ILZSG Insight

ILZSG SECRETARIAT BRIEFING PAPER January 2022 – No.50

A Discussion of Likely Future Trends in China's Economic Development and Implications for the Lead and Zinc Industry

Introduction

China is currently the second largest economy globally in nominal terms and is the largest in terms of purchasing power parity (PPP). Commensurate with its economic stature, China currently uses more than 40% of the world´s lead and zinc metal. China´s dominant role in the lead and zinc markets could bode either well or ill for the world lead and zinc industries. Continuous growth in the Chinese domestic market, a strong post-pandemic export market recovery, effective investment stimulus packages and the successful implementation of its various economic strategies and initiatives should sustain China's appetite for commodities and help it maintain its leading role in the world commodities market. However, sluggish domestic consumption, a deterioration in external markets triggered by the fallout from the pandemic, worsening trade disputes, subdued investment due to low returns and existential geopolitical hurdles hampering globalization may negatively impact commodity demand in the country.

In order to help understand the logic that resulted in China´s dominant role in commodity demand, and clarify the relationship between China´s likely economic development and trends in domestic lead and zinc usage, the secretariat proposed at the Group's meetings in April 2021 to prepare a paper that summarizes China´s economic development and its complex industrial policies, ambitious global initiatives, long-discussed strategic structural transformations and then discuss their relevance to the Chinese lead and zinc market.

This paper reviews China´s economic development over the past 40 years and explores the logic behind China´s colossal appetite for commodities. It also taps into China´s main economic strategies and initiatives including the 14th Five-Year Plan, Made in China 2025, the Belt and Road Initiative, the Dual Circulation Development Route, and Carbon Peak and Carbon Neutrality Targets. The implications of the above-mentioned strategies, initiatives and policies on the lead and zinc industries is observed through the lens of their impact on the key usage sectors of lead and zinc including construction, transportation, infrastructure and manufacturing.

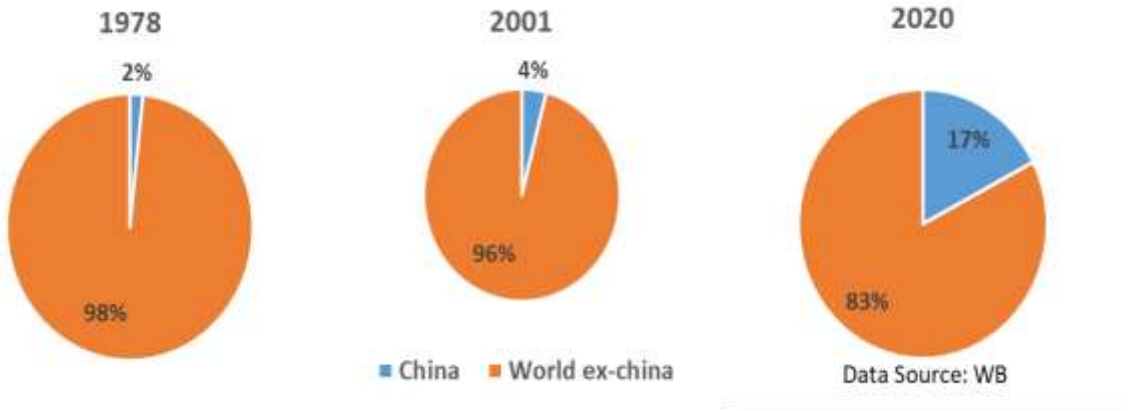
Comments or Questions

Please contact Jianbin Meng, Director of Economics and Environment at the ILZSG Secretariat. Email: jianbin_meng@ilzsg.org or telephone +351 21 359 2423.

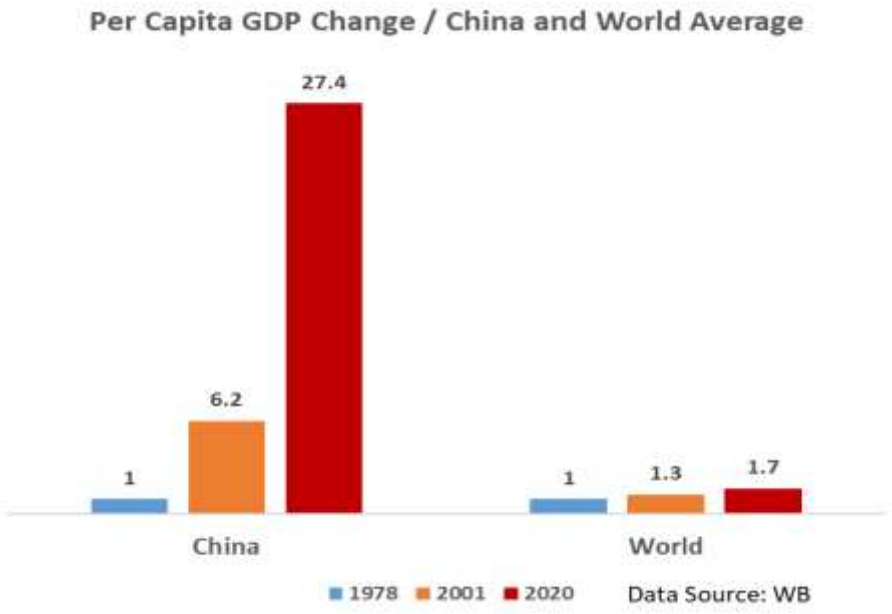
The logic behind China´s growing demand for commodities

GDP Growth

China´s emergence as a world economic power started in 1978 when it opened its door to the outside world marked by the abandonment of the centrally controlled and planned economic development model and the adoption of opening-up and reform policies. China´s integration into the world economic system reached its zenith after its access into the World Trade Organization in 2001. These two milestone events laid a solid foundation for China´s economic magnitude today as the world's second largest economy in nominal terms and the largest economy in real terms. Gross Domestic Product (GDP) in China reached US$14.723 trillion in 2020, which was almost 98.5 times and 11 times of that in 1978 and 2001 respectively. In contrast, the world economy in 2020 measured by GDP in nominal terms grew by 9.8 times and 2.5 times from that in 1978 and 2001. China´s share of the world economy increased to 17% in 2020 from that of 4% and 2% in 2001 and 1978 respectively.



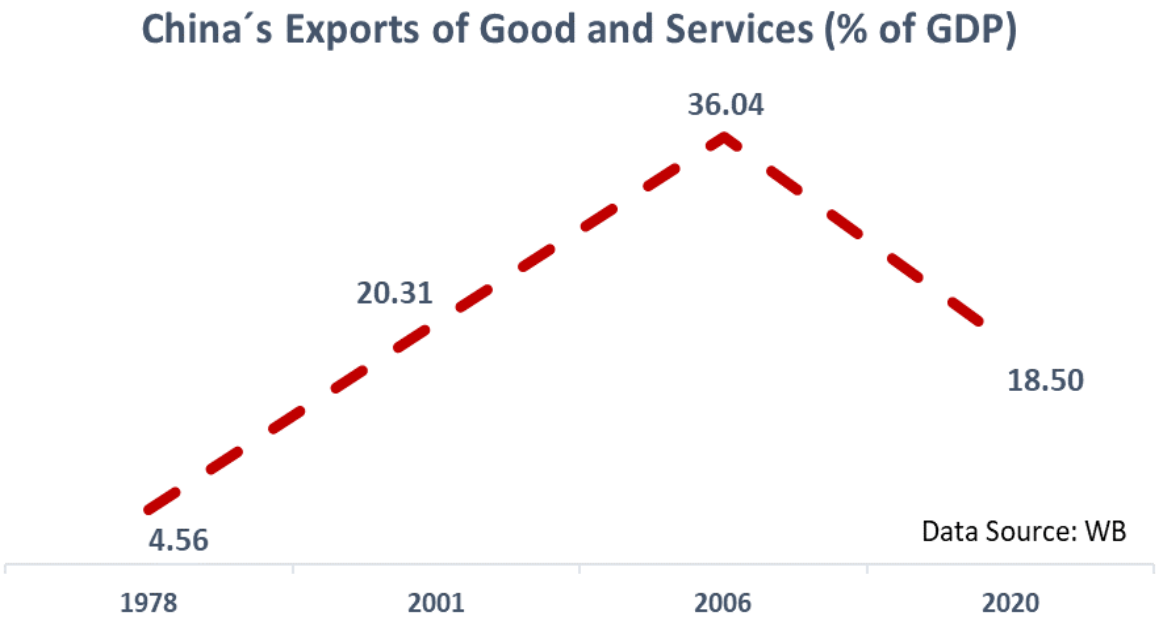
In 1978, China´s per capita GDP measured in constant 2010 US$ was US$307.093 which was only 5.01% of the then world average measured using the same parameters. After 20 years or so of opening-up and reform, its per capita GDP reached US$1901.362 or 23.1% of the 2001 world average. The growth of China´s per capita GDP accelerated after it joined the WTO in 2001. Data released by the World Bank show that the same figure for 2020 was US$8405.18 equivalent to 79.6% of the world average. China's GDP is currently 27 times higher than it was 40 years ago.



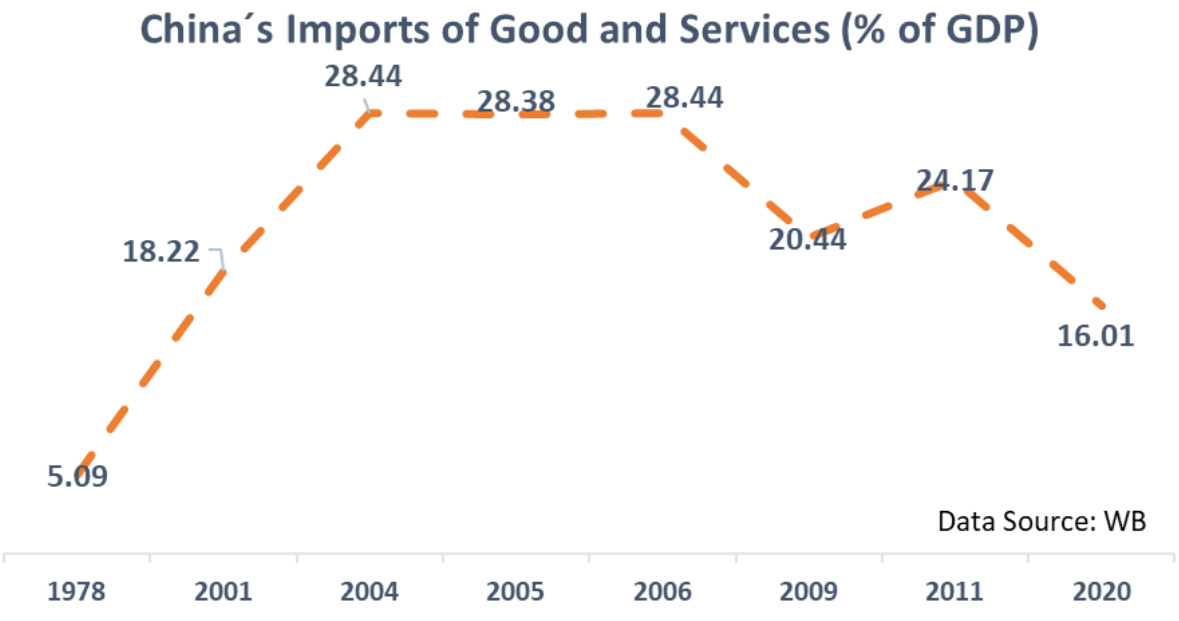
This impressive development has been driven by the three wagons of trade, investment and consumption.

