Delhi Policy Group

Advancing India's Rise as a Leading Power

DPG WORKING REPORT

India's Aluminium Industry: Pathways for Aatmanirbharta

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List of Abbreviations

AAI	Aluminium Association of India
ALUCAST	Aluminium Casters' Association
APTA	Asia Pacific Trade agreement
ASMA	Aluminium Secondary Manufactuers Association
BALCO	Bharat Aluminium Company Limited
CAGR	Compound Annual Growth rate
CECA	Comprehensive Economic Cooperation Agreement
CEPA	Comprehensive Economic Partnership Agreement
CIF	Cost, Insurance and Freight
CII	Confederation of Indian Industry
CPPR	Centre for Public Policy Research
CRM	Critical raw materials
CVD	Countervailing duties
DGFT	Directorate General of Foreign Trade
DGTR	Directorate General of Trade Remedies
EC	Electrical conductor grade
FICCI	Federation of Indian Chambers of Commerce and Industry
FOB	Freight on Board
FRP	Flat rolled products
FTA	Free trade ageement
GDP	Gross Domestic Product
GSP	Generalised System of Preferences
HINDALCO	Hindustan Aluminium Corporation
HS	Harmonised System
IAFTA	India ASEAN free trade agreement
ISRI	International Scrap Research Institute

JNRDDC	Jawaharlal Nehru Aluminium Research Development and Design Centre
LME	London Metal Exchange
MEIS	Merchandice Exports from India scheme
MFN	Most favoured nation
MRAI	Metal Recycling Association of India
MSME	Micro, Small and Medium Enterprises
NA	Niti Aayog
NALCO	National Aluminium Company Limited
RCA	Revealed comparative advantage
RCEP	Regional Comprehensive Economic Partnership
RoDTEP	Remission of Duties and Taxes on Export Products
ROO	Rules of Origin
SAARC	South Asian Association for Regional Cooperation
SME	Small to Medium Enterprise
UAA	Unwrought alloyed aluminium
USDOC	US Department of Commerce
UUA	Unwrought Unalloyed aluminium
VAI	Value added index
VAT	Value added tax
WITS	World Integrated Trade Solution
WTO	World Trade Organisation

Executive Summary

This is a study on the aluminium industry in India, which has the potential to emerge as a champion sector for the country. India has substantial coal and bauxite reserves that gives it an inherent advantage. India is the second largest producer of primary aluminium in the world at around 3.65 mtpa, even if it is a distant second to China at ten times that level. India is also the largest importer in the world of aluminium scrap, recycling around 1.35 mtpa of the metal domestically. India is well endowed to meet not only its domestic needs but also have a strong export presence.

Aluminium's versatile properties have turned it into a strategic metal. From hygienic packaging and electric transmission, its usage has grown manifold in the construction, infrastructure, automotive, machinery, information technology, mobile communications and aerospace industries. Aluminium powder is an ingredient in rocket propellants and high performance aluminium alloys are used in many weapons systems. Although the production of aluminium from bauxite ore is energy intensive, it is today regarded as a greening metal that is repeatedly recyclable with extensive usage in solar modules, e-vehicles, mass transportation and smart city development. India's consumption of aluminium, however, remains low at less than 3 kg per capita, against a world average of 11 kg. Its application extends to only around 300 uses, against 3000 internationally.

This study looks closely at three segments of the industry in India, comprising primary aluminium making, recycling of aluminium scrap and value added manufacturing. Primary aluminium makers have significantly built up backward and forward integration. Apart from getting into bauxite and coal mining, they are gradually extending their reach into certain value added products. Vulnerabilities, however, exist: from the high cost of power and the volatility of prices determined by the London Metal Exchange, to overcapacity in China.

Recycling of aluminium has rapidly grown in the country, using imported scrap. It has carved out a complementary space for itself with its usage suited particularly for certain cast products. It is, however, unorganised and lacks technology and standardisation. Collection and processing of domestic scrap has also not advanced.

Manufacturers of value added aluminium products complain of non-availability of primary aluminium at international prices and severe competition from China, the ASEAN countries and the Republic of Korea (ROK).

