

Future-proofing Asia Pacific – Hydrogen financing’s bamboo shoots

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Sponsors, bankers and advisers are increasingly seizing opportunities across hydrogen’s value chain.

Japanese trading house Sumitomo Corporation and Queensland state entities – Gladstone Regional Council, CQUniversity Australia and Australian Gas Industry Group – have [signed an MoU](#) for the 250-300 tonne Gladstone green hydrogen plant, allowing the project to enter its design phase.

Australian natural gas transmission company APA Group has taken on a new initiative – the first project under the company’s [Pathfinder Program](#) – to convert a 43km section of the Parmelia gas pipeline in Western Australia to a hydrogen-ready transmission pipeline.

French renewables developer Neoen is partnering with Australian utilities provider ActewAGL to deliver the [continent’s first commercial hydrogen refuelling station](#) to coincide with the rollout of the government of the Australian Capital Territory’s new fleet of 20 Hyundai Nexo hydrogen vehicles.

All these up-, mid- and downstream projects reached milestones during the past month.

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[Hydrogen task forces](#) have also buttressed the financing market, sprouting up first to map hydrogen’s value chain and then position firms to gain a competitive advantage.

“It’s rewarding to work with bank colleagues and clients in many industrial sectors across the hydrogen value chain,” says Astrid Behagel, hydrogen coordinator at BNP Paribas (pictured right).

“We’ve trained about 300 people within the bank, mainly industry teams who have deep, rich knowledge and explore how hydrogen may impact business models and support energy transition,” she says.

Discussions at SMBC in 2019 and 2020 tended to be open-ended and client-driven. As the bank last year gained more internal clarity about its value proposition, it started identifying unique client relationships and channels.



“Many of these hydrogen projects need matchmaking,” says Siddhartha Shrivastava, head of energy and natural resources of SMBC’s structured finance team in Asia (pictured left). “A refiner may need to sit together with a CO₂ user while a trader may want to talk with a certifier. We’re looking to push out more aggressively.”

Yet market sources appreciate the risk that undergirds the dynamism of this ever-growing subsector.

“If you ask for my thoughts six months from now, I might see things quite differently,” cautions a North American institutional investor.

Awareness buys time. Time buys options

Amid the market’s verve is the fact that non-recourse infrastructure loans in Asia Pacific’s hydrogen markets are not yet here.

“It’s early days for hydrogen financing in this part of the world,” says Shrivastava. “We started looking at hydrogen project financing a little more than a year ago.”

Whether project, corporate, sovereign or hybrid financing takes the lead may depend on where the project sits along the value chain. However, each is likely to materialise quickly.

Sponsors, bankers and advisers will soon be testing how defining aspects of project financing – financing structure, security and guarantee, governance and law, and risk mitigation – apply to the universe’s most abundant element.

Financiers appreciate that green hydrogen will be an important element of the world’s energy transition – much as renewables have reshaped the world’s power sector during this century’s first 20 years.

“But would it make complete economic sense to entirely focus on green hydrogen when our analysis shows green hydrogen is still more expensive than blue hydrogen?” asks Shrivastava.

“Blue and green hydrogen have enormous potential. However, it’s difficult to understand how and when the opportunities will materialise,” adds a pension fund investor. “We’re keeping a keen eye on the cost curve, especially around green hydrogen.”

“We don’t have to play directly in hydrogen production,” a Singapore-based managing director says. “We may gain exposure by investing in renewables to power the hydrogen plant or networks to offtake production.”

DNA detectives

A natural alignment is evolving between parts of the hydrogen value chain and financial solutions. Upstream production is likely to be more conducive to project financing, midstream pipelines may be reasonable candidates for corporate bonds since the asset is highly regulated, and end-use financing will very much depend on the sponsor’s culture of finance.

“We’re working with clients to find appropriate solutions,” says Behaghel. “Some companies, like IPPs, have project financing in their DNA. Whether products are something the client is familiar with or we together need to find a more innovative solution will depend on the corporate culture.”

Loan facility, project sponsor, currency, hedging, facility tenor, availability period and repayment are considerations when structuring a hydrogen infrastructure loan.

Project finance bankers may prefer that the senior debt facility be large to realise economies of scale in the production of the financial solution, involving costly technical, environmental, insurance and legal reviews.

Pitching to advise or lend on a project being developed by a reputable and experienced project developer may be a logical way to ensure the facility is sufficiently large. Big state-owned companies or investment-grade private developers – for example, Sinopec, refiner Indian Oil or the global Japanese trading houses – would be natural allies in this thinking.

However, smaller pure-play green hydrogen infrastructure developers have emerged to test that thesis, large incumbents and suppliers to those incumbents are noticing. Mitsubishi Heavy Industries [agreed in November 2020 to invest](#) in green hydrogen and ammonia project developer H2U.

