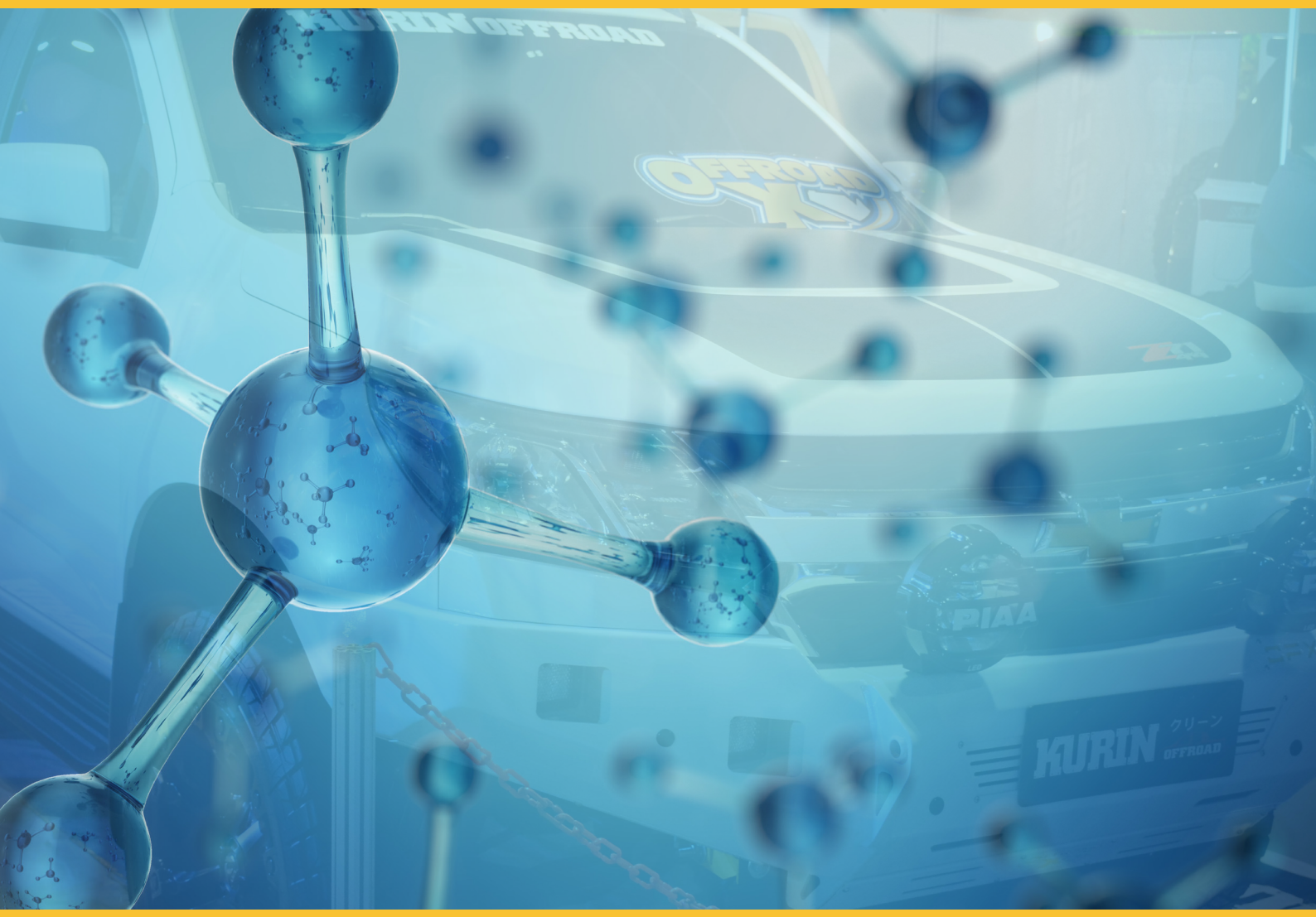
exponential energy
FORTUNES

A New North Sea Oil For Britain – Why Hydrogen is About to Change the World and my Number 1 stock to buy now



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A New North Sea Oil For Britain – Why Hydrogen is About to Change the World and my Number 1 stock to buy now

By James Allen
Publisher and editor, *Exponential Energy Fortunes*

As soon as next year, the British government is going to be forced to take drastic action to address a national emergency.

