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Magnetite makes a comeback under magnate

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IAN Burston is a West Australian legend, a man synonymous with the development of the iron ore industry in WA.

Now executive chairman of Cape Lambert Iron Ore, he has held many executive management posts in the mining sector since being Hamersley Iron's managing director in the 1970s.

There he oversaw the development of the mining of hematite — first as lump ore then as fines, which was the foundation of the massive expansion of the Pilbara iron ore industry.

At Cape Lambert Burston is coming full circle, away from hematite and back to magnetite.

He says his latest project does not represent turning back the clock to magnetite but going forward by recognising its market advantages in an increasingly carbon constrained world.

Hematite is the most common iron ore and has a high iron content, which gives it its signature reddish brown colour.

Magnetite has a lower iron content and is usually blackish in colour. But it is not the colour that makes the difference, it is the associated minerals.

Hematite is usually associated with alumina.

This means that a lot of energy needs to be employed by steel mills in the sintering process that removes impurities such as alumina.

Magnetite host rocks do not contain alumina, but contain silica.

Because it has a lower iron content than hematite, magnetite has been regarded as a less attractive proposition.

In the 1980s, the iron ore industry was characterised by clanging of gates closing on uneconomic pellet plants.

"Every operator in the Pilbara had a pellet plant but by around 1985 they'd closed," Burston says.

They used a lot of energy to produce pellets, a product that beneficiated or improved the iron content and reduced the impurities, but at huge cost.

The Arab oil embargo of the late 1970s sent crude oil prices soaring — on an inflation adjusted basis even higher than today — and pelletising went out of fashion, similar to steam cars and lace-up boots.

Now, of course, the energy equation is different. Steel producers want to reduce the

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amount of energy they use for both cost and environmental reasons.

This makes pelletising in Australia for natural gas — rather than the oil fuel used in the 1970s and 80s — a far more viable proposition.

"What we are doing is taking the energy cost of removing alumina from hematite from the steel producers and giving them a high iron content product which requires them to use less energy to process into steel," Burston says.

"For them it is highly attractive."

He makes another point: quality control on many older pellet plants was not the best, meaning that the iron content could vary, posing problems for steel mill operators.

As a result, magnetite demand also fell and high FE content hematite stole a march.

What has changed now is the capability of producing pellets consistently with an iron content of more than 62 per cent when the average iron content of hematite fines is declining slowly below 65 per cent. Just as important is the capability of producing magnetite pellets with less than 5 per cent silica content.

There are a number of magnetite hopefuls in WA, particularly in the Murchison region east of Geraldton, but Burston argues that the Cape Lambert project located 5km from the Pilbara coast, 10km from Rio Tinto's Cape Lambert iron ore port with direct connection to nearby infrastructure and the townships of Karratha, Roebourne and Wickham, make it a shoo-in.

While comparative prices are not available — no supplying country to the world's steel industry markets both hematite and magnetite — Burston believes the energy cost equation is sufficiently well understood, particularly in China, that the slightly lower iron content of magnetite pellets compared with hematite fines is not an issue.

Cape Lambert Iron Ore is working up a bankable feasibility study with its project expected to be in production late next year, delivering up to 15 million tonnes of iron ore concentrate a year over a project life of more than 20 years.

That will be legendary stuff.