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The closure
of the
Lynemouth
aluminium
smelter:
an analysis

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April 2012



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Introduction

Demand for aluminium within the UK has increased steadily over the last four decades, resulting in a 20,000-strong workforce and an estimated £3 billion annual turnover across the industry in 2008.¹ In addition, aluminium production plays an extensive role in the wider UK manufacturing supply chain. Of the aluminium consumed domestically, around four fifths are used by four key sectors: building / construction, transport, packaging and engineering.

Until recently, there were three major aluminium smelters in the UK:

1. Anglesey Aluminium (145,000 tonnes of production annually (tpa), closed September 2009)
2. Lynemouth (178,000tpa, to be closed May 2012)
3. Lochaber (43,000tpa)²

However, the financial crisis has had a major impact on the UK's production of aluminium. Primary output from all UK smelters dropped by 60 per cent to 130,000tpa in 2009, and some individual plants saw orders drop by as much as 90 per cent.^{3,4} Since then, Business Monitor International,^{3,4} a leading industry analyst, predicted prior to the announcement of the closure of Lynemouth:

While we forecast a return to operating rates of 90 per cent of the 221,000tpa capacity from 2011, this is weighed down with negative risk with the very real prospect of one or both of the country's smelters [Lynemouth and Lochaber] closing amid adverse market conditions.⁵

The pressure on the industry is set to rise drastically in the next few years, mainly as a result of increased climate change regulation and a likely rapid rise in energy prices. This situation is further exacerbated by additional factors such as a persistent incoherence within UK energy policy and the impact of global market distortions as production remains much cheaper in some countries such as China. The combination of challenges facing this vulnerable UK sector substantially undermines the industry's competitiveness, stifles investment and threatens the breakdown of its highly integrated supply chain.

¹ Alfed, *Lunch Briefing for Senior Civil Servant*, 5 October 2010. Accessed: http://www.alfed.org.uk/downloads/documents/JG9NGAJQFE_President_s_Address_Mr_Colin_Davies.pdf

² House of Commons Hansard Debates, *Aluminium Industry*, 2 February 2010

³ Business Monitor International, 'Executive Summary', *United Kingdom Metals Report Q4 2010*, October 2010

⁴ Alfed, *Annual Report*, 2009, p.3

⁵ Business Monitor International, 'Executive Summary', *United Kingdom Metals Report Q4 2011*, November 2011

The aluminium production process

The manufacture of primary aluminium consists of three steps: bauxite mining, alumina production and electrolysis. Bauxite is a clay-like mineral rich in aluminium oxide (alumina), but contains many impurities that must be removed. Four tonnes of bauxite are needed to produce two tonnes of alumina which in turn produces one tonne of aluminium. Aluminium is formed at about 900°C, but once formed it has a melting point of only 660°C, making recycling much easier and more cost-effective than production. The energy-intensive nature of the initial production process, equating to over one third of overall production costs, means that production location is largely dictated by the availability of electricity that is both reliable and cheap.

Unlike other commodities, the price of primary aluminium is internationally set by the London Metal Exchange (LME). Between 2003 and 2006 prices increased dramatically by 82 per cent and reached a cash-buyer value of US \$2500/tonne.⁶ Though the price of aluminium dropped to US \$1200/tonne during the earlier stages of the economic recession, it was relatively stable throughout 2010, remaining at approximately US \$2300/tonne.⁷ As a result of LME-set prices, the industry's ability to compete is directly linked to its local operating cost structure. Energy costs, competitively-priced raw materials and adherence to environmental regulations are major components of the UK industry's production costs.

The aluminium industry has seen a significant shift in the location of production facilities in recent years, away from the older industrial powerhouses of the USA and Western Europe and towards new industrial powers including China and the Middle East, as domestic energy suppliers become more reliable while still remaining cheap. In 2009, China is estimated to have produced around 17.7 million metric tons, over four times the output of Western Europe as a whole.⁸ The network of private producers of aluminium operating in this increasingly global market has been relatively re-consolidated in recent years, with only 20 companies representing 65 per cent of the world's primary aluminium production.⁹ As part of this consolidation and acquisition process, Rio Tinto gained ownership of Lynemouth and Lochaber, the two remaining primary aluminium smelters in the UK after the 2007 acquisition of Alcan Inc.

