PITT STREET RESEARCH

GreenHy2 Ltd

Illuminating the path for a sustainable energy future

Share Price: A$0.011

ASX:H2G

Sector: Utilities

19 October 2023

GreenHy2 (ASX:H2G), formerly Tempo Australia, is an Australian provider of Solid-State Hydrogen Storage systems (SSHS), the sole commercially available solution Down Under. GreenHy2 offers versatile and scalable solutions customised to meet various energy requirements. The company acts as a one-stop shop, providing innovative hydrogen storage solutions and a digital platform for remote operations and maintenance services.

Pioneering the future of green hydrogen storage

GreenHy2 stands at the forefront of transforming Australia's energy storage landscape with its pioneering SSHS technology. The company's hydrogen storage solution, based on metal hydride, signifies a paradigm shift in energy storage. GreenHy2's solution offers several competitive advantages, including the ability to operate at lower pressures, 100% recyclability compared to conventional methods, exceptional 30-year operational lifespan and 99% capacity retention. These advantages are poised to drive customer demand in the company's target markets. Moreover, the longevity and safety of GreenHy2's solution far surpasses conventional battery storage, making it a robust choice.

Addressing global energy challenges

In the global pursuit of clean energy, GreenHy2's SSHS technology addresses critical challenges associated with hydrogen storage. The Australian government's substantial backing, including a US$2bn investment in the Hydrogen Headstart program and US$2.25bn for 663 hydrogen projects by the Australian Renewable Energy Agency, underscores strong support for these initiatives. With hydrogen export demands projected to surpass 3 million tonnes annually by 2040, contributing US$10bn to Australia's economy, GreenHy2 is poised to drive growth in the evolving landscape.

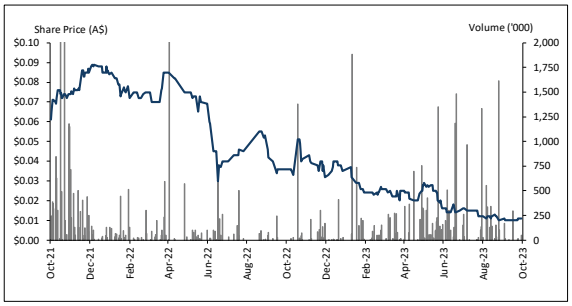
Valuation range of A$0.018–0.023 per share

Using a DCF methodology, we have calculated GreenHy2's intrinsic value to be at A$0.018 per share in on our conservative base case scenario and A$0.023 per share in an optimistic outlook. The main catalysts we see that could create shareholder value is an on-schedule achievement of the company's commercialisation goals and the pick-up in market share for the SSHS solution. The potential challenges to our target price range (outlined on page 23) include execution risk, maintenance of quality and safety standard, heightened competition, supply chain disturbances, and regulatory requirements.

Market Cap. (A$ m)	4.6
# shares outstanding (m)	418.8
# shares fully diluted (m)	476.3
Market Cap Ful. Dil. (A$ m)	5.2
Free Float	43.3%
52-week high/low (A$)	0.090 / 0.010
Avg. 12M daily volume ('1000)	299.8
Website	www.greenhy2.com.au

Source: Company, Pitt Street Research

Share price (A$) and avg. daily volume (k, r.h.s.)



Source: Refinitiv Eikon, Pitt Street Research

Valuation metrics	
DCF fair valuation range (A$)	0.018-0.023
WACC	12.9%
Assumed terminal growth rate	2%

Source: Pitt Street Research

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Table of Contents

Introducing GreenHy2

GreenHy2 (ASX:H2G), formerly known as Tempo Australia (ASX:TPP), is a specialised provider of renewable energy solutions. Since its inception in 2011, the company has evolved into a leading innovator in delivering engineering solutions for renewable energy in Australia. The company's focus is on Solid-State Hydrogen Storage (SSHS) batteries, which are entirely based on 100% renewable energy sources.

In Nov 2022, Tempo Australia underwent rebranding to reflect its focus on the hydrogen and renewable energy sector. Under the new name GreenHy2, the company now trades under the ticker symbol "H2G" on the Australian Securities Exchange (ASX).

The company has a major commercial partnership with GKN Hydrogen, a Germany-based firm specialising in the development and integration of green hydrogen storage systems. GKN Hydrogen operates within London-based Dowlais Group plc (LSE: DWL), alongside GKN Automotive and GKN Powder. Under this agreement, GKN will handle the integration, assembly, and supply of the hydrogen equipment that features Hydrogen Metal Hydride Storage Technology for system integration by GreenHy2 in the Australian and New Zealand markets.

GreenHy2's strategic partnership with GKN Hydrogen represents a promising resolution to the hydrogen storage challenges

GKN developed the first globally commercial SSHS technology with integrated electrolysers and fuel cells, generating green hydrogen from 100% renewable sources and safely storing it in a metal hydride format i.e., hydrogen stored as solid instead of gas (Figure 1). Over a period of two years, GreenHy2 collaborated with GKN to formulate a compliant solution for the Australian market. This solution covered design, integration with local solar setups, safety standards, and regulatory requirements (Figure 2).

Figure 1: GKN's patented SSHS technology

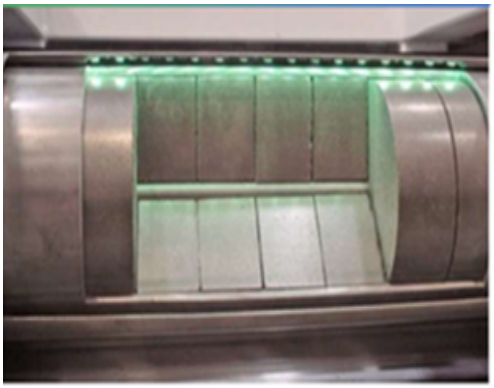
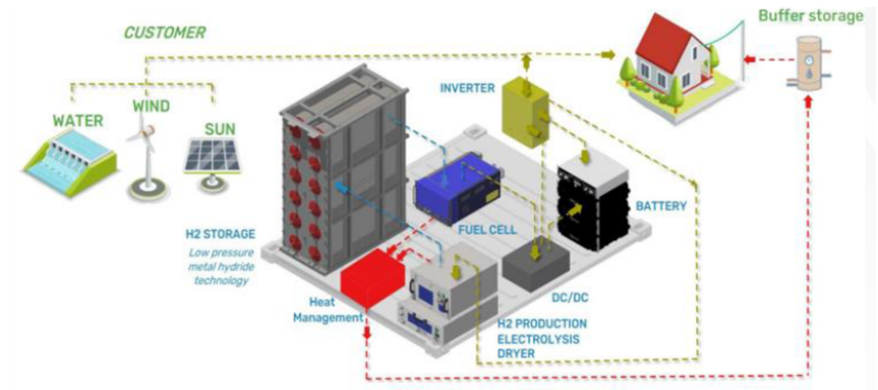


Figure 2: Integration of SSHS with GreenHy2's energy solution



Source: Company, Pitt Street Research

The GKN partnership addresses the long-standing energy storage challenge by providing the greenest and safest energy solution that eliminates the need for backup diesel generators fuelled by fossil fuels. GreenHy2's innovative SSHS technology is the only commercial solution of its kind in Australia. The patented SSHS technology excels in terms of cost-efficiency, safety, commercial viability, and recyclability. SSHS has the added advantage of maintaining battery life in warmer climates, such as Northern Australia where Li Battery life can be reduced to 5-6 years due to temperature.

GreenHy2 leads the way in offering sustainable and versatile hydrogen storage solution

GreenHy2's innovative solution leverages metal hydrides for hydrogen storage, storing the hydrogen molecules directly in a ferrous titanium lattice. GreenHy2's unique off-grid energy system provides compact storage systems where hydrogen maintains its integrity for decades without capacity degradation.

The versatile GreenHy2 energy system is utilised across a range of sectors, with a particular emphasis on meeting the energy requirements of Stand Alone Power Supplies (SAPs) and isolated microgrids. This solution can be utilised across the utility sector, government facilities, and businesses that are in the process of transitioning to renewable energy sources. GreenHy2's primary objective revolves around promoting environmentally responsible practices while concurrently lowering operational costs over the long term.

GreenHy2's offerings include solid-state hydrogen storage batteries in different ranges, which consist of HY2MINI, HY2MEDI, HY2MEGA, and TOWER storage solutions. Additionally, the company provides HY2CONNECT, a digital platform for real-time data and alerts.

