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ATLANTIC CAPITAL MARKETS


# HYDROGEN HEAVYWEIGHTS
# ITM Vs Ceres

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# Introduction

Hydrogen and energy have a longstanding relationship spanning nearly 200 years. Dating back to powering the first internal combustion engines to becoming an integral part of the modern refining industry. It is light, storable, energy-dense, and produces no direct emissions of pollutants or greenhouse gases. But for hydrogen to make a significant contribution to clean energy transitions, it needs to be embraced by consumption heavy sectors such as transport, buildings and power generation. Building the supply to industrial users is now becoming a major business sector globally, with demand for hydrogen continuing to rise.

## Hydrogen production

Hydrogen can be extracted from several sources, anything from fossil fuels and biomass to water, or from a mix of both. Natural gas is currently the primary source of hydrogen production, accounting for around three quarters of the annual global dedicated hydrogen production. Gas is followed by coal, due to its dominant role in China, and a small fraction is produced from the use of oil and electricity.

## Uses for hydrogen

Hydrogen use today is dominated by industrial applications, and most notably oil refining, ammonia, methanol and steel production. Virtually all this hydrogen has been supplied using fossil fuels, so there is significant potential for emissions reductions from clean hydrogen.

**In transport**, the competitiveness of hydrogen fuel cell cars is reliant on fuel cell costs and refuelling stations, drive these costs down and hydrogen powered cars become a serious challenger to traditional electric vehicles. Shipping and aviation have very few options for low-carbon fuel options and so also offer a strong growth opportunity for hydrogen-based fuels.

**In buildings**, hydrogen has the potential to be blended into existing natural gas networks, with the highest potential in multi occupancy and commercial buildings, particularly in dense cities.

**In power generation**, hydrogen is fast becoming one of the leading options for storing renewable energy, and hydrogen and ammonia can be used in gas turbines to increase power system flexibility. Ammonia could also be used in coal-fired power plants to reduce emissions. Hydrogen is already widely used in some industries, but it has not yet realised its potential to support clean energy transitions.

# Ceres Power

- **MARKET CAP £1.438B**
- **TICKER:- CWR**
- **52 WEEK PRICE RANGE:- 481P – 1380P**
- **ANALYST AVERAGE TARGET:- 1560p**

## Introduction

Ceres Power Holdings plc, is a fuel cell technology and engineering company, engaging in the development and commercialisation of fuel cell technology in North America, Asia, and Europe. The company offers SteelCell, a solid oxide fuel cell (SOFC) that generates power from conventional and sustainable fuels, such as natural gas, biogas, ethanol, and hydrogen. Its products are applied in commercial, data centres, transport, and residential markets. The business work with world-leading partners to bring their technology in mass-market energy products to these key sectors. Originally borne out of Imperial College in London, the SteelCell® was the invention of lithium battery and fuel cell pioneer, Professor Brian Steele. The team at Ceres has been perfecting this unique technology for nearly 20 years. In recent years, Ceres has established partnerships with significant global engineering and technology players, such as Bosch in Germany, Weichai in China and Doosan in South Korea, meeting the urgency for low carbon power systems in industry, data centres, transportation and everyday living.

## Product:- SteelCell®

The SteelCell® technology is Made from widely available materials, it's a cost-effective application and is robust and scalable. It's an ideal technology to tackle air pollution and climate change as it significantly lowers carbon emissions and pollutants, lowers running costs and can enable renewables. The SteelCell® technology has the potential to be a very cost-effective and robust fuel cell. As a Solid Oxide Fuel Cell (SOFC), the SteelCell® can use conventional fuels like mains natural gas from the existing infrastructure and can make an immediate improvement to energy costs and CO2 emissions.

## Applications

### Commercial

SteelCell® is ideally suited to commercial combined heat and power (CHP) applications. In collaboration with Ceres, Miura launched a new product in October 2019 with 50% electrical efficiency and by capturing exhaust heat an overall efficiency of 90% is reached. Commercial CHP systems with SteelCell® technology offer great resilience as they continue to operate to supply electricity and hot water even during power outages.

### Transport

SteelCell® technology also has applications in the transportation industry and especially in heavy payload and long-range transportation applications. In partnership with Weichai Power, Ceres has developed a unique electric vehicle (EV) range extender system operating at high efficiency and with very low emissions. By taking advantage of current liquid and gas refuelling infrastructure, it can significantly increase fleet operating effectiveness compared with pure EV.

