**AN ANALYSIS OF OPPORTUNITIES FOR   
TECK METALS IN iNDIA**

by

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Abstract

Teck Resources Limited is one of the world’s leading producers of zinc and operates a refined zinc production facility in Trail, British Columbia. The demand for zinc from Teck’s historical North American customer base has been stagnating for several years. Growth in global zinc consumption is being driven by the world’s developing economies.

The Indian economy is growing at the second fastest rate in the world, behind only China. This project examines the fundamental reasons for this strong growth and forecasts the impact of this growth on the demand for refined zinc in India.

This project examines the attractiveness of India for future business by Teck, including identifiable risks and whether or not Teck’s competitive advantages can be transferrable.

Opportunities for Teck in India are identified and recommendations are made for Teck to begin gaining more experience in India.

Executive Summary

In terms of emerging economies, India is second only to China in terms of annual growth in Gross Domestic Product (GDP). Between 2000 and 2009, the annual growth in real GDP in India was 7.1%. This dramatic growth rate is expected to make India the world’s third largest economy behind the USA and China by 2020. This growth is driven by:

* Mass urbanization – 30% of all Indians live in cities and more continue to move to larger centre
* Mass infrastructure spending – government spending on infrastructure is increasing at 22% compound annual growth rate
* Demographics – India has and large and growing middle class, 50% of whom are between 15-44 years of age
* Foreign Direct Investment – government reforms have resulted in strong FDI inflows in recent years

This economic growth will fuel the demand for zinc which is to be used in galvanizing applications for steel in construction, transportation and infrastructure. Estimates call for India to be the fifth largest market for steel in the world by 2018. India currently accounts for only 4% of global zinc demand, but has the lowest per capita consumption of zinc, even among other developing countries.

Other large mining companies such as BHP Billiton, Anglo American, Rio Tinto and De Beers are already doing business in India. Although India is a distant market to Teck Metals, Teck’s advantages of superior product quality, technical knowledge and support, customizable production ability, cost competitiveness and experience in distribution are readily transferrable to the Indian market. Potential opportunities exist for Teck in India to:

* Supply zinc concentrate in the short term to feed Indian Zinc smelter expansions
* Sell refined zinc metal after 2015 to fill forecast supply shortages
* Engage in exploration in India with possible acquisition of smaller mines and mining leases from private owners
* Participate in Joint Venture agreements and collaboration with existing Indian market participants

Although business in India does present some risks, the risks are known and manageable. Teck Metals should start to gain experience in the Indian market by setting up a local office.

Dedication

To my family for their encouragement and support over the past three years of my studies.

Kelly, Alison and Eva – you are my inspiration.

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# Introduction

This paper will examine opportunities for Teck Resources Limited, specifically the Teck Zinc Business Unit, to pursue business or investment in the emerging economy of India. Based on a strategic analysis, it will also recommend the best options for Teck to benefit from the growing Indian market.

Zinc is the fourth most commonly used metal today, with annual consumption of over eleven million tonnes. From as far back as the 10th century BC, zinc was used to make brass, an alloy with copper, which was used for decoration. In today’s world, zinc is most commonly used, due to its anti-corrosive properties, in galvanizing for the protection of steel. As such, its key end uses are in construction and infrastructure as well as automobiles and transportation. Teck Zinc currently markets a majority of its product to major steel mills in the United States. However, since before the great economic crisis of 2008, galvanized steel consumption in the USA has been stagnant, or even dropping. The global increase in zinc consumption has been driven by the developing nations – particularly China but also, to a lesser extent, India. India currently accounts for 4% of total zinc consumption, but has one of the lowest per capita zinc consumption rates in the world, even among its developing country peer group.

The Indian economy will be examined from a fundamental basis to determine the nature of the potential future growth for zinc. Government and regulatory issues that will affect zinc supply and demand will also be studied. An overall Indian zinc industry analysis will be completed to identify major players and key growth drivers, in addition to current levels of foreign mining company activity in India. Also, key risk elements will be identified that may influence the attractiveness of the Indian market. Finally, Teck Zinc’s competitive advantages will be considered and whether they can be effectively transferred to doing business in India.

# Opportunity – Is India the next China?

In recent years, India has shed its image of a poorly industrialized nation under the exploitation of British colonial rule. Beginning in the 1990s, with the Indian economy in crisis due to a massive balance of payments problem and with foreign reserves at an all time low, significant economic reform was undertaken (Indian Economic Reforms). Liberalization gradually resulted in the deregulating of markets, privatization reduced government control of industry and encouraged private sector involvement, and globalization began to reduce the crippling restriction on foreign direct investments. The Indian economy soon began to make strides towards joining the global market. As a result, the Indian economy began to grow at almost unprecedented rates – major industrial sectors such as steel, cement, aluminium, pharmaceutical and automobiles benefitted by way of restructuring through mergers, joint ventures with foreign partners and mass technological improvement. Much like China before it, India is developing into a world economic power and is forecast to be the world’s third largest economy by 2020. What will this mean for zinc?

According to the McKinsey Quarterly, “China and India are both urbanizing rapidly, but China has embraced and shaped the process, while India is still waking up to its urban realities and opportunities.” (Dobbs & Sankhe, 2010) This rapid increase in urbanization, combined with a steady increase in household incomes will boost demand for zinc in all goods. It is estimated that the number of urban households in India with true discretionary income will increase 600% by 2025, to 89 million households. While China continues to lead the world in terms of economic growth, India is close behind. (Table 1)

|  |  |  |
| --- | --- | --- |
|  | **India** | **China** |
| Urbanization Rate 1950 to 2005 | **29%** | **41%** |
| Urban Population Increase by 2025 | **215M** | **400M** |
| Urban Per Capita GDP Projected Growth Rate (2005 to 2025) | **6%** | **7.3%** |
| Square meters of floor space –every year until 2025 | **700 -900M** | **1,600-1,900M** |
| Kilometres of railways and subways – every year until 2025 | **350-400** | **1,000** |
| Percentage of inhabitants aged 55 or older by 2025 | **16%** | **28%** |
| Urban workers added to work force by 2025 | **170M** | **50M** |

*Table by author*

*Source: McKinsey Quarterly – Comparing Urbanization in China and India*

Table 1 – Urbanization – Is India another China?

“Never before in history have two of the largest nations (in terms of population) urbanized at the same time, and at such a pace.” (Dobbs & Sankhe, 2010) The percentage of Indians who live in urban centres will reach 30% in 2011, with 60 cities having a population of over 1 million people. By contrast, all of Europe has only 35 such cities. By 2025, India’s urban population is expected to be double that of the USA. In order to keep pace with growing demand, India will need to build a new Chicago every year for the next 20 years. As shown in Figure 1, the growing urbanization of India is resulting is higher and higher contributions to Indian national income, expected to reach 65% in 2011.

*Figure by author*

*Source: National Institute of Urban Affairs, UNDP, Ernst & Young Analysis*

Figure 1 – Growing Urbanization of India

With these impressive statistics, how will we expect the demand for zinc to change over the coming decades? Teck already has a presence in the economic superpower of China – Teck operates a corporate office in Beijing and, in 2009, Teck sold a 17% ownership share to China Investment Corporation. Does future investment in India make sense? What steps should Teck take to ensure it can benefit from this forecast growth?

# Indian Economy

## Macroeconomic Determinants

As of 2010, India is the seventh largest economy in the world is terms of total size (GDP US$ 1.43 trillion) (GDP - Report for Selected Countries and Subjects) but is the fourth largest economy in terms of purchasing power parity (PPP GDP US$3.8 trillion). Purchasing power parity (PPP) is a measure of the real cost of living in a given country by establishing a formula comparing what it costs to purchase a certain basket of goods and services in different countries, thus taking into account both the cost of living and the rate of inflation. Growth in PPP index indicates a growth in relative wealth in a country – Indian citizens are getting richer, which will increase demand for all goods, many of which use zinc.

