



27 MAY, 2024

Kalbarri heads to a hydrogen future

Business News, Perth



Shohan Seneviratne says the Murchison project is aiming for a final investment decision in early 2026. Photo: Michael O'Brien

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A pastoral station just north of Kalbarri could be home to Australia's first giga-scale hydrogen development after its backers introduced major changes.



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THIS month's federal budget included big financial incentives for developers of hydrogen projects in Australia.

One name at the head of the queue is global investment giant Copenhagen Infrastructure Partners (CIP), which is developing more than a dozen hydrogen projects across the globe.

Among these is Murchison Green Energy, which has a 120,000-hectare project site just north of the holiday town of Kalbarri.

Murchison chief executive Shohan Seneviratne is bullish on the project, which is expected to cost more than \$20 billion.

"We believe it's one of the most developed and one of the most advanced giga-scale green hydrogen and ammonia projects in the world," Mr Seneviratne told *Business News*.

He said the project had gained independent endorsement.

In December, it was one of just six hydrogen projects around Australia to be short-listed for the federal government's \$2 billion Hydrogen Headstart scheme.

"Hydrogen Headstart confirmed it to the world because CIP is not looking for money, so therefore we are not looking to spruik our projects," Mr Seneviratne said.

"Therefore, we go under the radar.

"We do the work that needs to be done and it's all funded internally, so therefore we are able to progress quite quickly."

Another measure of progress, he said, was the number and quality of offtake agreements CIP had signed.

"We have very strong offtake interest from large counterparties in Japan, [South] Korea and Singapore," Mr Seneviratne said.

"They do their own due diligence." CIP has been working on the project for more than three years and is aiming to make a final investment decision in the first quarter of 2026.

If all goes to plan, construction will start in mid 2026.

That would be followed by first ammonia supply in 2028 and full production by the end of 2030.

In the world of gigawatt-scale hydrogen projects, that constitutes rapid progress.

Major change

The Murchison project has been through some major changes in order to speed up the development.

Notably, CIP decided late last year to break it into two phases.

It has opted for a modular construction method with smaller processing trains.

It has also chosen an innovative ship-loading solution that removes the need to build traditional and expensive port facilities.

Nonetheless, it remains a massive undertaking.

Phase one, which constitutes half the project, is expected to cost in the vicinity of \$US8 billion (\$A12.3 billion).

This phase will involve the installation of 275 wind turbines and a vast solar farm to generate up to 3GW of electricity.

That equates to about half the total installed capacity in Western Australia's South West power grid.

The renewables will power a 1.5GW electrolyser to produce hydrogen.



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That will be fed into three 1,200-tonnes-per-day (tpd) ammonia trains, to produce 950,000t per year of green ammonia for export.

That is a big shift from the earlier plan to have one large processing train in each phase.

Mr Seneviratne said CIP was aiming to approve phase two in 2028 so it could provide continuity for the construction crews, expected to peak at about 3,500 people.

“When you have a construction ramp up you don’t want to demobilise people, so it will be at the back end of phase one,” he said.

CIP opted for a two-phase development to help deal with the enormous construction task.

“It is so big, the timelines are so big, we wanted to get to market soon,” Mr Seneviratne said.

The shift to smaller processing trains, or modules, was also designed to expedite the project.

“We saw globally what kind of module sizes made the most sense,” Mr Seneviratne said.

“We looked at it and applied it to the logistics constraints in Australia.

“We said 1,200 tpd modules because we can make them road transportable. It makes sense.

“And then from a labour point of view, we wanted to modularise because we don’t want to ‘stick build’ in Kalbarri.”

HYDROGEN PROJECTS IN WA

Proponent	Project	Capacity	Nearest Town
Intercontinental Energy	Western Green Energy Hub	50 GW	Eucla
BP	Australian Renewable Energy Hub	26 GW	Port Hedland
BP	Geraldton Export-Scale Renewable Investment	10 GW	Geraldton
Gascoyne Green Energy	Boolathana	10 GW	Carnarvon
Fortescue	Oakajee Green Hydrogen Hub	n/a	Geraldton
Copenhagen Infrastructure Partners	Murchison Hydrogen Renewables	6 GW	Kalbarri
Copenhagen Infrastructure Partners	Oakajee	n/a	Geraldton
Progressive Green Solution	Western Giga Energy	3 GW	Geraldton
Infinite Green Energy	Arrowsmith	2.3 GW	Dongara
BP	H2Kwinana	150 MW	Perth
Yara + Engie	Yuri	18MW	Karratha
Infinite Green Energy	MEG-HP1	10MW	Northam
Woodside	H2Perth	n/a	Perth

Source: BN research

Port solution

When the project starts ammonia exports, the tankers will be loaded 2.5 kilometres offshore.

The project is using a catenary anchor leg mooring (CALM) buoy, also known as a single point mooring.