**Data Centres**
SteelCell® technology can meet the demanding data centre application requirements of reliability, efficiency, cost and load following. It has been demonstrated with electrical efficiency exceeding 60% in a US Department of Energy programme. Data centres today consume around 2% of global electricity, this consumption is also predicted by the International Energy Agency to rise to 8% by 2030.

**Distributed Generation**
SteelCell® technology provides low carbon electricity at higher efficiency than power from the centralised grid. Being modular, the technology can be installed in a variety of formats, anything from residential use to car charging or grid reinforcement. SteelCell® systems are fuel flexible, running on natural gas today through to pure hydrogen in the future and any blend in between, making it an ideal transition technology to support trials of greater concentrations of hydrogen in gas grid networks.

**Company Fundamentals**

| **Valuation** | **Balance Sheet** | **Income Statement** |
|---|---|---|
| Market Capitalization1.157B | Quick Ratio (MRQ)— | Basic EPS (FY)-0.0608 |
| Enterprise Value (MRQ)— | Current Ratio (MRQ)23.6582 | Basic EPS (TTM)— |
| Enterprise Value/EBITDA (TTM)— | Debt to Equity Ratio (MRQ)0.0110 | EPS Diluted (FY)-0.0608 |
| Total Shares Outstanding (MRQ)190.73M | Net Debt (MRQ)−257.651M | Net Income (FY)−9.877M |
| Number of Employees— | Total Debt (MRQ)3.238M | EBITDA (TTM)— |
| Number of Shareholders— | Total Assets (MRQ)311.223M | Gross Profit (MRQ)— |
| Price to Earnings Ratio (TTM)— | **Operating Metrics** | Gross Profit (FY)14.218M |
| Price to Revenue Ratio (TTM)— | Return on Assets (TTM)-0.0821 | Last Year Revenue (FY)21.121M |
| Price to Book (FY)9.3872 | Return on Equity (TTM)-0.0959 | Total Revenue (FY)21.121M |
| Price to Sales (FY)50.9620 | Return on Invested Capital (TTM)-0.0943 | Free Cash Flow (TTM)— |
| | Revenue per Employee (TTM)— | |

### Technical Chart


# ITM Power

- **MARKET CAP £2.491B**
- **TICKER:- ITM**
- **52 WEEK PRICE RANGE:- 208P – 543P**
- **ANALYST AVERAGE TARGET:- 518p**

## Introduction

ITM Power Plc designs, manufactures, and sells hydrogen energy systems for energy storage, transportation, and industrial sectors in the United Kingdom, Germany, France, Italy, the Netherlands, and the United States. ITM Power was founded in 2001 and is headquartered in Sheffield. For the past twenty years, ITM Power has been designing and manufacturing electrolyser systems that generate green hydrogen based on proton exchange membrane (PEM) technology. Their electrolysers require just renewable energy and water, with oxygen and water vapour being the only by-products. It offers HGas for power-to-gas, clean fuel, and industrial hydrogen applications. The company is also involved in the research and development of scientific and engineering projects; development and manufacture of prototype products as well as the sale of electrolysis equipment and hydrogen storage solutions. In addition, it operates 15 hydrogen refuelling stations. In 2021, ITM opened a new Gigafactory in Bessemer Park, Sheffield, the world's largest electrolyser production factory. This shows the business is stepping up their desire as a business and has enabled ITM to cut the cost of electrolysers by almost 40% in the coming years. ITM also work with several heavy weight partners including Linde, Shell, Snam, Hyundai, and Honda.

## Product:- SteelCell®

**Electrolysers**
ITM electrolysers are powered by renewable energy and use their own PEM technology which currently creates the purest green hydrogen on the market. The proton exchange membrane (PEM) electrolysers use only renewable electricity and water to create green hydrogen through a process called electrolysis. The green hydrogen produced can be stored as a gas or liquid and can be released into the gas grid, be used as clean vehicle fuel, or in a host of industrial processes, significantly reducing emissions in logistics and heavy industry. As they can be switched on within seconds, PEM electrolysers have an edge in being able to rapidly react to fluctuations typical of renewable power generation. In comparison, the start-up time for alkaline water electrolysis is around an hour.

