November 18, 2014

Written Statement of Novelis Inc. to The Permanent Subcommittee on Investigations hearing on "Wall Street Bank Involvement With Physical Commodities"

To supplement Mr. Nick Madden's testimony, within this written statement, Novelis is providing background and explanatory comments to address the six specific areas that we were requested to be prepared to discuss in the invitation from Senators McCain and Levin to the hearings.

Introduction

The Contango Opportunity

At the start of the Great Recession from late 2007 through 2009, the global aluminum market excluding China was oversupplied as annual consumer demand weakened by approximately 20% or 5 million tonnes.[1] Despite the weakening consumer demand, annual global primary aluminum production (excluding China) only declined by approximately 2 million tonnes in 2009 because a new type of buyer of aluminum had emerged in the market.[2]

In a low interest rate environment, the forward aluminum curve offered an opportunity to generate an annual yield of between 3% to 7% to cover the costs of storage and provide a profit.[3] This could be achieved by entering into transactions in which a purchaser would buy aluminum on a spot basis, place it in storage and sell it forward for months or years. When delivery on the forward sale became due on the future date, the aluminum could be delivered physically to satisfy the sale or rolled forward into another forward sale if the forward aluminum curve remained in an attractive contango. Contango describes the forward curve when future prices are higher than near term prices. These transactions offered a predictable, low risk return and were being undertaken by new types of buyers - banks, hedge funds and traders.

The Warehousing Opportunity

Two types of transactions emerged: "on-exchange", where the metal is placed on warrant and stored in LME licensed warehouses; and "off-exchange" where the metal is stored outside the LME system and for which there are no publicly reported volume statistics. We believe that the owners of aluminum were able to negotiate attractive rents with off-exchange warehouses and commit metal to storage deals for periods of a year or more at the same time that stocks were building in LME warehouses;.

In 2008, LME warehouses, and specifically those in Detroit (such as Metro), saw the opportunity to earn rent from storing surplus aluminum and began offering incentives to primary producers to channel aluminum stocks to their warehouse system, away from consumers, traders and other financing arrangements. An LME warehouse such as Metro in Detroit would be able to

[1] Source - Harbor Research (Appendix 1)
[2] Source - Harbor Research (Appendix 1)
[3] Source - Harbor Research (Appendix 2) & Barclays Capital (Appendix 3) Aluminium – The impact of finance deals on premiums and supply

predict the minimum length of time that aluminum would remain in its system because the rules of its licensing arrangement with the LME allowed it to release metal to warrant holders at a minimum load-out rate, which before April 2012 was 1500 tonnes per day. The rent that the LME warehouses could charge for the storage of aluminum more than offset any incentives paid to primary producers and allowed the warehouses to compete with consumers, traders and other financing deals. In fact, the LME warehouses were able to raise their offers to primary producers as the stockpiles grew since the stockpiles caused the queues (and thus the rental revenues) to increase as well.

Impact of LME Warehouse Incentives

The impact of the payment of warehouse incentives to primary producers was to provide a new, competing buyer that drove up the Midwest US Transaction Premium (the Midwest premium) on aluminum to the highest levels in history at a time when inventory levels were also at the highest levels in history. It was 20 years ago following the collapse of the Soviet Union that the aluminum market suffered a massive overhang of inventory but this period was accompanied by low LME prices and extremely low local market premiums. The situation that began to develop in 2009 and endures today is unique in the history of the aluminum market. We believe that the current situation is the result of the combination of opportunistic financing transactions and the behavior of certain LME warehouses to drive premiums up by offering incentives to primary producers.

The LME's Role

Despite an increasing number of complaints and lobbying from market users, the LME was slow to react. In April 2012, the LME finally increased the load-out rates, but by a modest 1500 tonnes per day for the warehouses with the largest stocks (greater than 900,000 tonnes) and by lesser amounts for others.[4] At the time, the LME was owned by a broad group of LME members, with Goldman Sachs and JP Morgan being two of the largest shareholders with close to 10% ownership stakes each. We believe the largest LME members were influential in setting LME policy at the time, which helps explain some of the reluctance by the LME to act more quickly and decisively. Near the end of 2012, the LME was acquired by the Hong Kong Exchange. Since then, we have started to see far greater disposition to make proactive changes to support the functioning of the free market.

The Beneficiaries

The beneficiaries of the warehousing activity are the LME licensed warehouses, the owners of metal who are managing stock financing transactions in LME and "off exchange" warehouses, such as banks and trading companies, and the producers of primary aluminum.

The LME warehouses benefit from charging rent. The rent rates have reportedly been rising over recent years and those companies that own the metal that is stored in the LME warehouses are obliged to pay the prevailing rent. Even when a warrant is cancelled and a buyer joins the queue to await release of the metal, the buyer must continue to pay full rent. When the metal is finally loaded onto a truck, the buyer also pays a "load-out" charge. In January 2012, Novelis estimated that if Detroit ceased receiving aluminum on January 30, 2012 and proceeded to ship out all of the metal stored at the warehouse at the minimum load-out rate,

[4] Source – London Metal Exchange

it would have taken two and a half years for Detroit to empty and the rent revenue would have equated to approximately $230 million.[5] This gives an indication of the potential revenues available to the LME licensed warehouses. The graph in Appendix 12 illustrates the reduction in stock levels and the estimated rental income under this scenario.

The banks and trading companies that own aluminum involved in transactions in LME and off-exchange warehouses benefit in two ways. First, they benefit from the contango yield compared with the low cost of borrowing to finance the stocks. The degree of benefit depends upon the contango hedging strategy, their cost of money and the cost of storage and insurance. We have no information on the actual profits of any specific financial institution but as we mentioned above the gross yield from the LME contango has ranged between 3% and 7%. Second, they benefit from the premium appreciation between the premium cost when they acquired the aluminum originally and the premium that can be earned when they finally sell the aluminum. For example, if aluminum has been stored since 2008 when the Midwest premium was five cents per pound and is sold today at twenty three cents per pound, the benefit from premium appreciation could be eighteen cents per pound or $396 per tonne.

Finally, primary aluminum producers also benefit from the higher premiums because they are able to charge and pass through the higher Midwest premium on all of their production in North America. Similarly, they benefit from higher local market premiums in other regions where local market premiums are similarly inflated. The degree to which primary producers benefit was explored in The Wall Street Journal on October 24, 2013 in an article titled “Metals Logjam Benefits Producers” (Appendix 5).[6] The benefit to producers of the higher premiums was evidenced by Rusal’s lawsuit against the LME, which sought to block the LME from introducing further rule changes to relieve the situation. Although overturned on appeal, the lawsuit initially succeeded to prevent LME rule changes that sought to bring more balance between a warehouse’s inputs and its obligation to load out metal. It remains valid today that the primary aluminum producers are among the beneficiaries of the wildly inflated premiums in the market, and consequently they have a lot to lose if the queues go away and premiums decline.

Activism

Novelis has been consistent in its criticism of the LME since 2011 when we realized how serious the warehousing issue could become.[7] We have consulted with our customer base, which covers many of the end users of rolled aluminum, and we have their support in pressing for change. Since 2012, we have collaborated with other consumers, mainly from the beverage and packaging markets in the Aluminum User Group (AUG). Together with other members of the AUG, we have had discussions with government and regulatory bodies in the United States and Europe to seek their help to intervene and improve regulation in this area. We are confident that we represent the views of consumers in the United States as well as the rest of the world.

[5] Source – Novelis analysis – (Appendix 4) assessment of Detroit rent potential
[6] Source – Wall Street Journal (Appendix 5) The benefit to producers of higher premiums
[7] Source – Various news reports (Appendix 6) Examples of Novelis’ advocacy to tackle the LME warehouse issue

(1) The nature of Novelis' business including the acquisition of aluminum; how its customers use aluminum; and the impact of aluminum prices on its revenues and customers.

About Novelis

Novelis Inc. is the world's largest producer of flat rolled aluminum with revenues of $10 billion in its 2014 fiscal year and shipments of 3 million tonnes, representing 14% of the global market. We are also the world's largest recycler of aluminum. Novelis is a global company, headquartered in Atlanta, GA, with operations in United States, South America, Europe and Asia. We are the world's leading supplier of beverage can sheet and automotive sheet. Since its acquisition in 2007, Novelis has been a wholly owned subsidiary of Hindalco, part of the Aditya Birla Group, a multi-national conglomerate based in Mumbai, India.

Novelis employs approximately 11,200 employees in 26 operations in 11 countries across four continents. Novelis is the only industry player with the capability to produce high-end rolled products in all four major, industrialized market regions of the world. Here are some key statistics by region:

- In North America, we have just over 3,000 employees, $3.1 billion in revenue and nearly 958 kilotonnes of shipments.
- In South America, we have around 1,800 employees, $1.6 billion in revenue and 447 kilotonnes of shipments.
- In Europe, we have around 4,500 employees, $3.3 billion in revenue and 911 kilotonnes of shipments.
- In Asia, we have approximately 1,900 employees, $1.9 billion in revenue and 640 kilotonnes of shipments.

Our market focus is divided into 3 major sectors:

- Beverage can, where we supply major beverage companies such as Coca Cola and Anheuser Busch, and can manufacturers such as Rexam, Ball Corporation and Crown;
- Automotive, where we supply most of the OEMs around the world including Ford, GM, Chrysler, BMW, Audi, Jaguar, Land Rover and Mercedes Benz; and the
- High-end specialties market, which includes architecture, electronics and transportation. Customers include electronics majors like LG and Samsung, packaging customers like Pactiv Corporation, and windows and blinds company, VELUX. We also produce aluminum that has been used in the facades on such renowned buildings such as several of the Olympic Stadium buildings in China, the Titanic Belfast museum, Masdar City in Abu Dhabi and Europe's largest children's hospital in Moscow.

The market for flat rolled aluminum products is growing at a healthy 6% per annum. Automotive sheet is the fastest growing market in our sector, with a growth rate of 30% per annum as evidenced by Ford's revolutionary aluminum bodied F-150, which is now being manufactured in Dearborn, Michigan with Novelis being one of the lead suppliers of body sheet. In the last four years, Novelis has invested more than $2 billion to grow our rolling, recycling and automotive finishing capacity to capture the growth in demand, particularly in the automotive sector. We are in the midst of an investment program in the United States to support the rapid growth in

aluminum automotive body sheet and have invested an additional $400 million in facilities in Oswego, NY.

Procurement of Aluminum at Novelis

Novelis is the world's largest buyer of aluminum. In Fiscal Year 2014, which ended March 31, 2014, we purchased 869 kilotonnes of P1020 (LME grade), 1,372 kilotonnes of scrap and 775 kilotonnes of sheet ingot, all of which are inputs to our manufacturing process. We also produced internally 3,246 kilotonnes of sheet ingot from our internal process scrap and the purchased scrap and P1020 mentioned above. This sheet ingot is processed through hot and cold rolling mills and finishing processes.

Primary Aluminum

All purchases of primary aluminum (P1020 and sheet ingot) are priced on a similar basis. The base price includes the LME official price for high grade aluminum ("the LME price") plus a local market premium ("LMP"), which are published in metal journals. In the United States, the LMP is known as the Midwest premium and is published in Platts' Metals Week. In Europe, the LMP is defined by Metal Bulletins EC Duty Paid and Duty Unpaid indicators. In Asia, the LMP is defined by the Main Japanese Port Premium. In addition, there are often additional costs to cover logistics, payment terms and form. The term of most purchase contracts is at least one year and the prices are normally based on the monthly averages for the shipment month or the month prior to shipment. As a consequence, the purchase prices move almost exactly with changes in the LME price and the LMP.

The Midwest premium is established by Platts through price surveys whereby traders, producers and consumers from time to time report spot transaction premiums to Platts. Platts analyzes the information received from telephone surveys and publishes the Midwest premium.

Primary aluminum sheet ingot is purchased from primary aluminum producers such as Rio Tinto, Rusal, Emirates Global Aluminium, Hydro Aluminium, and Alcoa on long term contracts ranging from one to five years. P1020 is normally purchased on annual contracts from primary producers, trading companies such as Glencore, Trafigura, Mitsubishi Nobel and financial institutions such as Goldman Sachs.

As LME price and LMPs fluctuate, the changes directly impact Novelis' cost of purchased metal because of the "floating price" formula in our contracts. For example, when LME and LMP increases or decreases in total by $100 per tonne, our purchase cost also increases or decreases by $100 per tonne in the same direction. The reason our prices are perfectly coordinated with such movements is the pricing behavior known as "pass through". Suppliers pass through the entire LME price and LMP to mills like Novelis. Since aluminum represents approximately 70% of our operating costs, our cost base is volatile and highly dependent on market prices for aluminum.

Scrap

Scrap prices tend to follow movements in the market price for primary aluminum but not exactly. Scrap is normally priced at a discount to the primary aluminum price to reflect the additional cost of processing and is also influenced by factors specific to the market for scrap. Scrap purchases can be annual contracts but can also be short term in nature, sometimes referred to as spot purchases. Scrap is purchased from scrap merchants, national recycling systems, trading

companies and scrap collectors. For the purposes of this discussion, our focus is on primary aluminum.

Sales to our Customers and the Pass Through Business Model

Our sales contracts are structured similarly to our primary aluminum purchase contracts. Typically, they comprise a base price (LME price + LMP) plus a conversion premium that reflects our costs to convert aluminum ingot and scrap into coils plus our margin. There may also be additional charges, including for logistics, alloy, treatment, size and form. This type of pricing formula exists in virtually all of our sales contracts in all parts of the world, especially those of a longer term nature (*i.e.,* 6 months or more). Generally, sales prices are calculated on a monthly average basis, as they are for primary aluminum purchases. We also sell on a spot basis where the pricing has a similar structure but is based on the LME price and LMP at a point in time rather than on the average of a month.

The alignment between purchases and sales contracts is intended to shield Novelis from the movements in aluminum market price (LME price + LMP). In this regard, we attempt to always "pass through" these costs to our customers, the movements of which are expected to be set by market forces. Any aluminum converter like Novelis has the goal of achieving "perfect pass through" of metal prices.

However, there are timing differences due to the process lead time in our operations and timing differences between the pricing of purchases and the pricing of sales. These timing mismatches are managed through our offset hedging program, where we place hedges on the LME price to protect the LME value of purchased metal on our books until a sale is priced at a later point in time. At any time, our offset hedging position could be up to 500 kilotonnes. From time to time our customers request that we fix forward prices (rather than allowing them to float) for periods of months or years. In such instances, we hedge the LME price component of such forward price commitments to minimize price fluctuations.

Although the LME price is easily hedged, the pass through model becomes difficult to execute perfectly because the LMP cannot be hedged due to a lack of liquidity amongst market makers. For Novelis, this creates some positive and negative effects on financial performance that tend to offset one another. For example, metal in process that is priced but has not yet been sold is exposed to fluctuations in LMP. As LMP rises, there is an accounting gain related to inventory accounting which we call metal price lag. This is reversed when the LMP falls. As LMPs have been rising for several years, this has created a positive accounting gain recently. We also see some benefit from higher scrap discounts. However, these gains are offset by losses on fixed price sales where Novelis has committed to a fixed premium to a customer that is lower than the prevailing market premium. Also negative for us, is that working capital that is tied up in inventory increases due to the higher metal prices. Currently, we estimate Novelis' working capital to be over $200 million higher than it would be in a normal premium environment. When considering the additional financing costs of the higher working capital along with other effects described above, Novelis' overall profitability is largely neutral to the higher premiums with one very important exception in our Asian business, which is explained below (Where pass through fails).

Where pass through fails

In some cases, Novelis is not able to pass through its prices to its customers. In Asia, we sell aluminum products into China and we compete with Chinese suppliers in other Asian countries.

As the Asian market premium (MJP) has increased, it has become increasingly difficult to pass this through in some markets. China is the world's largest primary producer of aluminum but exports little or no primary metal. Market pricing in China is established through the Shanghai Futures Exchange and has little correlation to the LME price. Imports into China are competing with an flat SHFE price with no Asia LMP.. However, when exporting semi-finished products, such as flat rolled aluminum Chinese rollers benefit from VAT rebates which have the effect today of lowering their base price (SHFE) to the equivalent of LME without LMP. Consequently in Asia and increasingly in the global market, non-Chinese converters are losing competitiveness as the premiums continue to grow for U.S. companies, for example. In our case, in order to sell coil in China or in competition with Chinese rolling companies in broader Asia, Novelis has been obliged to forego part or all of the Main Japanese Port premium in its selling prices to certain market segments.. The impact of this in FY14 was approximately $42 million negative impact on EBITDA.

Pass Through by our Customers

In a perfect world, Novelis would seek to be neutral to changes in LME price and LMP, and our customers would likely seek to achieve the same state of price neutrality since their businesses would be impacted in the same way. We do not have specific information on how our customers manage their price exposure but we can give an overview of the value chain based on our understanding from conversations with customers and from market intelligence. Somewhere between Novelis and the consumer, it may be that the price fluctuations can no longer be passed through. For example, in the case of aluminum automotive body sheet, when Novelis supplies the automotive manufacturer at floating prices with perfect pass through, the automotive manufacturer must either pass these costs through to the end consumer or absorb the price fluctuations into its own profit and loss. In many cases, we believe that our customers hedge the LME exposure. However, with the market in LMP hedging being illiquid, the LMP cannot be hedged and we believe that increases in the LMP must be absorbed by the automotive manufacturer, at least temporarily, and ultimately the end consumer.

As another example, when Novelis supplies another processor prior to the end consumer, such as supply of beverage can sheet to a can manufacturer like Rexam, and the processor in turn supplies the beverage company with cans, the pass-through may stop at the beverage company or the can manufacturer. It depends on the nature of the contract between the two parties (either fixed pricing or floating pricing). After experiencing the losses and/or volatility associated with absorbing metal price movements, one could expect that the can maker will ultimately seek to negotiate a pass through clause in the next contract. As a consequence, the increased LMP will eventually be borne by consumers as the beverage company is forced to raise its own prices. Our estimation of the overall cost impact on consumers is further discussed and quantified in section (4) below.

(2) The role and function of the London Metal Exchange (LME) and LME-approved warehouses in the aluminum market.

The Role of the LME

The LME was founded in 1872 and has served as the world's premier metal trading exchange ever since. Aluminum was first traded on the exchange in October 1978. Over the last 36 years, the LME pricing mechanism has penetrated all geographical and business sectors. As the focal point for aluminum hedging and trading, the LME price has become the global price for

aluminum and for the other metals traded on the exchange. The LME price is a component in all of our purchases and sales contracts, globally. Through our purchase and sales contract negotiations, we know that most other aluminum semi products manufacturers use similar pricing mechanisms.

The exchange is used by many market participants for hedging, physical delivery (sales and purchases), investment and speculation. Industry users like Novelis derive three primary benefits from the LME: first, a globally accepted price discovery mechanism; second a vehicle for hedging aluminum price exposure; and third, a supplier or customer of last resort. This third benefit is accomplished through the LME's approved warehouse system. The LME operates committees that oversee activities in each of the metals traded on the LME. Aluminum is overseen by the LME Aluminium Committee, of which Novelis is a member. However, whilst the committees may discuss issues and approve the registration or deregistration of brands, the LME Board is the ultimate decision making authority.

The Role of the LME approved warehouses

The LME approved warehouses were concentrated in Europe until the early 1990s, after which they spread to the United States and Asia. This had the effect of harmonizing pricing globally because arbitrage between the LME and the physical market could be accomplished by physical delivery into or out of warehouses anywhere in the world. Historically warehouses were approved in locations which were "ports of entry" to consuming regions. Examples include Liverpool, Rotterdam, Antwerp, Trieste, Hamburg, Baltimore, Singapore, Bussan and more recently inner points of distribution such as New Orleans and Detroit for the Midwest United States.

To become a licensed LME warehouse, the warehousing company must agree to abide by LME rules, which are available from the LME. Warehousing activities are overseen by the LME Warehouse Committee, which meets quarterly.

The LME is a terminal market, which means that sale and purchase obligations can be satisfied through physical delivery. A seller can physically ship metal to an approved warehouse to satisfy an LME sales contract and a buyer can take delivery of warrants to satisfy an LME purchase contract. The warrants can be cancelled and metal withdrawn from the LME warehouse. It is this role that has been undermined in recent years.

Impact on Novelis

In the past, Novelis has looked to sellers on the LME as a potential supplier, comparing the cost to buy from a trader or producer with the cost of purchasing an LME warrant, withdrawing the metal from the LME warehouse and shipping it to one of our facilities. If the LME cost option is lower than the alternatives, we would seriously consider sourcing metal through that route. However, such costs are effectively the baseline from which other suppliers prepare their offers and, normally, it is slightly more cost effective to buy directly from the producers or traders. Consequently, it has been rare for Novelis to source from the LME but it was an important option in negotiating purchases.

In September 2011, Novelis purchased four lots of aluminum in Detroit on the LME with the intention to test the validity of the reported queues at the time. We finally received the metal at our plant in Oswego, NY in February 2012. The 5 month delay in delivery was directly as a result of the queue in Detroit at the time. We concluded that the LME warehouse could not be

viewed as a viable sourcing option and, as a consequence, we have not used the LME aluminum purchasing and warehouse system since then. Today, the wait time to withdraw aluminum from Detroit is reported to be approximately 670 days.[8]

As a consequence of the wait time to withdraw metal, the LME has ceased being a supplier of last resort to companies like Novelis. Manufacturing businesses cannot afford the working capital and cost penalty of owning metal almost two years before it can be used. The cost penalty we refer to here is not simply the cost of owning metal whilst it remains in the queue, it also refers to the fact that the owner of the metal must pay rent for the entire period too. At 50 cents per tonne per day, for example, this could equate to $335 per tonne with the current queue in Detroit, which helps make it clear why the premium is currently so high.

The wait time and inflated premiums have led to a divergence between the LME and physical aluminum market prices which has created major issues with price discovery and supply chain risk. Novelis believes that the warehouse issue has undermined the validity of the LME contract. No buyer of a commodity should be obliged to wait 670 days to get access to their property.

(3) The evolution of freight incentives offered by LME-approved warehouses in the United States since 2008, and the impact of those incentives on the aluminum market

Increasing Stockpiles

In 2008, the LME aluminum price fell by $2,000 per tonne between July and December. Demand for aluminum fell by 5 million tonnes in 2009 and producers began to idle production. According to Novelis' estimates, production cutbacks of only 2 million tonnes left the market significantly oversupplied, and we saw a huge build-up in stocks in LME warehouses. The most significant build up in an LME location was in Detroit where aluminum inventory increased from 350,000 tonnes in January 2009 to over 1 million tonnes in January 2011 and a peak of close to 1.6 million tonnes in January 2014.[9] In addition, there was a reported development of stockpiles in warehouses outside the LME system (stealth stocks). Since these stealth stocks were not captured in official reports, there is no way of knowing exactly how much was stored in these finance deals.

Banks start acquiring LME warehouses

During 2010, five LME licensed warehousing companies were acquired by banks and physical trading companies.[10] In January, JP Morgan acquired Henry Bath. In February, Goldman Sachs bought Metro. In March, North East Maritime Services was acquired by Trafigura. Later that year, Glencore bought Pacorini. In October, Noble Resources acquired WWS. These actions followed a significant increase in global aluminum LME stocks from approximately 1 million tonnes in 2009 to close to 4.5 million tonnes in 2010. From 2011, the Midwest premium began several major moves upwards, as warrant cancellation increased and the load-out queues grew to beyond a year in Detroit. We believe that these companies saw the opportunity of captive metal generating handsome rent revenues due to the size of the stockpiles and the limited load-

[8] Source - Harbor Intelligence
[9] Source - Harbor Intelligence (Appendix 7)
[10] Source - Aluminum User Group (Appendix 8)

out obligations required by the LME. In addition,, when combined with the other commodity activities of the firms, to generate even more rents by adding further to the stocks and lengthening the queues. An opportunity to artificially squeeze the physical aluminum market was clearly foreseeable at this time and new owners of LME warehouses seized that opportunity.

Incentives to Primary Producers

It is our belief that aluminum was being drawn to Detroit by the Metro warehouse offering incentives to primary producers. A Novelis employee visited the Metro facility in April 2011 and toured some of the warehouse. He reported that all of the metal that he saw was of North American origin (Alcoa and Rio Tinto Alcan). In conversations with our contacts within the primary producers and trading companies, we were also given examples of incentives being offered.

It is our view that when North American primary producers had surpluses due to the reduction in overall demand in connection with the recession, Metro offered incentives to encourage the producers to ship metal to LME warehouses instead of to a consumer or trader. In his way, the warehouse was competing with the consumer and trader, who would normally offer only the industry standard LMP, the Midwest premium. As the stock accumulated and being aware that there was only an obligation to ship out of 1500 tonnes of aluminum per day, the warehouse could predict the length of time metal would remain in storage and the rent that they might earn. Consumers, traders and banks began to compete with the warehouse for metal and it is our belief that the increase in the Midwest premium from 5 cents per pound in 2008 to 11 cents per pound in 2011 was entirely driven by the increasing bid from the warehouse, which was supported by the growing stockpile. Competing with the warehouses were consumers, traders who sought metal for resale to consumers or financing transactions, and banks who were interested in acquiring metal for financing transactions, investment instruments or resale to consumers and traders. Despite the weak demand at the time, there were many interested buyers of aluminum and the premium rose to the historic levels in 2011.

Banks have the tools and incentives to drive up prices

Novelis believes there is a direct link between the acquisition of LME licensed warehouse companies, the behavior of those warehouse companies, the queues and the rising Midwest premium. Particularly in the case of banks, where the firm has a physical metal trading business, an LME brokerage business, access to low cost finance and control of warehousing companies, the bank has four levers over the market. We believe that this gives them an unfair edge over other players in the market. Although the LME published rules in 1998 requiring “Chinese Walls” (appendix 6 – LME rule addition 98/213)[11] between the warehousing business and other bank activities, we cannot understand why a bank would choose to participate in the warehousing activity if it did not see synergies or opportunity relating to other activities of the bank. As a consequence we have long maintained that banks should not be allowed to participate in warehousing. Aluminium International Today magazine published an article that touched upon this topic and was written by Novelis.[12]

[11] Source - London Metal Exchange (Appendix 9) LME rule addition 98/213
[12] Source - Aluminium International Today (Appendix 10)

After initially writing to the LME in May 2011 to request tough action on the queues,[13] Novelis wrote a second letter to the LME August 2011[14] in which we specifically addressed this point, stating that banks and trading companies should not be allowed to own LME licensed warehouses.

(4) The impact of warehouse queues on Novelis Inc., its customers, and the aluminum market generally, including on consumer prices, the ability of consumers to hedge aluminum-related price risks, and the role of the LME as a market of last resort.

Increasing length of queues and increasing prices

The queue at Detroit began to develop noticeably in 2010. A number of complaints were recorded by the LME about delays in accessing metal in warehouses around the world in 2009 and 2010. This led to the commissioning of a study by the LME that was conducted by European Economics into warehousing and, specifically, the minimum load out rate. Novelis was one of over forty companies surveyed in the study, and an executive summary of the report was published in May 2011.[15] In the executive summary of the report, it stated that "there was a general belief that the loading out obligation could and should be increased though this was resisted by warehousemen." Novelis wrote to the LME on May 17, 2011 requesting that it take strong action in response to the report.

On May 27, 2011, the LME announced a change in the minimum load out rate to take effect on April 1, 2012. The minimum load out rate would increase for all warehouses with stocks greater than 300,000 tonnes. The LME introduced a sliding scale that would require the warehouses with stocks greater than 900,000 tonnes to double the rate from 1500 tonnes per day to 3000 tonnes per day. Warehouses with 600,000 to 900,000 tonnes would increase to 2500 tonnes per day and those with between 3000,0000 and 600,000 tonnes would increase the load out rate to 2000 tonnes per day. We were disappointed with the weakness of the change that was made and commented on this publicly.[16]

According to third party market research, the queue at Detroit increased to approximately 10 months in April 2011 but started to reduce following the LME's announced rule change. As mentioned earlier, Novelis bought four lots of aluminum in Detroit in September 2011 and waited until February 2012 to secure the metal in our plant in Oswego, NY. In 2012, as increasing numbers of warrants were cancelled and the stockpile grew, the queue grew to 12 months. Since then it has continued to increase and was said to be about 670 days in early November 2014.[17]

The Midwest premium has trended up in line with the queue length. As mentioned earlier, the warehouses were competing for metal by offering incentives based on the length of time metal could be expected to remain in the warehouse generating rent. With a different business model

[13] Source - Novelis (Appendix 11) First Novelis letter to LME
[14] Source - Novelis (Appendix 12) Second Novelis letter to LME
[15] Source - London Metal Exchange (Appendix 13) Executive Summary of European Economics Report
[16] Source - News Outlets (Appendix 14)
[17] Source - Harbor Research (Appendix 15)

from regular industry participants, the warehouses were able to raise their bids as queues grew, which drove the Midwest premium up to levels never seen before.

During 2013, the premium was fairly stable at around 12 cents/pound but in January 2014, it increased dramatically to over 20 cents per pound and remains above this level today. In the past the Midwest premium fluctuated between 4 and 7 cents/pound representing about 5% of the LME price. Today, it is approximately 25% of the LME price and 20% of the all-in price (LME+LMP). We believe that this phenomenal price increase is driven by a combination of the following factors:

1. Length of the queues and full cost of sourcing metal from the queue.
2. Inaccessible inventories (stealth stocks) that cannot be quantified and are held outside the LME system in financing deals.
3. Recent changes in market fundamentals that have left the free market short of P1020 because surpluses are not accessible.

Impact on Consumers - Hedging

There are several negative impacts for aluminum consumers. The Midwest premium is not hedgeable. Although the CME has recently introduced an aluminum contract with a composite price that includes the LMP, liquidity is still too low. Banks and trading companies from time to time offer “Over the Counter” premium hedges but it is normally at a time that suits the market maker and is not available in substantial volumes every day. Because it is an illiquid market, the bid ask spread on such deals is very wide and for many companies, unacceptably wide. The absence of a hedging instrument for LMP was tolerable when the Midwest premium was in a range between 4 and 7 cents per pound. But now, that LMP has risen to 25% of the LME and 20% of the all-in price, it creates enormous basis risk, in some cases greater than the margins of a converter or fabricator. This creates a significant, unpredictable risk in the profitability along the value chain.

Hedge accounting issues also arise. Hedge accounting is important to manufacturing businesses because it allows us to match the unrealized gains and losses on hedging instruments with the item being hedged by giving each a similar accounting treatment. This helps to reduce volatility in the income statement and thereby makes a company’s quarterly earnings less complicated to understand. Hedge accounting requires a certain minimum correlation between the value of a hedging instrument and the value of the product that it is hedging. If the value strays outside a range of 80-120%, hedge accounting rules do not permit the hedge to be accepted under the rules. This can lead to volatility in earnings performance, which can detract from a company’s market value. As such, it is a serious issue for all manufacturers like Novelis.