⁶ International Energy Agency, *Issues Behind Competitiveness and Carbon Leakage*, 2008, p.61. Accessed: http://www.iea.org/papers/2008/Competitiveness_and_Carbon_Leakage.pdf

⁷ Alfred, *Parliamentary Breakfast Meeting*, 1 October 2010, p.1. Accessed: http://www.alfed.co.uk/downloads/documents/QNFTNGQXLL_Presentation__H_Dickinson_12Oct10.pdf

⁸ International Aluminium Institute, *Consolidated IAI Primary Aluminium Production Reports*, March 2012. Accessed: https://stats.world-aluminium.org/iai/stats_new/formServer.asp?form=16

⁹ International Aluminium Institute, *The Aluminium Industry's Sustainable Development Report*, 2000. Accessed: <http://www.world-aluminium.org/cache/fl0000107.pdf>

The closure of Anglesey Aluminium

The loss of Anglesey Aluminium, a smelter facility responsible for almost half of the domestic primary output, cost the industry 400 jobs and 145,000 tonnes of annual production. The Anglesey Aluminium plant was forced to close due to the non-renewal of its long-standing low-cost energy supply contract with the nearby Wylfa nuclear power station. As the power plant had passed into state ownership, the lower price for energy was classified under EU law as 'state aid' and therefore deemed illegal. Philip Dunne MP argued in the Commons that 'the failure of the Government to recognise that the country needs an efficient and cost-effective energy policy has led to the demise of the nuclear plant at Wylfa, with no adequate replacement to allow production to continue at Anglesey'.¹⁰ The loss of Anglesey had a knock-on effect for the wider supply chain, as British companies working with aluminium struggled to source the metal. While its closure should have been a wake-up call to the government to avoid the erosion of the rest of the primary aluminium industry, there was no such realisation.

The Lynemouth closure

The Lynemouth smelter was opened in 1973 by Alcan, a Canadian company, and a new power station was built nearby to power the smelter. In 2007, Rio Tinto bought Alcan, and therefore took over ownership of the Lynemouth plant as well, which has been estimated to have contributed £60 million to the local Northumberland economy.¹¹ In only five years since then, the newly renamed Rio Tinto Alcan announced the closure of the Lynemouth smelter, in a move that will cost at least 323 out of 515 workers their jobs when the plant finally closes in May 2012. This is not the full extent of the job losses, given a further 3,500 workers are employed down the supply chain.¹² As of 29 March 2012, the power at the site has been switched off.

The official explanation from Rio Tinto Alcan was that 'energy costs are increasing significantly' and a 'thorough strategic review' were the cause of its demise.¹³ No buyer could be found for the plant,

¹⁰ House of Commons Hansard Debates, *Aluminium Industry*, 2 February 2010. Accessed: <http://www.theyworkforyou.com/debates/?id=2010-02-02a.275.0>

¹¹ BBC News, 'Alcan Lynemouth smelter: Landmark day as closure starts', 29 March 2012. Accessed: <http://www.bbc.co.uk/news/uk-england-tyne-17545827>

¹² *Financial Times*, 'Doubt cast over power plant's future', 23 April 2010. Accessed: <http://www.ft.com/cms/s/0/d7529c58-4e39-11df-b48d-00144feab49a.html#axzz1qDYsKOsY>

¹³ Rio Tinto press release, 'Rio Tinto Alcan announced intention to close Lynemouth aluminium smelter, 16 November 2011. Accessed: http://www.riotinto.com/media/5157_21255.asp

and the one offer proposed was rejected by Rio Tinto Alcan on the grounds that the buyer was financially unstable. In December 2011 the rejected buyer went bust.¹⁴

As stated, the site also houses a power station, which was used exclusively for the aluminium manufacturing process. The fate of this station is not yet certain and Rio Tinto Alcan is currently in talks to sell this off despite the plant's closure. The power station employs a substantial 111 workers, so a successful sale would still be very important to the highly impoverished area, which has no other large private sector employers. However, no deal can be made until regulations have been created to allow it to continue operating independently of the smelter. Nonetheless, it is expected that a buyer will be announced in the summer of 2012.

