



INTERVIEW TRANSCRIPT

Dr. Paul Dalglish delves into the technology of its Metal Hydride Solid State Hydrogen Storage System and how it operates, equipping GreenHy2 with a unique competitive edge by using first titanium hydride.

GreenHy2 is an Australian-based specialised provider of Renewable Energy solutions with a mission of delivering value for customers across the resource sector supply chain.

GreenHy2 has constructed many solar farms across Australia and continues to provide innovative engineering solutions combining renewable energy with Hydrogen storage capacity.

Today, GreenHy2 is a valued long-term partner of some of the country's leading electrical transmission providers.

Read the conversation:

Casey Portors:

"Hi everyone. I'm here with Paul Dalglish, the Managing Director and Chairman of GreenHy2 with ASX ticker code H2G. The company recently went through a renaming and ticker change, and was previously known as Tempo Australia. Thanks for joining me, Paul. Hi. We'd like to just jump into the specifics around the technology today, as it is quite special and it is something that would take a bit of an education process for everyone to understand how it works. Do you mind giving us an overview specifically of how the Metal Hydride Solid State Hydrogen Storage System does work?"

Paul Dalglish:

"The technology has been around for, you know, 50 years to store hydrogen in a metal hydride. It's really the type of hydride that we're using these days that's changed. And we have a very sharp competitive edge because we use a first titanium hydride. And so what we do is we store hydrogen instead of as a gas, we store it as a solid. Storing hydrogen as a gas is okay, but you just have to store at very high pressures to get a decent volume of gas and a decent amount of, electricity stored. Whereas we store it as a solid and solid is at least five -

times denser than, hydrogen gas at 500 bar, so at very, very high pressure. So the high pressures suitable for, say, the refining industry, not that suitable for the electricity industry. So this solution is at 40 bar, it's a very safe pressure. It's solid. So it's safe, it's at ambient temperatures, and so how it works is that we go through an electrolyser from a renewable energy source, such as solar or wind or hydro.

We come in through the electrolyser, it produces hydrogen as a gas. We put that into the metal hydride. It produces the gas from the electrolyser at 40 bar, and it goes straight into the hydride at 40 bar. So there's no compression, there's no, pumps or rotating equipment, expensive rotating equipment. It goes into the metal hydride stores as a solid. And then when we want to make electricity, we open up the other side of the vessel and we come out at two bar and go straight into the fuel cell. So again, no repumping, no compression cycle. It's a straight chemical reaction. The electricity that's made then goes off through our fuel cell off to the load.

So the ability to store it as a solid is the IP, the technology partner we use as a company called GKN out of Europe. They've been working in this area for 10, 15 years. It's a very commercial product. It's not experimental, and it's been developed for the last 10 to 15 years. The other site benefits are that it doesn't degrade, it lasts forever if you just lock the vessel up and it'll keep the storage.

It doesn't reduce its capacity to store like a lithium battery or any other normal battery system. It is 30-year life. We guarantee over 20 years, and it's a hundred percent recyclable at the end of the day. So the technology is, it's quite simple if you like, but there's a whole IP in there. Keeping the metal lattices as a structure is quite advanced and that's GKN and IP and putting the system together in an integrated system is of course our IP. So between us, we're able to deliver this product and we've got a demonstrator unit in with essential energy that's operating off-grid and has been for the last six to eight months."

Casey Portors:

"Great. And just jumping back to the far titanium hydride specifically, can you give us a brief outline of how that compares to other metal hydrides available on the market?"

Paul Dalglish:

"There's very few commercial metal hydrides available on the market- Lithium and nickel was the original workhorse of the metal hydride industry, and it was used for compressors. It's quite an expensive hydride, it's quite a good one, but it's an expensive hydride and it's not practical for this solution. Most of the other hydrides work at very high temperatures or have some magnesium or something in it, which is not as safe as a first titanium hydride. So at the moment, from a commercial point of view, we've really got probably the only commercial metal hydride for power production in the world."

Casey Portors:

"Great. So safe and, and economic would be the two takeaways. Yeah. Great. And I think something else that we'd like to touch on is the IP in the actual digital platform and user interface that comes along with the system that customers can use. Do you mind outlining a little bit of that?"