Somehow India's strength and competitiveness in primary aluminium production has not extended to the value added segment. Much of primary aluminium, a precious resource, gets exported. India does not figure high internationally in the manufacture of flat rolled aluminium products and extrusions that have wide applications.

This study examines India's trade flows covering all three segments of the aluminium industry. It maps the extent of value addition in each aluminium product group and the comparative advantage that India has or lacks in exporting them. India's tariff structure and export incentives for the aluminium sector are compared with competitive suppliers. Three key aspects are kept in perspective: a) the growth in production capacities in India and in other competitive suppliers, particularly China, in the last decade and more; b) India's FTAs with the ASEAN and East Asian countries; and more recently c) trade remedy actions taken by the US in respect of aluminium and its products.

The study surveys recommendations from recent studies on aluminium. A questionnaire survey was also undertaken, but elicited a limited response. This was supplemented with viewpoints from publicly available sources of stakeholders from the three segments. Differing perceptions emerged about tariff protection levels, the role for scrap imports and the roadmap for enhanced value added production.

The broad trends that emerged from the trade analysis were:

* A rapid growth of India's exports of unwrought aluminium, both alloyed and unalloyed (with the latter now comprising 15-20%), that together stood at 1.96 mt in 2019-20, comprising around 54% of production. Malaysia and ROK were the top markets for the unalloyed aluminium, and USA and Mexico for the alloyed variety.

* India's exports of value added items stood at around 400,000 tonnes in 2019-20. Aluminium wires, stranded cables, kitchen utensils and residual items under HS 7616, including castings, showed stable capacities and competitiveness. In most other items India's competitiveness was low.

* The US was India's main market for value added products, absorbing 25% of exports. The withdrawal of GSP to India in June 2019 by the US led to some decline in 2019-20, throwing up questions about export sustainability and the importance of its restoration. India has not been able to fully capitalise on the duty benefits under its FTAs for exporting

value added products to FTA partners. Nor has India's proximity to the SAARC countries helped. India's presence in the aluminium sector in Sri Lanka, Bangladesh and Nepal is impacted by their increased imports from China.

* Around 530,000 tonnes of value added products are being imported domestically. China's share aggregated to 57% by tonnage and 48% by value in 2019-20, and the share of the ASEAN countries was 21% in tonnage terms and 15% by value, implying lower unit values. Relatively low unit values and zero duty under the FTAs are in addition aiding increased unwrought alloyed aluminium imports from Malaysia (198,243 tonnes in 2019-20). All these products should be well within the realm of manufacture in India. Relatively low unit values also merit examination to ascertain whether such exports were subsidised.

* An inverted duty effect has resulted from India reducing its duties on most value added products to zero under its FTAs, but maintaining exclusion for primary unalloyed aluminium for which the applicable duty is 7.5%. Malaysia, which has followed the opposite policy, has particularly stood to benefit.

* India extends a uniform duty drawback and MEIS benefit to exporters of primary aluminium and value added products to several export destinations, barring some developed countries. China on the other hand has an export tax on primary aluminium, constraining its export.

Based on the foregoing analysis, the viewpoints gathered in surveys and other material available, the following policy recommendations are made in this study:

1. **Need for a balance between the three segments**: Pursue a balanced approach whereby all the three segments should be able to fire upto their potential. For a large country like India, a strong primary aluminium industry is critical. The country should, however, also gain from low energy recycling, even using imported scrap, as it is suitable for certain end use. Moreover, India should get the full benefits of undertaking value addition domestically and exporting the surplus. Overly protecting one segment or having excessively strict regulation of another may risk in the outcome continuing to be anomalous, as is the case at present.

2. **Need for an Aluminium policy:** Spell out aluminium's strategic role in the growing Indian economy, including towards advancing economic security. The national policy should set targets for production and

consumption over the next 10 to 15 year period. Current expansion plans of primary aluminium companies will raise capacity to only 6.3 mtpa in the next few years. According core status to the sector will help achieve targets set. The important roles for the recycling and value addition segments also deserve attention in the policy vision document.