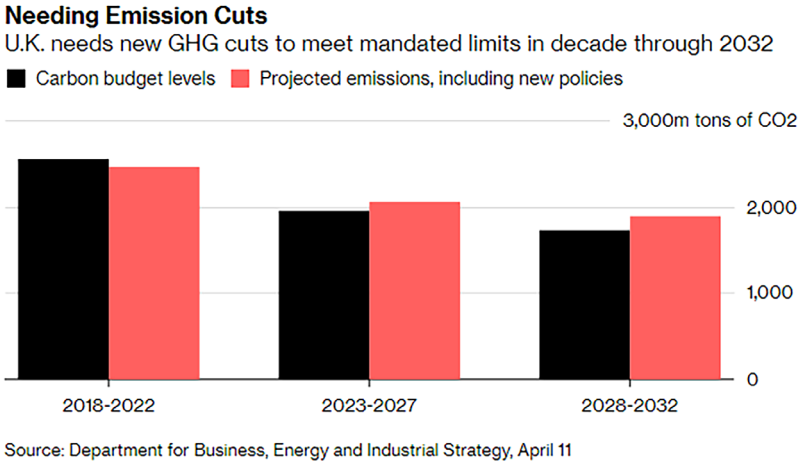
The emergency is not about Brexit, austerity or the NHS, or any of the other huge difficulties faced by our islands at the moment.

You could argue it's something potentially far more devastating and with even wider implications.

The emergency concerns climate change.

Specifically, how Britain is going to meet emission targets through 2032.

Quite simply, we're on track to miss the mandated limits in carbon emissions in the decade through 2032.



Earlier this year, the government confirmed it not only remains on course to miss its carbon targets for the mid-2020s onwards, but the shortfall against the UK's legally-binding carbon budgets has actually worsened.

The report by the government's department for Business, Energy and Industrial Strategy (BEIS) revealed that while the UK is on track to comply with the current third carbon budget, which runs from 2018 to 2022, it is expected to miss the fourth and fifth carbon

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budgets by a wider margin than previously expected, based on current policies.

In fact, the BEIS said there were "projected shortfalls against the fourth and fifth carbon budgets of 139 and 245MtCO2e respectively", suggesting the country will miss carbon targets for the 2023 to 2027 period by 5.6% and then miss the budget for the 2028 to 2032 period by 9.6%.

For a government that has long talked up its green credentials, this is terrible news.

That's because, with the expected "emissions gap" worsening since last year's official update, it's clear that the government's current UK policies – which include the Renewable Transport Fuel Obligation, vehicle efficiency policies, F-Gas rules, the Renewable Heat Incentive, the Energy Company Obligation, and smart meters – aren't working, or at least not working fast enough.

What's more, the decarbonisation challenge faced by the government could also increase in the coming months, given calls for UK to adopt a more ambitious net zero emission goal that is fully in line with the Paris Agreement.

Missing the targets is not an option

What all this means is that the government needs to find a way – or ways – to cut greenhouse gas emissions by a whole lot more than it's doing at the moment.

Let's be clear: missing the targets is not an option for the government.

No government will want that on its record, especially one that has talked such a good game on climate change.

But it's more than PR.

By missing the targets, the government will be at risk of legal action under the Climate Change Act 2008, which says ministers must plan to meet UK carbon budgets.

The act obliges ministers to set out how the UK will meet its goals. Section 13, below, says the government "… must prepare such proposals and policies as [it] considers will enable the carbon budgets… to be met."

Proposals and policies for meeting carbon budgets

13 Duty to prepare proposals and policies for meeting carbon budgets

(1) The Secretary of State must prepare such proposals and policies as the Secretary of State considers will enable the carbon budgets that have been set under this Act to be met.

(2) The proposals and policies must be prepared with a view to meeting—
  (a) the target in section 1 (the target for 2050), and
  (b) any target set under section 5(1)(c) (power to set targets for later years).

(3) The proposals and policies, taken as a whole, must be such as to contribute to sustainable development.

(4) In preparing the proposals and policies, the Secretary of State may take into account the proposals and policies the Secretary of State considers may be prepared by other national authorities.

Section 13 of the Climate Change Act 2008.

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So what will the government do?

To answer that, we need to delve back into the Climate Change Act 2008.