Key reasons to look at GreenHy2

1. **GreenHy2 is the sole provider of Solid-State Hydrogen Storage technology in Australia.** GreenHy2 holds a unique position as the sole provider of SSHS using metal hydride pellets in Australia. The pioneering SSHS solution sets the company apart in the rapidly evolving landscape of hydrogen energy solutions. This innovative approach addresses the issue of energy storage by offering an environmental-friendly and safe solution, eradicating the necessity for backup diesel generators powered by fossil fuels.
2. **GreenHy2's GKN Hydrogen partnership has positioned it well.** GKN, after 12 years of development and rigorous testing, introduced the pioneering SSHS technology, generating green hydrogen from renewables. Over the past couple of years, GreenHy2 collaborated with GKN to customise the technology for the Australian market, ensuring compliance with safety standards and regulations. This effort led to an exclusive agreement signed for two years, where GKN Hydrogen will provide hydrogen storage equipment to GreenHy2 in Australia and New Zealand.
3. **The company uses a unique metal hydride.** The approach used by GreenHy2 deploys titanium hydride, a distinctive metal capable of solid-state hydrogen storage. GreenHy2 holds an unparalleled competitive advantage by being the first to employ titanium hydride, recognised for its exceptional safety and cost-effectiveness in hydrogen storage. The key benefit of this method lies in its extraordinary density, surpassing the capabilities of numerous other energy storage approaches, with a density that is 10 times that of lithium in the same volume.
4. **GreenHy2's technology is an optimal solution for the Australian market**. Australia's population is widely distributed, with numerous remote and isolated communities rely on diesel as their primary energy source. These areas are vulnerable to recurrent natural hazards, including floods, cyclones, and bushfires that can jeopardize the expensive energy infrastructure that serves remote regions. Moreover, the transmission and distribution lines themselves carry inherent bushfire risks. At the same time, Australia is abundant in solar and wind resources, offering significant potential for expanding renewable energy generation. In this context, the Australian market represents a substantial growth

opportunity for GreenHy2, positioning the company to support its expansion efforts.

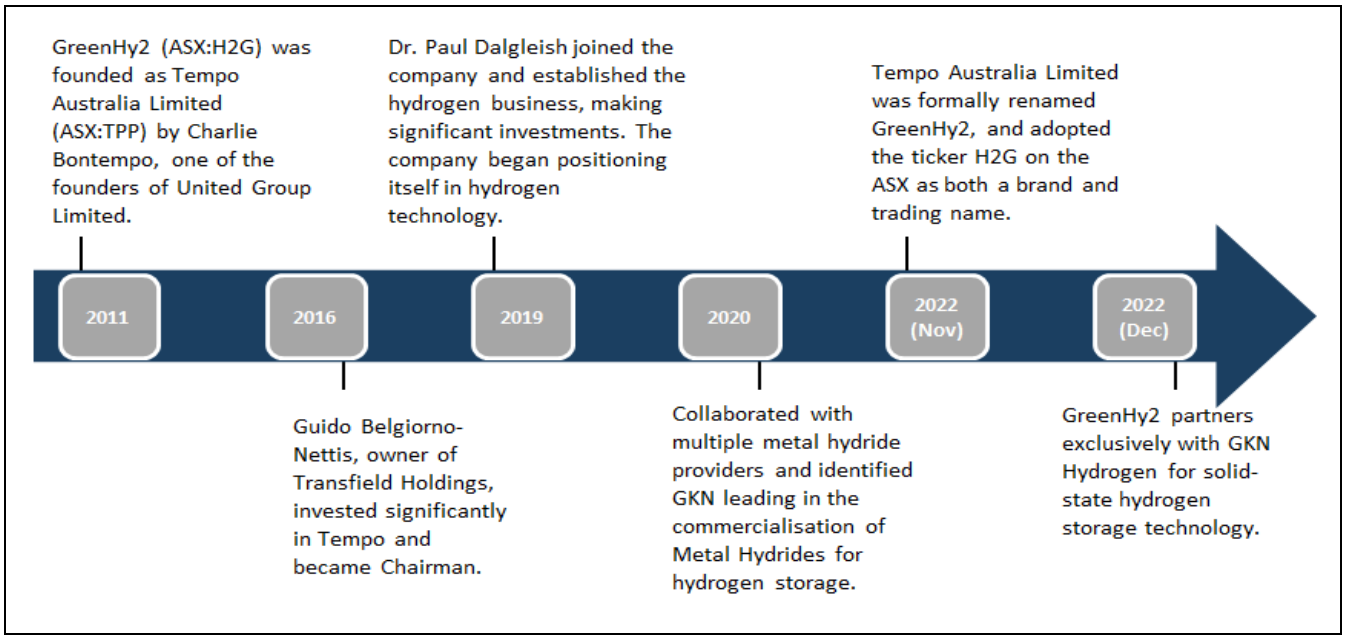
5. **GreenHy2's solution offers a rare combination of Low-pressure and high-performance in the context of a hydrogen storage:** GreenHy2's hydrogen storage solution operates at substantially low pressure, with no degradation or capacity loss over time. It achieves exceptional density and longevity through metal hydride technology, securely storing hydrogen at a maximum of 40 bar, significantly lower than high-pressure methods (350-700 bar). Additionally, GreenHy2 offers power storage with a proven operational lifespan of up to 30 years, surpassing the performance of comparable battery storage.
6. **The underlying metal hydride technology offers a sustainable closed-loop system**: GreenHy2's metal hydride technology offers high sustainability by creating a closed-loop system where water generates hydrogen, and hydrogen is converted back into energy (leaving only pure water as a by-product). The metals used for storage, particularly iron and titanium (Fe-Ti), are fully recyclable, enhancing sustainability. This approach substantially reduces the environmental impact compared to conventional energy storage reliant on non-renewable resources. Amid increasing concerns about climate change and environmental legislation, particularly around diesel use, it's reasonable to expect rising demand for GreenHy2's products.
7. **GreenHy2 aligns effectively with government initiatives:** The Australian government is actively promoting Standalone Power Systems (SAPs) in remote areas. In 2022, Western Australia launched a program to deploy over 1,000 renewable energy SAP systems over the next four years, improving electricity supply resilience. Nationally, Australia is also prioritising micro-grids in smaller communities, offering a huge opportunity for GreenHy2 to collaborate with the government in this area. With these industry shifts and government initiatives, GreenHy2 is well-placed for growth.
8. **GreenHy2 has initiated collaborations with publicly owned utility companies across Australia**. The company partnered with Essential Energy, a government-owned utility in Australia, to run a trial for its SAPs unit. The successful 12-month trial exceeded expectations.
9. **The company's management:** GreenHy2 has a strong management team with experience across engineering, design, construction and services, project management, operations and maintenance, finance, and general management domain. Additionally, some of the company's management are key shareholders in the company and this should provide required confidence to potential investors that there is alignment with management and shareholders' desired outcomes.
10. **We believe the company is undervalued valuation:** Given that GreenHy2's solutions offer innovative designs that provide a competitive edge, we believe that the stock is undervalued at its current market price. With the company's versatile energy systems finding utility across multiple sectors and utilising renewable energy sources, its attractiveness to potential buyers is unparalleled. Consequently, we expect a re-rating of the stock in the medium-to-long term. We have employed a DCF-based approach to value the company at A$0.018 per share in our base case and A$0.023 in our bull case. The key near-term catalysts remain the timely attainment of commercialisation milestones and the capture of a higher market share in the solid-state hydrogen storage market.

GreenHy2's shift to the hydrogen storage space

GreenHy2, formerly Tempo Australia, was founded in 2011 by Charlie Bontempo. He had earlier been a co-founder of United Group, a major engineering construction company in Australia. In 2016, Guido Belgiorno-Nettis, an owner of Transfield Holdings, made significant investment in GreenHy2 and took on the role of Chairman. Dr. Paul Dalgleish joined the company in 2019, bringing his expertise and substantial investments to establish the hydrogen business. All three founders remain major shareholders in GreenHy2.

Recognising the growing potential of the hydrogen economy, GreenHy2 strategically positioned itself in hydrogen technology, with a specific emphasis on metal hydride storage. This shift led to collaborations with various metal hydride technology providers, including partnerships with institutions such as the University of New South Wales and Chinese and French hydrogen start-ups. After conducting a thorough sector analysis, it saw GKN as the first mover that could commercialise the highly viable metal hydrides for hydrogen storage.

Figure 3: History of GreenHy2



Source: Company and Pitt Street Research

GreenHy2 has an Exclusive Agency Agreement to integrate, assemble and supply GKN's Hydrogen Equipment in Australia and New Zealand.

In 2022, Tempo Australia officially rebranded as GreenHy2 to reflect its focus on the Hydrogen and renewable energy market. GreenHy2 has an Exclusive Agency Agreement with GKN to integrate, assemble and supply GKN's Hydrogen Equipment in Australia and New Zealand as well as the right to act on a non-exclusive basis throughout Southeast Asia on a project-by-project basis subject to GKN's approval.

In our view, GreenHy2 is poised to play a pivotal role in the future of Australian hydrogen infrastructure in both the private and public sectors.

The challenge of energy storage and how GreenHy2 overcomes them

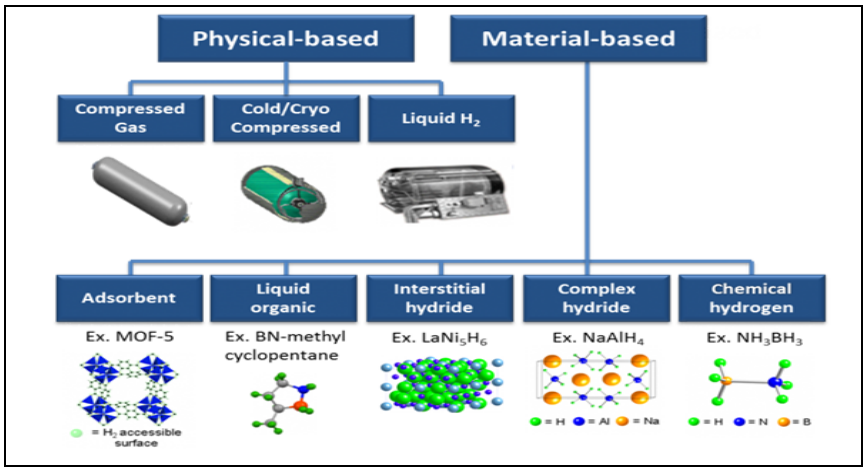
The heavy dependence on fossil fuels as the world's predominant energy source has led to substantial energy challenges and extensive environmental contamination. According to data from the International Energy Agency (IEA), the combustion of fossil fuels resulted in 36.8Gt[1] of greenhouse gases and toxic pollutants. Reducing emissions necessitates a shift towards the development of clean and renewable energy technologies.

