CLIMATE ENERGY FINANCE

The massive green iron opportunity is there for Australia to develop, but it requires strategic public capital investment and a decarbonised grid

By Tim Buckley, Annemarie Jonson and Matt Pollard, CEF

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Sweden's H2 Green Steel (H2GS) – founded in 2021 to produce green steel at globally significant scale using green hydrogen and powered by fossil-free electricity – fresh from raising €5bn of new capital to finance its domestic plant near Boden, is now exploring a new €1.5bn equity raise to build a second world leading, world scale low-emissions steel plant in Canada to supply its North American customers, leveraging Quebec's hydroelectric power.

The financing of the Boden plant is the largest equity placement in Europe this year. H2GS raised €1.5bn in equity for the world's first large-scale green steel plant (to produce 2.5Mtpa by 2026 rising to 5Mtp by 2030, cutting emissions by 95% in the process, strongly supported by the EU ETS and decarbonisation policy commitments) and Europe's first giga-scale electrolyzer. [1] H2GS has assurances of €3.5bn in debt financing underpinned by a pledge from the Swedish National Debt Office of a "green credit guarantee" of €1bn. Equity leverages debt, public capital leverages private.[2]

As for H2GS' new Canadian foray, the proposal will require capex of another €3-6bn. One potential plan is for H2GS to build a renewables-powered electrolyzer to replace coal with hydrogen for the production of green iron for export, with the alternative more ambitious scenario a full green steel mill delivering some 2,000 jobs. H2GS has made clear it requires the supply of 100% green power. The firm is looking for as much as 700 MW of electricity, ~1.5% of Quebec's actual capacity.

These are globally significant landmark developments in the greening of the steel industry – a sector which contributes 7-8% of global carbon emissions. Australia, as by far the world's biggest exporter of iron ore (A$124bn in 2022/23), has untold potential to value-add to green iron pre-export. These developments also point to three key conditions of possibility of broad-scale industrial decarbonisation: a clear and ambitious government policy framework; a

[1] H2 Green Steel raises €1.5bn in equity to build the world's first green steel plant, 7 September 2023
[2] Canary Media, The world's largest low-carbon steel plant moves closer to completion, 8 September 2023

significant, strategic national public investment in cleantech industry development to leverage private capital investment at scale; and the availability of abundant zero-emissions firmed renewable power for the processing and production of energy transition materials. This includes green iron and steel but also encompasses processed critical minerals, batteries, and green ammonia, hydrogen and aluminium.

September 2023 saw Northvolt of Sweden announce a C$7bn new factory complex in Montreal to manufacture EV batteries, following similar plant announcements by Volkswagen AG and Stellantis NV factories in Ontario. These investments all leverage strong clear policy support by the Canadian government.

October 2023 saw Korea's LGES announce the world's largest battery supply contract to-date, a 20GWh pa decade long supply agreement with Toyota US. LGES is building 8 new battery factories across the US. Outside of China, this is an unprecedented investment in expanding battery manufacturing capacity and supports a massive buildout of global battery material supply chains, something Australia is perfectly positioned to do.

Australia needs to redouble its efforts on these fronts – speed and scale of ambition is critical. Global capital is moving, and the energy transition is accelerating thanks to the ~$800bn US Inflation Reduction Act (including the Loan Program Office's US$400bn of capital) which has triggered a massive influx of private investment into manufacturing and decarbonising the US economy, as well as comparable flagship energy transition policy responses from Japan, Korea, Canada, India and Europe following the decade-long lead that China has opened up in the global technology and investment race to secure zero emissions industries of the future.

In 2023, China is installing a mind-blowing 20GW per month of new wind and solar, each and every month – 156GW in the eight months of this year to August, +120% year on year – and directing vast capex via its State Owned Enterprises (SoEs) into meeting its renewables targets and bolstering its defined "emerging industries", including "energy efficient and environmental technologies,high-end equipment manufacturing, new energy, new materials, and new-energy vehicles", as CEF's forthcoming China SoE report will track.

