



# Oscillate PLC

**Oscillate Plc – Potential Acquisition of Quantum Hydrogen Inc., Exploration Project**

**Corporate Presentation**

**September 2024**

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# Overview



## Executive Summary

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- Oscillate Plc ("**Oscillate**") is an Aquis quoted investing company.
- On 12 July 2024, Oscillate announced that it had entered into non-binding Heads of Terms regarding the potential acquisition of Quantum Hydrogen, Inc
- Oscillate has now conditionally agreed to acquire the entire issued share capital of Quantum Hydrogen, Inc. ("Quantum"), a corporation established in the State of Texas, USA.
- Founded in 2023, Quantum Hydrogen is focused on the exploration of natural or white hydrogen.
- Quantum Hydrogen Inc. has recently signed a three-year option agreement over a substantial land position (60,000 acres) in the Minnesota Iron Range.
- Under the terms of the Acquisition Agreement the Company will acquire Quantum Hydrogen through the issue of 140,000,000 Consideration Shares at a deemed valuation of £1,400,000.

# The Company



## Oscillate Overview

- Oscillate is an investment company with a diverse investment policy that includes investment opportunities in, inter alia, the natural resource sector.
- Oscillate PLC has an open view on investments. Under its specialist situations investing policy, it can look at an array of projects and opportunities that present compelling value to the long-term future of the business.
- The Directors' experience in Tech, Mining and these specialist situations puts the company well placed to take advantage of opportunities.
- The Company's other holdings include minority stakes in **Shortwave Life Sciences Plc, WeCap Plc & Evrima Plc.**



# The Target



## Quantum Overview

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- Quantum Hydrogen Inc, is a Houston based company founded in 2023 and focused on the exploration for natural or white hydrogen.
- Quantum Hydrogen is focused on the prime U.S.A. hydrogen market which is expected to grow from 15 million tons in 2020 to 121 million tons by 2050. (McKinsey 2023).
- Management has extensive experience in speciality gas exploration having been founders and director of **Pulsar Helium** (PLSR.V, market capitalization US\$43m) and **Helium One Global** (HE1/L, market capitalization US\$85m) (market capitalization figures as at 9 September 2024).
- Quantum has recently signed a three-year option agreement over a 60,000-acre land position, overlying iron-bearing rocks, specifically the Biwabik Iron Formation, in the Animike Basin in the Lake Superior region of North America.

# Rationale



## Acquisition Rationale



### Renewable Energy

#### Opportunity in Natural Hydrogen:

- Growing global emphasis on reducing carbon emissions and the worldwide effort to shift to renewable energy sources creates a favorable market for hydrogen technologies.
- Hydrogen is the fuel of the future due to its high energy conversion efficiency and zero carbon emissions.
- Estimated global hydrogen demand is set to grow from ~100 million tons to day to 800 million tons by 2050.\*



### Region

#### Favourable Geography:

- Low-cost entry to explore through existing mineral rights holders – circumventing local bureaucracy and expediting project execution
- Nearby markets include pipeline network, power plants, iron smelting and cement manufacturing
- Acreage located near Mid-Continent Rift containing iron rich minerals



### Team

#### Management Team/Board:

- Management has extensive experience in specialty gas exploration having been previous founders Helium businesses
- Multi-disciplinary team with **+150** years of combined experience, bringing technical, operational, commercial and financial capability.

# Hydrogen Facts & Uses



- Hydrogen is the fuel of the future due to its high energy conversion efficiency and **zero carbon emissions. When burned the only by-product is water.**
- Currently used in oil refining, manufacture of fertilizer, chemicals, ammonia, food processing and transportation (cars, trucks, buses)
- Additional uses include:
  - Decarbonization of the steel and cement manufacturing processes
  - Power generation
  - Fuel Cell Electric Vehicles (FCEV)
  - Internal combustion engines- zero emissions
- Can be delivered as a liquid, gas or ammonia by pipeline, in liquid tankers, tube trailers and barges
- Transportation infrastructure required includes compression, storage, dispensers, meters, contaminant detection and purification technology.