Although solar and wind energy may initially appear no-brainers as sustainable alternatives, they are constrained by intermittent availability, making them less reliable. And although energy storage solutions can mitigate this problem, they are restricted by the issues of limited capacity, short equipment lifespan, and substantial waste generation. Consequently, there exists a compelling need to explore hydrogen as a candidate that could fulfil Australia's energy needs. The green credentials of hydrogen are well known: The process of transforming hydrogen into electricity using fuel cells results in the production of only clean water as a residual by-product.

There exists a compelling need to explore hydrogen as a candidate that could fulfil Australia's energy needs.

Hydrogen storage can be physical-based or material-based (Figure 4).

Figure 4: Methods of Hydrogen storage



Source: U.S. Department of Energy

Hydrogen is difficult to store for several reasons, especially its low volumetric energy density. But this is where H2G's solution can come in.

Either way, hydrogen is difficult to store for several reasons, most pertinently the exceptionally low volumetric energy density - as the lightest and simplest of all elements (even lighter than helium!) it can easily escape into the atmosphere. Liquid hydrogen has the specific problem of an extremely low boiling point (-252.8°C) and gasified hydrogen presents its own set of challenges, demanding high-pressure tanks with pressure levels ranging from 350-700 bar.

Achieving the secure and efficient storage of hydrogen to address the intermittent nature of renewable energy sources has been a pressing challenge for companies in this space. This is where H2G's solution can come in.

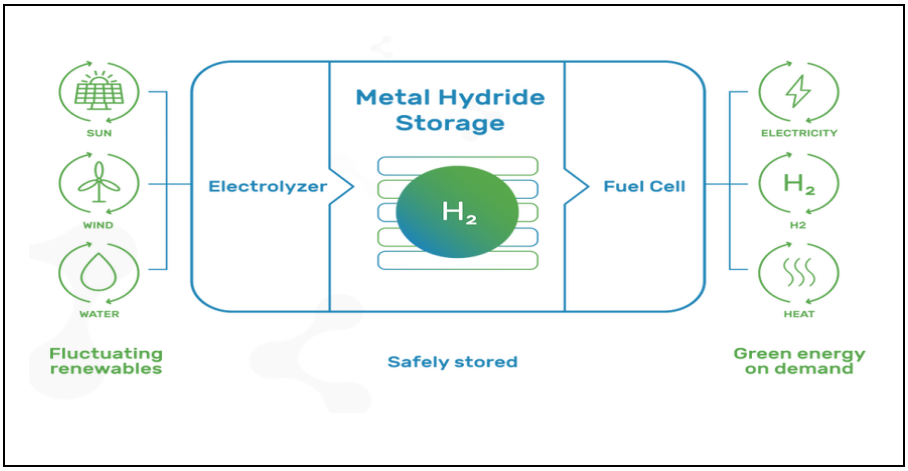
[1] CO2 Emissions in 2022 report by the International Energy Agency. Retrieved at https://www.iea.org/reports/co2-emissions-in-2022

GreenHy2's Solid-State Hydrogen Technology and how it works

GreenHy2 has a competitive advantage with metal hydrides, enabling hydrogen storage at ultra-low pressures unlike other conventional methods

GreenHy2's technology employs solid-state storage, specifically through **metal hydrides**, as opposed to gaseous or liquid forms (Figure 5). This involves the direct storage of hydrogen molecules within a ferrous titanium lattice, providing an optimal solution when coupled with solar or wind power, especially for off-grid consumers seeking to eliminate reliance on conventional electricity grids and the associated diesel support.

Figure 5: GreenHy2's hydrogen storage process

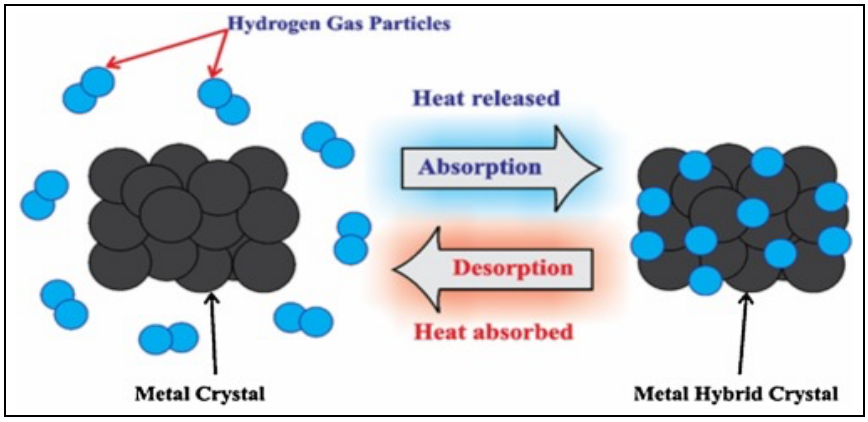


Source: Company

The process initiates with an electrolyser, where hydrogen production occurs through electrical power input. Subsequently, the produced hydrogen undergoes rigorous quality control before being securely stored within the metal hydrides as chemical energy. For end-consumers seeking to utilise this stored hydrogen, a fuel cell is utilised to facilitate its transformation back into electric energy. This comprehensive approach ensures a reliable and sustainable energy supply.

Metal hydrides provide an alternative method for solid-state hydrogen storage at low pressures, facilitated by the chemical bonding of hydrogen molecules within the metal compound structure (Figure 6). These systems typically operate at 10-40 bar, representing a substantial reduction compared to high-pressure hydrogen storage (350-700 bar).

Figure 6: The hydrogen storage and release process using metal hydrides



Source: ScienceDirect

GreenHy2's solid-state hydrogen storage technology has received official utility usage approval in Australia, having successfully met stringent regulatory requirements related to bushfire safety, operational integrity, and customer security. This solution allows utilities to achieve operational cost reductions, mitigate fire hazards, and enhance service reliability for remote customers.

How metal hydride technology is superior

Figure 7 outlines a succinct comparison of how metal hydrides stack up generally versus three other popular energy storage systems (diesel, lithium-ion batteries, high pressure hydrogen). All three of these have their own advantages over others, but none stand above low-pressure hydrogen.

Figure 7: Comparison of Metal Hydride hydrogen storage vs. other alternatives

Aspect	Diesel	Lithium-Ion Batteries	High-Pressure Hydrogen	Metal Hydride - Low-Pressure Hydrogen
Environmental Impact	Emissions and pollution	Limited emissions	Emission-free	Emission-free
Energy Efficiency	Moderate	High but degrade over time	Variable	High
Energy Density	High	Moderate	Moderate	High
Storage and Transport	Easy	Easy	Challenging	Relatively Easy
Renewable Integration	Limited	Suitable for grid	Suitable with green H2	100% renewable
Safety	Moderate safety risks	Potential fire hazards	Safety concerns	Highly safe
Lifespan	-	Moderate	Moderate	Long

Source: Pitt Street Research

Diesel energy has been popular because of its energy density and ease of storage and transport. But diesel emits CO_2, nitrogen oxides, and other pollutants during combustion, contributing to both air pollution and climate change. Additionally, they can experience energy losses due to heat and friction during operation as well as have high maintenance costs due to the complexity of internal combustion engines.

Lithium-ion batteries offer the benefits of limited emissions during manufacturing and disposal and have solid energy efficiency. However, they incur gradual losses in efficiency and density during the charging and discharging phases. Also keep in mind that lithium is obtained through mining, which can be emissions intensive. There is also a limited storage capacity, requiring other technologies for extended storage of high-demand situations. The latter fact hardly addresses the inherent intermittency of solar and wind power generation, in that where there is no sunlight or wind, the energy supply to charge the batteries will be limited. And finally, there are emerging concerns about the risk of thermal runaway, fires, and chemical hazards in certain conditions.

High-pressure hydrogen has a far smaller carbon footprint with zero direct emissions and the 70% recyclability of its storage tanks. But there are losses associated with hydrogen production.