Imports and Exports

According to the World Bank, China´s export sales reached US$2.723 trillion in 2020, accounting for 12% of the world total export sales. The same figures were 3.5% and 0.45% in 2001 and 1978 respectively. The ex-China market has provided strong support for China´s economic growth despite the fact that its share of the GDP has been decreasing following a peak in 2006. The gradual shrinkage of export sales´ share of Chinese GDP can be attributed to the rise of emerging markets, increasing labor costs in China and China´s efforts to adjust its economic structure.

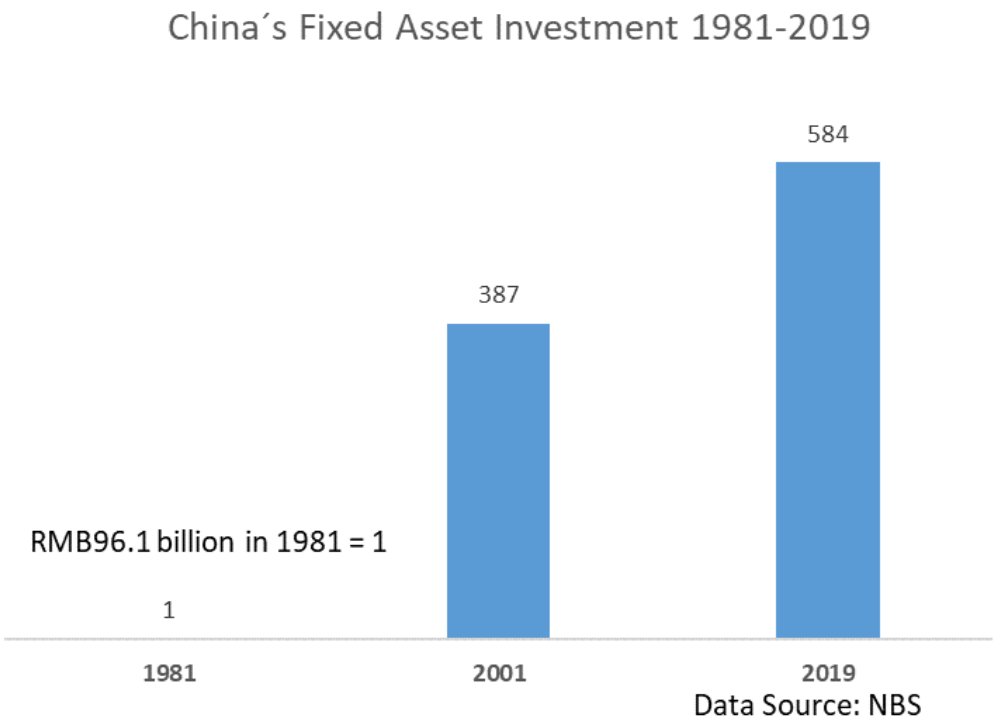


On the other hand, China´s import purchases stood at US$2.375 trillion in 2020, accounting for 10.8% of the world total. The same figures in 2001 and 1978 were only 3.2% and 0.5% respectively. In 1978, China spent 5.09% of its GDP on purchasing goods and services from other countries. After 20 years of opening-up and reform, its spending on imports rose to 18.22% of GDP in 2001 when China gained the access into the WTO. After plateauing at above 28% in 2004-2006, the share took a deep dive in the lead up to and during the aftermath of the 2007-2009 financial crisis before recovering to 24.17% in 2011. Thereafter, the import share of GDP continued to decline and dipped to 16.01% in 2020.

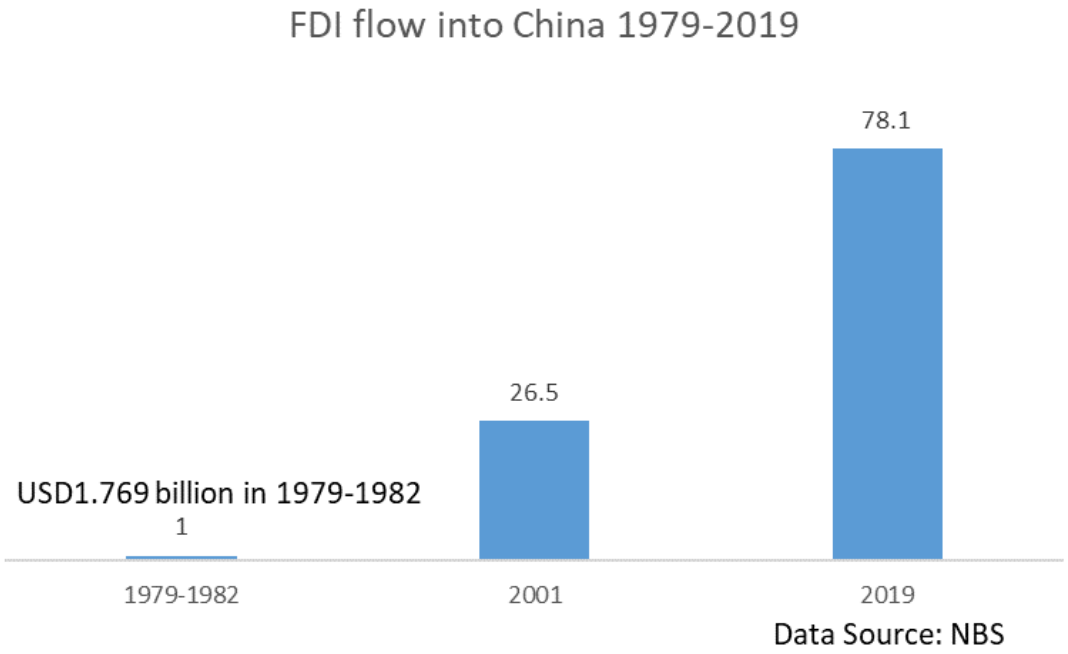


Investment

Fixed Asset Investment (FAI) in China witnessed exponential growth to more than CNY56 trillion in 2019 from CNY96.1 billion and CNY3.7 trillion in 1981 and 2001 respectively.

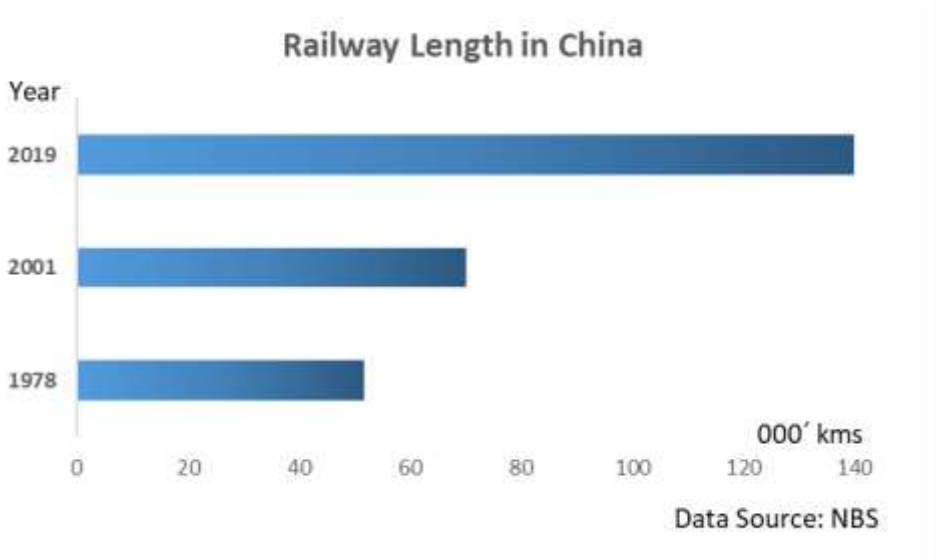


The level of Foreign Direct Investment (FDI) reflects the overall investment environment in a country and is an important supplement to the economic growth of the receiving country. To take advantage of China´s comparatively low labor costs, taxation incentives and vast market potential, the FDI flow into China reached more than USD138 billion in 2019 from USD46.9 billion and USD1.8 billion in 2001 and 1979-1982 respectively.