3. **Need for a stable and graded tariff structure:** Move towards a graded and stable tariff structure in which the duties on aluminium scrap and primary aluminium, which are raw materials for value addition, are lower. It is recommended that the duty on aluminium scrap should be capped at 2.5% and brought down when possible. The duty on primary aluminium should also be lowered to a level not above 5%. Duties on value added products could be pegged at 7.5% or 10%, depending on the product.

4. **Strengthen the position of the primary aluminium producers:** It is crucial to assist primary producers in reducing input costs, particularly power related costs, to stay at the lower end of the cost curve among global suppliers. Imposing coal cess or electricity duty on these producers needs reconsideration. Reducing the effect of inverted duty impact on inputs also needs remedial action. Mining leases once awarded require quick follow up. Setting up aluminium clusters around primary plants can provide a ready market and reduce logistic costs. Making the Angul park experiment a success will mark a good beginning towards replicating it near other plant sites.

5. **Modernise Scrap recycling**: Establishment of a new Metal Recycling authority is a welcome step, which should, however, also play a promotional and modernising role in upgrading this segment. It can start with strengthening existing aluminium casting clusters that can serve as a model for newer ones. It would also be important to stop imports of non-ISRI graded scrap (HS 76020090). Export of domestic scrap should be disallowed.

6. **Need for an aluminium value addition strategy:** Design and implement a value addition strategy that consolidates existing strengths in areas like wires and cables, castings and kitchenware. Simultaneously, focus on building capacities in extrusions, FRP and specialised alloys. The latter two areas should be promoted under the PLI scheme of the government. All this will, however, progress only if primary aluminium can be made available to value added producers at close to international prices.
7. **RoDTEP scheme and aluminium:** Accord higher priority for value added aluminium products in setting rates for the RODTEP scheme. While this

study does not recommend placing curbs on primary aluminium exports, this option may need consideration if primary aluminium does not become available to value added producers at close to international prices.

8. **Research and skill development:** Provide necessary research and skill development support for all the foregoing initiatives. Die-casting and specialised alloy making have specifically been identified as desirables by the stakeholders. Standard setting and compliance testing and certification would also be important.

9. **Trade administration issues:** Ensure, through vigilant trade administration, that there is strict adherence to rules of origin by parties claiming FTA benefits, and there is also no misclassification. The recent customs notification requiring pre-registration of imports provides another tool to ensure transparency and monitoring. Implementation should, however, not result in delays for regular/authorised importers.

10. **Should India's FTAs be renegotiated?**: Renegotiation would require providing compensation in other areas and will thus not be easy. Effective administration of trade should be accompanied by close monitoring to ensure that there is no dumping or subsidisation.

11. **Privatisation of NALCO?:** Privatisation of NALCO is not recommended at this stage of a company that is profit making, that has developed good forward and backward integration, and is known to be a competitive bauxite and alumina producer across the globe. With only two other private players, in effect, active in the primary aluminium sector, NALCO remaining under the government's direct control has strategic importance for the present. It can continue to play a wider role including in terms of conducting research on specialised aluminium alloys for defense and strategic purposes as directed by the government. A key issue we are also concerned in the whole report is the price at which aluminium is sold to value added producers. If NALCO gets privatised price collusion may become easier.

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Section 1: Introduction

"Our country has plenty of natural resources. It is the need of the hour that we start the value addition of these natural resources and human resources; and to take the country to new heights. How long shall we continue to export raw material to the world? How long will the process of exporting raw material and importing finished goods continue? So, we will have to be self-reliant. We will have to resort to value addition of our capabilities as per the world's requirements. It is our responsibility. We want to move ahead in the field of value addition to contribute to world welfare." - from PM Narendra Modi's speech on 15 August 2020 on India's 73rd anniversary of independence[1]

Aluminium is a versatile metal that is almost three times as light as steel. It is, however, regarded as strong, durable, formable, resistant to corrosion and is a good conductor of electricity. It is also perpetually recyclable, losing none of its properties in the process. All these attributes make it a metal of choice for a variety of applications across various sectors such as aviation and aerospace, defense, electrical and electronics, transportation, construction, packaging and consumer durables.