# Minnesota: Potential Sources of Natural Hydrogen

## Minnesota is a major source of iron ore which will be the main focus of the exploration program

- **Iron Reduction** - oxidation/reduction processes involving mafic minerals contained in Pre Cambrian rocks.
- **Serpentinization** – a process whereby rock ( usually olivine and pyroxene) is changed by the addition of water into the crystal structure of the minerals found.
- **Radiolysis of water** – energy imparted by the decay of naturally occurring minerals can split water molecules into hydrogen and oxygen.
- **Deep** - degassing of hydrogen from deep within Earth's core and mantle



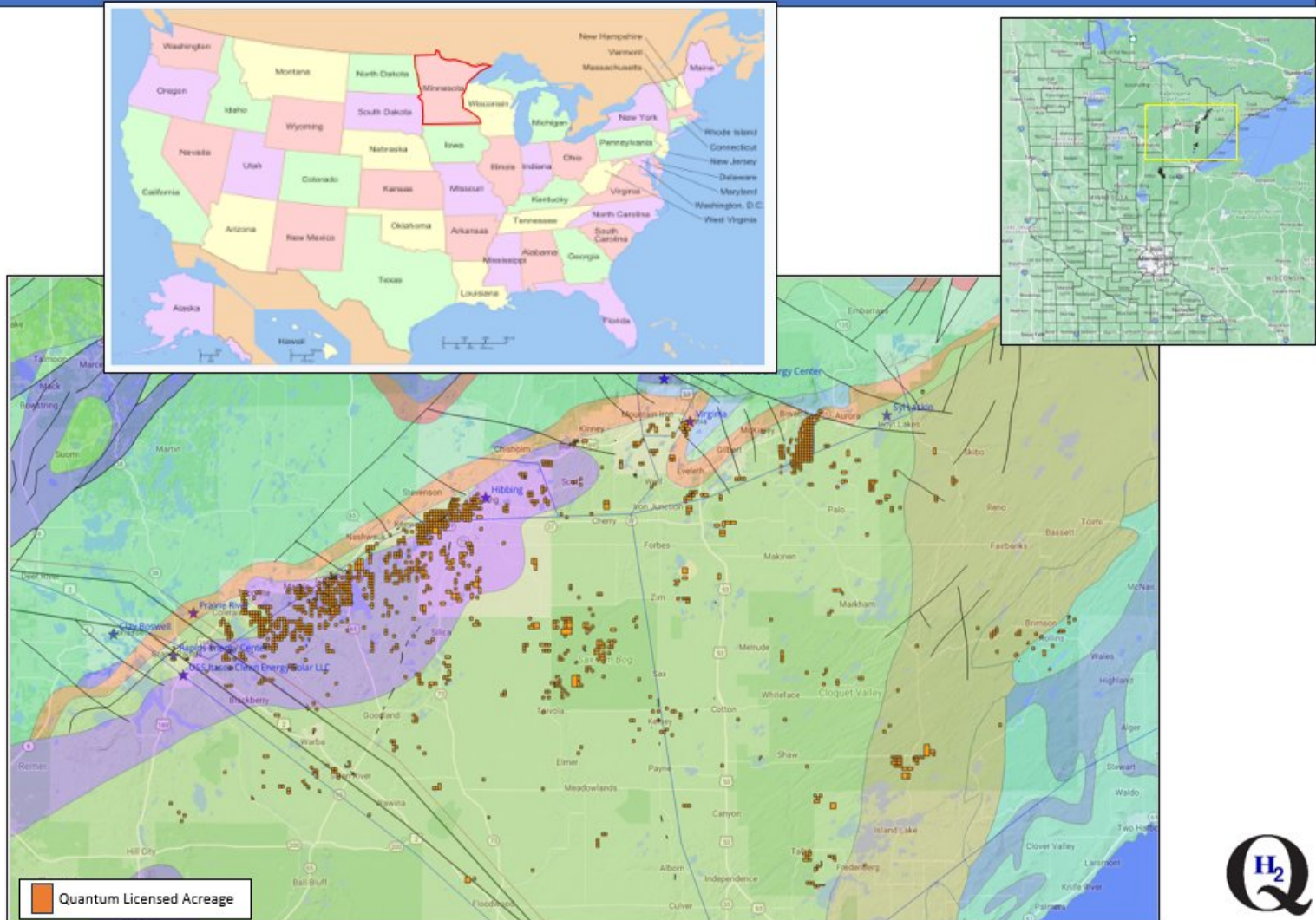
# Minnesota- Why?