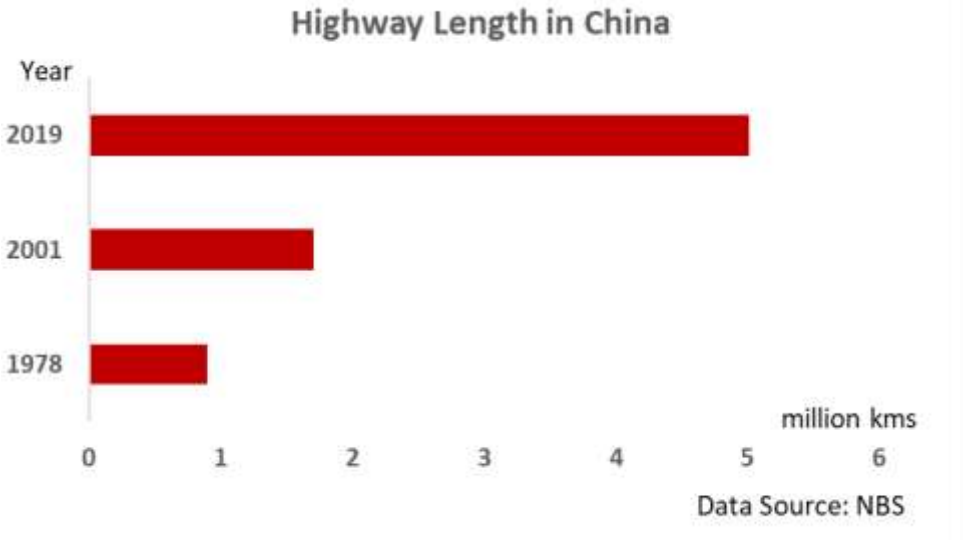


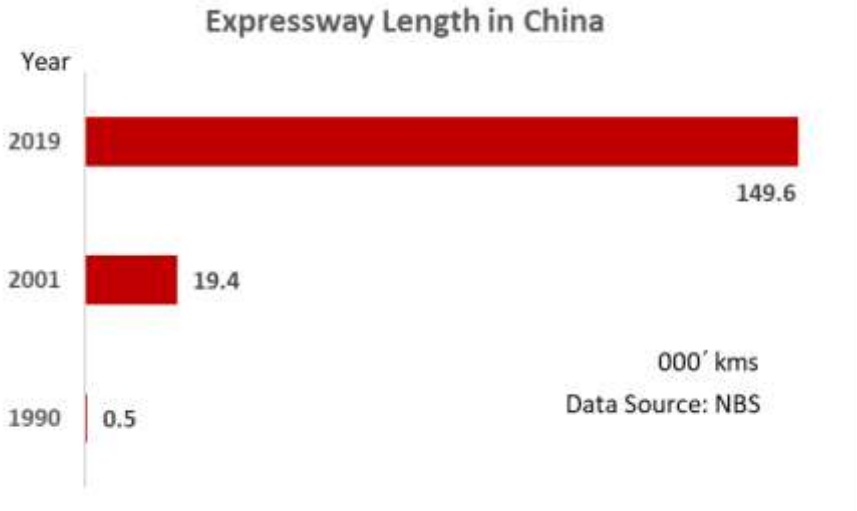
Investment in infrastructure has played a critical role in sustaining China´s economic growth over the past 40 years, in particular in railways, highways, ports, airports, oil and petroleum transportation lines, telecommunications and dams.

In 1978, the total length of railways in China was only 51.7 thousand kms, this had increased to 70.1 thousand kms by 2001 and 139.9 thousand kms including 35.388 thousand kms of high-speed railways by 2019.

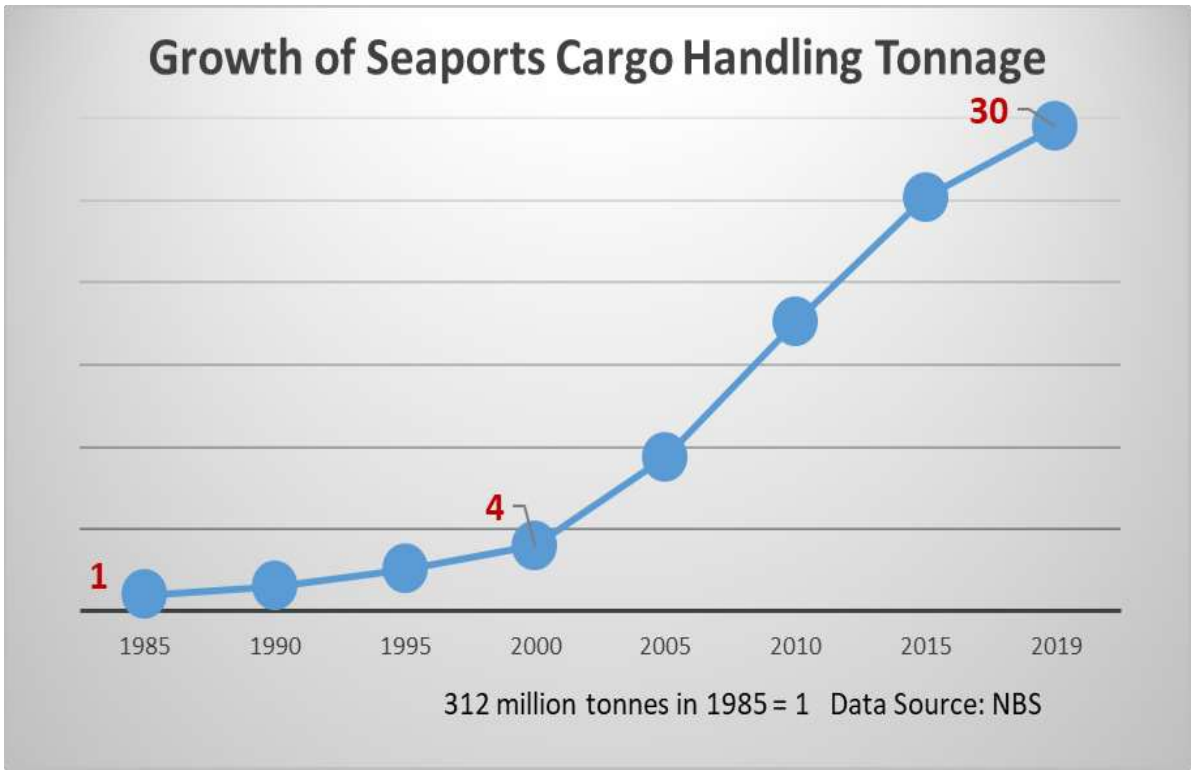


In 2019, the total length of highways in China reached more than 5 million kms compared to 1.7 million kms and 0.9 million kms in 2001 and 1978 respectively. Of this, the length of expressways was 149.6 thousand kms in 2019, the same figures were 19.4 thousand kms and 500 kms in 2001 and 1990.

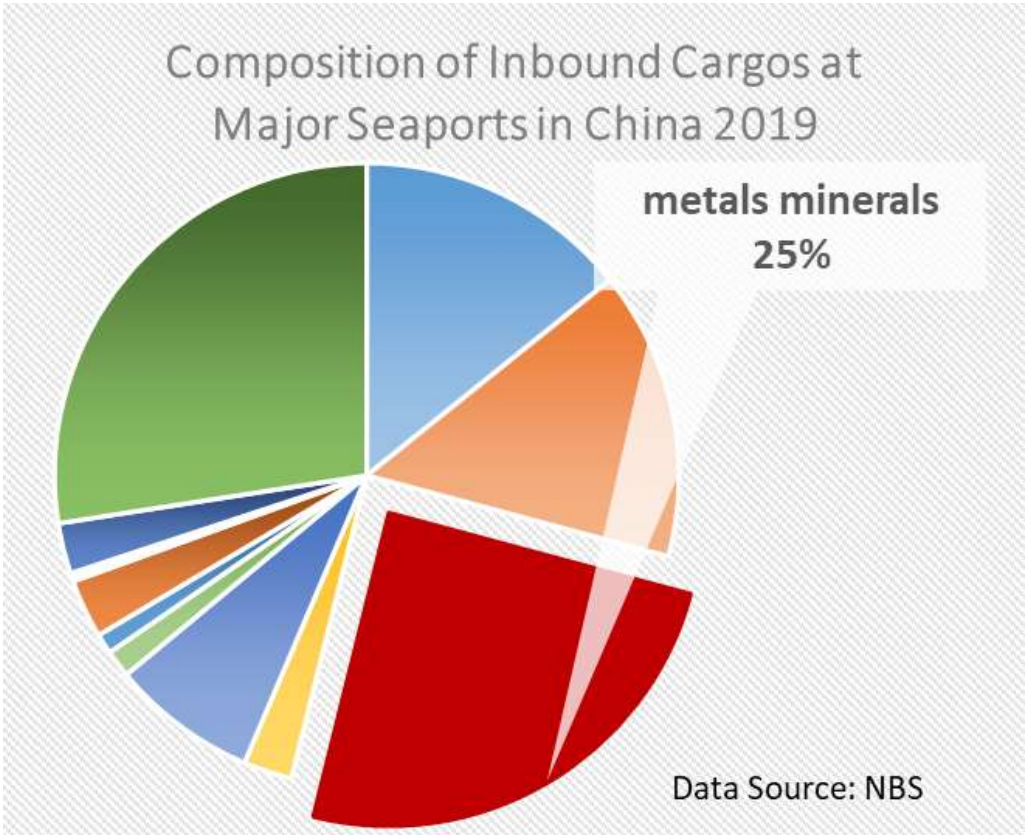




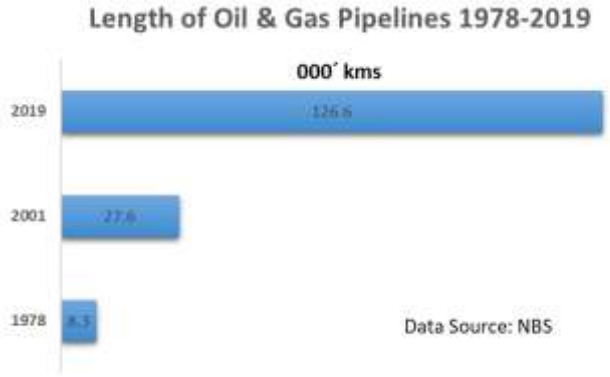
Besides road transportation, China invested heavily in cargo handling capacity at its seaports to break the bottlenecks hampering its commodities imports and exports. The cargo handling tonnage of 9.2 billion tonnes in 2019 at its major seaports was nearly 30 times that compared to the 312 million tonnes in 1985.



Out of the 9.2 billion tonnes of cargo loaded and unloaded at the major seaports in 2019, 16.8% or 1.55 billion tonnes were ferrous and nonferrous minerals. Overall, 25% of the inbound cargos unloaded at China´s major seaports were metallurgical minerals in 2019.

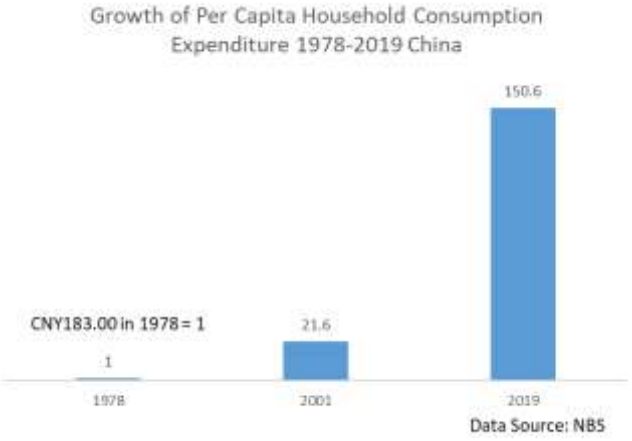


In 1978, the total length of oil and gas pipelines in China was only 8.3 thousand kms, that had increased to 27.6 thousand kms and 126.6 thousand kms in 2001 and 2019 respectively. This increase reflected both the accelerating rate of urbanization and the adjustment of the energy mix in China.