There are two principle reasons for the closure of the Lynemouth plant: energy costs and Rio Tinto Alcan's own priorities. Both are independently very important, but it shall also be seen that they are inextricably linked.

Energy costs

The spiralling energy costs about which Rio Tinto Alcan complained are indeed dire and a major reason for the Lynemouth smelter's closure. These increased costs are intimately tied up with legislation aimed at decarbonising the economy. The full effect of these policies, both in terms of their impact on energy costs and the environment, are discussed in great detail in the Civitas publication *Chain Reactions: How the chemical industry can shrink our carbon footprint*. This examines their effect on the chemicals sector, another energy-intensive but valuable industry, and the pessimistic outlook is as valid for the aluminium sector. To avoid repetition, readers are advised to read this report if they want detailed explanations of the brief outlines discussed here.¹⁵

The most damaging of all additional energy costs are those that are imposed unilaterally, so that British energy-intensive industries pay costs that their rivals in other countries do not. With the addition of the most recent of these, the carbon price floor, total UK electricity costs in 2013 will be raised by 24 per cent for energy-intensive sectors.¹⁶ To put this in perspective, German energy-intensive businesses will only be paying 16 per cent extra through government-added costs at the

¹⁴ Morpeth Herald, 'Smelter bid refusal was the right decision', 30 March 2012. Accessed: <http://www.morpethherald.co.uk/news/business/businesses-news/smelter-bid-refusal-was-the-right-decision-1-4396275>

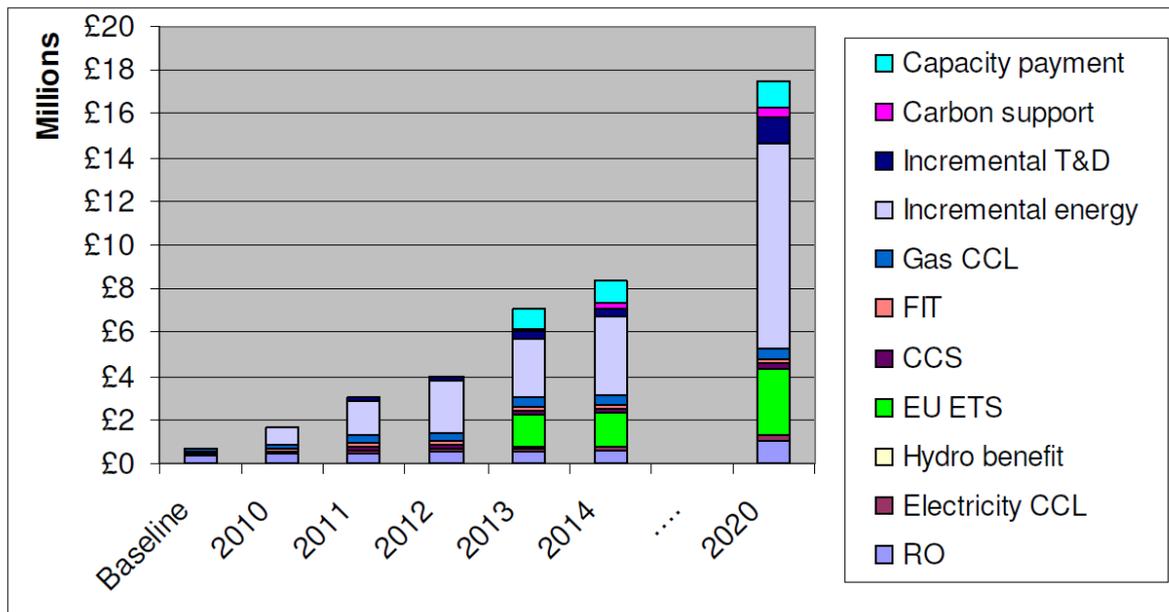
¹⁵ Merlin-Jones, D., *Chain Reactions: How the chemical industry can shrink our carbon footprint*, Civitas (London), June 2011