*Figure by author*

*Source: World Bank*

Figure 2 – World Economies in terms of Purchasing Power Parity (PPP)

Although India currently has the lowest GDP per capita in comparison with the USA, EU, Russia, Brazil and China, it is growing at the fastest rate in the world after China. The International Monetary Fund estimated growth rate of 7.5% is supported through recent Government of India (GoI) policies that are aimed at dramatically increasing expenditures on infrastructure through government spending, supplemented by private sector contributions. (Figures 3-5). Government spending on infrastructure has grown at a Compound Annual Growth Rate (CAGR) of 22% since 2007-2008.

*Figure by author*

*Source: International Monetary Fund (IMF)*

Figure 3 – Gross Domestic Product (GDP) per capita (PPP)

*Source: International Monetary Fund (IMF), World Economic Outlook Database, October 2009*

*Figure 4 – Real GDP growth rate (2009-2014)*

*Figure by author*

*Source: Indian Government (www.infrastructure.gov.in)*

Figure 5– Indian Economic Growth helped by Infrastructure Spending

Strong growth in consumption has led to a surge in project announcements (Singh & Singh, 2010):

* The Government of India (GoI) recently raised US$16 billion in revenues through its Telecom 3G auctions
* In a joint-venture with the Airport Authority of India, upgrade and expansion of the Mumbai and Delhi International Airport is nearly complete
* US$ 14 billion investment underway on 5,846 km “Golden Quadrilateral” highway connecting four major centres and 7,300 km “North-South/East-West Corridor”
* Government Mega-Projects such as the “Golden Sea Chain Project” – setting up and modernizing several ports along the coastline in the next 8-10 years as well as the National Marine Development Program, a US$13 billion initiative to modernize India’s 12 major and 180 minor and intermediate ports – 65% of the investment to come from the private sector

The GoI has also put in effect a program called Scheme for Financial Support to Public Private Partnerships (SFSPPP). According to Government documents (Government of India, 2005), the intent of the scheme is to “provide financial support to bridge the viability gap of infrastructure projects undertaken through Public-Private Partnerships.” The GoI has also approved the establishment of a Special Purpose Vehicle (SPV India - Special Purpose Vehicle in India) to fund mega infrastructure projects. The Special Purpose Vehicle will raise long-term funds from domestic and overseas markets and multi-lateral lending agencies giving priority to the SFSPPP projects. Figure 6 shows the increase in infrastructure development in power, roads, urban infrastructure, irrigation, railways, telecommunications, airports, ports and tourism.

*Figure by author*

*Source: CRIS INFAC*

Figure 6 – Increased Infrastructure Development

Morgan Stanley is even predicting that India’s GDP growth will outpace China’s by as early as 2013, “boosted by improving demographics, structural reforms and globalization”. Published on Bloomberg Businessweek, a Morgan Stanley report predicts a long-term sustainable GDP growth rate of 9-10% for India by 2013-2015, while China’s GDP growth will slow to about 8% in 2015. (India GDP Growth to Outpace China’s by 2013-15: Morgan Stanley, 2010)

Compared to its emerging economic peer group, India’s export dependence is low (see Figure 7); its growth is expected to be driven by increasing domestic consumption.

*Source: CEIC; CLSA Asia – Pacific Markets*

Figure 7 – % of exports as part of GDP

## Demographics

India has a large and growing “middle class” – larger than the entire populations of the European Union or the United States. Included is a large pool of educated and qualified professionals - 40,000 English-speaking engineers, 100,000 engineering diploma holders, 40,000 MBAs and 17,000 physicians graduate each year. This growing sector, as well as significant demographic growth in the 15-44 age bracket, will drive significant growth in future consumption in India. Approximately 50% of people in India are in the 15-44 years age group. Of the six emerging markets shown in Figure 8, India has the largest share of young people (less than 15 years old). Unlike China’s “One Child” policy, India has no current policies on population control. The Guardian speculates that India’s population is likely to surpass China’s as the world’s biggest within a few decades. (Rahman, 2004)

Figure by author

Source: Trikona Services Research

Figure 8 – Age Demographics in Developing Economies

## Technological Base

India has developed a strong technological base, already acting as a software hub for many Fortune 1000 corporations. It is already a well-known destination for business process outsourcing and automotive ancillary productions. It has also developed as an R&D hub for consumer durables and electronics. India is graduating over 100,000 engineers every year, compared to 70,000 in the US.

## Deregulation/Foreign Direct Investment

In 1994, the GoI started a process of liberalization in the minerals, metals and mining industry. As a result, private investment (both domestic and foreign) has been permitted for the exploration of thirteen minerals (Singh & Singh, 2010):

Iron ore **Zinc** Tungsten Ore

Copper Sculpture Diamond

Manganese Molybdenum Nickel

Lead Gold Platinum Group Metals

Chromo Ore

Further liberalization of the Foreign Direct Investment (FDI) Policy in January 1997 opened up an “automatic approval” route for investments involving foreign equity up to 50% in mining projects and up to 74% in the services incidental to mining.

In December 1999, the Indian Mines and Minerals Act, 1957 was amended further to make it more investor friendly developing the concepts of a reconnaissance operations permit as a stage of operations distinct from and prior to actual prospecting operations have been started. The Reconnaissance Permit holder gains a preferential right for subsequent granting of a Prospecting License.

In February 2000, the act was amended once again to allow for FDI of up to 100% allowed for both exploration and mining in all mineral areas except diamonds and precious stones, which remained at 74%.

In other industries in India, all foreign ownership restrictions have been removed except in Telecom (74%), Banking (74%), Insurance (26%) and media (26%). FDI is not permitted at all in Defense, Agriculture, Railways and Atomic Energy.

This has resulted in strong growth in FDI inflows to India as shown in Figure 9.

*Figure by author*

*Source: RBI Bulletin, January 2010*

Figure 9 – Strong Growth in FDI Inflows (US$ billions)

India is working to create a modern financial sector in order to allocate capital efficiently. The Bombay Stock Exchange has its roots in the era of British rule in India. The Indian legal system is based on English Common Law. India has developed one of the more robust capital markets is the world (Singh & Singh, 2010):

* Screen based trading
* T+1 settlement
* Securities Regulator framework “best in class” benchmarking
* Third largest investor base in the world

T+1 settlement describes an investment trade life cycle in which a trade is settled or paid for and delivered to the buyer the day after the trade is executed. The major stock markets in the USA operate on a T+3 settlement system. T+3 settlement increases risk – a company could fold, go bankrupt or a major economic crisis could hit the economy between trade date and T+3. T+1 settlement reduces the risk of trade failure. The GoI has made other policy changes to ensure India’s position as the largest democratic market in the world. These changes have included a simplification of the indirect tax structure through rationalization of the existing tax regime and the introduction of a Value Added Tax (VAT). India has also worked to reduce import and export duties (Value Added Tax, 2008). It has developed a Free Trade Agreement with Sri Lanka, resulting in a large influx of copper and copper products at zero import duty from Sri Lanka.

India’s investment environment involves risk that has been rated as moderate by IHS Global Insights (Singh & Singh, 2010).

**Key Investment Environmental Variables**

**Rating on a scale of 1 – 5 (low – high risk)**

|  |  |  |
| --- | --- | --- |
| Risk Factor | **Rating** | **Summary** |
| Political | 2.50  (medium) | * The decisive mandate of the Congress-led United Progressive Alliance (UPA) in the May 2009 general election translates into higher degree of political stability * Also depends on the UPA also being able to push through a variety of reform processes, including reviving economic growth |
| Economic | 2.75  (medium) | * India’s recent economic performance has retained traction, even during sharp economic recession and a drought in 2009 * Investment has been stifled by intrusive market regulation, poor infrastructure, inflexible labour-market practices, and recurring fiscal deficits, which have crowded out private investment * Therefore, reform remains essential to unlocking the economy’s full potential and propagating growth across the whole country, which forms the central platform of the current administration |
| Legal | 2.50  (medium) | * The legal system, which is based on English Common Law, is mature, clear, and there is an accepted process of arbitration * The government appears intent upon improving the clarity and consistency of regulations by introducing reforms in laws and regulations dealing with the organization, management and dissolution of business entities, bankruptcy and labour policy * While the judicial process is considered fair, a large backlog of cases and frequent adjournments often result in considerable delays before a case is closed |
| Overall | 2.73  (medium) | * Politically, the country is largely stable. The security environment is mixed with parts of the country facing significant security threats, often related to leftist (Naxalite) or separatist campaigns in the east and north-east, although the disputed region of Kashmir is the most well-known * In addition to this, the external risk of conflict, most notably with neighbouring Pakistan, constitutes a long-term risk * Operational problems are an issue, particularly with regard to the infrastructure deficiencies and bureaucratic delays. However, the judiciary is regarded as strong and independent of politics * The tax system requires further development and reforms |

*Table by author*

*Source: HIS Global Insights India Intelligence Report*

Table 2 – Indian Investment Risk Variables

An overall risk rating of 2.73 out of 5 rates risk in India as lower than the Global risk level of 2.85, and the Asia Pacific risk level of 2.90.

