

# In-Focus Report

## Saudi Aluminum Sector Review

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### Executive Summary

- Aluminum's unique characteristics and application in numerous industries make it the most used non-ferrous metal in the world.
- Players in the industry range between "upstream" primary aluminum producers (bauxite extraction and alumina refinery), and "downstream" aluminum product fabricators.
- The Kingdom's aluminum sector is predominately downstream focused, however is on the verge of becoming a major upstream player. Three announced aluminum smelter projects, valued at USD 19.3 bn, will supply 2.44 million tonnes per annum (mntpa) of primary aluminum between 2013 and 2016.
- The Saudi market is ideal for primary aluminum production, as well as downstream development, because of its long-term supply of low-cost energy, bauxite reserve base, strong infrastructure, proximity to markets, and government regulation that encourage FDI.
- The economic crisis resulted in global consumption and production of aluminum contracting by 8.3% and 6.1% respectively, with the biggest cutbacks taking place in the U.S. and Europe. Supply and demand imbalances resulted in a 38.2% expansion of aluminum stocks.
- LME aluminum prices were highly volatile in 2009, ranging from a high of USD2,500 to a low of USD1,700 with the core ranging around USD2,100.
- Total local market consumption in 2008 was 199,247 tonnes with a value of SAR3.45 billion, marking a volume growth rate of 42%. For 2009, we estimate the government's involvement would have kept physical aluminum demand from rescinding into negative growth rates like it did in the rest of the world.
- Global demand for aluminum is expected to pick up in 2010, growing by 12.8% to 38.7 mntpa with China leading the recovery. Meanwhile, China, India and the Middle East will also account for around 97% of the 7.9 mnt global capacity increase anticipated in 2010 and 2011.
- As the supply-demand balance tightens, the LME price is expected to rise to USD2,400 in 2010.
- The GCC is forecast to produce 3.5 mnt of primary aluminum by the end of 2010 - 10% of global production. By 2015, this share will likely rise to 12.3% with production at 5.5 million tons.

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## Introduction

Aluminum is the most widely used non-ferrous metal world-wide, ranking the second as the most consumed metal after steel. The metal has a wide range of characteristics that enable it to take part in several industries, such as construction, transportation and packaging. It is extremely light (a third of steel's weight), a good conductor of electricity, a transmitter of heat, corrosion resistant and 100% recyclable without any deterioration to quality.

The Kingdom's aluminum sector is predominately downstream focused, with no primary aluminum production currently onstream. Over 110 companies make up the sector, which processes various types of imported aluminum products to produce aluminum fixtures for construction, kitchens, cooking utensils and other aluminum related applications. Further diversification of the sector's downstream production portfolio will allow local manufacturers to enter new markets and increase their market share.

Furthermore, Saudi Arabia is on the verge of becoming a major upstream players in the global aluminum industry. Upon completion, three announced aluminum smelters will supply roughly 2.44 million metric tons per annum (mntpa) of primary aluminum by the start of 2016. The projects, valued at USD19.3 bn, will turn the Kingdom into a net exporter, and eventual global supplier, of the metal.

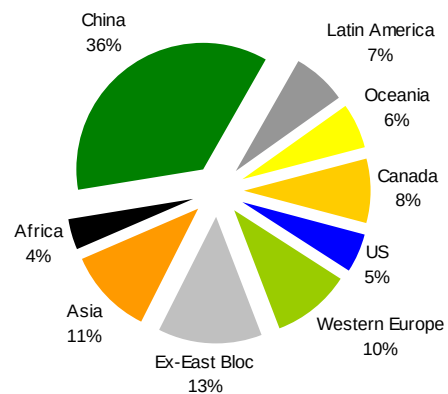
## Global Aluminum Sector

To gain an in-depth understanding of the Saudi aluminum sector, a look into the global market and its performance over the course of the economic crisis is necessary. The worldwide financial crisis hit the aluminum sector very hard as of the last quarter in 2008, forcing major primary aluminum producers to take measures to avoid bankruptcy. This included reducing smelting output, workforce size and capital expenditures, as well as selling off downstream businesses. The latest global

production figures show that there was a lagging and patchy supply-side response to the collapse in demand which resulted in a massive oversupply. (Chart 1)