Low-pressure hydrogen is the 'best of all worlds' with all the upsides and no drawbacks

GreenHy2's product suite and its various applications

GreenHy2 offers a diverse range of customisable options and smart performance monitoring with HY2CONNECT

GreenHy2 offers a diverse range of hydrogen storage solutions available in three different sizes. Each product is custom configured to seamlessly integrate and cater to specific energy needs. These systems can be individually customized to align with required energy loads and renewable energy sources through the selection of appropriate fuel cells and electrolysers, taking into consideration the customer's load requirements and geographical location. The final configuration undergoes rigorous testing using GreenHy2's simulation software to guarantee optimal design performance. Below are the different storage solutions offered by GreenHy2:

HY2MINI

HY2MINI stands out as the optimal choice for small-scale hydrogen projects, offering a compact and convenient 10-foot containerized solution (**Figure 8**). With energy storage capacity ranging from 10 to 25 kilograms (kg) of hydrogen, equivalent to 165-420 kilowatt-hours (kWh) of electrical energy at a maximum pressure of 40 bar, this solution is versatile and adaptable. It finds applications in SAPs, commercial buildings, and microgrids, proving to be an excellent option for new customers entering hydrogen energy storage for smaller applications.

Figure 8: GreenHy2's HY2MINI product

Source: Company

HY2MEDI

This system represents an ideal solution for hydrogen storage projects falling within the lower to mid-range capacity. HY2MEDI is a standardised 20-foot container and exhibits an impressive energy storage capacity ranging from 30 to 120kg of hydrogen equivalent of 0.5 to 2 megawatt-hour (MWh), all while operating at a maximum pressure of 40 bar (Figure 9). Its versatile applications include backup power systems, commercial buildings, microgrids, maritime transport, and seasonal energy storage solutions. Furthermore, it can be configured to deliver both electricity and thermal energy, thereby optimising its adaptability and utility across a diverse range of energy requirements.

Figure 9: GreenHy2's HY2MEDI product

Source: Company

HY2MEGA

HY2MEGA is the premier solution for large-scale hydrogen storage, ideal for utility-scale grids and decarbonising challenging sectors (Figure 10). This is the market's largest metal hydride storage, with up to 50% less carbon footprint than Li-ion batteries. Offering 250kg of hydrogen storage (equivalent to over 8.3MWh) at 0.5-40 bars, its scalable design integrates seamlessly with existing electrolyser processes. HY2MEGA enables direct industrial use of stored hydrogen and conversion into energy or heat. Its applications span commercial buildings, industrial processes, and maritime transport.

Figure 10: GreenHy2's HY2MEGA product

Source: Company

Tower solution

This system comprises four HY2MEGA units, allowing for the storage of up to 1,000kg of hydrogen and 16MWh of energy (**Figure 11**). The Tower solution finds applications in industrial processing plants, microgrids serving communities, commercial buildings, as well as Hydrogen Battery Energy Storage Systems (HBESS).

Figure 11: GreenHy2's Tower solution

Source: Company

GreenHy2 is empowering operational excellence through digital platform

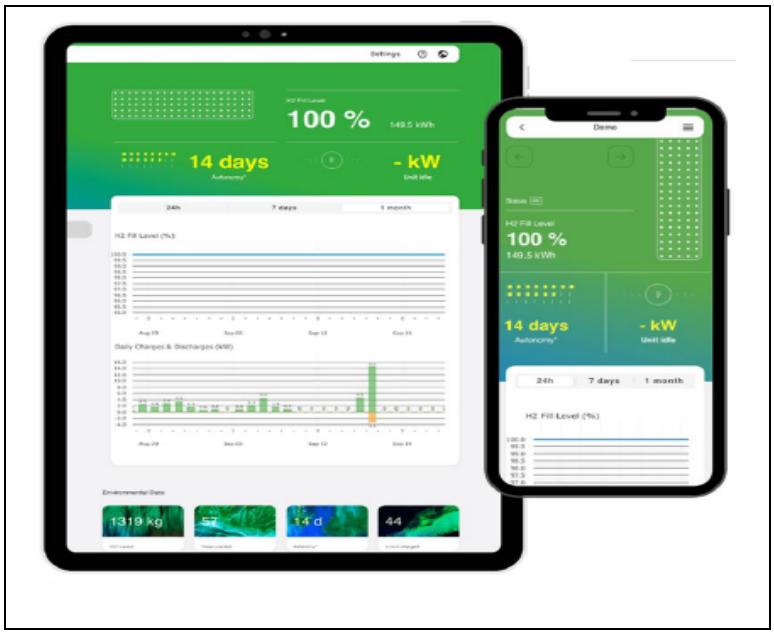
HY2CONNECT

To ensure seamless operation of customers' plants and infrastructure, GreenHy2 focusses on providing efficient services that minimise downtime and decrease maintenance costs. GreenHy2's smart services leverage technologies such as artificial intelligence (AI), the Internet of Things (IoT), and data analytics to enhance service quality.

GKN's digital platform, HY2CONNECT, allows users to remotely monitor their systems from any location worldwide (Figure 11). This versatile application provides a comprehensive overview of essential functions, including stored energy, performance metrics, maintenance alerts, and usage statistics. HY2CONNECT is compatible with various devices, including computers, tablets, and smartphones.

The GreenHy2 system operates without the need for routine maintenance or physical on-site inspections. A GreenHy2 team can remotely access the system's status from anywhere in the world, promptly detecting and addressing potential issues. Consequently, this proactive approach enhances overall operational efficiency by minimising downtime and reducing maintenance expenses.

Figure 12: GreenHy2's digital platform – HY2CONNECT



Source: Company

We have outlined many of the potential end-uses for H2G in our descriptions of its product suite. But the initial focus of the company will be as SAPS for government-owned utilities. H2G believe this is a 'low hanging fruit' because it is a big opportunity and will be the most economical to service.

The eight key benefits of GreenHy2's metal hydride storage systems

GreenHy2's metal hydride storage systems offer a multitude of benefits:

1) **Environmental sustainability**. This is because:
   - i) Metal hydride technology has minimal reliance on continuous supplies of raw materials like lithium, cobalt, and nickel.
   - ii) It uses materials are fully recyclable (specifically iron and titanium)
   - iii) It generates no by-product other than clean water.

   GreenHy2's systems have a substantial environmental impact, saving c.150 tons of CO_2 emissions over their operational lifetime, with this estimate relying on a scenario of turnovers per year for a 120kg of HY2MEDI system.

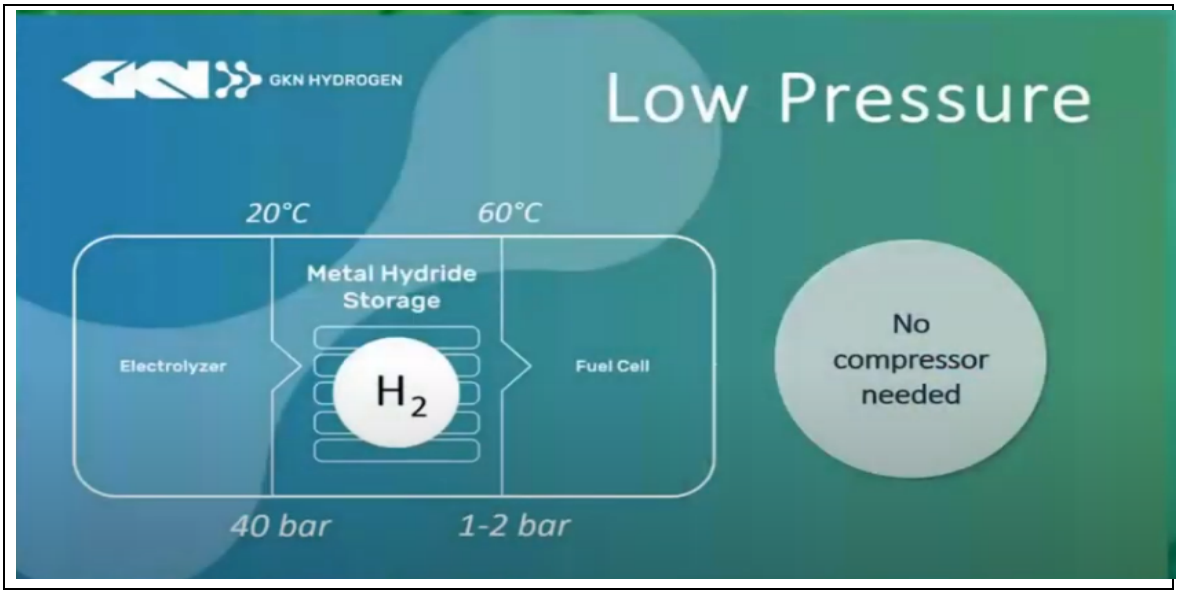
2) **Exceptional density.** Titanium hydride presents a density that is ~10 times that of lithium, within the same volume.

Titanium hydride presents a density that is ~10 times that of lithium.

3) **The ability to operate at substantially low pressure.** Given the exceptional density, there's no need for complex and costly compression systems. The ability to operate at modest pressures comes from a distinctive chemical interaction in metal hydride technology where metal atoms attract and bond with hydrogen molecules, facilitating efficient hydrogen absorption and storage. This feature significantly enhances the

process efficiency compared to compressed gas or liquid storage. Specifically, the low-temperature metal hydride storage system operates within the same pressure range typically found in electrolysis for hydrogen production and fuel cells. The stored hydrogen is securely maintained at a maximum of 40 bar (Figure 13), compared to high-pressure hydrogen gas storage methods (anywhere between 350 & 700 bar). This approach enhances safety and simplifies the storage process by mitigating the need for complex and costly compression systems.

