Logistics provides the crucial link between a mineral's mine and market, be it container-shipped graphite and lithium, or dry bulk transported iron ore, coal, barite and magnesite. But with global minerals and metals evolving quicker than ever before, is this mature industry ready for modern day demands?

THE CHANGING ART OF MOVING

Sibelco's Head of Shipping, Frank Solberg at IMFORMED's Mineral Logistics 2015 which set the stage for discussions on the future of transporting raw materials

From Rotterdam, Netherlands

It has long been said that a mineral without a market is just a geological curiosity. One of the only links standing between a mineral being a valuable raw material and remaining in the ground is logistics.

Many new mining projects that are low cost to extract fail on logistical grounds. Yet moving minerals is a somewhat private industry despite being global and it is a sector that is not used to significant change.

Dry bulk and container are the mainstream methods in which raw materials are transported across the world's oceans. Over the last three decades, the flow of international trade has increasingly come from the lowest cost mining areas in the world, including Africa, Brazil, South Africa, Australia, but most importantly China.

China's supply and demand of raw materials such as iron ore, bauxite and coal has created the blueprint for the modern day logistics industry.

Since 2011, however, growth has stagnated and its major customers, such as the US, Japan and Germany, have settled at a new lower equilibrium for mineral consumption. In short and in general, the boom years are over and the world is getting used to consuming minerals and metals at a much slower rate.

"Industry is being disrupted and this is being forgotten. Everything is now changing a lot faster," Geert Lagae, supply chain manager at Belgium's Vlassenroot Group said at the inaugural IMFORMED Mineral Logistics Forum 2015 in Rotterdam, Netherlands.

Logistics has long been seen as an industrial stalwart of the mining industry, but delegates at IMFORMED's launch event heard how it plays a crucial link between all raw materials, whether industrial or hi tech.

"If you can't grow it, you'll have to mine it," said logistics expert Clive Kessell, director of Coastalwise Ltd. "Logistics knits everything together."

Since the boom times, however, the logistics industry – which consists of many disciplines including shipping owners, brokers, traders, port authorities, port handling and storage companies – has had to deal with a stop-start market asking whether the sector is efficient enough.

"You will always hear from the market: this is how we have done business for 120 years. But it's now not true," explained Vlassenroot Group's Lagae.

"Customers are ordering smaller quantities and no one keeps stocks anymore," he added.

Destocking of the mineral supply chain has been a dominant trend since the global financial crisis as stocks equate to cash and, in tough economic times, cash becomes king.

In the recent boom periods of 2005-2008 and 2011, there was a race for raw material supply before the next price hikes were put in place. 2005-2008 especially was the sellers' market to beat all sellers' markets and as a result companies purchased what they could for storage as strong growth in demand was all but guaranteed. With this growth, new shipping capacity and storage facilities were needed - almost everyone was winning.

Today, we are in a very different world and it is one that has asked questions of those developing new storage capacity. Especially if major end users such as UK glass producer, NSG – as the Rotterdam delegation heard – prefer just-in-time deliveries of its Scottish silica sand and Turkish feldspar, as explained by the group's Raw Materials Manager Tim Smith.

Mike O'Driscoll, Forum Chair and Director, IMFORMED, explained: "The NSG case study of its captive Lochaline silica sand source is a prime example of one of the key trends we have seen over the last few years, and continuing, of large volume mineral consumers vertically integrating upstream to secure their own raw material supply in order to ensure consistent and uninterrupted supply availability and quality."

However, Imerys SA, the world's largest diversified mineral group, explained how it sees storage playing a pivotal role in softening the unpredictable peaks and troughs in supply and demand.

"Storing minerals protects the value chain from inefficiency – it's an insurance policy," Thierry Salmona, the group's Chief Technical Officer told IMFORMED's delegation.