Bauxite ore is the naturally available resource for aluminium production. Refining bauxite leads to alumina, which then has to be smelted at high temperatures into aluminium. The metal so produced can have higher than 99 per cent purity, referred to also as primary or mined or virgin aluminium. India has a substantial reserve of bauxite and ranks fifth in the world in production

[1] https://pib.gov.in/PressReleseDetail.aspx?PRID=1646045

of the ore. It also ranked second in primary aluminium production[2] at around 3.65 mmt per annum, even if it is a very distant second, after China[3].

Aluminium can also be obtained from recycling. Well sorted and graded aluminium scrap if melted and processed can yield aluminium of corresponding grade, also referred to as secondary aluminium, or recycled aluminium. Depending on the nature of scrap or waste used, it may have more of alloy composition. But production of the latter is over 90 per cent more energy efficient than the production of primary aluminium. India is a rapidly growing producer of secondary aluminium, estimated currently at around 1.35 mmt pa[4].

Unwrought aluminium of a primary or secondary kind, in the form of ingots, billets, and wire rods are processed to make intermediate products such as rods, bars, wires, plates and sheets that can be further tailored to various specific uses. A variety of processing options exist - casting, forging, extruding and rolling- for making intermediate products or to make a whole range of downstream products including foils, tubes and pipes, structures, containers, stranded wires and cables, kitchen utensils, doors and windows, claddings, solar panels and a host of other items. These products are manufactured in India using primary or secondary aluminium, depending on the specification of the end product.

Aluminium usage in India has, however, been low and is estimated at only around 2.5 to 3 kg per capita as against an average of 11 kg globally[5]. There is also a significant variation in the sectoral usage pattern in India that shows 48 per cent usage by the electrical sector. Nair and Dhanuraj (2017) have traced[6] the predominance of aluminium usage by the electrical sector to the

[2] As per data released by the Ministry of Mines the primary aluminium production in India in the financial year 2019-20 was 3.656 mmt as against an installed capacity of 4.126 mmt. The production in 2018-19 was 3.694 mmt. See the link at https://mines.gov.in/writereaddata/UploadFile/monthlysummary30042020.pdf

[3] China produced 36 mmt in 2019 almost ten times that of Indian production level. India was closely followed by Russian Federation which produced 3.6 mmt that year. This is as per the US National Minerals Information Center. See the link https://pubs.usgs.gov/periodicals/mcs2020/mcs2020-aluminum.pdf

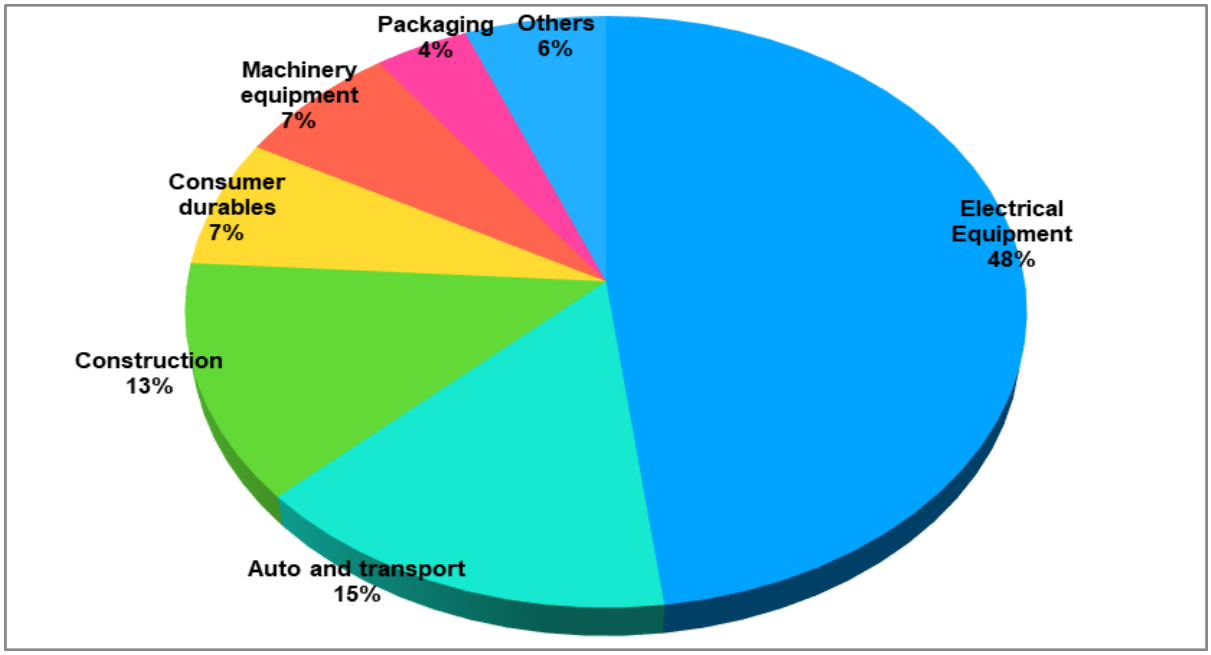
[4] As per a note on recycling circulated by the Ministry of Mines the recycled aluminium production was estimated at 1.348 in 2018-19 and 1.395 mmt in 2019-20. See the link at https://mines.gov.in/writereaddata/UploadFile/policy27032020.pdf

