One to Watch

Hazer Group

Meeting with CEO Glenn Corrie

29th January 2024

Venn Brown sat down with Glenn Corrie, CEO of Hazer Group, to discuss the current state of the business, its revenue model, entering the commercialisation phase, potential market size and partnerships with global tier-1 partners.

Company background: Hazer Group is a technology company that has developed a new low-energy (and therefore lower cost), low-carbon pyrolysis hydrogen production process converting methane feedstock into hydrogen and near-pure graphite. The process uses less energy than the traditional steam methane reforming (SMR) method used across the industry and with no carbon dioxide by-product.

Market size: Globally, the SMR industry processes 100 million tons of hydrogen a year and more than 1 billion tons of annual CO^2 emissions. As industries look to reduce their carbon footprint, Hazer's process is an easy step to at least halve scope one, two and three emissions. Current SMR processes produce eleven tons of CO^2 for every ton of hydrogen.

Decarbonisation: The key driver for the shift away from SMR is the need to decarbonise industries. Hazer's proprietor pyrolysis uses methane (natural gas) and an iron ore catalyst to produce hydrogen and graphite. SMR uses methane and huge volumes of water to produce hydrogen and carbon dioxide. While decarbonisation may be the driver, Hazer's process is still price competitive, with landed hydrogen less than existing methods.

Commercialisation phase: Hazer has just commissioned its first scale commercial demonstration plant (CDP) and is already working with global giants Fortis, Chubu Electric, Engie and Mitsui to bring three other facilities online. With each facility worth around US$100 million, these plants will make Hazer a US$300 million company over the next three to five years

Ten facilities in ten years: Hazer is targeting ten operating facilities within ten years, a goal that seems conservative given the group's capital-light model of licencing the technology rather than building and operating the facilities themselves. These ten facilities represent just half a per cent of current global hydrogen demand.

Hazer Group

ASX:HZR

Sector	Process Industries
Date	29-Jan-24
Share price	$0.580
52-week range	$0.45 / $0.81
Market cap	$116.6m
Free float	88.8%
Dividend	-
Yield	-

Year-end 30 June	FY20	FY21	FY22	FY23
Revenue	-	-	-	-
EBITDA	-$4.6m	-$8.6m	-$7.4m	-$14.3m
EBIT	-$4.7m	-$8.6m	-$7.5m	-$14.4m
Net profit	-$3.2m	-$11.7m	-$16.4m	-$12.2m
Earnings per share	-$0.03	-$0.08	-$0.10	-$0.07
Operating cash flow	-$2.5m	$5.1m	-$5.2m	-$1.3m
Free cash flow	-$3.5m	-$1.5m	-$21.3m	-$5.8m
Cash & equiv	$17.2m	$24.6m	$18.0m	$9.3m
Net debt	-$17.2m	-$21.9m	-$14.2m	-$9.0m
Net debt / EBITDA	3.7	2.6	1.9	0.6
Dividend per share	-	-	-	-
ROA	-17.4%	-44.1%	-60.7%	-96.4%
ROE	-17.9%	-87.5%	-131.8%	-309.8%

3-year Price Chart

Analysts

Andrew Wilkinson awilkinson@vennbrown.com

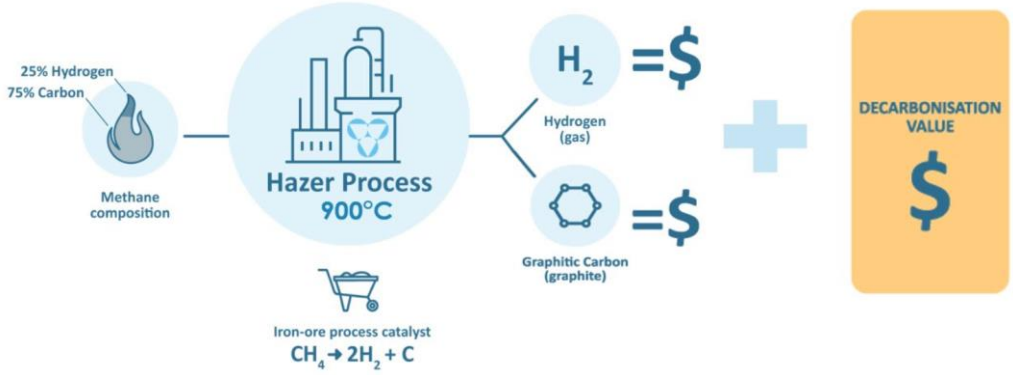
Thanks for being with us today Glenn. To start, can you give us a brief overview of Hazer Group?

The Hazer Group is a technology development company commercialising a new low-energy, low cost, low-carbon hydrogen generation process. Called the Hazer Process, our proprietary process uses iron ore as a catalyst in methane pyrolysis, enabling low-temperature conversion of methane and similar feedstocks into hydrogen and high-quality graphite.

Unlike other forms of hydrogen generation, the Hazer process uses less energy for conversion and has only hydrogen and near-pure graphite as outputs. The benefits for customers are 1) lower operating costs; 2) lower carbon footprint; 3) no water supply, 4) carbon credits; and 5) revenue-generating graphite by-product.

While methane pyrolysis isn't new (it's been around since the 1930s or 1940s), it never really took off because oil and gas just took over as the main fuel sources. What is new is our process that uses the iron ore catalyst to deliver all the benefits I mentioned. Essentially we have one technology that can serve three very valuable markets – hydrogen, graphite and decarbonisation.

Figure 1: The Hazer Process requires less energy, no water & produces no CO^2



Source: Hazer Group

Just to be clear, the hydrogen production you're talking about is already being done using other methods in existing refineries and industrial plants, correct?

Yes, that's right. Currently, around a hundred million tons of hydrogen are produced each year, mostly in petrochemical plants, oil refineries, and ammonia plants. Hydrogen is a key input to these processes. We're not talking about new markets like many of the green hydrogen projects you hear about. Our process improves upon existing processes already in use around the world.

What are the existing hydrogen production processes customers are currently using?

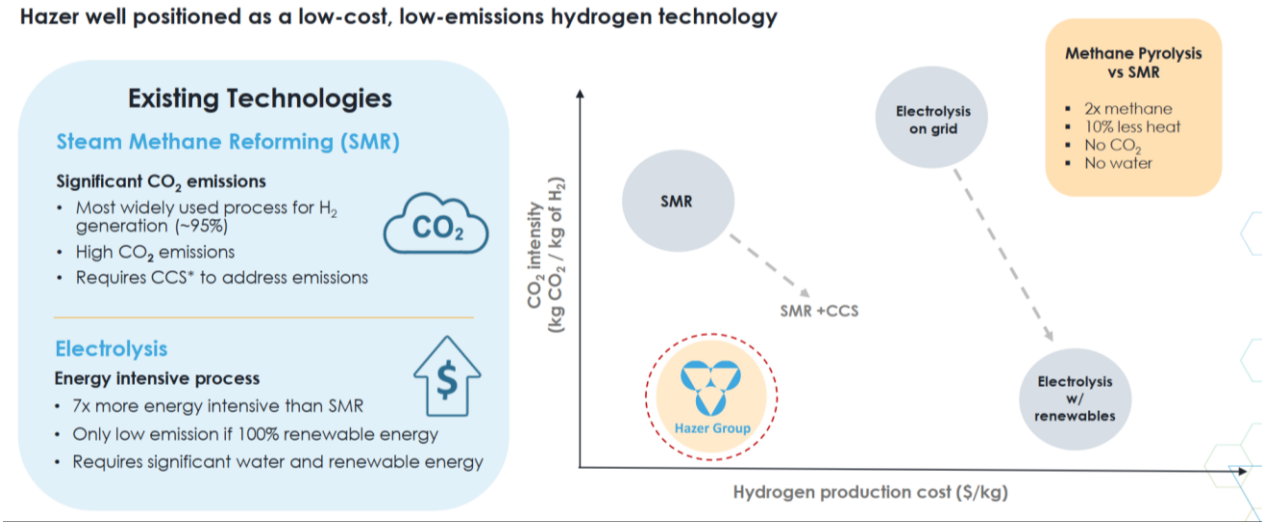
The most widely used process, representing around 95% of global production, is steam methane reforming (SMR). This higher energy process produces a lot of CO^2, requiring carbon capture and storage to be carbon neutral. While the SMR process requires less methane as a feedstock (approximately a 3-to-1 ratio methane to hydrogen, compared to 5-to-1 for the Hazer Process), it requires around 20% more energy than the Hazer process and also requires

huge volumes of water, roughly nine units of water per unit of hydrogen. Our process takes methane in and breaks it into its hydrogen and high-purity carbon in the form of graphite.

The other option, which is not widely used because of the cost and energy intensity, is electrolysis. Electrolysis requires seven times the energy of SMR and also a lot of water. This makes it far less suitable for most applications as the only way to make it low or zero carbon is for it to be powered by 100% renewable energy sources, and even then, you also need a large water supply.

The energy requirement for electrolysis is about 55 kilowatt hours per kilogram of hydrogen. For SMR, it's about 13-15 kilowatt hours per kilogram of hydrogen. Standard methane pyrolysis is around 13 kilowatt hours per kilogram of hydrogen, but our process needs less than 10 kilowatt hours per kilogram.

Figure 2: Hazer is well-positioned as a low-cost, low-emissions hydrogen technology



Source: Hazer Group

The process we've developed services three markets: the hydrogen market, the graphite market, and the overall decarbonisation market.

If you can substitute SMR with Hazer, you are going to effectively save money or create value because you're not buying carbon credits or having to abate as much CO^2. While at-scale electrolysis is not necessarily available today, Hazer can plug directly into existing refineries or plants within the customers' existing footprint and produce hydrogen at the customer's centre of demand.

Who are your potential customers?

As I already mentioned, we're not creating a new market. Our process directly replaces existing SMR systems used in petrochemical plants, oil refineries, ethanol plants or power generation facilities. Any industrial, high-volume users of hydrogen. Most of these facilities already use methane as a feedstock, so our processing facilities, which have quite a small footprint, are built within their facility, tap into their existing gas and power supply and produce hydrogen onsite, removing the need for transportation or the construction of additional pipeline infrastructure.

Again, as I mentioned, the market is huge. It's on the scale of a hundred million tons a year, about a quarter the size of the LNG market. And beyond this market, there are other potential opportunities where our zero-carbon hydrogen can be used to replace gas. For instance, steel manufacturing is responsible for around 10% of global CO^2 emissions. The Hazer process could eliminate this carbon output at a lower energy point than other options. But that's a long way off and requires a lot of work first, but it's just an example of longer-term opportunities.

To put the carbon issue in perspective. As I said, SMR produces 11 units of CO^2 per unit of hydrogen, so that's more than a billion tons of CO^2 produced every year from SMR. There are scope two and scope three elements to this, but the Hazer Process would reduce the CO^2 output by at least half.

How complicated is replacing an existing solution on an operating refinery or plant with your process?

It's pretty straightforward. Our footprint is fairly similar to an SMR, but unlike SMR, our only inputs are power and methane or a similar gas, whereas SMR also requires water. Our customers need hydrogen to make their products, so they either produce it on-site using SMR, which produces large amounts of carbon, or our produce, which is lower energy and lower carbon. Alternatively, they can bring hydrogen on site but that introduces transportation costs and risks.

Figure 3: The Hazer Process has a similar footprint but fewer inputs than SMR

Source: Hazer Group

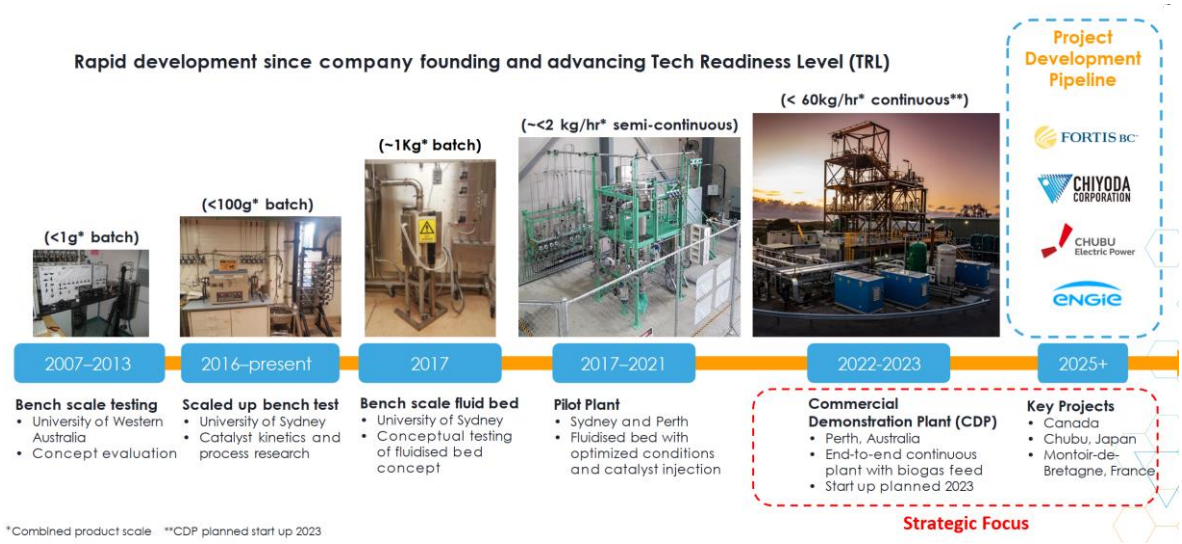
In what stage of commercialisation is the business right now?

We've just entered a really exciting phase. In December, we announced the commissioning of our commercial demonstration plant (CDP) in Perth. The reactor successfully achieved full operating temperature and pressure. It's now ready to receive feed gas, with the first hydrogen production targeted for early 2024, and we're building towards continuous operation in the first half of the year. The commissioning of the reactor is a key milestone and de-risking event for the business. We've been on this journey for 15 years, and this is the fifth

scale-up starting from the benchtop concept evaluations first done at the University of Western Australia labs back in 2010.

Looking ahead, we have several developments at various design and development stages in Canada, Japan, and France.

Figure 4: After 15 years of development, Hazer has started commercialisation



Source: Hazer Group

Speaking of these potential projects, what interest are you getting from potential customers and partners?

We've had a lot of interest in the technology. Even before we'd commission the CDP, we've had partners who want to take on some risk and be first in line with their own plant, so in parallel with commissioning the CDP, we've been continuing to scale and design new facilities. I credit Fortis in Canada, Chubu Electric in Japan and Engie in France for identifying the technology and saying, "This is world first; we get it. Let's see how the CDP goes, but we want to be in the queue for a plant." Canada was the first out of the blocks for us, so we're currently in the detailed design phase. That project is with Fortis, which is a twenty billion dollar gas, electricity and transmission company in North America, so it's a great project for us. The final investment decision is due this year and it will take about two years to build once it's got the go-ahead. The design phase was about a year, and we now have a design package, not just the reactor but also the entire balance of a plant that's 25 times the scale of the CDP.

We've got another project underway in Japan with Chubu Electric and Chiyoda. Both these groups are fantastic partners as they open up dozens of potential projects in the future. Chubu Electric is the world's largest LNG importer, so they understand the gas market better than almost anyone. They're also a power generator so they understand the energy markets and energy value chain. Chiyoda is a massive engineering company with LNG projects throughout Asia and the Middle East, so they bring a huge number of potential projects with them.

The Japanese plant will leverage our Canadian designs for a 2,500-ton-a-year facility, but this can be scaled up to 5, 10, or even 20,000 tons simply by increasing the reactor size. As I said, most of this technology isn't new, so it's well understood and low-risk. What the CDP and

these projects will help us do, and what we're already doing, is exploring other options to see how we can scale efficiently. These are tweaks from the technology, minimising footprint, lowering energy intensity and ultimately reducing costs.

We've got a third project with the massive European gas and utility company Engie. We're having multiple discussions with customers in Asia, North America and Europe, so I wouldn't be surprised to see another couple of projects announced over the next six to twelve months.

Figure 5: Tier-1 partners are developing commercial projects around the world

Source: Hazer Group

Has there been much interest in the graphite output?

The graphite by-product offers quite a few opportunities. Mitsui (the giant Japanese conglomerate) is leading the development of the graphite market. As you're probably aware, the graphite market changed overnight in October when China, the world's largest exporter, almost ceased exporting. In the future, we can potentially be a massive supplier of graphite. Graphite is predominantly used in battery technology, and the feedback we've gotten has been really positive for other applications as well, including steel and cement production, water purification, energy storage and bitumen and asphalt production.

Keep in mind that for every ton of hydrogen, we produce four tons of graphite. The applications for the graphite will vary depending on the geography. In Japan, we're 100% confident of selling it. In Singapore, it might be different.

An Australian company is working on some really advanced technology using graphite as energy storage. MGA has secured some government funding to continue developing the technology. They use synthetic graphite with an iron compound to store energy, which fits perfectly with our graphite which has trace elements of iron.

Overall, there are a lot of use cases for our graphite, and we're confident that we'll be able to sell the graphite into medium and high-value markets.

Given these customer's early involvement, do they own any of the intellectual property?

The broad IP is all with Hazer Group, and we have it locked up in over 30 jurisdictions globally. There are small amounts that will sit with others. There will be project IP and certain technology components, but that doesn't inhibit us from doing anything with it. We have unencumbered rights to the IP. Even if a project owner has some of it, that will not limit us

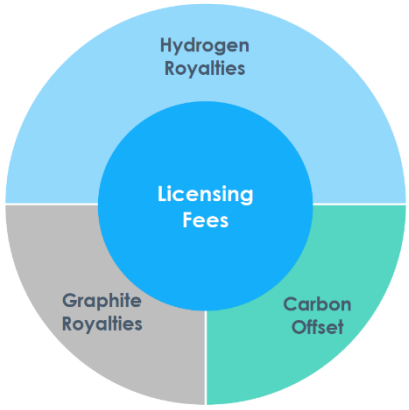
from moving forward. When we commission a project, we're not selling our IP. We're licensing our technology.

That brings us to an important point: what is your revenue model?

It's a good question, for now, we're focussed on a licencing model. We're a small company. We're 30 people, mostly engineers, that are developing the technology. We haven't built, and we don't build large-scale plants. We've been partnering with large engineering groups like Wood, Hatch and Chiyoda that do the large-scale construction. They're all engineering experts who do that much better than us. The licencing model fits our strategy well because it enables us to accelerate our cash generation by not having to deploy large capital upfront. We'll license our technology and receive a licence fee and a royalty stream on the products produced through the plant.

This might change in the future. If you look at the economics, these plants can quickly generate a lot of cash. They're not expensive upfront. They use existing infrastructure. And if you think about the margins you'll get on hydrogen and graphite, owning them presents a potentially attractive business case. These are all options for the future. For the moment, we're focused on the capital-light licensing model.

Figure 6: Hazer's capital-light revenue model maximises ROI while supporting an accelerated roll out



Source: Hazer Group

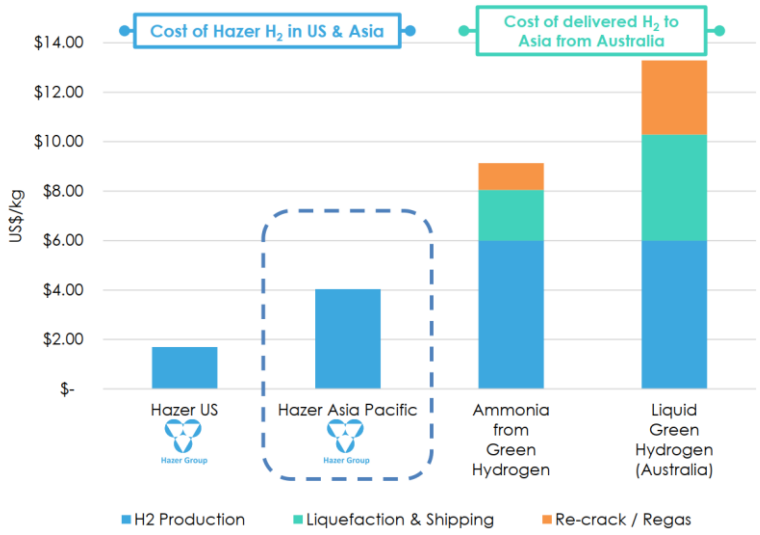
How substantial are the upfront costs for customers to replace their existing SMR with the Hazer Process?

The driver for customers is going to be as much driven by carbon policy as economic returns. But that's also impacted by what happens with carbon prices. Initially, we might be more expensive, but that will also change. We're a newer technology, but we and our customers will benefit as we scale. Our costs will come down. And the fact that we use existing industry equipment should support that model, but it'll be a question for individual project owners.

As I mentioned earlier, SMR has the advantage of requiring less feedstock (three units of feedstock for one unit of hydrogen, compared to the five-to-one ratio for our process), but this is offset by its ~20% higher energy consumption, the significant water requirement (nine units of water, for every unit of hydrogen produced) and the major disadvantage that it produces a lot of CO^2.

It's really a question of decarbonisation. I think that's where our conversations will focus and a lot of people are prepared to switch.

Figure 7: As well as emissions advantages, Hazer's process is cost competitive



Source: Hazer Group

Where do you see your biggest growth opportunities?

It's difficult to fully comprehend the size of our market opportunity. We're targeting ten operational facilities in ten years, but thousands of refineries and plants currently use SMR facilities. As I mentioned, the global market is about a hundred million tons of hydrogen annually, and our ten facilities will be one-half of one per cent of that.

We'd like to have three to five sites open over the next three to five years. Each one of these sites should be worth around US$100 million, so ten of them should make us a US$1 billion dollar company. Three in five years, simply means the three we've already got underway, make us a US$300 million dollar company. Could we have more? Probably, but let's get through this first phase and take it from there. I'd prefer to underpromise and overdeliver.

What are the biggest risks to reaching these goals?

Look, there's always going to be technology at risk, so I'm not going to shy away from that, but I think we have an exceptionally good team that has worked with technology for a long time. We've got some of the world's best process engineers, hands down. So we are across a lot of, we know where the risks are. It's the unknowns you can't really figure out but we've done it five times, so we should have a reasonable handle. And it's not that complicated. Don't tell the engineers that. I think the biggest risk for Hazer is the pace that we can move, and we must move faster. And for that, we need a bit of funding. We have already spent a lot on the technology, but we must continue moving fast. There are other groups in this space that are moving fast.

What are the most misunderstood parts of the business?

People look at us and think we're just another hydrogen development company. We're not. We're a pure-play technology venture. We're not putting our hands in our pockets and building electrolysis projects.

