

Image courtesy of Engenium



Driving down the cost of rail in the mining sector

Following the rapid expansion of mining output over the last decade, it appears that the sector has entered a new era where the buzzwords and phrases include reduced capital intensity and sweating the asset. While the name of the game not so long ago used to be schedule and speed to market, miners are, by and large, more interested in reducing costs than doing things quickly. **Jennifer Perry** reports

For new miners, there are often less capital cost intensive start-ups available than rail such as road transport, but as output grows, miners invariably need to look at more efficient methods of transporting their product from mine to port. Rail haulage and particularly heavy haul rail haulage comes into its own as the volumes that need to be moved increase and as the distance from mine to port grows.

Engenium executive director, rail, Greg O'Rourke, has been involved in rail in the Pilbara iron ore industry since the early 1990s and says the expansion of the iron ore railways there and the introduction of new players into the industry has been truly incredible.

"There has been extraordinary growth in the volume of iron ore railed and shipped. 1991 Rio Tinto first exported 50 million tonnes in a year; in 2013 they are pushing toward 300mtpa. BHP Billiton has also experienced rapid growth of export tonnes, and Fortescue Metals Group has become a major exporter in the last decade," O'Rourke says, adding that a number of smaller players have also established themselves in the market.

For significant new greenfields rail developments, O'Rourke says the number one factor in driving down costs is the selection of the most appropriate corridor.

"Often the most critical part of a project is during the approvals process, yet there is a tendency to rush this process," he says. "Considering at least 80% of the value of a project is locked in during corridor selection, if the wrong corridor is chosen it is quite difficult to go back and alter it without impacting on the project's timeline."

O'Rourke believes it's crucial that engineers properly consider all factors during the route selection process, including engineering, heritage, geological, drainage and environmental considerations.

"Should all of these factors not be properly considered in the early work, it can be incredibly expensive or impossible to deal with them later" he says.

Over the course of time, heavy haul railway standards have changed in the Pilbara, with axle loads increasing from around 32 tonne to 40 tonne and above. As technology has allowed, mining companies have taken the opportunity to get more from less by

ramping up axle loads therefore using less trains for the same haulage task.

Another key area where the cost of rail can be reduced is in procurement of materials and equipment.

"In heavy haul rail, where axle loads can be 40t or more, the quality of key supply items can be critical. Competition from new suppliers can drive down costs significantly, so it is worth investigating and properly evaluating alternatives in order to realise capital cost savings," he says.

Third party access

Access to a third party's rail infrastructure can help for a low capex start-up, if that indeed is an option, though given the current third party access battles playing out in the Pilbara between miners such as FMG and Brockman Mining, this is by no means a fast or easy option.

"While sharing the cost of new rail infrastructure with others can help ease the capex burden, third party scenarios have been played out in the Pilbara iron ore

Image courtesy of Engenium

industry for the last 20 years with limited headway," says O'Rourke.

"There are a number of problems that emerge when a junior miner tries to get access to existing rail infrastructure. Providing access to another can provide capacity problems resulting in a need for a capital injection, access charges need to be agreed and operational parameters need to be established."

While these issues can potentially be overcome, there are limited examples of that occurring in the Pilbara. Inevitably, the obligation for one party to allow their infrastructure to be used by another most times ends up being tested in the courts.

An alternative pathway to becoming an iron ore exporter is to find a low capital cost start-up. Atlas' Pardoo project is one such example. The project benefited from its proximity to an existing deep water port, the ability to road haul relatively low tonnes and an increasing iron ore price.

"The result is a company that generated good revenues and moved quickly from explorer to producer," O'Rourke says.

As a company expands production and new mines are further from the coast, increasingly it must look to rail to meet that increasing task.

"While a solid history of earnings can provide easier access to capital markets, the capital intensity of new projects is still a major consideration," he says.

Engenium's executive director, resources, David Sourbutts, has a wealth of experience in the resources industry with large mining companies, junior miners and explorers who wish to move into production. He is also an expert on what is known as scalable logistics.

Sourbutts believes that with most bulk commodity projects such as iron ore and coal, once the resource is proven, the project becomes a logistics/infrastructure challenge as opposed to a processing challenge.

"While it is desirable to have world class and operationally efficient infrastructure



from day one, this is often just not economically viable," he says.

"A scalable logistics solution might start with a minimum capital cost solution with low tonnes being hauled by triple road trains on public road at a relatively high operating cost.

"As the tonnes grow, it might then move to a higher (but still relatively cheap), private haul road solution with bigger trucks, and a reduced operating cost.

"Finally if it has the tonnages to support it, the project might move to a high capital cost solution such as a railway, with minimum operating cost, or a miner might jointly develop a rail solution with others to create the economy of scale required."

Two projects that Engenium have been involved with in Africa demonstrate a scalable logistics and low capex start-up solution.

The first, a project in Sierra Leone, has aimed to put limited tonnes onto another party's railway in order to establish itself and then consider its options for expansion while generating free cash.

The second, also in West Africa, is considering barging 2mtpa down a major river to the port which also represented a quick and low cost start-up. The next stage will be to build an extension to an existing railway, which will enable it to increase tonnes significantly.

"Both of these projects illustrate a low cost start-up to help generate revenues and cash flow," says Sourbutts. "However, expansion of production will require the logistics chain to be scaled up to meet an increased haulage task."

Sweating the asset

The term sweating the asset generally belongs to existing producers that already own rail networks, often ageing. The idea of sweating the asset is basically to get more from it. This might mean changing the operating system or parameters, for example, more efficient trains, better rostering, and improved maintenance practices. It can also mean improving the existing asset, for example, targeting bottlenecks in the rail system such as low speed sections, along with spending targeted sustaining capital on removing these constraints and raiiling more tonnes through the same asset.

O'Rourke says this approach is certainly nothing new.

"In the early 1990s Rio changed its rail operating philosophy and were able to rail the same number of tonnes with 232 less ore cars," he says, adding that these efficiencies were necessary at a time when the real price of iron ore had been in decline for 20 years.

"At the end of the day, getting more out of your asset is the same as being more capital efficient.

"It is the responsibility of engineers and managers in the rail industry to always be looking at new and more efficient ways of improving the competitive advantage of rail."

And getting more out of what is already there, pushing the limits of technology, selecting the best route and utilising the principles of scalable logistics are just some of the ways that this can be done.

Looking ahead, O'Rourke says if Australia is to maximise its advantages in the mining and export of bulk resources, it needs to ensure continuous improvement so that the mining industry benefits from the most efficient supply chains possible. ■



Image courtesy of Engenium