# The Global Zinc Industry

Zinc is the fourth most widely used metal in the world after steel, aluminium and copper. Galvanizing, or the electro-deposition of a thin layer of zinc on steel to prevent corrosion, represents 50% of the world use of zinc, and this percentage is growing. Zinc end uses such as construction, infrastructure and transport account for 85% of zinc demand (Figure 10). As such, zinc consumption is highly correlated to Industrial Production growth.

Figure 10 – Global Zinc Uses 2008

## Zinc – Geographical Use

Urbanization and industrialization in populous and developing nations drive the demand for zinc. According to data compiled by Global Insight, the per capita consumption of zinc in India is at 0.3 kilograms per annum, very low compared to the world average of 1.6 kilograms per annum (Figure 11).

*Figure by author*

*Source: Global Insight*

Figure 11 – Global Zinc Consumption Intensity

According to data from the International Lead and Zinc Study Group (ILZSG), zinc use in the United States accounted for only 9% of total usage in 2008. The exploding economy in China accounted for 36% of global zinc demand, while emerging India accounted for 4%.

Figure 12 – Global Zinc Demand 2008

Growth in zinc consumption will be led by the developing world – China and India in particular. In the next five years, the developing world will represent 74% of global consumption, up from 60% in 2008. Annual zinc consumption growth in developing countries is anticipated to be 5% in comparison to 1% growth in mature economies. This is due to the slump in the developed world, where automobile production and construction have been flat to falling, especially in the US where there is a glut of houses to be sold before new ones are built. Mature economies do grow but at a lower rate than the developing economies. As developing economies get richer, the dramatically growing numbers of middle class consumers demand more and more. For zinc, in particular, developed economies can afford and often demand higher end, more expensive substitutes. For instance, composite plastic or aluminium can replace steel and zinc in many anti-corrosive applications. However, plastics and aluminium have higher price points – developing economies demand less expensive alternatives.

*Figure by author*

*Source: International Lead Zinc Study Group, Teck Metals Ltd*

Figure 13 – Global Zinc Consumption - Forecast to 2020

## Zinc Supply/Demand Balance

In 2008-2009, due to the poor global economic conditions, refined zinc production was curtailed significantly, with several permanent plant closures such as Dateline in Germany, Balkhash in Kazakhstan, Copse Mica in Romania and Kidd Creek in Canada. Based on a global zinc supply and demand balance, provided by Brook Hunt and Xstrata Zinc, there is sufficient smelting capacity to meet forecasted demand through 2016. However, mine supply of zinc concentrates could be constrained after 2012 as many major mines come to the end of their mine lives. Several probable mine projects could add 3 million tonnes of zinc by 2017 but it is expected that not all will be developed in time. By 2020, a mine production shortfall of over 5 million tonnes may develop. See Figures 14 and 15.

*Figure by author*

*Source: International Lead Zinc Study Group, Teck Metals Ltd*

Figure 14 – Global Zinc Production

*Figure by author*

*Source: International Lead Zinc Study Group, Teck Metals Ltd*

Figure 15 – Global Zinc Gap between mine production and smelter demand

# Indian Zinc Market

Domestic production of zinc in India is currently provided by only two players: Hindustan Zinc Limited (HZL) a Vedanta Group company, and Binani Zinc (BZ) Limited. Hindustan Zinc Ltd is the world’s largest integrated refined zinc producer with the following operations (with annual capacities) (Hindustan Zinc Limited):

1. Charderiya Smelting Complex –525,000 tonnes zinc
2. Zinc Smelter Debari – 88,000 tonnes zinc
3. Zinc Smelter Vizag – 56,000 tonnes zinc
4. Dariba Smelting Complex – Hydro Zinc Smelter – 210,000 tonnes zinc

HZL successfully commissioned the new Dariba Zinc Smelter in March 2010, increasing its annual zinc capacity from 669,000 tonnes t0 879,000 tonnes. HZL is backward integrated – operating four domestic mines with 2010 production of 682,770 tonnes of mined zinc. The Rampura Agucha mine is the world’s largest zinc mine and produces 90% of HZL total production. The mine has a stated life of more than 20 years with almost all the concentrate produced going to HZL smelters. Other mines include the Rajpura Dariba mined (43,000 tpa Zn), Sindesar Khurd Mine (14,000 tpa Zn – but planned to increase to 70,000 tpa), and the Zewar Mining Complex (40,000 tpa Zn). Another mine, Keyar, is planned with a capacity of 32,000 tpa Zn.

HZL continues to be heavily focused on growth of long-term zinc resources and reserves. Their efforts in exploration and development have resulted in an increase of over 100% in total zinc resources and reserves from 2004 to 2010. See Figure 16.

*Figure by author*

*Source: Hindustan Zinc Ltd*

Figure 16 – Hindustan Zinc Ltd Exploration

HZL’s parent company, Vedanta Resources Plc, is aggressively seeking growth internationally, with the acquisition of Anglo American Zinc in May 2010 (Singh & Singh, 2010). With an increase in 343 tonnes per year of zinc capacity, Vedanta has consolidated its position as the world’s largest integrated zinc producer.

BZ has a significant history with Cominco Limited, which ultimately merged with Teck to become Teck Metals Limited. In 1962, Binani Zinc was established through collaboration with Cominco Limited to form Cominco Binani Zinc Limited (CBZ), becoming the first producer of primary zinc in India. CBZ achieved a milestone in 1967 by producing the first high-grade electrolytic zinc in India. Throughout the 1970s and 1980s, CBZ continued to upgrade technology, also becoming the first plant in India to begin production of special high grade (SHG) zinc with 99.995% purity. In 1991, Cominco Limited decided to withdraw from the collaboration and the company was re-christened as Binani Zinc Limited. BZ currently operates one smelter with an annual capacity of 38,000 tonnes. Although BZ has no firm plans for expansion, their 2009-2010 Annual Report states “the company’s vision is to expand the capacity to 100,000 tonnes per annum.” (2009-2010 Annual Report - Binani Zinc Ltd, 2010)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Financial Year | Hindustan Zinc Limited | | Binani Zinc Limited | Total Production | Domestic Consumption | For Export |
| 2009 - 2010 | 578 | 35 | | 613 | 540 | 73 |
| 2010 – 2011 (Est.) | 870 | 36 | | 906 | 600 | 306 |
| 2011 – 2012 (Est.) | 870 | 36 | | 906 | 660 | 246 |
| 2012 – 2013 (Est.) | 870 | 36 | | 906 | 730 | 276 |
| 2013 – 2014 (Est.) | 870 | 36 | | 906 | 800 | 106 |
| 2014 – 2015 (Est.) | 870 | 36 | | 906 | 920 | -14 |

*Table by author*

*Source: Hindustan Zinc Annual Report 2010 and Binani Zinc Limited 2009-2010 Annual Report/Note: Indian Financial Year is April 1 – March 31*

Table 3 – India Domestic Refined Zinc Production (in ‘000 TPA)

India is currently self-reliant in zinc production, and is currently a net exporter of zinc. However, the high increases in domestic consumption forecast (CAGR of 11.28% between 2010 and 2014), with no further zinc capacity expansions yet announced, will result in a deficit in zinc starting in the 2014 fiscal year.