Figure 13: Operation occurs at extremely low pressure



Source: Company

4) **An extended lifespan and reliability.** This is a result of key attributes including chemical stability, high storage density, and low-pressure operation. These materials maintain their integrity through repeated hydrogen absorption and release cycles due to their resistance to degradation. Operating at moderate temperatures and pressures (as noted above) further enhances its durability. Its capacity for easy hydrogen release and absorption, and its minimal maintenance requirement render it more reliable for long-term hydrogen storage applications.

5) **The ability to store power indefinitely.** GreenHy2 technology offers the invaluable advantage of indefinite power storage, distinguishing it from many other battery types that degrade with time. Rigorous testing has showcased its exceptional operational lifespan of up to 30 years, ensuring consistent, long-lasting, and dependable performance. Within the domain of energy storage, GreenHy2's metal hydrides emerge as an exceptional solution in terms of long-term durability and capacity retention. After undergoing an impressive 3,500 cycles of hydrogen absorption and release, metal hydride systems still retain a staggering 99% of their original capacity - a sharp contrast from your typical lithium-ion battery that only retains 70% of its original capacity after ~2,000 charge and discharge cycles.

6) **Reduced safety concerns.** Metal hydride storage systems are renowned for their safety profile, primarily attributed to controlled hydrogen release and lower operating pressures. For comparison purposes,

alternative storage technologies, such as compressed gas, require the utilisation of extremely high pressure, up to 500 bar, leading to safety concerns. Conversely, while liquid hydrogen offers comparable performance and storage density of half the metal hydride, it presents further challenges due to constant boil-off issues, ultimately resulting in hydrogen loss.

However, metal hydride storage, employ a chemically absorbent method where hydrogen becomes bonded to the metal. This hydride-metal bonding resembles a sponge-like structure, allowing for both compactness and enhanced safety. H2G's metal hydride storage solution has received utility usage approval and successfully met all safety regulations related to bushfires, operations, and customer safety in the Australian market.

7) **Versatility**. GreenHy2's product suite, HY2MINI and HY2MEDI storage solutions offer versatile options for using excess hydrogen generated from renewable sources. This surplus hydrogen can serve a dual purpose: it can be efficiently converted into energy when required, providing a valuable power source, or it can be directly utilised for effectively warming residential spaces**.**

   Similarly, within the HY2MEGA hydrogen storage system, there exists a versatile capability, the stored hydrogen can be used to produce energy or provide heat, accommodating various applications. Furthermore, for industrial needs, hydrogen can also be accessed directly**.** This adaptability ensures that the stored hydrogen within the HY2MEGA can be seamlessly converted into energy as needed or serve as an immediate and efficient source of heat. This makes it a flexible and asset for a wide range of energy and industrial requirements. GreenHy2's product range offers modular solutions tailored to specific customer needs.

8) **Uniqueness.** GreenHy2 holds a unique position as the sole provider of this innovative solution in Australia, positioning them as the preferred and capable choice for delivering this solution to an expanding customer base.

Overcoming challenges in Australia's energy market

Looking specifically at Australia, the nation has abundant solar and wind resources that hold tremendous potential for driving renewable energy generation, particularly in remote communities and isolated regions. Even so, realising that potential is easier said than done.

Australia's expansive geography, and low population density present near insurmountable challenges in establishing a cost-effective national grid. Many existing power networks serve dispersed and economically unviable customer bases, necessitating significant infrastructure investments. Consider that energy provider Essential Energy (H2G's demonstration partner) has 1% of its customers accounting for 17% of grid-related expenses. In our view, these costs can be reduced by off-grid solutions that do not require diesel backup systems.

Australia also faces recurrent natural hazards such as floods, cyclones, and bushfires, which pose threats to the expensive energy infrastructure required for remote areas. Furthermore, the transmission and distribution lines carry inherent bushfire risks. The legacy Single Wire Earth Return (SWER) systems that tend to be used in regional areas are particularly susceptible because

they are grounded to earth and employ the earth as a return path for load current.

With H2G's solution, there is no need for a formal distribution network or for non-renewable generators such as diesel. There's little to no ongoing costs and minimal upfront capex compared to alternative battery technologies. The technology ensures that households will have a renewable supply of power all year around and thereby improves their standard of living. People can rely on H2G's solution for energy all year round and on individual hydrogen storage systems for over 20 years. And there is minimal noise, something that is crucial in regional areas where noise travels further.

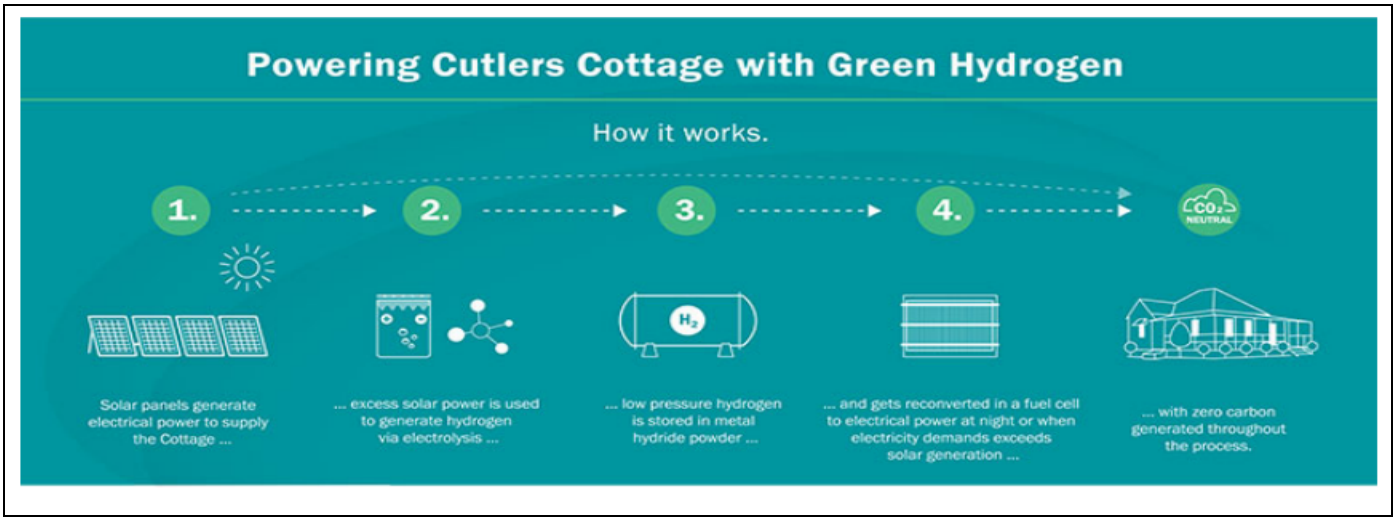
Unlocking growth potential through a strong prospective client base

GreenHy2 has initiated collaborations with key industry stakeholders to drive innovation and advance sustainable energy solutions. The company has started engaging with publicly owned utility companies across Australia,

Essential Energy is the most advanced of these, with it and H2G having embarked on an innovative trial involving hydrogen-powered SAPs. This trial powers a heritage accommodation cottage located on the mid-north coast of New South Wales called Cutlers Cottage (Figure 14). GreenHy2 was chosen as the supplier for this innovative SAPs unit due to its distinctive solution how it eliminates the need for backup generators while ensuring a high level of reliability. as well as for its resilience against natural disasters and provides cost savings

Essential Energy and GreenHy2 have successfully completed the 12-month trial for this SAPs system at 'Cutler's Cottage, which operates similarly to a conventional rooftop solar system, storing excess power as hydrogen for subsequent conversion into electricity during periods of peak demand or at night, ensuring both efficiency and reliability.

Figure 14: GreenHy2's demonstration plant at Cutlers Cottage in collaboration with Essential Energy



Source: Company

Western Power stands as a next promising entity in adopting SAPs for its customer base, with c.1% of its customers (23,000) being considered economically challenging to serve through conventional sources. Western Power is actively progressing in transitioning these customers to SAPs, with a future investment of over US$5bn.

Meanwhile, **Horizon Power, Energy Queensland**, and **Telstra** are actively assessing the SAPs technology. Telstra represents an attractive opportunity for GreenHy2 as it has historically relied on battery and diesel for backup power at its SAPs, and it is keen to reduce its carbon footprint in regional areas. Telstra has also expressed interest in hydrogen, demonstrated by its receipt of funding from the Victorian government in early 2022 to deploy renewable hydrogen fuel cell generators at regional mobile communication sites. Additionally, Telstra is exploring entry into the energy retail market.

GreenHy2 has identified a target market of c.57,000 customers within Horizon Power's network, driven by microgrids and existing diesel power stations. Horizon Power conducted a site visit to Cutler's Cottage in September 2022 and is actively evaluating the suitability of technology for its operations. All these entities represent potential customers for GreenHy2, and securing these projects would be a significant achievement for the company, further enhancing its market position and reputation.