¹⁶ *Financial Times*, 'UK manufacturers to bear greater energy costs', 27 October 2011. Accessed: <http://www.ft.com/cms/s/0/ae4099de-00b0-11e1-930b-00144feabdc0.html#axzz1liWM8B6m>

same time. Figure 1 demonstrates the total effect of all energy policy changes up to 2020 for an UK average energy-intensive user. As can be seen, the costs will rise sharply from next year, with an increase of over £13 million expected in just eight years. This explains why finding a buyer for the Lynemouth plant was impossible: no company wanted to be saddled with the future costs that Rio Tinto Alcan was unprepared to pay.

The main issue here is that aluminium production is an energy-intensive process. There is no way to avoid using large quantities of electricity in the production process so inflating the cost of electricity in the hopes that this will act as a ‘signal’ and result in less power usage is reckless. Even if high emissions in absolute terms compared to non-energy-intensive industries are inevitable, in relative terms, Lynemouth is one of the most efficient smelters in the entire world. Since 1990 it has reduced its emissions by 65 per cent, which is far above the UK’s goal of a 34 per cent reduction on 1990 levels by 2020 and the wider EU’s goal of a 20 per cent reduction by 2020.¹⁷ It is highly unfair to suggest the plant has not done enough to reduce its environmental impact.

Figure 1: Incremental impact on a representative customer of: costs of all climate change policies, higher energy prices and higher transmission and distribution prices



Source: Waters Wye Associates, The Cumulative Impact of Climate Change Policies on UK Energy Intensive Industries - Update Against New Government Policy, March 2011, p. 14

¹⁷ ‘Doubt cast over power plant’s future’

It is already acknowledged that this needless punishment through government policy will probably cause carbon leakage and therefore increase global CO₂ emissions. In the case of aluminium this is a travesty. It is globally acknowledged that British aluminium is produced in the most energy- and emission-efficient ways possible and Lynemouth has two world-leading ring burners, each costing £17 million, to take this record further. Business Monitor International summed up the situation thus:

Smelter closures are unfortunate, given the British aluminium industry's reputation for being highly efficient... Ironically, this will benefit less regulated smelters in Asia which have fewer restrictions on carbon emissions. The transfer of metals production from the UK to lightly regulated emerging markets undermines the British government's objective of reducing global carbon emissions.¹⁸

Within the context of reducing emissions, it would therefore have been much wiser for the government to have done its best to retain the Lynemouth plant.

Having said that, some commentators have been surprised that Rio Tinto Alcan could complain about high energy costs for Lynemouth while not saying the same about its other assets and aluminium smelters around Europe. However, some of these other costs have been offset and, in Iceland, the company secured a 26 year electricity contract for its facility and will consequently invest US \$350 million to modernise the plant and increase output by 20 per cent.¹⁹ This will create many new jobs and guarantee existing ones while also facilitating downstream industries. This guarantee gives a level of forward security almost unheard of now in the UK.

In addition, the mitigation measures the UK gives to energy-intensive companies, such as a 65 per cent rebate on the climate change levy that will rise to 80 per cent from next year, are still small fry compared to the other green costs they face here and the greater discounts other countries offer. Germany for instance provides energy-intensive firms with a rebate of 98.5 per cent of the cost of subsidising renewable energy on electricity bills. This allows the German government to pursue its green agenda but without the risk of overburdening valuable and vulnerable industries. Including all other costs, British companies will be paying 15 per cent more for their electricity compared to Germany in 2013.²⁰ This sends out a very negative message and means many multinationals, as Rio Tinto Alcan proves, will move operations elsewhere to countries where energy is cheaper.