## Temporal Parameters

The Indian market is changing extremely quickly. As such, estimates as to market growth must be taken as just that – estimates. For instance, the presented supply and demand curve for zinc in the Indian market indicates a deficit in domestic zinc production by 2015, resulting in a potential opportunity for Teck Metals zinc sales. However, without better on going, inside information from the Indian market, this opportunity remains in question.

Zinc is a commodity used primarily in anti-corrosion applications. It is not tied to many high-tech applications and so speed of innovation does not pose a particular threat to this market. Zinc is used in large, low-tech applications where its advantages are its long life and low cost. There are no innovations on the horizon to change the use of zinc in these applications. On-going continuous improvement may marginally influence the demand for zinc because of better surface galvanizing techniques, resulting in slightly lower use of zinc per unit area of steel. However, typically this sort of efficiency improvement will open up potential new markets, which will increase the demand for zinc in these applications. Indirect substitutes for zinc, such as composite plastics or aluminium are always a threat. However, both aluminium and plastics have significant disadvantages compared to zinc. Aluminium, while being the most abundant metal in the earth, is extremely energy intensive to extract and refine, resulting in much higher costs. Composite plastics, which will become more and more important in the lightweight, battery operated automobiles of the future, are also expensive to produce compared to steel and suffer from issues around disposal and recyclability. In developing economies, price point is critically important. Aluminium and plastic cannot compete with zinc-coated steel on price.

A concern to Teck will be the current Indian market domination by Hindustan Zinc Limited, which controls 96% of the zinc supplied in India. The entry of Teck into the Indian zinc market is not likely to be regarded favourably by HZL.As a result, there is high probability that HZL may retaliate, perhaps by affecting zinc pricing or potentially by lobbying the Indian government for increased import tariffs. To counter this threat, Teck must carefully consider the timing of entry into the market. Teck has also had success in Joint Ventures (Keevil, 2006) and may consider such an agreement with HZL or perhaps the smaller Binani Zinc Limited.

# Zinc Demand in India – Key Growth Drivers

## Steel Industry in India

A significant portion of zinc demand is ultimately used as a corrosion inhibitor for steel through galvanizing. As shown in Figure 14, galvanized steel production in the USA is stagnant, while overall world production has been steadily rising with the exception of 2008 during the economic crisis.

*Figure by author*

*Source: CRU plotted to 3Q 2009*

Figure 17 – Galvanized Steel Production

The steel industry in India is still in its infancy – demand is still very low, not only by developed-market standards but also based on emerging market comparisons.

*Figure by author*

Source: World Steel Association

Figure 18 – Per Capita Consumption of Steel in Major Countries

According to data available from the World Steel Association (Figure 15), India’s per capita consumption of steel was only 44 kg versus 319 kg for China. The per capita consumption for South Korea is more than twice that of the next highest country, Japan. The reason for this is South Korea’s export oriented economy. South Korea has thrived on producing steel containing goods, including cars, buses, ships and machinery, and exporting to the rest of the world. India, on the other hand, exports very little steel. Growth is driven primarily by increases in domestic use. The WSA predicted that in 2009-2010, India would be the only major world economy to see an increase in steel consumption. (Dutt, 2009)

Plotting the Indian steel industry against other global steel industries on a matrix of industry development potential versus industry size (Figure 16), India is second only to China in development potential. The resulting capacity pressures will ensure that the current high growth scenario will be maintained. Production of Indian steel has been growing steadily over the past five years at an annual CAGR of 6.75%. With current Indian steel production at 56 million tonnes per year, India accounts for a little over 7% of global production. Current growth in domestic steel demand is estimated to be around 10% per year compared to 3-4% globally. The GoI has developed a draft of India’s National Steel Policy that foresees annual production levels of 110 million tonnes by 2020. In comparison, North American and European Steel Industries are large but, with little capacity pressures, are declining. Reform pressures refer to pressures to reform the business – for instance, many smaller US steel makers have closed down or have merged to form larger companies.

Capacity Pressures

**(Large and growing fast)**

**(Future Markets)**

**India**

**China**

**South East Asia**

**Middle East**

Development Potential

**South America**

**(Big but declining)**

**South Korea**

**Japan**

**North America**

**Europe**

*Figure by author*

*Source: World Steel Association, Trikona Services Research*

Reform Pressures

Figure 19 – Steel Industry in India versus the World

Industry Size

With crude steel production at 55 million tonnes per year, India is the fifth highest producer in the world, accounting for approx 7% of total global production. Due to the current low demand, Indian steel exports have been growing steadily. To meet anticipated growth in domestic demand, the GoI’s Steel Policy Draft, calls for annual production levels of 110 million tonnes by the end of 2020, with investments of over US$ 30 billion in steel planned over the next 5 years alone. (Figure 17)

*Figure by author*

*Source: Steel and Natural Resources Strategy Research Estimates*

Figure 20 – India Steel Demand Growth Estimates (in tonnes)

Based on these estimates, India will be the fifth largest market for steel worldwide by 2018. Fifty-eight percent of future steel demand growth is expected to come from industries driven by consumer spending such as automotive, construction, manufacturing, and consumer durables (Figure 18). Continued growth in steel demand will also help to increase demand for galvanization and thus will induce demand for the zinc industry as well.

*Figure by author*

*Source: McKinsey Analysis*

Figure 21 – India Steel Demand Growth by Sector

## Zinc Market in India

The zinc market in India is forecast to grow by over 11% per year over the next five years. The consumption pattern for the domestic Indian market is reported as:

*Figure by author*

*Source: Trikona Services Research*

Figure 22 – Indian Domestic Consumption and Production Segmentation

The key drivers for the growth of zinc consumption in India account for 70% of end usage:

* Transportation/Automobiles – resulting in strong demand for sheet/tube galvanizing, die-casting and batteries
* Construction/Infrastructure

## Transportation/Automobiles

As consumer disposable income increases, the demand for cars will increase as well. The current automobile industry in India is around US$40 billion with growth of 26.4% in the 2009 fiscal year (Singh & Singh, 2010). In 2009, automobile exports totalled 1.8 million vehicles. Completion of new infrastructure projects such as the Golden Quadrilateral, as well as the north-south and east-west corridors, are expected to fuel annual growth of 10-12% in the next five years. Estimates call for 40 million cars owned by 2025, an increase of 150% from 2006. In terms of per capita car ownership, this will still leave India at a very modest 28 cars per thousand population. Global automakers are tying up with Indian component companies on long term supply contracts. Large foreign players have presence in India: Suzuki, Hyundai, Daimler-Chrysler, Fiat, General Motors, Toyota, Volvo, Renault and Honda. As automobile sales increase, so will the demand for sheet galvanization, die-casting and batteries – thus increasing the demand for zinc.

## Construction

Reforms in the Indian real estate industry have had a multiplier effect on the Indian economy through a boost in all types of construction activities. The dramatic increase in urbanization of India has resulted in rapid growth in the housing industry and other built-up infrastructure facilities. Zinc growth will be buoyed by this increase through greater demand for zinc die-cast builder hardware.

The growth rate in the real estate industry in India’s major cities is quoted to be as high as 30% with construction activities, undertaken by both the public and private sectors, accounting for 6% of the GDP (Singh & Singh, 2010).

Residential construction activity makes up approximately two-thirds of total Indian construction activity, in terms of area of construction. Residential construction growth is driven by (Real Estate , 2009):

* Rapid urbanization: urban population expected to exceed 590 million by 2030
* Decreasing household size: increase in number of nuclear families estimated to be over 300 million (middle class population)
* Number of rich households growing at CAGR of 21%
* Increasing working age population
* Increasing income levels: per capita GDP increased by 66% in last 5 years

In terms of segmentations, there are broad categories that include low, medium and high cost housing. The luxury segment is growing annually at 25-30%.

The outlook for the residential real estate market in India is:

* A current shortage over 19 million units, primarily in the low and middle income group
* Residential real estate market is expected to grow at a CAGR of 20% up to 2012
* Increased availability of mortgage financing in urban housing sector

India will need to build 700 to 900 million square metres of new residential and commercial space annually for the next 20 years – the equivalent of a new Chicago every year!