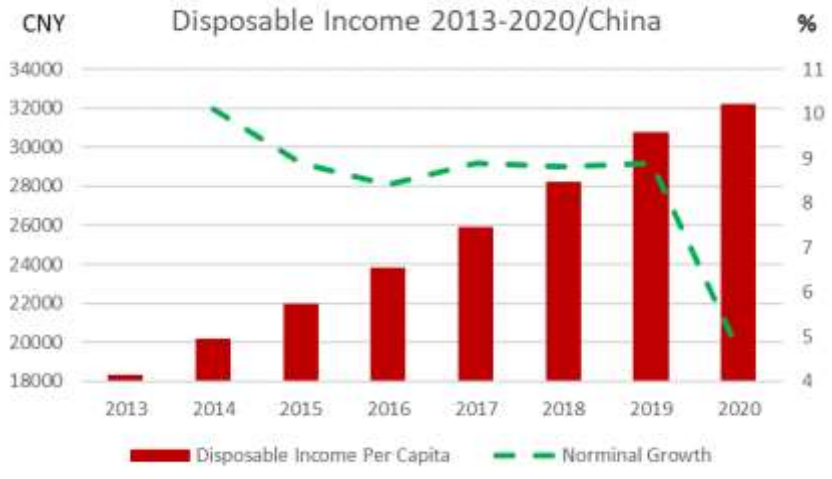


Consumption

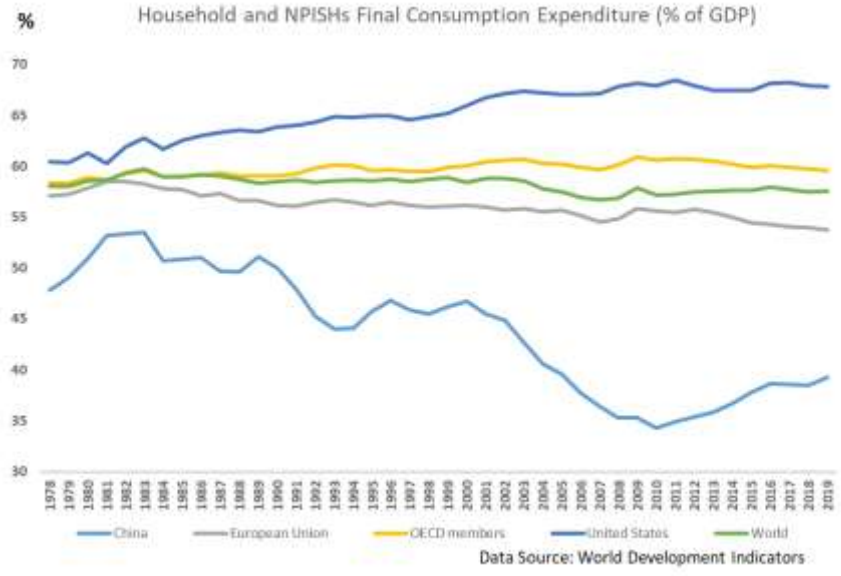
Consumption is a critical apparatus in propelling economic growth. In 1978, China´s household consumption expenditure per capita was only CNY183.00. With around 20 years of productivity liberalization, the figure climbed to CNY3954.00 in 2001 when China started to get involved in the global value chains and by 2019, the same figure had risen to CNY27563.00 representing a 151-fold increase.



Disposable income is an essential economic indicator in analyzing the state of an economy. China started to survey household disposable income in 2013 in order to assess how much money was being saved, invested and spent by its citizens. Statistics published by the National Bureau of Statistics (NBS) show a healthy and incremental growth of the disposable income per capita in China which supports its strategic structural adjustment of the economy: shifting from export and investment to consumption-driven growth.



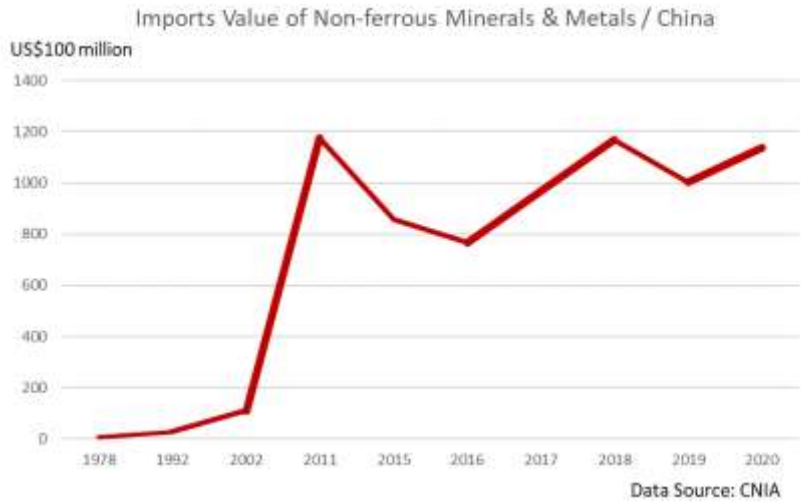
Although China´s household consumption has kept increasing and contributed more and more to its growth, compared to other major economies the consumption potential in China is still huge. According to World Development Indicators compiled by the World Bank, the Household and NPISHs (Non-Profit Institutions Serving Households) Final Consumption Expenditure in China was only 39.3% of its GDP in 2019 far below the world average of 57.6%. The same figure for the United States was 67.9%, for OECD members 59.6%, and for the EU 53.8%.



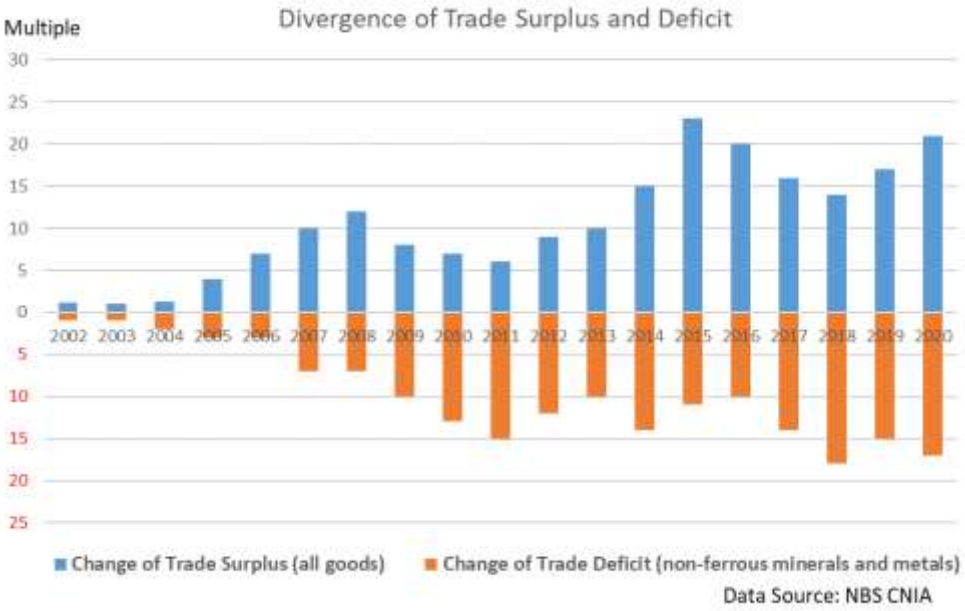
The progress made in China over the past 40 years shows the importance of combining the right domestic policies together with global integration at a time of rapid development of the economic landscape of a country. Without the revolutionary recalibration of policies in 1978, the strangled and suppressed domestic resources and productivity could not have been liberalized in China. Without the successful, all-round and comprehensive participation in and integration into the global value chains marked by its access into the WTO in 2001, China could not have amassed the economic magnitude it has today.

Non-ferrous Metals Industry – Still Vibrant but with Underlying Worries

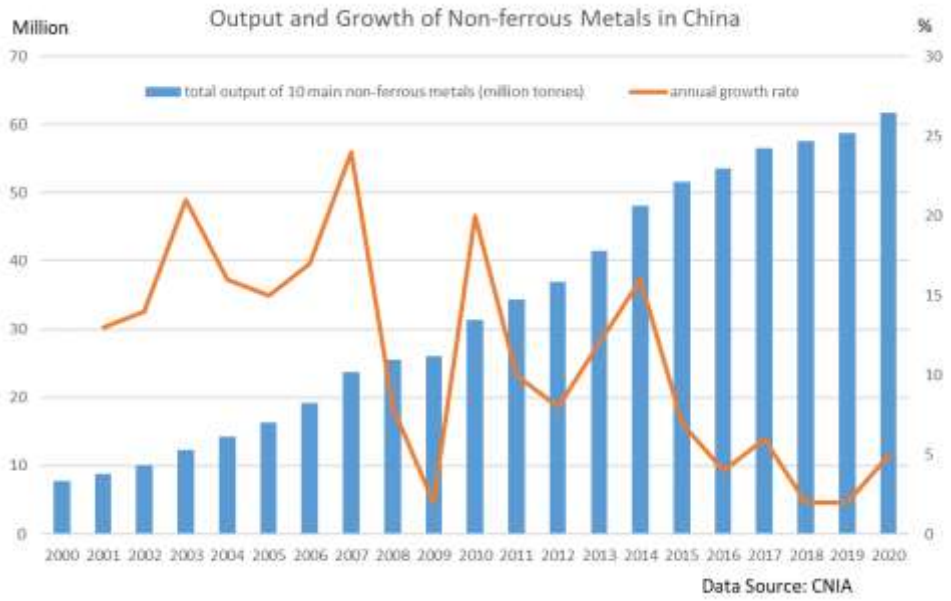
In the context of non-ferrous minerals and metals, China is now the largest buyer in the world. When China opened its door to the world in 1978, it only imported US$756 million worth of non-ferrous minerals and metals. This value fluctuated over the following years and confirmed its upward trend in the early 1990s when China reaffirmed to the world and its people that it was focused on economic development. One year after it´s accession into the WTO, the value of China´s import of non-ferrous minerals and metals rose sharply to over US$10 billion. In recent years the value of China´s annual imports value of non-ferrous minerals and metals has been consistently at a level of around US$100 billion.