**HGAS1SP**
The smallest containerised PEM electrolyser system. The HGAS1SP Plug & Play product includes a single ITM Power high-efficient PEM electrolyser stack alongside all the necessary sub-systems required to produce high-purity, self-pressurised green hydrogen gas.

**HGAS3SP**
The medium-sized containerised PEM electrolyser system. The HGAS3SP Plug & Play product includes three ITM Power high-efficient PEM electrolyser stacks alongside all the necessary sub-systems.

**3MEP CUBE**
This is the firms  modular approach and provides flexibility to match to wide-ranging project requirement (approx. 10 – 50 MW) As this module shares design concepts with other ITM Power concepts, there is a reduced technical risk, making it a reliable and versatile option.

**2 GEP Skid**
Two stack modules with 5 MW capacity - giving flexibility to match to wide-ranging project requirements (approx. 80 – 250 MW+) As this module shares design concepts with other ITM Power concepts, there is a reduced technical risk, making it a reliable and versatile option.

## Applications

### Transport

**Green Hydrogen for Cars** - Enhancing the driving experience with Green Hydrogen for cars. ITM manufacture and supply on-site hydrogen generation systems using the PEM electrolyser technology to produce green hydrogen for refuelling Fuel Cell Electric Vehicles (FCEVs).

**Green Hydrogen for Trains** - A zero emissions alternative to expensive electric infrastructure. The green hydrogen generation systems can be retrofitted to diesel trains, allowing locations across the UK to reach net-zero where alternative renewable sources aren't economically available.

## Energy

The gas network has the capacity to store energy at scale and Power-to-Gas (P2G) has the potential to store MW to GW for extended time frames, anything from hours to months. ITM Power has played a leading role in the Power-to-Gas sector, supplying the first and second PEM P2G systems into Germany to the Thuega Group and RWE/Innogy. ITM Power was also the first company to inject hydrogen into the German distribution network. They have has also supplied HyDeploy with the first P2G plant in the UK which has already acquired the necessary exemptions to inject up to 20% green hydrogen into a local gas grid network.

### Green Hydrogen for hydrogen islands

ITM's systems can also utilise the renewable resources found on remote islands to create sustainable energy sources for island communities. The integration of renewables into an island's power grid can soon create certain balancing and curtailment problems. These can be overcome by deploying controllable rapid response electrolysers to produce green hydrogen for the island's transport, heat, and power sectors. Projects such as BigHit are demonstrating how this may be achieved.

### Hydrogen Tube Trailer Filling

Green Hydrogen for hydrogen tube trailer filling. Green hydrogen can be generated in regions of high renewable resource, including remote areas with little or no hydrogen demand, and transported by tube trailer to demand centres. This approach allows a supply of green hydrogen to be available wherever it is required. Shipping hydrogen stored in pressure vessels by road is a long-established practice for conveying hydrogen to small industrial users and refuelling stations.

## Industry

### Green Hydrogen for refineries

Green energy produced by the PEM electrolysers can improve the desulphurisation of crude oil, without the output of CO2 into the atmosphere. Refineries use vast quantities of hydrogen in the desulphurisation of crude oil to make petrol and diesel. Hydrogen production is central to the operation of a refinery and recently demand has been increasing. Currently it is made at the refinery via steam methane reformation (SMR) using natural gas for the feedstock, but this results in a high CO2 output per tonne of hydrogen. With refineries under increasing pressure to meet environmental legislation and reduce the emissions of their processes it is becoming more desirable to produce hydrogen in a cleaner way. The production of green hydrogen by locating large scale electrolysers at refineries serves to decarbonise the use of hydrogen.

### Hydrogen for steel

There is a gap for significant sustainability gains in the steel industry by switching to green hydrogen to reduce iron ore to iron. Hydrogen can also be used to replace coke at large-scale in furnaces during steel production. Conventional steel mills are highly energy intensive and in general are incredibly dependant on fossil fuels, which makes them one of the largest contributors to industrial CO2 emissions (approx 7-9% of global emissions). Furnaces have conventionally used coke or hydrogen derived from natural gas to reduce iron ore to iron. Alternatively, green hydrogen produced by a large-scale PEM electrolyser can be used as the reducing agent, in order to decrease the CO2 emissions of steel production. In addition, the oxygen by-product from the electrolyser can be used to increase furnace efficiency and so further reduce CO2 emissions.