Global consumption of aluminum fell by 8.3% in 2009 to 34.3 million tons. Demand was pummeled by the sharp contraction in the key automotive and construction sectors. Meanwhile, production contracted by 6.1% Y/Y to reach 37.7 million tons. The biggest cutbacks took place in the U.S. and Europe, where annualized production fell by 17% in both regions between May 2008 and March 2009. Meanwhile, over one third of production is due to China's continuous industrial development. Despite having to reduce their smelter capacity by 3.3 mntpa at the start of 2009, China was able to re-start production and increase total capacity by 6.3 mntpa by the end of the year. (Chart 2)

Chart 2: Global Production 2009, 37.7 mntpa



Source: IAI

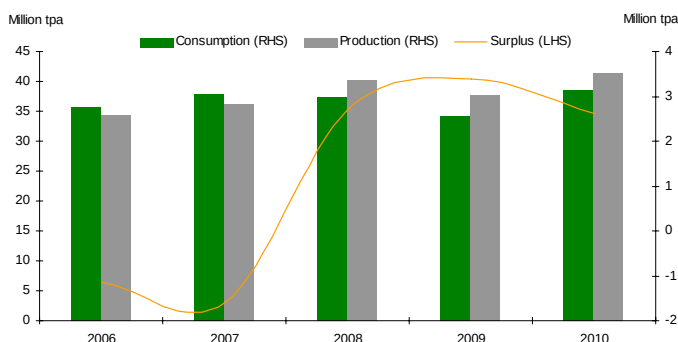
The decline in both global consumption and production have resulted in a significant 38.2% expansion of aluminum stocks. A big percentage of these stocks are being held by financial institutions, that are hedging the metal rather than trading it. As demand begins to recover in 2010 this will lead to tightness on the spot market and high premiums to countries like the U.S. and China.

## International Aluminum Prices

Primary aluminum is traded on several metal exchanges, mainly the London Metal Exchange (LME). While high speculative trading in derivative markets influences aluminum prices, causing short-to-medium term price volatility, we believe that market fundamentals and the cost of production are the main determinants of long-term aluminum prices.

The sharp drop in the LME quote between July '08 to March '09, hitting a low of USD1491 per tonne, reflected the dramatic fall of world trade of aluminum. However,

Chart 1: Global Aluminum Market



Source: CRU, MEED and NCB Estimates

the recent substantially higher three-month prices for aluminum, which have been above \$2,200 a tonne, signals a modest trade upswing on the horizon. (Chart 3)

Chart 3: LME Aluminum Prices



Source: Reuters

However, this does not ensure that a stable aluminum price exists yet for end users to justify the metal over competing materials. Price stability would be helped by: (1) long-term fixed-price contracts between metal producers and their main customers, (2) adjusted-price contracts which reflect the transient LME spot prices and instead alter inversely against world aluminum stock levels, and (3) market regulations by the industry or governments to promote these measures, such as putting controls on premiums.

### Local Market Determinants

Many factors are driving growth in the Saudi Aluminum sector. Most importantly are the government initiatives to rapidly expand the non-oil economy. Despite the tightening conditions of 2009, the real non-oil GDP grew by 3%, with the private sector in particular expanding by 2.54%. Furthermore, the 2010 national budget includes SR 260 billion for investment projects that ensure sustainable and balanced development, as well as job creation. The Kingdom has recently acknowledged its massive minerals resources, and has set goals to develop its minerals and mining sector to become the third pillar of the economy after hydrocarbons and petrochemicals. Its goals include developing its downstream aluminum sector to add value to industry goods and promote job creation, and begin up streaming aluminum to reduce imports and become a production hub for the metal.

Another determinant fueling the current expansion of the sector is the nation's comparative advantage in low cost energy production. Power forms 27% percent of the total aluminum production cost, and Saudi Arabia has roughly a USD5 advantage in energy cost over the rest of the world—excluding fellow GCC nations. Foreign investors

have taken an interest in the Kingdom due to its reliable and affordable energy supply, which will generate the electricity required for the primary smelting process.

