

Iron ore and rare earth metals mining: an industry under siege?

By Wayne Visser

Resource scarcity and human rights issues surrounding metals extraction, coupled with unrelenting global demand mean the industry is facing some tough realities.

The good news: the number of people living in extreme poverty could drop from 1.2 billion in 2010 to under 100 million by 2050, according to UN projections. The bad news is that the flotilla of hope currently rising on the tide of economic growth in emerging countries is at serious risk of being dragged down under the waves. The reason is growing resource scarcity and the environmental disasters that could ensue.

As always, the poorest will be worst affected. The UNDP projects that, under an environmental disaster scenario, instead of reducing the population living in extreme poverty in south Asia from over half a billion to less than 100m by 2050, it could rise to 1.2bn. In sub-Saharan Africa, the numbers may rise from under 400m to over a billion. For the world as a whole, an environmental disaster scenario could mean 3.1 billion more people living in extreme poverty in 2050, as compared with an accelerated development scenario.

The message is simple: unless these booming economies – and the high-income countries they churn out ‘widgets’ for – can lighten the weighty anchor of resource consumption, we will all, sooner or later, get that sinking feeling. To illustrate the point, demand for steel – driven in no small part by a global car fleet doubling to 1.7bn by 2030 – is expected to increase by about 80% from 1.3bn tonnes in 2010 to 2.3bn tonnes in 2030. These trends raise red flags about material shortages of many metals in the future.

Besides steel, rare earth metals are cause for concern, as they comprise 17 chemical elements that are critical in the automotive, electronics and renewables sectors. Not only is demand for these metals rising, China is responsible for about 97% of global production. The United States, Japan and Germany are making big investments to secure their own supplies, but these new mining projects may take a decade to come on stream. As a result, supply shortages are predicted. Yet rare earth metal recycling rates remain very low – only 1% in Germany, for example.

Add the challenge of ‘conflict minerals’ – and the metals sector starts to look like the Titanic. The metals of most concern right now are tantalum (or coltan), tin, tungsten and gold – collectively known as 3TG – which are used extensively in the electronics industry. The Democratic Republic of Congo (DRC) and adjoining countries have been the hot spots – and the target of legislation like the Frank Dodd Act in the US – but other conflict minerals can (and probably will) arise for other metals in other parts of the world in future.

Besides resource scarcity and human rights issues, the mining and metals industry has significant environmental impacts, especially on land, energy and water. Trucost estimated that the largest metals and mining companies of the world have environmental external costs of around \$220bn, 77% of which relate to greenhouse gases.

For iron ore, if carbon prices would rise to a level of \$30 per tonne, iron ore costs would increase by 3.3% across the industry. An adequate incorporation of the water costs of iron ore mining would result in a 2.5% cost increase. Combining carbon and water costs, this could mean increased costs of up to 16% for some operators in water-scarce regions. These land, energy and water impacts also appear to be increasing, as about three times as much material needs to be moved for the same ore extraction as a century ago.

The picture that emerges is of a metals sector under siege, an industry that is soon to be the victim of its own success. And yet it is also one of the sectors that has the most potential for innovation and technological solutions. McKinsey and Co estimate that iron and steel energy efficiency and end-use steel efficiency could deliver \$278bn in resource savings by 2030 and go some way towards

addressing the metals scarcity crisis. The metals sector may still be in danger, but sustainable technologies could make the situation better.

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