Johnson Matthey and Plug Power: Strategic partnership to accelerate the hydrogen economy

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Delivering a key strategic milestone in Hydrogen Technologies

JM and Plug agree long-term strategic partnership

Partnership covers

- Extension of supply of existing products from 2023
- New supply and joint development agreement to at least 2030
- Co-investment in new US manufacturing capacity of 5GW scaling to 10GW over time

Underpins targeted sales in Hydrogen Technologies of more than £200m by the end of 2024/25, and an acceleration of growth thereafter
The global hydrogen market is accelerating

Key markets:

US:
Inflation Reduction Act transforming clean energy markets

Europe:
Geopolitics increasing desire for energy security

China:
Government driving fast-paced change to meet net zero

India:
Accelerating clean energy transition

Clean hydrogen demand is expected to grow more than one hundred fold in the 10 years to 2030

Developing the hydrogen economy

- Hydrogen fueling
- Power generation
- Household use (e.g. heating)
- Hydrogen production:
  - Electrolysis (green)
  - Low carbon hydrogen (blue)
- Hydrogen powered fuel cell trucks, buses, cars and trains
- Industrial gas users
- CO₂ storage
- Transporting H₂
- Renewable energy for electrolysis
- Seasonal hydrogen storage
- Hydrogen converted to ammonia for shipping
- CO₂ storage
PGM based raw materials

#1 global refined PGM supplier and secondary recycler

Applications to make fuel cells and electrolyser

Components

CCMs drive performance in the fuel cell and electrolyser

JM and Plug partnership accelerates deployment of fuel cells and electrolyser

Stack assembly to make fuel cells and electrolyser

JM and Plug partnership accelerates deployment of fuel cells and electrolyser

Components

- Proton exchange membrane (PEM)
- Catalyst coated membrane (CCM)
- Membrane electrode assembly (MEA)
- Catalysts
- Sealed CCM

Applications

- Fuel cell
- Residential power
- Commercial power
- Transportation
- Drives performance in the fuel cell and electrolyser

Stack assembly

- Electrolyser
- Stack
A collaborative relationship to accelerate growth

- Established hydrogen fuel cell business
- Expertise in PGM chemistry and catalysis
- Existing manufacturing with extensive process development
- Reliable supply of scarce, critical metals
- Leading PGM recycler with objective to provide closed loop offering

A leading provider of turnkey hydrogen solutions for the global green hydrogen economy

- Key customer relationships:
  - Amazon
  - Walmart
  - Carrefour
  - BMW

- Strong demand targeting sales of US$5bn by 2026 and US$20bn by 2030
- Strong balance sheet with over US$3.5bn in cash and liquid investments to execute on growth objectives
Strategic partnership leverages JM and Plug’s expertise

JM to be a lead supplier of MEA components including CCMs, catalysts and membranes – supplying a substantial portion of Plug’s demand

Supports delivery of Plug’s next generation technology roadmaps

Supply and joint development agreement to at least 2030

Supply of existing products from 2023, and future generations of technology

JM contributing expertise in sourcing, managing and recycling PGMs

Co-investment into new manufacturing capacity in the US – expected to be the largest CCM production facility in the world

Note: MEA – membrane electrode assembly, CCM – catalyst coated membrane.
Co-investing into dedicated capacity in the US

01 Building new plant in US, with capacity of 5GW scaling to 10GW over time
Production expected to commence 2025

02 Plug responsible for construction of the building and related site services

03 JM will provide and operate the equipment

04 JM investment broadly included within £1bn group capex guidance to 2024/25
Strategic benefits reach beyond the partnership

- Provides JM access to Plug’s strong commercial function, selling stacks directly to the customer
- Plug is the leading company developing the hydrogen value chain
- Growing and expanding into new markets
- Demonstrates the benefits of partners specialising in areas of expertise
Strategic partnership to accelerate the hydrogen economy

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<td>Delivering on <strong>key strategic milestone</strong></td>
<td><strong>Step-change</strong> in development of Hydrogen Technologies</td>
<td>Significant proof point of JM’s ability to be <strong>leading global supplier</strong> of CCMs</td>
<td>Underpins targeted sales of <strong>more than £200m</strong> in Hydrogen Technologies by end of 2024/25, and an acceleration of growth thereafter</td>
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Catalysing the net zero transition