- Presence of Banded Iron Formations favorable for hydrogen generation based on research by French Groups and seen in Namibia.
- Acreage located near Mid-Continent Rift containing iron rich minerals
- Availability of existing geological and potential fields database
- Low-cost entry to explore through existing mineral rights holders – circumventing local bureaucracy and expediting project execution
- Nearby markets include pipeline network, power plants, iron smelting and cement manufacturing

# Opportunity in Natural Hydrogen

- Estimated global hydrogen demand is set to grow from ~100 million tons to day to up to 800 million tons by 2050.
- Quantum Hydrogen is focused on the North American hydrogen market which is expected to grow from 15 million tons in 2020 to 121 million tons by 2050 - (McKinsey 2023)
- Quantum Hydrogen has secured an initial highly prospective target area of 60,000 acres in the Iron-Range in Minnesota.
- Management/Advisory Board has extensive experience in speciality gas exploration having been founders of Helium One Global (HE1/L, market capitalization GBP£78.67m (London Stock Exchange website 16 August 2024)

# Minnesota: Acreage located in Itasca and St. Louis Counties



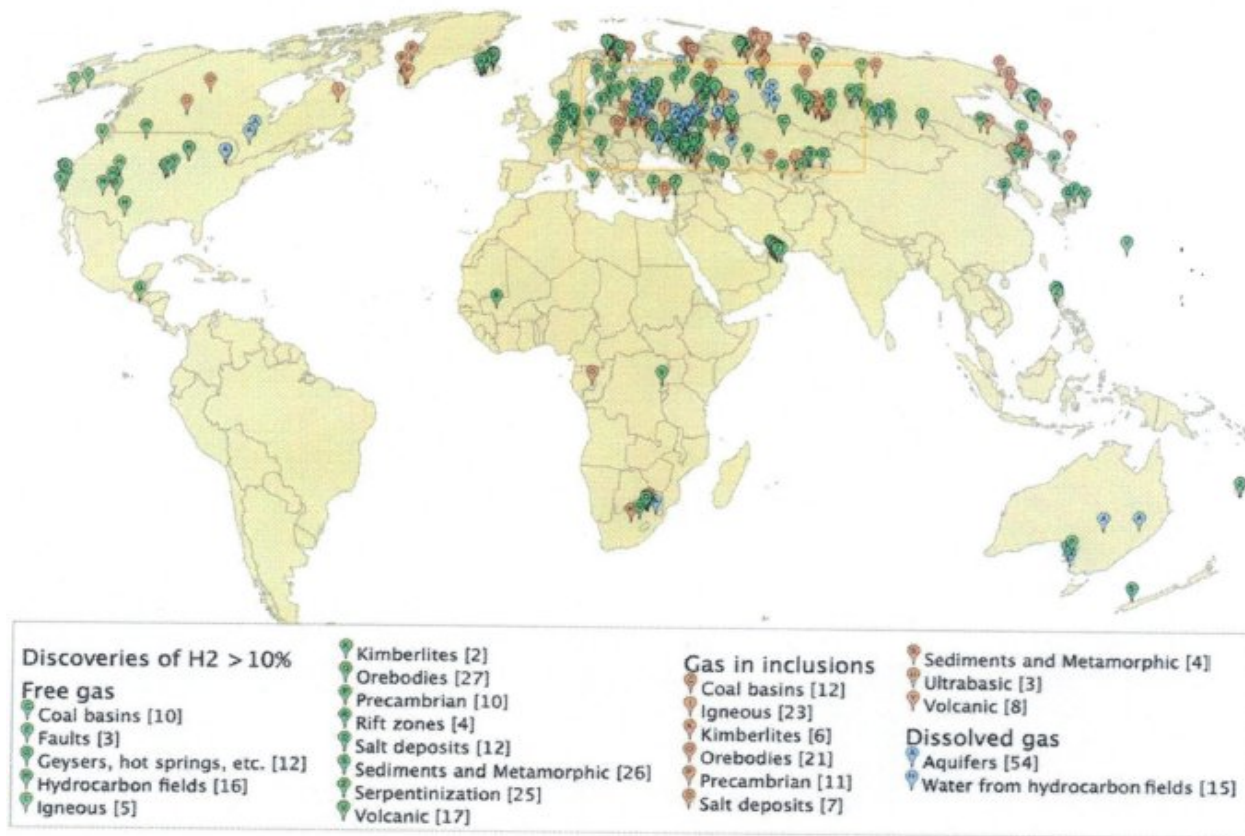
# Hydrogen Classification: The Hydrogen Rainbow