In the Australian context, Federal Resources Minister Madeleine King has confirmed that tax breaks for critical mineral projects and lithium processing are "on the table", as the government seeks to compete with the US and our other allies for international investment.[3]

We recommend tax incentives and patient public capital also be applied to facilitate the world-leading development of green iron – Australia must move beyond the 'dig-and-ship' mentality of the last few decades to value-add onshore, powered by our world-leading renewable energy resources. This is a blue-sky ~$100bn pa value-add uplift opportunity to enable Australia to secure its position in global green steel supply chains, helping our trade partners move to decarbonise. There is both the potential and need for global collaboration, for example with world-leaders Baowu[4], the biggest steelmaker in China, and Korea's POSCO, the world's sixth largest producer of steel.[5] Baowu and Rio have signed an MoU on potential

[3] AFR, Tesla's call for tax breaks for lithium is 'on the table': minister, 6 September 2023
[4] AFR, Rio, world's biggest steelmaker join forces on green iron plant in WA, 12 June 2023
[5] Small Caps, POSCO reveals plans to pour $142 billion into new steel and green initiatives, 4 July 2023

decarbonisation project partnerships, while POSCO has announced it will invest $142bn into projects aimed at significantly "greening" its global operations.

To facilitate and lock in opportunities for the development of green iron, Australian iron ore majors should be paying far more attention to targeting meaningful and credible reductions in their Scope 3 (exported) emissions, and directing capex to decarbonisation accordingly. Brazilian iron ore producer Vale has announced a new MoU[6] to supply 100Mtpa of low-carbon HBI (hot briquetted iron) beyond 2030 with H2GS as a key strategy to credibly deliver on Vale's scope 3 emissions reduction target.

A clear articulated path to net zero emissions by 2050 Scope 3 target is something "world leader" in iron ore BHP hasn't got – a clear omission in a rapidly decarbonising globe and symptomatic of the company's continued advocacy against Australian leadership and vision, its refusal to invest in decarbonisation at the speed and scale the climate science dictates, and to value-add onshore pre-export as it utilises Australia's public resources.

BHP CEO Mike Henry has recently argued that the federal government should decline to provide industry support for onshore value-adding of the critical minerals needed for the global energy transition. Ironic, or maybe hypocritical, as BHP alone booked an estimated $502m in 2022 from Australia's biggest fossil fuel subsidy – the federal diesel Fuel Tax Credit Scheme (FTCS) – making it by far the largest single recipient in Australia, all while maintaining its unblemished record of failing to invest any material capex in value-adding or decarbonisation in Australia over the last decade.

Rio Tinto lacks a measurable Scope 3 target at all, an omission likely to see increasing investor pressure, as alternatives to coal based steel production attract increasing investment globally and trade barriers to high-carbon exports proliferate. At least Rio doesn't have BHP's conflict of interest of being a major coking coal exporter. BHP and Rio are both under increasing shareholder pressure to act and align with the climate science.

Of the Australian mining majors, only Fortescue has made aggressive investments into decarbonisation, hydrogen and exploring green iron, investing in a renewable powered chemical electrolysis process that was first proven in the company's WA laboratories, whilst also partnering with Liebherr to co-develop its EV mine haulage fleet. While this program is yet to be implemented at scale, it is reflective of Fortescue's commitment to net zero Scope 3 by 2040.

On green steel, the Australian federal government should be incentivising domestic demand "pull", encouraging steel firms to pivot from outdated coal-powered blast furnaces to electric arc furnace technologies (such as GFG in Whyalla[7]). And it must resist caving in to luddite boards like that of BlueScope Steel, which has demanded Safeguard Mechanism exemptions so it can prolong its high emissions profile for another few decades even as its European competitors invest in the future and reap the enormous commercial, investment and climate benefits.[8] Representative of this is Bluescope's recent $1bn decision to invest in relining its blast furnace 6,

[6] Vale and H2 Green Steel sign agreement to study the development of green industrial hubs in Brazil and North America, 6 September 2023

[7] GFG, Coke Ovens Closure: Sun Sets On Coal In Our GREENSTEEL Voyage, 7 September, 2023

[8] H2 Green Steel raises €1.5 billion in equity to build the world's first green steel plant, 7 September, 2023

locking the company indefinitely onto coal-based steelmaking in Australia even as it greens its operations globally.