Impact on Consumers – Supply Chain Risk

Another negative impact that is very serious for large consumers of P1020 is supply chain risk. In a competitive market, fabricators cannot tolerate the working capital burden of carrying inventory in an LME warehouse for more than a year before it can receive and process the metal. Consequently, P1020 consumers are exposed to lack of metal availability in the short term. Novelis sources on longer term contracts based on forecasted requirements. However, if we underestimate the quantities of P1020 and we must go to the spot market for additional metal, we have limited options and the LME has proven that it is not one of them. Imagine the irony of Novelis running out of metal in our new $400 million automotive production facility in

Oswego, NY and stopping Ford's F-150 production line in Dearborn, Michigan because we are unable to access metal stockpiled to generate rent in a warehouse in Detroit, Michigan. While we will take precautions to keep this from ever becoming an issue by planning carefully, it remains an unconscionable risk for the business.

Impact on Consumers – Increased Prices

The greatest impact felt by our customers, provided that we continue to manage the supply chain effectively, is the inflated premium. In the pass through model, primary producers of aluminum pass through the floating LME and LMP (Midwest premium) to Novelis. Novelis has a similar contract structure with its customers and passes the LME and LMP (Midwest premium) to them. Where Novelis is supplying end users such as automotive OEMs, the cost passes into the product and ultimately to the consumer. The same is true for all equipment manufacturers such as aircraft, architectural applications, and electronics to name a few. Ultimately, the consumer does or soon will pay the additional cost. .

As an illustration, we understand that there is approximately 1000 pounds of aluminum in the new F-150.[18] If the increased premium is 15 cents per pound of aluminum, the impact on cost is $150 per vehicle. Either in advance or to recoup what it has absorbed, at some point, Ford will likely pass that increased cost on to the consumer of its vehicles.

At a bank hearing in July 2013, Tim Weiner, Global Risk Manager, Commodities/Metals of Miller Coors stated that consumers were paying $3 billion more than they should because of the artificially inflated metal premiums. Today, we think this excess cost has more than doubled. Novelis has estimated that the incremental cost borne at the consumption end of the aluminum value chain, caused by the artificial inflation is greater than $6 billion per year. We calculate this as follows: Metal premiums are at least $250 per tonne higher today than historical norms. World (excluding China) production of primary aluminum is approximately 25,000,000 tonnes. All new production earns the higher premiums and the cost is passed through the value chain. Thus, consumers are paying over $6 billion more than they would if normal market forces prevailed. The math is simple but it is because the cause and effect is obvious to us. This does not even take into account higher premiums payable on metal in storage that was produced in previous years. We are taking steps to rely more and more on scrap rather than primary aluminum but the impact has carried through to scrap prices, which are higher than they would otherwise be because of the linkage to primary aluminum prices.

(5) Warehouse transactions in which an incentive is paid to a warehouse customer to wait in the queue and ship large amounts of aluminum out of one warehouse and into another warehouse owned by the same company in the same city.

Novelis is able to comment on areas where we have a clear view of activities. However, when we look at what is happening within the warehousing network, metal being moved from one warehouse to another or being re-warranted without leaving the warehouse is not visible to us and we are not able to comment on it.

[18] Source - Drucker (Appendix 16)

(6) Warehouse transactions that link warehouse revenues to the market price for aluminum

Novelis is able to comment on areas where we have a clear view of activities. However, when we look at what is happening within the warehousing network, metal being moved from one warehouse to another or being re-warranted without leaving the warehouse is not visible to us and we are not able to comment on it.

Conclusion

Since the Great Recession in 2008 and 2009, primary producers of aluminum have been channeling excess production of LME deliverable P1020 into storage deals. Banks, hedge funds and trading companies have exploited low interest rates and the contango in the LME aluminum forward curve to generate revenues by simply storing metal and financing it with the forward curve. This has starved the market of aluminum units and forced up premiums globally. Here in the U.S., the Metro warehouse in Detroit has paid incentives to primary producers to divert metal from the market and store it in warehouses. With a minimum load out obligation in the LME warehouse rules, the warehouses are able to estimate the length of time metal would be stuck in the warehouses paying rent and use these projections to calculate incentives that could be paid to producers in competition with consumers and traders. This was the major factor in driving the Midwest premium to an unprecedented 12 cents per pound in 2012. The existence of long queues and increase in demand and careful management of flows by some traders and producers has since led the Midwest premium to almost double from these levels to an unprecedented 23 cents per pound today.

The wait time to draw metal from Detroit is around 670 days today. This means if a consumer tried to source aluminum today from a Detroit warehouse, it would have to wait until September 2016 to get the metal. This has led to a breakdown in the connection between the derivatives market and the physical market and the loss of price convergence through physical delivery has caused two serious risks for the aluminum world: Supply Chain Risk and Wildly Inflated Premiums. The cost being paid today by consumers of aluminum is at least $6 billion higher than it would be in a normal premium environment. And with the premium now representing 20% of the all in price, instead of 4-5% historically, hedging has become ineffective and margins have eroded in the consumer end of the value chain.

We have collaborated with some customers and other consumers of aluminum in the Aluminum User Group which has lobbied in the U.S. and Europe to see rule changes in the LME to resolve the situation. While the LME has finally begun to act, progress is slow and the situation is worsening.

We at Novelis would welcome further inquiries and action into changing the rules that allow such market disruptions. In our eyes, there is a simple fix – cause the warehouses to load out enough metal to reduce the wait time to draw metal down to 0 days, and have rules in place that require the warehouses to keep these queues to no more than a few days. Soon thereafter, if not immediately, local market premiums will reduce to normal market rates and customers will stop paying the exorbitant premiums. All we seek to achieve is for prices of aluminum to be set by normal supply and demand forces involving primary producers, manufacturers and consumers, without the effects of warehouses and banks taking actions to push up prices and profits through opportunistic behavior that is allowed and encouraged by current rules.

APPENDIX 1

ANNUAL FORECASTS BY REGION: PRIMARY ALUMINUM CONSUMPTION AND PRODUCTION

(thousand tons)

GLOBAL ALUMINUM CONSUMPTION BY REGION

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013e	2014f	2015f	2016f
China	5,897	7,094	8,764	12,497	13,126	14,505	17,724	20,047	22,135	25,299	27,443	29,700	32,450
y/y	15.8%	20.3%	23.6%	42.6%	5.0%	10.5%	22.2%	13.1%	10.4%	14.3%	8.5%	8.2%	9.3%
World ex-China (ROW)	24,322	24,537	25,429	25,121	23,990	20,145	23,740	25,411	25,214	25,862	27,367	28,877	30,357
y/y	10.8%	0.9%	3.6%	-1.2%	-4.5%	-16.0%	17.8%	7.0%	-0.8%	2.6%	5.8%	5.5%	5.1%
North America	7,182	6,863	6,973	6,090	5,731	4,880	5,292	5,632	5,825	6,012	6,330	6,650	6,985
of which USA	*6,380*	*6,093*	*6,180*	*5,345*	*5,062*	*4,112*	*4,590*	*4,890*	*5,107*	*5,272*	*5,560*	*5,855*	*6,167*
y/y	12.2%	-4.4%	1.6%	-12.7%	-5.9%	-14.8%	8.4%	6.4%	3.4%	3.2%	5.3%	5.1%	5.0%
West Europe	6,670	6,652	6,992	7,255	6,097	4,097	5,822	6,331	5,702	5,764	5,880	5,917	5,947
y/y	4.9%	-0.3%	5.1%	3.8%	-16.0%	-32.8%	42.1%	8.7%	-9.9%	1.1%	2.0%	0.6%	0.5%
East Europe	1,721	1,867	2,011	2,109	2,086	1,825	1,950	2,050	2,119	2,176	2,250	2,350	2,450
of which Russia	*910*	*960*	*1,034*	*1,063*	*1,031*	*882*	*938*	*990*	*1,012*	*1,010*	*1,040*	*1,085*	*1,129*
y/y	0.6%	8.5%	7.7%	4.9%	-1.1%	-12.5%	6.8%	5.1%	3.4%	2.7%	3.4%	4.4%	4.3%
Japan	2,427	2,390	2,419	2,270	2,203	1,807	2,095	2,035	1,984	1,939	1,988	1,993	1,993
y/y	-0.1%	-1.5%	1.2%	-6.2%	-3.0%	-18.0%	15.9%	-2.9%	-2.5%	-2.3%	2.5%	0.2%	0.0%
Other Asia	3,720	3,982	4,190	4,413	4,668	4,475	5,190	5,802	5,979	6,192	6,650	7,300	8,025
of which India	*868*	*930*	*1,020*	*1,125*	*1,227*	*1,428*	*1,653*	*1,860*	*1,882*	*1,882*	*1,995*	*2,188*	*2,400*
y/y	20.7%	7.0%	5.2%	5.3%	5.8%	-4.1%	16.0%	11.8%	3.1%	3.6%	7.4%	9.8%	9.9%
Middle East	648	659	700	760	785	780	817	890	910	990	1,314	1,524	1,619
y/y	28.0%	1.6%	6.2%	8.6%	3.3%	-0.6%	4.7%	8.9%	2.2%	8.8%	32.7%	16.0%	6.3%
Latin America	1,171	1,306	1,325	1,348	1,490	1,411	1,660	1,750	1,780	1,850	1,970	2,095	2,240
of which Brazil	*636*	*743*	*758*	*762*	*939*	*820*	*1,040*	*1,069*	*1,070*	*1,110*	*1,150*	*1,190*	*1,240*
y/y	8.7%	11.5%	1.5%	1.7%	10.5%	-5.3%	17.6%	5.4%	1.7%	3.9%	6.5%	6.3%	6.9%
Africa	380	410	449	486	530	495	524	541	545	569	612	675	725
y/y	16.7%	7.9%	9.5%	8.2%	9.1%	-6.6%	5.9%	3.2%	0.7%	4.4%	7.6%	10.3%	7.4%
Oceania	403	408	370	390	400	375	390	380	370	370	373	373	373
y/y	3.9%	1.2%	-9.3%	5.4%	2.6%	-6.3%	4.0%	-2.6%	-2.6%	0.0%	0.8%	0.0%	0.0%
Global Consumption	30,220	31,631	34,193	37,618	37,116	34,650	41,464	45,458	47,349	51,161	54,811	58,577	62,807
y/y	**10.1%**	**4.7%**	**8.1%**	**10.0%**	**-1.3%**	**-6.6%**	**19.7%**	**9.6%**	**4.2%**	**8.0%**	**7.1%**	**6.9%**	**7.2%**

GLOBAL ALUMINUM PRODUCTION BY REGION

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013e	2014f	2015f	2016f
China*	6,589	7,743	9,317	12,598	13,600	13,630	17,600	19,600	22,300	24,900	27,453	30,252	33,050
y/y	20.6%	17.5%	20.3%	35.2%	8.0%	0.2%	29.1%	11.4%	13.8%	11.7%	10.3%	10.2%	9.2%
World ex-China (ROW)	23,198	24,149	24,560	25,543	26,463	24,043	24,926	26,444	25,731	25,803	25,788	27,101	29,253
y/y	3.2%	4.1%	1.7%	4.0%	3.6%	-9.1%	3.7%	6.1%	-2.7%	0.3%	-0.1%	5.1%	7.9%
North America	5,110	5,379	5,333	5,643	5,783	4,759	4,689	4,970	4,841	4,918	4,570	4,726	4,894
of which USA	*2,517*	*2,480*	*2,281*	*2,560*	*2,659*	*1,727*	*1,722*	*1,987*	*2,060*	*1,948*	*1,734*	*1,737*	*1,759*
y/y	-7.0%	5.3%	-0.9%	5.8%	2.5%	-17.7%	-1.5%	6.0%	-2.6%	1.6%	-7.1%	3.4%	3.6%
West Europe	4,295	4,350	4,175	4,306	4,618	3,722	3,808	3,994	3,604	3,525	3,540	3,594	3,673
y/y	5.6%	1.3%	-4.0%	3.1%	7.2%	-19.4%	2.3%	4.9%	-9.8%	-2.2%	0.4%	1.5%	2.2%
East Europe	4,533	4,616	4,681	4,948	5,155	4,479	4,661	4,684	4,662	4,340	3,989	4,087	4,399
of which Russia	*3,809*	*3,855*	*3,893*	*4,103*	*4,284*	*3,782*	*3,947*	*3,992*	*4,021*	*3,724*	*3,395*	*3,491*	*3,802*
y/y	20.1%	1.8%	1.4%	5.7%	4.2%	-13.1%	4.1%	0.5%	-0.5%	-6.9%	-8.1%	2.5%	7.6%
Asia ex. China	1,568	1,623	1,873	2,006	2,181	2,217	2,512	2,682	2,735	2,901	3,112	4,120	5,628
of which India	*861*	*942*	*1,105*	*1,222*	*1,308*	*1,412*	*1,604*	*1,688*	*1,699*	*1,752*	*1,930*	*2,867*	*4,029*
y/y	11.0%	3.5%	15.4%	7.1%	8.7%	1.6%	13.3%	6.8%	2.0%	6.1%	7.3%	32.4%	36.6%
Middle East	1,410	1,790	1,867	1,953	2,054	2,467	2,960	3,820	4,005	4,299	5,270	5,408	5,458
y/y	11.1%	27.0%	4.3%	4.6%	5.2%	20.1%	20.0%	29.1%	4.8%	7.4%	22.6%	2.6%	0.9%
Latin America	2,356	2,391	2,493	2,557	2,660	2,508	2,277	2,185	2,053	1,905	1,511	1,455	1,461
of which Brazil	*1,454*	*1,497*	*1,604*	*1,658*	*1,540*	*1,535*	*1,535*	*1,440*	*1,436*	*1,304*	*965*	*880*	*883*
y/y	3.8%	1.5%	4.3%	2.6%	4.0%	-5.7%	-9.2%	-4.0%	-6.0%	-7.2%	-20.7%	-3.7%	0.4%
Africa	1,710	1,748	1,864	1,815	1,715	1,681	1,742	1,803	1,637	1,810	1,763	1,741	1,760
y/y	19.3%	2.2%	6.6%	-2.6%	-5.5%	-2.0%	3.6%	3.5%	-9.2%	10.5%	-2.6%	-1.3%	1.1%
Oceania	2,216	2,252	2,274	2,315	2,297	2,211	2,277	2,306	2,195	2,105	2,032	1,950	1,960
y/y	2.5%	1.6%	1.0%	1.8%	-0.8%	-3.7%	3.0%	1.3%	-4.8%	-4.1%	-3.5%	-4.0%	0.5%
Total Global Output	29,787	31,892	33,877	38,141	40,063	37,673	42,526	46,044	48,031	50,703	53,240	57,334	62,284
y/y	**6.6%**	**7.1%**	**6.2%**	**12.6%**	**5.0%**	**-6.0%**	**12.9%**	**8.3%**	**4.3%**	**5.6%**	**5.0%**	**7.7%**	**8.6%**
ROW Market Balance	**-1,124**	**-388**	**-869**	**422**	**2,473**	**3,898**	**1,186**	**1,033**	**517**	**-59**	**-1,580**	**-1,795**	**-1,123**
China Market Balance	**692**	**649**	**553**	**101**	**474**	**-875**	**-124**	**-447**	**165**	**-399**	**10**	**552**	**600**
Global Market Balance	**-433**	**261**	**-316**	**523**	**2,947**	**3,023**	**1,062**	**586**	**682**	**-458**	**-1,570**	**-1,243**	**-523**

Source: *HARBOR Aluminum*

IMPORTANT NOTES:

*Production figures for China are official CNIA/IAI reported data up to 2009. From 2010 on, production data incorporates an estimate for non-reported production.

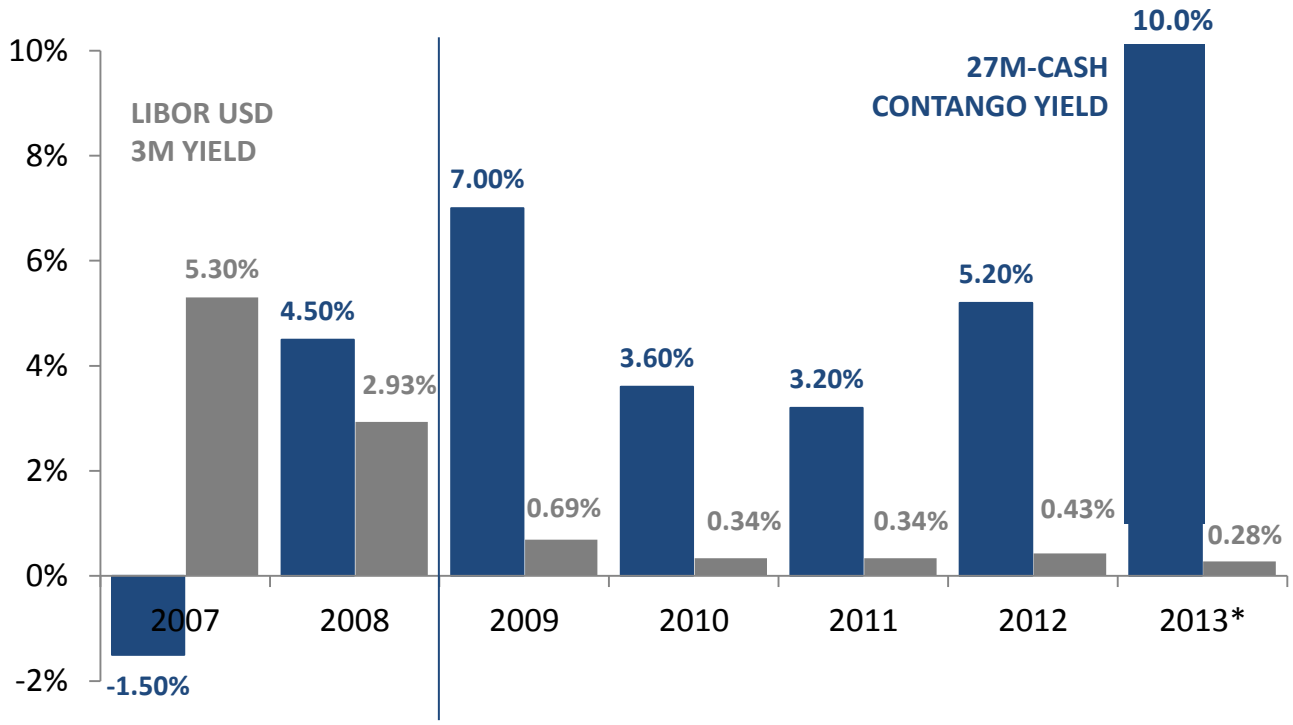
A)Aluminum production forecasts assume all confirmed brownfield / greenfield projects hit the market as planned (no delays).

B)Aluminum production forecasts assume no cuts in production beyond the ones that have been confirmed so far nor disruptions in operating capacity.

C)Aluminum production forecasts include annual capacity creep of 0.5% per year for all smelters.

APPENDIX 2

LME 27M-CASH PRICE ANNUALIZED CONTANGO YIELD VS LIBOR USD 3M ANNUALIZED YIELD (average annual data)



Source: *HARBOR Aluminum* with *LME* data

APPENDIX 3

BARCLAYS CAPITAL

Aluminium: The impact of financing deals on supply and premiums

March 2012

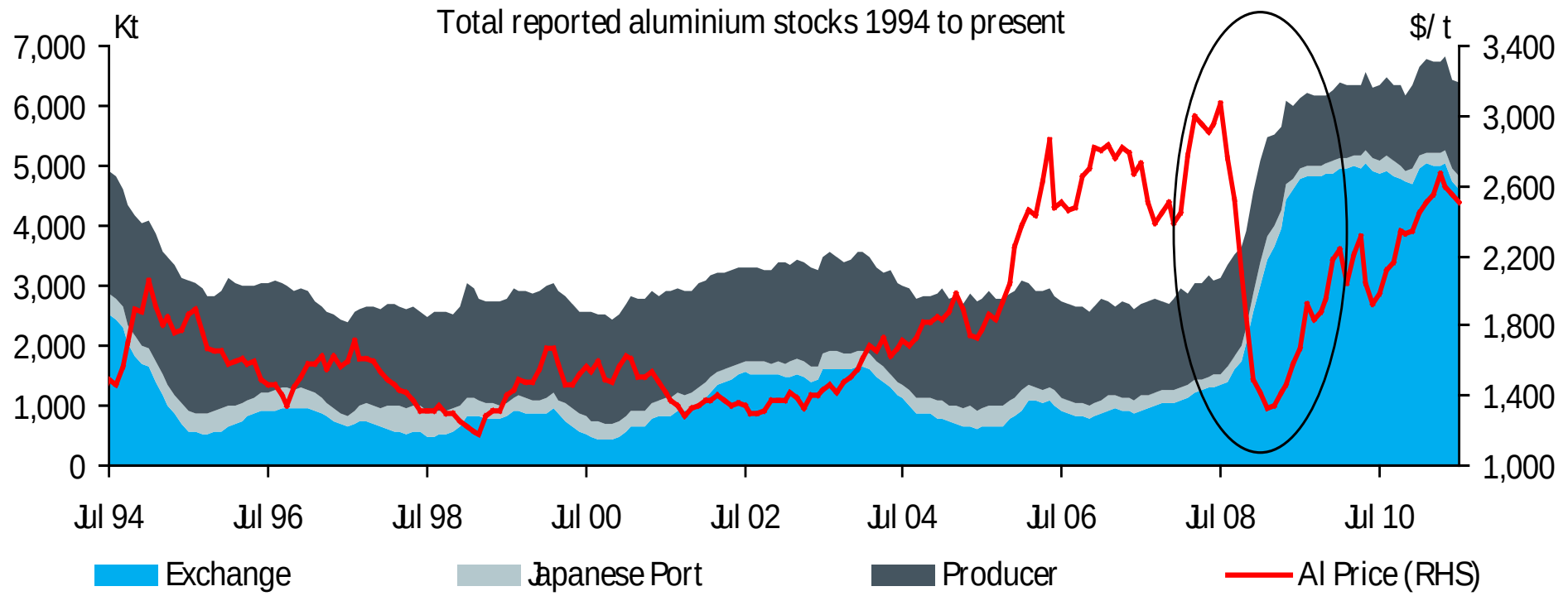
Nicholas Snowdon

Base Metals Research

What are financing deals and why are they occurring?

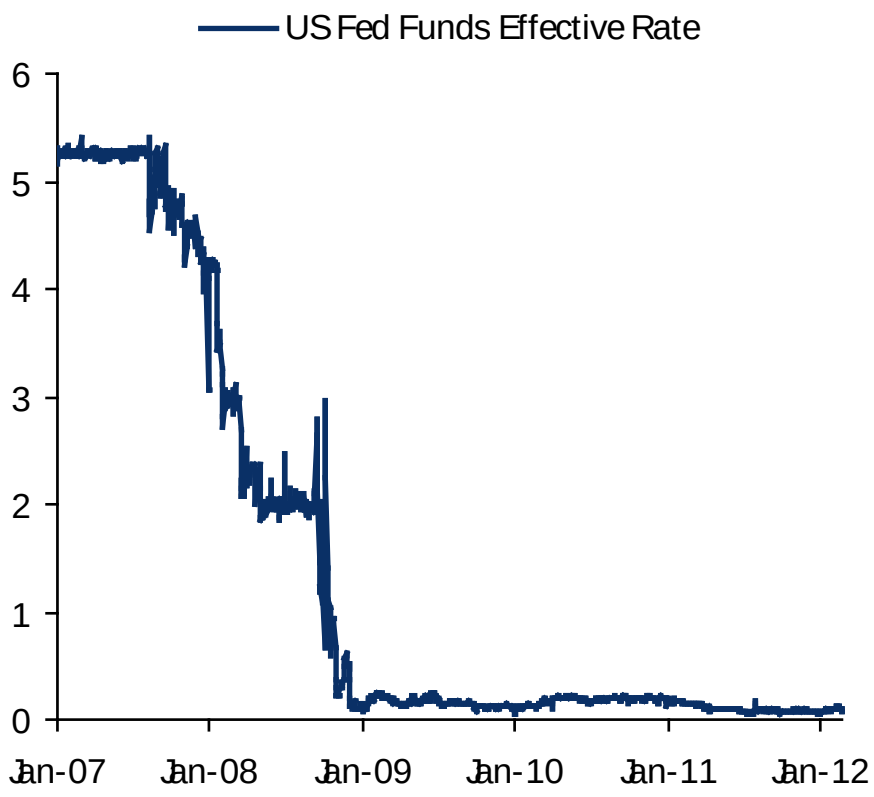
Aluminium stock holders were faced with a critical management challenge in late 2008…

Collapse in aluminium prices and demand in late 2008 created a challenge for holders of aluminium looking to extract value from the material held on their balance sheet

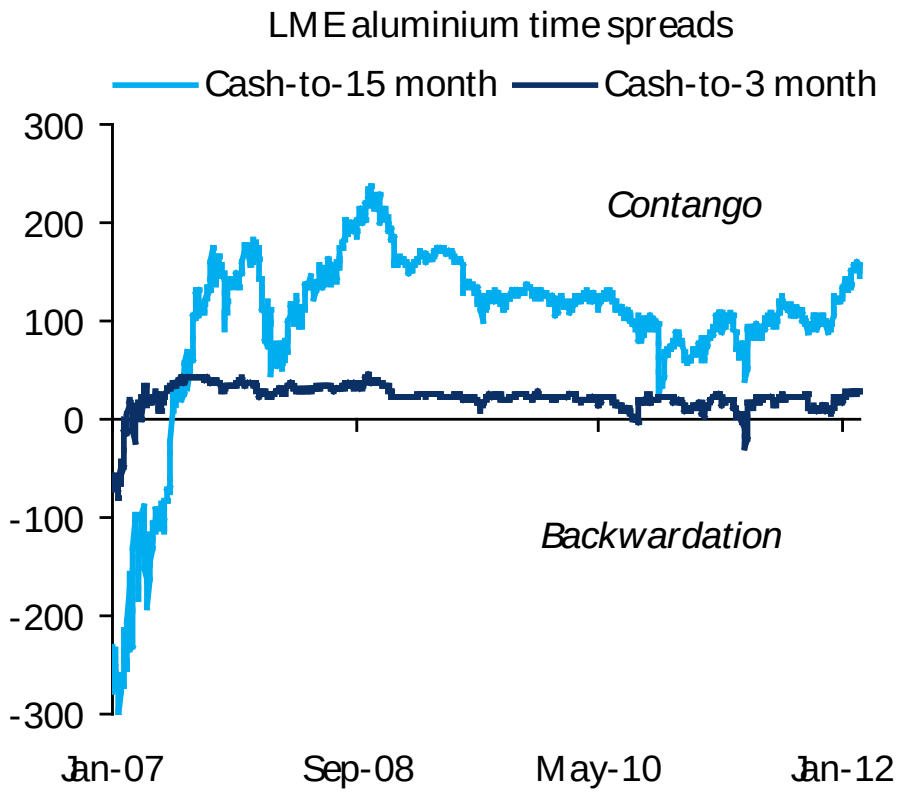


Low interest rates and contango provided the basis for inventory financing as the solution to this problem

Slashing in interest rates from 2008 radically reduced the cost of capital

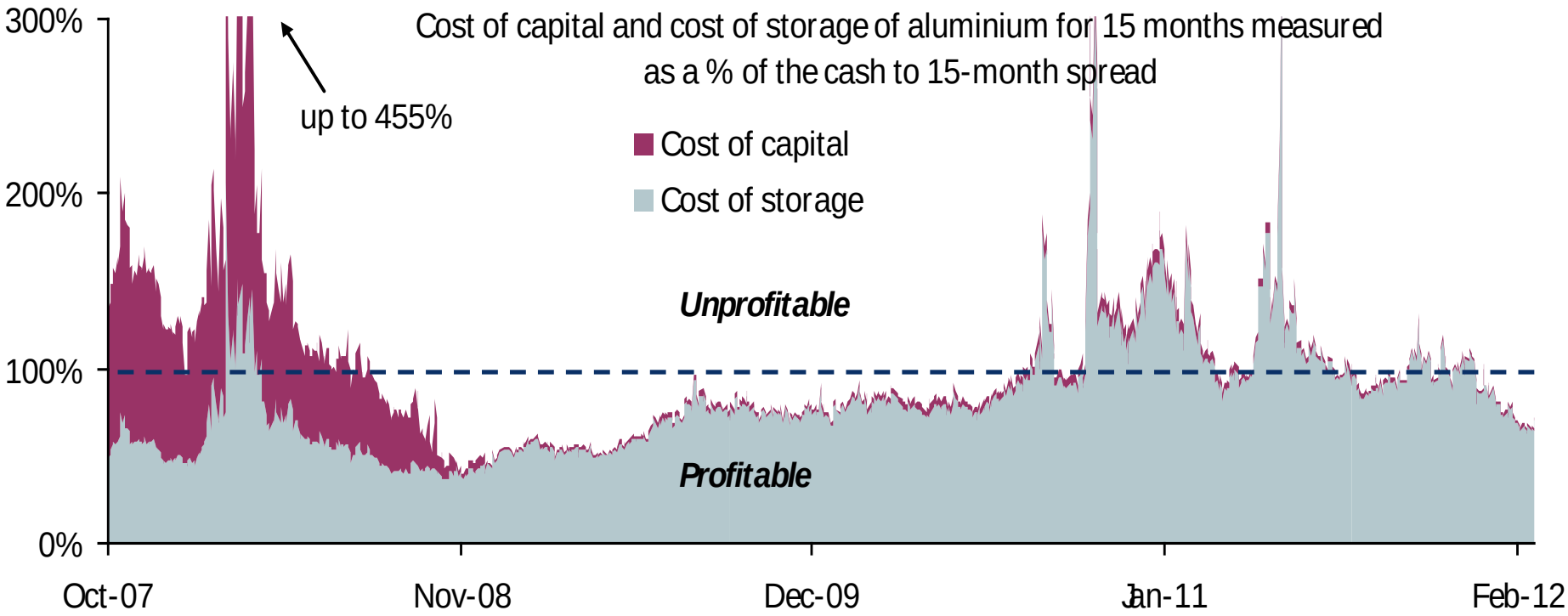


Contango has been supported by surplus market balances seen from 2008 to present



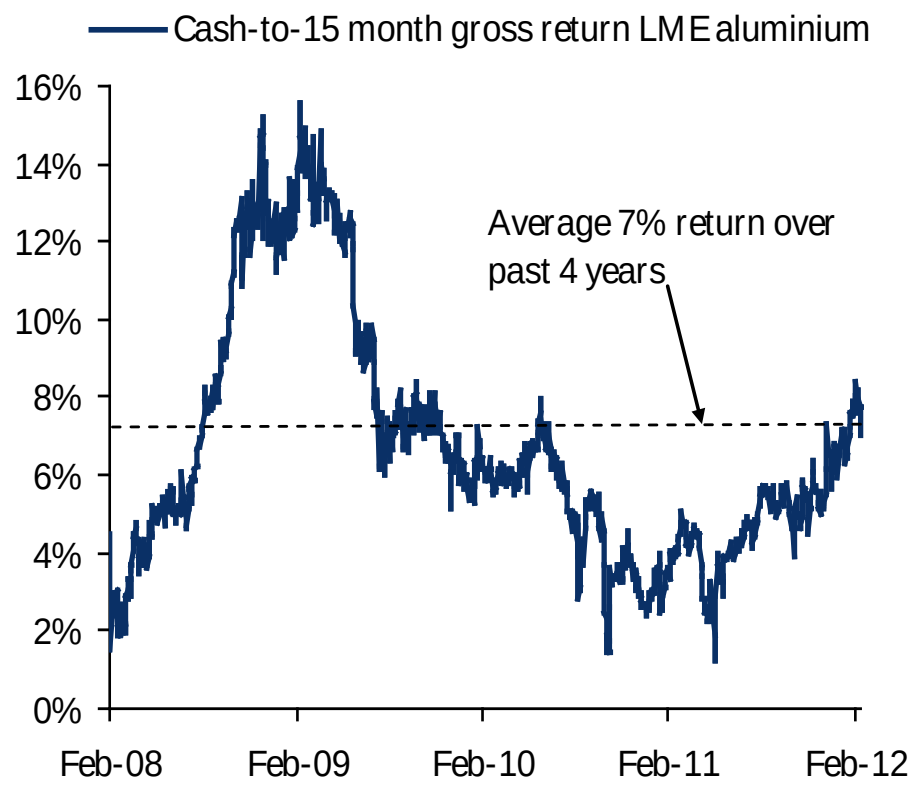
These two factors have periodically supported the profitability of inventory financing over past 4 years

Interest rates remaining low combined with low cost of storage have supported the profitability of these financing trades, with strength of spreads the critical determinant. Up to 70% of LME and closer to 100% off-warrant material tied-up at points in time.