This technology is commonly used in the North Sea gas industry and CIP regards it as the best solution for ammonia exports.

The ammonia will be transported offshore through a pipeline that will run seven kilometres from the process plant to the coast.

It will be buried underground as it crosses the coast and stay underground for further 1,800 metres before the final 700 metres on the seabed.

The buoy, which will be anchored to the seabed, is itself a substantial structure: it will be about 15 metres in diameter and sit five metres above the water line.

Once the project is fully developed, there will be one tanker per week to be loaded with ammonia.

Key risks

Mr Seneviratne said almost every aspect of the project was crucial to its success.

“When you have a project of this size in a nascent industry, everything is critical,” he said.

“If you look at labour, that is critical; if you look at land, that is critical; if you look at equipment supply chains, that is critical; if you look at technology, that is critical.

“While electrolysis and ammonia have been around since the early 1900s, at this scale, no.

“There are 400 or 500 megawatts of electrolysis in the world.

“We are going to put in three gigawatts.

“Everything is either new or larger.”

Mr Seneviratne explained the large scale was needed in order to bring down costs and make the project competitive, but he singled out one factor as the main risk for all hydrogen projects.

“The biggest risk we see in green hydrogen and derivatives around the world is very much around offtake,” he said.

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WIND TURBINES (PHASE ONE)

“The reason is that there is no liquidity in the market; it is a nascent market.”

Mr Seneviratne said a particular concern was the price disparity between different forms of energy.

For instance, so-called blue ammonia, which partly uses fossil fuels in the production process but sequesters the carbon emissions, will be cheaper than green hydrogen, which is produced completely from renewables.

He believes schemes like Hydrogen Headstart, which will provide production credits to successful applicants over 10 years, will fill the pricing gap.

“That’s where these subsidy programs come into play, to bridge that pricing gap and thereby allow the early offtake demand, which is quite minimal, to be secured by projects like Murchison and other Australian projects,” Mr Seneviratne said.

This month’s federal budget included a doubling in funding for Hydrogen Headstart, to a total of \$4 billion.

That is additional to the new hydrogen production tax incentive of \$2 per kilogram of renewable hydrogen, costing an estimated \$6.7 billion over 10 years.

Competition

There will be plenty of project developers across Australia hoping to qualify for these schemes (see table).

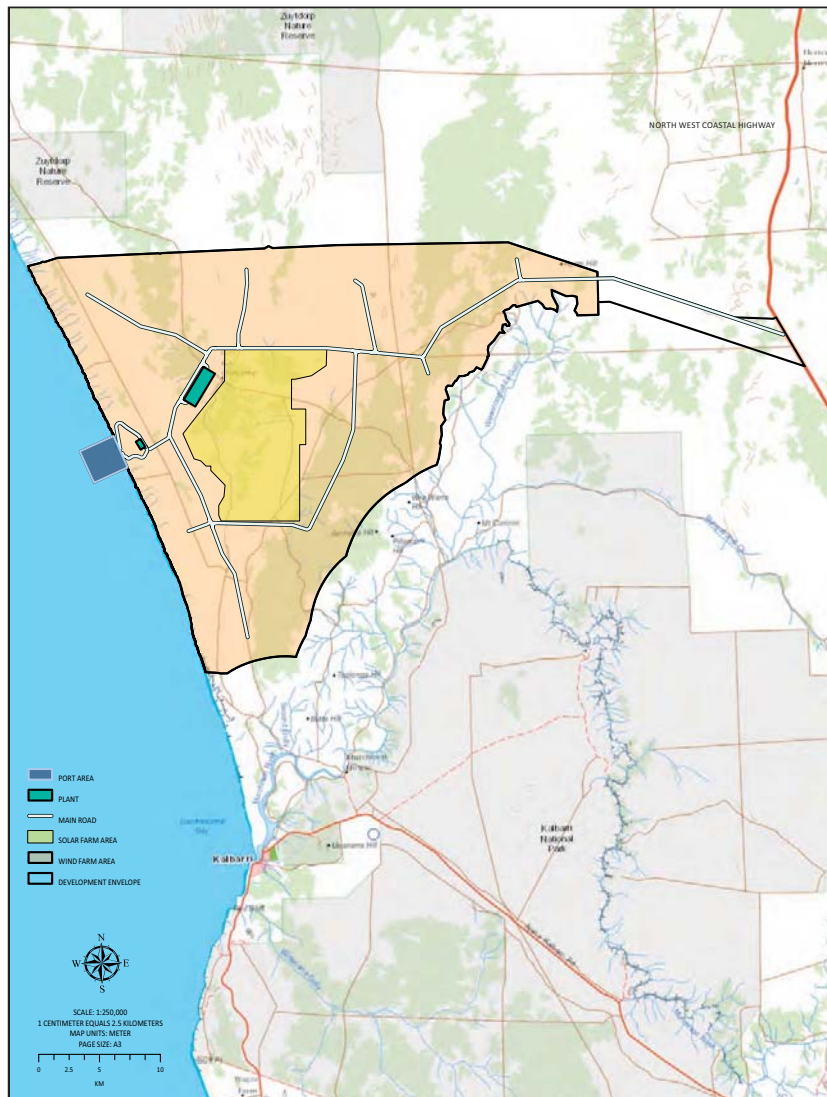
Within WA, BP is leading the development of three hydrogen projects.

