rough into an offshore hydrogen gas storage facility** as part of our transition to a net zero future.
- A repurposed Rough has the **potential to provide around half of the UK's hydrogen storage requirements**, putting us on track to meet the government's objective of decarbonising the UK's gas supplies, while creating thousands of local jobs.



hydrogen storage potential



offshore from Easington



under the seabed



area that the reservoir spans