H2U’s A\$240 million Gateway hydrogen project in South Australia’s Eyre Peninsula is set to be the largest green ammonia plant in the world, 60x bigger than Australia’s largest electrolyser at Tonsley, Adelaide, which is under construction.

A banker’s normal preferences for hard currency contracts – or local currency contracts with foreign currency adjustments – interest rate swaps and commodity price hedging will be an integral part of the financing structure.

The greatest need for innovation among those three may be in commodity price hedging because there are yet no spot prices for hydrogen. S&P Global Platts’ hydrogen price assessments are helping to develop the market by covering the following:

- **Alberta, Canada**
 - steam methane reforming (SMR) without carbon capture and storage (CCS)
 - alkaline electrolysis
 - polymer electrolyte membrane (PEM) electrolysis, excluding and including capex
- **10 regions in the US**
 - SMR w/o CCS
 - alkaline electrolysis
 - PEM electrolysis, excluding and including capex
- **Netherlands**

- SMR with and w/o CCS
- PEM electrolysis
- alkaline electrolysis
- **Japan**
 - SMR w/o CCS
 - PEM electrolysis
 - alkaline electrolysis

Sponsors, bankers and advisers will need to consider whether to continue using the practice of conventional hydrogen production, or grey hydrogen, through SMR without CCS. This hydrogen subsector tends to use the feedstock price, predominantly natural gas, as an integral element in contracts.

Shrivastava says that most of his discussions in Asia during the past year have been about production of blue hydrogen through SMR or auto thermal reforming, coupled with carbon capture, utilisation and storage (CCUS). "It's low-hanging fruit and the mark-up on the commodity is not significant," the Singapore-based banker says.

"Where is hydrogen going in 30 years?" asks Perth-based Philip Sealey, Clifford Chance director and head of renewables in Asia Pacific (pictured right).

"It may be like natural gas. I don't have a 15-year contract with my NG supplier. There's a liquid market to buy at spot. That's where it will end up. However, during this initial period hydrogen financing will need much more structured arrangements."



Weaving a banker's blankie

Arguably, sponsors, bankers and advisers will need to devote most resources towards drafting and negotiating the security and guarantee package. This element to reach financial close may determine whether Asia Pacific's hydrogen financing market leans more towards sponsors or bankers.

Project contracts, insurance, security package, ranking, guarantees, covenants and share retention obligation will loom large in reaching financial close. A banker's proclivity towards enforceable, robust project contracts with proper allocation of risks will surely be at the vanguard.

"Our main challenge during the next year is not whether hydrogen-related projects can be banked," says Shrivastava. "We're really looking for commercial projects with robust contracts. The good news is that there's fertile ground for commercial models."

The development of economic and technical advisory markets should play an important role in how quickly projects can achieve financial close. An early step to provide confidence to industry participants will be market studies supporting cashflow projections with adequate coverage. Enegix Energy in March (2021) [signed an MoU](#) with US-based Black & Veatch to complete feasibility studies for the construction of a \$5.4 billion green hydrogen plant in Brazil.



Washington, DC-based Rachel Crouch of Norton Rose Fulbright (pictured left) has analysed long-term revenue contracts, comparing how hydrogen financing may adapt the LNG market's use of two models: tolling and sale and purchase. She also explores take-or-pay, which is common in the LNG subsector, or take-and-pay models to deal with contract quantities.

Pricing is a third factor in commercial contracts. "Given the projected rapid pace of development of the hydrogen market, parties may consider whether to include price review provisions in their offtake contracts," Crouch writes.

"These provisions should be considered carefully because price reviews are very susceptible to dispute, and there are unlikely to be objectively determinable spot prices to rely on by the time the opportunity for a price review arises under early green or blue hydrogen sale contracts."

Tokyo-based Hans Menski (pictured right), project finance partner at Clifford Chance, adds: “Along with robust, detailed contracts, at a practical level storage will be very important. Industrial users will need uninterrupted supply. Since hydrogen will not be as fungible as natural gas – at least for the foreseeable future – supply bottlenecks need to be addressed.”



Borrowers will continue taking out comprehensive asset insurance packages to cover construction and operational risks, as well as third-party liabilities. The insurance market for blue and green hydrogen production will need to mature more quickly than grey hydrogen, market insiders argue.

Project financiers’ preferences for security over fixed assets, bank accounts and contracts for project companies will be matched by their desire to have borrowers pledge shares.

During this initial phase, dominated by blue and green hydrogen production, the market will likely see a fair share of guarantees by forward-leaning governments, export credit agencies and development finance institutions.