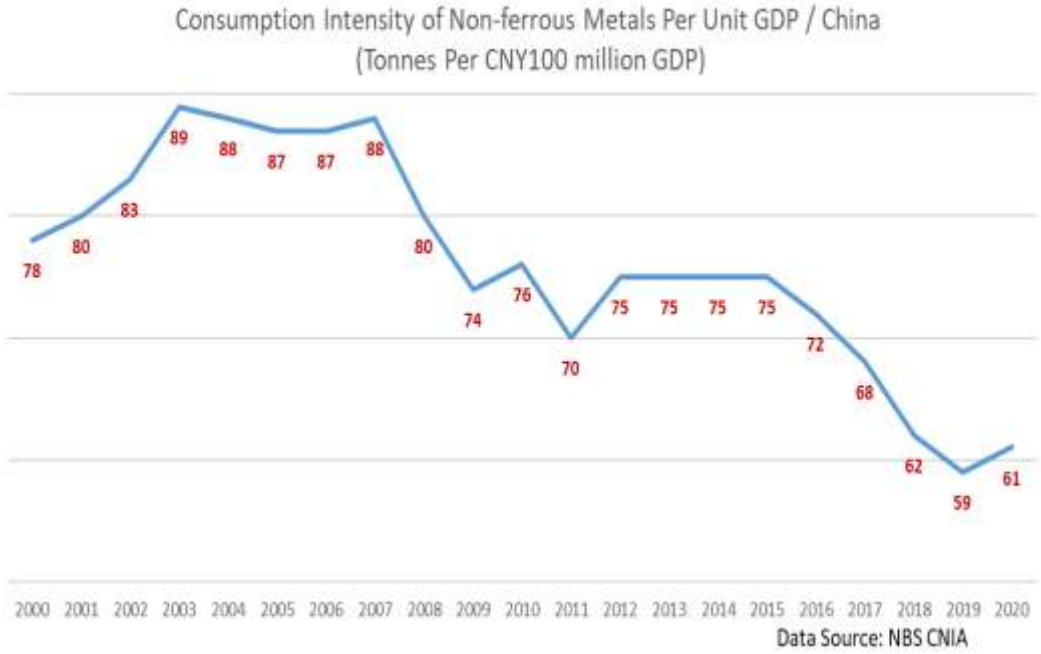
China has registered a trade surplus for goods in most of the past 40 years. Since it joined the WTO its trade surplus has rapidly expanded with only a transitory interruption ensuing from the global financial crisis. In 2015, its trade surplus was 23 times higher than that in 2002. Impacted by the rising trade tensions between major trading partners, its trade surplus narrowed in the following years before recovering in 2019. In 2020, China´s exports benefited from its successful control of the COVID-19 outbreak domestically. The trade surplus of US$535 billion in 2020 was the second highest figure behind the US$594 billion recorded in 2015. In contrast China´s trade in non-ferrous minerals and metals has mainly been one of deficit since 1992. This deficit has expanded significantly since the mid-2000s with the deficits in 2011, 2018 and 2020 being 15, 18 and 17 times larger respectively than those in 2002-2004.



Imports of non-ferrous raw materials have supported the continuous growth of non-ferrous metals production in China over the past 20 years. Although production has continued to increase, the growth rate in recent years has slowed. During most of the years over the period 2000-2014, the output of the 10 main non-ferrous metals in China recorded double-digit growth, with a deep drop in 2008 and 2009 as a consequence of the global financial crisis followed by a V-shaped recovery in 2010. Entering into 2015, the growth rate dropped to 7% and thereafter further dropped to a lower range of single digit growth. Boosted by strong commodity demand in the midst of COVID-19 pandemic, the growth rate recovered to 5% in 2020.

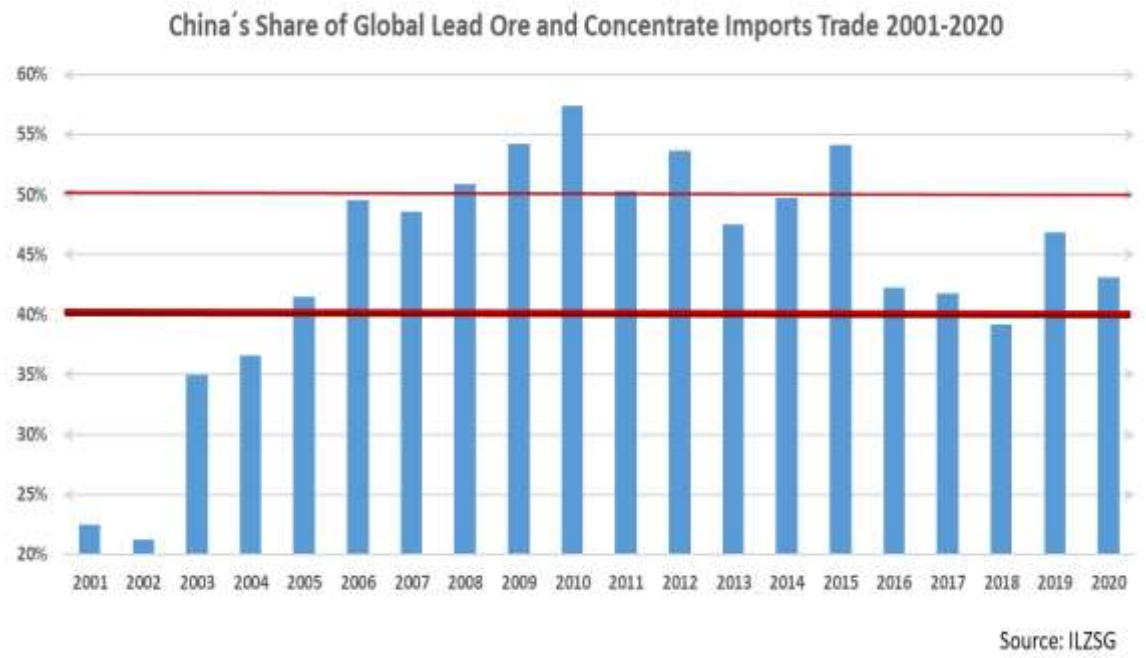


China is proactively adjusting its economic growth paradigm. Policy focus will be shifted from quantitative growth to qualitative growth. Also constrained by the pressing requirement of emissions reduction, the non-ferrous metals industry cannot expect a continuance of the high growth rates experienced in recent years. Another change the industry should watch closely is that the consumption intensity of non-ferrous metals in GDP has weakened. After years of growth, the consumption intensity plateaued at 87-89 tonnes per CNY100 million worth of GDP in mid 2000s. It then fell to 70-80 tonnes per CNY100 million worth of GDP in late 2000s and maintained that level until 2017. Over the past 3 years, consumption intensity further slipped to around 60 tonnes per CNY100 million worth of GDP.