Researchers use colors to distinguish between different types of hydrogen

Quantum is focused on White Hydrogen

- **White Hydrogen** - Produced from natural subsurface accumulations
- **Grey Hydrogen** - Made from fossil fuels, which release carbon dioxide and add to global warming
- **Blue Hydrogen** - Similar to gray hydrogen, but the carbon is captured and sequestered
- **Green Hydrogen** - Made without carbon emissions by using renewable electricity to split water
- **Orange Hydrogen** - Stimulated by pumping water into deep source rocks

# Natural Hydrogen Discoveries with Concentration >10% H<sub>2</sub>



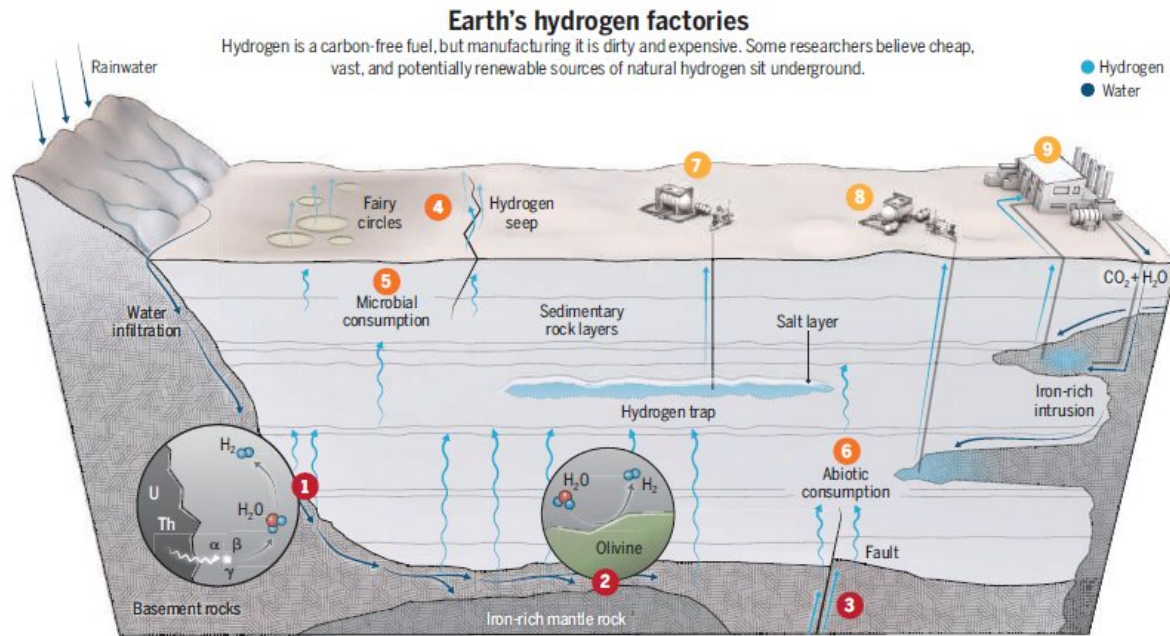
**Authors Note:** High density occurrences across Eastern Europe and Northern Asia reflects that researchers in these areas were looking for hydrogen more frequently, not because these regions are richer in hydrogen



