



Impact investing in hydrogen and CO2 utilisation for decarbonisation

By Stephen B. Harrison on Apr 10, 2023 | [Q&A](#)

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Carbon dioxide (CO₂) emissions have resulted in global warming. Decarbonisation to the point of carbon neutrality will be essential to avoid a climatic catastrophe. Amongst other things, this will require a switch from hydrocarbon fossil fuels and grey hydrogen to renewable forms of energy, such as green hydrogen, or other forms of low-carbon hydrogen.

As a clean burning renewable fuel, hydrogen will have a central role to play in securing the 2050 target of 'Net Zero' CO₂ emissions which is the shared aspiration of many nations worldwide. Hydrogen has a role to address the main challenge of our generation. Utilisation of captured CO₂ will also have a role to play in creating carbon-neutral e-fuels using power to liquids technologies.

Yufeng Wan, Partner and Head of Decarbonisation at Templewater in Hong Kong, says that, "Templewater invests in technologies and teams to provide capital and market access. We support technology firms that are innovating and scaling up their businesses to enable decarbonization. Furthermore, we offer conscientious investors a structured way to engage in the attractive returns that decarbonisation and the hydrogen economy will offer."





Decarbonisation is a win-win investment opportunity

The value of the hydrogen sector in Europe today is estimated to be €2bn. According to the EU Hydrogen Strategy, published on the 8th July 2020. By 2030 this is expected to grow to become a staggering €140bn. That is a compound annual growth rate exceeding 50%. It is speculated that 140,000 jobs will also be created along the way.

In 2022, the US government enacted the Inflation Reduction Act and the EU followed with various initiatives to stimulate innovation and investment in the hydrogen economy and decarbonisation technologies. "I am convinced that hydrogen is a powerful lever of decarbonisation," adds Wan. "Equally, I believe that a range of other technologies will be required to combat climate change. We will invest in hydrogen

related businesses in addition to a broad scope of decarbonisation technologies.”

Impact investing with a decarbonisation focus is a win-win scenario. Planetary health and future generations stand to benefit from the innovation and infrastructure, which requires investment. In parallel, investors are offered superior returns in a sector which will meet their sustainable investment objectives and ESG priorities.

Business maturity and typical decarbonisation investment characteristics					
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Typical investor	Angel	Venture Capital	VC or PE	Specialist PE	Bulge bracket PE
Typical investment	US\$ 10 K – US\$ 250 K	US\$ 250 K – US\$ 2 M	US\$ 10 M – US\$ 50 M	US\$ 50 M – US\$ 100 M	US\$ 100 M – billions
Typical holding period	8 – 10 years	6 – 8 years	5 – 7 years	3 – 7 years	3 – 5 years
Targeted financial returns	> 75% IRR or +10x	> 60% IRR or +10x	> 40% IRR or +7x	~25 to 35% IRR or +5x	> 18% IRR or +3x
Financing stage and investment type	Initial raise, friends and family, angel investors	Seed capital, first institutional check	Growth capital, Series A to C rounds with full due diligence	Series C round to IPO with full prospectus	Majority control, debt leveraged
Typical technology maturity (TRL)	1 – 3	2 – 4	4 – 7	7 – 8	8 – 9
Example decarbonisation technologies	Developments of emerging and established technologies				

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Project finance and opportunities

Major hydrogen and decarbonisation infrastructure projects will provide project finance investment opportunities for lenders. Green ammonia terminals, hydrogen refuelling stations, e-methanol bunkering and hydrogen pipelines are examples.

Hydrogen end e-fuels producers will also pull for investment through equity, debt, or bonds to fund expansion of their capacity. Technology start-ups will pull for VC funding – and many opportunities are likely to yield attractive returns.

“Cultural fit is important,” declares Wan. “For growth investing, we believe that the best results are realised when the investor is a supportive partner to the business they invest in. We offer a nurturing investment style through the highly experienced team at Templewater which has a mix of industrial and financial backgrounds. We also offer synergy with other portfolio companies and through our presence in Hong Kong, we enable access to the attractive Asian market.”

Corporate giants are actively seeking bolt-on acquisitions to build scale and improve their technology portfolio. IP investments can accelerate their R&D pipelines. The decarbonisation sector is not yet in a phase of consolidation, but cash-rich, established players are seeking to make the right moves to ensure that they have access to the technologies that will dominate the sector decades from now.