This is not to say that the British government has been completely useless. As already discussed, the EU has deployed its own legislation aiming to curb CO₂ emissions and all EU countries (in theory) are

¹⁸ *United Kingdom Metals Report Q4 2011*

¹⁹ <http://www.advfn.com/nyse/StockNews.asp?stocknews=RTP&article=44499894>

²⁰ 'UK manufacturers to bear greater energy costs'

obliged to enact them. One of these regulations was the Large Combustions Plant Directive (LCPD), which the European Commission felt the UK government failed to enforce on the power station tied to the Lynemouth plant. As such, the case was taken to the European Court of Justice (ECJ), which ruled in April 2010 that Britain had indeed failed to apply the LCPD, resulting in the need to make modifications worth £200 million to the power station. No appeals were or could have been made against the ECJ verdict and some commentators saw the decision as the point at which the smelter was doomed to close. Even a year before this, predicting the outcome, *The Telegraph* stated:

Brussels has ruled that the power plant fails to comply with its Large Combustion Plants directive. So it too will have to close, with the loss of 600 more jobs and almost all that remains of our aluminium production. In a neat double whammy for the EU, another efficient British industry passes into history.²¹

Profit motive

There is another strong motive that led to the closure of the Lynemouth smelter which ties into rising costs but is somewhat more mercenary. As a company with global operations, Rio Tinto has multiple outfits all competing at any one time for limited investment. While using profit level to decide investment is a good way to ensure competition between individual plants and smelters, Rio Tinto Alcan also used this as a simple way to decide which outfits would be shut down. According to Ian Lavery, the MP for Wansbeck, where the Lynemouth plant is located:

They want much more profit from their different organisations throughout the world... Most people would be happy with £40m, but they want 40 per cent profits on the investments that they make.²²

This 40 per cent required return is also claimed to exist by John McCabe, Corporate Affairs Director of Rio Tinto Alcan itself:

Rio Tinto is streamlining its global aluminium business in order to focus on its top assets globally, unfortunately Lynemouth isn't considered to be one of them as it does not return 40 per cent rate of return for the business.²³

Quite what the '40 per cent' return is remains unclear, and no official documentation clarifies this point. Nonetheless, it is clear that to secure future investment from its owner, Lynemouth would have to exhibit some form of 40 per cent return on the expenditures Rio Tinto Alcan spent on it.

²¹ *The Telegraph*, 'EU Directives will close down most of Britain's aluminium industry', 15 August 2009. Accessed: <http://www.telegraph.co.uk/comment/columnists/christopherbooker/6035552/EU-directives-will-close-down-most-of-Britains-aluminium-industry.html>

²² BBC News, 'No decision over Alcan smelting plant in Lynemouth', 18 October 2011. Accessed: <http://www.bbc.co.uk/news/uk-england-tyne-15348331>

²³ 'No decision over Alcan smelting plant in Lynemouth'

Given the closure, it is reasonable to assume that the Lynemouth plant margins were shrinking and either came close to or fell below this threshold.

However, it is somewhat incongruous for Rio Tinto Alcan to imply energy costs were rising at such a pace that the plant was not viable. It seems more likely that the rising costs meant Lynemouth was producing *less* but nowhere near *zero* profit. Whether or not this matters, and the strength of the argument that Rio Tinto Alcan should have kept operating the plant for less profit is up to the reader to decide. However, Rio Tinto Alcan is not an innocent victim here. Paradoxically, the wider Rio Tinto's status as a global giant means that while it can impose such draconian targets on its own plants, it is also in the best position to continue operating them when they fall below the 40 per cent target. In 2011, the company saw net annual profits of US \$5.83 billion, hardly an inconsequential sum. The year before that was even higher, with net profits of almost US \$14 billion.²⁴

In light of the required profit margin, there is a case for arguing that the Lynemouth smelter would still be commercially viable in the future, although how long this would be for depends on future energy costs, which are still likely to cripple the smelter in the long-run.

Effects of the closure

Increased imports

The British aluminium sector is already heavily reliant on imports, with 92 per cent of all UK net supply imported in 2010.²⁵ This is a rapid increase since the recession began, when 'just' 69 per cent of UK net supply was imported in 2007. In 2007, 44 per cent of total imports came from inside the EU, with most of the additional imports in 2010 also coming from inside the EU while extra-EU imports rose by only three per cent.²⁶ Of these 2010 92 per cent imports, 64 per cent of supply was sourced from inside the EU and 28 per cent was sourced outside the EU. This is surprising, given that these other EU states are subject to the same climate change and energy related policies as UK companies. Of course, the UK's energy policies are unilaterally tougher and raise costs higher, so this trend lends credence to British policy causing the reduction in primary aluminium manufacturing in the UK. Were it not for these costs, the UK, like the rest of the EU, would still be an attractive place to manufacture.