# Active World-Wide Natural Hydrogen Exploration

Company Name	Domicile	Operations	Stock Exchange + Symbol	Shares in Issue	Market Capitalization (as @ 16/8/24)
Hytterra	Australia	U.S.A.	ASX:HYT	606.5M	A\$29.81m
Gold Hydrogen	Australia	Australia	OTCMKTS: GHYLF	159.7M	A\$62.47M
Buru Energy	Australia	Australia	ASX:BRU	671.3M	A\$57.06M
Koloma	U.S.A.	U.S.A.	n/a	Unknown (not public)	USD 91M from Bill Gates + Investors
45-8 Energy	France	Europe	n/a	Unknown (not public)	n/a
Hydroma	Canada	Mali	n/a	Unknown (not public)	n/a
Natural Hydrogen Energy	U.S.A.	U.S.A.	n/a	Unknown (not public)	n/a

# Earth's Hydrogen Factories



## Generation

### 1 Radiolysis

Trace radioactive elements in rocks emit radiation that can split water. The process is slow, so ancient rocks are most likely to generate hydrogen.

### 2 Serpentinization

At high temperatures, water reacts with iron-rich rocks to make hydrogen. The fast and renewable reactions, called serpentinization, may drive most production.

### 3 Deep-seated

Streams of hydrogen from Earth's core or mantle may rise along tectonic plate boundaries and faults. But the theory of these vast, deep stores is controversial.

## Loss mechanisms

### 4 Seeps

Hydrogen travels quickly through faults and fractures. It can also diffuse through rocks. Weak seeps might explain shallow hydrogen depressions sometimes called fairy circles.

### 5 Microbes

In shallower layers of soil and rock, microbes consume hydrogen for energy, often producing methane.

### 6 Abiotic reactions

At deeper levels, hydrogen reacts with rocks and gases to form water, methane, and mineral compounds.

## Extraction

### 7 Traps

Hydrogen might be tapped like oil and gas—by drilling into reservoirs trapped in porous rocks below salt deposits or other impermeable rock layers.

### 8 Direct

It might also be possible to tap the iron-rich source rocks directly, if they're shallow and fractured enough to allow hydrogen to be collected.

### 9 Enhanced

Hydrogen production might be stimulated by pumping water into iron-rich rocks. Adding carbon dioxide would sequester it from the atmosphere, slowing climate change.

# Natural Hydrogen Exploration Techniques

## Hydrogen can be explored for using similar techniques as for natural gas exploration

- Trapping mechanisms are similar
- Reservoir rock types are similar
- Migration from source generation to trap is similar

## The difference from natural gas is where hydrogen traps may be found

- Likely concentration increases with depth
- Largest accumulations likely to be in ancient rocks

## Requires:

- Gravimetric anomaly
- Magnetic anomaly
- Location of an aquifer to identify potential hydrogen storage areas.



# Acquisition Terms



**“The most important benefit of using hydrogen as a fuel is that when you burn it, the by product is just water”**

- Oscillate proposes to purchase the entire issued share capital of Quantum for £1.4m payable in shares at a price of £0.01 per share alongside a placing to raise £500,000 at £0.01 per share with a 1 for 1 warrant exercisable at 2p for two years from Admission of the Acquisition and Placing Shares to the market. The acquisition is not classified as an RTO, considerably reducing transactional costs.
- Oscillate's current cash position is £1m.
- Oscillate will fund the 2024-2025 work program and budget. These funds will only be released to Quantum via milestones on reaching target work programs and budgets.
- The acquisition is subject to, among other things, approval of shareholders at a General Meeting. Number below

	Number of Shares	Value at £0.01 per share	Percentage
<b>Oscillate plc - Current Issued Share Capital</b>	210,556,550	£2,105,565	52.57%
<b>Shares to be issued the Sellers</b>	140,000,000	£1,400,000	34.95%
<b>Shares to be issued the Placees</b>	50,000,000	£500,000	12.48%
<b>Enlarged group</b>	400,556,550	£4,005,565	100%