We have developed a unique, disruptive technology with a global market. We're a capital-light technology business and should get the economic leverage that comes with that. Anyone can develop a project, take an electrolyser and split water. We're the only one that can produce hydrogen using a low energy, low carbon pyrolysis process.

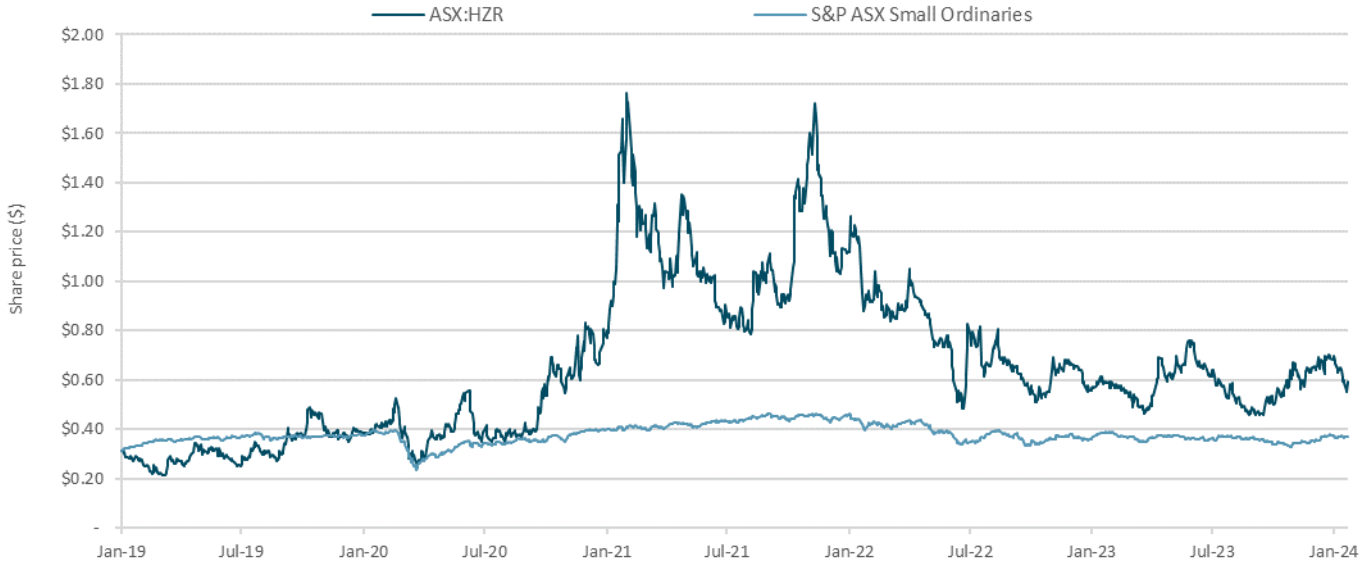
The second thing that people misunderstand is the potential of the business. We're doing this now, not in five or ten years' time. We're disrupting SMR now. It's a complicated industry. It's difficult to understand the value opportunity when people don't understand the dynamics of SMR electrolysis. We need to do more market education around that. Maybe you can help with that. People within the industry understand it, and they're coming to us because they see the potential. They've done the work, but it will take the market a while to understand it. It will get easier as we commission more sites.

When do you expect to be cash flow positive?

Our focus is to get the CDP fully operational, get these commercial projects off the ground, and make the commercial arrangements for these projects visible to investors so that they can see that there is a licence fee structure. Once we've done that, I think investors will see us differently.

We will take a few years to get free cash positive because we're still an evolving technology venture. We need to demonstrate and validate the technology and the commercial viability of the business model. We're working with massive, global tier-one partners that believe in the technology and, once proven, can help us roll it out worldwide. Let's validate it again for the fifth time at scale and give visibility to the revenue stream. Then, I think we will be a different company.

Share price performance



Source: Factset

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