You see, tucked away in section 17 of the act is another interesting requirement, namely that it has to take obtain advice from the so-called Committee on Climate Change (CCC) and to take account of that advice (see paragraph 4, below).

17 Powers to carry amounts from one budgetary period to another

(1) The Secretary of State may decide to carry back part of the carbon budget for a budgetary period to the preceding budgetary period.
The carbon budget for the later period is reduced, and that for the earlier period increased, by the amount carried back.

(2) The amount carried back under subsection (1) must not exceed 1% of the carbon budget for the later period.

(3) The Secretary of State may decide to carry forward the whole or part of any amount by which the carbon budget for a budgetary period exceeds the net UK carbon account for the period.
The amount of the carbon budget for the next budgetary period is increased by the amount carried forward.

(4) Before deciding to carry an amount back or forward under this section, the Secretary of State must—
(a) consult the other national authorities, and
(b) obtain, and take into account, the advice of the Committee on Climate Change.

(5) Any such decision must be made no later than 31st May in the second year after the end of the earlier of the two budgetary periods affected.

Section 17 of the Climate Change Act 2008.

Established 11 years ago under the Climate Change Act, the CCC is a cross-party group of MPs that's right at the centre of UK climate policy.

In fact, in policy circles, its analysis defines the discussion.

In the decade or so since it was set up, the CCC's advice has been followed much more often than not. That's because the government runs a tangible risk of a judicial review if it does not follow the CCC's policy advice.

What this means is that it's worth closely following what the CCC says to get an early steer on likely governmental policy.

And it's here – on the paths the government should take to speed up the UK's emissions cuts – that the CCC has been clear.

In fact, according to the CCC, there's one particular gaseous substance that could form the backbone of any substantive efforts to cut emissions across energy generation, transportation, industry and heating.

That substance is hydrogen.

Hydrogen offers climate change hope

In fact, in its last report in May, the CCC mentioned "hydrogen" a total of 141 times, which was quite something considering the report was 270 pages long.

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Hydrogen, in fact, was one of the central themes to emerge from the CCC report, which said it could contribute to the UK actually ending its contribution to global warming within 30 years by reducing national greenhouse gas emissions to zero by 2050.

Hitting the new stiffer target will require a "significant low-carbon hydrogen economy", the report said, as the gas is the one alternative energy solutions that cuts across all systems.

After all, hydrogen has the unique potential to change the way we use, store and balance energy.

Unlike natural gas, for example, hydrogen is a zero-emission fuel as it emits only water when burned. Either you convert natural gas into low-carbon hydrogen, or you convert excess renewable energy into a hydrogen gas.

For instance, as hydrogen-fuelled cars produce water vapour instead of greenhouse gases from their exhaust, the CCC said all new cars and vans should be electric or run on fuels such as hydrogen by 2035 at the latest.

The committee also suggested hydrogen as a potential alternative to natural gas that could be piped by adapting the current transmission network for use in periods of peak electricity and heating demand.

Indeed, studies have found that converting the UK to hydrogen gas could be £150 billion to £200 billion cheaper than rewiring British homes to use electric heating powered by lower-carbon sources.

What's more, hydrogen heating would be the least hassle for energy customers because very few appliances would need to be replaced.

In fact, the existing gas grid would need only minor upgrades because it was actually originally designed for hydrogen before the North Sea boom provided a flood of cheap natural gas to burn instead.

The plan is a crucial part of efforts to cut carbon from heating, which makes up almost a fifth of the UK's total carbon emissions, because hydrogen produces only water vapour and heat when burned – with no carbon emissions.

Although the government has already proposed a ban on gas boilers in all new-build homes from 2025 – a ban made at the response of the CCC, I might add – there's a much bigger problem of converting the 23.9 million existing properties heated by natural gas, meaning radical alternatives such as hydrogen are needed.

UK to spend half a billion euros per year on the hydrogen economy

"By 2050, a new low-carbon industry is needed with UK hydrogen production capacity of comparable size to the UK's current fleet of gas-fired power stations," the CCC said in its May report.

Digging deeper into the numbers, the technical report backing up the headline CCC report

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predicted that between 6 GW and 17 GW of electrolyser capacity (electrolysers produce hydrogen by using an electrical current to split water molecules into both hydrogen and oxygen) will be required in the UK by 2050, depending on energy demand and utilisation rates.