Saudi Arabia is also the only country in the GCC with a proven reserve base of 126 million tonnes of bauxite, with approximately 58% alumina, in Al Zabirah mines. Alumina is the main component of aluminum production, and comprises 43% of production costs. The long-term locally available alumina and raw material supply will bring the sector's upstream production costs below that of its GCC rivals; giving the Kingdom a competitive edge in the world market.

The growth of the Saudi aluminum sector is also dependent on the nation's infrastructure and government regulations. The availability and easy access to ports and railways, allows bulk materials and finished goods to be brought in and out of the country. Meanwhile, Saudi Arabia's accession to the WTO has given foreign operators the opportunity to establish a mining or metals processing presence in a joint venture with a licensed Saudi entity. All newly established joint ventures will be granted national treatment clause, with no discrimination or restriction on repatriation of profit and capital. Furthermore, mineral investors enjoy a 20% reduction in tax liability, down 10% from previous years, to attract a greater degree of foreign direct investment (FDI). One of the benefits of opening the market internationally is that foreign operators bring with them the latest technological developments. This allows local manufacturers to enhance the end quality of their products and cater to different customer needs.

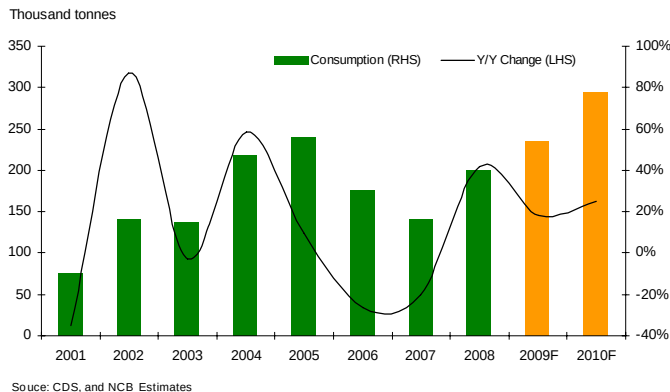
Saudi Arabia's adoption of a New Mining Code provides greater transparency and lower costs, equal treatment of foreign investors and fewer obstacles to the development of new mines and related industries. With this approach in place, the nation is well on its way to becoming a net exporter of aluminum.

### Saudi Aluminum Market

Based on the general assumption that current local production of semi-finished aluminum is zero, the balance between import and export figures are used to determine apparent local consumption. In terms of volume, total market consumption in 2008 was estimated at 199,247 tonnes with an annual growth rate of 42%. This marks a significant increase in demand over the previous year's contraction of 20%. However, in terms of value, the local market is estimated at SAR3.45 billion in 2008, a 19.8% increase over the year's 2007 growth of 18.1%. The 2008 growth of the sector is driven by the expansion of the construction industry in the Kingdom, whose nominal GDP grew by 9.2% Y/Y in 2008.

Chart 4 illustrates an erratic incremental demand volume pattern over the past few years. Such volatility can be partly explained by: (1) the perpetual increase in the cost of imported aluminum, reflected in the 2006-2007 demand value hike from higher prices that moved in opposition to falling volume figure, and (2) the build up of residual inventory from previous years.

Chart 4: Apparent Local Consumption



In 2009, the repercussions of the economic crisis were felt in the construction industry with project delays, cancellations and retenders piling up. Fortunately, the government intervened by dipping into its reserves to invest in key social and economic infrastructure projects, and keep the construction sector afloat. We estimate that the government's involvement would have kept physical aluminum demand from rescinding into negative growth rates. However, we do expect the growth rate to have fallen to a lower 6%, bringing local consumption to 211,202 tonnes. In terms of demand value, we believe that the dramatic drop in worldwide aluminum prices would have shrunk the market demand value by 4.04% to reach SAR3.3 billion.

