



Hydrogen and Fuel Cells “Here and Now”

NEC Birmingham, 28 June 2022

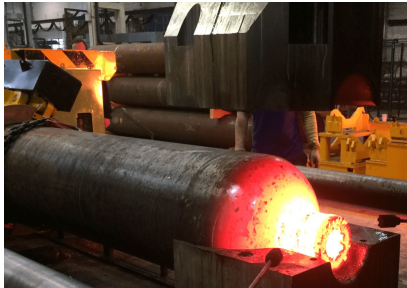
The long future of steel cylinders for Hydrogen storage

Frank Ashton
Head of Strategy and Partnerships



A long future ahead for steel cylinders storing gaseous hydrogen... important to get good advice at an early stage

- Chesterfield Special Cylinders (CSC), part of Pressure Technologies plc
- A steel-based route to low costs per kilo of hydrogen stored...
- ... offers greener, long cylinder life, therefore very good asset utilisation
- Greener, lower Total Cost of Ownership business models - more likely to use Type 1 steel cylinders



Strong heritage and knowledge base, including in hydrogen

- Heritage - 125 years
- CSC designs, makes and inspects cylinders for customers working in safety-critical environments
- Excellent knowledge and products for oil and gas, defence, hydrogen and other sectors
- CSC designs, makes hydrogen ground storage cylinders, trailers 200bar/500bar
- CSC hydrogen customers include Shell, Haskel, Arcola



Steel cylinders - a great choice - low capex per kilo hydrogen

- Wide range of sizes, weights and pressures to match customer needs
- Our design service adds value through optimal choices on
 - Codes/standards leading to optimal efficiency
 - Pressure vessel design
 - Production constraints
 - Through-life implications
- Low capex per kilogramme of hydrogen stored



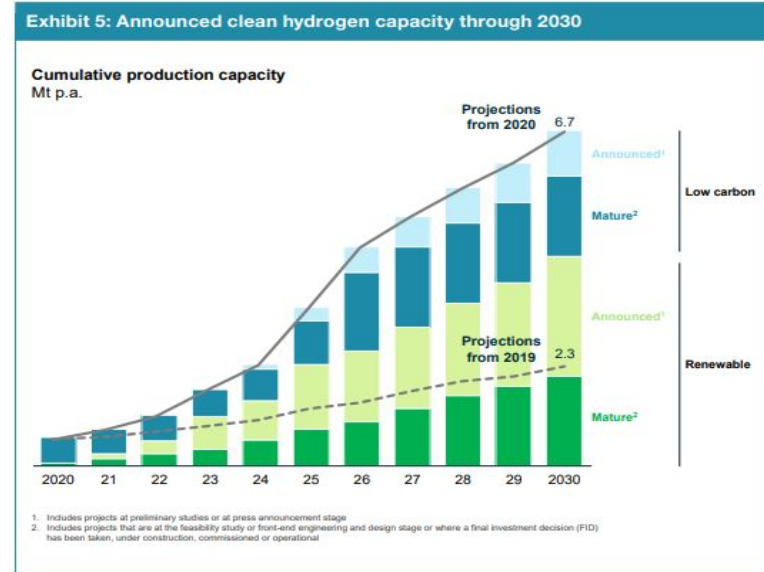
Steel as a material offers greener, long cylinder life, safety

- Steel, as a homogeneous material, offers well-understood inspection and re-certification process
- End boxes or racks (to stack cylinders) are designed to allow easy inspection
- CSC are experts in inspection of cylinders in place, often in confined spaces
- Steel cylinders can be re-certified multiple times
- Safe, reliable, greener solution



Greener, lower TCO business models - more likely to use steel vessels, especially for ground/static storage

- Modular build for Ultra Large cylinders
- Single life → several → many lives
- Ground storage - small HRS to Green H project
- Transportable solutions - 200bar, 500bar trailers
- Low - medium - high pressures
- Single supplier through-life for initial supply then maintenance
- In-service knowledge results in even better next generation product, services



To get things started, strategies should aim at the critical unlocks, like reducing the cost of hydrogen production and distribution"

Hydrogen Insights, Hydrogen Council/McKinsey Feb 2021

Thank you for attending and listening today

- Come and see us at our Chesterfield Special Cylinders stand
- Frank Ashton - Head of Strategy and Partnerships
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- Tom Bruce - Design Engineer



[Chesterfield Special Cylinders \(CSC\) | LinkedIn](#)

And keep up to date with news from around the Pressure Technologies plc Group
<http://www.pressuretechnologies.com/news>