# Complimentary Products

## Iron and Steel

As has previously been demonstrated, steel is the most important complimentary product to zinc demand. Zinc use as an anti-corrosion in iron in steel is unmatched. The growth predicted for the Indian steel industry will be a positive contributor to the demand for zinc in galvanizing applications. Once again, composite plastics and aluminium pose risks of substitution. However, the Indian market is still emerging. Capacity pressures will favour low cost alternatives versus the more sophisticated choices that may gain market share in more developed economies. Until India’s wealth rivals that of the developed western world, steel coated with zinc will remain the lowest cost alternative for anti-corrosion applications.

## Automobile/Transportation

Growth in private automobile ownership in India will continue to be complimentary to zinc demand. In automobile production, zinc is used as a coating to body panels to prevent corrosion. India is well-known as the producer of the world’s lowest cost passenger car, the Nano, with a cost of approximately US$2,000 each. In order to meet this extremely low price point, steel coated with zinc is the only alternative for the body panels, etc. The demand for more cars is not only driven by increasing consumer wealth, but also by the building of new roads – such as the Golden Quadrilateral. The building of this new road infrastructure is also complimentary to zinc demand since zinc is used for coatings on highway guardrails, light posts and traffic signs, and even rebar used for the construction of overpasses.

## Construction/Building

Increasing urbanization requires the building of new homes. India’s mass rate of urbanization over the next 20 years will require the construction of an area the size of Chicago every year. This is complimentary to zinc demand as many plumbing fixtures and other household hardware, such as door handles, use zinc die-cast alloy.

# Cannibalization

Teck Metals currently does not do any business in India. Should Teck enter the market prior to a zinc supply shortage, the cannibalization would be external – removing market share from existing suppliers. This would likely result in retaliation from the existing suppliers, most notably, the powerful Hindustan Zinc. Retaliation will likely by via reduced prices, through cutting of premiums on zinc products. Given Hindustan Zinc’s low cost of production, they will likely be able to be aggressive in price-cutting and be able to maintain the lower prices for a long period of time.

If Teck does enter the market, some form of internal cannibalization could also occur. As previously mentioned, the emerging Indian market desires low cost over sophistication. Teck Zinc is known as a world leader in developing and producing technically superior zinc alloys. The Indian steel market would demand basic aluminium alloy galvanizing grades. Making more of these basic grades would use up zinc production capacity used for more advanced alloys – thereby lowering Teck’s ability to attract price premiums with other customers.

# Sales Origin Analysis

As identified, entering into the Indian market at the incorrect time would be likely to result in retaliation from the existing heavyweight in Indian zinc, Hindustan Zinc Limited. Teck Zinc has a strong presence in the global zinc market, however, not currently in India. The Cominco brand however, may still have some name recognition within India.

Sales of refined zinc into India by Teck Metals will have the disadvantage of high cost of delivery and distribution as Teck’s production facility in Trail is far away from the Indian market. However, even if Teck does not sell refined zinc into the Indian market, the strong growth of zinc demand in India will have a dramatic influence on the world demand for zinc. While other companies such as Hindustan Zinc, Korea Zinc or Nyrstar may have location advantages in servicing the Indian market, Teck will benefit by picking up demand in other south east Asian markets that are already serviced.

# Indirect Substitutes

Threats of indirect substitutes for zinc in the automotive industry are from aluminium, which has taken market share from zinc for use in light-weight, anti-corrosion applications. Aluminium is also becoming more and more common in use in engine blocks. The advantages of aluminium are its light-weight and the fact that it does not rust. However, galvanized steel still holds a majority of the market share due to its lower cost and its strength. Plastics and other composite materials have also taken market share as a substitute in automobile body panels, trim, door handles, etc. Aluminium is has also gained market share in the construction business. Aluminium is common in pipes, tubing, wire, window trim, doors, railings, ladders, shutters, skylights, etc. Staircases are also made from aluminium. Due to its high strength to cost ratio, steel maintains is dominance in the main structural components, especially in commercial buildings. The enormous potential for growth in both the automotive and construction industries in India over the next 20 years will ensure a steady demand for zinc, in-spite of increasing substitution.

# Foreign Mining Company Activity in India

With the increasing liberalization of FDI policy in India, several large, international mining companies have become active in the Indian market (Singh & Singh, 2010):

* The Pohang Iron and Steel Company, or POSCO, located in South Korea is the world’s second largest steel company by market value (Kyoungwha, 2009) and has signed a Memorandum of Understanding for a 12 million tonne per year steel plant at Paradip in the Jagatsinpur district. The estimated investment is $US 12 billion, which would make it the largest FDI in India. The capacity will make it the biggest steel project in India and one of the largest in the world. The project is expected to reach full capacity by 2016 and includes a port with berth size to accommodate cape size vessels and a captive power plant. However, to date, no construction has started as POSCO has been facing some land acquisition issues as a result of protests. The state government is actively involved in mediating and trying to resolve the issues.
* BHP Billiton has established offices in Delhi and Orrisa. BHP is a major supplier of coking coal to the steel industry and also a new supplier of high grade manganese ore in India. In 2002, BHP entered into a strategic alliance with Dwyka Diamonds, out of Australia, for major diamond exploration in India (Singh & Singh, 2010). BHP is also involved in various exploration activities in iron ore and bauxite and is rumoured to be looking to start production in India with a bauxite or alumina mine in Orissa.
* Anglo American has limited operations in India. They are reported actively exploring for base metals in the Proterizoic Aravalli Delhi Ford Belt – the same geological area that hosts three large HZL mines including the largest, Rampura Agucha. Anglo American has an exploration office located in Udaipur, in the State of Rajasthan (Singh & Singh, 2010).
* Rio Tinto is active in India as well and has identified Orissa as a key iron ore region of the world (Walsh, Rio Tinto Iron Ore Financial Community Briefing Frankfurt, 2007). Rio Tinto Orissa Mining Limited Joint Venture provides access to 3 lease areas, Malangtoli, Gandhamardan and Sakradihi, with permission to produce 5 tonnes per year of iron ore for domestic market. Unfortunately, the future of this JV is in doubt as it is currently locked in a legal dispute on contractual issues. Regardless, Rio Tinto is still involved in talks with the State Governments of Chhattisgarh, Madhya Pradesh, Maharahtra, Karnataka, Orissa and Goa to undertake new mining projects on its own.
* De Beers has five exploration companies in India: De Beers India Prospecting, De Beers India Exploration, De Beers India Surveys, De Beers India Minerals and De Beers India Geology. De Beers owns 9,300 hectare of land leases in India (Operating and Financial Review, 2010).

In addition to the companies that are active in reconnaissance and prospecting in India, several other companies are reportedly involved in technology transfer and marketing collaboration (Singh & Singh, 2010):

* There is an alliance formed between HZL and Broken Hill Minerals for exploration in Rajasthan
* There are Memorandum of Understanding (MoUs) between:
  + Sumitomo Metal and Bhushan Steel
  + JFE Steel, Japan and JSW Steel

# Regulatory Procedure for Entry in India

Geologically, India is similar to mineral rich Australia, South Africa and South America, all of which originally formed a continuous landmass known as Gondwanaland. India possesses a rich wealth of mineral resources with a current industry producing 89 different minerals.

The Indian Department of Mines is responsible for the survey and exploration of all minerals (other than natural gas and petroleum), for mining and metallurgy of non-ferrous metals such as aluminium, copper, zinc, lead, gold and nickel, and for the administration of the Mines and Minerals Act of 1957. It has jurisdiction over the Geological Survey of India (GSI) and the Indian Bureau of Mines (IBM). The National Minerals Policy was revised in 1994 to allow for private, foreign investment for the exploration of thirteen minerals, including zinc. It was revised further is 1999 including (Singh & Singh, 2010):

* The concept of reconnaissance operations as a stage of operations distinct from and prior to the actual prospecting operations have started
* The Reconnaissance Permit holder has preferred rights for granting of Prospecting Licenses
* The area restrictions of Reconnaissance Permits, Prospecting Licenses and Mining Licenses apply only state-wise
* Reconnaissance Permits may be granted for 3 years to a maximum area in any state of 10,000 square kilometres
* Prospecting Licenses may be granted for 3 years with a renewal of 2 years for a maximum area of 25 square kilometers
* Mining Licenses may be granted for 20-30 years with renewal blocks of 20 years for a maximum area of 10 square kilometres

The procedures for regulatory clearance and approval have a stipulated timeline of seven months, although, in actual fact, approvals and clearances for fresh leases in India can take   
3-7 years (Singh & Singh, 2010). An applicant in India has to interface with over 10 agencies compared to only 4 for application in Western Australia. The is a high degree of interdependence among the various approving agencies – for instance, the State Forest Department cannot give forest clearance unless district administration allocates alternative land for forestation. There is also no single repository of all records pertaining to mining blocks.