[5] See the news item https://economictimes.indiatimes.com/blogs/et-commentary/counting-on-policy-support-for-indian-primary-aluminium/es

[6] Evaluation of the effects of tariff hikes on Indian aluminium industry by Lekshmi R. Nair and D. Dhanuraj, Centre for Public Policy Research, June 2017 accessible at https://www.cppr.in/wp-content/uploads/2017/06/Evaluation-of-the-Effects-of-Tariff-Hikes-on-Indian-Aluminium-Industry.pdf

aluminium regulation order of 1970 that required 50 per cent of total aluminium production as electrical conductor grade (EC) in the shape of ingots and wire rods.

Figure 1. 1: Sectoral Aluminium Consumption in India



Source: Minerals Yearbook 2018

Aluminium in India is also used only in about 300 applications, compared to over 3000 in more advanced countries[7]. This will likely change as the country progresses further, since aluminium, being lightweight and recyclable, is also seen as more environment friendly and already finds wider use in the manufacture of electrical vehicles and rapid transit systems. With the government in India launching the Make in India and Atmanirbhar Bharat campaigns in order to boost and expand the manufacturing sector, and also as a result of the various initiatives to boost infrastructure, create smart cities and provide housing for all, there is bound to be greater demand for aluminium products.

Another distinguishing feature in India's aluminium usage is the low level of recycling of domestic aluminium waste or scrap, estimated at only 10-15 per cent of the total aluminium scrap recycled in the country. The rest of the scrap for recycling is imported. More advanced countries have a far higher percentage. This aspect has received domestic attention in recent years and the

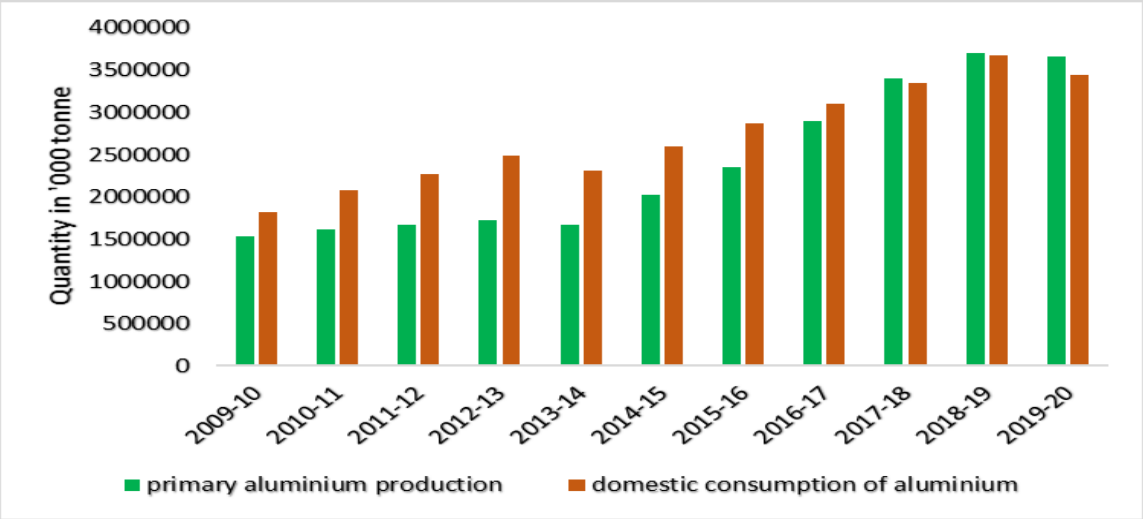
[7] op cit.,

Ministry of Mines (March 2020) had circulated a draft National Non-Ferrous metals (Aluminium and Copper) Scrap Recycling Policy for wider discussion[8].

