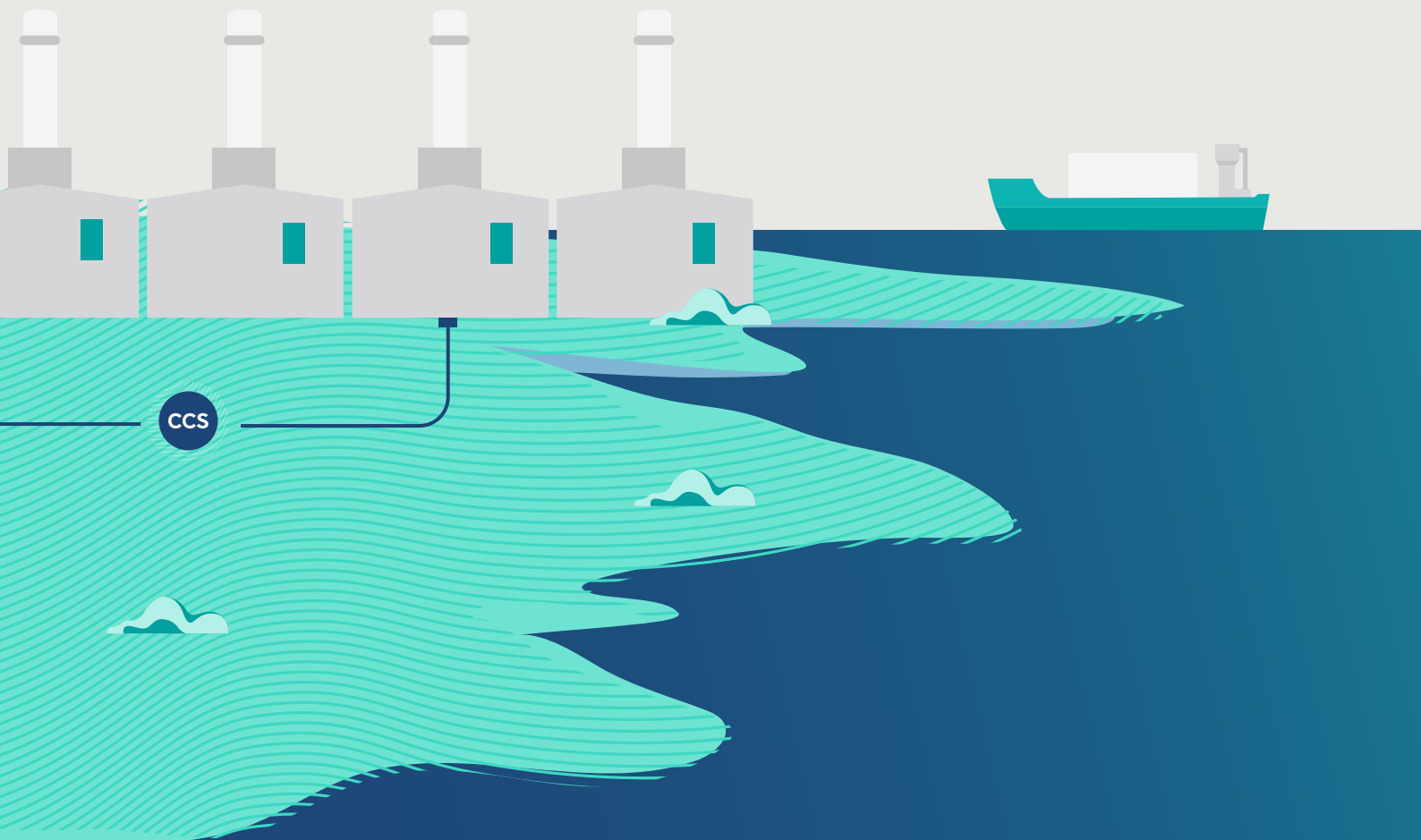
RWE

UK Carbon capture projects

Our decarbonisation journey



Foreword

Tom Glover, UK Country Chair

The way electricity is generated in the UK has changed dramatically over the last decade, with more and more renewables coming onto the grid and powering homes across the UK.

This transition to renewable power is pivotal in the race to net zero, and is only going to intensify over the next few years.

At RWE, we pride ourselves on being a partner in the transition towards a secure, low carbon and affordable energy system - in the UK alone, we have an ambition to invest up to £15 billion in new clean technologies and infrastructure by 2030.

The transition to renewables is however not without challenge. The path to renewables requires support from firm and flexible power sources such as gas. The Climate Change Committee, in its March 2023 'Delivering a reliable decarbonised power system' report[1], highlights the ongoing and future importance of low-carbon dispatchable generation, which includes gas power abated by carbon capture, with a requirement for 12-20GW of capacity required in 2035.

RWE currently operates approximately 7 GW of efficient gas-fired capacity in the UK. We believe that this firm and flexible power will remain an essential part of the energy mix, for the forseeable future.

We also recognise the need to decarbonise our gas fleet. RWE is currently considering a series of carbon capture projects which will provide a decarbonised future for a number of our existing gas-fired power stations, and will be the core technology behind a new-build carbon-capture enabled power station, to help secure our continued contribution to the UK's security of supply.

This involves installing carbon capture technology at two existing power station sites, Staythorpe and Pembroke, and a new-build carbon capture-enabled power station near the Humber.

These three sites are not only crucial for the UK's energy security, but will secure hundreds of high quality jobs.

A lot of hard work will be required to make these plans a reality. These three sites cover more than 60% of RWE's total UK gas generating capacity, and represent the first stage of our gas decarbonisation journey. Our ambition is to have the first of our fleet decarbonised by 2030, with further plans to decarbonise a number of our other sites by 2035.

In this brochure we set out further detail about our decarbonisation journey, and the many benefits that this will bring.

Tom Glover
UK Country Chair, RWE

1 www.theccc.org.uk/publication/delivering-a-reliable-decarbonised-power-system/

Our decarbonisation journey & renewable energy investment

RWE is a key partner in the decarbonisation of the UK's power sector and the transition towards a secure, low carbon and affordable energy system.

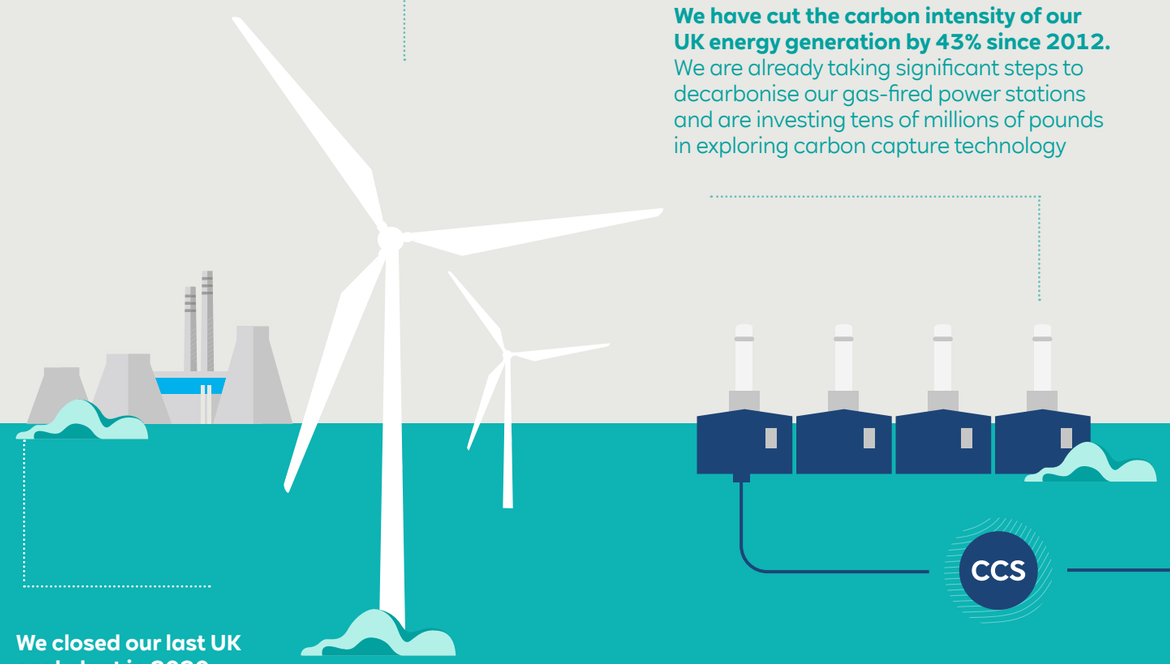
We will ensure that our gas fleet operations transition to support the UK's decarbonisation targets, while maintaining security of supply. We have the ambition to invest up to £15 billion in new clean technologies and infrastructure in the UK by 2030. We have already made substantial progress including:

We are one of the UK's leading renewable power operators, with a total combined installed capacity of more than 4.8 GW*

We are the largest power generator in the UK, supplying around 15% of the country's electricity

We operate around 7 GW of efficient, conventional gas-fired power stations in the UK, which support the transition to renewables by providing a firm and flexible source of power around the clock

We have cut the carbon intensity of our UK energy generation by 43% since 2012. We are already taking significant steps to decarbonise our gas-fired power stations and are investing tens of millions of pounds in exploring carbon capture technology



We closed our last UK coal plant in 2020

*RWE's pro rata equity share capacity 2.79 GW

Why gas is essential in the transition to net zero

Gas-fired power stations are essential in the UK's transition to a decarbonised energy system, through the provision of firm, flexible power, especially on days where sun and wind resources are lower.

The role gas has played in the UK's power system has evolved over time, and continues to do so. As coal power stations have shut down, gas has played an increasingly central role, providing around 40% of the UK's power in 2022[2] and up to 50% at certain times, as well as representing a cleaner alternative to coal.

As the UK's power system continues to transition towards a majority renewables mix, the role gas plays will also evolve, towards an increasingly supportive and complimentary role to renewable energy generation.

In their recent report, the Climate Change Committee note that the GB electricity system in 2035 will still require significant volumes of gas for use with CCS, whether in post-combustion power plants or 'blue' hydrogen production to fuel hydrogen turbines. Within their central scenario, there is a requirement for 17 GW of dispatchable low-carbon capacity, with a range of 12-20 GW across the scenarios[3].

In the future, gas power will operate in partnership with renewables to ensure security of supply, including during periods of low renewable generation and periods of peak demand.

However, there is no doubting the need to decarbonise the UK's power system, including gas fired generation, through technologies such as carbon capture and the use of hydrogen.

As an operator of around 7 GW of efficient gas-fired capacity in the UK, RWE recognises the central role we play in helping to drive forward this decarbonisation through responsible, proactive stewardship of the UK's largest gas fleet.

> **"Gas is currently the glue that holds our electricity system together...**
>
> **...the flexibility of gas underpins our world-leading rollout of offshore wind..."**
>
> The UK Government's British Energy Security Strategy

2 UK Energy in Brief 2022 www.gov.uk/government/statistics/uk-energy-in-brief-2022

3 www.theccc.org.uk/publication/delivering-a-reliable-decarbonised-power-system/

RWE's pathway to decarbonisation

RWE is currently considering three potential carbon capture projects across the UK.

As the largest operator of gas-fired power stations in the UK, we are looking at carbon capture technology as a viable way to decarbonise our gas plants which are located within the vicinity of proposed CO_2 networks or shipping facilities, where the CO_2 could be transferred to safe storage solutions. This would extend the lifespan of the power stations in a way that enables cleaner, future energy generation.

RWE is currently progressing early development work and preparing information that will allow for existing plants at Staythorpe and Pembroke, and a new build Combined Cycle Gas Turbine power station (CCGT) near the Humber, to be submitted into the next stage of the Government's Track-2 Phase-2 of the Cluster Sequencing for Carbon Capture Usage and Storage Deployment process. Together, these sites cover more than 60% of RWE's total UK gas generating capacity, representing the initial stage of our gas decarbonisation journey.

Environmental studies and surveys needed to support the consenting process are already progressing.

Together, these three projects would enable:

4.5 GW

Approximately 4.5 GW of secure, flexible, low carbon energy – enough to power around 8.1 million homes[4]

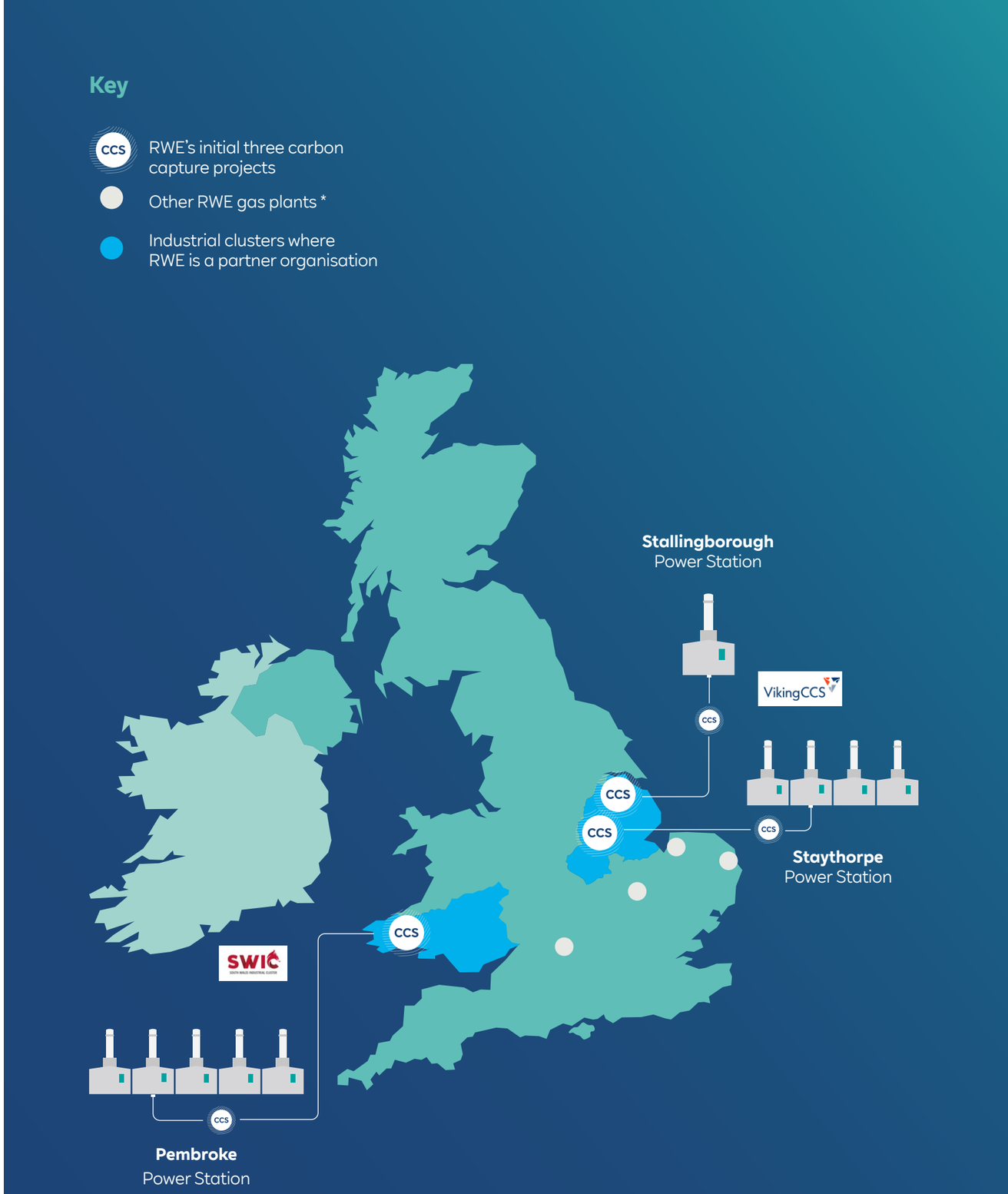
11 Mt/year

11 Mt/ year of CO_2 capture, the equivalent of removing 2.2 million petrol cars from the road

300+ jobs

Support and create 300+ high-quality, long-term operational jobs and thousands of jobs during construction and in the supply chain

4 Calculated based on 2022 generation, and assuming average (mean) annual household consumption of 3,509 kWh, based on 2021 statistics from the Department of Energy Security and Net Zero



*Combined Cycle Gas Turbine (CCGT) plants

** Calculated based on 2022 generation, and assuming average (mean) annual household consumption of 3,509kWh, based on 2021 statistics from the Department of Energy Security and Net Zero.

Pembroke
carbon capture project

Power generation has taken place at RWE's Pembroke site for 60 years. Originally the site was an oil fired power station, and began commercial operation in 2012. A state of the art combined cycle gas turbine station was built with an investment of over £1 billion.

We are now investigating options to apply carbon capture technology to Pembroke power station.

The project is a key part of the Pembroke Net Zero Centre (PNZC), RWE's decarbonisation initiative in South Wales, and supports the broader decarbonisation of the region's industry through its involvement in the South Wales Industrial Cluster.

The PNZC has three key pillars of development, including the decarbonisation of Pembroke Power Station; hydrogen production and floating offshore wind development in the Celtic Sea.

Benefits of the carbon capture facility

2.2 GW

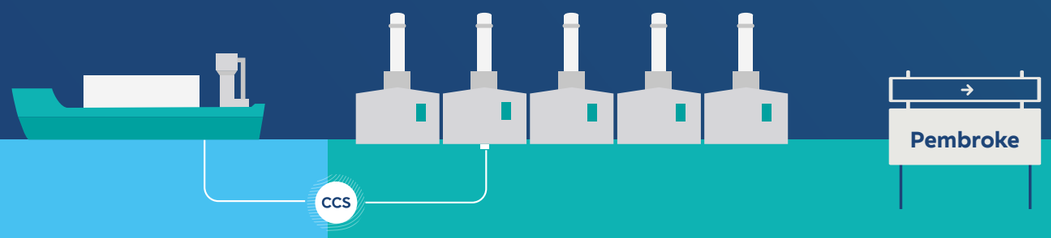
Up to 2.2 GW of decarbonised, secure, flexible energy - enough to power around 4.3 million homes[5]

5 Mt/year

5 Mt/year of CO_2 capture, the equivalent of removing 1 million petrol cars from the road

100+ jobs

Support an additional 100+ high-quality, long-term, operational jobs and thousands of jobs during construction and in the supply chain



Staythorpe
carbon capture project

Staythorpe is a gas-fired combined cycle gas turbine power station that began commercial operation towards the end of 2010.

We are now investigating options to apply carbon capture technology to Staythorpe power station to provide reliable, decarbonised electricity to the grid.

We are working with Harbour Energy to explore options for transporting and storing the captured carbon through its Viking CCS network. This will allow a high percentage of the carbon that is emitted by the power station to be captured and stored safely to offset any emissions.

Benefits of the carbon capture facility

1.7 GW

Up to 1.7 GW of decarbonised, secure, flexible energy - enough to power around 2.8 million home[5]

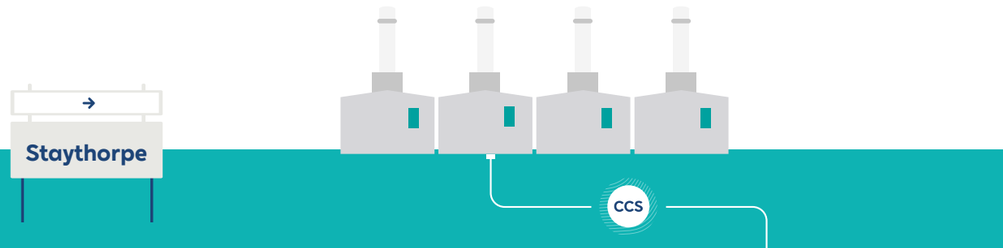
4 Mt/year

4 Mt/year of CO_2 capture, the equivalent of removing 800,000 petrol cars from the road

100+ jobs

Support 100+ high- quality, long-term, operational jobs and thousands of jobs during construction and in the supply chain

5 Calculated based on 2022 generation, and assuming average (mean) annual household consumption of 3,509 kWh, based on 2021 statistics from the Department of Energy Security and Net Zero



Stallingborough carbon capture project

A new gas-fired power station with carbon capture technology is proposed to be located on RWE land adjacent to the Humber estuary near Stallingborough, North East Lincolnshire.