This prediction implies the country will need to build up to 567 MW of electrolysis per year for 30 years.

Considering each megawatt of electrolyser capacity costs about €1 million, that's over half a billion euros that will need to be spent in the UK per year on average for 30 years to get to zero emissions.

For the so-called hydrogen economy in the UK, that's huge.

Although the CCC report was focused on 2050, the government will have its analysis at the forefront of its mind when it also considers how to meet its carbon budgets out to 2032.

Window of opportunity

The government is considering the CCC report and, with a history of respecting the advice from the independent body, is expected to adopt most or all of its recommendations. That could see it implement policy to back multi-billion pound investments in the hydrogen economy.

When it will do so is not clear, however. There is currently no policy framework for hydrogen in place and the timing of any decision-making is not known yet.

However, the CCC said the government "should legislate as soon as possible" and that its target is "only credible if policy to reduce emissions ramps up significantly".

What's more, MPs on the influential Business, Energy and Industrial Strategy Committee have said the rules should be changed as soon as next year to allow hydrogen into the natural gas grid.

In fact, it is now the most urgent task of any government to put in place the policies needed to rapidly decarbonise our economy over the coming decades.

Lawmakers from across the political spectrum are in agreement: hydrogen can significantly reduce the nation's greenhouse gas emissions and help transition to a low-carbon system.

Quite simply, the UK is looking to replace natural gas sooner than many will expect, leaving us with a window of opportunity right now to take advantage before the governmet presses "go" on its plans.In a new paragraph, new section:

The UK isn't the only one to notice…

Hydrogen has truly global potential.

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It's already happening...

In the transportation sector, General Motors, Amazon, Walmart and courier firm DHL are all already creating fleets of vehicles powered entirely by hydrogen. That could be the start of a much bigger shift away from "traditional" vehicles (or even electric cars) – and towards hydrogen-powered engines. As great-grandson of Henry Ford and executive chairman of Ford Motor Company said: "I believe hydrogen could end the 100-year reign of the internal combustion engine."

Hyundai is getting in on the act too. It plans to spend $6.7 billion to increase the number of hydrogen powered cars it produces 200-fold. It's working closely with a startup formed by executives from Google, Tesla and Uber to do this.

As Hyundai vice chairman Euisun Chung says:

"We are confident that hydrogen will transcend the transportation sector and become a leading global economic success."

Countries too are rushing to invest in the ground-breaking fuel:

China expects to increase the number of hydrogen powered vehicles on its roads by over 650% in the next decade. Behind this move is Wan Gang, former minister of science and technology. It was his advice that drove the massive boom of electric car sales in China.

But now in a recent Bloomberg interview, Wan said that he wants China to move to hydrogen powered cars.

Japan is also moving into the space in a big way.

The plan? To power next years' Tokyo Olympics with Hydrogen. Hydrogen-powered buses will move visitors between venues. VIPs will cruise in hydrogen fuel cell cars. A government spokesperson said that "we want to expose the technology to as many people as possible."

The Tokyo Olympics is less than a year away... a year in which we'll see "hydrogen" rolled out all over the world.

In Eirope, Angela Merkel in Germany is pumping $110 million to test new industrial-scale applications.

Germany's Economy minister said: "We have to set the course so that Germany becomes the No. 1 in the world in hydrogen technologies."

France wants a piece of the pie as well. It has a €100 million hydrogen investment plan. And its minister for Ecological and Inclusive Transition vowed to make France a world leader.

In California, hydrogen charging stations are part of a $900 million project to cut pollution.

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Plans already taking shape in the UK

Back in the UK, the good news is that the industry isn't moving from a standing start.

One pilot hydrogen project, named HyDeploy and run by Keele University in northern England, is already up and running, and aims to blend a volume of as much as 20% of hydrogen with normal gas supply. The project is currently serving 17 university faculty buildings and 100 domestic properties in the local area.

If small scale testing is successful, this could then be rolled out with live public trials across 1,000 properties in northern England from summer 2020 before a larger commercial scale rollout in 2023, at the earliest.

Blending hydrogen across the whole of the UK could save 6 million tonnes of carbon every year, or the equivalent of removing 2.5 million cars from the roads.

Many of Britain's grids are already replacing metal pipes with plastic, which helps prevent leaks, improve safety and can also allow the transport of different gases including hydrogen.