Paul Dalglish:

"So the, the digital platform that comes with it is very advanced, so GKN can provide support on that side of the package. They are very advanced in that area from their manufacturing processing heritage. We are able to look at our units anywhere in the world.

We're able to service them and maintain them as well remotely. We're able to run simulation models for them both going forward and forecasting. We have AI that updates the simulation models and uses machine learning to match the simulation to the actuals, and then that gives us the capability to run what they call a digital twin, where we can run a digital model of the unit.

And we can look for variances to real world conditions and see, okay, maybe it needs some maintenance or is it bearing for a good reason, say less sun, or does it need some servicing? So we run a digital twin in the background. It's quite advanced technology, but it's what will be required by these big utilities who will be our customers such as Essential Energy and Ergon on those people. They want to be able to monitor thousands of these units and have it all remote and have it all remote and simple and also self diagnostic."

Casey Portors:

"Great. It's very valuable technology. And also just to outline what the application would be for this system in market at the moment. You're looking at standalone power supplies at the moment. For anyone who isn't familiar with that, could you explain how, how standalone power supplies work and how they service a key part of the Australian market?"

Paul Dalglish:

"So all of the utilities in Australia have a process of taking an economical uses of grid for a number of reasons. For many of them, they are in a place where they get unreliable supply. Part of that is due to our bushfires, part of it's due to our floods and cyclones. Part of it's due to the long lines that run into them and that, that they can cause bush fires and then they have to be replaced. And so that leaves them with diesel solutions. For a lot of them, of the, you know, big customers like essential 1% of their customers cost 17% of their grid cost.

I've heard Western Power, quote, 1% of their customers can cost up to 50% of their grid costs. For the other horizon and people like Northern Territory Power and Water, their grid costs a lot higher than like an urban area. And so what they wanna do is they wanna take these people if grid or make microgrids for say, indigenous communities and so if you're gonna take people off grid, you need to be able to guarantee them power all year round. The only way we can do that at present is to give them diesel backup. If we go onto solar or we go onto wind; in our system, we can put the very large high density batteries in and they last for 30 years. And fully recyclable. And then we can take the community or the user off grid. One, they lose the transmission line, which is good because they can't cause bush fires with it. It doesn't get burned down. They don't have to maintain the easement. So there's all these other advantages, silent, so it makes no noise. So again, in country areas where that noise travels a long way, or indigenous communities where that noise travels a long way, they don't have that issue. It sits there, it runs off solid, it's fully renewable, and the actual operating costs are extremely low because they don't have to pay for power anymore.

So, and no one's flying in diesel in flood times, yeah, as massively advantages for them. So that's the goal. And they've all got program of taking users off grid to benefit. And as a benefit. And so we are gonna be part of that program."

Casey Portors:

"I think it speaks volumes to the viability of the technology on the market that you have given, that you've actually got trials with these utilities at the moment. and they've also got significant programs underway for standalone power."

Paul Dalglish:

"They've all got future programs for standalone power wise of some description."

Casey Portors:

"Great. And I think something else to that's worth mentioning is the fact that it, standalone power supplies aren't the only application for this technology. Could you give us an overview of what it could look like in the next five to 10 years as you, as you move along in this process?"

Paul Dalglish:

"Standalone power supplies are the low hanging fruit at the moment because they're, they're gonna be the most economical and competitive for our technology. So that's where we're targeting. And all forms of diesel replacement, of course we are gonna be far more competitive than diesel. So those are our low hanging fruit at the moment. That's a massive market to start with. So we'll go into that first, and then we'll look at the rest of the market. Then we'll move into you know, other areas, microgrids.

There's also a large market for depots and warehouses where they're gonna put solar on the roof and then store their excess energy if they have it during the day, and then run their operations during the night. And we're also seeing large inquiries for people wanting to store daytime solar to run car charges at nighttime. And that can be for, just for a smaller facilities, or it can be for quite large depots where they park a lot of cars."

Casey Portors:

"Great. Thank you very much for that, Paul. It's really exciting to think about what the possibilities are in this space."

Paul Dalglish:

"My pleasure."