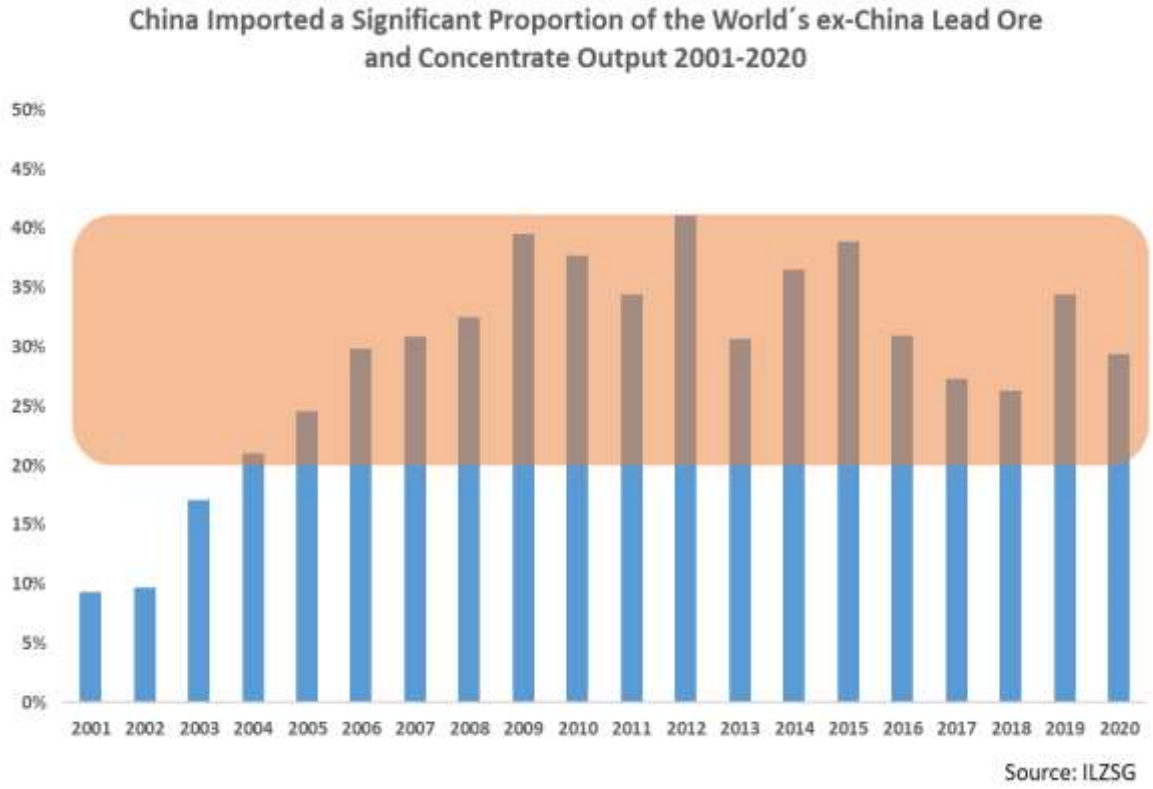


China´s Lead and Zinc Imports and Usage 2001-2020

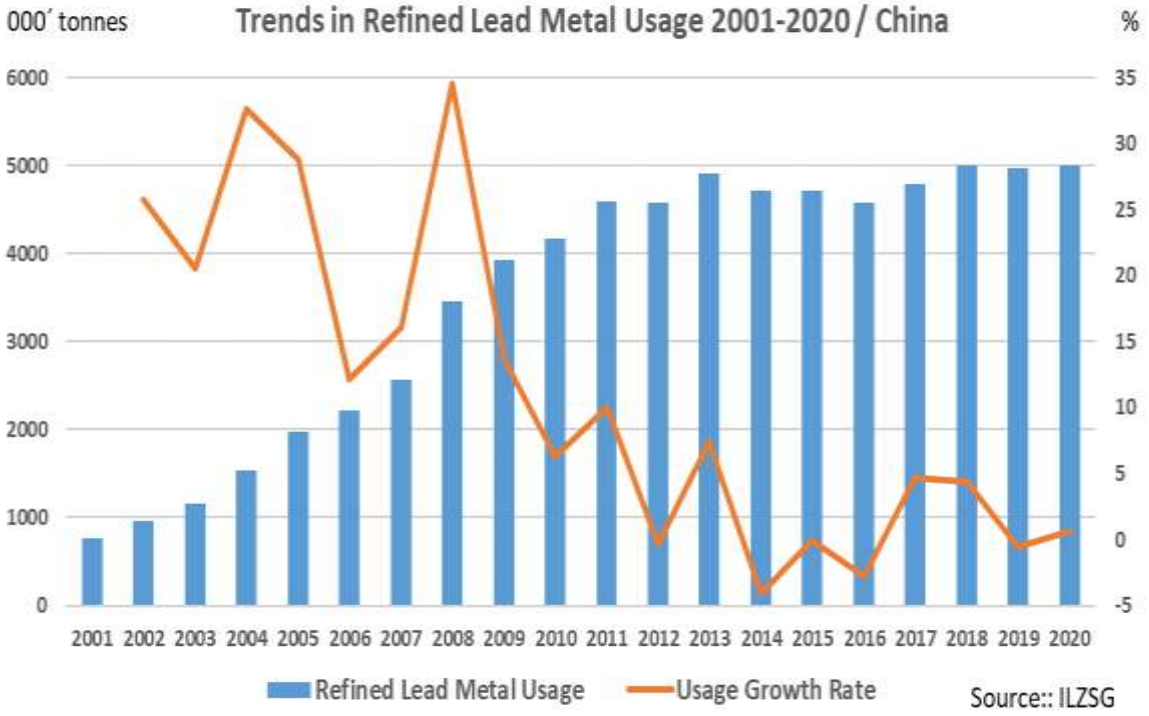
China´s import demand for lead ore and concentrates over the past 20 years bolstered the international trading market and provided strong support for overseas lead mining activities. Its import volume surpassed 40% of the world total import trade in 2005 and then kept increasing to a high of 57% in 2010. In fifteen out of the observed 20 years, China´s imports of lead ores and concentrates accounted for more than 40% of the world total imports



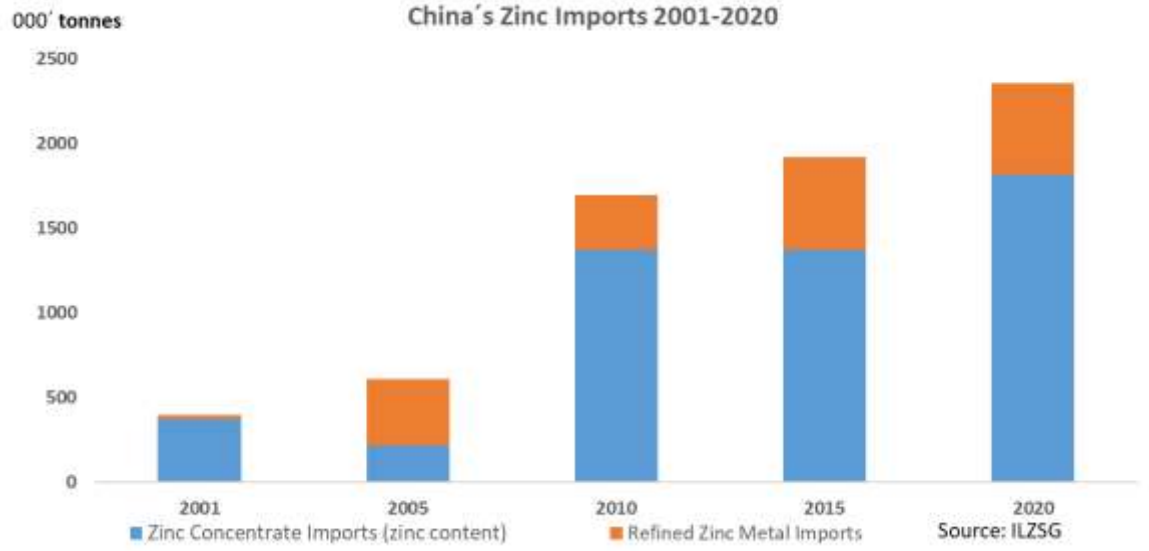
Over the period 2001-2020, besides using domestic mining output, China´s imports of lead ores and concentrates provided substantial support to mining activities outside China. Between 2004 and 2020, China bought 20-40% of the lead ore and concentrate produced outside China.



Boosted by the accelerating urbanization rate, buoyed the demand for SLI, motive power and backup batteries as well as energy storage facilities, refined lead metal usage in China grew from 1 million tonnes in 2003 to over 4 million tonnes in 2010. However, total usage then plateaued at a level of 4.5-5 million tonnes per year between 2012-2020, and even recorded negative growth in some years over this period.



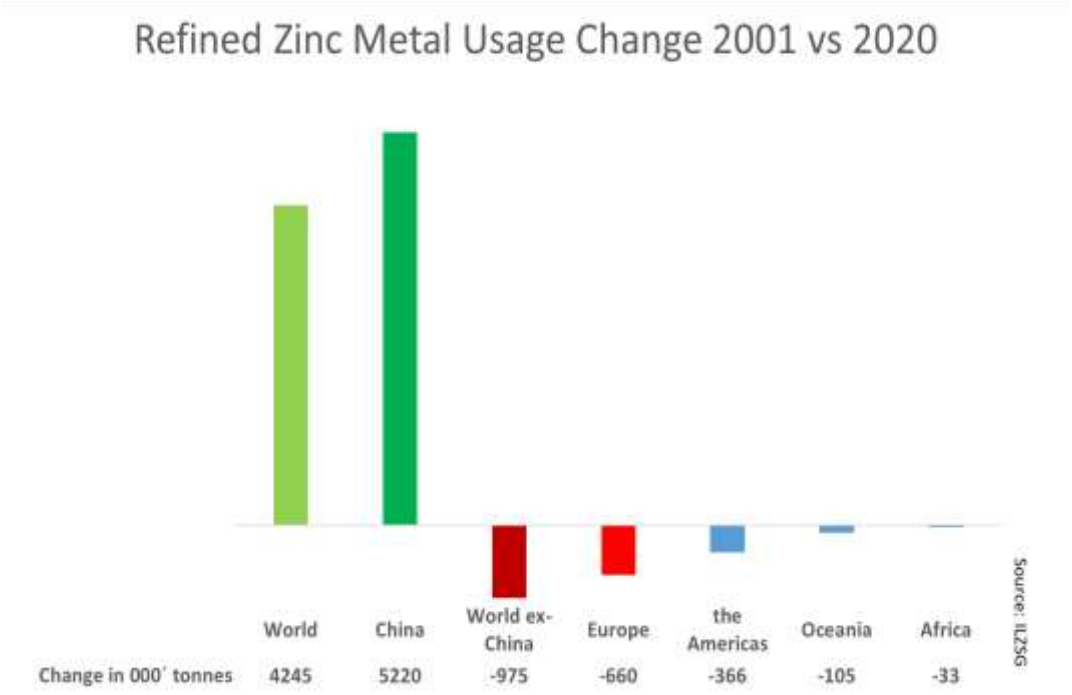
Over the past 20 years, China´s import volume of zinc including concentrates and refined metal almost sextupled to more than 2.3 million tonnes in 2020 from less than 400 thousand tonnes in 2001.



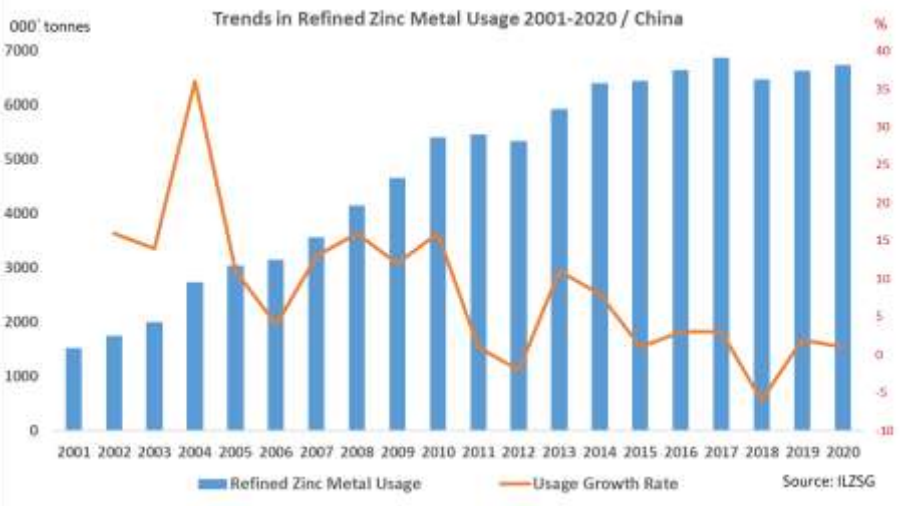
Zinc concentrate imports into China increased to more than 1.8 million tonnes in 2020, 1.4 million tonnes higher compared to 2001. Over the same period, growth in production outside China was only 861 thousand tonnes.

Over this period total refined zinc metal production outside China increased by only 154 thousand tonnes compared to China´s staggering growth of over 4.3 million tonnes. Over the same period, refined zinc metal imports into China increased by more than half a million tonnes.

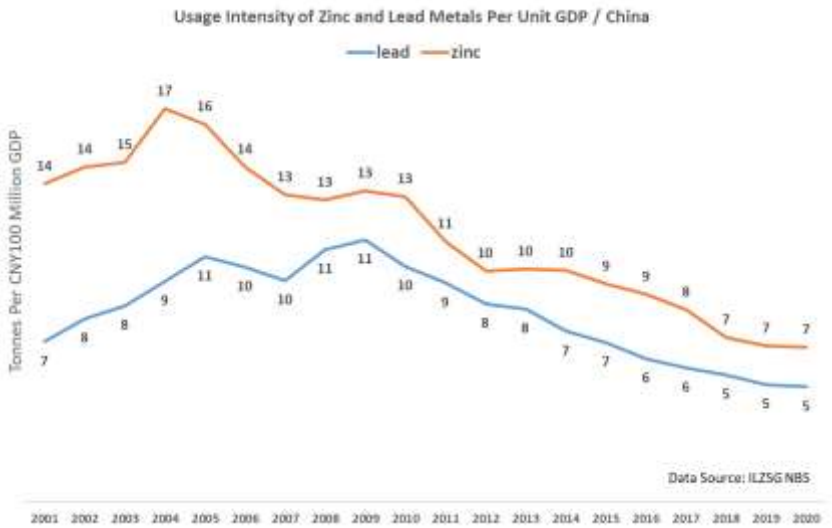
The expanding market in China along with the shrinking market outside China further reinforced China´s dominant position in both the world zinc concentrate and zinc metal markets.