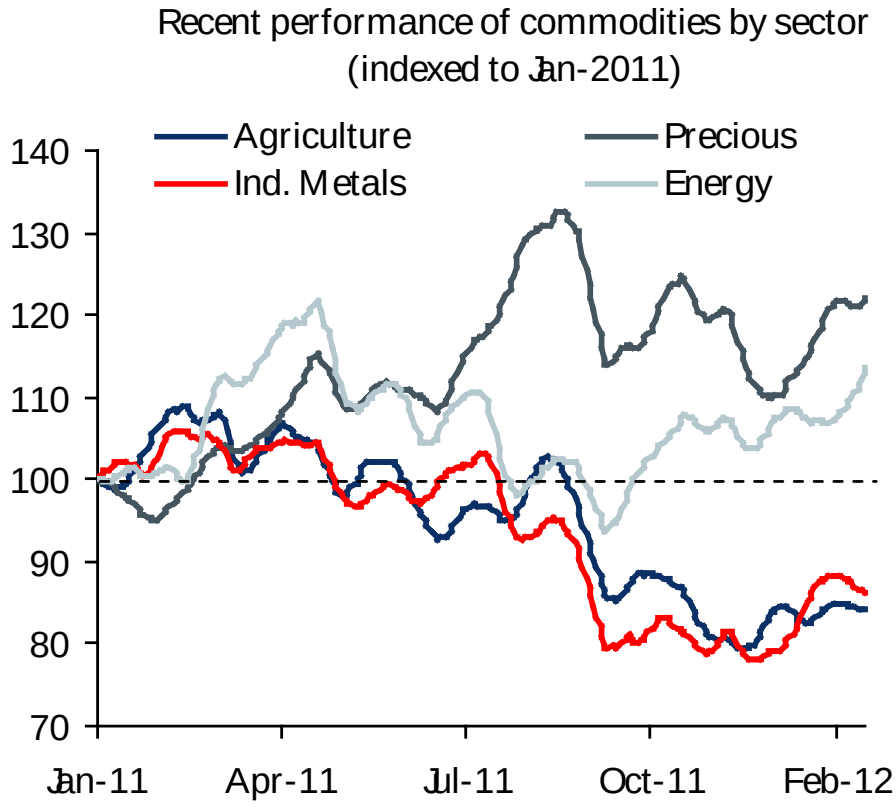


In an environment of constrained returns in other asset classes, financing has also attracted investment flows

Pre-storage and capital, gross return on 15 month trade has averaged 7% since 2008



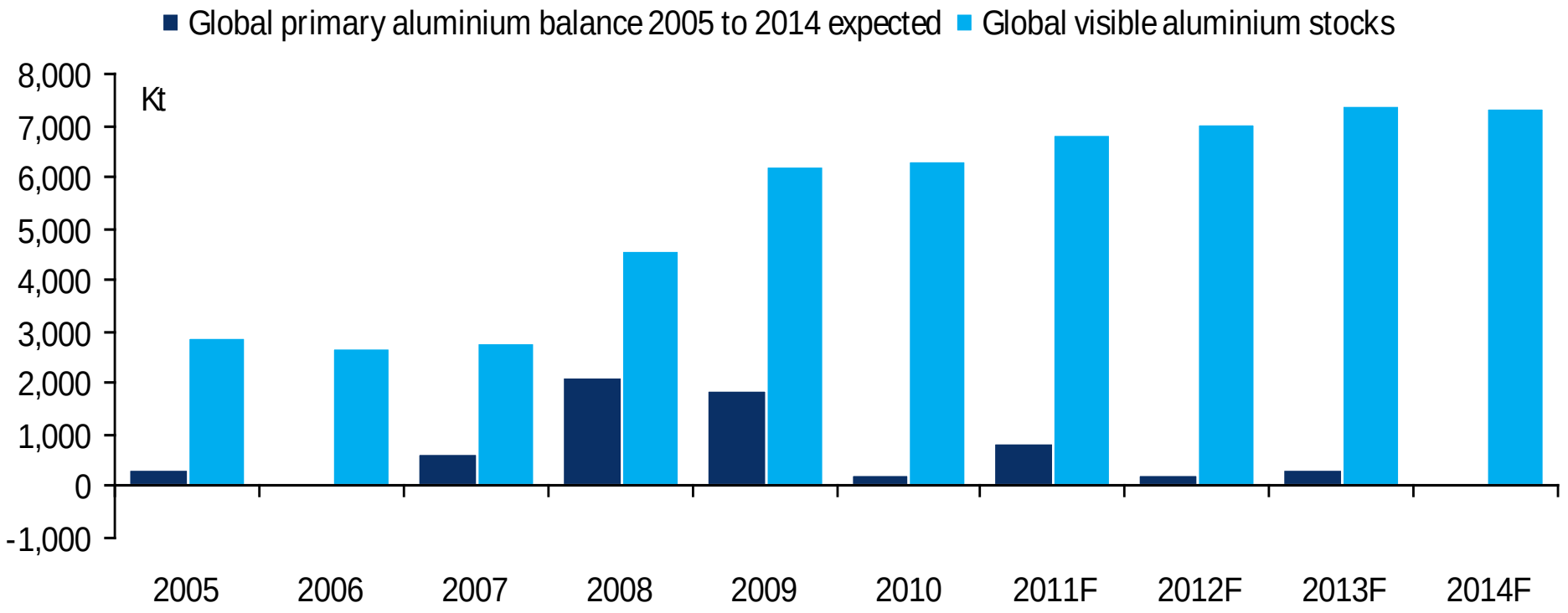
Such relatively low risk consistent returns compare favourably with commodities



What are the impact on aluminium market fundamentals?

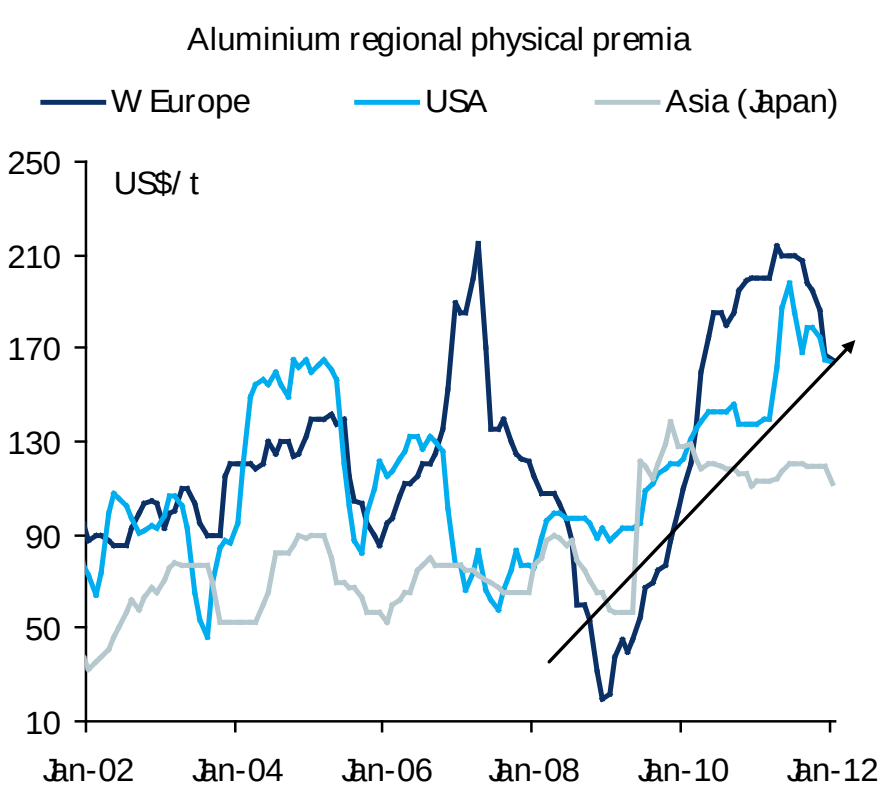
As a surplus market with substantive inventory, we do not believe flat price impact has been significant

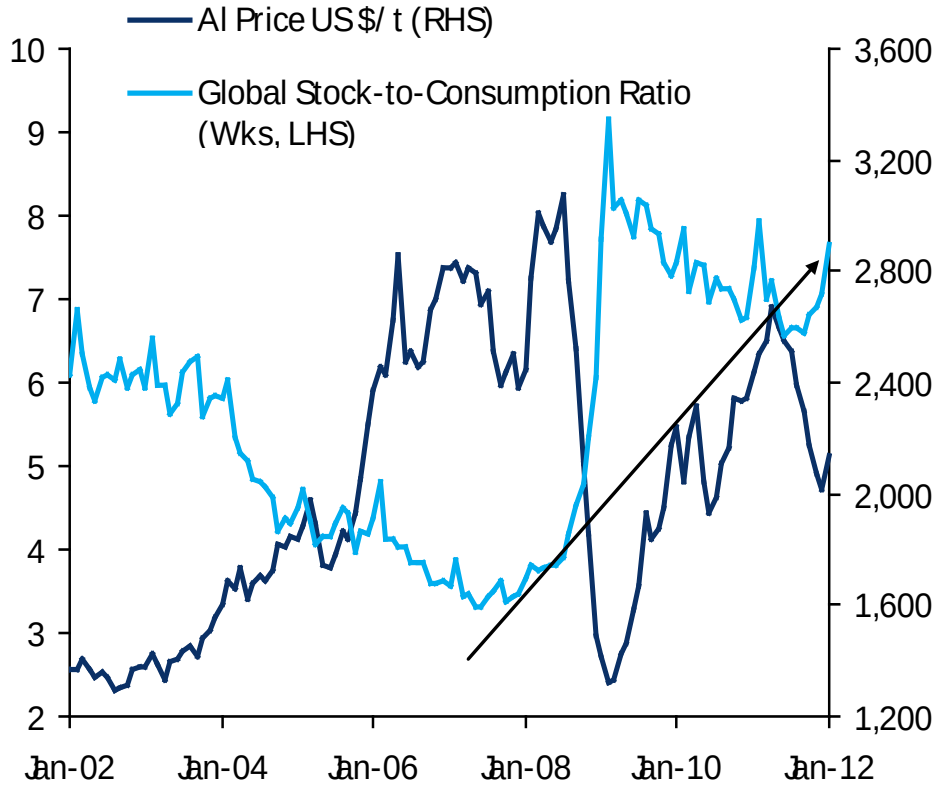
The inventory financing mechanism is itself a reflection of surplus market conditions – if the aluminium market was tight and in deficit, as with the copper market, a sizeable contango would not exist to support the transactions. Record global visible inventory of close to 7Mt in 2012 combined with clear market surpluses for the past five years, as well as forecast for 2012, indicate financing deals are not to nature of balance



There is however clear evidence that physical premiums have been supported by the financing deals

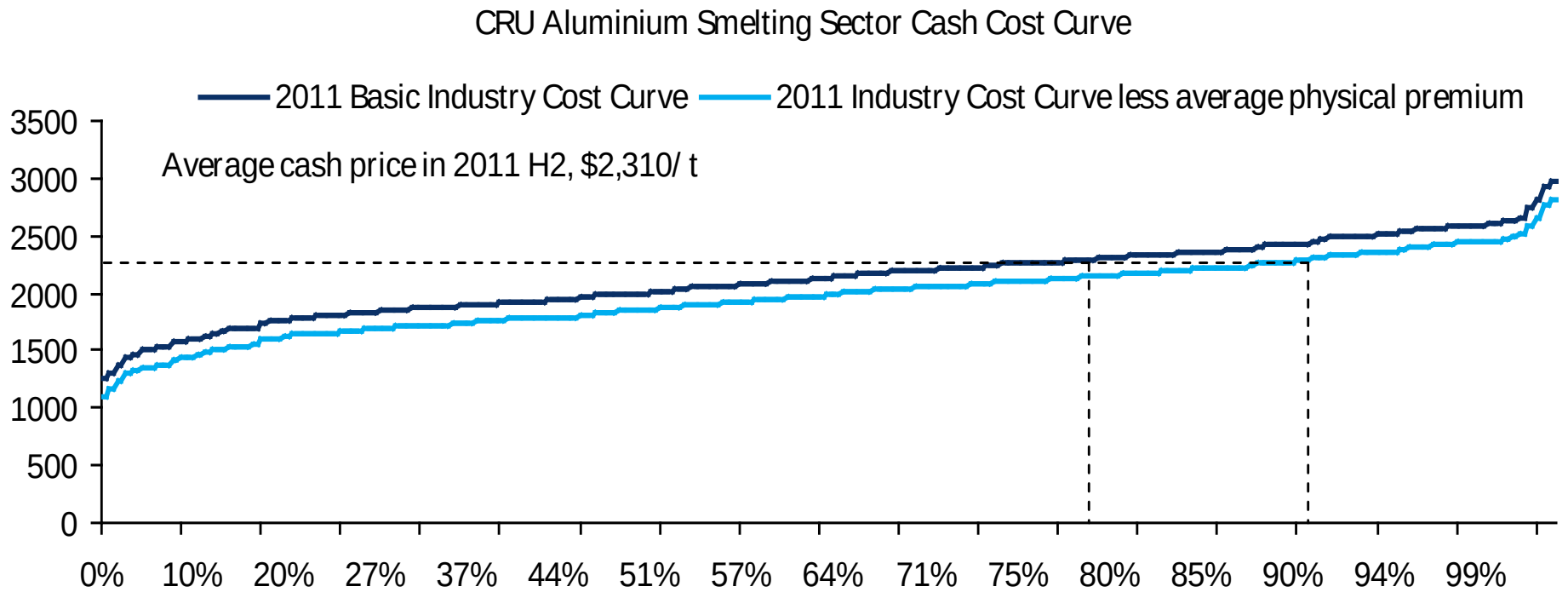
We would however argue that via the interference in the efficiency of the physical market- inventory fluidity has been impacted. It is clear that physical premia have risen despite a much higher global stocks-to-consumption ratio. This points to the impact of financing deals on physical market conditions from tightening supply of liquid inventory accessible to the market. Premiums would not have been as strong if financing deals had not occurred.





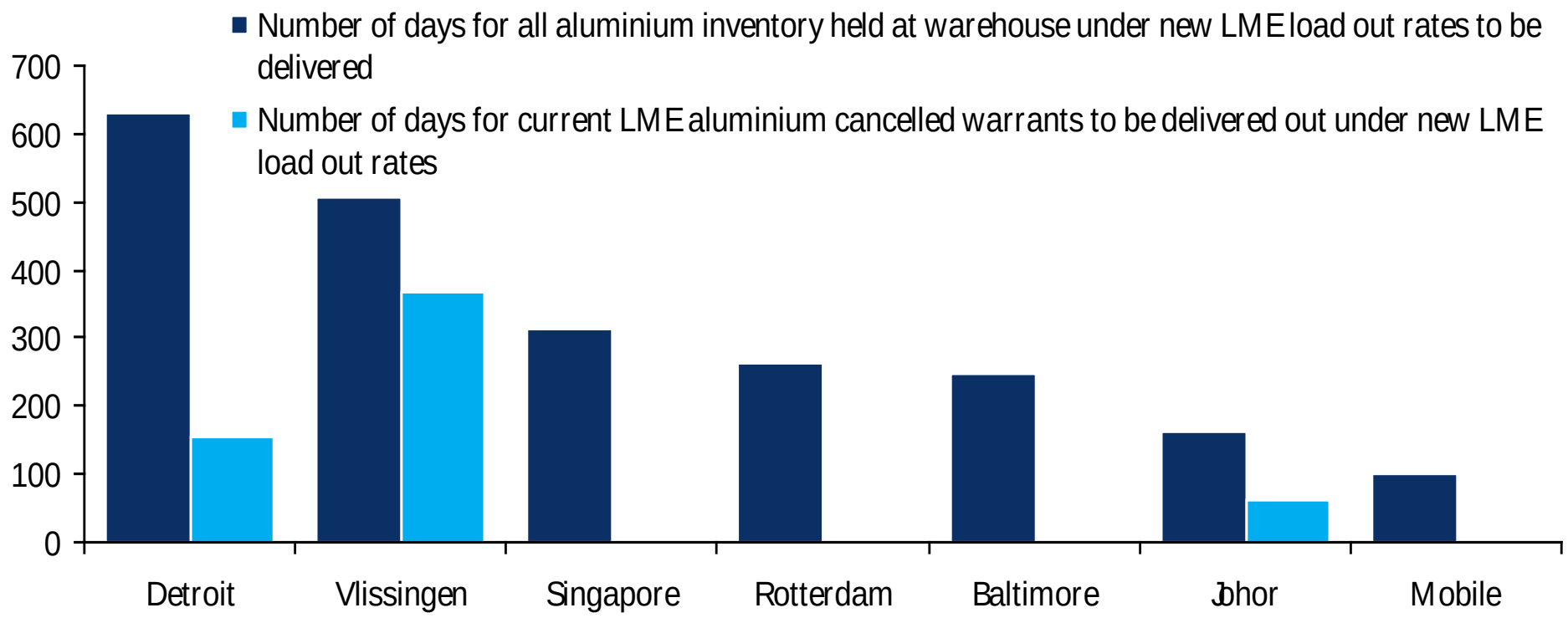
Have elevated physical premia have played a part in supporting margins at otherwise uneconomic smelters?

Another interesting question is whether the support from financing deals has promoted smelters operating when under other conditions would be closed. If we assume that the strength in physical market premia has been driven by the financing deals then certainly it has supported margins. Rather crudely in a 'worst case scenario' of premia supported 100% by financing, this would have increased profitability of 10% of industry in H2 2011 although fundamental factors have also likely directed premia.



Another by-product has been load-out delays due to warehouse competition driving redistribution of material

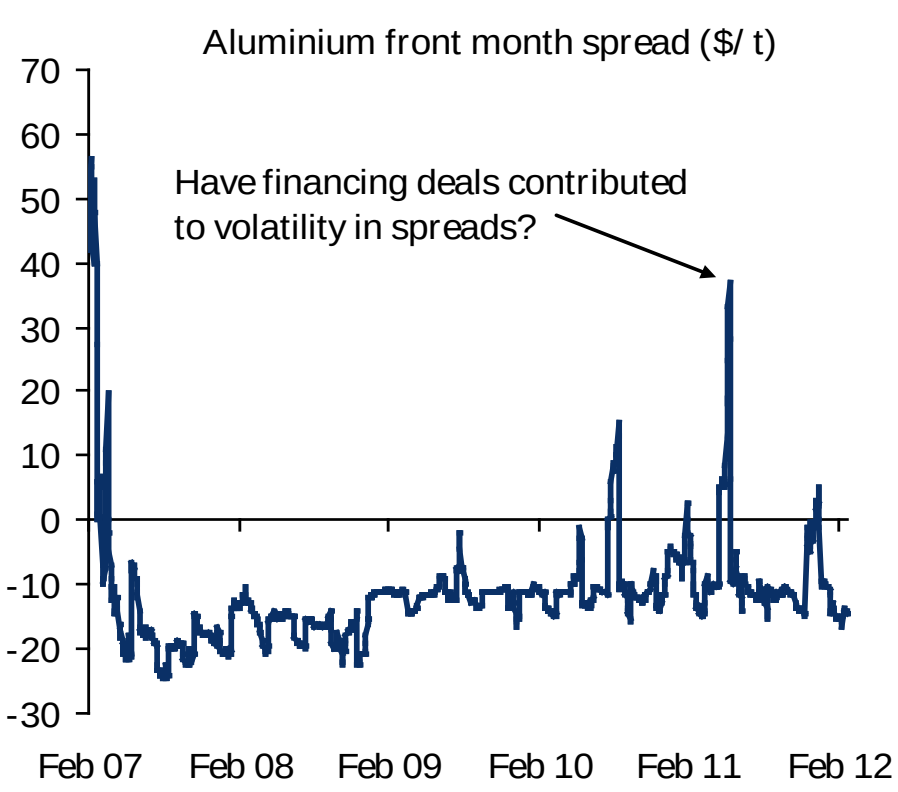
Another impact of the trend of inventory financing has been the competition between warehouses for material, offering different storage rates. Inevitably this has contributed to wholesale redistribution of material between warehouses, although due to limitations of load out rates this has led to significant delays between cancellations and actual delivery. Arguably some of the delayed material may also have been for actual consumption.

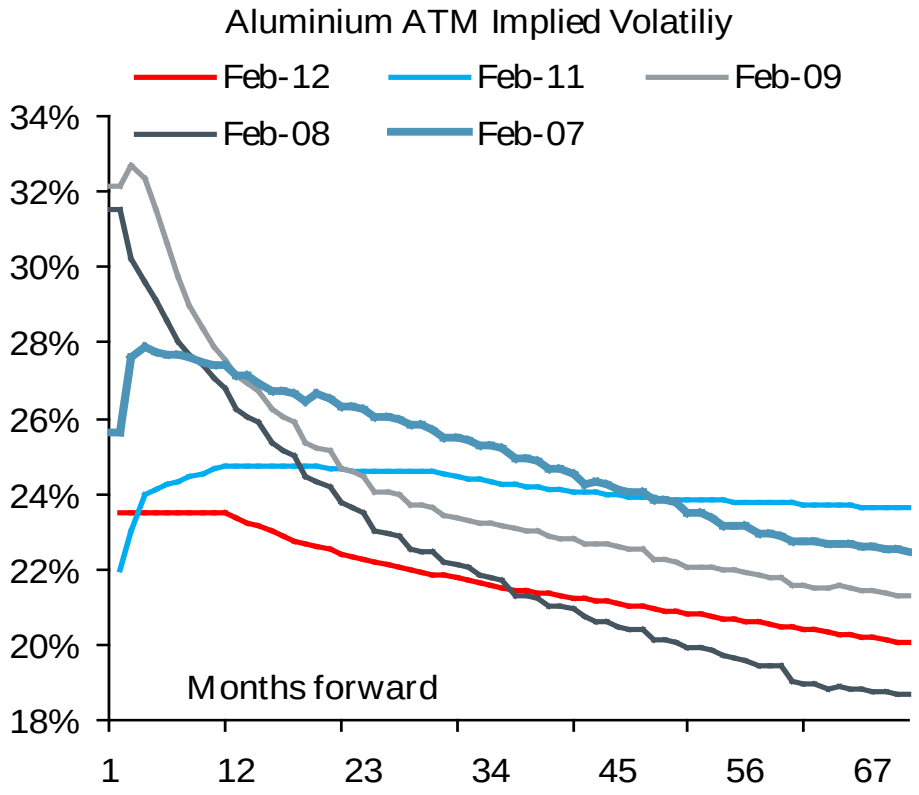


Source: Metal Bulletin

Have the financing deals and underlying transactions contributed to increased volatility in near-by spreads?

General perception has been that rolling forward of underlying positions related to financing deals has contributed to volatility in nearby spreads. Trend of near-by spreads tightening as short positions are closed in run-up to prompt date, has been common. However, the data for implied volatility does not suggest a consistent increase in vol from pre-2009 period

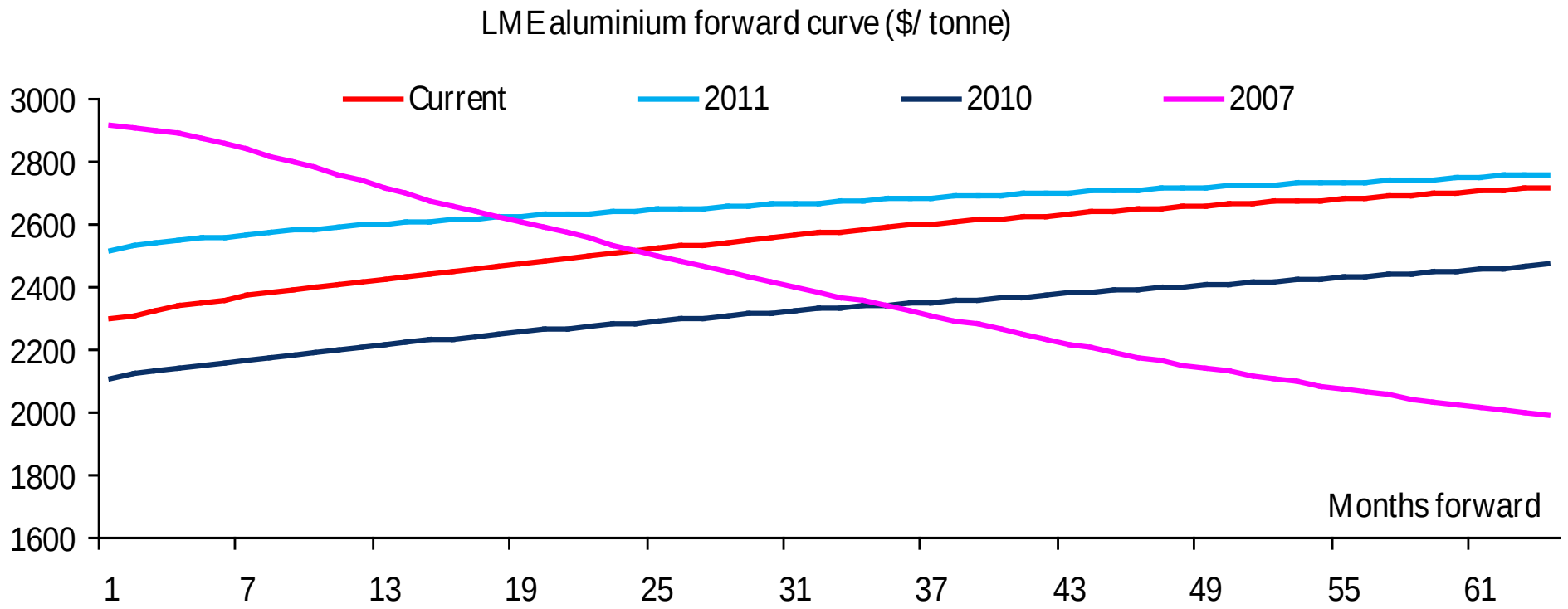




What is the end-game for financing deals or is there such a thing?

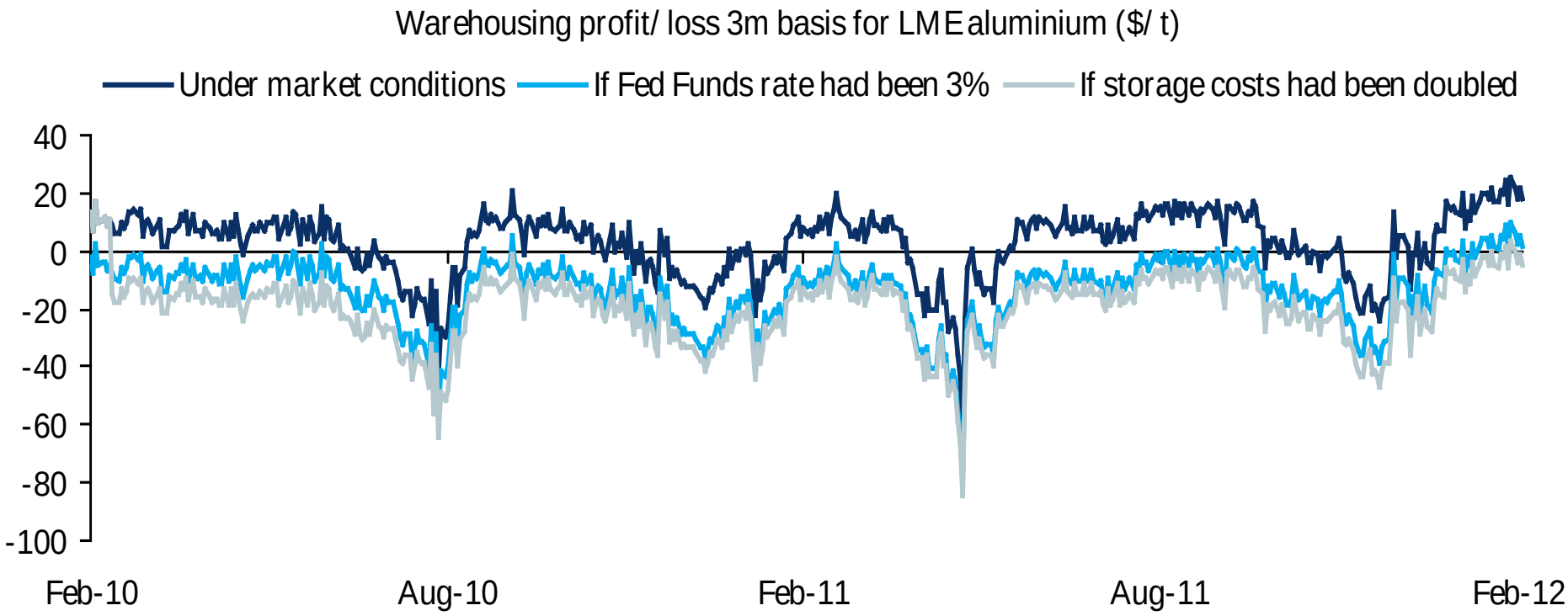
Fundamental outlook indicates it is unlikely contango will be eradicated in the near term…

While one need only return to pre the 2008/09 financial crisis to see an aluminium forward curve in backwardation, we do not consider fundamentals over the next 3 years supporting such a reversion. While the market will remain generally tightly balanced during that time frame, the backdrop of record visible inventories and excess capacity will likely prevent any sustained periods of deficit.