In transport, too, progress is already well under way, with fleets of hydrogen-fuelled vehicles already on our roads. After all, hydrogen-powered cars are seen as being far better for the environment in terms of emissions than those running on petrol, as when you burn hydrogen, it produces steam, meaning only water is the by-product.

But with such a ramping up of hydrogen facilities across industry, energy and transport expected over the coming years, a huge pick-up for a range of UK-listed companies will take place.

But there is one stand-out hydrogen company that will, to my mind, benefit particularly.

It has been growing steadily for a few years, manages its finances well for a small growth stock, and is seeing deals increase in both number and size.

Its name is ITM Power and it's listed on the AIM market in the UK.

ITM Power – the UK-listed hydrogen trailblazer

ITM Power is a leading supplier of hydrogen production plants, so-called electrolysers, including complete hydrogen refuelling stations. Its electrolyser technology is already being taken up in consumer and industrial applications. In fact, it's supplying the electrolyser system to the HyDeploy project mentioned above.

The AIM-listed company's power-to-gas business provides PEM (proton exchange membrane) storage systems that allow customers to convert excess electrical energy into hydrogen for injection into the gas grid or storage for vehicles.

The group's clean fuels solutions come in the form of modular hydrogen stations to recharge fuel cell vehicles.

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It currently has eight hydrogen fuelling stations across the UK. Two more are under construction and they have planned and financed another three.

Having expanded over the last five years, it is currently developing a larger production facility in Sheffield. Once complete, it will have five times the manufacturing space as ITM's current home. Marry that with a decade of industry experience, an established expertise and a growing project pipeline, ITM looks set to ride the hydrogen wave.

Products and **projects**

ITM's projects range from hydrogen refuelling stations in fuel garages for cars, a civic project for Birmingham's bus network, a refining plant in Germany, energy storage for tidal energy and clean hydrogen supply. It is involved in so many parts of the hydrogen industry that, as hydrogen becomes a more popular choice, it will benefit across the board.

One of the best looking things about ITM is the project pipeline it is building up.

It now has eight hydrogen "solutions" installed across the UK. two more were under construction, including the largest one yet for the Birmingham bus fleet. Another three are financed and in the design and planning phase.

It generates revenue from multiple sources, including from consultancy, design, grants, fuel sales and – the biggest contributor – construction contracts, many of which are field leading.

For example, ITM has installed the first "under the canopy" charging station alongside normal petrol pumps. This is at the Beaconsfield service station on the M4, one of the busiest in the country.

It has also built and operates the largest PEM electrolyser in the world. Basically it's a 10 MW hydrogen refinery.

It was also the first company in the world to generate hydrogen using energy from tidal power.

This is crucial because one of the problems with current electric vehicles is that they are actually quite carbon intensive to make. The batteries in particular need a lot of fossil-fuelled electricity to make.

If ITM can produce hydrogen from renewable sources like tidal, so called "green hydrogen", it would accelerate the decarbonisation of road transport, with ITM leading the charge.

Shell partnership

What's more, the firm has also just renewed its partnership with Shell for vehicle refuelling, which had been in place since 2015. So far, ITM has installed three refuelling stations in Shell garages in the UK. three more are funded and planned: in Derby, as well

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as two in London. The new agreement will run until 2024 so we can expect to see more new projects like these in the UK.

But it doesn't stop there. Shell, with ITM power, is building the world's largest hydrogen electrolyser. The project, called "Refhyne", enables hydrogen to be made from electricity rather than natural gas. This facilitates the use of more renewable electricity, reducing the carbon footprint of the company, which is a key goal for obvious reasons.

This is obviously a big success in its own right, but will also serve as a reference point for future bids into the industry.

ITM is also in partnership as a fuel supplier to Green Tomato – a UK taxi company that uses environmentally friendly cars for its taxis – and London's Metropolitan Police.

Green Tomato is a leader in the green-taxi field in the UK. These relationships can tell us as much if not more than just balance sheets and income statements at this early stage in the company's growth.

But the company isn't just focused on the UK. In fact, it has also made its first sale of four 250 kW electrolyser systems to three different customers in Australia.

Australia is a clean tech leader and so a crucial market for hydrogen companies. It's a positive sign to see ITM making its first steps into that market.