As noted above, availability of zero-emissions energy is integral to greening heavy industry. The green iron, steel and critical minerals supply chain race will be won by jurisdictions with abundant, low-cost zero-emissions energy to produce hydrogen, power DRI plants and use electrification to haul and process minerals and metals onshore. This means that in addition to industry investment and tax incentives, we need a rapid decarbonisation of the three main Australian grids – the National Electricity Market (NEM), the South West Interconnected System (SWIS) and in the Pilbara – and massive buildout of transmission, to prepare for an unprecedented electrification demand surge in onshore mining, processing and manufacturing, as well as in transport.

A coordinated approach between the mining and downstream processing and manufacture sectors, power utilities, State and Federal Governments and export partners like Baowu and POSCO and import partners like Liebherr, Idemitsu and LGES are all critical to accelerating the deployment of renewable energy generation and high-voltage transmission required to realize Australia's potential as a zero-emissions value-added producer of the minerals, metals and energy transition materials needed to achieve the global energy transition.

Transmission and distribution infrastructure are key bottlenecks to decarbonising Australia's energy grid. Queensland, for example, will require 1,500km of new high voltage backbone transmission to connect heavy industry and green hydrogen hubs like Gladstone and Townsville to regional renewable energy zones (REZs). The QLD Government announced the $5bn 1,100km high-voltage transmission project, CopperString 2032, to connect the North West Minerals Province to the national electricity grid. CopperString will be the largest grid expansion in Australia, and largest economic development project in North Queensland.

The decarbonisation of the Pilbara region of WA – a world-leading precinct for the production of iron ore and critical minerals – will drive unprecedented growth in the state's renewable energy demand, as Australia's energy transition material miners phase out diesel-dependent heavy haulage and electrify processing.

APA seems to be positioning itself accordingly to pivot towards decarbonisation, and help our mining sector in the process. Renewable energy generation will need to increase by 30x from 0.4 TWh in 2024 to 12 TWh by 2040 to support the forecast load of the North West Interconnected System (NWIS) – the interconnected electricity generation, transmission and distribution infrastructure in the Pilbara – Rio Tinto Pilbara iron, Fortescue Metals Group's (FMG) Pilbara Energy Connect and BHP/APA's Newman networks, from the electrification of haulage, rail and heavy machinery alone.

AngloAmerican is well ahead of BHP and Rio Tinto in Australia, announcing in October 2022 a strategic outsourcing alliance with EDF Renewables of France to jointly build out 3-5GW of renewables by 2030.

The Pilbara Industry Roundtable, including Rio, BHP, FMG and Roy Hill, has agreed to establish a new common user electricity infrastructure network. The common user infrastructure agreement is a critical milestone to deploying the multi-gigawatt scale of renewable energy

generation needed to transform the Pilbara into globally competitive green iron and lithium hydroxide hubs.

We strongly endorse the move by the Commonwealth-WA in their recent Rewiring the Nation deal to provide up to $3bn in concessional loans and equity investments via the Clean Energy Finance Corporation (CEFC) to enable major upgrades to the transmission networks of the NWIS and the SWIS, Western WA's main electricity network, serving most of the state's population.

The initiatives we outline above all work in tandem with the Safeguard Mechanism and Australia's targets of 82% renewables to deliver on the 43% emissions reduction by 2030. They also point to the need for an Australian Carbon Border Adjustment Mechanism (CBAM), to both protect our domestic trade exposed industries as they decarbonise at speed and respond to the upsurge in carbon tariffs amongst our trade partners globally, including the EU's introduction this month of a CBAM.

Australia requires a fiscal and policy response proportionate to the massive investment, employment and export opportunities ahead, leveraging our world leading renewable energy resources to export embodied decarbonisation to the world – including, but not limited to, decarbonisation embedded in the form of green iron.

Australia should be a value-added energy transition materials superpower. CEF joins our partners the Climate Capital Forum, the ACTU, the Smart Energy Council, Australian Conservation Foundation, Rewiring Australia, the First Nations Clean Energy Network and others in calling for an urgent federal commitment to an Australian Renewable Industry Package comprising $100bn of federal public interest strategic capital investment, to attract the additional $200-300bn of private domestic and foreign capital needed to position Australia a zero-emissions trade and investment leader. This call has recently been backed by peak body the Clean Energy Council.

The scale of Australia's opportunity is nation-building, but it is also time-critical as global decarbonisation accelerates. The window to act is now, and it is closing.