**Green Hydrogen for Methanation**
Through the methanation process, green hydrogen generated by PEM electrolysers can improve the development of synthetic natural gas for usage in both industry and the home. Methane (or 'synthetic natural gas') can be produced via the methanation of electrolytic hydrogen with carbon dioxide. Synthetic natural gas (SNG) is compatible with the natural gas grid and all existing gas burning devices used in industry and the home. SNG is produced via the methanation of green hydrogen and green CO2, sourced from the anaerobic digestion of biomass or by direct air capture.

There are two methods of methanation, biological and chemical, which can be deployed at various scales to feed gas networks with SNG and so displace the use of natural gas.

**Green Hydrogen for Glass**
Hydrogen is employed to create an oxygen-free environment as a blanket to avoid oxidisation of the glass, preventing imperfections. Hydrogen can also help decarbonise glass production. Hydrogen is used in float glass processes to provide an atmosphere of 5-10% hydrogen in nitrogen. Float glass is widely used to create high quality glass for automotive and buildings applications. Due to the way it is made, float glass is very flat, has a uniformed thickness, and contains no bubbles or distortions.

**Company fundamentals**

| **Valuation** | **Balance Sheet** | **Income Statement** |
|---|---|---|
| Market Capitalization1.93B | Quick Ratio (MRQ)— | Basic EPS (FY)-0.0546 |
| Enterprise Value (MRQ)— | Current Ratio (MRQ)5.9411 | Basic EPS (TTM)-0.0573 |
| Enterprise Value/EBITDA (TTM)— | Debt to Equity Ratio (MRQ)0.0359 | EPS Diluted (FY)-0.0546 |
| Total Shares Outstanding (MRQ)613.158M | Net Debt (MRQ)−157.69M | Net Income (FY)−27.697M |
| Number of Employees— | Total Debt (MRQ)6.545M | EBITDA (TTM)−26.699M |
| Number of Shareholders— | Total Assets (MRQ)221.559M | Gross Profit (MRQ)— |
| Price to Earnings Ratio (TTM)— | **Operating Metrics** | Gross Profit (FY)−14.742M |
| Price to Revenue Ratio (TTM)234.4617 | Return on Assets (TTM)-0.2110 | Last Year Revenue (FY)4.275M |
| Price to Book (FY)9.8000 | Return on Equity (TTM)-0.2724 | Total Revenue (FY)4.275M |
| Price to Sales (FY)416.9640 | Return on Invested Capital (TTM)-0.2584 | Free Cash Flow (TTM)−26.548M |
| | Revenue per Employee (TTM)— | |

### Technical Chart


# Summary

On initial inspection the shares of both firms seem highly correlated as we can see from the chart below, and largely both firms are very similar, both have cutting edge technology, and both are driving the push for hydrogen fuel cells in similar sectors. And as they are both listed on the AIM market, they both offer investors and traders some high risk/high reward opportunity.

Despite the obvious technical similarities highlighted above, fundamentally there are differences, recent partnership news from Ceres, with Weichai Power and Bosch, is being cited as the sector's most significant news for 2022 and has seen several analysts reporting strong target prices. It has also been highlighted that the plant would be 6 times larger than ITM Power's factory at Bessemer Park. On the other side of the coin recently analyst commentary for ITM has been somewhat dulled down with downgraded target prices and commentary that ITM needed to show it can deliver current consensus revenue expectations without also seeing any major step-up in balance sheet provisions.

Ceres recently also reported a 44% increase in revenues for 2021 and are expecting further growth in the year ahead as major commercial partners continue to place orders for its hydrogen-based solid oxide fuel cell (SOFC) technology. ITM's sales have been lagging analyst expectations and other sector peers, and the business has been under pressure recently for its lack of growth.

Due to the high risk, high reward nature of both stocks, and the fact that both generally move with a high degree of correlation despite the differences I would approach the pair with a split pot attitude. What I mean by this is that it is a rapidly expanding and changing market and news flows can fuel moves, at this point with so little to split the difference on the share price movement I would split your normal position size in half and hold half of each.
I'd also leave a little bit of space for the other upstart disruptor in the sector AFC Energy... but this is a stock for another report!!!!

## About Atlantic Capital Markets

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