Positive market trajectory to propel GreenHy2's growth

According to the IEA, Europe and Australia are at the forefront of hydrogen production via water electrolysis. Australia has positioned itself as a hub for electrolysis initiatives, leveraging its advantageous conditions for solar and wind energy generation. Based on the project pipeline, Australia is on track to achieve hydrogen production of c.3 million tonnes of H2 by 2030, bolstered by an electrolyser capacity of nearly 50 gigawatts. Most announced projects pertaining to electrolyser capacity where those projects are intended to be operational by 2030 are clustered in Europe (32%), Australia (28%), and Latin America (12%) (Error! Reference source not found.). This trend indicates a significant upswing in hydrogen production achieved through the process of electrolysis. Moreover, as per Valuates reports, in 2022, the global hydrogen energy storage market reached a valuation of US$1.4bn. It is expected to achieve US$4.3bn by 2029, experiencing a robust CAGR of in excess of 20% during forecast period of 2023-2029.

As per the Australian Renewable Energy Agency (ARENA), in the 2023-24 Federal Budget, the Australian Government has initiated the Hydrogen Headstart program amounting to US$2bn. This program is dedicated to the expansion of large-scale green hydrogen projects within Australia. Over a period of 10 years, this initiative will provide production credits to cover ongoing operational expenses for these substantial green hydrogen projects. Furthermore, the projected demand for hydrogen exports from Australia could surpass 3Mt annually by 2040, potentially contributing up to US$10bn per annum to the nation's economy. Notably, ARENA has already funded 663 hydrogen projects, with a total investment value of US$2.25bn. With this remarkable shift in the industry landscape and the multitude of government initiatives in play, GreenHy2 is well positioned to leverage this opportunity, bolstering the company's growth potential.

GreenHy2 is well-placed to drive expansion by capitalising on government initiatives and seizing market opportunities

Figure 15: Public companies to watch

Company	Location	Ticker	Market cap. (US$m)	Stage	Entirely Renewable?	Website
ITM Power	UK	AIM: ITM	469.4	Commercialised	Yes	http://itm-power.com/
Energy Vault Holdings	US	NYSE: NRGV	328.6	Commercialised	No	http://www.energyvault.com/
ADS-TEC Energy PLC	Ireland	NasdaqCM: ADSE	330.4	Commercialised	Yes	http://www.ads-tec-energy.com/
Eos Energy Enterprises	US	NasdaqCM: EOSE	277.4	Commercialised	Yes	http://www.eosenergystorage.com/
Lhyfe	France	ENXTPA: LHYFE	239.3	Commercialised	Yes	http://www.lhyfe.com/
Kyoto Group AS	Norway	OB: KYOTO	269.9	Commercialised	Yes	http://www.kyotogroup.no/
Energy SpA	Italy	BIT: ENY	100.2	Commercialised	No	http://www.energysynt.com/
Altech Batteries	Australia	ASX: ATC	116.9	Commercialised	No	https://www.altechgroup.com/
AFC Energy PLC	UK	AIM: AFC	108.1	Commercialised	Yes	http://www.afcenergy.com/
Flux Power Holdings	US	NasdaqCM: FLUX	60.6	Commercialised	Yes	http://www.fluxpower.com/
RedFlow Ltd	Australia	ASX: RFX	45.0	Commercialised	Yes	https://redflow.com/
GreenHy2	Australia	ASX: H2G	4.6	Commercialisation	Yes	http://www.greenhy2.com.au/

Source: S&P Capital IQ, Pitt Street Research

Comparable companies

We have shortlisted a set of public and private comparable companies from entities operating in the broad energy storage technology space in developed markets. We have also applied an additional market capitalisation filter of below US$500m for public peers (Figure 15).

ITM Power (AIM: ITM) is an energy storage and clean fuel company based in the UK, with a presence in Germany, Australia, the rest of Europe, and the US. It designs, manufactures, and integrates electrolysers based on the proton exchange membrane (PEM) technology to produce green hydrogen using renewable electricity.

Energy Vault Holdings (NYSE: NRGV) is a grid-scale energy storage company that is driving a faster transition to renewable power by solving the intermittent issues that are inherent to the most prevalent sources of renewable energy, solar, and wind.

ADS-TEC Energy (c: ADSE) provides intelligent and decentralised energy storage systems in Europe and North America. The company develops and produces battery-based platform solutions for the energy industry of the future.

Eos Energy Enterprises (NasdaqCM: EOSE) designs, manufactures, and markets zinc-based energy storage solutions for utility, commercial and industrial, and microgrid markets in the US. The company's flagship product is the Eos Znyth DC system, a battery that can be used as an alternative to lithium-ion batteries.

Lhyfe (ENXTPA: LHYFE) is a renewable energy company that designs, installs, and operates green hydrogen production units in France. The company operates 93 projects. It serves local authorities, industries, transport and logistics, and fuel distribution.

Kyoto Group (OB: KYOTO) offers thermal batteries for industrial applications in Norway. Its solution captures and manages energy from renewable energy sources, such as solar and wind. The company focuses on leasing, operating, and selling Heatcube thermal batteries that enable industrial consumption of heat sourced from excess solar and wind energy.

Energy SpA (BIT: ENY) designs and distributes energy storage systems for residential, commercial, and industrial applications worldwide. It offers

single-phase and three-phase hybrid inverters; high and low-voltage lithium storage batteries; large and modular power control units; EV charging wall box; accessories; and energy manager systems for controlling the functions of the power conversion system and batteries.

Altech Batteries (ASX: ATC) operates as a specialty battery technology company in Australia. It holds interest in the CERENERGY Battery Project, an alternative salt nickel battery for grid storage; and the Silumina Anodes Project, an alumina coated silicon graphite anode material for batteries.

AFC Energy (AIM: AFC) is the provider of hydrogen fuel cell technology to generate clean off-grid energy. It is commercialising scalable fuel-flexible cell systems, to provide clean power for off-grid applications. The technology, pioneered in 2006 in the UK, is now deployable in electric vehicle chargers and used for applications in construction, data centre, and shipping sectors.

Flux Power Holdings (NasdaqCM: FLUX) designs, manufactures, and sells advanced lithium-ion energy storage electrification solutions for a range of industrial and commercial equipment including material handling, airport ground support equipment, and stationary energy storage.

Redflow Ltd. (ASX: RFX) develops, manufactures, and sells zinc-bromine flowing electrolyte batteries worldwide. The company's batteries are used in telecommunications, commercial and industrial, grid-scale, and residential applications.

The private companies that can be considered as comparable to GreenHy2 are as follows (Figure 16).

Figure 16: Private companies to watch

Company	Location	Ticker	Stage	Entirely Renewable?	Website
Boundary Power	Australia	Private	Commercialisation	No	https://boundarypower.com.au/
h2Planet	Australia	Private	Small Scale	No	https://www.h2planet.eu/en/
LAVO Hydrogen Storage Technology Pty Ltd	Australia	Private	Early Stage Commercial	Yes	http://lavo.com.au/
Pacific Energy	Australia	Private	Commercialisation	No	https://pacificenergy.com.au/
Hystar AS	Norway	Private	Commercialisation	Yes	http://www.hystar.com/
Ergenics Corp	US	Private	Early Stage Commercial	Yes	http://www.ergenics.com/

Source: S&P Capital IQ, Pitt Street Research

Boundary Power is delivering a new, innovative series of stand-alone power system solutions by integrating the design, construction, and operational expertise of its collaboration between Australia's only vertically integrated electricity company, Horizon Power, and Ampcontrol Ltd., a leading global provider of power and control solutions for more than 50 years.

H2Planet develops 'smart' hydrogen solutions based on user-friendly electrolysis, storage, and power generation.

Lavo Hydrogen Storage Technology is an Australia-based renewable hydrogen company focusing on offering energy storage and digital solutions underpinned by proprietary hydrogen solid-state storage technology.

Pacific Energy provides sustainable distributed energy. The company specialises in designing, building, owning, and operating power generating assets for mining companies, businesses, townships, and state-owned utilities across Australia.

Hystar AS is a high-tech company specialising in advanced PEM electrolysers for large-scale green hydrogen production from water electrolysis that is 100% sustainable.

Ergenics Corp. is a renewable energy company that offers a line of solid-state hydrogen storage systems, including heat engines, such as solar thermal, geothermal, and ocean thermal powered electric generators; solar powered hydride water pumps; and temperature sensor-actuators.