Certainly higher interest rates, tighter credit or higher storage costs will start to erode feasibility…

While the contango is the ultimate driver of the logic of financing deals, it is also clear that if interest rates start to rise (although Fed expectations do not point to this being likely in next 2-3 years) and storage costs increase, then the profitability of the transaction would be dented as per the chart below. These cannot be ignored as risks but under current conditions do not appear likely to be near term game changers.



Conclusions: Impact of financing deals on aluminium physical market and supply mechanism

•The impact of financing deals on aluminium market fundamentals has certainly provided a key talking point, and the strength in time spreads early in 2012 has acted as a catalyst to support the profitability of such deals – they arent going away!

• We do not believe the impact on flat price levels has been as significant as some believe – financing deals are the product of surplus market conditions driving a strong enough contango to support such transactions. This means there is an excess of material in the market – if there wasn't enough aluminium to meet demand then time spreads would weaken but that is clearly not the 'average' situation in the market place.

•There is however good evidence to suggest the constraints on inventory liquidity and fluidity have contributed to regional physical market tightness, supporting premia to some degree. In turn this has supported margins for some smelters and may have supported profitability for marginally longer than if the financing deals were not occurring.

•Another question posed by market participants is how and when might these financing deals come to an end? We do not believe any such 'flooding' effect is imminent. Certainly tightness in market fundamentals will be critical to any sustained weakening in time spreads. In addition, rising interest rates will also be a weight on profitability but will need to rise for some time before eradicating total potential profitability. For the next three years, while tighter fundamentals point to a reduced contango, warehouse competition combined with low expected interest rates mean financing deals will not go away.

Data Sources

Data in this presentation comes from the following sources: Ecowin, Reuters, Bloomberg, MTN-I, CFTC, CRU, Brook Hunt, ICSG, ILZSG, AA, IAI, INSG, LME, SHFE, SGE, BBA, ETP-Issuer websites, China Customs, Antaike, Wards, Antaike, Barclays Capital, IEA, Johnson Matthey, MTN-I, WGC, SGE, Company reports, ECB, Riksbank, SNB.

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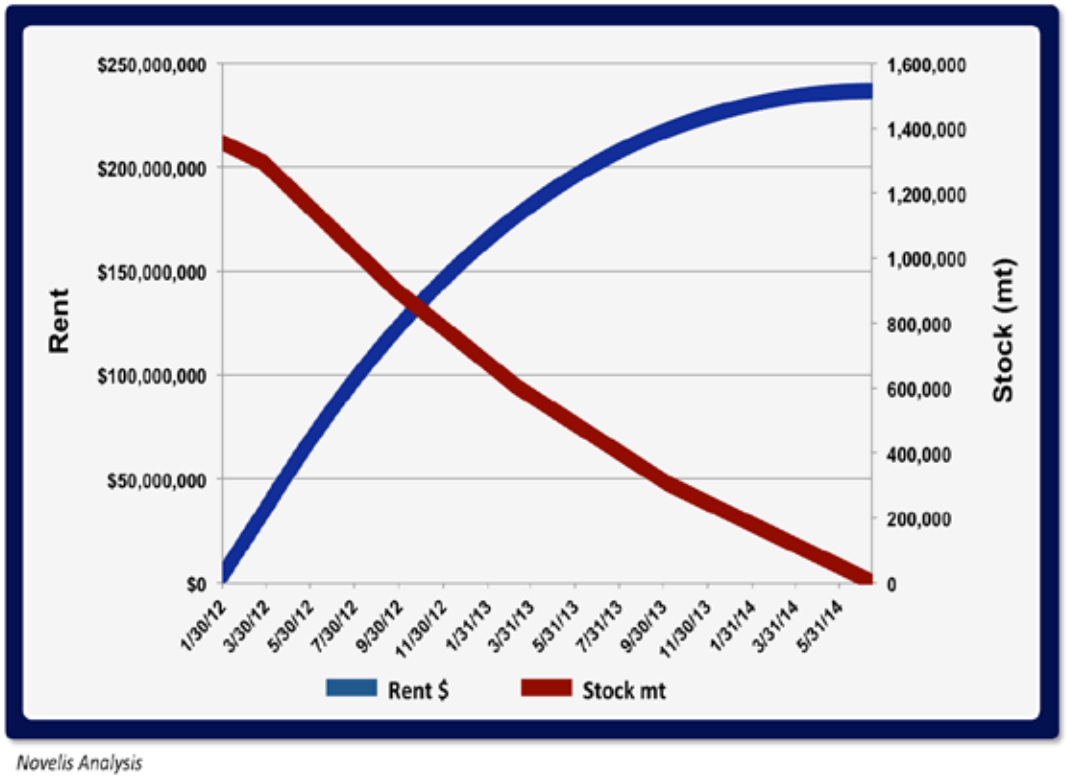
APPENDIX 4

Novelis Analysis – Detroit rent potential



Detroit Stock Depletion and Revenue Jan/2012

Novelis evaluated the potential rental income at Detroit. On January 31, 2012 Detroit stock level was 1,354,500 tonnes.

If no further metal was brought into the warehouse complex and from 1 February onwards, and the metal was shipped out at the minimum load out rate, it would have taken until July 2014 for the warehouse to empty. The rental income that could have been earned at published rent rates available in 2012 was approximately $230 million.

These calculations take into account the impact of the load-out changes which took effect April 1, 2012.

APPENDIX 5

MONEY & INVESTING

CAT Scratches Stocks

Soft Earnings Help to Douse the DJIA IN THE MARKETS C4

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DJIA 15413.33 ▼ 54.33 0.35% S&P 1746.38 ▼ 0.47% NASDAQ 3907.07 ▼ 0.57% 10-YR. TREAS. ▲ 9/32, yield 2.482% OIL $96.86 ▼ $1.44 EURO $1.3776 YEN 97.38 See ma

Metals Logjam Benefits Producers

Alcoa, Rusal Reaped Revenue From Higher Fees That Accompanied Aluminum-Warehouse Bottleneck

By Matt Day

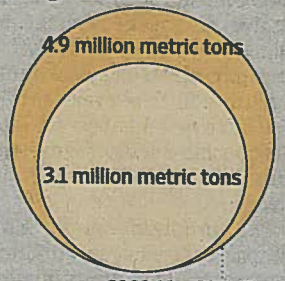
Two of the world's largest aluminum makers reaped an estimated $1.4 billion in revenues from higher fees amid a logjam at London Metal Exchange warehouses, according to an analysis by The Wall Street Journal.

The two companies, **Alcoa** Inc. and **United Co. Rusal**, have emerged as some of the most vocal opponents of an LME proposal aimed at easing bottlenecks at warehouses.

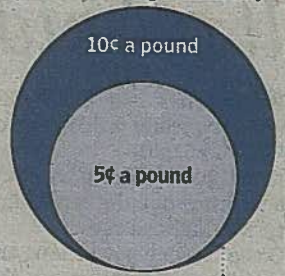
Many analysts say the fees, known as "premiums" to industry insiders, are likely to shrink from record levels if the new warehouse rules are implemented. While the holdups at

Aluminum's Arc

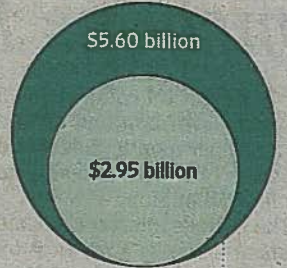
Stockpiles are growing...
Aluminum stored in London Metal Exchange warehouses



...adding to prices...
U.S. Midwest aluminum premium, the fee paid for handling and delivery



...and boosting producer revenue.
Premiums' contribution to revenue of three largest global aluminum firms



*2010 and 2013 figures are for the first half of each year
The Wall Street Journal

Sources: CQG (inventory); CRU (premium); WSJ (estimated revenue, based in part on production figures from United Co. Rusal, Alcoa and Rio Tinto)

flected the increased involvement of investors wagering on metal prices.

The increased premiums have benefited aluminum producers. Premiums essentially are a surcharge that buyers pay producers or other holders of aluminum—in addition to the price of the metal—to cover handling, insurance and other delivery costs. But in this case, analysts say, premiums are rising simply because demand for aluminum is increasing while warehouses are backed up. Lower premiums would hit a stream of revenue that aluminum companies have come to rely on since 2010, because prices for the metal itself have languished in recent years.

041

Logjam at Metals Warehouses Benefits Producers Like Alcoa, Rus

Continued from the prior page

U.K. Financial Conduct Authority calling the LME proposal a "misguided" effort that would disrupt the market. Alcoa, which is based in Pittsburgh, said the LME should halt any plans to implement the changes.

Last month, Oleg Deripaska, chief executive of Rusal, the world's biggest aluminum producer by volume, said in a letter released publicly that the LME proposal "is an unprecedented intervention and one that Rusal strongly objects to."

The FCA declined to comment. The CFTC didn't respond to a request for comment.

The resistance of Alcoa and Rusal, based in Russia, to the proposal underscores how any fallout from changes to LME's warehouse system is liable to reverberate beyond Wall Street. To date, big banks have attracted most of the scrutiny from regulators because they own warehouses in the LME system, the biggest of its kind in the world.

In early 2011, aluminum premiums began an unprecedented rise. The premium averaged about six cents a pound in the late-2000s, according to data from consulting firm CRU Group. It was at a record 11.75 cents as recently as July, according to CRU.

If premiums decline, "this is hundreds of millions [of dollars] of profitability that's disappearing" for aluminum makers, said David Gagliano, who covers metal and mining companies as an analyst for Barclays PLC. "There's a lot of talk about consumers paying high prices. But who benefited? The producers, and the traders."

When the LME released its proposal July 1, the exchange said its board would consider it in October following a consultation period with producers, consumers, traders and other officials. Earlier this month, amid rising criticism from industry groups on one hand and metal companies on the other, the LME said it was possible the board wouldn't reach a decision this month. A spokeswoman for the LME, a subsidiary of **Hong Kong Exchanges & Clearing** Ltd., declined to comment further this week.

In 11 quarters, starting with the first quarter of 2011, Alcoa's revenue from premiums on sales of primary, or raw, aluminum to third parties could have totaled about $1.7 billion. That is based on Journal calculations that take into account reported sales of this aluminum over the period and the annual premiums, based on an average of market prices. The number excludes sales to other Alcoa units. Aluminum companies sometimes break out revenues attributed to delivery premiums but not consistently.

The $1.7 billion figure is $649 million more than Alcoa would have received in premium payments if premiums were at their average of six cents a pound in the late 2000s calculated by CRU.

The picture is similar for Rusal, which so far has reported financial results only through the second quarter of 2013. The company's revenue tied to premiums may have totaled $2.1 billion in the past 10 quarters, according to the Journal analysis.

If premiums had been at their average levels, revenues would have been about $790 million less, according to the analysis.

Rusal and Alcoa declined to detail the financial impact of the higher premiums. An Alcoa spokeswoman said the company's profitability also depends on factors other than metal prices.

Rio Tinto PLC, the other major global aluminum maker, hasn't weighed in publicly on the LME's proposal. The company—which derives most of its revenue from sales of iron ore—still likely profited from the higher-than-average premium. According to Journal calculations, Rio Tinto may have posted revenues tied to premiums of $1.8 billion in the last 10 quarters. Rio Tinto declined to comment.

Based on the Journal's analysis, premium revenue at the three firms totaled $5.6 billion in 2011, 2012 and the first half of 2013. This is up from $2.95 billion in the comparable period through the first half of 2010.

Based on other analysts' calculations, the windfall from the high premiums may have been even bigger. Alcoa's primary-metals division earned $979 million more than it would have had premiums stayed at the historical average, according to Curt Woodworth, an analyst with Nomura Securities who included in his model Alcoa's realized prices rather than just premiums and production.

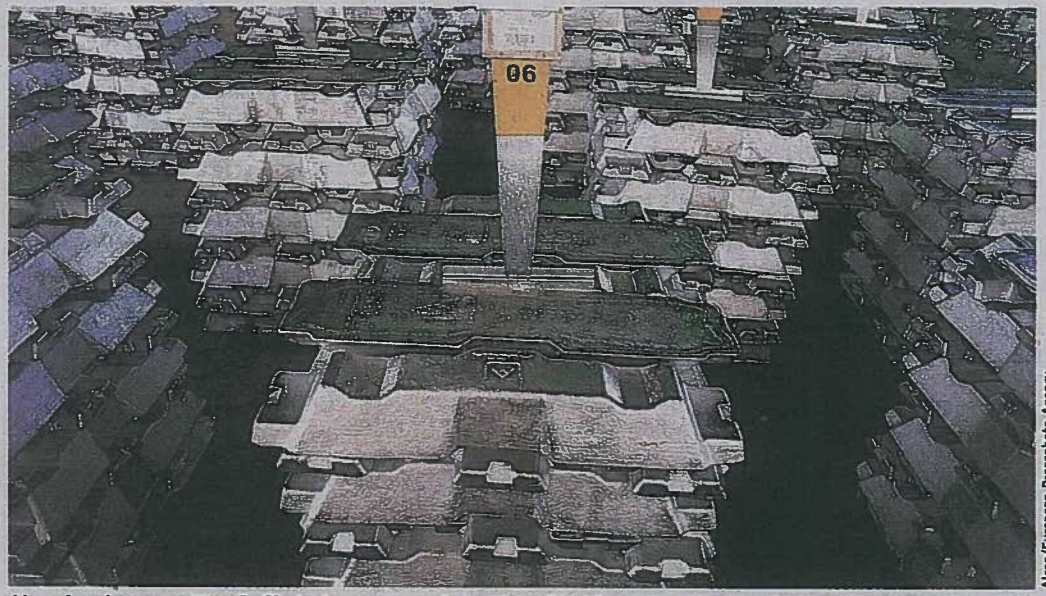
In the third quarter of 2013, the premium would have been the difference between a profit and a loss for Alcoa, according to Journal calculations. The pany sold 1.51 billion pour aluminum to outside custo during the three months ended in September, whe premium was 5.2 cents abo historical average.

Some analysts expect p ums could decline by as mu a third if the LME rules as posed come into force. Tha of decrease would shave A earnings before interest taxes by $302 million a yea cording to Barclays. Ana surveyed by Thomson Re expect the aluminum mak earn $350 million this yea

Alcoa's shares are up 6. 2013, a rise many analysts bute to strong performan businesses other than the mary-aluminum unit. Still, s are down by three-quarters their 2007 peak. In 2013, shares are down by 50%, ar Tinto shares have fallen b

Some industry experts that, if aluminum premiu vert to their historical ave the industry itself woul healthier over the longer Without that added boo their realized prices, alum makers would be forced t back production from marg profitable smelters and re supplies, said Aldo Mazza an analyst with Macquarie Any decrease in supplies w lend support to aluminum p

"The theory is that should help long-term," Mr. zaferro said. "The proble you have to get from he there. It's a short-term hit don't know [investors] hav counted for."



Alcoa/European Pressphoto Agency

Alcoa has been a critic of efforts to ease supply bottlenecks. Above, ingots at an Alcoa plant in Brazil.

APPENDIX 6

Novelis CEO Lashes Out At LME Ruling

The Wall Street Journal
March 28, 2014, 12:23 PM ET
By Francesca Freeman

The chief executive of major aluminum consumer Novelis Inc. has hit out angrily at a U.K. High Court ruling that quashed, for now, key parts of the London Metal Exchange's proposed metals-warehousing overhaul.

On Thursday the U.K.'s High Court ruled that the LME's consultation process, on proposals designed to address delays in accessing metals held in its warehouse system, was unlawful.

Atlanta-based Novelis, which buys huge quantities of aluminum to make sheet metal for beverage cans, cars, buildings and electronics, had released a short response to the ruling on Thursday. But Friday its CEO Phil Martens weighed in, and he pulled no punches.

In a statement he said:

"It is indefensible that queues of more than a year exist at warehouses and unconscionable that players in the aluminum market are actively working to maintain the status quo to protect artificially inflated premiums."

He added:

"Primary aluminum producers, traders and banks have created an artificial global shortage and driven spot premiums to ridiculously high levels."

and:

"This recent legal action taken outside of the LME's consultation process is grievous–it sanctions the continuation of this destructive regime…This exploitation of an artificial market squeeze appears to us to be blatant, and the effects are being felt further down the supply chain and ultimately by the end consumer."

Rusal, which took the LME to court, responded to Mr. Martens's comments:

"Rusal's action was not based on any mission to derail reforms and changes to the warehousing and price discovery system which we do support. It was the consultation process that was flawed and led to proposals that did not solve the fundamental issues of transparency due to the movement of metal to off warrant warehouses, the divergence of the exchange price and the market price and the risk of the exchange price being increasingly linked to the trading strategies of speculators based on macroeconomic factors, rather than the fundamental market factors of supply and demand of metal."

The LME, which said it was "disappointed" with Thursday's ruling, is currently taking legal advice on whether to appeal or to undertake a fresh consultation.

Novelis Reacts to Verdict in Rusal Lawsuit Against LME President and CEO says Ruling will be Destructive to Market

ATLANTA, March 28, 2014 /PRNewswire/ -- Novelis Inc. President and Chief Executive Officer Phil Martens issued the following statement today in response to Thursday's ruling by the UK High Court regarding planned changes to aluminum warehousing rules by the London Metal Exchange (LME):

"We are very disappointed with the outcome of the legal process in the UK," said Martens. "We have worked closely with the LME and other stakeholders for two-and-a-half years to push for changes. Unfortunately, Rusal's unilateral action resulting in this court decision will stifle the LME's proposal to alleviate the unprecedented backlog at LME warehouses and will be very destructive to the market.

"It is indefensible that queues of more than a year exist at warehouses and unconscionable that players in the aluminum market are actively working to maintain the status quo to protect artificially inflated premiums. The divergence between the LME price and the physical market price is undermining the credibility of the industry's pricing discovery process and causing havoc in the fabricating and consuming end of the industry. This is a global issue.

"Primary aluminum producers, traders and banks have created an artificial global shortage and driven spot premiums to ridiculously high levels. The change in the LME load out rate was intended to restore equity in the LME system and remove the queues which are directly responsible for driving up the premiums in the first place.

"This recent legal action taken outside of the LME's consultation process is grievous -- it sanctions the continuation of this destructive regime. At the same time, the producers are continuing to make outsized windfall gains, which a year ago we estimated to be $3 billion, but are now twice that level. This exploitation of an artificial market squeeze appears to us to be blatant, and the effects are being felt further down the supply chain and ultimately by the end consumer.

"Novelis had hoped that the LME changes together with possible regulatory actions would identify any wrong doing that may have taken place and dramatically improve the scrutiny of the market and market convergence. The court decision, unfortunately, throws yet another wrench in the works and does nothing to settle the ongoing supply chain risk to aluminum fabricators and beverage marketers and other customers where premiums are at the highest levels in history."

Novelis Blasts LME Warehousing Plan
http://www.amm.com/Article/3324986/Novelis-blasts-LME-warehouse-plan-ruling.html
American Metal Market
March 28, 2014

Novelis Inc. president and chief executive officer Philip Martens lashed out at a judgment by the United Kingdom's High Court of Justice that stopped proposed London Metal Exchange warehouse reforms from being implemented, saying the outcome would prove "destructive to the market."

The Atlanta-based secondary aluminum producer has worked closely with the LME and other interested parties for more than two years to push for changes to warehouse rules aimed at trimming queues at sheds with bloated inventories, Martens said in a statement March 28.

Those efforts have been stymied by the High Court's ruling in favor of Moscow-based primary aluminum producer United Co. Rusal's (UC Rusal's) "unilateral" lawsuit seeking to block the proposed changes, Martens said. The result is that waits of more than a year for metal at some LME-listed warehouses will continue, supporting "artificially inflated premiums" and calling into question the relevancy of LME pricing, he said.

Nearly 5.4 million tonnes of aluminum are held in LME-listed warehouses globally, with the bulk in Detroit-area sheds, which account for more than 1.5 million tonnes, and facilities in Vlissingen, the Netherlands, where more than 2 million tonnes of metal are stored, according to LME data. The big stocks and limited load-out rates have caused long waits for metal at those locations in particular, a subject that has sparked antitrust lawsuits, Senate hearings and scrutiny from U.S. regulators.

“The divergence between the LME price and the physical market price is undermining the credibility of the industry’s pricing discovery process and causing havoc in the fabricating and consuming end of the industry,” Martens said. He also accused primary aluminum producers, traders and banks of creating an “artificial” global shortage of aluminum in an effort to drive spot premiums to “ridiculously high levels.”

“This exploitation of an artificial market squeeze appears to us to be blatant, and the effects are being felt further down the supply chain and ultimately by the end consumer,” Martens said. “The court decision, unfortunately, throws yet another wrench in the works and does nothing to settle the ongoing supply chain risk to aluminum fabricators and beverage marketers and other customers where premiums are at the highest levels in history.”

Novelis has “no plans at this time” to file an appeal, a company spokesman said March 28.

AMM’s Midwest premium stands at 18.15 to 18.25 cents per pound, down from highs of more than 20 cents per pound earlier this year but well above historical norms.

The market had been expecting the proposed LME reforms to warehouse loading and unloading rates to go into effect April 1. But following the court’s decision, it is no longer clear when or whether those changes might be made.

While some market sources have said the ruling should have little impact on premiums, others have argued that the lack of change could push up LME prices for aluminum and regional premiums, including Midwest premiums.

Novelis decries UK ruling, fears aluminum backlog, higher prices

The Atlanta Journal-Constitution
March 27, 2014

Atlanta-based **Novelis** Inc., an aluminum products manufacturer and recycler, on Friday blasted a High Court ruling in the United Kingdom that the company said will lead to backlogs of aluminum for delivery and inflated prices, ultimately leading to higher costs for consumers.

Novelis is among major manufacturers, including soft drink producers like Coca-Cola, beer companies like MillerCoors and automakers, that rely on aluminum held in warehouses like those registered by the London Metal Exchange. The warehouses, owned by companies such as JP Morgan, Goldman Sachs and Glencore Xstrata, have been accused of purposely keeping large stockpiles with long delivery “queues” to keep prices paid by Novelis and others artificially high.

Critics say warehouses have an incentive to keep stockpiles high because of the rents they receive and metal owners profit since prices for future deliveries may exceed current prices.

Last year U.S. regulators, including the Justice Department, began investigating the backlogs at LME-registered warehouses. The exchange, which has also faced lawsuits, was set to impose a new rule that would ease the stockpiles and long queues, and that backlogs had already begun to decline, according to multiple media reports.

But the UK High Court on Thursday blocked the new LME rule after it was challenged by Rusal, a Russian company and the world's largest aluminum producer. Rusal, which feared more aluminum on the market would depress prices, argued LME violated the law over how consultations were carried out on changing its rules, and the court agreed.

Novelis is a major supplier of aluminum sheet and foil products to automotive, transportation, packaging, construction, industrial and consumer electronics markets around the world.

In a statement, Novelis President and Chief Executive Officer Phil Martens said the UK ruling will cause an "unprecedented backlog at LME warehouses."

"Primary aluminum producers, traders and banks have created an artificial global shortage and driven spot premiums to ridiculously high levels," Martens said. Buyers pay premiums above prices for spot supplies. "This exploitation of an artificial market squeeze appears to us to be blatant and the effects are being felt further down the supply chain and ultimately by the end consumer."

Martens did not say specifically how Novelis' costs would be affected.

Novelis gives up on LME, seeks other avenues in warehouse battle
Reuters
February 1, 2013

* LME says can't resolve logjams, calls on industry

* Logjams only at warehouses owned by banks, trade houses

* Consumers pass complaints to EU watchdog

By Susan Thomas and Maytaal Angel

LONDON, Feb 1 (Reuters) - The world's top maker of aluminium for beverage cans has lost patience with the London Metal Exchange's failure to tackle access problems at the warehouses the LME monitors and says it will seek a solution elsewhere.

Novelis has long criticised the warehouse system for contributing to record-high price premiums for aluminium, a metal in chronic surplus.

"The LME sees no need to do anything else, even though they sympathise with the aluminium consumers," Nick Madden, vice president and chief procurement officer at Novelis, a unit of Hindalco Industries, said in an interview.

Madden's words follow a speech by Chris Evans, LME head of business development, who told a recent conference in the United States that the solution to the problem would have to come from the market, rather than the LME.

"I can only conclude that now that we have tried the direct approach and failed, Novelis will have to work through other stakeholders," Madden said.

"We will continue to be active, we just have to find some other way to get attention, we have to try other avenues."

Madden, whose company has been speaking out about the current LME warehousing problems since 2011, declined further comment.

Europe's competition watchdog received a complaint late last year against owners of LME-registered warehouses for ramping up rental profits by letting long queues for metal grow at some locations.

NEW OWNERSHIP CREATES HOPE

Metal buyers also hope the exchange's new owner, Hong Kong Exchanges and Clearing, will tackle the problem forcefully. The big banks and trade houses that own the warehouses will now have less influence on exchange policy after they sold their LME shares during the takeover.

For those warehouses, backlogs are lucrative because metal waiting to be delivered out continues to earn storage fees. They also say the backlogs are due to the logistical difficulties of moving large amounts of metal.

LME rules stipulate a low minimum load-out rate for metals stored in the warehouse network that the exchange monitors.

Warehouses do not have to deliver out any more than the minimum. They are also free to set their own rents, and even if the LME raises the load-out rate, they can raise rents to compensate for any loss of income.

Novelis has proposed that the load-out rate for the warehouses carrying the largest stockpiles should be trebled.

The LME rejects this proposal.

"There is no solution that the LME could or should propose. This isn't a debate about delivery (out rates)," Evans told the U.S. conference.

"This is an aluminium industry problem, and it is the industry that must come up with a solution. If fabricators choose to sell at uneconomic levels, they will of course lose money."

Fabricators are crippled by high premiums because they are paid a percentage of the LME base price for converting a sheet of metal into a can for example. They are not able to pass on the costs of premiums, which in some cases might equal their sale price.

Premiums for duty-paid aluminium in Rotterdam are currently at record highs of around $300 a tonne - about 15 percent of the LME base price. Benchmark U.S. Midwest spot aluminium premiums have also reached a record high.

They have been rising since the financial crisis pushed interest rates to near zero, making the financing deals both lucrative and safe.

The financing deals, which have locked up more than 70 percent of LME aluminium inventories, keep metal away from industrial users, while at the same time resulting in a concentration of metal in certain LME locations.

This exacerbates backlogs when material is booked for delivery by industrial or other users of the exchange, putting even more upward pressure on premiums.

Millions of Tons of Metals Stashed in Shadow Warehouses

Wall Street Journal

Dec. 26, 2013

The world's metal is slipping into the shadows.

Banks, hedge funds, commodity merchants and others are stashing tens of millions of tons of aluminum, copper, nickel and zinc in a hidden system of warehouses that span the globe.

These facilities are known to some in the industry as "shadow warehouses" because they are unregulated and don't disclose their holdings.

They operate outside the London Metal Exchange system of warehouses, the traditional home for these metals.

As of October, a record seven million to 10 million tons of aluminum were being housed in these facilities, in countries as far apart as Malaysia and the Netherlands, according to estimates from several analysts.

The amount dwarfs the 5.5 million tons of aluminum in the LME-licensed warehouses, based on LME figures as of Tuesday. Just 12 months ago, the figures were about equal.

A similar shift is taking place with other industrial metals, analysts say.

As a result, producers and consumers are bracing for potentially wild swings in metals prices as market participants have difficulty accurately gauging supplies of these metals. With no clear insight into how much metal is in the shadow system, setting prices will become increasingly difficult, they say.

Analysts and traders say the flow of metal into shadow warehouses already is making prices move in unpredictable ways—such as when a large amount of unaccounted-for metal suddenly makes its way onto the market.

"It's a real concern for anyone in the industry that metal can be sucked away into a nonreporting location with no expectation or date as to when it's going to be available again," said Nick Madden, senior vice president and chief supply-chain officer with Atlanta-based Novelis Inc., an aluminum-products maker that is among the world's biggest buyers of the metal.

"The risk here is that the metal gets controlled by fewer and fewer hands, whose interests and business model is probably conflicting with that of end users," he said.

Industrial metals end up in all sorts of everyday goods—from aluminum soda cans to copper wires inside refrigerators to zinc-plated steel in roofs. Turbulent raw-materials prices can make it more expensive to produce such goods when prices spike or limit output from mines and smelters when prices drop below their cost of production.

The lack of transparency is making this shadow system increasingly attractive to institutions seeking to profit from information that other buyers and sellers don't have. Some companies also are seeking a cheaper alternative to the LME warehouses, which can be 10 times as expensive as the unregulated storage, analysts and traders say.

However, metal owners can face higher interest rates from banks if they wish to use metal stored in shadow warehouses as collateral for loans, because banks see the LME system as less risky, analysts say.

Five companies operate 75% of the LME's 778 licensed warehouses. All own shadow facilities as well, people familiar with the companies said.

In some instances, a single firm runs licensed and unlicensed warehouses in the same building, with the metal counted by the LME separated from hidden stockpiles by a chain-link fence, said David Wilson, a commodities analyst with Citigroup.

Until 2010, most warehouses were owned by logistics firms like Netherlands-based C. Steinweg Group. But as metal-financing trades became more popular, C. Steinweg was joined by units of Goldman Sachs

Group Inc. and J.P. Morgan Chase & Co. as well as commodity traders Glencore Xstrata PLC of the U.K. and Switzerland and Trafigura Beheer BV of the Netherlands.

All five companies declined to comment.

Metal consumers like Novelis say that prices could increase sharply if warehouse owners buy up large amounts of metal, creating a shortage.

Alcoa Inc., the largest U.S. aluminum maker, has the opposite worry. The company fears aluminum prices are vulnerable to a shock if a large amount of metal suddenly gets moved from shadow warehouses back to the LME's facilities, said Tim Reyes, president of materials management at Alcoa.

"If one day, 2 million tons of aluminum show up and it just went from one pocket to another pocket, it has an impact on price that it shouldn't, and that's a concern for us," Mr. Reyes said.