The sector's imports of all types of aluminum products rose by 14.6% to 428,718 tonnes in 2008, while their value increased by 18.2% to SAR5.51 billion. We anticipate that the volume of imports grew at a significantly slower rate of 0.72% in 2009, reaching 431,805 tonnes, due to the contraction in the Kingdom's non-oil sectors. Real non-oil GDP is estimated to have increased by 3%

Table 1: Saudi Aluminum Imports and Exports

| Year  | Import (tons) | Export (tons) | Import (SR '000) | Export (SR '000) |
|-------|---------------|---------------|------------------|------------------|
| 2001  | 136,166       | 60,446        | 1,135,379        | 400,843          |
| 2002  | 202,228       | 60,623        | 1,603,729        | 439,020          |
| 2003  | 207,501       | 69,924        | 1,697,295        | 527,334          |
| 2004  | 301,549       | 83,135        | 2,567,761        | 711,839          |
| 2005  | 335,290       | 95,429        | 3,238,370        | 897,262          |
| 2006  | 385,270       | 209,032       | 3,695,880        | 1,255,440        |
| 2007  | 374,053       | 233,749       | 4,662,099        | 1,780,713        |
| 2008  | 428,718       | 229,471       | 5,511,903        | 2,060,133        |
| 2009E | 471,590       | 236,478       | 5,236,308        | 1,922,609        |
| 2010F | 546,921       | 253,032       | 5,759,939        | 2,081,733        |

Source: CDS - Ministry of Economy & Planning, NCB Estimates

in 2009, with a 0.32% growth witnessed in the construction sector. These expansions are the driving forces behind the estimated increase in the growth rate of aluminum imports. Import value will drop by 5.18% alongside falling LME aluminum prices and level out at SAR5.24 billion. (Table 1)

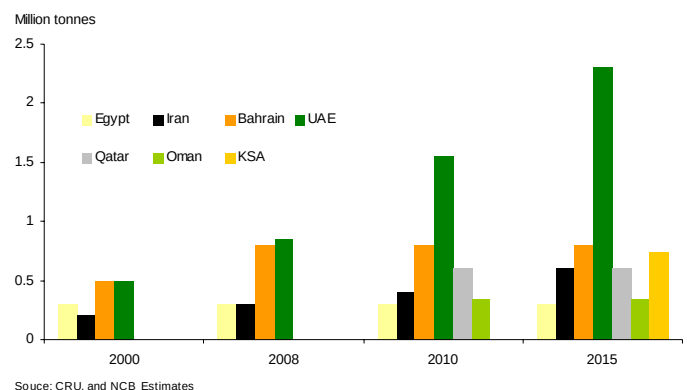
Saudi exports of manufactured aluminum products fell by 1.83% in 2008 to 229,471 tonnes, while export value rose by 15.69%. The collapse in global demand of aluminum related sectors, such as transport and construction, brought about the decline in physical exports, however, the 2008 peak in prices ensured that export value remained high. Global consumption remained low in 2009, and Saudi Arabia focused national infrastructure projects to strengthen its own economy. As such exports are estimated to have fallen by 3.86% Y/Y to reach 220,603 tonnes last year.

### Aluminum Sector Outlook

A comprehensive forecast of the Saudi aluminum sector has two dimensions; (1) an analysis of the trends in the global aluminum market, and (2) the projects in place to develop the downstream and upstream productions in the Kingdom.

Global demand for aluminum is expected to pick up in 2010, growing by 12.8% to 38.7 million tonnes. China will be leading the recovery accounting for 72.7% of the additional 4.4 million tonnes of demand. The Middle East is forecast to recover in 2010 to 2008's demand levels, while North America and Western Europe will take a number of years to reach pre-downturn levels. The awaited strong recovery will be driven by improvements in the electrical, construction and transport sectors of emerging countries.

Chart 5: GCC Primary Aluminum



China, India and the Middle East will also account for around 97% of the 7.9 mntpa global capacity increase anticipated in 2010 and 2011. Although China dominates

the increase in global capacity, its supplies will cater only to its local market. It is not expected to become a net exporter for some time, as it imports the majority of its raw materials and uses outdated technology. Roughly 90% of smelters in China utilize 160kA technology, whereas smelters in the GCC and in the West use 500kA and above. This translates into lesser efficiency in Chinese aluminum production.