These include its 150MW H2Kwinana project, which entails a repurposing of its former oil refinery site.

It was short-listed in December alongside the Murchison project for Hydrogen Headstart funding.

BP is also the operator and 40 per cent shareholder in the Australian Renewable Energy Hub: a giant 26GW project in the Pilbara that has been on the drawing boards for more than a decade.

MURCHISON GREEN HYDROGEN PROJECT LAYOUT



The project site covers 120,000ha on a pastoral station north of Kalbarri.

Its project partner, Intercontinental Energy, told *Business News* last year it was aiming for first production before 2030.

Private company Progressive Green Solution is also aiming to get its project out of the ground before 2030.

It has a site at Geraldton for its Western Giga Energy project.

Another potential developer is Woodside Energy, which is pursuing several green energy projects around the globe.

These include its H2Perth hydrogen and ammonia project.

Woodside submitted an environmental approval application last May after securing a 140ha site at Rockingham.

Any new hydrogen developments would join Project Yuri, a small project under construction in the Pilbara.

It is designed to decarbonise the ammonia plant operated by Norwegian company Yara on the Burrup Peninsula.

There are multiple other projects seen as longer-term opportunities.

These include Intercontinental Energy’s Western Green Energy Hub, to be built near the South Australian border.

The Oakajee industrial area just north of Geraldton is another potential site.

In 2022, the WA government selected six proponents to develop green energy projects at Oakajee.

These were CIP, Fortescue and BP and three smaller businesses: Green LOHC, Kinara Power and Blue Diamond Australia.

Oakajee has long been touted as the next big thing for industry in WA but needs to be developed from scratch, as it has no existing infrastructure.

Most notably, it requires a port that is likely to be extremely expensive to build.



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“What we are waiting on at Oakajee is a better understanding of shared infrastructure

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Mr Seneviratne said CIP was yet to finalise its lease agreement at Oakajee.

“What we are waiting on at Oakajee is a better understanding of shared infrastructure,” he said.

All the big hydrogen projects in WA are focused on opportunities to export to Japan, South Korea and Singapore.

Japan and South Korea are keen to use ammonia and hydrogen to help decarbonise their electricity production by blending these fuels with coal and gas.

Another market opportunity is bunkering or using these fuels in shipping.

Other potential opportunities include the production of fertiliser and chemicals, along with green steel and green iron.

Approvals

In the meantime, CIP has been progressing multiple work streams on its Murchison project.

This has included more than two years of flora and fauna surveys, testing wind speeds, seabed surveys and community consultation.

It is also in ongoing dialogue with the traditional owners, the Nanda people, with a view to finalising a land-use agreement.

The project team plans to submit its environmental review documents later this year and aim for approvals late next year.

It has also applied to the Shire of Northampton for amendments to the town planning scheme to allow for industrial use in the project area.

That may seem a minor concern but it has tripped up local company Infinite Green Energy.

Its plans for a small hydrogen project at Northam have previously gained state government backing but the company has failed so far this year to secure planning approval.

Mr Seneviratne said the nature of the project afforded lots of flexibility.

The process plant was originally to be built on the coast but has been moved seven kilometres inland, in part because of visual amenity.

“There has been a significant number of important changes in the layout in order to get to where we are today,” Mr Seneviratne said.

Local flow-through

Mr Seneviratne said his project team was in the early stages of looking at opportunities for local industry to become part of the project’s supply chain.

“We are definitely looking at how we can utilise the green energy

growth in WA to make sure we benefit WA and not just the rest of the world,” he said.

“And it’s not just the benefits to WA. Local supply chains will fundamentally de-risk the project.”

However, Mr Seneviratne expects local industry capability and the project’s timelines would be a constraint.

“For example, the blades [for the wind turbines] are not going to be manufactured locally for our project and our timeline, but can we look at towers and tower sections?” he asked.

He suggested local industry may build capability over time.

“Maybe not the first electrolyser stacks, but maybe the replacement stacks after five or seven years. [Maybe we] could we have them assembled here,” Mr Seneviratne said.

“They are all very early conversations.”

In the meantime, he anticipates the modules and other equipment will most likely come in through Geraldton.

CIP was liaising with the Mid West Ports Authority on the proposed berth eight-nine expansion.

The project team is also looking at Henderson and Ashburton to import other equipment, such as the blades for the wind turbines.