Such volatility makes it harder to make production plans, he said.

Many metal buyers and producers say they are worried that new rules approved by the LME in November will speed up the flow of metal into shadow warehouses.

Starting April 1, LME warehouses with wait times exceeding 50 days must deliver out more metal than they take in. The delays help boost income from rent and increase the fees paid for faster service, so warehouse owners are expected to increase LME rent charges to offset any reduction in profits.

The rules strike at a trade that has grown sharply since 2010, where investors buy the cheap physical metal and sell a futures contract on the LME at a higher price.

Meantime, the metal sits in an LME-licensed warehouse until the futures contract expires. Higher warehouse costs make this trade less profitable.

If applied today, the rules would flush aluminum out of LME-licensed warehouses holding 3.5 million tons of the metal, equal to 7% of annual global demand.

Warehouses holding copper and zinc also would be required to speed up the release of their stockpiles.

In a Nov. 7 report, the exchange said one potential negative side effect of the new regulations is that more metal could end up in shadow warehouses.

The LME in a statement said it has a duty to run a fair and orderly market and that the warehouse bottlenecks posed a range of issues in terms of price discovery.

The rule changes were made following a consultation process that included an examination of all concerns raised about the possible unintended consequences of any changes, it said.

"We believe that the package of measures contained in the proposal is, on balance, the best solution for all market users," the exchange said.

The Vampire Squid Strikes Again: The Mega Banks' Most Devious Scam Yet

Banks are no longer just financing heavy industry. They are actually buying it up and inventing bigger, bolder and scarier scams than ever
Rolling Stone Magazine
February 12, 2014

Aluminium warehousing - the price of queues

BBC Radio
November 8, 2013

The London Metals Exchange has announced new rules to cut unprecedented year-long queues at aluminium warehouses. That may sound esoteric, but those hold-ups affect the price of a metal used in everything from drinks cans to window frames to car chassis. We speak to one of those losing his patience, Nick Madden of the aluminium rolling firm Novelis, who says that the warehouse owners - who include investment banks Goldman Sachs and JP Morgan - are profiting from the delays by charging extra rents. We also speak to Garry Jones, the boss of the London Metals Exchange about what the new rules, unveiled on Thursday, will achieve.

Goldman Sachs Tinkering With Aluminum Prices?

Fox Business News
July 23, 2013
Novelis Senior V.P. Nick Madden on allegations Goldman Sachs is manipulating aluminum prices.

A Shuffle of Aluminum, but to Banks, Pure Gold
By **DAVID KOCIENIEWSKI**
The New York Times
July 20, 2013

MOUNT CLEMENS, Mich. — Hundreds of millions of times a day, thirsty Americans open a can of soda, beer or juice. And every time they do it, they pay a fraction of a penny more because of a shrewd maneuver by Goldman Sachs and other financial players that ultimately costs consumers billions of dollars.

The story of how this works begins in 27 industrial warehouses in the Detroit area where a Goldman subsidiary stores customers' aluminum. Each day, a fleet of trucks shuffles 1,500-pound bars of the metal among the warehouses. Two or three times a day, sometimes more, the drivers make the same circuits. They load in one warehouse. They unload in another. And then they do it again.

This industrial dance has been choreographed by Goldman to exploit pricing regulations set up by an overseas commodities exchange, an investigation by The New York Times has found. The back-and-forth

lengthens the storage time. And that adds many millions a year to the coffers of Goldman, which owns the warehouses and charges rent to store the metal. It also increases prices paid by manufacturers and consumers across the country.

Tyler Clay, a forklift driver who worked at the Goldman warehouses until early this year, called the process “a merry-go-round of metal.”

Only a tenth of a cent or so of an aluminum can’s purchase price can be traced back to the strategy. But multiply that amount by the 90 billion aluminum cans consumed in the United States each year — and add the tons of aluminum used in things like cars, electronics and house siding — and the efforts by Goldman and other financial players has cost American consumers more than $5 billion over the last three years, say former industry executives, analysts and consultants.

The inflated aluminum pricing is just one way that Wall Street is flexing its financial muscle and capitalizing on loosened federal regulations to sway a variety of commodities markets, according to financial records, regulatory documents and interviews with people involved in the activities.

The maneuvering in markets for oil, wheat, cotton, coffee and more have brought billions in profits to investment banks like Goldman, JPMorgan Chase and Morgan Stanley, while forcing consumers to pay more every time they fill up a gas tank, flick on a light switch, open a beer or buy a cellphone. In the last year, federal authorities have accused three banks, including JPMorgan, of rigging electricity prices, and last week JPMorgan was trying to reach a settlement that could cost it $500 million.

Using special exemptions granted by the Federal Reserve Bank and relaxed regulations approved by Congress, the banks have bought huge swaths of infrastructure used to store commodities and deliver them to consumers — from pipelines and refineries in Oklahoma, Louisiana and Texas; to fleets of more than 100 double-hulled oil tankers at sea around the globe; to companies that control operations at major ports like Oakland, Calif., and Seattle.

In the case of aluminum, Goldman bought Metro International Trade Services, one of the country’s biggest storers of the metal. More than a quarter of the supply of aluminum available on the market is kept in the company’s Detroit-area warehouses.

Before Goldman bought Metro International three years ago, warehouse customers used to wait an average of six weeks for their purchases to be located, retrieved by forklift and delivered to factories. But now that Goldman owns the company, the wait has grown more than tenfold — to more than 16 months, according to industry records.

Longer waits might be written off as an aggravation, but they also make aluminum more expensive nearly everywhere in the country because of the arcane formula used to determine the cost of the metal on the spot market. The delays are so acute that Coca-Cola and many other manufacturers avoid buying aluminum stored here. Nonetheless, they still pay the higher price.

Goldman Sachs says it complies with all industry standards, which are set by the London Metal Exchange, and there is no suggestion that these activities violate any laws or regulations. Metro International, which declined to comment for this article, in the past has attributed the delays to logistical problems, including a shortage of trucks and forklift drivers, and the administrative complications of tracking so much metal. But interviews with several current and former Metro employees, as well as someone with direct knowledge of the company's business plan, suggest the longer waiting times are part of the company's strategy and help Goldman increase its profits from the warehouses.

Metro International holds nearly 1.5 million tons of aluminum in its Detroit facilities, but industry rules require that all that metal cannot simply sit in a warehouse forever. At least 3,000 tons of that metal must be moved out each day. But nearly all of the metal that Metro moves is not delivered to customers, according to the interviews. Instead, it is shuttled from one warehouse to another.

Because Metro International charges rent each day for the stored metal, the long queues caused by shifting aluminum among its facilities means larger profits for Goldman. And because storage cost is a major component of the "premium" added to the price of all aluminum sold on the spot market, the delays mean higher prices for nearly everyone, even though most of the metal never passes through one of Goldman's warehouses.

Aluminum industry analysts say that the lengthy delays at Metro International since Goldman took over are a major reason the premium on all aluminum sold in the spot market has doubled since 2010. The result is an additional cost of about $2 for the 35 pounds of aluminum used to manufacture 1,000 beverage cans, investment analysts say, and about $12 for the 200 pounds of aluminum in the average American-made car.

"It's a totally artificial cost," said one of them, Jorge Vazquez, managing director at Harbor Aluminum Intelligence, a commodities consulting firm. "It's a drag on the economy. Everyone pays for it."

Metro officials have said they are simply reacting to market forces, and on the company Web site describe their role as "bringing together metal producers, traders and end users," and helping the exchange "create and maintain stability."

But the London Metal Exchange, which oversees 719 warehouses around the globe, has not always been an impartial arbiter — it receives 1 percent of the rent collected by its warehouses worldwide. Until last year, it was owned by members, including Goldman, Barclays and Citigroup. Many of its regulations were drawn up by the exchange's warehouse committee, which is made up of executives of various banks, trading companies and storage companies — including the president of Goldman's Metro International — as well as representatives of powerful trading firms in Europe. The exchange was sold last year to a group of Hong Kong investors and this month it proposed regulations that would take effect in April 2014 intended to reduce the bottlenecks at Metro.

All of this could come to an end if the Federal Reserve Board declines to extend the exemptions that allowed Goldman and Morgan Stanley to make major investments in nonfinancial businesses — although there are indications in Washington that the Fed will let the arrangement stand. Wall Street banks, meanwhile, have focused their attention on another commodity. After a sustained lobbying effort, the Securities and Exchange Commission late last year approved a plan that will allow JPMorgan Chase, Goldman and BlackRock to buy up to 80 percent of the copper available on the market.

In filings with the S.E.C., Goldman has said it plans by early next year to store copper in the same Detroit-area warehouses where it now stockpiles aluminum. On Saturday, however, Michael DuVally, a Goldman spokesman, said the company had decided not to participate in the copper venture, though it had not disclosed that publicly. He declined to elaborate.

Banks as Traders

For much of the last century, Congress tried to keep a wall between banking and commerce. Banks were forbidden from owning nonfinancial businesses (and vice versa) to minimize the risks they take and, ultimately, to protect depositors. Congress strengthened those regulations in the 1950s, but by the 1980s, a wave of deregulation began to build and banks have in some cases been transformed into merchants, according to Saule T. Omarova, a law professor at the University of North Carolina and expert in regulation of financial institutions. Goldman and other firms won regulatory approval to buy companies that traded in oil and other commodities. Other restrictions were weakened or eliminated during the 1990s, when some banks were allowed to expand into storing and transporting commodities.

Over the past decade, a handful of bank holding companies have sought and received approval from the Federal Reserve to buy physical commodity trading assets.

According to public documents in an application filed by JPMorgan Chase, the Fed said such arrangements would be approved only if they posed no risk to the banking system and could "reasonably be expected to produce benefits to the public, such as greater convenience, increased competition, or

gains in efficiency, that outweigh possible adverse effects, such as undue concentration of resources, decreased or unfair competition, conflicts of interests, or unsound banking practices."

By controlling warehouses, pipelines and ports, banks gain valuable market intelligence, investment analysts say. That, in turn, can give them an edge when trading commodities. In the stock market, such an arrangement might be seen as a conflict of interest — or even insider trading. But in the commodities market, it is perfectly legal.

"Information is worth money in the trading world and in commodities, the only way you get it is by being in the physical market," said Jason Schenker, president and chief economist at Prestige Economics in Austin, Tex. "So financial institutions that engage in commodities trading have a huge advantage because their ownership of physical assets gives them insight in physical flows of commodities."

Some investors and analysts say that the banks have helped consumers by spurring investment and making markets more efficient. But even banks have, at times, acknowledged that Wall Street's activities in the commodities market during the last decade have contributed to some price increases.

In 2011, for instance, an internal Goldman memo suggested that speculation by investors accounted for about a third of the price of a barrel of oil. A commissioner at the Commodity Futures Trading Commission, the federal regulator, subsequently used that estimate to calculate that speculation added about $10 per fill-up for the average American driver. Other experts have put the total, combined cost at $200 billion a year.

High Premiums

The entrance to one of Metro International's main aluminum warehouses here in suburban Detroit is unmarked except for one toppling sign that displays two words: Mount Clemens, the town's name.

Most days, there are just a handful of cars in the parking lot during the day shift, and by 5 p.m., both the parking lot and guard station often appear empty, neighbors say. Yet inside the two cavernous blue warehouses are rows and rows of huge metal bars, weighing more than half a ton each, stacked 15 feet high.

After Goldman bought the company in 2010, Metro International began to attract a stockpile. It actually began paying a hefty incentive to traders who stored their aluminum in the warehouses. As the hoard of aluminum grew — from 50,000 tons in 2008 to 850,000 in 2010 to nearly 1.5 million currently — so did the wait times to retrieve metal and the premium added to the base price. By the summer of 2011, the

price spikes prompted Coca-Cola to complain to the industry overseer, the London Metal Exchange, that Metro's delays were to blame.

Martin Abbott, the head of the exchange, said at the time that he did not believe that the warehouse delays were causing the problem. But the group tried to quiet the furor by imposing new regulations that doubled the amount of metal that the warehouses are required to ship each day — from 1,500 tons to 3,000 tons. But few metal traders or manufacturers believed that the move would settle the issue.

"The move is too little and too late to have a material effect in the near-term on an already very tight physical market, particularly in the U.S.," Morgan Stanley analysts said in a note to investors that summer.

Still, the wait times at Metro have grown, causing the premium to rise further. Current and former employees at Metro say those delays are by design.

Industry analysts and company insiders say that the vast majority of the aluminum being moved around Metro's warehouses is owned not by manufacturers or wholesalers, but by banks, hedge funds and traders. They buy caches of aluminum in financing deals. Once those deals end and their metal makes it through the queue, the owners can choose to renew them, a process known as rewarranting.

To encourage aluminum speculators to renew their leases, Metro offers some clients incentives of up to $230 a ton, and usually moves their metal from one warehouse to another, according to industry analysts and current and former company employees.

To metal owners, the incentives mean cash upfront and the chance to make more profit if the premiums increase. To Metro, it keeps the delays long, allowing the company to continue charging a daily rent of 48 cents a ton. Goldman bought the company for $550 million in 2010 and at current rates could collect about a quarter-billion dollars a year in rent.

Metro officials declined to discuss specifics about its lease renewals or incentive policies.

But metal analysts, like Mr. Vazquez at Harbor Aluminum Intelligence, estimate that 90 percent or more of the metal moved at Metro each day goes to another warehouse to play the same game. That figure was confirmed by current and former employees familiar with Metro's books, who spoke on condition of anonymity because of company policy.

Goldman Sachs declined to discuss details of its operations. Mr. DuVally, the Goldman spokesman, pointed out that the London Metal Exchange prohibits warehouse companies from owning metal, so all of the aluminum being loaded and unloaded by Metro was being stored and shipped for other owners.

“In fact,” he said, “L.M.E. warehouses are actually prohibited from trading all L.M.E. products.”

As the delays have grown, many manufacturers have turned elsewhere to buy their aluminum, often buying it directly from mining or refining companies and bypassing the warehouses completely. Even then, though, the warehouse delays add to manufacturers’ costs, because they increase the premium that is added to the price of all aluminum sold on the open market.

The Warehouse Dance

On the warehouse floor, the arrangement makes for a peculiar workday, employees say.

Despite the persistent backlogs, many Metro warehouses operate only one shift and usually sit idle 12 or more hours a day. In a town like Detroit, where factories routinely operate round the clock when necessary, warehouse workers say that low-key pace is uncommon.

When they do work, forklift drivers say, there is much more urgency moving aluminum into, and among, the warehouses than shipping it out. Mr. Clay, the forklift driver, who worked at the Mount Clemens warehouse until February, said that while aluminum was delivered in huge loads by rail car, it left in a relative trickle by truck.

“They’d keep loading up the warehouses and every now and then, when one was totally full they’d shut it down and send the drivers over here to try and fill another one up,” said Mr. Clay, 23.

Because much of the aluminum is simply moved from one Metro facility to another, warehouse workers said they routinely saw the same truck drivers making three or more round trips each day. Anthony Stuart, a forklift team leader at the Mount Clemens warehouse until 2012, said he and his nephew — who worked at a Metro warehouse about six miles away in Chesterfield Township — occasionally asked drivers to pass messages back and forth between them.

“Sometimes I’d talk to my nephew on the weekend, and we’d joke about it,” Mr. Stuart said. “I’d ask him ‘Did you get all that metal we sent you?’ And he’d tell; me ‘Yep. Did you get all that stuff we sent you?’ ”

Mr. Stuart said he also scoffed at Metro’s contention that a major cause for the monthslong delays is the difficulty in locating each customer’s store of metal and moving the other huge bars of aluminum to get at it. When he arrived at work each day, Mr. Stuart’s job was to locate and retrieve specific batches of aluminum from the vast stores in the warehouse and set them out to be loaded onto trucks.

“It’s all in rows,” he said. “You can find and get anything in a day if you want. And if you’re in a hurry, a couple of hours at the very most.”

When the London Metal Exchange was sold to a Hong Kong company for $2.2 billion last year, its chief executive promised to take “a bazooka” to the problem of long wait times.

But the new owner of the exchange has balked at adopting a remedy raised by a consultant hired to study the problem in 2010: limit the rent warehouses can collect during the backlogs. The exchange receives 1 percent of the rent collected by the warehouses, so such a step would cost it millions in revenue.

Other aluminum users have pressed the exchange to prohibit warehouses from providing incentives to those that are simply stockpiling the metal, but the exchange has not done so.

Last month, however, after complaints by a consortium of beer brewers, the exchange proposed new rules that would require warehouses to ship more metal than they take in. But some financial firms have raised objections to those new regulations, which they contend may hurt traders and aluminum producers. The exchange board will vote on the proposal in October and, if approved, it would not take effect until April 2014.

Nick Madden, chief procurement officer for one of the nation’s largest aluminum purchasers, Novelis, said the situation illustrated the perils of allowing industries to regulate themselves. Mr. Madden said that the exchange had for years tolerated delays and high premiums, so its new proposals, while encouraging, were still a long way from solving the problem. “We’re relieved that the L.M.E. is finally taking an action that ultimately will help the market and normalize,” he said. “However, we’re going to take another year of inflated premiums and supply chain risk.”

In the meantime, the Federal Reserve, which regulates Goldman Sachs, Morgan Stanley and other banks, is reviewing the exemptions that have let banks make major investments in commodities. Some of those exemptions are set to expire, but the Fed appears to have no plans to require the banks to sell their storage facilities and other commodity infrastructure assets, according to people briefed on the issue.

A Fed spokeswoman, Barbara Hagenbaugh, provided the following statement: “The Federal Reserve regularly monitors the commodity activities of supervised firms and is reviewing the 2003 determination that certain commodity activities are complementary to financial activities and thus permissible for bank holding companies.”

Senator Sherrod Brown, who is sponsoring Congressional hearings on Tuesday on Wall Street’s ownership of warehouses, pipelines and other commodity-related assets, says he hopes the Fed reins in the banks.

“Banks should be banks, not oil companies,” said Mr. Brown, Democrat of Ohio. “They should make loans, not manipulate the markets to drive up prices for manufacturers and expose our entire financial system to undue risk.”

Next Up: Copper

As Goldman has benefited from its wildly lucrative foray into the aluminum market, JPMorgan has been moving ahead with plans to establish its own profit center involving an even more crucial metal: copper, an industrial commodity that is so widely used in homes, electronics, cars and other products that many economists track it as a barometer for the global economy.

In 2010, JPMorgan quietly embarked on a huge buying spree in the copper market. Within weeks — by the time it had been identified as the mystery buyer — the bank had amassed $1.5 billion in copper, more than half of the available amount held in all of the warehouses on the exchange. Copper prices spiked in response.

At the same time, JPMorgan, which also controls metal warehouses, began seeking approval of a plan that would ultimately allow it, Goldman Sachs and BlackRock, a large money management firm, to buy 80 percent of the copper available on the market on behalf of investors and hold it in warehouses. The firms have told regulators that these stockpiles, which would be used to back new copper exchange-traded funds, would not affect copper prices. But manufacturers and copper wholesalers warned that the arrangement would squeeze the market and send prices soaring. They asked the S.E.C. to reject the proposal.

After an intensive lobbying campaign by the banks, Mary L. Schapiro, the S.E.C.'s chairwoman, approved the new copper funds last December, during her final days in office. S.E.C. officials said they believed the funds would track the price of copper, not propel it, and concurred with the firms' contention — disputed by some economists — that reducing the amount of copper on the market would not drive up prices.

Others now fear that Wall Street banks will repeat or revise the tactics that have run up prices in the aluminum market. Such an outcome, they caution, would ripple through the economy. Consumers would end up paying more for goods as varied as home plumbing equipment, autos, cellphones and flat-screen televisions.

Robert Bernstein, a lawyer at Eaton & Van Winkle, who represents companies that use copper, said that his clients were fearful of “an investor-financed squeeze” of the copper market. “We think the S.E.C. missed the evidence,” he said.

Goldman's new money machine: warehouses
Reuters
July 29, 2011
By Pratima Desai, Clare Baldwin, Susan Thomas and Melanie Burton

LONDON/DETROIT (Reuters) - In a rundown patch of Detroit, enclosed by a cyclone fence and barbed wire, stands an unremarkable warehouse that investment bank Goldman Sachs has transformed into a money-making machine.

The derelict neighborhood off Michigan Avenue is a sharp contrast to Goldman's bustling skyscraper headquarters near Wall Street, but the two operations share one important element: management by the bank's savvy financial professionals.

A string of warehouses in Detroit, most of them operated by Goldman, has stockpiled more than a million tonnes of the industrial metal aluminum, about a quarter of global reported inventories.

Simply storing all that metal generates tens of millions of dollars in rental revenues for Goldman every year.

There's just one problem: much less aluminum is leaving the depots than arriving, creating a supply pinch for manufacturers of everything from soft drink cans to aircraft.

The resulting spike in prices has sparked a clash between companies forced to pay more for their aluminum and wait months for it to be delivered, Goldman, which is keen to keep its cash machines humming and the London Metal Exchange (LME), the world's benchmark industrial metals market, which critics accuse of lax oversight.

Analysts question why London's metals market allows big financial players like Goldman to own the warehouses which store huge quantities of metal even as they trade the commodity. Robin Bhar, a veteran metals analyst at Credit Agricole in London says the conflict of interest is so acute he wants U.S. and European anti-trust regulators to weigh in.

"I think it makes a mockery of the market. It's a shame," Bhar said. "This is an anti-competitive situation. It puts (some) companies at an advantage, and clearly the rest of the market at a disadvantage. It's a real, genuine concern. And I think the regulators have to look at it."

Goldman said its warehouse subsidiary Metro International Trade Services has done nothing illegal, and abides by the LME's warehousing rules. "Producers have chosen to store metal in Detroit with Metro," a Goldman spokeswoman said. "We follow the LME requirements in terms of storing and releasing metals from our warehouses."

The London Metal Exchange defends its rules. "There is a perception that consumers have not been able to get to their metal when the reality is that it is big banks, financing companies and warehouses that are not able to get to their huge tonnages of metal fast enough," said LME business development manager Chris Evans.

BUSINESS MODEL

Goldman's warehouse business relies on a lucrative opportunity enabled by the LME regulations. Those rules allow warehouses to release only a fraction of their inventories per day, much less than the metal that is regularly taken in for storage.

In the year to June 30 Metro warehouses in Detroit took in 364,175 tonnes of aluminum and delivered out 171,350 tonnes. That represented 42 percent of inventory arrivals globally and 26 percent of the metal delivered out, according to the London Metal Exchange said.

The metal that sits in the warehouse generates lucrative rental income.

Little wonder that so many want in. Metro was acquired by Goldman in February 2010, while commodities trading firm Trafigura nabbed UK-based NEMS in March 2010, and Swiss-based group Glencore International acquired the metals warehousing unit of Italy's Pacorini last September.

Henry Bath, a warehousing firm and founding member of the London Metal Exchange in 1877, has been owned for about 40 years by traders or banks including Metallgesellschaft in the 1980s and failed U.S. energy trader Enron at the turn of the century. It now comes under the umbrella of JP Morgan, which bought the metals trading business of RBS Sempra Commodities in July last year.

Despite its rental income, Goldman's warehouse strategy apparently hasn't been enough to snap a slumping performance in commodity trading, with the company reporting a "significant" drop in revenues from a year ago in its latest quarter, the sixth time in the past 10 quarters that it has failed to expand.

CONSUMERS FUME

The long delays in metal delivery have buyers fuming. Some consumers are waiting up to a year to receive the aluminum they need and that has resulted in the perverse situation of higher prices at a time when the world is awash in the metal.

"It's driving up costs for the consumers in North America and it's not being driven up because there is a true shortage in the market. It's because of an issue of accessing metal ... in Detroit warehouses," said Nick Madden, chief procurement officer for Atlanta-based Novelis, which is owned by India's Hindalco Industries Ltd and is the world's biggest maker of rolled aluminum products. Novelis buys aluminum directly from producers but is still hit by the higher prices.

Madden estimates that the U.S. benchmark physical aluminum price is $20 to $40 a tonne higher because of the backlog at the Detroit warehouses. The physical price is currently around $2,800 per tonne. That premium is forcing U.S. businesses to fork out millions of dollars more for the 6 million tonnes of aluminum they use annually.

It has also had a knock-on impact on the global market, which is forecast to consume about 45 million tonnes of the lightweight, durable metal this year.

Also pushing aluminum costs higher are bank financing deals, which are estimated to have locked up about 70 percent of the 4.4 million tonnes of the metal sitting in LME-registered warehouses around the world. ME inventories hit an all-time record above 4.7 million tonnes in May.

In a typical deal, a bank buys aluminum from a producer, agrees to sell it at some future point at a profit, and strikes a warehouse deal to store it cheaply for an extended time period.

The combination of the financing deals and the metal trapped in Detroit depots, means only a fraction of the inventories are available to the market. Premiums for physical aluminum -- the amount paid above the LME's cash contract currently trading at $2,620 a tonne -- in the U.S. Midwest hit a record high of $210 a tonne in May, up about 50 percent from late last year. In Europe, the premium is at records above $200 a tonne, double the levels seen in January 2010.

The ripple effect into Asia has seen the premium paid in Japan increase 6 percent to $120 a tonne in the third quarter from the previous quarter, the first rise in nearly six quarters.

COLLECTING THE RENT

You won't hear banks like Goldman complaining. Rental income continues to pour in at the 19 Detroit area warehouses run by Metro as of June.

From the outside one recent afternoon, a depot in the Detroit suburb of Mt Clemens appeared to be deserted. But neighbors say the place is a whirl of activity in the early hours of the morning when metal is usually delivered for storage.

The LME says the current maximum rent, set by warehouse operators, is 41 U.S. cents per day per tonne. At that rate, Goldman's warehouse operation in Detroit -- said to be holding more than 1.1 million tonnes -- could be generating as much as $451,000 per day or about $165 million a year in revenue.

An exact figure cannot be calculated because many clients negotiate lower rental rates and Goldman declined to detail its income from its warehouse business. But when Swiss-based trading company Glencore listed earlier this year it revealed that its metals warehousing unit generated $31 million in profit on $220 million in gross revenue in 2010.

LONG HISTORY Caught between consumers and warehouse operators is the 134-year old LME, one of the world's last exchanges with open-outcry trading. Sessions take place in a trading ring with red padded seats while visitors can watch from a gallery. Traders juggle multiple telephones and use archaic hand signals to fill orders from consumers, producers and hedge funds.

The ring is a perhaps more civilized version of the tumultuous trading pits made famous in Chicago. Each of six major industrial metals including copper and nickel are traded for five minute bursts in the morning and afternoon. Only 12 firms have access to the ring, arranged in fixed positions in a circle, with many others involved via the ring dealers and on the LME's electronic trading system.

Longer sessions in the late morning and afternoon allow trading of all metals simultaneously and are known as "the kerb" from the days when dealers continued to trade on the kerb, or sidewalk, after leaving the exchange.

The LME certifies and regulates the Detroit sheds as part of a global network of more than 640 warehouses. The network is meant to even out swings in volatile metals markets. During recessions, surplus metal can be stored until economies recover and demand picks up, when the metal can be released.

But that function is now being undermined by the backlog in Detroit.

LME rules stipulate that warehouses must deliver a certain amount of metal each day. However the rules apply not to each warehouse but to each city that a company has warehouses in. At the moment, a warehouse operator needs to deliver just 1,500 tonnes a day per city, whether it owns one warehouse there or dozens. That means each of Metro's Detroit warehouses need to release only 79 tonnes of aluminum a day. At that rate, it would take two years to clear the stocks held by Goldman's Detroit warehouses.

The backlog sparked outrage last year, prompting the LME to task London-based consultancy Europe Economics to look into its rules. Europe Economics recommended the exchange raise its minimum delivery rates and earlier this month the exchange announced a new regime for operators with stocks of over 900,000 tonnes in one city.

From April 2012 the minimum delivery rate will double to 3,000 tonnes a day.

Critics dismiss the move as too small to have any real effect, especially because of the delay until it comes in.

"The move is too little and too late to have a material effect in the near-term on an already very tight physical market, particularly in the U.S.," Morgan Stanley analysts said in a July note.

A senior executive at a metals brokerage told Reuters "the recommendations won't change anything. The problem will still be there six, nine months down the line." "If Detroit has 1.1 million tonnes at the moment, what's to say it won't have 2 million tonnes next year," he said.

MOVING MORE METAL

One obvious solution would be to impose minimum delivery requirements per warehouse or per square meter of warehouse space rather than per city. It's not as if the warehouses can't cope with delivering more stock: large operations can shift much more than 3,000 tonnes a day, warehousing sources say. An experienced forklift driver takes about 20 minutes to load one 20-tonne truck with aluminum in the United States. That means one warehouse in Detroit with two doors, two forklifts and an eight-hour working day could move out as much as 1,920 tonnes of metal every day.

"If you take Detroit in particular, those warehouses historically extracted metal at a faster rate ... the infrastructure is there," a senior analyst in the metals industry told Reuters.

Madden at Novelis said: "I don't know the specific details of every warehouse but our view is that they seem to be able to absorb metal coming in at almost an infinite rate and so we feel there's a lot more they can do on the output side to push up the (load out) rates."

The LME could also crack down in the same way it did in 1998 when it banned Metro from taking any more copper into its Long Beach and Los Angeles warehouses. Then the complaints were said to have come from copper consumers worried that 80 percent of total copper stocks in LME-approved warehouses were held in California. The exchange argues that any change right now might disrupt the market.

"Changes to the delivery out rate have required careful consideration because it will impact the cost structure for those holding metal, and were those costs to rise sharply it could affect the way that metal is stored and traded," said the LME's Evans.

The exchange could also rule that a warehouse cannot charge rent once aluminum has been purchased, no matter how long it takes to ship it. But a change like that would hit the LME itself as it receives about 1 percent of the rental income earned by the warehouses it approves.

LEGAL FEARS

Nobody at the LME will say whether the Europe Economics study -- industry sources said it talked to more than 40 companies -- advised more radical measures, arguing that such information is "proprietary." In any case, say metal markets sources, LME officials may be hesitant to make bigger changes because they fear legal action from the likes of Goldman, which could argue that Metro's business model has been based on existing LME warehouse rules.

The LME declined to comment on possible legal challenges, but its Chief Executive Martin Abbott said at a recent briefing that the warehouse delays were not causing market and price distortions.

"No, I don't believe it is," Abbott said, when asked if the situation was causing distortions in the market. Abbott said the exchange had received no official complaints from consumers about bottlenecks at warehouses. The LME also dismisses concerns about banks trading metal and owning the warehouses where it is stored.

While a British parliamentary committee raised the issue in May, Britain's Office of Fair Trading declined to open a probe. The U.S. Commodity Futures Trading Commission, which regulates the futures and options markets, said it would not comment. Britain's Financial Services Authority, which regulates exchanges where commodity futures are traded but not warehouses that store physical material, declined to comment.