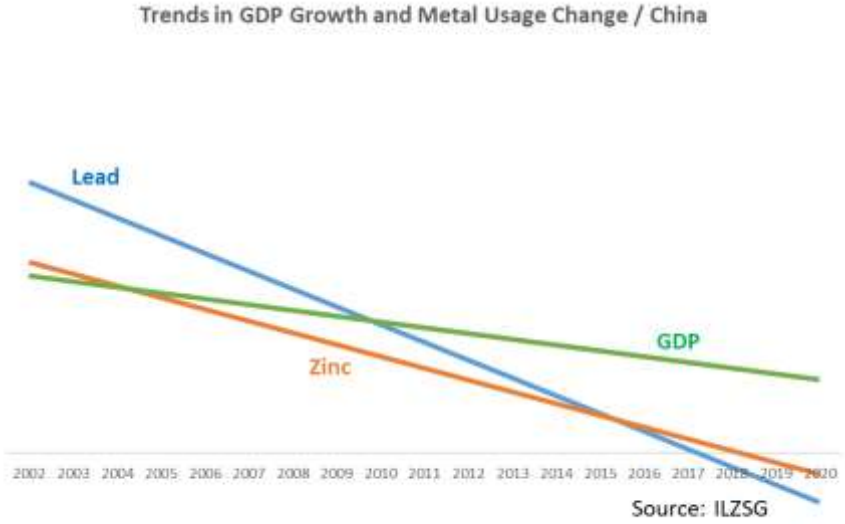
The usage of refined zinc metal in China increased by around 450% over the period 2001-2020, or from 1.5 million tonnes to 6.9 million tonnes. Over the first decade of the century, usage growth was continuous and seemingly unaffected by the financial crisis. At the beginning of the second decade, growth stagnated due to the EU debt crisis but gained traction again in 2014 reaching a high of 6.87 million tonnes in 2017. In recent years the growth rate has plateaued, as shown in the chart below, and in some years usage has even fallen.



In line with the weakening consumption intensity of 10 main non-ferrous metals, lead and zinc metal usage per unit GDP measured by CNY100 million in China has dropped to around 5 tonnes per CNY100 million GDP and 7 tonnes per CNY100 million GDP respectively in recent years.



Over the last three decades China's economic growth has been propelled by intensive expenditure in the building and infrastructure sectors and buoyed by growing external demand. Although negatively affected by the COVID-19 pandemic in 2020, the economy still grew by 2.3%. However, more recently China´s proactive efforts in adjusting its growth mode together with deteriorating external markets have resulted in lower growth rates. In addition, in the lead and zinc markets, demand growth has been significantly lower than general economic growth.

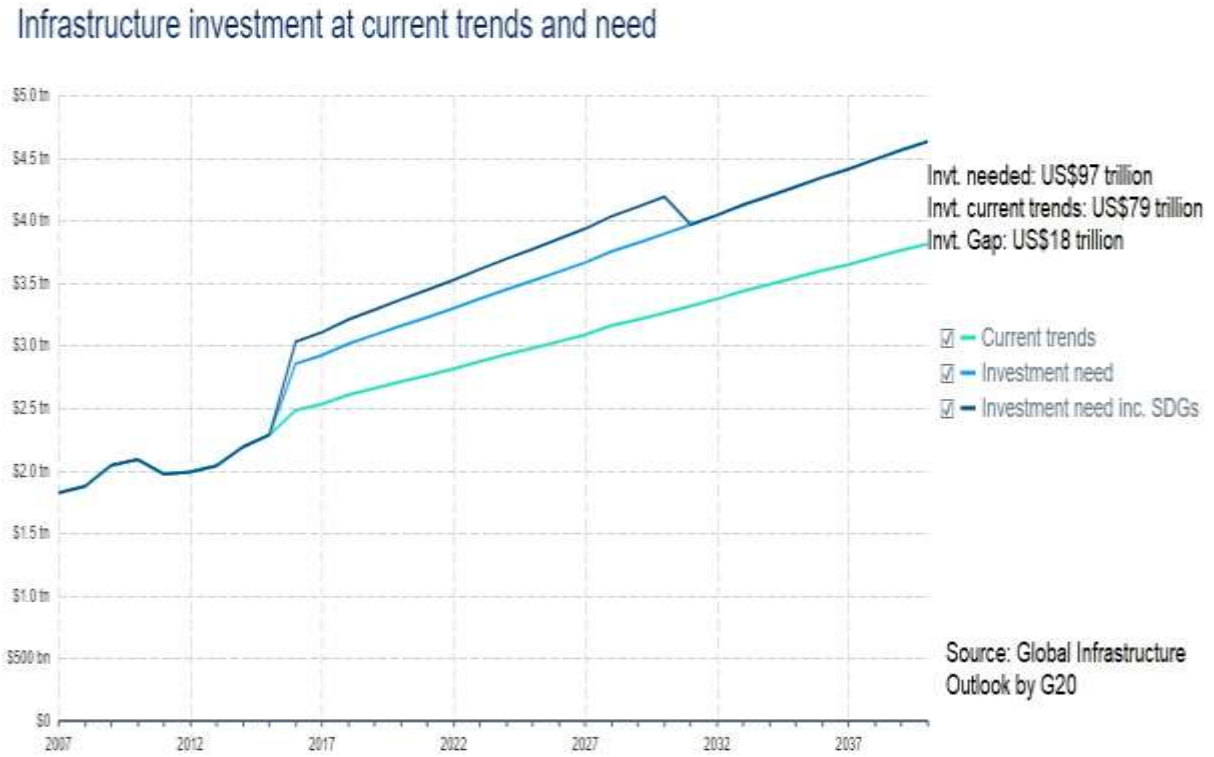


At the present time, profound supply-side reform is underway in China. This is characterized by the cutting of excessive industrial capacity which is also being constrained by stricter emission limits that in turn have been spurred by China´s pledge to reach a carbon peak before 2030 and carbon neutrality by 2060. As a consequence, the development of carbon-intensive smelting industries including lead and zinc are likely to be negatively impacted. In addition, the country's efforts to shift from export and investment-driven growth to consumption-driven growth are expected to result in demand stagnation or reduction with regard to base metal commodities. As more than 40% of world lead and zinc production is used in China any downward changes in China´s lead and zinc market will affect the markets on a global basis Despite these challenges, lead and zinc demand, in addition to other commodities in China, also should benefit from some opportunities brought about by China´s efforts in its economic transformation and a series of policy drives and industrial initiatives as discussed in the following pages of this report.

Belt and Road Initiative (BRI)

Investment in infrastructure such as transportation, water, sanitation, electricity, telecommunication, energy, schools, irrigation systems etc. requires large quantities of commodities whilst at the same

time unlocking bottlenecks hindering economic growth which in turn further boosts demand for commodities. According to the Global Infrastructure Outlook published by the G20, there is currently a huge investment gap between what is needed and what is planned for infrastructure in countries and sectors observed through to the year 2040.

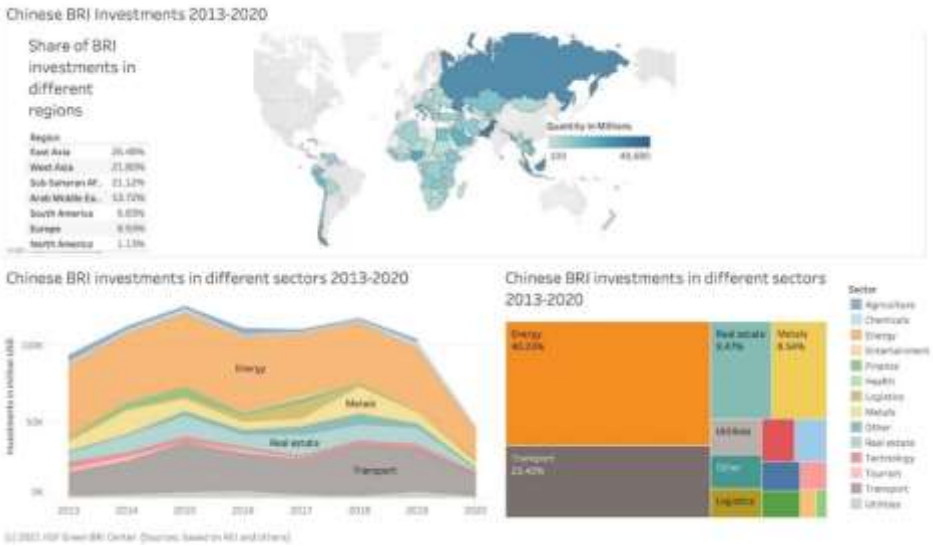


The Asian Development Bank pointed out that if Asia is to maintain its development momentum, an investment of US$1.7 trillion per year in infrastructure is needed through to 2030. The most recent Build Back Better World which is an affirmative initiative for meeting the tremendous infrastructure needs of low and middle-income countries, pioneered by the United States, aims to narrow the infrastructure gap of US$40 trillion in the developing world. In December 2021, The European Union unveiled the EU´s Gateway Strategy involving an investment of €300 billion by 2027 to boost infrastructure development in developing countries.

In 2013, China launched the Belt and Road Initiative in order to further make up the infrastructure shortfall that has been hindering connectivity, impeding trade and blocking financing channels with its trade partners. This includes the Silk Road Economic Belt and the 21st Century Maritime Silk Road. By June 2021, there were already 140 countries and 32 international organizations signed up to the Initiative.