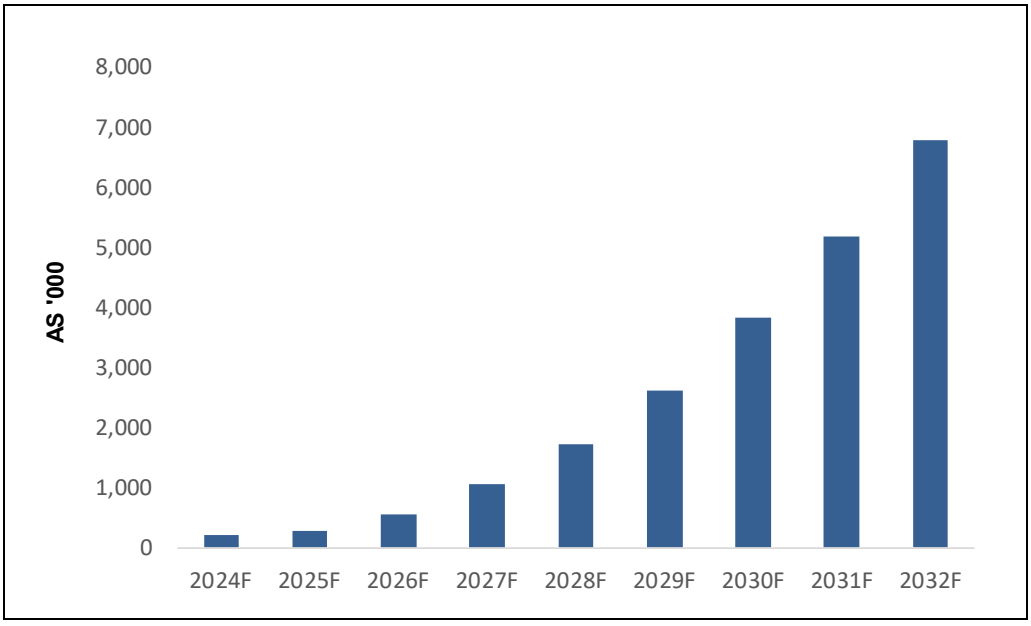
Our Valuation of GreenHy2

We have determined the company's valuation to be A$0.018 per share under our conservative assumptions (base case), while our more optimistic scenario places the valuation at A$0.023 per share. We have used a DCF approach, and our key assumptions are as follows:

Given the high initial investment required to capture market share, we assume that GreenHy2 will achieve operational break-even only in 2028 (base case)

- **Commercialisation timelines**. We model initial revenue to commence in late 2023.
- **Revenues.** We derived Green Hy2's revenue using a market share-based approach, incorporating current estimations based on the global market size and share of Solid-State Hydrogen Storage Solutions. For our conservative projection, we anticipate that Green Hy2 will achieve a market penetration of 8.5% by 2032. Based on these assumptions, we estimate that Green Hy2's revenue will reach approximately A$6.8m by 2032, an assumption which we believe may prove conservative (Figure 17).

Figure 17: Top-line outlook, base case, (A$m, 2024E–32E)



Estimates: Pitt Street Research

Costs and margins - Green Hy2's major cost items include employee & director benefit expenses, administration costs, and other professional costs. By 2032, we estimate these costs to account for approximately 20%, 9%, and 10% of sales, respectively. Additionally, other costs encompass occupancy costs, equipment & other subcontractor costs, and listing and other statutory charges. We anticipate these costs to be around 8%, 3%, and 7%, respectively,

by 2032. These projections result in an estimated EBIT margin of approximately 43% for the company by 2032 in our base case.

Tax - We assume 30% corporate tax rate, equivalent to the local tax rate for companies based in Australia.

Forecast horizon – We have considered forecast horizon of 11 years (2023 included) as the company is still in the early phase of its growth lifecycle and yet to experience a consistent revenue growth momentum. We have applied terminal growth of 2% beyond 11 years of the forecasted period.

Discount rate - Considering that Green Hy2 is a volatile stock, we have assumed a WACC of 12.9%. Given that the company's business is highly quality-conscious, there is uncertainty surrounding future clients and revenue conversion. As a result, cash flows during the anticipated time frame may exhibit volatility.

Corporate tax - We assume a corporate tax rate of 30%. As Green Hy2 is anticipated to achieve net-level breakeven only in 2028, the company will start to pay-out taxes then.

Figure 18: GreenHy2's DCF calculation

GreenHy2 Valuation (A$ m)	Base Case	Bull case
Enterprise Value (A$ m)	7.5	9.9
Net (debt) cash	1.1	1.1
Equity value (A$ m)	**8.7**	**11.0**
Share outstanding (Diluted)	476.3	476.3
Implied price (A$ cents)	**0.018**	**0.023**
Current price (A$ cents)	0.011	0.011
Upside (%)	64.9%	110.5%

Estimates: Pitt Street Research

Figure 19: Sensitivity analysis of DCF calculation (base case)

		WACC						
		9.9%	10.9%	11.9%	12.9%	13.9%	14.9%	15.9%
Terminal Rate	1.25%	0.028	0.023	0.020	0.017	0.015	0.013	0.012
	1.50%	0.028	0.024	0.020	0.018	0.015	0.013	0.012
	1.75%	0.029	0.024	0.021	0.018	0.016	0.014	0.012
	2.00%	0.030	0.025	0.021	**0.018**	0.016	0.014	0.012
	2.25%	0.030	0.025	0.022	0.018	0.016	0.014	0.012
	2.5%	0.031	0.026	0.022	0.019	0.016	0.014	0.012
	2.8%	0.032	0.027	0.022	0.019	0.016	0.014	0.013

Estimates: Pitt Street research

Differences in our valuation scenarios

There are primarily two differences that we have applied across our valuation scenarios (Figures 18 and 19):

- **Market penetration rate:** We expect that the growing potential of the Green Hydrogen economy and GreenHy2's competitive edge as the only commercial SSHS technology available in Australia will serve as catalysts for enhancing revenue expansion. In our conservative projection, we have considered Green Hy2's market share reaching 8.5% in Australia by

2032. In our optimistic outlook for the same timeframe, we envision achieving a market penetration of 8.5% in Australia.

- **Net profitability:** The increase in costs exhibits different trends in our two valuation scenarios. In our conservative projection, we expect to achieve net profitability by 2028. Conversely, in our optimistic outlook, we anticipate reaching net profitability by 2027. However, the net margin is expected to be approximately 30% in both the base case and the optimistic scenario.

Catalysts for a re-rating of Green Hy2

GreenHy2 is currently trading significantly below our valuation range. We believe the following factors can contribute to the re-rating of the stock in the direction of our valuation range:

- **Attaining commercialisation milestones promptly** - Despite already holding an exclusive agreement with the Germany-based GKN Hydrogen and having commenced offering the high-quality renewable energy-driven solution for solid-stage hydrogen storage to the Australian market, GreenHy2's robust market share gain is projected for the years 2025–2026. As the company begins to report initial sales in this market, investors are likely to gain heightened confidence in the stock.
- **Product enhancements** – We anticipate enhancements to the company's products as a catalyst for further sales growth.
- **Further partnerships** – Even though we think commercialisation will be the key step towards unlocking shareholder value in the medium term, we think company will do well if it enters further partnerships for pilot-scale testing of its technology.

Key Risks

Execution risk: Green Hy2 is just initiating a shift in the business operations transitioning towards marketing of a technology-leading solid hydrogen solution. This transition is currently in nascent stage. There is a risk associated with bringing the prospective solution to the market and commercially establishing itself in the much-anticipated hydrogen storage market.

Commercialisation risk: After the successful deployment of a new technological solution, it is imperative that the company has a well-rounded commercialisation strategy and the resources to implement it to gain market share in a niche and competitively growing industry. Failure to execute a commercial strategy, and potentially pivot if required, could prevent the company from realising its potential.

Competition: The solid-stage hydrogen storage market has become increasingly competitive, which can lead to price pressure. It might get tough to differentiate solutions purely based on the product design.

Intellectual property concerns: The hydrogen storage industry is rapidly evolving, and protecting intellectual property, such as product designs, can be challenging. As the industry grows, intellectual property disputes and patent challenges could arise, particularly around storage solution design and delivery methods.

Quality control and product safety: Ensuring consistent quality and safety of a technological-driven solution is essential. Faulty design and inept material quality can lead to legal liabilities.

Financial Challenges: The niche industry will require significant upfront investments in infrastructure, R&D, and marketing. Access to financing can be challenging in the current high interest rate environment, more so with the uncertainty of returns looming high. This could impact Green Hy2's ability to grow and expand.

Appendix I – GreenHy2's leadership team

GreenHy2's leadership team possesses diverse experience ranging engineering to financial services across Infrastructure and resources domain. We believe this expertise will be an asset to the company in its quest to grow through acquisitions across different end markets. The company's current board composition is as below (Figure 20).

Figure 20: GreenHy2's board members

Name	Designation	Affiliations (Current and Past)
Paul Dalgleish	Chairman & Managing Director	RCR Tomlinson, UGL, MWH, Thames Water
Charles Rottier	Non-Executive Director	LogiCamms Pty Ltd, Transfield Services Design and Construction group, MWH Australia, CMPS&F Pty Ltd, Future Fuels CRC
William Howard	Director and Chief Financial Officer	AJ Lucas, Lahey Constructions Pty Ltd
Dr Luc Bodart	Chief Engineer and General Manager	Senipah Combined Cycle Power Plant, Thai Oil Co-Generation Plant, Chandra Asri Refinery Utilities Boilers, Kaeng Khoi Power Plant WTP, Salalah SWRO, Johor River Water Works, Tamar Valley Power Plant, Pimpama WWTP Alliance
Dr Anthony Pignat	General Manager	Rio Tinto, BHP and FMG

Source: Company

Paul Dalgleish has a 30-year long career in senior management of multi-national engineering companies and has been CEO of publicly listed engineering companies for over 17 years. He has operated across a vast range of sectors, from energy and infrastructure to resources including diverse geographies.

Charles Rottier is a professional Non-Executive Director who has worked in design, construction, and service companies. He has held senior strategic, management and project roles at various engineering focussed organisations. Before joining GreenHy2, he stepped down as Chairman of LogiCamms (now Verbrec, ASX: VBC) after successfully leading a turn-around and merger effort.

William Howard was appointed as CFO and Company Secretary in July 2019 and Executive Director in August 2019. He served as the CFO of a Financial Services company in Western Sydney for past 3 years, where he played a

pivotal role in realigning financial systems, operations, along with coordinating due diligence processes for interested parties on potential acquisitions.