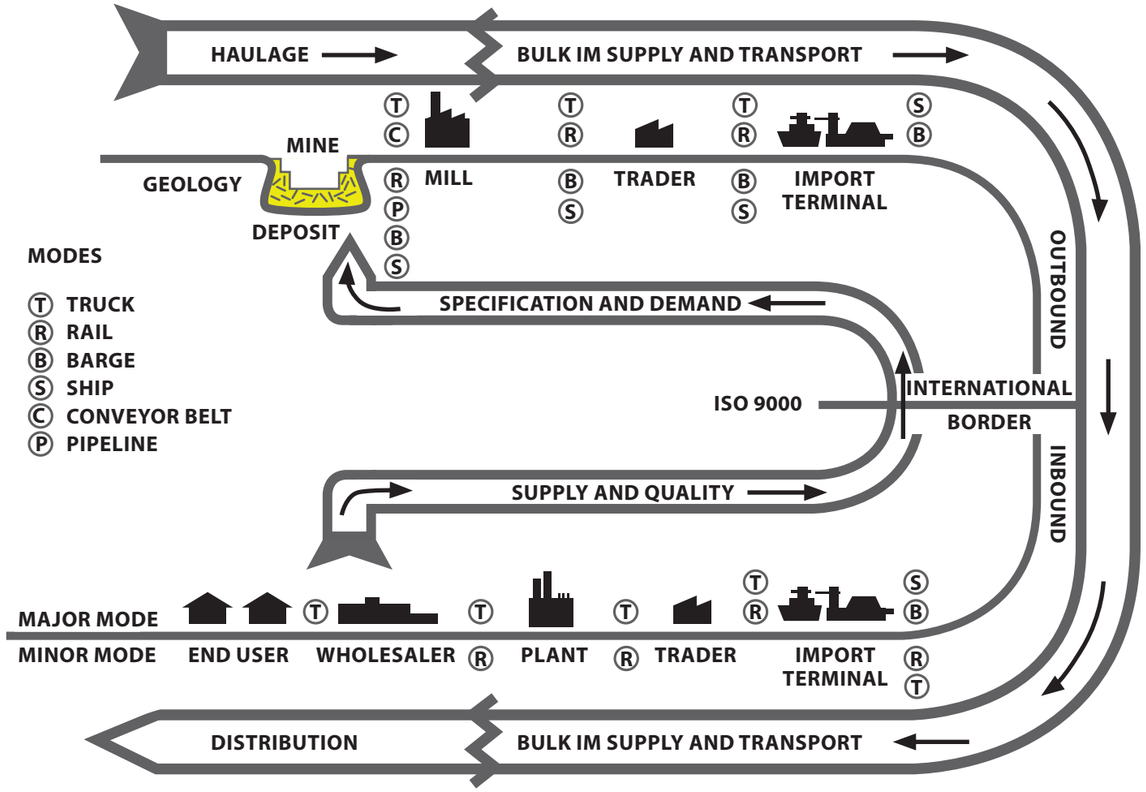
"Long term, however, I expect storage capacity to decrease as supply chain efficiency increases. But it's a pendulum, so don't stick your neck out," Salmona added.

Imerys, a French-based company with a 2014 revenue of €3.6bn, specialises in both bulk raw materials such as talc, kaolin and calcium carbonate in addition to speciality raw materials like graphite and white fused alumina. Mastering these global supply chains has become central to its success.

Another critical factor in Imerys' dominance is adding value and creating new products. As Salmona explained, the company was not ▶

TRANSPORTING A MINERAL FROM MINE TO MARKET

With a mineral's market very rarely located at its source, the logistical operation to transport raw materials to the other side of the world is complex



Source: Santini, Barker and Bentzen 2006, from a presentation by Mike O'Driscoll, IMFORMED Logistics Forum 2015

▶ satisfied in 2011 when it saw that 5% of its revenue came from new products, therefore the group focused on increasing the figure and in 2014 it rose to 12%, or €449m euros.

Speciality versus bulks

At the IMFORMED meeting there was a clear split between minerals such as barite, kaolin and magnetise, which are dry bulk shipped in huge volumes of up to 75,000 tonnes and speciality minerals such as graphite and lithium, which are container shipped in smaller lots of 50 tonnes.

This subject also divided the audience with little cross-over between bulk and container disciplines.

For example, Imerys transports huge tonnages of kaolin clay – the paper and plastics raw material – in 35-40,000 tonne dry bulk shipping vessels from the depths of Brazil into a specially designed hub at Antwerp port, which can handle 600,000 tpa kaolin.

Meanwhile, Magnesita Refactários, the Brazilian magnesite, talc, dolomite, and refractories producer, explained how it transports minerals such as magnesite and graphite from China to Brazil via both dry bulk and container.