Industrial gases interest in hydrogen and decarbonisation

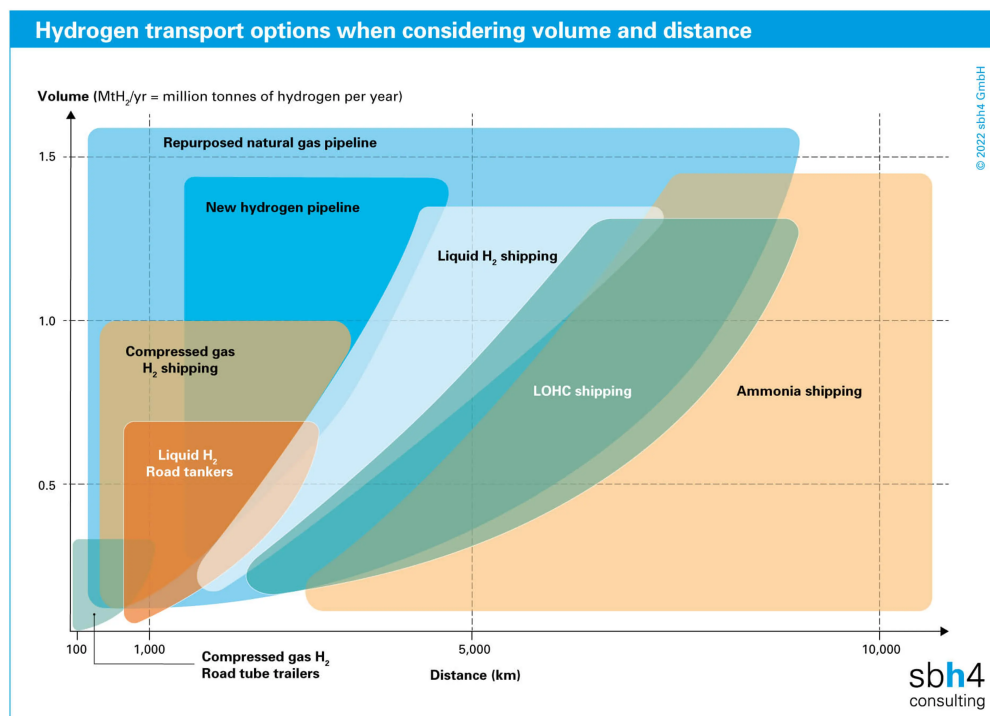
Industrial gas majors such as Air Liquide, Air Products and Linde have a strong presence in both the traditional grey, and emerging green hydrogen economies. Linde and Air Liquide are invested in the electrolyser producers ITM Power and Hydrogenics, respectively. Investment in industrials and chemicals companies will also provide some

exposure to the hydrogen sector.

One might assert that Air Products leads the field when it comes to major green hydrogen projects, since its announcement of final investment decision (FID) on the 2GW green hydrogen to green ammonia scheme in NEOM, in the northern part of the Kingdom of Saudi Arabia. It has also announced its involvement in a green ammonia import terminal to be built in northern Germany.

Industrial gas companies are also ideally positioned to support CO₂ capture, transportation, and storage through their expertise in gases purification, liquefaction, compression, and distribution. Some of the largest project investment announcements from Linde and Air Products the sector in recent years have been related to blue hydrogen and CCUS.

Beyond industrial gases, catalyst manufacturers such as Johnson Matthey and Haldor Topsøe, and chemicals giants such as BASF, are key players in the grey hydrogen market and are deepening their exposure to green and low-carbon hydrogen scene. Haldor Topsøe is leading in the realm of electrification of hydrogen and ammonia production and has announced FID on a major new facility to construct solid oxide electrolyzers. Others are innovating catalysts for hydrogen electrolysis and power to liquids technologies.



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Mobility as an investment model

Further up and down the green hydrogen value chain, vehicle makers such as Toyota and Hyundai provide some exposure to hydrogen mobility. Alongside that, Honda recently invested in the German startup INERATEC, an emerging leader in the field of micro-channel reactors for e-fuels synthesis using Fischer Tropsch Synthesis and the reverse water gas shift reaction.

Focused hydrogen mobility players such as Wisdom Motor may also be attractive for conviction-led investors. "Our investment style is flexible," confirms Wan. "We can help to fund the scale up of technologies that at an early stage of commercialisation. Additionally, we recognise that the hydrogen technology space is dynamic, so we are equally keen to make investments in high-potential start-ups with the intention to

continue supporting their development with capital and market access.”

Large industrial fuel cells from leading providers such as Ballard will also be deployed in maritime applications and on trains. Fuel cells are also critical elements of hydrogen to power generators that will offer a clean alternative to diesel gen-sets for mobile power and grid back-up.

Component makers such as CIMC ENRIC and Hexagon Purus (a division within Hexagon Composites ASA) make high pressure hydrogen cylinders for hydrogen distribution and hydrogen storage on buses, trucks, and cars. These entities are heavily exposed to hydrogen mobility and compressed gaseous hydrogen logistics.

“Templewater works closely with reputable industry leading providers to support high quality technology firms not only by deploying capital but also by embedding them in ecosystems that can provide competitive turnkey solutions to users in Asia and beyond,” states Wan.

Moving with discipline and agility to secure the best opportunities

At a projected compound annual growth rate of more than 50%, the ‘new’ hydrogen economy is poised for phenomenal returns. Carbon capture and utilisation and many other decarbonisation technologies are enjoying similar growth.

The reason for investing is clear, and with the recent confirmation of significant regional, national, and local funding in the US, the EU and other nations, the timing is ideal.

Wan says that his team is “open to making investments in all areas of decarbonisation and the hydrogen value chain, including ammonia and sustainable e-fuels. In addition to technologies that are in the spotlight, such as electrolysis and hydrogen mobility, we are looking into undiscovered niches and services.”

With many well-funded VC funds and PE companies investing tens of billions in cleantech, there is a risk of getting caught in the rush. However, as with all investments, a considered selection of the right investment opportunities that fit the risk/reward profile, hurdle rates, fund rules and portfolio policy is essential to maintain a disciplined approach.

“We are keeping our eyes open for transformational decarbonisation technologies and business models that may exist within, or outside the hydrogen value chain.”

Wan also says that, “Templewater’s scouting is technology agnostic across and as a financial investor, we have the flexibility to look for premium opportunities that will secure the most outstanding returns.”

Deep due diligence is also essential to pick the winners. Consider the VHS/Betamax question for video recording technologies 40 years ago. Or the number of search engines, such as Bing, Ask Jeeves and Yahoo that were competing for attention before the dominance of Google. Compliance, IP, and legal issues are key in due diligence, in addition to financial, market and technology studies.

Wan is encouraged by the market reaction to his vale proposition. “Our flexible investment style, combined with a disciplined deep diligence approach is proving to be attractive,” he confirms. “And our flexibility to invest across the most promising hydrogen and decarbonisation technologies means we can find opportunities with the best returns and diversify capital exposure.”