GCC aluminum producers in particular are looking forward to a long term and brighter future. Several expansion plants and new smelters of aluminum companies across the region are expected to be completed over the next 5 years. The region is forecast to produce 3.5 million metric tons of primary aluminum by the end of 2010, representing 10% of global production. By 2015, this share will rise to 12.3% with GCC primary production reaching 5.5 million tons. (Chart 5)

LME aluminum prices were highly volatile in 2009, ranging from a high of USD2,500 per tonne to a low of USD1,700 with the core ranging around USD2,100. As the supply-demand balance tightens, the price is expected to rise to USD2,400 in 2010

With both global demand and supply on the rise, we forecast that Saudi imports and exports of aluminum and its products will also increase. In 2010, exports are estimated to expand by 4.04% to reach 229,517 tonnes, valued at SAR2.06 billion. Meanwhile, imports will grow at a higher rate of 7.20% to accommodate the expansion of Saudi's fast pace construction sector. Import volumes will reach 462,895 tonnes valued at SAR5.46 billion.

In Saudi Arabia, the total value invested in primary aluminum production projects is projected at USD19.3 billion. Three announced aluminum smelters will supply roughly 2.44 mntpa of primary aluminum between 2013 and 2016. As the Kingdom moves towards achieving its initiative of economic diversification through the concept of economic zones, two out of the three projects will be developed in an economic city. The proposed projects are (Table 2):

**Ma'aden/Alcoa:** The JV between Ma'aden and Alcoa plans to develop a vertically integrated "mines to mineral" aluminum complex. Ma'aden will own 60% of the JV, and Alcoa will control the remaining 40% through an investment partnership in which it will finance 20% of the project, and its partners the remaining 20%.

The complex includes a bauxite mine in Al Zabirah with a capacity of 4 mntpa, an alumina refinery at Ras Az-Zawr with a capacity of 1.8 mntpa, an aluminum smelter also at Ras Az-Zawr with a capacity of ingot, slab and billet of 740,000 tpa, and a rolling mill with a hot-mill capacity between 250,000 to 460,000 tpa. The mill will be established in Ras Az-Zawr and will focus initially on the production of sheet, tab stock for the manufacture of aluminum cans, and potentially products to serve the construction industry. First production from the aluminum smelter and rolling mill is anticipated in 2013, and while initial production from the mine and refinery is expected in 2014.

This fully integrated system will give Ma'aden a cost advantage over its regional competitors. The company will also benefit from its agreement with the Royal Commission for Jubail and Yanbu to share in the development and usage of the railway from Al Jalamid to Riyadh. This will substantially reduce the projects transportation costs, which accompanied by low-cost, clean power generation and port access will significantly cut production costs. Ma'aden has contracted Saudi Binladen Group to construct the railway from Ras Az-Zawr to the bauxite mine in Al Zabirah.

Capital investment is expected to be approximately USD10.8 billion. Ma'aden will send out financing invitations by end-April 2010 or early-May 2010. The financing is expected to be split between a USD1500 mn commercial debt tranche and an additional commercial loan from the Saudi banks, direct loans from the Export-Import Bank of the United States, the Public Investment Fund and Saudi Industrial Development Fund. The commercial bank loans will have a tenor of 15 years. Alcoa and the partners will each invest USD900 million over a 4 year period.

**Table 2: Announced Aluminum Projects in Saudi Arabia**

| Project Name                                  | Location                    | Budget Value, USD Million | Production Capacity               | Expected Completion date |
|-----------------------------------------------|-----------------------------|---------------------------|-----------------------------------|--------------------------|
| Ma'aden/Alcoa - Az Zabirah Aluminium Project  | Al Zabirah                  | \$200                     | 4 mntpa of Bauxite                | 1Q 2014                  |
|                                               | Raz Az-Zawr                 | \$1,000                   | 1.8 mntpa of Alumina              | 1Q 2014                  |
|                                               | Raz Az-Zawr                 | \$7,000                   | 740,000 tpa of Aluminum           | 1Q 2013                  |
|                                               | Raz Az-Zawr                 | \$2,600                   | 250,000 - 460,000 tpa of hot mill | 1Q 2013                  |
| Emaar/EMAL - Aluminum Smelter                 | King Abdullah Economic City | \$5,000                   | 700,000 tpa of Aluminum           | 1Q 2016                  |
| Sino Saudi Jizan Aluminium - Aluminum Smelter | Jizan Economic City         | \$3,500                   | 1 mntpa of Aluminum               | 2Q 2014                  |
| <b>Total</b>                                  |                             | <b>\$19,300</b>           | <b>2.4 mntpa of Aluminum</b>      |                          |

