

# The West Australian



Matt Birney

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Public Companies

## Reedy eyes green pig iron production in WA



Molong's second-generation HIs melt pig iron plant in Shandong province, China. Credit: File

Reedy Lagoon is looking to produce “green” pig iron in Western Australia after an ongoing study pointed to the potential viability of a second-generation HIs melt facility to manufacture a high-purity intermediate pig iron product. The plan is to utilise feed from the company's massive Burracoppin iron ore deposit and biochar as the fuel load instead of the more traditional coal.

Recent work by industry experts, Dinsdale Consultants has continued to build the business case for the development of Reedy's Burracoppin magnetite deposit.

High-intensity smelting, or “HIs melt” has an interesting history in ironmaking, with WA having played a key role in the development of the innovative smelting process. HIs melt was first trialled in Germany in the 1980s before Rio Tinto took over its commercial development in the 1990s, building a research and development operation south of Perth near Kwinana.

By the 2000's, Rio had joined forces with Nucor, Mitsubishi and China's Shougang Corporation to ramp up the Kwinana plant to more than 800,000 tonnes per annum of production. The plant

processed a menagerie of metallurgically complex ores and various by-products from other operations to produce a high-purity pig iron – a specialty of the HIs melt process.

However, the WA HIs melt party ended in 2011 due to burgeoning smelting capacity in Asia, with the Kwinana mill being decommissioned before much of the equipment was sold to Molong Petroleum Machinery Corporation in 2013, who has gone on to build its own “green” mill at Yangkou, in China’s Shandong Province.

Molong’s second-generation plant seems to have ironed out many of the initial teething issues with the original facility and passed a key milestone in 2019, marking the production of its millionth tonne of pig iron.

Molong’s success has attracted the attention of a raft of aspiring green iron producers, with two new plants under construction in China and a further ten plants being considered for sites in China, North America, Europe and Reedy’s plant in Western Australia.

Reedy management says the HIs melt iron-making process delivers a raft of economic and environmental benefits. In addition to the cost savings in the construction of the processing circuit itself, as opposed to a conventional blast furnace, the HIs melt process can potentially be geared to produce zero net carbon emissions via the innovative use of “biochar” in the smelting process.

Both conventional and traditional HIs melt furnaces typically use coal as a reductant in the smelting of iron ore to produce pig iron, the intermediate product used in the later production of steel. Typically, conventional blast furnaces put out around 2 tonnes of carbon emissions to produce 1 tonne of pig iron, making the process less than ideal in a world looking to “decarbonise” its economy.

By contrast, HIs melt only produces 1.3 tonnes of carbon emissions to produce one tonne of pig iron when utilising coal as a reductant. However, these emissions can be further offset by replacing coal with biochar in the smelting process, reducing the net emissions from the process to zero – a feature that appears to be particular to the HIs melt process.

Biochar represents a green solution to the smelting process and may spawn an industry in itself due to the ability of biochar to capture carbon. Biochar is created utilising biomass from various tree species which are farmed and then subjected to “pyrolysis”. Pyrolysis involves cooking the biomass by subjecting it to high-temperature thermal decomposition in the absence of oxygen, preventing it from burning, which produces solids in the form of biochar in addition to bio-oil and syngas by-products.

Reedy’s consultants estimate that around 2 million tonnes of biomass would be required to produce 800,000 tonnes of biochar per annum, feeding a one million tonne per annum HIs melt pig iron production circuit. Dinsdale also highlights the location of the company’s Burracoppin deposit in WA’s wheatbelt as being near-ideal to establish a biochar production network, with biomass crop trials in Europe and North America flagging annual harvesting, low inputs, drought tolerance and remediating soils as being attractive features for a biomass program – all attributes found in the Wheatbelt of Western Australia.

Presently, the company is assessing a number of potential locations for a HIs melt mill including Collie which is near existing coal and biomass fuel sources.

Other potential sites are being assessed including the Kwinana industrial complex south of Perth that was the previous home to Rio Tinto’s HIs melt operations.

Northam also gets a gig as a potential site.

The farming town of Northam is just north of the company's Burracoppin project and Reedy highlights the potential for farmers to produce biomass as an alternate crop for use in a HIs melt operation.

With central wheatbelt covering an estimated 38 million hectares, there is plenty of scope for growing a potential feedstock.

Reedy also says a HIs melt plant may deliver other benefits to the West Australian economy, including the building of a level of vertical integration in WA's iron ore sector and producing "green pig iron" product for sale to steelmakers across the globe.

Curiously, the HIs melt process also generates a considerable amount of excess power during the smelting process which might be used to power local communities or play a role in the production of hydrogen gas says Reedy. Interestingly, in a sign that the State Government is getting serious about hydrogen, it just created its very first Ministry for Hydrogen and appointed Labor Party stalwart Allanah MacTienan to head it up as WA's first Minister for Hydrogen.

Reedy now looks to have its hands full as it attempts to assess the economics of its proposed iron ore mine near Burracoppin and the economics of a new generation HIs melt pig iron production facility.

Key to its evolving studies will be the massive Burracoppin iron ore deposit and the company's enviable access to supporting infrastructure and resources, including roads, rail, power, port facilities and potentially biomass.

With pig iron currently commanding more than US\$550 per tonne, more than triple the current iron ore price and demand forecast to quadruple over the next twenty years, there looks to be money to be made in this emerging green industry.

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