Further reforms to the Minerals Act are currently being considered via the Mines and Minerals (Development and Regulation) Bill 2010. The objective of the new bull is to ensure that the interest of the state governments is protected and simultaneously propelling metals and mining as the key growth drivers of the Indian economy by removing the bottlenecks which have hindered foreign investment.

To help to overcome the bureaucracy involved in applying for licenses in India, and considering that Teck currently has no significant contacts or partners in this market, consideration should be given to entry into the market through a Joint Venture. In spite of the GoI’s desire to make foreign direct investment simpler and less regulated, cooperation with a local partner would help smooth the legal and political issues around entry.

# Attractiveness of Investment in India –Distance Considerations

According to Pankaj Ghemawat, “Companies routinely exaggerate the attractiveness of foreign markets, and that can lead to expensive mistakes.” (Ghemawat, Sept 2001) Ghemawat argues that a company considering expansion into a foreign market must look beyond sales potential, expressed as national wealth (GDP) or buoyant forecasts of increasing demand. He suggests that an analysis of the impact of distance from the home country to the foreign market is critical to success. More than just geographic distance, he advocates consideration of three other dimensions: cultural distance, administrative and political distance and economic distance.

## Cultural Distance

### Language

The 8th schedule to the Indian Constitution lists 22 official languages in India – virtually each of the 28 states that make up India have their own official language. For the country as a whole, Hindi and English are both identified as official languages. English is the result of the fact that India was ruled under the British Crown until August 15, 1947 when it gained its independence. English is the language of business in India and is commonly spoken by most university-educated people. Language therefore will not be an issue for Teck in a business relationship with India.

### Religion

By far the most common religion in India is Hinduism – over 81% of the population are Hindus. Only 2.3% of the population is identified as Christian (India - Language, Culture, Customs and Etiquette). However, this is not seen as a significant barrier to business so long as religious differences are respected.

### Social Norms/Beliefs

Indians put great value in respecting established hierarchical relationship. This is due to the strong influence of the Hindu religion and the strong belief in the caste system. All relationships, including those in business, have a clear-cut hierarchy that must be maintained. Indians greatly value the role of the family – in general, they identify themselves more with the group they are from than as individuals. This also results in very high levels of trust afforded to family or close business relationships. Indians are therefore reluctant to do business without having established a long-standing relationship. Indians are non-confrontational and are known to have a hard time saying “no”, either verbally or non-verbally. This is based on the strong desire to please and not to disappoint – Indians are known to give the answer they think you want to hear. This is starting to change with increased western influence on business practices. Decisions are always made by the most senior persons. Therefore, decision-making is a slow process and delays are to be expected. In negotiations, a loss of temper will also result in a loss of trust of the Indian negotiators. Indian’s also expect concessions on both price and terms – but it is considered acceptable to expect concessions in return for those granted. In general, the word of a trust relationship is sufficient to seal and deal.

### Administrative or Political

Canada shares a link with India in that both countries are members of the British Commonwealth and both countries were once under British rule. Relationships between the two countries are considered cordial. Both countries are free enterprise, democratic economies. Both countries have constitutions that provide government checks and balances. The legal systems in both countries are based on English common law. Although there is considerably more frequent political change on going in India, there seems to be an over-riding consensus on economic reform, including the liberalization of FDI. There is considerably higher political risk in India currently, primarily due to its hostile relationship with neighbouring Pakistan. Transparency Internationals (Corruption Perceptions Index 2010) 2010 Corruption Index ranked India as 87th out of 178 countries, tied with Albania, Jamaica and Liberia. China was tied with Peru and Columbia at 78th while Mexico ranked 98th. Canada ranked sixth while the United States ranked 22nd.

## Geographic Distance

Canada and India are far away from each other, although both have excellent access by sea. The countries have significantly different climates – India being much warmer than Canada’s. India does not have the internal transportation or communication infrastructure of Canada. However, several large Indian government mega-projects are aimed at improving transportation corridors in India. Communications is also growing at a high pace, particularly wireless communications. This distance should not negatively affect a positive business relationship. However, the distance does pose real challenges, especially with respect to supply of product into the Indian market. Distribution and freight costs can be restrictive to business.

## Economic Distance

There is an enormous difference in the wealth of Canada and India. In term of GDP per capita, the IMF ranked Canada as 11th in the world in 2010 at US$39,033 while India ranked 127th at US$3,290. There are more than 400 million people in India below the poverty line. However, as an emerging economy, India does rank strongly in terms of information and knowledge producing a very large pool of qualified professionals each year from its many universities (Farrell & Lund, 2006) state that India had a more balanced financial system than China, featuring a modest-sized banking sector, a large and growing capital market, and a sizeable government bond market. India’s capital market has over 9,000 listed companies and 23 domestic stock exchanges, including the Bombay Stock Exchange, recently reported as the world’s best performing (20 facts you must know about India's growth, 2010).

# Sustainability and EH&S Considerations

In 2009, Teck Resources Limited was placed on the Dow Jones Sustainability North American Index – ranking it among the top 20 percent of North American resources industries in terms of sustainability practices (Lasley, 2010). In September 2010, Teck earned a promotion to the Dow Jones Sustainability World Index (DJSWI) – placing it in the top 10% of its peers in the global industry.

Placement on the DJSWI is based on outstanding performance on sustainability in fives key areas:

* Safety
* Environment
* Community Engagement and Development
* Values for it Stakeholders
* Responsible Stewardship of its products in society

These areas are identified as core principles for Teck Resources Ltd and Teck Zinc. Will doing business in India allow Teck to maintain these principles?

The rapid urbanization and industrialization of India have contributed to significant environment issues such as forest and agricultural land depletion, resource depletion (including water), loss of bio-diversity and livelihood security for the poor. Indian cities are polluted by increased vehicle presence and by industrial emissions. In India, old, inefficient engines burn diesel containing 150-190 times as much sulphur as European diesel (Environmental Issues in India). India has no effective plans for future land utilization or solid waste disposal. Recycling has only recently entered the Indian lexicon.

On the website for Indian zinc giant, Hindustan Zinc Limited, references are made towards targets and improvements made in sustainability through specific goals related to safety and the environment as well as Corporate Responsibility (Hindustan Zinc Limited). HZL claims significant reductions in the number of employees injured at work over the past four years through programs designed to build safety culture including intensive training and auditing via external consultants. In environment, water conservations programs have been successful in reducing specific water consumption by 41% in since 2006. Commitment to mitigating the effect of climate change is referenced, though not firm plans are outlined. Solid waste management planning is not well developed.

Governmental regulation on the environment is made through a disorganized plethora of Indian agencies.

Other members of the DJSWI have started doing business in India. BHP Billiton is an example of one such company. Teck’s entry into the India economy can meet the stated sustainability goals through appropriate planning, leadership and stewardship. Prior to exporting zinc to a new customer, Teck’s Product Stewardship Committee must review the potential buyer and ensure that buyers meets with Teck stated requirements for sustainability including solid waste management planning. For exploration and/or business inside India, Teck Resources and their reputation could provide leadership and guidance in sustainable practices for the Indian Government and Indian industry.

# Teck Resources Limited

Teck Resources Limited is Canada’s largest diversified resource company. It is the result of a merger between two Canadian mining giants – Cominco and Teck Corporation.