Source: MEED, and NCB



**Emaar/EMAL:** After successfully executing plans to set up an aluminum smelter in UAE, Emirates Aluminum International (EMAL), the joint venture of Mubadala Development Company and Dubai Aluminum Company (DUBAL), has signed a memorandum of understanding (MoU) with Emaar to build a smelter in King Abdullah Economic City (KAEC). Initially the total capacity of aluminum was targeted at 1.5 mntpa. However, after concerns over fuel allocations, Emaar and Emal have lowered the annual production capacity of the smelter to 700,000 tpa.

The financing for Phase 1 of the aluminum smelter comprises of a USD1.8bn term loan, USD2.6bn equity bridge, and a USD270mn letter of credit underwritten by Emirates Bank. Financing for Phase II which is estimated at USD3 billion will be discussed once the Phase I is complete. The project is valued at USD5 bn is currently in its "Study" phase and is expected to be completed by 1Q 2016.

**Sino Saudi Jizan Aluminum:** The Malaysian Mining Corporation Berhad (MMC) and Saudi Binladin Group (SBG) have signed an MoU with Aluminum Corporation of China Limited (Chalco) to set up a second aluminum smelter at Jizan Economic City (JEC). Chalco is expected to provide the feedstock and technologies. As JEC's joint master developer, MMC will take on the responsibility to build the second power plant which will cater to aluminum smelter as well as the other tenants at JEC.

Total capacity will be 1 mntpa of aluminum; 335,000 tpa will come online in the first phase, and the capacity will then be raised to its max of 1 mntpa in the second and third phase. The projected date of completion is 2Q 2014.

The project could require up to USD4000m of debt, depending on the final debt to equity ratio on the development. Al Khabeer Merchant Finance Corporation has signed a memorandum of understanding with the Jizan Development Company for the financing of projects in Jizan Economic City. Al Khabeer will allocate USD107mn to contractor to target various real estate developments within the city. Financial closure is expected by the end of 2Q 2010.

The three projects mentioned above reflect the adequacy of primary aluminum supply that will be available to accommodate the development of the sector's downstream industry. Although there is little information on the matter, the three developments plan to diversify their downstream production portfolio to include casting, extrusion, forging and rolling. Local manufacturers will benefit from the value added in downstream products, as well as enter new markets in hopes of capturing a

greater market share. To develop the downstream industry producers have taken the first step in establishing vertical integration plants. Now they need to capitalize on their competitive edge in oil and gas, and invest in research and development.

### Conclusion

The global aluminum sector is facing a brighter outlook in 2010. Consumption and production are set to increase by 12.8% and 9.6% respectively, shrinking world surplus by 23.1%. Demand will be driven by emerging countries, however the pace of recovery will depend on how quickly LME traders release the metal. Saudi export and import growth rates slowed in 2009 following the contraction of local and global construction sectors. However, in 2010 we forecast trade figures to rise above 2008 levels in terms of volume, and slightly below in terms of value. This in turn signifies a 25% increase in demand consumption in 2010.

A shift in the global production of primary aluminum is taking place. The U.S. and East Europe are closing smelters, while China, Asia and the Middle East are on their way to becoming net exporters. Saudi Arabia in particular is taking advantage of its bauxite reserves and competitively priced long-term energy price to develop its first upstream developments. The Kingdom's key infrastructure and proximity to demanding international markets will propel its aluminum sector towards success.

Upon completion, three announced aluminum smelters—valued at USD 19.3 bn—will supply roughly 2.44 mntpa of primary aluminum between 2013 to 2016. The developments are vertically integrated complexes that will enable the diversification of the sector's downstream production.



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