Behaghel expects that governments that have already strategized about hydrogen will turn those commitments into guarantees. [Australia](#), Japan and South Korea already have hydrogen targets.

Bankers would like to focus on markets and sectors with investor-friendly regimes and policy tailwinds and avoid reliance on unsustainable subsidies. An example of a favourable signal is the [Wollongong City Council’s pitch](#) to make Port Kembla the site of a production facility, as part of an NSW Standing Committee on State Development inquiry to develop the state into a hydrogen hub.

The proposal by Wollongong – Australia’s steel city – is also significant because it may portend other steel-producing cities, which are keen to decarbonise their production processes, to take a gander at hydrogen’s opportunities.

“A significant portion of the cost of green hydrogen production comes from renewables,” notes Shrivastava. “Some APAC markets may have excess renewable energy supply that could be tapped into to bring economic viability to green hydrogen production.”

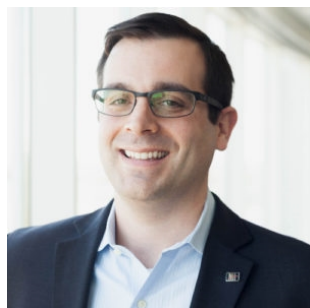
“Australia has huge ambitions with electrolyzers and commercial green hydrogen in general,” says the SMBC banker. “It’s entirely plausible they can do large solar and wind projects at cost that makes sense.”

He also highlights the mitigation of completion and performance risk. “Well beyond construction risk, we would want to see these units perform and expect strong warranties to be in the mix,” he says.

A bolt-on CCUS unit has the risk of leaks. Likewise, corrosion may be a factor in hydrogen pipelines. “Developers and technology providers would need to stand behind those warranties,” says the SMBC banker.

The dearth of performance history may translate into higher financing costs, but this is the case with any new subsector. In the meantime, bankers may turn to the supplier’s creditworthiness.

Intermountain Power Agency (IPA) in March (2020) awarded Mitsubishi Power with a notice to proceed to deliver two power trains for the Intermountain Power Plant in Delta, Utah. IPA is recommissioning the coal-fired power plant into an 840MW hydrogen/natural gas-fired plant.



“It’s really the world’s first gas turbines specifically designed to run on green electrolytic-produced hydrogen,” says Mitsubishi Power vice-president of renewable fuels Mike Ducker (pictured left).

IPA and the Los Angeles Department of Water and Power will respectively own and operate the facility. “The starting point is this is fully contracted,” Ducker emphasises.

Moving forward

Hydrogen financing faces challenges. While the number of governments expressing their commitment to hydrogen is growing, more of them need to articulate coherent hydrogen strategies, market insiders say.

“More and more countries will continue publishing hydrogen strategies,” remarks Clifford Chance’s Sealey. “Written policies help people get excited about the size of the market. But I’d be surprised if a project financing of a full-scale project closed within six months.”

He suggests sponsors, bankers and advisers in Asia Pacific study HyDeal Ambition – an initiative among more than 30 companies across the value chain to deliver 100% green hydrogen across Europe at €1.5/kg, including transmission and storage before 2030.

“APAC, of course, lacks the [EU’s coordination](#),” Sealey recognises, “but the project’s value-chain approach, based on extensive market research, may accelerate us to where we want to go.”

Behaghel anticipates government-to-government hydrogen pacts to proliferate.

Australia and Japan have agreed to work together on hydrogen. “Australia and Japan recognise that hydrogen is a key contributor to reducing emissions, especially when produced from renewable energy or fossil fuels combined with carbon capture, utilisation and storage,” said Minister for Resources and Northern Australia Matt Canavan in a statement in January 2020.

Singapore and Chile in February (2021) also signed an MoU to collaborate on low-carbon hydrogen technologies.

More recently, Canada and Germany in March (2021) [entered into an agreement](#) to collaborate on a number of “shared energy priorities”, including hydrogen and LNG. Germany and Saudi Arabia have also [signed an MoU](#) on the production and use of hydrogen during a German-Saudi virtual session.

Menski envisions a fair amount of work for [cluster projects in industrial zones](#). Investment in bolt-on assets to bring a hydrogen production component to existing facilities or upgrade legacy natural gas pipelines to transport hydrogen may not require project financing.

“We continue to engage with developers and technology providers all around the world,” says a market insider. “We’re already invested in a large gas grid that has been at the leading edge of hydrogen and has pilots pushing forward.”

An institutional investor anticipates Europe to remain the leading region for hydrogen. “Government support is the only way this thing is going to get moving from a practical standpoint,” they confide.

“While our team independently looks at hydrogen’s trajectory, it’s better to learn through an existing platform or portfolio company. They will have a strong network and good relationships with governments.”

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