WHAT NEXT?

The lack of real change has some in the industry questioning the very structure of the LME, which, unlike its publicly owned U.S.-based rival commodities exchanges, is owned by many of the financial institutions that trade there.

"The belief is that they are focused on serving their shareholders; most of them being the banks ... We see our clients and contacts trying to avoid the LME as much as possible now," said Jorge Vazquez, Managing Director of the Aluminum Intelligence Unit at HARBOR Commodity Research.

That concern is growing. Critics of the exchange point to a potential problem with zinc supply though New Orleans, where inventories now account for 61 percent of total LME-registered stocks. Most of the warehouses in New Orleans are owned by Goldman and Glencore.

Metal industry sources believe regulators should take a closer look at the possible conflict of interest that arises when trading houses also own the warehouses.

"If the whole thrust of regulation and regulatory reform is increased transparency and open and above board operations, letting banks own warehouses seems to run entirely counter to that," said Frances Hudson, global thematic strategist at Standard Life Investments said.

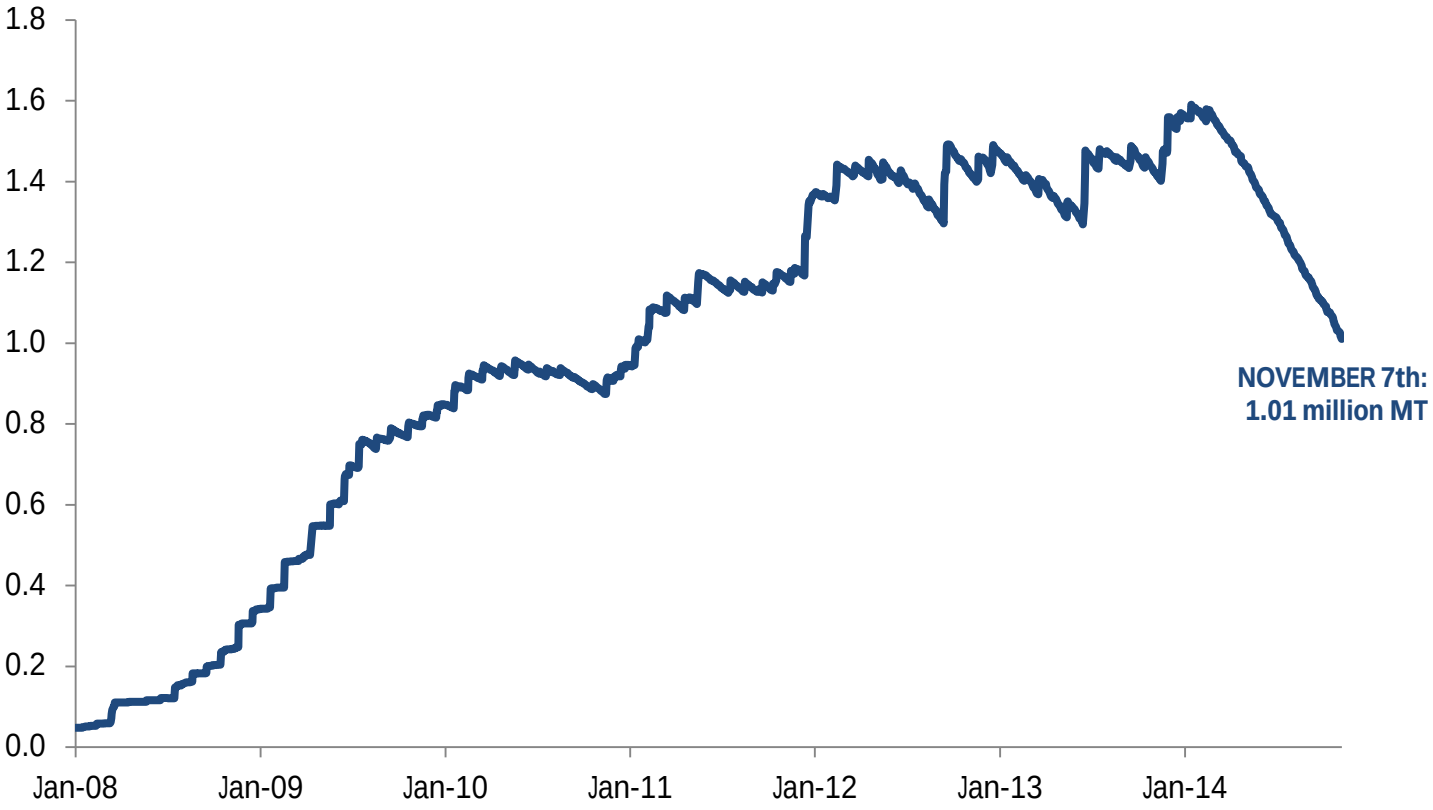
The LME says it enforces a strong separation between warehouses and the trading arms of their owners. Just this week it proposed that companies which own warehouses should engage an independent third-party to verify the robustness of Chinese walls.

"We enforce it through regular audits of warehouses," said the LME's Evans. "If people say Chinese walls are leaking then they should bring us evidence and we'll investigate."

APPENDIX 7

DETROIT LME PRIMARY ALUMINUM INVENTORIES

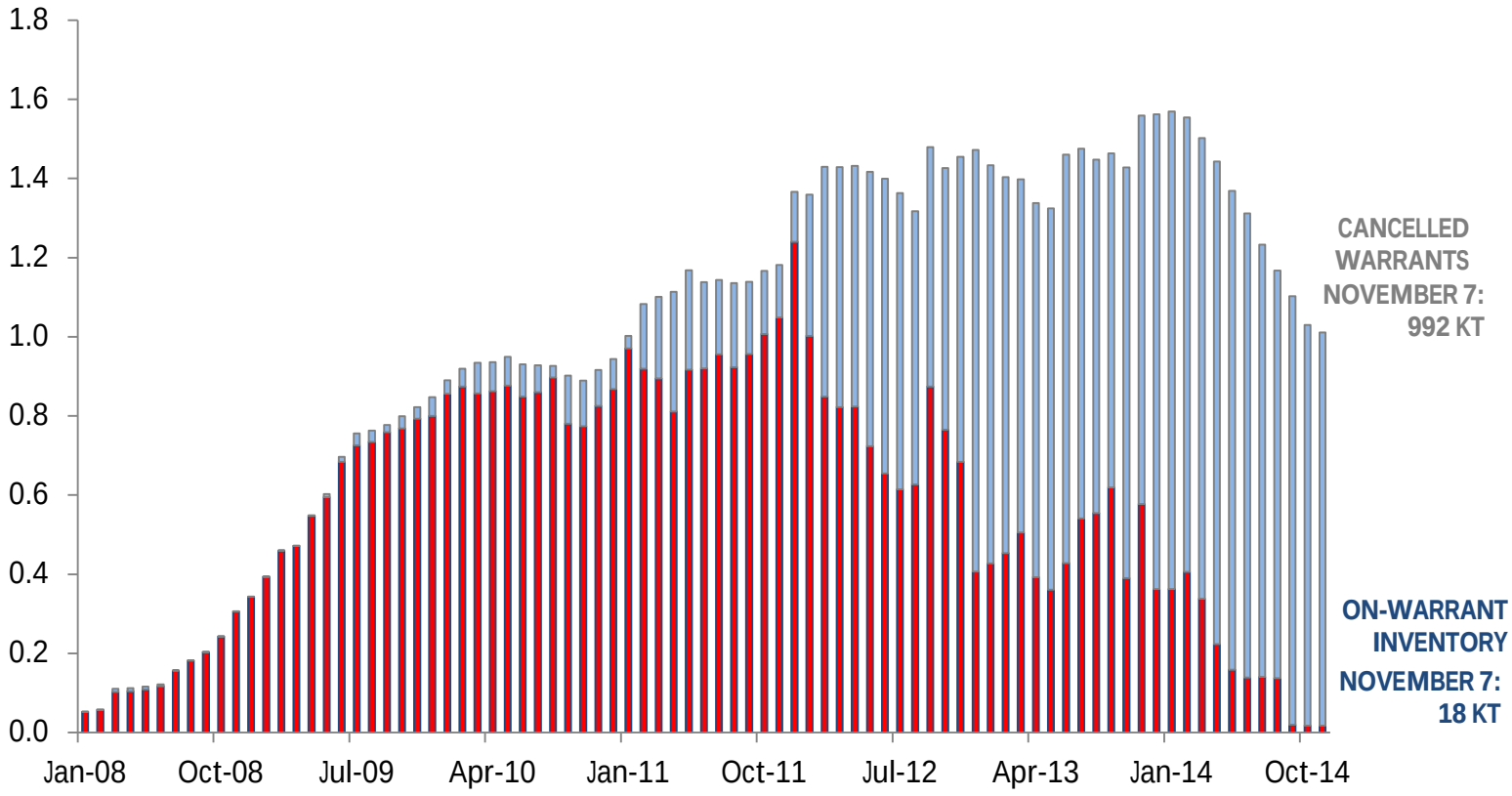
(million mtons)



Source: *HARBOR Aluminum* with *LME* data

DETROIT LME PRIMARY ALUMINUM INVENTORIES VS CANCELLED WARRANTS

(million tons)



Source: *HARBOR Aluminum* with *LME* data

APPENDIX 8

Weekly Aluminum Price Chart

- **Five major players purchase LME warehouses in 2010 as the opportunity to make money by storing, holding and controlling the flow of metal becomes apparent**

Weekly Aluminum Price Chart

- **LME aluminum prices are only slightly lower since the five major warehouse purchases of 2010, But…**

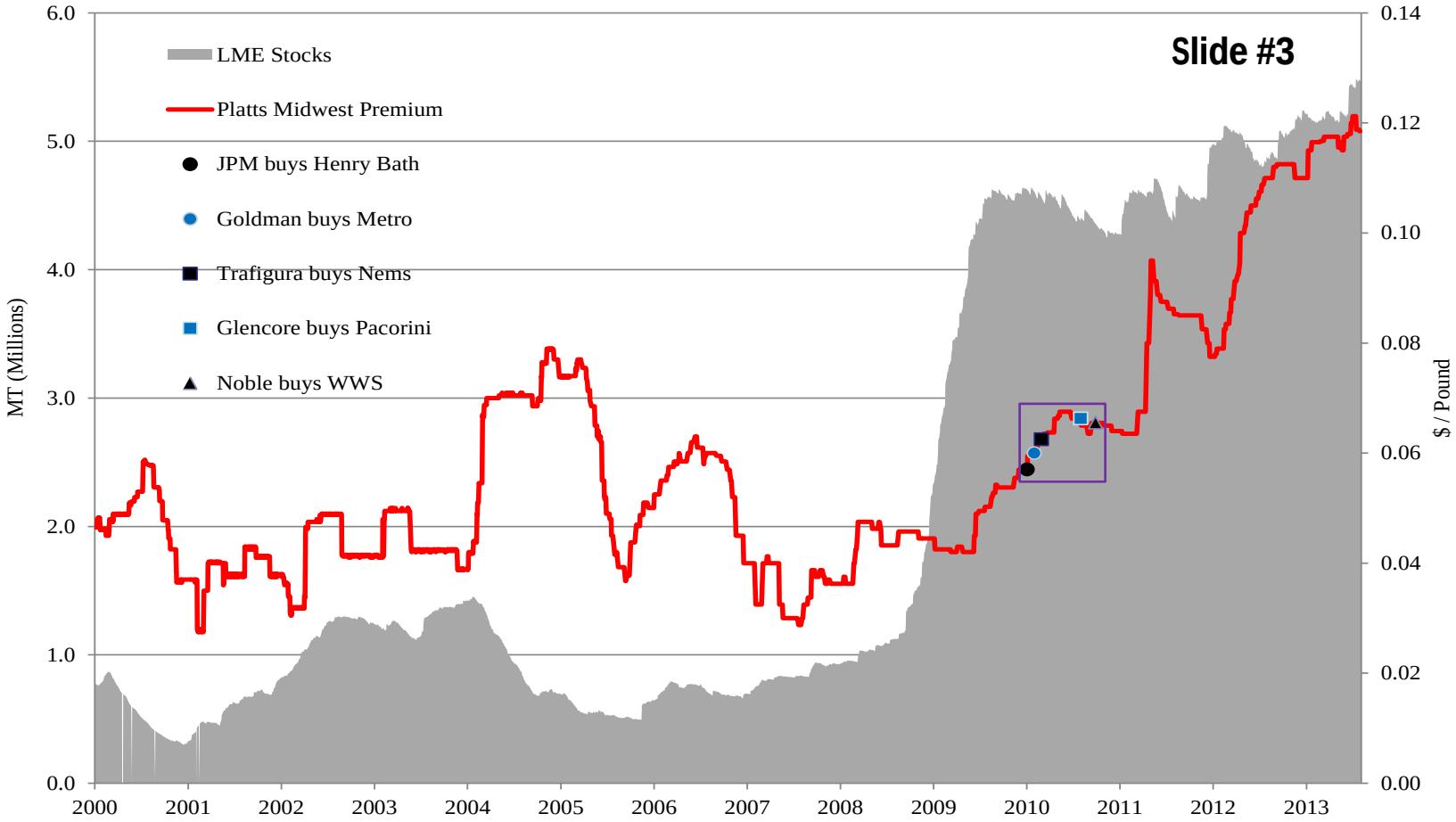
Weekly Aluminum Price Chart

- **LME aluminum prices are only 16% below the average price of $2,166, since the five major warehouse purchases of 2010, but…**

Weekly Aluminum Price Chart

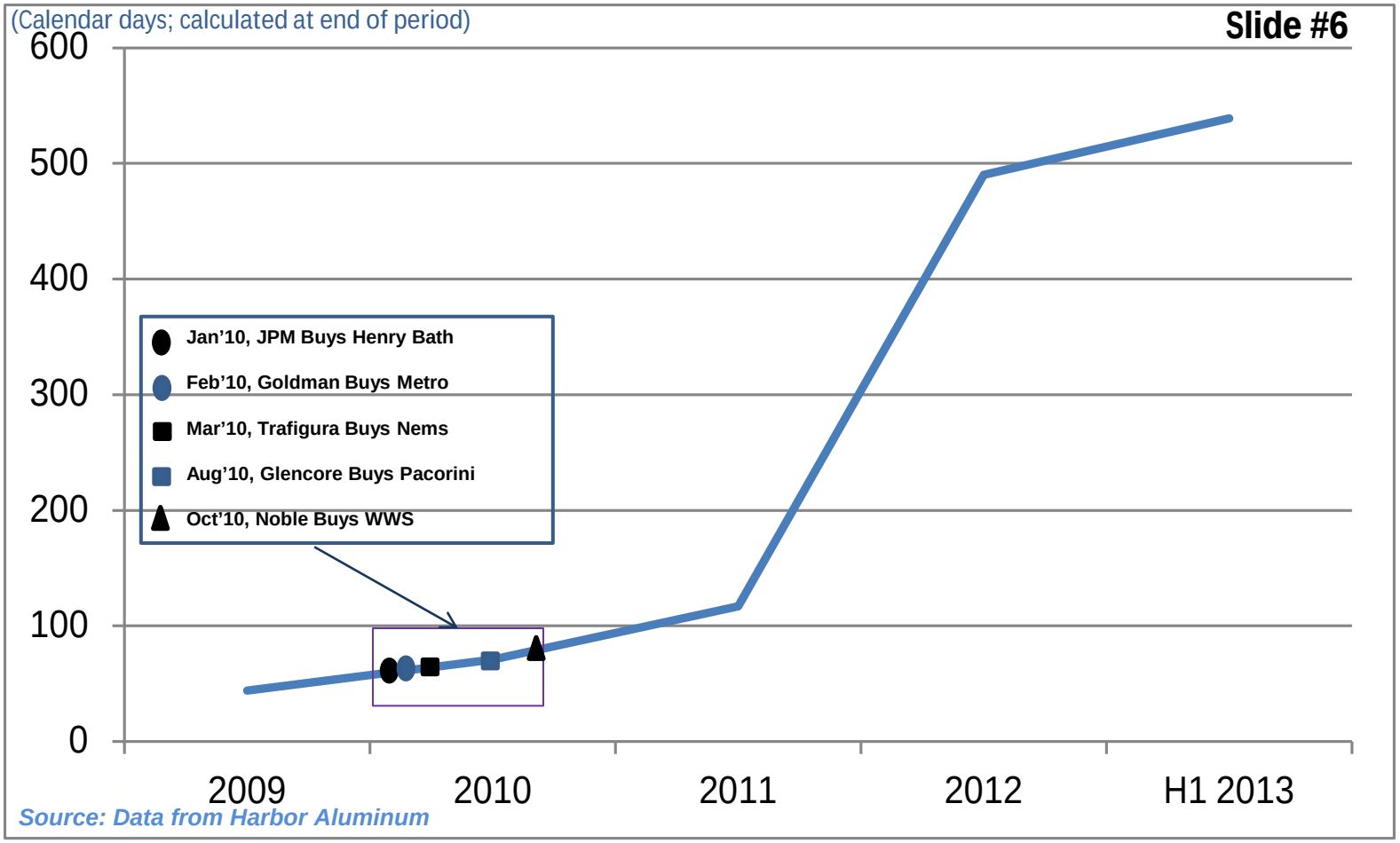
- **…LME aluminum prices averaged $1,688 for the 10 years prior to the LME warehouse purchases, well below the current market and the past three year average price**

Midwest Premiums and LME Stocks



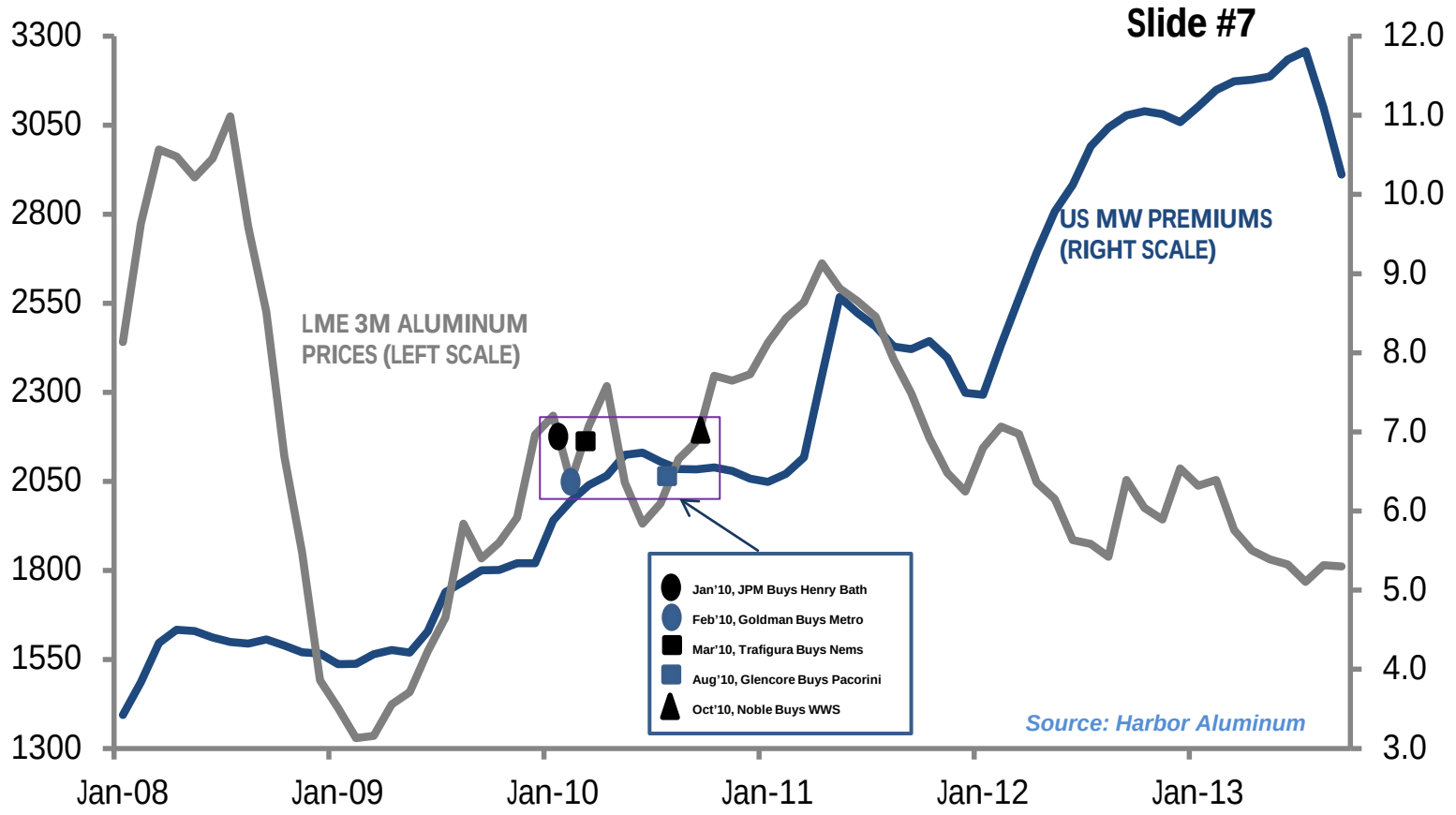
- **…LME stocks and Midwest Premiums (MWP) are both at record highs, with MWP's up 100% since the 2010 LME warehouse purchases**

Maximum load-out queues, LME warehouse location Detroit



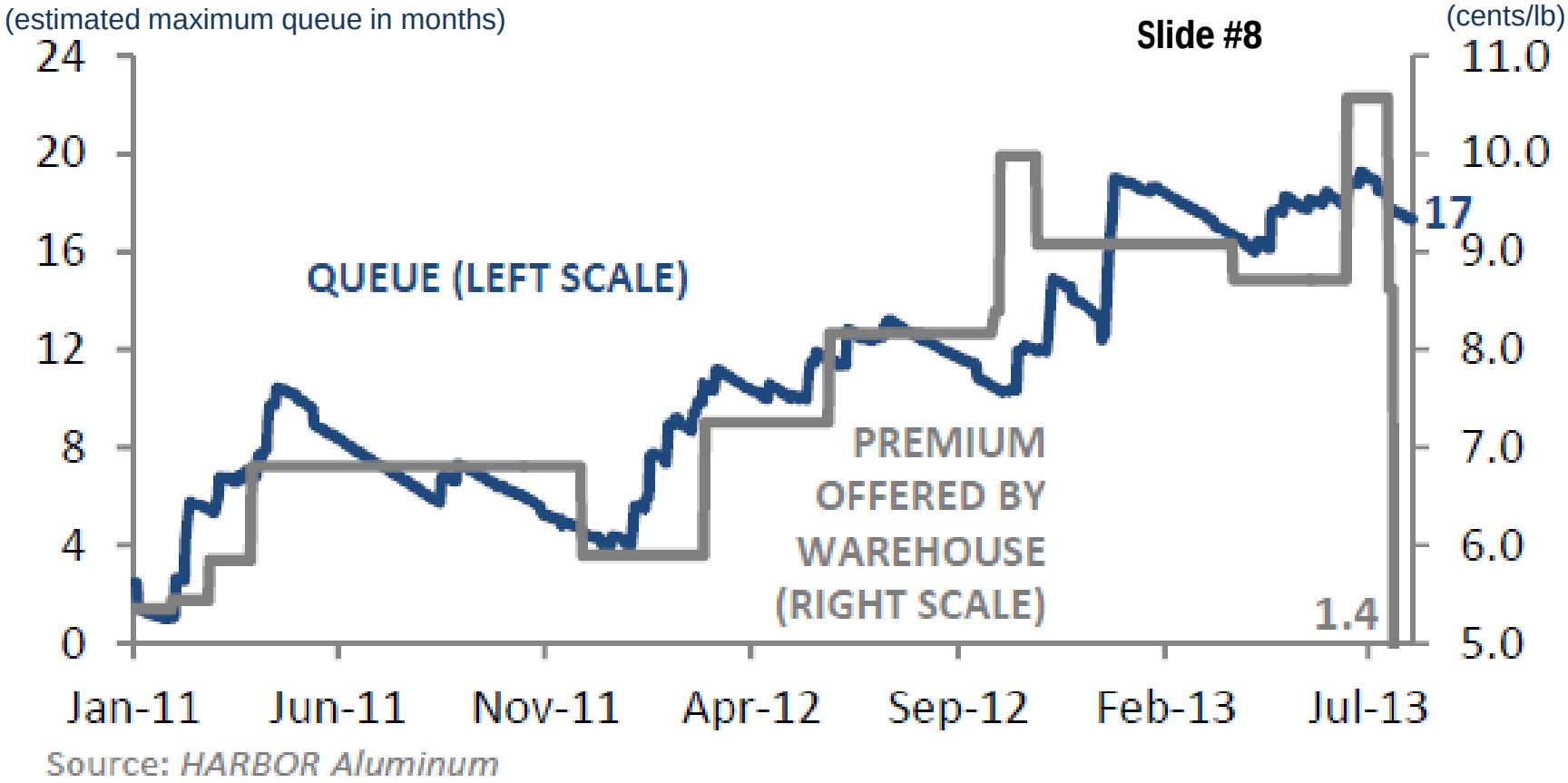
- **LME load-out queues in Detroit were less than 50 days prior to the 2010 warehouse purchases, currently through first half of 2013 the queue is greater than 535 days**

LME 3 mo. aluminum prices vs. Midwest Premiums (MWP)



- **Since the warehouse purchases in 2010, LME prices have stayed in a relatively tight range while MWP's have hit all-time highs**

Detroit load-out queue vs. premium paid by warehouse



- **There has been a direct yet delayed correlation between the premiums offered by warehouses to producers and days metal spends in the queue**

There have been claims that “only 5% of all the aluminum produced in the world per annum is in stock or in storage in delivery facilities through the LME warehouse system, so how can one say that this could possibly influence the price of the other 95% of the market?”

This is actually very common in the world of commodities

- For example on the Chicago board of trade (CBOT, part of CME Group), the “Mecca” for grain trading as the LME is to base metal trading, less than one tenth of one percent (0.1%) of all the corn produced in the world on an annual basis is in stock or in storage in delivery facilities through the CBOT…
  - …only 0.5% of all the worlds soy beans, and
  - …only 3.0% of the world’s wheat

- As the LME is known for being the global centralized place for price discovery for base metals, so too is the CBOT for grains, only with much less underlining physical stocks and very few complaints

- What you don’t see on the CBOT or other major commodity exchanges is major consumers, producers and even warehouse owners calling for greater transparency and rule changes, like in the case of the LME

Appendix/Notes

- Slide #1, is a weekly LME 3 month aluminum price chart that shows the price action of aluminum, prior to, during and after the five major players purchased LME warehouses in 2010 as the opportunity to make money by storing, holding and controlling the flow of metal became apparent
- Slide #2 is again a weekly LME 3 month aluminum price chart that shows the price action of aluminum to support a point that LME aluminum prices are currently not much lower than when the warehouses were purchased in 2010
- Slide #3 shows the official Platts Midwest Premium (MWP) prices from the year 2000 along with the evolution and exponential growth of LME stocks during the same time period, it is interesting to note that as LME stocks and MWP's have all made new all-time record highs, with MWP's up 100% since the 2010 LME warehouse purchases. Under normal market conditions commodities, like in the case of aluminum, where warehouse stocks are at all-time record highs, signifying excessive supply, common sense dictates that MWP's should be at record lows, unless access to supply is somehow being adversely influenced.
- Slide #4 shows the LME 3 month aluminum price, depicting the average price of $2,166, since the five major warehouse purchases of 2010 and the fact that LME aluminum prices are currently only 16% below this average. In addition the chart shows that LME aluminum prices from a more recent date of 2009 are actually up over 40% today, but only down 35% from the high made in May 2011, since the warehouses were purchased. These are more recent dates compared to a more relative price average over the past three and a half years from when the warehouses were acquired.
- Slide #5 this shows the LME 3 month aluminum price, the average price of $2,166, from when the five major warehouses were purchased in 2010, as compared to a more relevant price average of LME aluminum prices for the 10 years prior to the LME warehouse purchases which is $1,688, well below the past three and a half year average price and the current market.

Appendix/Notes

- Slide #6 this shows that the LME load-out queues in Detroit were less than 50 days prior to the warehouse purchases in 2010, but that currently through the first half of 2013 the queue in Detroit is now greater than 535 days. That is a more than "10 times longer" queue which is highly irregular and nothing like it exists on any other major commodity exchange in the world.
- Slide #7 this shows the LME 3 month aluminum price vs. the Midwest premium, since the warehouse purchases in 2010, LME prices have stayed in a relatively tight range while MWP's have hit all-time highs
- Slide #8 this chart shows a direct yet delayed correlation between the premiums (or incentives) offered by warehouses to producers and traders to attract metal away from the market to their warehouses vs. the days aluminum spends in the Detroit queue. On other exchanges like the CME this practice of warehouses paying incentives to entice metal away from the market to their own warehouses, is strictly forbidden.
- Slide #9 this slide basically refutes the question that has been floating around the press and asked in the most recent Senate hearing: "If only 5% of all the aluminum produced in the world is in stock or in storage in delivery facilities through the LME warehouse system, how can one say that this could possibly influence the price of the other 95% of the market?". This is very common with respect to other globally recognized centralized places for price discovery, like the LME or the CME. For example on the Chicago Board of Trade (CBOT, part of the CME), the "Mecca" for grain trading as the LME is to base metal trading, less than one tenth of one percent (0.1%) of all the corn in the world produced on an annual basis is in stock or in storage in delivery facilities through the CBOT and only (0.5%) of all the worlds soy beans, and 3.0% of the world's wheat. What you don't see on the CBOT or other major commodity exchanges is major consumers, producers and even warehouse owners calling for greater transparency and rule changes, like in the case of the LME system.

Appendix/Notes

Although slides and data have been used from Harbor Aluminum in this presentation, they have had no part in its preparation or message.

All information in this presentation is true and correct based on the best market intelligence at the time of its preparation.

APPENDIX 9

---------*From Executive Director: Regulation and Compliance*

To: ALL MEMBERS, WAREHOUSE COMPANIES AND THEIR LONDON AGENTS

Ref: **98/362, A:350, R:020, W:071**

Date: 13 October 1998

Subject: **RULE ADDITION – RELATIONSHIP BETWEEN MEMBERS AND WAREHOUSE COMPANIES: CONFIRMATION OF NOTICE 98/213, A:207, W:033**

Introduction

Notice 98/213, A:207, W:033 set out proposals by the Board of Directors to introduce rules to require "chinese walls" between a member of the Exchange and a related warehouse company. The proposed provisions were designed to prevent the misuse of confidential and price sensitive information and to ensure that members and warehouse companies could compete with each other on equal terms. The proposals were subject to consultation.

Consultation

Of the responses to the consultation, all but one were supportive of the Board's proposals. The one non-supportive respondent believed that members of the Exchange should not be allowed to own warehouses. Any rule which attempted to prevent members owning warehouses would, however, be in conflict with UK competition law and with the way potential conflicts of interest are addressed elsewhere in the UK's financial regulatory structure.

Several respondents suggested, in order to prevent warehouse abuses with any party, that the proposals should be widened to include all commercial agreements/relationships between members and warehouse companies which fall short of ownership. The Board's attention has been drawn to various comments and reports alleging payment of exceptional inducements, demand for a variety of substantial charges in addition to FOT charges and impediments to speedy physical re-delivery out of warehouses. The Exchange is looking into these matters and is reviewing, as a matter of urgency, its contractual arrangements with warehouse companies to ensure that LME approved warehouse companies and their placing metal on warrant

adhere to the spirit as well as the letter of the LME rules. The Board will give consideration to making changes to warehousing rules where considered appropriate in the light of this review. The specific issues relating to common ownership of members and warehouse companies need to be addressed separately through the introduction of "chinese walls" procedures.

On the details of the Board's proposals, amendments have been introduced in two areas in the light of the consultation. Under section 2 of the proposals – Definitions – it has been made clear that 'confidential information' includes any information which a warehouse company acquires through its warehousing activities in respect of specific LME brands, ahead of general publication by the LME. This clarification is incorporated by a new 2iv of the new rule addition set out below. Second, Ci of the proposals has been amplified to require that where the personnel of the related warehouse company and the member occupy the same premises, security access systems must be installed to prevent unauthorised access by the related company's personnel.

Rule Addition

The Board of Directors has approved the rule changes and guidance as set out below. The new procedures come into effect immediately.

1 Background

The review by the Financial Services Authority (formerly the Securities and Investments Board) of the LME and the metals markets raised aspects of the relationship between warehouse companies and members which are potentially open to anti-competitive and distorting behaviour.

Concern centred around the independence of members and warehouse companies from one another, the flow of information between them and the existence of systemic advantages which could restrict the ability of both members and warehouse companies to compete with each other on equal terms. The main areas of concern are:-

i the possibility that a member might gain access to price and/or commercially sensitive information from a warehouse company;

ii the possibility that a member could pass commercially sensitive information gained from having access to one warehouse company to another warehouse company;

iii the ability of a member to advantage one warehouse company by offering warrants from a competing warehouse company to customers at a discount; and

iv the effect of long term storage deals restricting the amount of LME stocks in circulation.

These issues are of most concern and give rise to serious potential conflicts of interest where a member and a warehouse company are both part of the same group.

In the light of both UK competition law and the dependence, throughout the UK's regulatory structure, on "chinese walls" to handle conflicts of interest, it is not open to the LME to prevent the common or related ownership of LME members and warehouse companies. This Notice, therefore, proposes provisions and procedures to establish and enforce strict "chinese walls" between a member and a related warehouse company. These provisions are designed to prevent the misuse of confidential and price sensitive information.

2 Definitions

For the purposes of this Notice:

"Confidential Information" means, in respect of a warehouse company's business, any of the following, ahead of general publication by the LME:

i stock figures for LME deliverable metal;

ii all information relating to proposed or actual shipments of LME deliverable metal to be made or received by that warehouse company (including, in respect of shipments to be made by that warehouse company, any information of a commercially sensitive nature given to that warehouse company by the shipper, his agent or the recipient of that shipment, such as the identity of the customer, customs information, etc);

iii all information related to the issuance, holding and cancellation of LME warrants by that warehouse company; and

iv any other information in relation to specific LME brands which a warehouse company acquires through its warehousing activities.

"Related warehouse company" means a warehouse company which is a subsidiary or holding company of a member, or a subsidiary or holding company of one of a member's subsidiaries or holding companies. The terms "holding company" and "subsidiary" have the meanings given to them in section 736 of the Companies Act 1985.

3 Members' and Warehouse Companies' Obligations

Under the terms of the Conditions and Obligatory Procedural Notes for warehouse companies, a warehouse company is prohibited from revealing Confidential Information to other entities. This prohibition is an important part of the Exchange's rules and practices designed to ensure the orderliness of its market.

A member which encouraged or facilitated a warehouse company to breach these prohibitions would itself be in breach of its obligation to observe high

standards of integrity and fair dealing and high standards of market conduct under Regulation 9.6 of Part 2 of the LME's Rules and Regulations.

Equally, a member which took advantage in its trading of Confidential Information would be in breach of Regulation 9.6.

4 Members and Related Warehouse Companies

The risk that Confidential Information may pass between a warehouse company and a member is increased if they are both companies in the same group. A member must not unfairly take advantage of its group relationship with a related warehouse company by utilising Confidential Information in a way which would jeopardise the proper functioning of the metals market, or breach any of the Financial Services Authority's Statements of Principle, with which all members must comply, along with the LME's own Rules and Regulations.

It is essential that personnel engaged in trading activities do not come into possession of any Confidential Information. The LME considers that members will only be able to satisfy this requirement if appropriate procedures exist within both the member and the related warehouse company. Within the member itself, this will require that all personnel engaged in trading activities are made aware of the confidentiality procedures adopted by the related warehouse company to comply with the requirements set out in 5 below, and advised that if they inadvertently come into possession of any Confidential Information they must not trade on the basis of the information. Strict procedures as set out below must be put in place within the member itself to ensure these provisions are complied with.

5 Procedures to be followed

In order to ensure that Confidential Information is properly protected where a member has a related warehouse company, the Exchange will expect the member and the related warehouse company to put in place procedures which satisfy the following requirements:

A "Need to Know" Principle

Access to Confidential Information must be given only to those personnel whose responsibilities could not be carried out without such access. The LME expects related warehouse companies to organise their affairs in such a way that this number is kept to a minimum. This should be the case both for personnel within the related warehouse company and within the related member. Normally, for the related member, and even then only in exceptional circumstances, such information will be confined to common directors.

B Physical Separation

i All Confidential Information must be kept in a secure location to which only authorised personnel have access. Access to unauthorised personnel must be effectively restricted (i.e. by locked door, security card, signing in and out procedure etc.).

ii All Confidential Information held within a computer system must be accessible only by authorised personnel and be protected by a password. Passwords should be changed at regular intervals.

C Separation of Personnel

i Related warehouse company personnel should be physically separated from the personnel of the member. Where they occupy the same premises, security access systems must be installed to prevent unauthorised access.

ii It is obviously essential that personnel with access to Confidential Information do not also carry out any functions for the member, although the LME acknowledges that for strategic reasons it may be necessary for an employee of the member or related warehouse company to be a director of both that related warehouse company and a member. In these circumstances strict procedures must be put in place regarding board meetings etc, to ensure that no Confidential Information is disclosed by that director to other personnel of that member.

iii Both the member and the related warehouse company must maintain a contemporary record of personnel sitting on each side of the "chinese wall".

D Employee Awareness

i It is essential that related warehouse companies ensure that relevant personnel are familiar with the procedures adopted to comply with this Notice and abide by them. It must be impressed upon relevant personnel that their obligations apply both during and outside of office hours. Employees must be trained in the procedures adopted and reminded of their obligations on a periodic basis.

ii Each employee who has access to Confidential Information should also be given a set of written procedures to follow.

iii Relevant employees should sign acknowledgements that they understand and will adhere to the confidentiality procedures.

iv Internal sanctions should be established for breach of the confidentiality procedures and strictly enforced. Depending on the nature of the breach, sanctions may range from written warnings to dismissal.

6 Senior Employee

Related warehouse companies will be expected to appoint a senior employee who will be responsible for ensuring that the confidentiality procedures adopted are effective and are followed. Members' own compliance officers will be responsible for ensuring that members adopt and follow fully compliant procedures. Ultimately however, the LME will look to directors of the member to put in place procedures designed to ensure compliance with the terms of this Notice.

7 Duty to Inform LME

A member which comes into possession of any Confidential Information, whether through an employee or any other related party such as a Non-Executive Director or consultant, and whether from a related warehouse company or otherwise (or which is otherwise aware of a breach of these procedures) must immediately inform the LME of that fact.

8 Discounted LME Warrants

A member with a related warehouse company which is operating a listed warehouse in a particular location may not sell or offer to sell LME warrants issued in respect of other listed warehouses in the same LME approved Location or within a 250 mile radius of the related warehouse company at a discount to the related warehouse company's LME warrants, unless it can demonstrate that it would have offered the same discount even if it did not have a related warehouse company. Subject to the above proviso, a member must not otherwise offer any incentive to customers to exchange or substitute LME warrants issued by a related warehouse company for LME warrants issued by any other warehouse company's listed warehouse in the same Location or within a 250 mile radius of the related warehouse company. Any member or warehouse company which is aware of any such sale or offer must immediately inform the LME of that fact.

9 Access to Warehouses

Personnel of a member with responsibilities for a related warehouse company may not inspect metal held on LME Warrant by that member at another warehouse.

10 LME Inspections

The LME intends to make periodic and thorough inspections of members' and related warehouse companies' procedures to ensure compliance with the provisions of this Notice. These inspections may be conducted by third party professionals appointed by the LME. The cost of these inspection visits and any subsequent action taken will be paid for by the relevant member.

11 Disciplinary Sanctions

Breach of these procedures by a member or a related warehouse company will be regarded as an act of misconduct and will result in disciplinary action and the imposition of a severe penalty.

12 Review Procedures

The new procedures will be strictly monitored and will be reviewed after one year to ensure that the new system is delivering fair and transparent trading relations and preventing the misuse of confidential and price sensitive information.

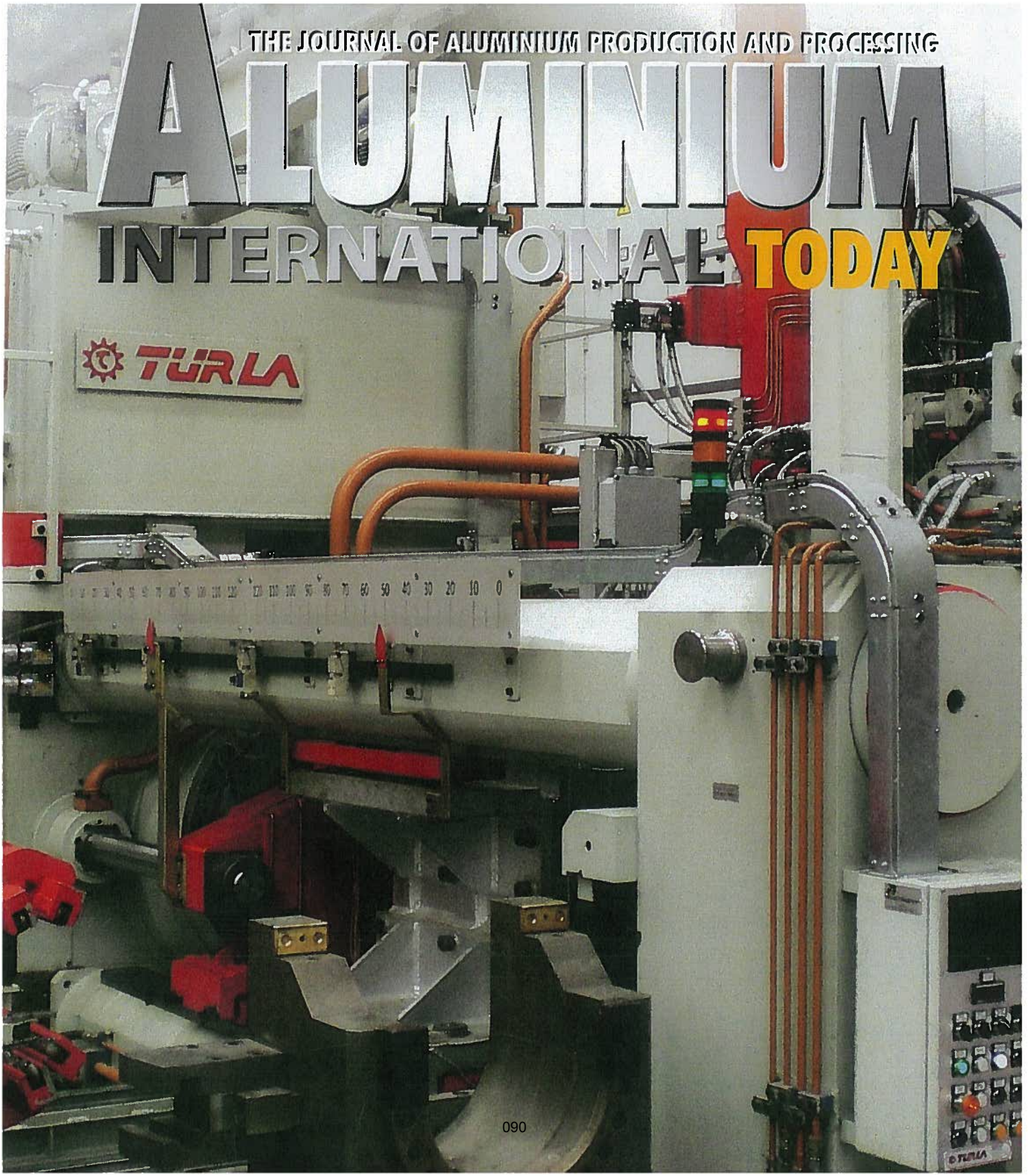
A WHITING

cc Board of Directors

APPENDIX 10

THE JOURNAL OF ALUMINIUM PRODUCTION AND PROCESSING

ALUMINIUM INTERNATIONAL TODAY



The great LME debate

Nick Madden* explores how the warehousing situation developed.

In the last two years there has been a debate raging about London Metal Exchange (LME) warehouses, queues and inflated metal premiums. Consumers have publicly criticized the LME and called for sweeping reforms. Some producers have attacked those claims and fought to maintain the status quo. Lawsuits have been filed. The Senate Banking Committee, the Department of Justice, the Commodity and Futures Trading Commission, the Financial Conduct Authority and the European Commission have all been talking about the LME. An article in July on the front page of a Sunday edition of the New York Times talked about investment banks shuffling metal between warehouses in order to prop up the price of aluminium.

What has been going on? I'll attempt to explain this issue from my own perspective.

How did the warehousing situation develop?

The story begins in 2008 when the commodity boom ended abruptly and the financial crisis triggered a catastrophic drop in the aluminium price from $3,300 to $1,300/t in the span of seven months. At the same time, we saw a 20% decline in global consumption of aluminium. World consumption (excluding China) dropped by five million tonnes, but primary production only fell by two million.

In the past, when there was such a significant oversupply, cutbacks in primary production might normally be expected. But this did not happen. With ultra low interest rates and a wide contango, the opportunity emerged to stockpile aluminium and

Perhaps the most widely reported build-up was in Detroit. The metal was moving to Detroit because the LME-registered warehouse complex there had become the equivalent of a competitive buyer in the market. The warehouse company sought to lure aluminium onto their premises, gambling that the metal would remain in storage for a long time. They took a portion of the forecast rent that they would earn and offered this as an incentive to primary producers. As the stockpile grew and the queue developed, the warehouse company was able to increase the incentive offered because they knew that the metal would be there for some time.

How did they know? Because the LME had rules which required the warehouse to ship a minimum of 1500 tonnes per day, which increased to 3,000 tonnes per day on April 1, 2012. An analysis undertaken in January 2012 illustrates the captive rental income from metal stuck in the queue. (See **Fig 1**).

If Detroit had closed its doors to inputs on January 31, and shipped-out metal at the minimum loading rate until the warehouse was empty, it would have taken 2.5 years and the rent that would have been paid during that period by the owners of the stranded metal was estimated at $230 million. This took into account the rule change in April 2012, which doubled the minimum load out rate for warehouses with more than 900,000 tonnes of stocks. Certain warehouses treated the minimum obligation as a

What were the key problems?

#1: Inflated premiums

The ability of the warehouse to bid t metal by offering incentives was the dir driver of the increase in the Mid W Premium from 7c/lb to over 12 c/lb at t 2013 peak. And it quickly became obvio especially to producers, that as long as t warehouse was bidding competit numbers with the rising premium, provided an outlet for excess productio thus keeping the market balanced. T premium was only able to reach the unprecedented levels because a complet different business model than conventio supply and demand drove the offer fr the warehouse. The warehouse offer v based upon rental income and the ti the metal would stay in storage. T phenomenon was sustainable beca metal stored in many other L warehouses was locked in finance de and the warrants were not in circulati As a consequence in 2013, if a consur wished to take metal out of the LME, would be offered far-flung locations w no queue at warrant premiums, wh reflected the already inflated market in t region. In Detroit, for instance, a consu would join the back of the queue and rent, insurance and finance for 19 mor while waiting for metal.

#2: Supply chain risk

One consumer tested the queue September 2011. The company bou four lots in Detroit and waited five mo until February 2012 for the metal to

a serious problem for the supply chain, because although the aluminium is sitting in storage, it is inaccessible for this prolonged period. While most major aluminium consumers secure metal requirements on longer-term contracts, if a consumer wanted fast access to LME metal in response to a demand upswing, it was simply not accessible.

How high are the stakes?

One major consumer, MillerCoors in a US Senate banking hearing in July, talked about consumers over-paying for metal by $3 billion per year. This number was an estimate of the artificial inflation of approximately $120/t compared with normal premium levels, multiplied by non-Chinese annual production of about 25 million tonnes at the time. In reality, it was a conservative estimate. All metal outside China, including inventories in warehousing deals and scrap, was impacted by the higher premiums.

The premiums, such as the Mid West Premium and EU Duty Unpaid Premium are published in business journals such as Platts and Metal Bulletin. The prices are derived from surveys conducted by the publications on a daily basis to capture news of actual transactions taking place in the market. It can be a handful of transactions, which actually set the market price. These published prices are referenced in most supply contracts between, producers, semi-fabricators and consumers. As a consequence, a very small volume of transactions sets the price for almost every contract in the region. This explains how the LME queue problem, and the consequent inflated premiums, can affect all metal flows in a region and ultimately in the world, leading to claims that consumers are paying $3 billion too much for aluminium.

Who benefits?

Some believed that this windfall was going to the warehousing companies. This was not the case. They have a different business model, which benefits from rent earned on the metal in their warehouse.

In fact, the extra premiums go to primary producers. And if you want to know how much of the estimated $3 billion goes to each producer, just multiply their primary production by $120/t and it will give you an idea. For example for a non-Chinese producer of $4 million tonnes, the windfall could be expected to be around $480 million per year.

Aluminum User Group (AUG), formed in 2012. The AUG wanted the LME to overhaul the warehousing system and eliminate the queues quickly.

In July 2013, the LME responded to widespread criticism and published proposals to reform the warehouses and address the queue problem at locations with a queue of longer than 100 days. Their proposal sought to increase the minimum load-out rate of warehouses with long queues and introduced a mechanism to link the load-in and load-out rates to bring more equity between a warehouse's ability to absorb metal and to release it. The LME gave market participants three months to consider their proposals and provide feedback and ideas.

The AUG responded with a series of recommendations. At the heart of the AUG's feedback lay a simple concept. There should be no queue. When a buyer of any futures contract takes delivery and requests access to the asset, it should be immediately available. The AUG proposed that once a warrant is cancelled, the warehouse should not be able to charge rent after 30 days following cancellation. This would have a dual benefit of discouraging the warehouse from allowing a queue to develop through eliminating the rent, which it would earn, and would remove the driver of the incentive payment that drove up the premiums in the first instance.

The LME received feedback from over 40 market participants and finally released a reform package on November 7, 2013. Amongst the reforms, the new load out requirements would apply to warehouses with queues greater than 50 days, a reduction of 50 days from the initial proposals. Further, a new Physical Market Committee would be formed, a full warehouse logistics review would be held and delayed data on commitments of traders would be published. Through these changes, the LME sought to address the problem of the queues, market transparency and market representation. The new load-out arrangements become effective April 1, 2014.

How has the market reacted to the rule changes?

There is a reasonable consensus among consumers that the LME's changes seeking more equilibrium between a warehouse's ability to intake metal and the obligation to release metal do make sense. But consumers do not believe that this should only apply to a warehouse with a queue of

changes to have an effect and there wa little immediate reaction.

However, since the start of the New Yea the Mid West premium has nearly double – moving from the 2013 peak of aroun 12 cents/lb to 21cents/lb early in 2014.

On this occasion, the LME warehous queues play only a small part. Som market players have accused the LME o "getting it wrong," implying that their rul changes have caused the spike ir premiums. Of course, they have not. Sinc the announcement, we have seen ar unprecedented cancelling of warrants as metal seeks to leave the warehouses, either to return to circulation in the free marke or to simply be re-directed to a non-LME warehouse under another financing arrangement.

The recent spike has more to do with a very short-term shortage of metal in North America. With millions of tonnes of primary aluminium believed to be stored in stealth stock in unreported locations, recent producer cutbacks, a tight scrap market and an up tick in demand, along with the delay in accessing metal in LME warehouses, the market is simply short of spot physical metal. It has the appearance of an engineered squeeze because, despite an abundance of metal in storage, it can't be accessed freely and premiums are at astronomical levels.

However, the answer to this may be in these high premiums. With the Mid West Premium at $450/t, metal is already being drawn from stocks in Europe. At the same time, it is not possible for the warehouses to compete with the premium at this level and those who are holding metal in stock will look seriously at liquidating it and taking the profits from the sky-high premiums. It seems that the premium has become over extended and should normalize in the coming months. However, many believe that it will be a long time before we see the Mid West Premium return to previous norms of four to seven cents per pound.

How can these issues be fixed permanently?

The LME is in a difficult spot. As LME officials stated when announcing the proposal back in July 2013, they could already see potential issues developing in the future. For example, when the market is in backwardation, and companies wish to deliver metal to satisfy their obligations, warehouses may refuse to accept large quantities simply because they do not

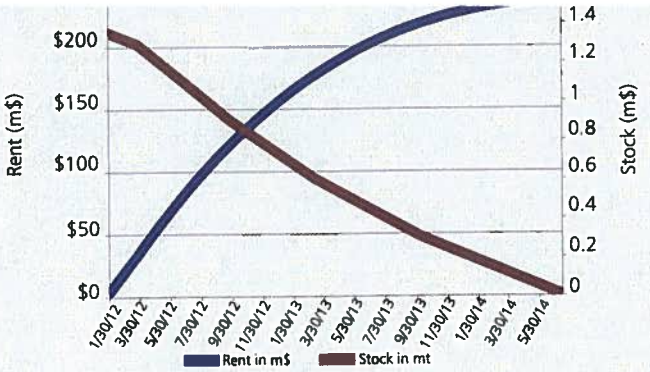
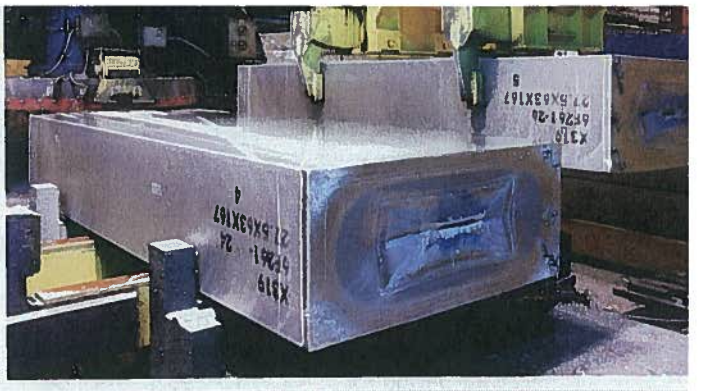


Fig 1 Detroit stock depletion and revenue (30 Jan 2012).



Aluminum ingots being prepared for rolling at Novelis plant in Oswego, NY.

Why is this? There are players in the metal market who have an edge over regular physical users of the market. For example, certain banks may have LME brokerage, physical trading and warehousing operations and access to finance. Trading companies may not be LME brokers, but possess the other attributes and may offer OTC premium deals or fixed pricing on the back of their LME trades or physical books. The combination of multiple levers in the market gives them an edge over other users and it is this edge that creates a conundrum for the LME.

No matter what the LME does, such market participants may look for gaps, flaws and loopholes in any new proposal and combine their levers to generate value for themselves at the expense of other market participants. This is the real issue.

It became clear over the last two years that warehousing and, more broadly, commodities are outside the normal scope of the regulators. This is an enormous issu for consumers of commodities. This is wh the LME has such difficulties in finding silver bullet.

Because in this under-regulated marke the players with all the levers have to many opportunities to generate value fo themselves.

So what is the solution? Either increas the scope of regulation or prohibit th financial institutions from participating unregulated markets. ■

APPENDIX 11

ADITYA BIRLA
NOVELIS

May 17, 2011

Mr. Martin Abbott,
Chief Executive
London Metal Exchange
56 Leadenhall Street
London, United Kingdom

Dear Mr. Abbott,

I would like to offer to you some observations related to the anomalous situation that exists in the physical aluminium market today and is a direct consequence of the LME warehouse load-out rules.

Novelis Inc. is the world's leading aluminium rolled products manufacturer and the largest buyer of aluminium, with 3 million tonnes purchased annually. The LME plays a hugely important role in our business. All Novelis contracts for sales and purchases include formulae which are based on the LME aluminium high grade price. We manage a significant hedging book with LME members, and at times we look to LME warehouses as a source of metal.
Novelis participated in the recent independent study into warehousing issues in North America and recommended a significant increase (on a tonnage basis) in the required output capacity of warehouses, with specific reference to Detroit. We applaud your initiative in conducting this review and look forward to a solution that alleviates the current bottleneck to the satisfaction of traders, consumers and producers.

There is no doubt that the Mid West and other regional premia are at all time highs since the introduction of aluminium warehouses in North America. We believe these high premia are a direct consequence of the bottleneck that has arisen in LME warehouses due to the limited output capacity required by LME warehouse load-out rules. It is otherwise very difficult to imagine that premia could be at historical highs when global inventory is also at an historical high.

The pain caused by the bottleneck issue is suffered by semi-fabricators who are struggling to source metal, particularly in North America, and by their customers who ultimately pay the high premia. At the same time, the producers are discouraged from supplying physical customers directly because every sale though the LME creates price advantages for them. The tightness created in the physical market causes premia to rise and that benefit is multiplied across their entire regional production system. As a consequence, the warehouse bottleneck is contributing to a migration of value from the consumers to the producers and warehouse companies. Without the elimination of the bottleneck, the impact on our supply chain will be intolerable. Accordingly we support the LME in its effort address this phenomenon.

At Novelis, we hope that the study will make clear that the warehouse bottleneck gives economic pricing advantage to producers and a disproportionate benefit to warehouse companies at the expense of consumers and creates significant price exposure and supply chain risk to the semi-fabricators and consumers, especially in North America. We hope that the LME will act quickly and decisively in line with the recommendations of the study and relieve the difficult situation that consumers are facing.

If you would be interested to discuss this further, I would be pleased to visit you or participate in a call.

Yours faithfully,

NG Madden

Nick Madden
Vice President & Chief Procurement Officer
Novelis Inc.

APPENDIX 12

ADITYA BIRLA
NOVELIS

August 19, 2011

Mr. Martin Abbott,
Chief Executive
London Metal Exchange
56 Leadenhall Street
London, United Kingdom

Dear Mr. Abbott,

I am writing to you for the second time regarding LME warehouses. For reference, my previous letter was mailed to you on May 17, 2011.

As you may know, Novelis is the largest buyer of aluminium in the world and a significant stakeholder in the market. In our May 17 letter, we strongly urged the LME to increase substantially the minimum load-out requirements to relieve the artificial market constraint in the U.S., specifically Detroit, where 25% of the LME's global stocks of aluminium are stored. In our view, the minimum load-out requirements have caused a bottleneck in the North American supply network, creating supply chain issues and leading to artificial upward pressure on the local market premium. The result has been historically high regional premia at the same time as LME stocks in storage were also a historical highs. This anomalous situation was entirely attributable to the minimum load-out requirements and has been causing a migration of value from consumers, on one hand, to producers and warehouse companies, on the other. In this way, producers are incentivized to ship discretionary metal to LME warehouses so that regional market supply remains tight and regional premia remain high in an over-supplied market. Warehouses also benefit, as increased storage of aluminium stocks under constrained load-out minimums translates to additional storage fees. As a consequence, the LME is contributing to market distortions that favor producers and warehouses to the disadvantage of consumers.

In June and July, the LME announced rule changes that increased the load-out requirements on a sliding scale. We applaud the LME for taking action and believe that this was move in the right direction. Nevertheless, the new minimum quantities are still too low and the implementation date of April 2012 is too late. Regional market premia have remained steady for near-term deliveries, despite the rule change.

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We write to you again because Novelis is deeply concerned that the bottleneck situation will not subside and is likely to become more severe over the next two or three years. While the LME took initial steps to alleviate the constraint in Detroit, aluminium stocks in Vlissingen increased by a staggering 200,000 tonnes overnight earlier this month. This phenomenon has now spread to the Zinc market (New Orleans), and we expect this effect to continue and to become more global.

The U.S. Federal Reserve Bank recently announced its intention to maintain short term interest rates close to zero until 2013. Coupled with a strong contango, this will encourage more and more warehousing deals that will absorb the projected excess primary production in 2011 and 2012. It is our expectation that LME stocks will continue to increase, warehousing capacity will be expanded and a supply reservoir will amass in LME warehouses.

While we do not question the motives of those who would own stored aluminium to generate income from cash and carry transactions, we are very concerned that warehouses have the ability to lure metal from producers using cash incentives. They can only do so if there is a reasonable certainty that the metal will be stored for sufficient time to generate a profitable return on the investment of the incentive. Since warehouse owners have a voice via the LME Warehousing Committee, they have the opportunity to influence the LME to maintain the status quo or at least limit the extent to which the minimum load-out requirements may be increased. By doing so, the warehouse companies have a detrimental impact on the functioning of the LME, which is exacerbated by the ownership of LME warehouses by members of the LME, such as Goldman Sachs and J.P. Morgan. We believe that LME members should not be allowed to own LME registered warehouses because we see a conflict of interests in the potential for undue influence (or, worse, manipulation) in both the physical delivery and metal warehousing functions of the market, as well as the rulemaking authority of the LME, which would directly affect the economic prospects of the warehouses.

We also believe that warehousing companies should not be allowed to make incentive payments to producers to attract metal for storage. The regional market premia are at an historically high level today because LME warehouses offer incentives which indirectly inflate local market premia. Producers have the option to ship discretionary (non-contracted) metal to physical customers, LME warehouses or not to produce it at all. The storage incentive offers from warehouses create a viable arbitrage option for the producers. The incentives themselves are entirely driven by the length of time the metal is expected to stay in the warehouse. In turn, the storage time in the warehouse is significantly affected by the load-out rate. If the rules were changed and warehouses were required to load-out pursuant to demand without any daily limit, matching their apparent ability to receive metal without any daily limit, there would be no opportunity for warehouses to skew normal supply-demand dynamics with incentives to producers and local market premia would reduce to a level that is consistent with an over-supplied market.

As we look ahead, Novelis is very concerned that the "anomaly" of historical highs in both tonnes of aluminium in storage and regional market premia will continue. If the LME allows these circumstances to persist, metal stocks in LME warehouses will continue to increase, creating additional serious risks that another, more significant, spike in premia will adversely affect the whole supply chain to the

detriment of consumers. To mitigate these risks, we strongly urge the LME to act quickly to discourage market manipulation by its members and stakeholders. Specifically, we would like to see the following:

1. Prohibit LME members from ownership of, or consortium relationships with, LME registered warehouse companies.
2. Prohibit incentive payments from LME warehousing companies to metal producers.
3. Increase minimum load-out rates as follows:
    a. Where stocks are less than 300kt, increase minimum rate to 5kt per day.
    b. Where stocks are greater than 300kt, increase minimum rate to 10kt per day.

Mr. Abbott, we must look ahead to the inevitable time when LME aluminium stocks are drawn-down. The current load-out requirements do not today and will not in the future allow for an adequate response to urgent demand from the physical market. In addition to liberating supply to meet market demand, the LME should address the ownership issues and incentives which create the opportunity for market distortions. The LME has the ability to address these complex issues with the three simple recommendations outlined above.

I did not receive a response from you to my previous letter and I read in the press that you had not received any formal complaints about the warehousing issues. Please consider this a formal complaint. The LME and its regulations are being "gamed" by market participants and this is distorting the market at the expense of consumers and, in the end, damaging the reputation of the LME.

I would like to meet you in person to discuss this further. We will both be in Paris attending the Metal Bulletin Conference in September, and I would be very pleased if you could find an hour in your schedule for a meeting. I will certainly make sure that I attend your presentation.

Yours sincerely,

Nick Madden
Vice President & Chief Procurement Officer
Novelis Inc.

APPENDIX 13

European Economics Study

- Executive Summary
- Recommendations

1 EXECUTIVE SUMMARY

Introduction

1 The London Metal Exchange (LME) commissioned Europe Economics to "Prepare an independent assessment for the LME of whether the current requirements in the LME warehouse contract for rates of physical delivery out are satisfactory." The Steering Committee for the project comprised LME Chief Executive Martin Abbott, Deputy Chief Executive Diarmuid O'Hegarty, and Head of Physical Operations Robert Hall.

2 Current LME regulations require approved Warehouses to be able to deliver out a minimum tonnage per day, which is 1,500 tonnes per day for Warehouses with space of 7,500 square metres or more (currently all but three Warehouses), 1,200 tonnes for 5,000 square metres and 800 tonnes for 2,500 square metres. In 2010 there were a number of complaints regarding delays to the delivery out of metal and the loading out process more generally.

3 This report covers the background to the emergence of long queues and the context of current regulations, in addition to an analysis of the problems that long queues cause and potential solutions. Broader issues surrounding allegations of manipulation and the entrance of large financial players are beyond the scope of this report.

4 The foundation of the study was information gathered in a programme of 46 interviews, including visits to 12 Warehouses in Europe, Asia and North America. The focus of the study is the aluminium market.

Background

5 Between March 2009 and August 2010 18 complaints were made to the LME about delays in loading out. Ten informal complaints were made in the period between March and April 2009 concerning Warehouses in South East Asia. Of these, only four related directly to delivery out and none was indicative of any systemic problem.

6 Eight complaints, one of which was made formally, related to Warehouses in the United States and, with the exception of one informal complaint in July 2009, were made in the period from February to June 2010. Three of the informal complaints concerned the performance of the Warehouse delivery out system as a whole. The formal complaint alleged that a Warehouse in Baltimore was not scheduling deliveries sufficient to achieve the 1,500 tonne per day minimum.

7 In the course of our consultation, stakeholders generally agreed that some queues were an inevitable part of the system, and that short queues did not pose an important systemic problem. Long queues were regarded as damaging, on the grounds that they inhibited arbitrage between the LME and the physical market, increased physical premiums and damaged the reputation of the LME.

8 There was a general belief that the loading out obligation could and should be increased, though this was resisted by warehousemen. It was widely acknowledged that the loading-out rate should be considered in relation to the level of stocks in a Warehouse.

9 Although there was some interest in the idea of rent rebates, they were not seen as in themselves an effective way of reducing queues or of addressing their effect on the price discovery mechanism.

Problem Analysis

10 The longest queues that occurred in 2010 were of an unprecedented length, but were confined to limited to a small number of warehouses. Nevertheless, due to the large number of stocks in particular locations these queues affected approximately one fifth of the LME's aluminium warrants.

11 Queues may inhibit the LME's price discovery process by preventing arbitrage. Queues make arbitrage more costly because rent must be paid while metal is in the queue, because the length of queue is uncertain, and because of other uncosted inconvenience. In effect, this lowers the value of warranted metal in relation to the value of physically delivered metal.

12 This may be damaging to the price discovery process because this reduction in value is a result of warrant cancellations and LME loading out requirements, rather than a result of developments in the physical market. Changes in the LME price will then be related to changes in queue lengths, as well as to physical supply and demand.

13 While the effects of a short queue are likely to be trivial, long queues may have a significant impact on the value of warranted metal. This is of particular concern because any warrants whose value is significantly lowered will be used to settle Exchange contracts, and thereby set the LME price.

14 It is for this reason that persistently long queues are especially concerning. With sufficiently large stocks, which need only leave the Warehouse at a rate of 1,500 tonnes per day, the Warehouse's revenue may allow it to pay high enough incentives to maintain or increase its stocks, and these warrants, being both the most numerous and the least valuable, will come to dominate the settlement of contracts on the Exchange.

15 These arguments are supported by empirical evidence, which shows that premiums have increased in conjunction with the emergence of long queues, and that spreads have moved in conjunction with changes in the length of queues. They are also supported by the observations of some stakeholders that premium levels are greatly in excess of the cost of arbitraging between locations.

16 The origins of the current situation can be traced to macroeconomic developments. The collapse in demand that followed the financial crisis of 2008 resulted in a large surplus of physical metal and a consequent expansion in the LME's stocks. In response to the demand contraction monetary policymakers lowered interest rates.

17 Although it was frequently alleged that finance deals constrained the supply of warrants and decreased liquidity on the Exchange, this argument is implausible because any shortage of warrants would result in a backwardation and either result in the creation of new warrants or induce other warrants out of rent deals. Nevertheless, finance deals do affect the distribution of cancellations among warehouses, resulting in a concentration of cancellations in those Warehouses that do not engage in finance deals.

18 When large amounts of metal are financed, movements of metal on and off warrant will be governed by changes in spreads, as institutions try to cut their cost of carry by moving metal off the LME during a prolonged contango, and put metal onto warrant in order to sell cash contracts during a backwardation. Given the large positions that some financial institutions can take, this had led to the large volumes of cancellations that are a necessary condition for the emergence of long queues.

19 However, large cancellations are not a sufficient condition for long queues. Rather, such queues result from large cancellations in particular Warehouses, each of which need not load out more than 1,500 tonnes per day. The potential for this to occur is a result of the accumulation of large stocks in individual Warehouses. The fact that the largest Warehouses can allow their Warrants to float at full rent makes such cancellations all the more likely.

20 Although it was argued that an increase in physical demand would reduce the size of the largest LME warehouses, thereby reducing queues, the amount of metal in the largest would take more than two and a half years to empty. Moreover, given the size of incentives that a large Warehouse can afford to pay, there is no reason to believe *a priori* that these Warehouses would not be able to maintain their stock levels. Indeed, as physical demand picked up and cancellations occurred for physical consumption, it is conceivable that queues could worsen.

Policy Options

21 The LME's five main policy options to address this issue comprise: capping particular locations; increasing the loading out requirement for all Warehouses; increasing the loading out requirement for larger Warehouses, in order to eliminate the critical mass feature of current regulations; extending the current loading out table proportionately beyond 7,500 square metres; and inviting Warehouses to offer rent rebates.

22 The capping provision in the LME's regulations was not envisaged as a routine method of controlling stocks and on the one occasion it was used, this to address the accumulation of a large volume of metal in a location on the West coast of the United States, which was seemingly immobile due to a lack of demand. Moreover, the idea of setting an absolute limit to the level of stocks in a location goes against the principle that the LME's stocks should expand and contract freely in order to reflect the physical market.

23 While some stakeholders advocated an increase in the loading out requirement for all Warehouses, it was clear that this was already at the limit of what was consistently

achievable for some small Warehouses. Indeed, 2,000 tonnes per day was seen as the limit of what most Warehouses could consistently achieve.

24 A 2,000 tonne per day loading out rate would not succeed in eliminating long queues and, on the basis of the observed pattern of cancellations, would still have left queues of up to 54 days in 2010. Moreover, since queues are confined to a small number of Warehouses, this option would impose an unnecessarily large operational cost (an estimated upper bound to which is $66.4 million in 2010) on the whole Warehousing industry, which would probably be passed on to warrant holders in the form of increased rent or FOT charges.

25 Implementing a loading out requirement of 1,500 tonnes per 300,000 tonnes of stock would affect many fewer Warehouses than a general increase, and the upper bound to its operational cost to the whole industry is calculated as $9.3 million for 2010. However, while it would probably succeed in eliminating indefinitely long queues, it would still leave open the possibility of long, albeit transitory, queues, when Warehouses experienced a sudden large cancellation.

26 As this option would make it more difficult for the largest Warehouses to maintain their stock levels while floating their metal at full rent, it is likely that it would result in a more even distribution of cancellations across Warehouses.

27 Eliminating all long queues would require much more stringent loading out requirements than either an increase to 2,000 tonnes per day or a requirement of 1,500 tonnes per day per 300,000 tonnes of stock. Current requirements for Warehouses whose authorised space is below 7,500 square metres constrain queues to 19 warehouse days, on the assumption that one square metre of space may store three tonnes of metal and if all warrants were cancelled. (It should be noted that only three Warehouses' space is currently less than 7,500 square metres.) Rounding this up to 20 days would imply a loading out requirement equal to stock level divided by 20.

28 Given current stock levels, the loading out requirements that such a regulation would imply are beyond what is physically practicable. For example, at 1,000,000 tonnes of stock (less than the current maximum) a Warehouse would have a loading out requirement of 50,000 tonnes per day. Moreover, even if such amounts were physically possible, the extra operational costs involved (estimated at a minimum of $255 million for 2010) apply across so many Warehouses that they would result in large increases in rent and/or FOT charges, which the Warehousing system, as presently configured, might be unable to support.

29 Offering rent rebates equivalent to half rent for metal caught up in queues between 10 and 20 days, and zero rent beyond 20 days would cost the Warehousing industry as a whole $14.9 million in 2010, on the assumption of 40 cents rent and the observed pattern of cancellations. However, there are some doubts about the feasibility of this option.

Recommendations

30 We do not recommend that the LME take no action, as the present loading out regulations are permitting queues of an undesirable length.

31 A universal increase in loading-out requirements would impose large costs across the Warehousing industry without eliminating long queues.

32 Rent rebates could address some aspects of the problem, though they are subject to significant feasibility issues which could hamper their effectiveness. We therefore recommend that this option be subject to further discussion.

33 A loading out requirement of 1,500 tonnes per 300,000 tonnes of stock would address the most acute problem, the persistent queue in a critical mass Warehouse. Moreover, this would be done without imposing a large burden on Warehouses.

34 Although this option also improves on current regulations by putting an upper bound to queue lengths, at 200 days this is still longer than desirable for the LME system. It is therefore recommended that the requirement of 1,500 tonnes per 300,000 tonnes of stock be formally reviewed at intervals of 6 months, and the level of stocks to which the 1,500 tonne delivery requirement applies be reduced should persistent and lengthy queues continue.

Recommendation to the LME Board Following Warehouse Study

LONDON METAL EXCHANGE

To: All Members, Warehouse Companies and London Agents

Ref: 11/141: A135 : W092

Date: 27 May 2011

Subject: **Warehouse Study by Europe Economics**

The Europe Economics report "Assessment of Warehouse Minimum Loading Out Rates" has been considered by a steering committee of the Executive together with the Independent Directors of the Exchange. A recommended course of action will be presented for a decision to the Board of LME Limited at its meeting on 16 June 2011.

The report is extremely detailed and contains a great deal of proprietary information that makes it impossible to publish the full version. However, the executive summary and the recommendation section from the Europe Economics report are attached to this notice and will be published on the LME website.

The decision to commission the report was taken because the LME recognised the concerns of various sectors of the industry with regard to the existence of long waiting times for the delivery of aluminium out of LME listed warehouses in North America.

It should be noted that this issue currently is specific to aluminium and to one location; the LME does not have a systemic issue with its warehouse network.

The mechanisms and systems that the LME approves are subject to the various pressures of the economic cycle, and that means that different problems will arise at different points in the cycle. The current LME procedures have developed over a long period in response to market requirements. It is desirable that the LME approves procedures that are capable of dealing with different circumstances with the minimum of change, but it is also necessary to recognise the impossibility of designing 'one-size fits all' regulations.

Market participants will recollect that only two years ago the North American aluminium industry was facing a major recession with the apparent collapse of its major automotive customers. At that time the concerns of the industry were all centred on the need to deliver material into warehouse, with dire warnings about the consequences for the LME should there be a capacity constraint that affected the free flow of surplus material onto warrant.

We now find that the major concern of that same industry (and in some cases, the same participants) is the ability to take material out of warehouse. It is not surprising that there should be some tension created by such a rapid journey between the two poles of the aluminium economic cycle. We also note that the situation has been exacerbated by the coincidental availability of surplus aluminium with the widespread policy of central banks holding down interest rates and creating a pool of cheap money that increases the attractiveness of financing deals and in turn increases the pressure for fiscally-motivated stock movements. We do not make value judgements about the different motivations for warrant cancellation, but we do note that the system is under pressure as a result of some extraordinary factors.

The challenge for the LME is therefore to manage its warehouse regulations in such a way that the changing nature of the business environment can be managed within a relatively stable mechanism. It must also be recognised that there are consequences to all decisions (often leading, among other things, to higher costs) and that all actions must be viewed, as far as is possible, with a long term perspective.

The Europe Economics report contains a number of policy options that might appear to address the situation under review. The LME agrees with the authors of the report that the capping of storage capacity in particular locations is not consistent with the LME's general policies.

The report suggested that the implementation of rent rebates for material that is 'stranded' in a queue should be the subject of further discussion, though it noted that there are significant feasibility issues with this option. The LME believes the feasibility issues do indeed outweigh the advantages of this option.

The option of a significant increase in loading out rates across all warehouses is also not attractive. The increased cost of such an approach would impact all warehouses and therefore all users of the market and might simply create a new generation of problems.

The LME does agree that there should be a link between the amount of metal stored in a company's warehouses at a location and the minimum load out rate. The current regulation has a sliding scale of load out minimum rates, rising to an upper level of 1,500 tonnes per day. The scale is based on the total storage capacity that the company has in the location.

We are recommending to the Board of the LME that the sliding scale be changed. If the Board approves the recommendation then the load out requirement will be linked to the amount of metal stored rather than the storage capacity and the new scale will be as follows:

Warehouse company's tonnage stored per location	Minimum delivery out
Up to 300,000 tonnes	1,500 tonnes
300,000 to 600,000 tonnes	2,000 tonnes
600,000 to 900,000 tonnes	2,500 tonnes
More than 900,000 tonnes	3,000 tonnes

(The daily delivery rate does not include deliveries out for cobalt and roasted molybdenum concentrates: any deliveries out for these metals must be made in addition to the rates stipulated in the table above.)

The changes would be effective from 1 April 2012. The date has been chosen to give ample time for the warehouse companies to prepare for the new regime and for the market to digest the consequences of the change.

Martin Abbott
Chief Executive

cc: Board directors

APPENDIX 14

LME rule disappoints aluminium consumers
The Financial Times
By Jack Farchy
July 15, 2011

Some of the world's largest buyers of aluminium reacted with disappointment on Friday to a long-awaited decision by the London Metal Exchange to change its warehousing rules.

General Motors, one of the world's largest automakers, and Novelis, a leading aluminium processor, told the Financial Times that the LME's move to double the rate at which the largest warehouses must deliver metal did not go far enough.

The controversy has sparked a fierce debate in the metals community, pitching consumers against Wall Street banks and traders who own warehousing companies.

The consumers, along with several traders, banks and metal producers, argue that long queues to take delivery of aluminium, used in the manufacture of everything from drinks cans to cars and aircraft, have driven up the cost of metal in the physical market.

The debate is focused on Detroit, where some 200,000 tonnes of aluminium are waiting to be delivered from warehouses owned by Goldman Sachs.

Current LME rules stipulate that warehouses must deliver at least 1,500 tonnes of metal out each day – meaning a trader requesting delivery of their aluminium today could wait more than six months to receive it.

On Friday, Martin Abbott, chief executive of the LME, announced that the exchange would increase the minimum loading out rate for the largest warehouses to 3,000 tonnes a day, starting in April next year.

But Nick Madden, chief procurement officer at Novelis, which supplies companies including Coca-Cola, BMW and Tetra Pak, said he was "disappointed" that the LME had made only a "relatively minor adjustment to this critical problem".

"We believe a higher [load-out] rate is necessary," Mr Madden said. "We are also concerned that this change will not take effect until April 2012. This unnecessary delay will prolong anomalous pricing and supply chain issues for both manufacturers and consumers in the market."

Kevin Moore, senior manager for raw materials purchasing at GM, said the changes were "welcome", but added: "Unfortunately, many in the market have indicated to us that the rule changes are not likely to result in significant improvement."

"LME aluminium price and availability does not appear to be acting in according with natural market forces resulting in a less effective pricing tool and hedge mechanism," he said.

The decision by the LME was in line with an earlier proposal, which the LME's board failed to ratify at a previous meeting in June as several board members pushed for a higher load-out rate.

After an all-day meeting on Thursday, however, the LME agreed the new rules. Mr Abbott said the effectiveness of the changes would be kept "under constant review".

He said that he shared the concerns of metal consumers, but argued that a larger increase in loading out rates would not be possible because of "insurmountable logistical issues", including a "critical shortage of trucks" in the US Midwest.

"We do not make rules that cannot be kept," he said.

The change of rules could affect the profitability of warehouse owners, whose revenues are dependent on the amount of metal they hold. Warehousing has traditionally been a niche business dominated by privately owned companies, but in the past two years large banks and trading companies, including Goldman Sachs, JPMorgan, Glencore and Trafigura, have been buying up warehouses.

Barclays Capital is also considering investing.

LME warehouse load-out proposal not enough: US aluminum sources
Platts
June 2, 2011

Proposed recommendations by the London Metal Exchange to increase load-out rates by next April is too little, too late, as the market's landscape may be vastly altered over the next 10 months, according to US aluminum market players.

The LME on March 27 said its board would consider a recommendation to amend load-out rates at LME-registered warehouses after an independent consultant made its recommendations.

At a June 16 meeting, if the LME board agrees, the load-out requirement will be linked to the amount of metal stored, rather than the square meter storage capacity.
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The rate will be set at a minimum of 1,500 mt/day for up to 300,000 mt stored; 2,000 mt/day for 300,000-600,000 mt; 2,500 mt/day for 600,000-900,000 mt; and 3,000 mt/day for more than 900,000 mt. The changes would be effective from April 1, 2012, thus allowing "ample time for the warehouse companies to prepare for the new regime and for the market to digest the consequences of the change."

The current regulation has a sliding scale of load-out minimum rates, rising to an upper level of 1,500 mt/day, for warehouse storage capacity of 7,500 meters/location.

Vast stock build-ups in certain warehouse locations, prompted in part by storage incentives paid by warehouse companies -- currently $140-150/mt for aluminum in Detroit -- have led to accusations that the system is being distorted and that there are clear conflicts of interest now that a number of trading companies and financial institutions -- Goldman Sachs, JP Morgan, Glencore, Trafigura -- have acquired warehousing companies in the past 12-18 months.

As of June 2, there was 4.69 million mt of aluminum in warehouses -- 1.1 million of which was in Detroit alone -- up from 4.2 million mt in January and 4.5 million mt a year ago. Lead times to get metal out of Detroit are now nine months.

US aluminum market players have voiced concern over the long lead times to get metal out of US warehouses, particularly in Detroit. Market players said it will take until February/March 2012 to get metal out of Detroit. That is up from six months in February and from only two months in June 2010.

These complaints spurred the LME last year to hire Europe Economics to study the issue and make its recommendations.
Nick Madden, vice president and chief procurement officer for US aluminum sheet maker Novelis -- one consumer that wrote the LME pleading for changes -- said he was "very disappointed" with the proposed minimum output requirement, calling it "insufficient."

Further, he said, not implementing the change until 2012 "will simply prolong the pain being felt by consumers in North America. My preference would be to see the minimum requirement trebled for warehouses with stocks over 600,000 mt and to see the change take place immediately."

Madden previously told Platts that the aluminum supply chain would be at risk if the situation continued and suggested the LME consider increasing the load-out rates to 10,000 mt/day, among other options.

An extruder said he did not understand why it would take warehouses 10 months to get prepared for the changes when all they have to do is "hire staff and get a few more tow trucks."

A trader agreed and suspected the LME Board would agree to the recommendations "as a gesture. The warehouses will ship out a little more, but I don't think it's a significant change. They needed to do more."

A billet remelter said the potential increased load-out rates could have the opposite effect than was intended and spur an increase in warehouse stocks as "warehouses [owners] may want to buy more to make up for what they are losing with the load-out rates increasing. We are talking about banks and profits."

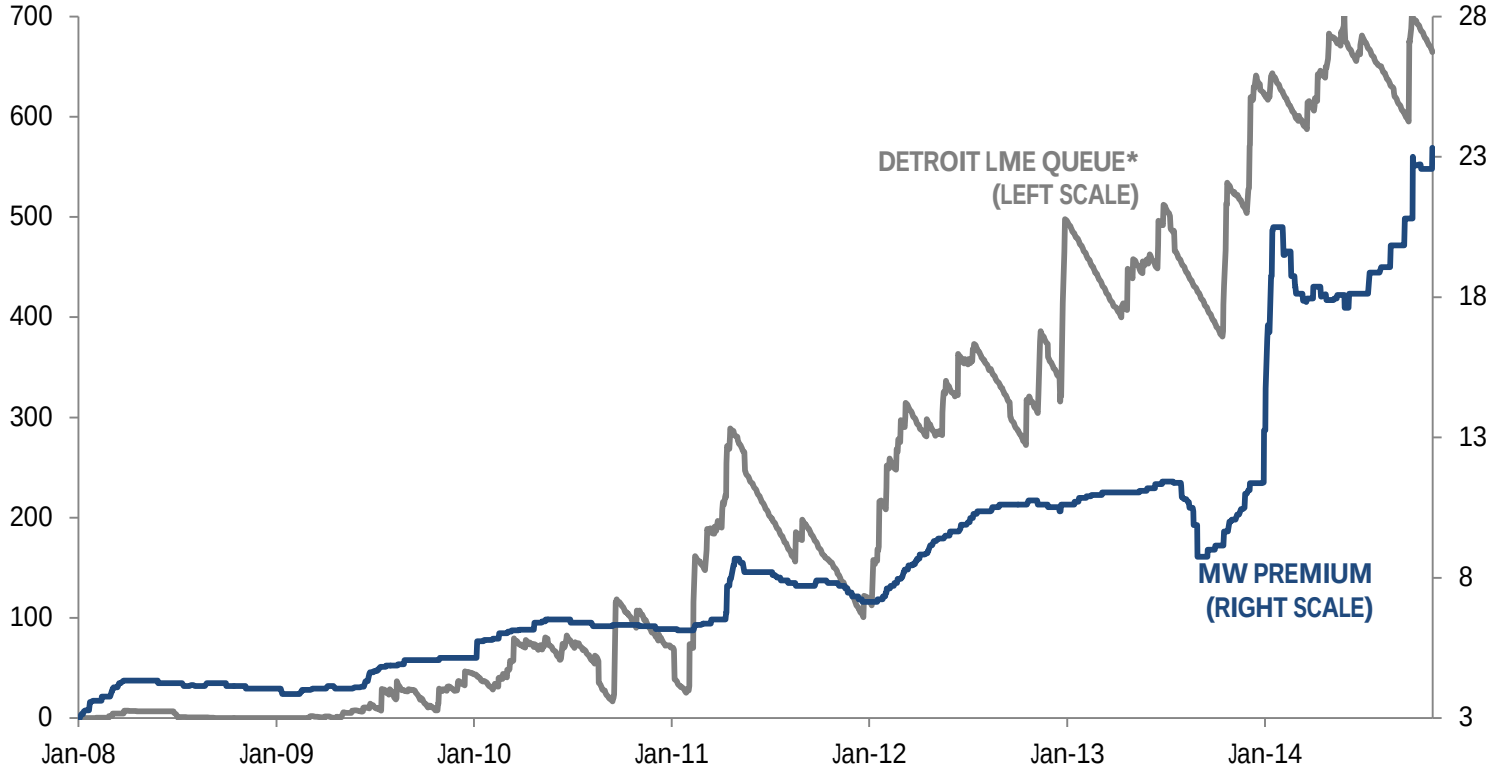
One trader said that although consumers think the recommendations are not enough, even just doubling the load-out rates could cost them more money. He said warehouses will need more revenue to be able to double the load-out rates. The trader said the current FOT rate in Detroit is $33/mt, and the rent rate is 41 cents/mt/day.

Noting that deals "will be priced reflecting the logistical issues of getting trucks," he said the result could be that "metal will come out sooner, but consumers will be paying the same amount of money as if they waited nine months."

APPENDIX 15

MIDWEST P1020 TRANSACTIONAL SPOT PREMIUM vs ESTIMATED LME LOAD OUT QUEUE IN LME DETROIT*

(cts/lb vs calendar days; daily data)

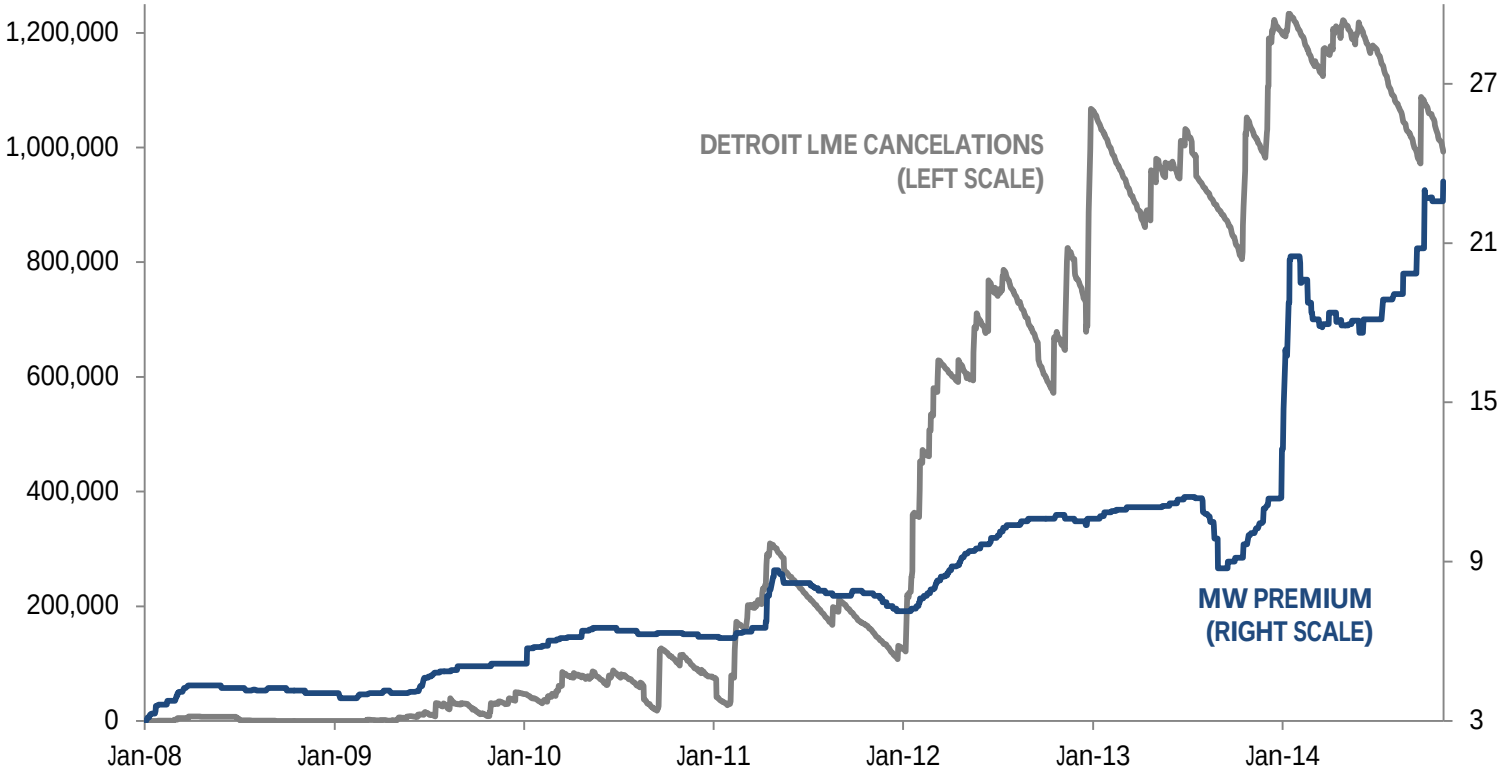


**HARBOR´s estimate*

Source: *HARBOR Aluminum and LME data on queues for the last day of each month from April 2014 to date*

MIDWEST P1020 TRANSACTIONAL SPOT PREMIUM vs DETROIT LME PRIMARY ALUMINUM CANCELLED WARRANTS

(cts/lb vs mtons; daily data)



Source: *HARBOR Aluminum and LME data for Detroit cancelations*

APPENDIX 16

Executive Summary

The 2015 Ford F-150 will have over 1,000 pounds of net aluminum content, or approximately 25% of its curb weight

2015 F150 Crew Cab	Lbs. / Vehicle CY2015
Block	71
Heads	66
Other Engine	37
Transmission Case	68
Other Transmission	12
Differential Carriers	17
Drive shaft & Yokes	7
Heat Exchangers	32
Heat Shields and Sinks	10
Wheels	72
Brakes	6
Steering	5
Closures	223
Body Sheet HT	281
Body Sheet NHT	96
Body Shapes	31
Body Tube	37
All other	9
Total	1080