# Use of Proceeds



## Quantum Use of Funds for Quantum Work Program and Budget

- Geological Mapping, Data base build- up and evaluation of land package £58,000
- Field Soil Sampling for detection of Hydrogen and Gas detection equipment purchase £102,000
- Ore samples and soil gas analysis/testing £75,000
- Project management team and field geologist appointment £160,000
- Acquisition target assessment / other corporate opportunities and corporate costs - £145,000
- Total Estimated Expenditure £550,000

**Objective– build database, identification of drilling targets, identification of future acquisition targets leading to drill targets and a potential listing on AIM in the future.**

# Post-acquisition Board



## Board of Directors

- **Non-Executive Chairman – John Treacy:** John qualified as a solicitor in the London office of a major international law firm where he specialised in Capital Markets and Mergers & Acquisitions. From there he moved on to practice corporate finance in the advisory teams of several prominent UK brokerages where he acted as an adviser on numerous initial public offerings, acquisitions, debt restructurings and placings. He is an experienced London-based financier who specialises in working with growing companies.
- **Chief Executive Officer - Steven Xerri:** Steve is a professional investor with over 10 years of experience in raising funds for both private and publicly listed UK companies. Steve has over 30 years of experience in the aviation industry and has previously held several significant management roles, including serving as the airfield manager of Heathrow Airport, where he was responsible for managing the day-to-day operations of the airport.
- **Executive Technical Officer - Michael John “Jack” Keyes:** Mr Keyes is an oil and gas industry executive specialising in international business development, project management and corporate/public company management. Further details on his biography can be found in paragraph 5 of Part I of this Document. Notably Mr Keyes worked on the Topaz helium discovery of Pulsar Helium Inc until 2023. Mr Keyes has been a director of Quantum Hydrogen since 20 December 2022 and served as a director of Frontier Resources International plc from 2008 -2016, alongside Neil Herbert.
- **Financial Controller – Shakespeare Martineau LLP**

# Advisory Board



## Advisory Board

- **John (“Ian”) Stalker** - Ian is a senior international mining executive with over forty-five years of experience in resource development, mine construction, and operations in Europe, Africa, South America, and Australia. He was Chief Executive officer of Helium One Global Limited until its IPO and Chairman following its IPO until 2023, a helium development company in Tanzania. Ian has been responsible for managing the development of over twelve major mining projects from initial exploration drilling to start-up. He is the former Chief Executive of both LSC Lithium Corporation and K92 Holdings International Ltd. He has extensive public company experience with companies listed on both AIM and the TSX. such as Brazilian Gold Corp., Berkeley Resources Ltd., Niger Uranium Ltd., and UraMin Inc. Mr Stalker holds a Bachelor’s Degree (Hons) in Chemical Engineering from the University of Strathclyde in Glasgow, Scotland. Mr Stalker served as a director of Quantum Hydrogen from 1 April until 17 July 2024.
- **Neil Herbert** – Neil has over 25 years of experience managing, advising, and investing in growth companies from start-up through IPO, development, and successful M&A. He began his career in 1991 with PwC and spent six years working with clients across several disciplines. He joined Antofagasta Plc in 1998 as Group Financial Controller and in September 2001 began to act as an executive and non-executive director capacity to a wide range of natural resource companies including Polo Resources Ltd., Patagonia Gold Plc, Kalahari Diamond Resources, International Molybdenum Plc., Galahad Gold, UraMin Inc and Atlantic Lithium Inc. He was Chairman of Helium One Global Limited from its inception until its IPO and is currently Chairman of Pulsar Helium Inc . Mr. Herbert holds a BA Joint Honors degree in Economics and Economic History from the University of Leicester. He is also a Fellow of the Association of Chartered Certified Accountants. Mr Herbert served as a director of Quantum Hydrogen from 1 April 2023 until 17 July 2024.

# Thanks and Presentation Notes

Many thanks for taking the time to listen to this presentation

Presentation Notes: