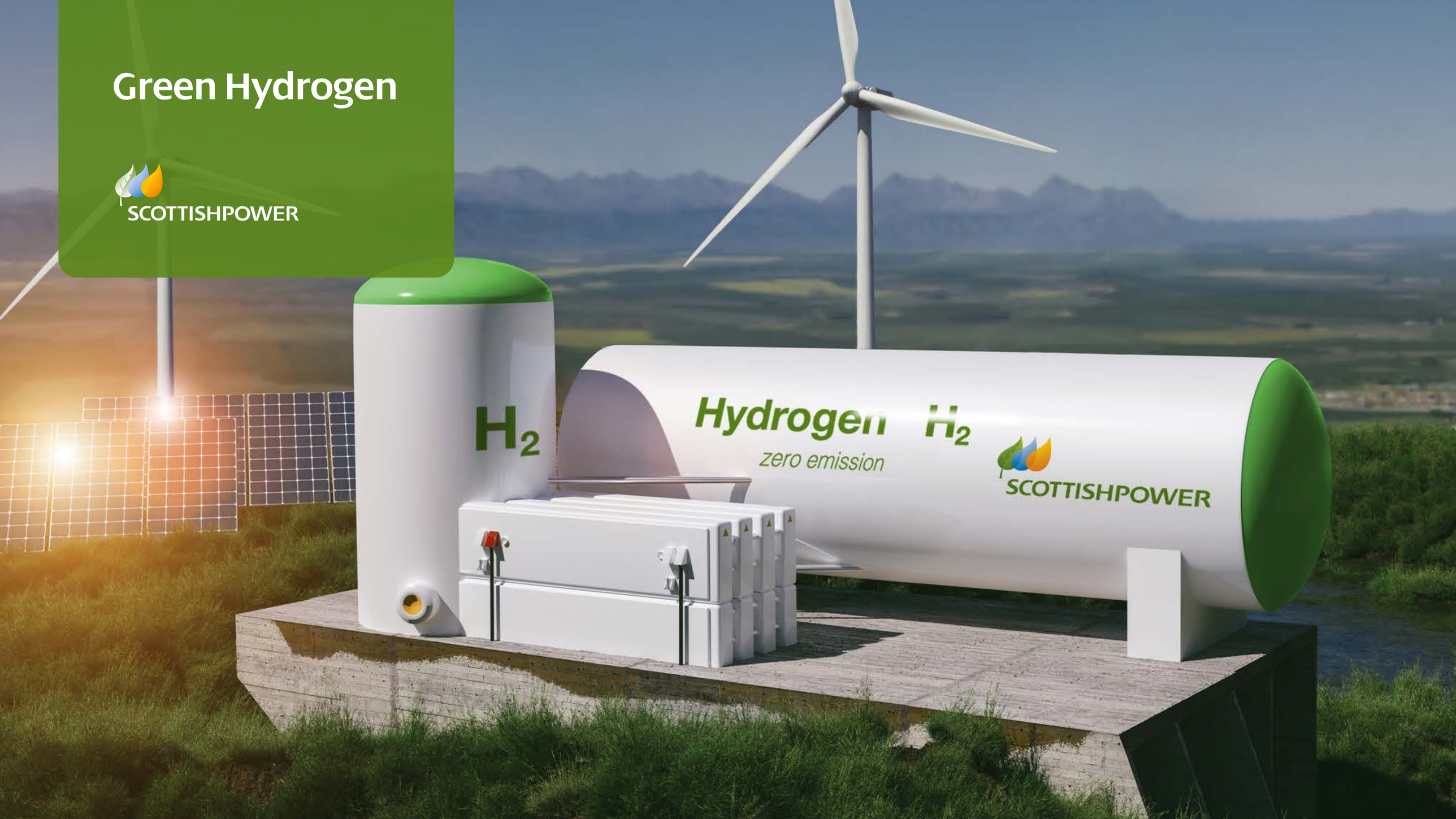
Green Hydrogen

SCOTTISHPOWER



Who we are

ScottishPower is part of the Iberdrola Group, one of the world's leading green majors and a world leader in wind energy. The Group is firmly committed to a green economic recovery and its investment in clean energy generation and networks infrastructure will lead to the Iberdrola Group becoming a zero-carbon company in Europe by 2030.

At ScottishPower, we're on a mission to deliver a cleaner, electric future. We're proud to be the UK's first, fully integrated energy company that generates 100% green electricity, which we transport and supply across the UK.

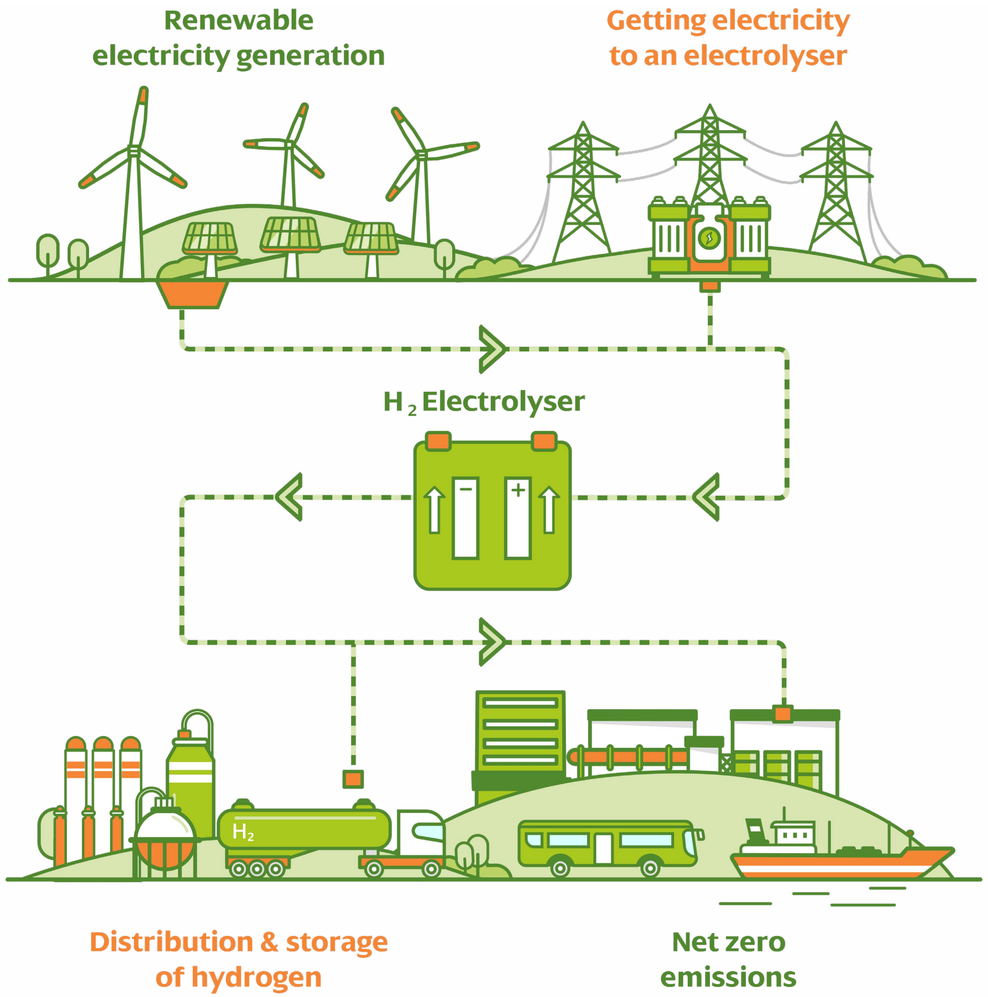
Across everything we do – from the windfarms we develop, to the networks we build and maintain, and the innovative customer services we provide – our aim is simple: we want to deliver a better future, quicker.

The climate crisis is the most important issue of our time, and we're committed to helping the UK reduce its carbon emissions and reach Net Zero by 2050.

In our drive to cut carbon emissions, we recognise the crucial role that businesses play in helping to build a greener future. That's why we're working to provide innovative and flexible low carbon solutions for businesses of all sizes.

As we move towards Net Zero, electrification will take us 80%-90% of the way. At ScottishPower, we have the technology and expertise to decarbonise using clean, green hydrogen which can be used in sectors where electrification can't reach.

How green hydrogen works?



Green hydrogen: a versatile, clean energy source

Green hydrogen is one of the most promising ways we can decarbonise energy-intensive industries. Suitable as an alternative to fossil fuels, it has the potential to provide a clean source of energy to businesses that are interested in helping to create a more sustainable future.

Green hydrogen is incredibly versatile and can be used to support a variety of industries such as steel works, distilleries, heavy-end transportation and businesses that use high temperature processes.

Hydrogen can also be used to create further green products, such as ammonia. By utilising green hydrogen in another chemical production step, ammonia can be obtained in liquid form and used as another green alternative to fossil fuels - further demonstrating the flexibility and future value of green hydrogen.

How is green hydrogen made?

Green hydrogen is produced using a process called electrolysis. Using an electrolyser, we can harness electricity to separate water (H2O) into hydrogen gas (H2) and oxygen gas (O2) and create zero carbon emissions. With the hydrogen and oxygen in their gaseous forms, it can be stored and easily transported, so it's fit for purpose.

What are the benefits of green hydrogen?

A clean alternative to fossil fuels for industry:

- A clean and flexible fuel source
- Zero carbon emissions
- Suitable for heavy duty and long-range transport
- Can be transported to wherever it's needed
- Ability to support rural and harder to reach communities

How is green hydrogen made?

Case studies:
how we can utilise green hydrogen?

Transportation

Green hydrogen can be used to power heavy-end transportation, including buses, lorries and marine vessels. As hydrogen can easily be stored and transported, it can either be produced on-site through our Power Purchase Agreements or off-site at one of our solar or windfarms and delivered to where it's needed.

Transitioning all modes of transport away from polluting fossil fuels does present challenges. We expect hydrogen (and other green products such as green ammonia and synthetic fuels) to support several modes of transport where electrification may not be optimal, including:

- Heavy-duty vehicles including refuse collection
- Heavy plant and construction vehicles
- Medium/long-range logistics and buses
- Rail, maritime and aviation

Case Study:

Transports Metropolitans de Barcelona (TMB) has partnered with Iberdrola to power its fleet of city buses with green hydrogen, with the aim of providing zero carbon transport. To achieve this, Iberdrola will build and operate a hydrogen plan on a 5,000-square-metre plot in an industrial area, which the TMB buses equipped with this technology will use.

Distilleries

As consumers become increasingly concerned with the environmental impact of the products and services they purchase, distillers have a unique opportunity to explore greener ways to power their operations. Distilleries across the UK can play their part in reaching Net Zero by harnessing green hydrogen. We can develop solutions and produce green hydrogen either on-site or off-site to significantly lower carbon emissions.

Case Study:

We have already started work on a project in the Highlands, which will provide distilleries in the region with green hydrogen. The Distilleries Project is part of The North of Scotland Hydrogen Programme, which aims to develop a hydrogen hub in the Cromarty Firth to produce, store and distribute hydrogen.

The Distilleries Project kicked off with a feasibility study in March, with findings expected in summer 2021. We're working on this project with The Port of Cromarty Firth, Pale Blue Dot, Diageo, Whyte and Mackay and Glenmorangie.

High temperature industries

We can support many types of industrial processes with clean alternatives to fossil fuels. Our Green Hydrogen Business Team will work to develop optimal solutions that will help businesses significantly reduce their carbon emissions.

Many industries that currently use high temperature processes can benefit from clean, green hydrogen, such as:

- Glass manufacturing
- Steel & fabrication works
- Aggregates production
- Petrochemicals and refineries
- Food & drinks processing
- Commercial heating & cooling

Case Study:

We are working with partners such as Global Energy Group in the North of Scotland to support their new steel fabrication, painting & marshalling facilities for the offshore wind sector. This project will see a multi-technology solution using electric heating, renewable electricity supply and hydrogen.

Fertilisers and chemicals

Many chemicals and fertilisers used today have substantial carbon footprints due to their reliance on fossil fuels for production. By using hydrogen, we can support the large-scale production of green ammonia for example, which can be used in low carbon fertilisers and chemicals across industry and agriculture.

Case Study:

A long-term partnership between Iberdrola and Fertiberia aims to put Spain at the forefront of green hydrogen in Europe by becoming the first country with 100% production of ammonia for completely green fertiliser.

The project will include the development of 800 MW of green hydrogen and an investment of 1.8 billion euros until 2027. The plan aims to ensure around 25% of the hydrogen currently used in Spain would generate zero CO2 emissions.

Why partner with ScottishPower?

We have over 20 years' experience identifying, developing and operating renewable technologies.

With decades of energy trading in a market leading position, we have the expertise to accelerate your business's green ambitions. Tackling the climate crisis requires a collective effort and together, we can support the transition to Net Zero.

- 20 years of renewable energy expertise
- Energy Infrastructure design and management
- Decades of energy trading in a marketing leading position
- International Global Engineering and Contracting team
- Dedicated Green Hydrogen Business Team

Partnership and funding support

With government policies and targets evolving to address the Net Zero challenge, there are an ever-changing array of opportunities to access support schemes for decarbonisation.

Whatever your business size or sector, our team can help you navigate public policy and regulatory mechanisms that may influence your own transition to a cleaner, greener future. We will help you explore funding schemes which could accelerate your transition to zero emission alternative fuels and energy supplies.

Many policies and funding schemes exist which aim to support decarbonisation across energy, industry and transportation, such as:

- Net Zero Hydrogen Fund for hydrogen production
- Industrial Energy Transformation Funds
- Renewable Transport Fuel Obligations
- Emerging Energy Technologies Funds
- Clean Steel Funds
- Green Distilleries Funds
- Industrial Decarbonisation Funds
- Hydrogen for Transport Programme
- Other sector-specific opportunities

Let's chat

Through partnering with you and addressing your decarbonisation challenges, our dedicated Business Team will help to shape the best investment decisions for your business and support your journey to a Better Future, Quicker.

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