The Belt and Road Initiative encompasses six economic corridors including: the New Eurasia Land Bridge: building and linking the rail network to Europe via Kazakhstan, Russia, Belarus, and Poland; the China, Mongolia, Russia Economic Corridor: breaking the transportation bottlenecks by building and linking the rail networks and constructing a transportation route across the steppe; the China, Central Asia, West Asia Economic Corridor: revitalizing the trade, economic and investment routes linking Kazakhstan, Kyrgyztan, Tajikistan, Uzbekistan, Turkmenistan, Iran, and Turkey; the China Indochina Peninsula Economic Corridor: boosting economic cooperation between China and Southeast Asian Countries including Vietnam, Thailand, Laos, Cambodia, Myanmar, and Malaysia; the China, Pakistan Economic Corridor: a flagship project under the Belt and Road Initiative including highways, railways, pipelines, optical cables, power, energy, and ports; the China, Bangladesh, India, Myanmar Economic Corridor: linking the two largest markets in Asia through cooperation in key sectors including connectivity, energy, investment and financing, facilitation of trade and investment in goods and services, sustainable development, and cultural and people-to-people exchanges.

According to data published by the Green Belt and Road Initiative Centre, International Institute of Green Finance at the Central University of Finance and Economics in Beijing, China invested US$770 billion in 138 countries under the Belt and Road Initiative over the period 2013-2020. The graph below shows that the majority of this investment was in infrastructure including energy, transport, utilities and logistics. These sectors are normally metal intense, for instance, zinc is widely used in protecting steel structures from corrosion through galvanizing, and lead-acid batteries are used in power storage and power backup facilities. Among the total investment of US$770 billion, 8.54% or US$65.8 billion were invested in the minerals and metals industry which helped the development of untapped resources in a number of BRI countries.



China´s 14th Five-Year Plan

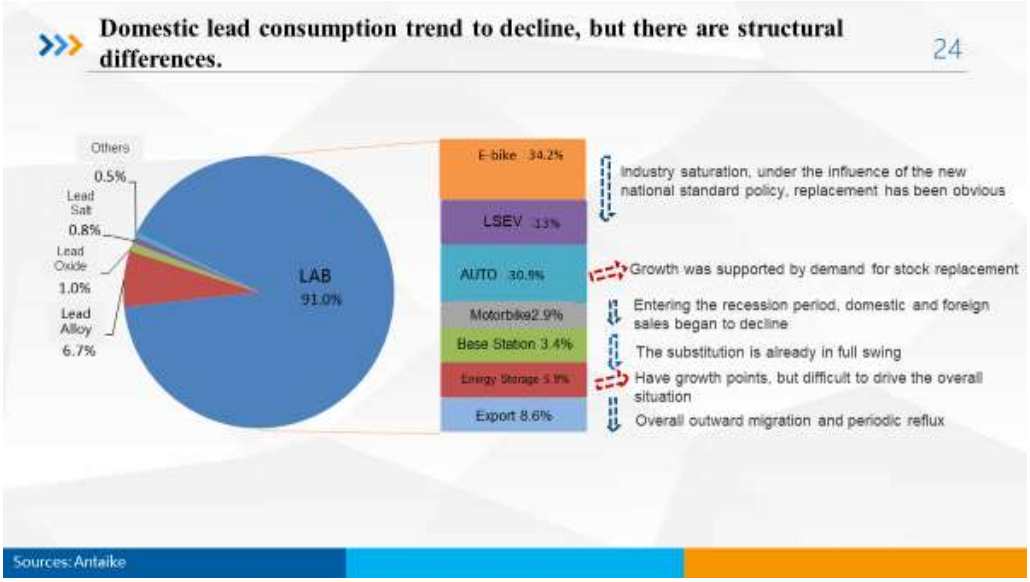
With the inception of its first Five-Year Plan in 1953, China reviews its economic and social development strategies, sets the goals and priorities every five years in the blueprint National Five-Year Economic and Social Development Plan. The year 2021 is the debut year of the 14th Five-Year Plan. In the Plan, China also set out its development vision through to 2035. The most revealing part of the plan is that the government acknowledged that both the internal and external landscapes are changing fundamentally, the traditional development route is not sustainable and a profound and progressive structural adjustment would have to be put on the agenda.

In chapters related to industries, the Plan emphasizes technological innovation, strengthening manufacturing capabilities, new infrastructure development, environment and ecosystem protection. Each of these will have an impact on the exploration, mining, production, use and recycling of minerals and metals including lead and zinc.

China benefited a lot from its demographic dividends in the past. Now China's society is aging and its

demographic dividend is diminishing. In contrast, the strategic importance of science and technology in economic and social development is emerging. The demographic change towards an aging society will result in the reduction of merchandise consumption and growth in the demand for services. Technological advancement may on one hand extend the durability of manufactured products and on the other hand lower the material intensity in products.

As the shift from quantity focused growth to quality focused growth takes shape, China needs to modernize its industries to produce high quality products instead of producing large quantities of high energy-intensity and low value-added products. More and more resources will be allocated to the innovation and development of industries such as integrated circuits, aerospace equipment, high-tech ships and ocean engineering equipment, robots, advanced railway equipment, advanced power equipment, engineering machinery, high-end CNC machine tools, medicine and medical equipment. At the same time the layout and structure of traditional industries such as petrochemical, iron and steel, nonferrous metals, building materials, and other raw material industries will be adjusted. This will be two pronged: firstly, the geographical relocation of some existing and new capacities driven by emission reduction and secondly, the increased use of secondary materials driven by the circular economy. Antaike, the research arm of CNIA, quantified the specific impacts and expected change in the zinc and lead industries through to 2025.



The critical role of Infrastructure was also reiterated in the 14th Five-Year Plan with a focus on modern infrastructure, namely, data centres, cloud computing, 5G telecommunications, digitization of traditional infrastructures including transportation, energy, and urban utilities, and other Internet of Things such as internet of industries and internet of vehicles. A secure and reliable power supply is of paramount importance in ensuring the stable operation of these modern infrastructures, and this provides opportunities for zinc and lead containing batteries although other types of batteries are also vying for the growth potential in these sectors.

Transportation infrastructures including high-speed railways, normal railways, expressways, highways, sea ports, inland waterways, freight and passenger airports will continue to be constructed, improved and interconnected, particularly in China´s far-flung central and western regions which are known for their harsh environment and uneven development. The construction, operation and maintenance of these facilities will be metal intensive and should provide the possibility for the increased use of galvanized steel sections and rebars. It is also anticipated that lead acid batteries will be widely adopted in power backup facilities.

To tackle climate change and speed up its transition to a greener economy, China has pledged to reach its carbon emission peak by 2030 and achieve carbon neutrality by 2060. In the 14th Five-Year Plan, it is made clear that China will develop a clean, low-carbon, safe and efficient new energy system characterized by reducing the share of non-fossil fuel energy and scaling up the adoption of renewable energies. Onshore and offshore wind power, solar photovoltaic, hydropower, geothermal and other renewable energy sources will be aggressively promoted within and beyond the 14th Five-Year Plan period.

As renewable energies, wind and solar in particular, have the inherent shortcoming of intermittency – the wind does not always blow and the sun does not always shine, the renewable duck curve between peak demand and renewable energy generation has to be flattened by storing the energy generated in batteries. Zinc and lead containing batteries could be an ideal option for wide adoption thanks to their improving energy density and low cost compared to other types of battery. In addition, galvanized steel structures are used as the racks supporting the solar panels and zinc-coated steel towers are used to for the wind turbines as they provide protection against harsh atmospheric conditions. Lead is a less expensive alternative to silver, bismuth and tin in the coating layer of solar panels. However, its usage in this application is expected to shrink due to environment concerns. Besides their use in the generation and storage of renewable energy, zinc and lead are also employed in renewable energy transmission and distribution facilities.

Made in China 2025

Digitalization, the increased availability of information and computerization have brought about a revolution in research, development, manufacturing and every aspect of our life and the way society is managed. To adapt to the new changes and accommodate the new mega trends, major industrial countries have put forward development strategies to reshape their manufacturing capabilities. In 2011, the US initiated the Intelligent Manufacturing or Smart Manufacturing plan aimed at reshoring manufacturing capabilities back to the US; in 2013, Germany put forward its manufacturing initiative Industries 4.0 aiming at upgrading Germany´s industrial capability through digital transformation; in 2014, the United Kingdom initiated a coherent UK-wide remanufacturing strategy and proposed the concept of future manufacturing, it then established the Advanced Manufacturing Research and the National Formulation Centres to mobilize the resources of government, industry and research institutes in promoting the UK´s manufacturing capabilities; in 2015, China declared its Made in China 2025 plan as part of its medium to long-term industrial development strategy.

The background of Made in China 2025 is that the global value chain is undergoing substantial restructuring. Advanced economies such as the US, Japan, the EU and OECD members are all making efforts in reindustrialization. Emerging and developing economies are fully exerting their comparative advantages in attracting overseas investment. China, after years of rapid development, is facing labor cost increases and resource and environmental constraints. Instead of focusing on further expansion of scale, China now needs to shift its focus towards efficiency, quality and sustainability.

The main implications for the lead and zinc industry and the overall non-ferrous metals sector are the requirement for the greening of further development. By 2025, energy consumption per unit industrial added value is required to decrease by 34% from the level in 2015; CO2 emissions per unit industrial added value are required to drop by 40%; water usage per unit industrial added value has to be cut by 41%; and 79% of the solid industrial wastes needs to be re-used. These tasks will be allocated to governments at all levels and industrial supervision bodies for implementation and compliance. The non-ferrous metals industry is on the target list for fulfilling these reduction and re-use requirements. This will incentivize the smelting and refining industry to scale up adoption of renewable energies, lower energy consumption and utilize advanced technologies and processes to reduce greenhouse gas emissions and conserve water resources. In addition, the use of recycled solid waste and scrap will certainly increase to meet the requirement of 79%.

Non-ferrous metals companies including lead and zinc smelting and refining operations will be put under strict scrutiny, and that is very likely to result in higher operational costs and the requirement for cleaner raw materials when importing ores and concentrates. It is also mentioned in the Plan that China is still in the process of industrialization and that resource scarcity remains one of the many constraints. Various supportive financing vehicles will be used to encourage exploration and exploitation of overseas resources.

Conclusion

China will continue to be the biggest commodities market for the foreseeable future, but its growth pattern is tilting towards a more consumption-driven and environmentally conscious development. As a consequence, the commodity intensity of future economic growth will be weaker. The incredibly fast growth of the past 40 years is unlikely to be repeated. The shortfalls in global infrastructure investment and various international initiatives in making up the shortfalls should help to support the base metals markets. The pronounced battle against climate change will add a carbon mark to all commodities and entail extra costs in every part of the commodities value chain. Currently, China uses more than 40% of the world’s lead and zinc production, and in recent years all the additional production outside China was shipped into China. For this reason the world’s lead and zinc industries will need to continue to closely monitor demand fluctuations and economic developments in China when planning either future green-field or brown-field projects.