In fact, around the world, ITM has built a reputation for excellence that is clearly carrying weight with major consumers.

Financials

A look into the books reveals that ITM's revenue has grown steadily since 2014, from £1.13 million to £3.28 million.

From 2014 to 2017, operating loss fell accordingly, from £7.97 million to £3.55 million.

In 2018 though, losses spiked die to a surge in hiring in manufacturing and after-sales support, plus a high proportion of "first of a kind" projects. These cost overruns amounted to £0.9 million.

These heavy losses continued into the first half of 2019, with H1 results showing a loss of £5.3 million, compared to £2.9 million for H1 2018. Although revenue was only £1.2 million (down from 1.7 million), the shortfall was mostly covered by grant funding of £3.8 million from the UK and EU, up from £2.7 million the previous year.

But it's still worth looking into why the costs have gone up in the last 18 months.

To understand ITM's increased spending, you have to look at what it spent money on. Adding staff to manufacturing and after-sales support shows that ITM is not desperately trying to generate new business, but actually growing in order to service its current projects.

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Average project size is up from £3.5 million to £6 million on average, reflecting strong demand for larger systems as the hydrogen fuel and energy storage markets continue to grow worldwide.

At the end of the 2018 financial year, its pipeline stood at £240 million, up from £200 million the previous year.

Growth in the business is strong, and the increased spending reflects that.

I fully expect the investment in new projects and new staff to pay off over the next few years.

In any case, the fact that ITM power is loss-making is far more the result of being in a very young industry than any product or business failures of the company.

With momentum increasing in the hydrogen market, that should be the start of a great period when ITM can finally capitalise on all its hard work over the last decade.

Risks

There are a few main risks and factors mitigating against widespread hydrogen adoption, which could affect the share price of ITM moving forward.

Firstly, the main risk affecting all green energy companies is that regulation doesn't move quickly enough to give businesses the confidence they need to invest. We don't know exactly when the UK will firm up its policies on hydrogen and although I expect this will take place next year, there's a chance it might not happen until the early or mid-2020s.

Secondly, Brexit is a key risk. If trade relations with the continent fray and worsen, ITM could lose out to European competitors. Or EU funding could fall away. At this stage, it's anyone's guess what will happen.

There is also a risk that in the event of a wider global downturn, the financing on which the company still relies could be less forthcoming. If interest rates go up, its indebtedness will become more of a problem.

It also has a few competitors. The smaller hydrogen focused companies include Nel, a Norwegian company, Hydrogenics and McPhy Energy, while Siemens and Thyssenkrupp are two of the larger global players.

However, in my eyes none of these other companies are as well positioned to capitalise on the hydrogen boom as ITM.

On a wider level, the hydrogen sector will be hit if battery electric vehicles (EVs) become significantly more competitive. Hydrogen fuelled cars are competing for market share with EVs as petrol vehicle usage fades. There looks to be plenty out there for both hydrogen and battery EVs, but should an unforeseen super-development occur in battery EVs, they could become by far the better option.

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What's more, more testing is needed to ensure hydrogen is viable on a commercial scale, while questions remain on the cost of switching to the fuel. Renewable energy and batteries may even curb the need for green gas.

A plan by distributor Cadent Gas Ltd to build a hydrogen network across about 20% of Britain to heat homes and supply industry would require about £20 billion. Costly but not that costly, especially not set against the alternatives.

Buy now before the government presses go

A few months ago, ITM's share price doubled following the release of its half-year results, which were better than expected. A lot of what I've highlighted here was revealed in the report, and so you can see why it's done well.

To my mind, that was just a short-term move. After all, ITM looks set to be a prime beneficiary of rising demand for low carbon hydrogen,

Quite simply, the UK's influential CCC has already made clear the UK is going to need millions and millions of pounds worth of the equipment that ITM makes.

Invest now before the government confirms it.

Action to take: BUY ITM Power (AIM:ITM), current market price 65.4p GBp. Buy up to 80p. If the stock is trading above our recommended buy-up-to price, DO NOT BUY. Remember to use limit orders.

Name: ITM Power PLC
Ticker: ITM:LN
Current price: 30/05/19: 65.2 GBp
Market cap: £309.02 million
52-week high/low: 73.00/18.60 GBp

All the best,

James Allen
Editor, *Exponential Energy Fortunes*

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