At its metallurgical facility in Trail, British Columbia, Cominco has been producing electrolytic lead since 1902 and electrolytic zinc since 1906. Originally known as the Consolidated Mining and Smelting Company of Canada, CM&S was purchased by the Canadian Pacific Railway, primarily to gain control of the railway lines associated with the smelter. CM&S became an industry leader in the production of lead and zinc, including the invention of differential flotation to separate the two associated elements, at its Sullivan Mine in Kimberly, British Columbia. In 1962, initial investments in global industry took place through the establishment of Cominco Binani Zinc Ltd in India. In 1966, the company’s name was changed to Cominco and further international investments took place in Cominco American Limited and Cominco Australian Pty Ltd. Other international explorations and operations included a 47% interest in Exploracion Minera International S.A in Spain. Cominco divested itself of these non-core assets during the recession of the 1980s.

Teck began as Teck-Hughes Gold Mine Limited in 1913, developing gold mines in Ontario. The Teck-Hughes mine operated until 1965. Teck also purchased other gold mines, such as the Beaverdell mine, which produced until 1991.

The association between Cominco and Teck started in 1986 when Teck purchased a shareholding from the CPR. That initial share purchase ultimately resulted in the merger of the two companies in 2001, as Teck Cominco Limited. In 2008, the corporation became known as Teck Resources Limited, simply called Teck (Teck Corporation Company History).

Today, Teck has a global presence, with a workforce of over 8,000 employees, and is divided into four major business units (Committed to the Core - Teck Resouces Ltd Annual Report, 2010).

## Teck Copper

Teck produced 313,000 tonnes of copper in 2010 in five active copper operations: Highland Valley Copper and Duck Pond in North America, and Antamina, Quebrada Blanca and Carmen de Andacollo in South America. Three further sites are in various stages of development: Galore Creek in Canada, Quebrada Blanca Phase 2 in Peru, and Relincho in Chile. Teck Copper accounted for 33% of Teck’s operating profit in 2010.

## Teck Coal

Teck Coal produced 23.1 million tonnes of metallurgical coal in 2010, an increase of 22% from 2009. Teck is the world’s second seaborne exporter of steelmaking coal, with an average of 25 years proven reserves in its six operating mines: Coal Mountain, Elkview, Fording River, Line Creek and Greenhills in British Columbia’s East Kootenay region and Cardinal River in Western Alberta. Teck Coal accounted for 49% of Teck’s operating profit in 2010.

## Teck Energy

Teck holds a 20% interest the Fort Hills oil sands projects, partnered with Suncor energy, the project operator, and Total E&P Canada. In addition, Teck holds 50% interest in developing oil sand projects – Frontier and Equinox. All three properties are located in the Athabasca region of northern Alberta.

## Teck Zinc

Teck is one of the world’s largest producers of zinc, producing 645,000 tonnes of zinc in concentrate and 280,000 tonnes of refined zinc in 2010. Teck is a large, low cost producer of zinc with mining operations with 4 major sites: Red Dog Mine, in northern Alaska, one of the world’s largest zinc mines, Antamina in Peru, Pend Oreille mine in Washington State, currently not operating and under care and maintenance, and Trail Metallurgical Operations, in Trail, British Columbia. The operation in Trail is one of the world’s largest fully integrated zinc and lead production facilities. Teck Zinc accounted for 18% of Teck’s operating profit in 2010.

Teck stated strategy for zinc is not to expand production, but to work at growing worldwide demand. Addressing zinc deficiency in developing and third world countries is one of these strategies.

## Zinc as Micro-nutrient

Teck has become heavily involved in the “Zinc Saves Kids” initiative run by the International Zinc Association (IZL). Teck Resources Limited CEO Donald Lindsay, in his role as Chair of the IZA, is championing the world-wide initiative to end zinc deficiency, especially in kids (IZA joins forces with UNICEF to reduce zinc deficiency in children, 2010). According to the “Zinc Save Kids” website, “Zinc is an essential micronutrient for human health. It is vital for activating growth and physical and neurological development in infants, children and teenagers. Zinc is found in all parts of the body. It is a component in more than 300 enzymes and influences hormones. Zinc also accelerates cell division and enhances the immune system. Zinc is vital in protecting the body from illnesses and fighting infections. It can reduce the duration and severity of a common cold, and halt diarrhea. Two billion people worldwide are not getting enough zinc through their diet. Zinc deficiency is a major health problem in developing countries. Young children are most impacted. Zinc deficiency weakens their immune system and leaves them vulnerable to infectious diseases such as diarrhea, pneumonia and malaria which claim millions of lives of children under the age of five every year. Zinc deficiency also accounts for physical and intellectual retardation and stunting, preventing children from developing to their full potential.

UNICEF estimates that diarrhea accounts for nearly 2 million deaths among children under the age of five every year. The children become dehydrated, losing all body fluids and nutrients. Diarrhea is a preventable and treatable disease, but in developing countries, only 35% of children with diarrhea receive the recommended treatment consisting of oral rehydration salts and zinc supplements.

Zinc supplements rank high on the list of child survival interventions. Zinc is particularly effective in treating diarrhea and shows good results in supporting the treatment of pneumonia.

In 2008, a group of internationally acclaimed economists, including five Nobel Laureates, concluded that combating the world’s malnutrition problem through the provision of vitamin A and zinc ranked high among the various cost-effective solutions to the world’s pressing problems. They calculated that for every dollar invested in zinc supplements, there would be a return of US$ 17.

# Teck’s Competitive Advantage

What is Teck Metal’s competitive advantage with respect to other zinc producing companies? Referencing Meredith’s Supplier Performance Evaluation Table (Meredith, 2006), Teck competitive advantage can be linked to: Superior Product Quality relative to most competitors, excellent support to customers, customizable production ability at Trail, lowest decile of conversion cost among competitors, and experience and well developed distribution routes in Asian markets.

## Product Quality

Teck Metals produces very high quality zinc concentrates from the zinc mining operations – high zinc content and low impurities make it desirable for global zinc refiners. Teck Metals refined zinc is ISO 9001 certified and is regarded among the highest quality SHG product is the world. This fact provides some differentiation of commodity zinc is the eyes of our customers. This provides some measure of competitive advantage for Teck.

## Services Support/Technical Knowledge

More than 77% of Teck refined zinc sales in 2009 went into Galvanizing Applications.

*Figure by author*

*Source: Teck Sales Data, 2009*

Figure 23 – Teck 2009 Zinc Sales by First Use

To support the major part of the business, Teck operates a Product Technology Centre (PTC) in Mississauga, Ontario to provide technical support to our galvanizing customers, particularly in technology related to continuous galvanizing. PTC has developed and markets continuous aluminium sensing technology for these customers. This is a large source of competitive advantage for Teck Metals. Teck is a world leader in zinc production technology. This could be desirable to Indian steel producers – potential access to Teck technology through the purchase of refined zinc product or perhaps entry into a joint venture or other agreement for technology transfer.

## Customized Production Ability

Trail Operations zinc refinery offers three main product shapes and over 30 different alloys to customers, including alloys of aluminium, lead, cadmium and manganese. Teck’s proprietary alloying technology allows for quick changes between different alloying grades, resulting in significant cost savings.

Many Asian zinc producers supply unique shapes, such as the two tonne jumbo and the one tonne “slim jim” jumbo, in order to differentiate themselves from western suppliers. However, more and more larger Asian including Indian steel makers are moving towards a standardized ASTM specified one tonne jumbo produced by Teck. While some smaller steel makers still request unique shapes and sizes, Teck has decided not to entertain these requests, as the volume and competition do not justify the investment needed to retool the lines.

Teck Trail Operations has also been a leader in development of new alloys. Recent development has been a “thin-wall die cast” alloy for use in delicate giftware due to its weight and finishing properties. The next emerging alloy is ZAM alloy (containing zinc, 6% aluminium and 3% magnesium) for specialty galvanizing in steel mills. The corrosion resistance of ZAM is 10-20 times that of normal galvanized steel but its adoption rate thus far has been slow and has been primarily in Japan.

## Cost

As a commodity, the price of zinc is set by a terminal market, in this case, the London Metals Exchange (LME). Teck competes strongly on the basis of cost – Trail is reported in the Brook Hunt Report as the seventh lowest cost producer of zinc in the world. Due to the variety of shapes Trail offers, there would be little if any switching costs for a new customer to move to Teck zinc.