Dr Luc Bodart currently holds the positions of Chief Engineer and General Manager at GreenHy2. He has over 30 years of international experience in engineering and project management within Design-Build, EPC and BOOT environments, related to major municipal and industrial water and power generation projects.

Dr Anthony Pignat is a General Manager and has over 35 years of construction, operation, and maintenance experience in the resources sector. He has also worked as part of the management of the construction teams on large scale iron ore processing facilities for Rio Tinto, BHP and FMG.

Appendix II – Glossary

Bar – A standard unit used to measure atmospheric pressure and gas pressure in industrial contexts. 1 bar is equivalent to 100 kPa.

Clean Hydrogen – Clean hydrogen is generated from sustainable energy sources like solar, wind, or hydroelectric power. Another method involves electrolysis, where water is separated into hydrogen and oxygen using electricity. Additionally, clean hydrogen can be produced from fossil fuels with the aid of carbon capture and storage (CCS) technology, which captures and stores the carbon dioxide emissions produced during the manufacturing process.

Decarbonisation – Decarbonisation is the action of decreasing or eradicating the emissions of carbon dioxide and other greenhouse gases into the atmosphere.

Decentralisation – Decentralisation involves shifting power generation from large-scale facilities with extensive transmission lines to smaller, localised systems that cater to local loads or communities. In a decentralised setup utilising solar power, the sun serves as the "grid," delivering energy directly to the local area where it is generated.

Electrolyser – An electrolyser, also referred to as an electrolytic cell, is a device utilising electrical energy to break down water or other liquids into their constituent elements. Electrolysis is a chemical process wherein an electric current is passed through a solution, prompting ions to migrate toward the electrodes and engage in chemical reactions. In the context of a hydrogen electrolyser, water usually serves as the solution, and the electrodes are typically composed of conductive materials like platinum or titanium. When an electric current is applied to the water, it induces a reaction called water electrolysis, leading to the separation of water molecules into hydrogen and oxygen gas.

Fossil Fuel – Fossil fuels encompass natural resources like coal, oil, and natural gas, which originated over millions of years from the remnants of ancient plants and animals. These resources are classified as non-renewable, signifying their finite nature and eventual exhaustion. Fossil fuels serve as a significant energy source for human civilisation, propelling transportation, industry, and electricity generation.

Fuel Cell – A fuel cell is an electrochemical device that produces electricity by converting the chemical energy of a fuel and an oxidant directly into electrical energy. Like batteries, fuel cells generate electricity through an electrochemical reaction. However, unlike batteries, fuel cells need a continuous supply of fuel and oxidant to function. In most cases, fuel cells use

hydrogen as the fuel and oxygen from the air to generate electricity, along with water as a by-product.

Green energy – Green energy pertains to energy produced from renewable sources such as wind, solar, hydro, geothermal, and biomass. These sources are characterised by their minimal or negligible environmental impact and their ability to naturally regenerate.

Green hydrogen - Green hydrogen refers to hydrogen produced through electrolysis, where water is separated into hydrogen and oxygen. This process is exclusively powered by renewable energy sources like solar or wind, eliminating the use of fossil fuels in its production. This characteristic renders green hydrogen a sustainable and environmentally clean form of energy.

Hydride – A hydride is a chemical compound consisting of hydrogen and one or more other elements, typically metals or non-metals. Hydrides are broadly categorised into two main types: ionic hydrides and covalent hydrides.

Hydrogen – Hydrogen is a chemical element denoted by the symbol H and atomic number 1. It stands out as the lightest and most prevalent element in the universe, accounting for c.75% of its elemental mass. At standard room temperature and pressure, hydrogen exists as a colourless, odourless, and tasteless gas. It possesses an extremely low density and is classified as a non-metallic element.

Lattice Framework – A lattice framework is a specific structural design composed of interconnected elements like beams or rods, forming a repetitive pattern. This lattice structure is defined by its open and lightweight construction, which imparts strength and stability while minimising the material used. In the context of storing hydrogen as a solid metal hydride, the metal needs to be structured as a lattice, creating interstitial sites for hydrogen to occupy. This arrangement allows hydrogen molecules to be stored more closely than they can be in their liquid form.

Lithium-ion Battery – A rechargeable battery that stores and releases electrical energy through the movement of lithium ions. These batteries are commonly utilised in electronic devices like smartphones, laptops, and tablets, as well as in electric vehicles (EVs) and renewable energy storage systems.

Low Carbon – Any approach aimed at reducing or minimising greenhouse gas emissions, especially CO_2, as part of efforts to mitigate climate change.

Metal Hydride – Metal hydrides are compounds resulting from the chemical reaction between a metal element and hydrogen gas. These substances are distinguished by their capacity to store and release hydrogen, rendering them valuable for diverse applications, including hydrogen storage and fuel cells.

Off the Grid – The state of being disconnected from the conventional electrical grid and relying on alternate sources of power.

Renewable energy – Energy derived from natural sources like sunlight, wind, rain, tides, and geothermal heat. Renewable energy is often classified as clean energy because it does not result in harmful emissions or pollutants during its production. Common renewable energy sources encompass solar, wind, biomass, hydro, geothermal, and ocean energy.

Renewable energy storage – Renewable energy storage pertains to the method of storing energy produced from renewable sources like solar, wind, hydropower, geothermal, and biomass, enabling its later use. The necessity for renewable energy storage arises due to the intermittent and variable nature of these energy sources, ensuring a stable supply even when the renewable sources are not actively generating power.

Remote power supplies – The delivery of electricity to areas that lack access to the primary power grid. These areas can encompass remote or rural communities, off-grid residences, distant industrial facilities, or any location situated far from the nearest power grid connection.

Solar energy – Energy derived from the sun's radiation. This energy can be captured and transformed into practical forms like electricity or heat using various technologies, including solar panels or solar thermal collectors.

Solid State Hydrogen Storage (SSHS) – The storage of hydrogen within solid materials, such as metal hydrides or chemical hydrides. Hydrogen is a promising energy carrier due to its production feasibility from renewable sources. Moreover, when utilised in fuel cells, it generates only water as a by-product, making it environmentally friendly. However, hydrogen gas can be difficult to store and transport.

Traditional Battery – An electrochemical cell that produces electrical energy through a chemical reaction. It comprises two electrodes: a positive electrode (cathode) and a negative electrode (anode), which is separated by an electrolyte.

Wind energy – Wind energy refers to the power derived from the wind, which is a renewable and environmentally friendly energy source. Wind turbines are employed to capture the kinetic energy of the wind and transform it into electrical energy. This electricity can then be utilised to power homes, businesses, and various other facilities.

Zero emissions – The total eradication of greenhouse gas emissions, especially carbon dioxide, stemming from human activities. This objective is typically accomplished by relying on renewable energy sources like solar, wind, and hydropower, as they do not release carbon dioxide or other greenhouse gases during the process of power generation.

Appendix III – GreenHy2's capital structure

Class	In millions	% of fully diluted
Quoted Securities		
Ordinary shares on issue	418.8	87.9%
Unquoted		
Options and performance rights	57.6	12.1%
Fully diluted shares	**476.3**	

Appendix IV – Major shareholders

GreenHy2 currently has four substantial shareholders (holding >5%):

Investor Name	Ownership (%)
Angophora Capital Pty Ltd	19.9
Anthony Barton & Associates	10.75
Bontempo Nominees Pty Ltd	10.09
Dr Paul Joseph Dalgleish & Associates	8.71

Appendix V – Analyst Qualifications

Stuart Roberts, lead analyst on this report, has been an equities analyst since 2002.

– Stuart obtained a Master of Applied Finance and Investment from the Securities Institute of Australia in 2002. Previously, from the Securities Institute of Australia, he obtained a Certificate of Financial Markets (1994) and a Graduate Diploma in Finance and Investment (1999).
– Stuart joined Southern Cross Equities as an equities analyst in April 2001. From February 2002 to July 2013, his research speciality at Southern Cross Equities and its acquirer, Bell Potter Securities, was Healthcare and Biotechnology. During this time, he covered a variety of established healthcare companies, such as CSL, Cochlear and Resmed, and numerous other emerging companies. Stuart was a Healthcare and Biotechnology analyst at Baillieu Holst from October 2013 to January 2015.
– After 15 months over 2015–2016 doing Investor Relations for two ASX-listed cancer drug developers, Stuart founded NDF Research in May 2016 to provide issuer-sponsored equity research on ASX-listed Life Sciences companies.
– In July 2016, with Marc Kennis, Stuart co-founded Pitt Street Research Pty Ltd, which provides issuer-sponsored research on ASX-listed companies across the entire market, including Life Sciences companies.
– Since 2018, Stuart has led Pitt Street Research's Resources Sector franchise, spearheading research on both mining and energy companies.

Nick Sundich is an equities research analyst at Pitt Street Research.

- Nick obtained a Bachelor of Commerce/Bachelor of Arts from the University of Sydney in 2018. He has also completed the CFA Investment Foundations program.
- He joined Pitt Street Research in January 2022. Previously he worked for over three years as a financial journalist at Stockhead.
- While at university, he worked for a handful of corporate advisory firms.

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