By building a new carbon-capture enabled power station, we will help to deliver a stable, low carbon, supply of electricity to the grid during periods where renewable energy generation is low. It will also make a significant contribution to energy security and decarbonisation of the energy system in the UK.

RWE has an established presence in the region with onshore and offshore wind farms, including the 1.4GW £3bn Sofia offshore wind project, currently in development in the North Sea. Our state-of-the-art operations and maintenance centre - Grimsby Hub - is also currently under construction.

The Stallingborough project is well positioned alongside industries to support broader decarbonisation of the Humber Region.

As with our Staythorpe carbon capture project, we are working with Harbour Energy to explore options for transporting and storing the captured carbon through its Viking CCS network.

Benefits of the carbon capture facility

800 MW

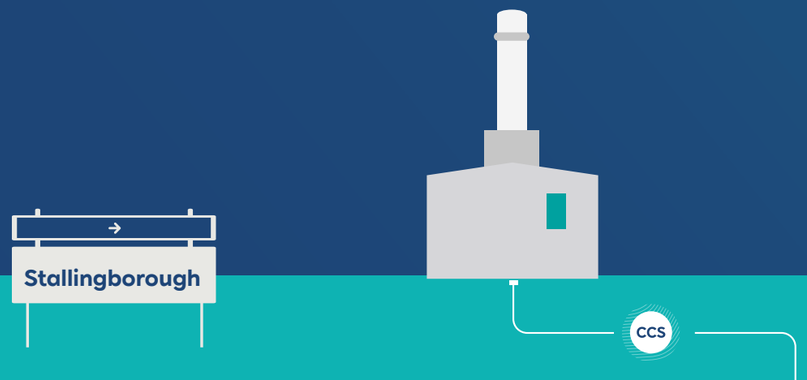
Up to 800 MW of decarbonised, secure, flexible energy – enough to potentially power around 1 million homes[6]

2 Mt/year

2 Mt/year of CO_2 capture, the equivalent of potentially removing 400,000 petrol cars from the road

100+ jobs

Potential to support at least 100+ high-quality, long-term operational jobs and thousands of jobs during construction and in the supply chain



Our gas decarbonisation journey

The next few decades will be pivotal to changing the way we create and consume energy.

RWE is working towards a global target of carbon neutrality by 2040. Our decarbonisation plan in the UK is crucial to achieving this target. The timeline outlines the steps we will take to decarbonise our gas-fired fleet in the UK.

2023

We are currently carrying out feasibility studies, preparatory work and investigating options for carbon capture technology at three sites across the UK

Start of Government Track-2 Cluster Sequencing Programme

2030

Transport and shipping partners develop infrastructure to transport captured carbon dioxide offshore

At least one of our fleet to be decarbonised before 2030

2035

UK Government target date for decarbonised power system

RWE's UK gas fleet transitions in line with UK Government's decarbonisation target, whilst maintaining security of supply

2040

RWE to operate as carbon neutral by 2040 across global portfolio

2050

UK Government target to get to Net Zero

6 Estimated based on modelling of plant load factors in mid-2030s, and assuming average (mean) annual household consumption of 3,509 kWh, based on 2021 statistics from the Department of Energy Security and Net Zero

Find out more

To find out more about our carbon capture and storage projects and wider decarbonisation ambitions, visit our website at:

Decarbonised flexible generation ambitions | RWE in the UK & Ireland

Contact

You can also email our team for each project:

Pembroke carbon capture: pembrokedecarbonisation@rwe.com

Staythorpe carbon capture: staythorpedecarbonisation@rwe.com

Stallingborough carbon capture: stallingboroughdecarbonisation@rwe.com

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