²⁴ <http://online.wsj.com/article/SB10001424052970203646004577212272340025502.html>

²⁵ PRODCOM Intermediate Results, Division 24, SIC(07) 2442

²⁶ PRODUCT SALES and TRADE, PRA 27420, Aluminium Production, 2007

Nonetheless, a significant volume of domestic aluminium is exported, with export figures for 2010 revealing that 88 per cent of UK aluminium manufacture was exported to the EU (71 per cent) and outside the EU (17 per cent).²⁷ Again, these are steady rises on the 2007 levels, from 54 per cent to the EU and eight per cent to the extra-EU markets.²⁸ The loss of this export ability will be a blow for the UK's balance of trade in goods, which, hovering around £100 billion, is already grossly negative as a result of our (increasing) reliance on foreign imports.

A new direction?

While the loss of primary production of British aluminium is probably permanent, this does not mean the entire industry is collapsing. Business Monitor International pointed out that while 'the closure of capacity would invariably increase the UK's reliance on imported aluminium', it also stressed this would 'boost demand for recycled aluminium.'²⁹ This 'secondary' aluminium production is thriving in the UK with 39 different plants in operation across the country.³⁰

There is far more scope to increase production of recycled aluminium in the UK, to offset the loss of primary production. When recycled from process scrap and used products, this aluminium manufacturing requires only five per cent of the energy required to make primary aluminium. In addition, amalgamation of recycled metal with new metal still allows substantial energy savings, as well as the effective use of process heat. There is no difference between primary and recycled aluminium in terms of quality or properties and, as a result, recycling plays a significant role within the sector. UK recycling rates reach up to 85 per cent in the building sector and 90 per cent in the transport sector. Aluminium's recycling potential has resulted in almost three-quarters of all aluminium ever made remaining in use today, representing an impressive growing energy and resource bank.³¹ Given the lower energy costs in this secondary industry, the government should encourage companies to expand their existing facilities and incentivise new ones to set up here.

Conclusion

The effects of the Lynemouth smelter closure are clear enough: Britain has now all but lost the valuable aluminium primary smelting industry and the blame for this falls at the government's feet.

²⁷ PRODCOM Intermediate Results, Division 24, SIC(07) 2442

²⁸ PRODUCT SALES and TRADE, PRA 27420, Aluminium Production, 2007

²⁹ *United Kingdom Metals Report Q4 2011*

³⁰ <http://www.lightmetalage.com/producers.php#U>

³¹ International Aluminium Institute, *Global Aluminium Industry Sustainability Scorecard*, 2009, p.7. Accessed: <http://www.world-aluminium.org/cache/fi0000364.pdf>

While Rio Tinto is merciless in its pursuit of maximum profit, and has therefore abandoned the plant soon after purchasing it, the fact remains that the smelter's long-term viability is critically undermined by the government's energy policies. The government is willing to push the price of energy to a level that makes continued manufacturing of aluminium uneconomic. While it believes it is delivering relief through semi-useful rebates and allowances for energy-intensive companies, it refuses to provide the relief businesses really need: guaranteed, steady and reasonable future energy prices that allow firms to plan ahead. This is why Rio Tinto Alcan could find no buyers for the Lynemouth smelter – it is effectively a time bomb.

This report is a eulogy with a warning. While the primary aluminium industry is all but dead, there are still many other energy-intensive industries left in the UK, such as glass, chemical and ceramic manufacturing. Together, these are worth £75 billion and employ 700,000 people, and they are just as vulnerable to the future rises in energy costs.³² The government has allowed the primary aluminium sector to die, but it should not let this happen to other sectors, most pressingly because it cannot afford to: these are some of the most valuable industries Britain retains and their growth is vital to the economic rebalancing the government is supposedly championing.

³² 'UK manufacturers to bear greater energy costs'