## Distribution

Teck already actively services the Asian market, representing 19% of 2009 production.

*Figure by author*

*Source: Internal Teck Sales Information, 2009*

Figure 24 – Teck Zinc Sales by Customer Region (2009)

Teck has already developed effective shipping and distribution routes, including warehousing facilities in Asia. Teck maintains excellent delivery reliability with well-regarded conflict resolution. Teck has quoted into India for refined zinc sales in the past – however, the high cost of freight to move material into India has contributed to the inability to get business there. As the Indian economy continues to develop, and Indian becomes a greater exporter, the increase in vessel movements to India will lower the cost to move product there – making Teck zinc more competitive. This must continue to be monitored.

# Transferability of Teck’s Competitive Advantage

Teck Zinc has established itself as a world leader in zinc production and technology. However, as Hu (Hu, 1995) points out, competitive advantages and success for a company at home, does not always assure commensurate success abroad. When considering Teck’s expansion into India, there are many ways in which this may be accomplished (Gadajlovic, 2010):

|  |  |  |
| --- | --- | --- |
| **Mode of Entry** | **Advantage** | **Disadvantage** |
| 1. Exporting | Ability to realize global scale economies | High transportation cost/Potential tariff barriers/Problems with local marketing |
| 1. Joint Ventures | Access to partner’s knowledge  Sharing development costs and risks | Difficulties achieving global strategic coordination  Lack of control over technology/Political acceptability? |
| 1. Wholly owned subsidiary | Protection of technology | Assumption of all development costs and risk/Establishment of tight control necessary for achieving global strategic coordination |

Table 4 – Options of Entry into the Indian Market

Of these, establishing a wholly owned Indian subsidiary requires the highest commitment and has the highest risks. Better options early on would be to establish the Teck brand by means of exporting both zinc concentrates and refined zinc metal to make up for forecast supply shortfalls within the next 5 years. The potential for a Joint Venture may also be appealing.

Teaming up with a domestic Indian company could help in several ways (Gadajlovic, 2010):

* Government relations
  + JVs can help smooth potential government protection policies
* Access to Raw Materials
  + JVs may be a means of gaining access to raw materials
* Local Market Information
  + JVs may be a means to gain much needed local market information

In considering the transferability of Teck’s competitive advantage, the different methods of entry offer different potential for success.

|  |  |  |
| --- | --- | --- |
|  | **May be Transferable** | **May be Non- Transferable** |
| 1. Quality | Export – although would not have brand recognition  JV – would require sharing of technology | Subsidiary – depending on raw materials availability and skills of local workforce |
| 1. Service Support | Export , JV and subsidiary – distance may be a factor |  |
| 1. Customizable Production | Export – as per current operation | JV and Subsidiary – depending on transfer of proprietary technology |
| 1. Cost leadership | JV and Subsidiary – take advantage of low cost of labour | Export – high cost of transportation |
| 1. Distribution | Export – take advantage of current routes to Asia/may require new warehouses | JV and Subsidiary – would require development of new distribution routes |
| 1. Tacit Knowledge | Export – as per current operation | JV and Subsidiary – difficult to transfer tacit knowledge of management |

Table 5 – Transferability of Teck’s Competitive Advantage

# Potential Opportunities for Teck in India

India is a strong and emerging economy. India’s economic picture, in terms of material consumption, population and demographics, is similar to that of China 15 years ago. Given the strong economic fundamentals of the Indian zinc market, several business and investment opportunities are present for Teck Zinc in India:

* Supply of zinc concentrate (in the short term) to feed zinc smelter expansions of Hindustan Zinc Ltd (HZL)
* Sale of refined zinc (in the long-term) to fill forecast demand shortages in 2015 onwards
* Apply for reconnaissance permits for exploration and mining of zinc, copper, and lead in various states of India (100% FDI permitted). Several other international mining companies such as BHP Billiton, Rio Tinto, Anglo American and De Beers are already doing so
* Possible acquisition of mines/mining leases from small private sector owners in different states of India
* Possible JV and marketing collaboration with HZL which may extend in the form of equity participation in future Greenfield projects in India. Examples of JV already exist between Indian and Foreign companies

# Risks – What can go wrong?

Despite the compelling economic growth forecasts, business and investment in India is not without risks. These risks must be evaluated fully when considering business opportunities:

1. Huge pressure on resources in India combined with fast changing environmental and political issues around energy, green-house gases and climate change
2. Political issues – although India is a democracy with free elections, there are several marginal sections and a recently formed left wing radical Maoist Party aims to overthrow the Indian State by 2050 (Maoists want to overthrow Indian state by 2050: Pillai, 2010). India is also listed as 87th out of 178 countries on the Perceived Corruption Index
3. Poverty – although India has a growing middle class, more than 400 million people remain below the poverty line
4. Supply side constraint for raw materials for the domestic industry (although they could also be an opportunity)
5. Issues around solid waste disposal and land utilization. There is no plan for promoting recycling. Management of environmental concerns is dealt through a heavily bureaucratic plethora of agencies
6. Fiscal and Tariff policies – although liberalization of government regulation is underway, there is an absence of a long-term fiscal and tariff policy

# Summary

India has a large resilient economy that continues to grow at dramatic rates. While currently the seventh largest economy in the world, India is forecast to be third behind the USA and China by 2020. Many economists are forecasting India’s annual GDP growth to pass that of China’s by 2015. The rapid current and future growth is supported by:

* Mass urbanization
  + Percentage of Indians who live in cities will be 30% in 2011
  + By 2025, India’s urban population will be double that of the USA
* Mass Infrastructure spending
  + Government spending increasing at 22% compound annual growth rate (CAGR)
* Demographics
  + Large and growing middle class with increasing consumer consumption
  + Large pool of educated and qualified professionals – 350,000 engineering students enrolled per year
  + 50% of Indian population is in 15-44 age bracket
* Foreign Direct Investment
  + 100% FDI allowed for most industries
  + Strong FDI inflows in recent years

This growth will result in large, sustainable increases in zinc demand in India through growth in steel production and galvanizing for infrastructure, construction and transportation. India is currently self-sufficient for zinc supply but this is expected to end around 2015. Teck should consider entry into the market once there is a supply shortage. The best potential future market for Teck would be to focus on galvanizing for steel involved in infrastructure and transportation. These markets require lower tech continuous galvanizing grade alloys that are less costly to produce. To avoid costs associated with re-tooling, the marketing focus should be on one tonne zinc jumbos shape. This market also is the least risky to Teck. Low up-front costs to enter means it is easy to get out of at any time.

The Indian market is not without risks. However, these are known and are manageable. Moreover, many other large multi-national mining companies have already entered the Indian market.

# Recommendations

The high growth rate of zinc usage that is forecast for the Indian market will be a benefit to Teck Metals, regardless of whether Teck enters the Indian market directly. Although India is currently self-sufficient in zinc, this is expected to end in the next 5-7 years. India’s resulting demand for zinc will have to be supplied somehow. If not by Teck, then it is likely to be by one of Teck’s competitors located closer to the Asian market, such as Korea Zinc or Nystrar Zinc. Without significant capacity increases from these competitors, Teck will benefit due to greater demand in the Asian markets that it already services such as Japan, China and Taiwan. Regardless, the Indian market will become more and more important in the coming decade. To be best prepared, it is recommended that Teck:

1. Start to gain experience in the Indian market. Without a local presence, reliable market information is difficult to gain. Teck should gain a local presence by opening a local Indian exploration and sales office as has been done in China, or, at the very least, hiring the use of a local Indian agent as local representation. The local office could:
   1. Assess potential and opportunities for exploration in India
   2. Test the market for additional sales of key commodities such as copper and metallurgical coal
   3. Closely monitor and report regularly on market changes – assess potential for future refined zinc sales and zinc concentrate sales. Teck should continue to periodically bid on refined zinc business in India in order to maintain a presence in the market.
   4. Develop networks and relationships within the Indian market. Assess potential JV opportunities

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