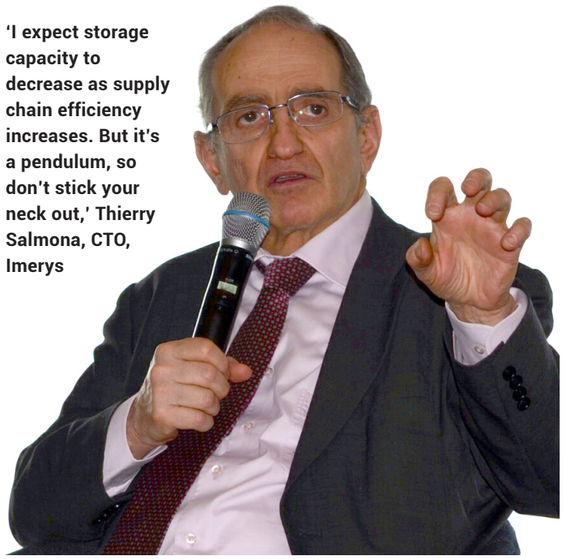
It was especially interesting to see Rio Tinto Iron and Titanium explain how it favours the more expensive and specialised container shipping method over bulk shipments, especially as the group is a classic bulk commodity company and the second largest miner in the world.

As well as titanium minerals and zircon from South Africa, Madagascar, and Canada, Rio Tinto mines borates in southern California, a mineral that finds end uses in ceramics, glass, batteries and fuel cells.

It led to the question: as mineral companies are forced to specialise and innovate their products in tougher economic times, are they likely to favour containers as their first choice of transport?

Robert van Muiden, CEO of RoBuLog Rotterdam Bulk Logistics explained his vision of the future where increasing amounts of minerals are container shipped to ensure ease of transport and a lower chance of contamination.

"More minerals are moving into containers," explained van Muiden,



'I expect storage capacity to decrease as supply chain efficiency increases. But it's a pendulum, so don't stick your neck out,' Thierry Salmona, CTO, Imerys

Credit: Mike O'Driscoll, IMFORMED

who cited battery raw materials such as graphite and lithium as growth markets in the sector. He outlined that although the prospects appeared bright for containers in general, innovations were still needed in the space, which has not fundamentally changed since their widespread adoption in the 1960s.

One particular development described by van Muiden, new to Europe and certainly, until this presentation, unknown to the audience upon asking, was Arrows Up Inc.'s Jumbo Bin System.

The Jumbo Bin is a steel and fibre glass square container holding a maximum of 27.4 tonnes of raw material which sits on a 20ft modified chassis and can be loaded through the top and discharged from its floor.

Key features of the Jumbo Bin include it being integrated, intermodal, and universally transportable; transport of product from source to destination in one contained unit; and savings on transloading and demurrage. To date they have been used for shipments of frac sand, cement, and clay.

The sentiment, however, was also backed by Michael Dai, Manager of Trade and Finance at Chinese company PJYT Logistics Co Ltd. The company, which specialises in coal, bauxite and barite mining and transportation in southern China, explained how its own government is backing increased container shipping by offering discounts of up to 30%.

"Containers have really improved mineral transport in south-west China," Dai explained.

"The government has supported the situation as well, with the China Railway Company offering 10-30% discounts for mineral companies that use containers."

Dai also outlined how China is benefitting from open top containers, which are new in the country but have been in use in Europe for some time. He explained a concept that would eliminate sea freight for minerals from China should container transport take off in a major way.

The "one belt, one road" vision that Dai outlined to the audience would see minerals being container transported from China through Mongolia, Russia and into Europe by rail – a route which could take only 15 days compared with the 45 days for sea bound freight. While some niche mineral logistics companies specialise in this at the moment, costs can still be four times higher than sea freight.

China also faces a major efficiency issue. With the world reliant on the country for many of the lowest cost raw materials, full shipments flow from China into Europe and North America but more often than not the vessels return empty. Dai explained that if China could work harder to fill these ships then costs could fall further. With demand for Chinese raw materials falling from all time highs between 2011-2013 and with no sign of a return, this is something that its companies will have to address imminently.

Destined to be the minnows?

It was Sibelco that probably gave the most home truths to the delegation.

One of the world's largest minerals groups and a long time competitor to Imerys, Sibelco Europe's head of shipping, Frank Solberg, explained how it struggles with securing long term, low cost logistics.

"Mineral companies are small players in the global freight market," said Solberg.

"At Sibelco we have around 650 shipments a year from 2,000 tonnes up to 75,000 tonnes and we are still a minor operation. We are not BHP Billiton or Glencore and don't have this kind of market power," he added.

For companies in the niche minerals and metals segment of the mining sector, this will always be an impossible challenge to compete with huge volumes of raw materials of iron ore, coal and bauxite.

For example, the natural graphite industry produced 375,000 tonnes in 2014, while barite – the oil and gas drilling mineral – mined 9m tonnes and the world's magnesite mines produced 7m tonnes.

Compare these numbers to the 1.7bn tonnes of iron ore produced last year alone and the challenge becomes clear.

Should the big commodity producers assert more pressure onto the shipping market, niche mineral and metal producers will be pushed into more specialised shipping methods.

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