Against the above backdrop there are several inter-related issues that pose challenges as the country moves towards the further development of the aluminium industry.

1. First, is the challenge of increasing aluminium consumption domestically and moving towards the global average. The total domestic consumption has risen from 1.81 mmt in 2009-10 to 3.674 mmt in 2018-19 which is, however, still less than 3 kg per capita. Moreover, the economic slowdown saw the consumption[9] dip slightly to 3.437 mmt in 2019-20, which will very likely be even lower in 2020-21 thanks to the impact of COVID-19. Reviving and speeding up increased domestic consumption has to be a priority and doubling consumption levels by 2025 or so should be a worthwhile target.

Figure 1. 2: Production and consumption of aluminium in India



Source: Figures computed from data given by Ministry of Mines and Ministry of Commerce and Industry

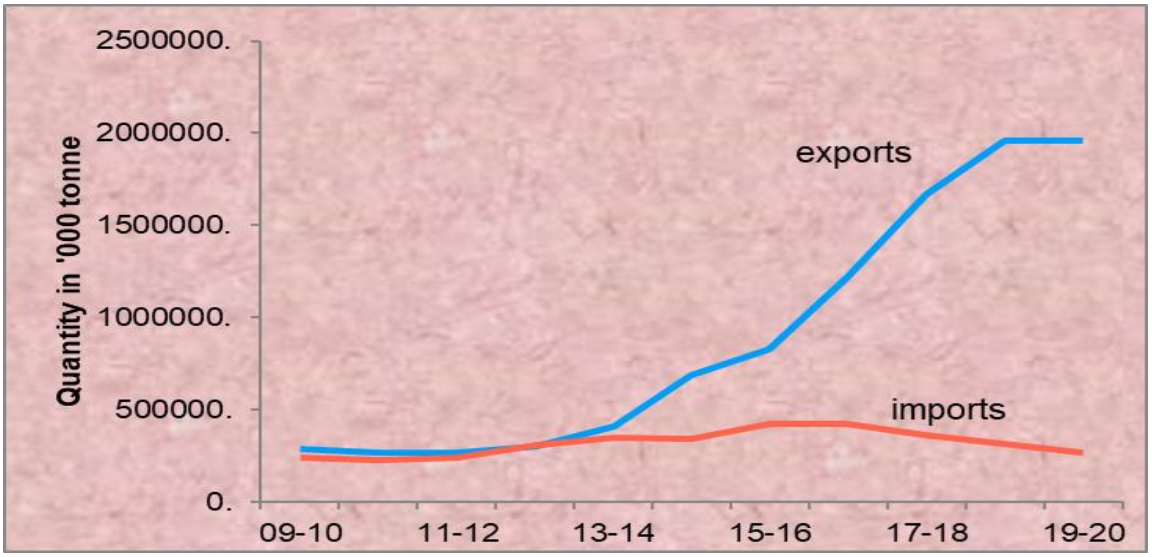
2. Second, while domestic production of primary aluminium has been increasing and went up from 1.525 mmt in 2009-10 to 3.694 mmt in 2018-19, with a slight dip to 3.656 mmt in 2019-20, a majority of primary aluminium produced in the country is getting exported as unwrought

[8] The draft policy aims for a comprehensive revamping of recycling to make it an organised industry and to progressively shift to a circular economy. The draft can be seen at https://mines.gov.in/writereaddata/UploadFile/policy27032020.pdf

[9] We talk here about apparent consumption which is production of primary aluminium minus exports plus imports of HS 76 products. Admittedly it is an approximation but appears a reasonable one

aluminium. In 2019-20, this accounted for 53.6% of primary aluminium produced that year. Indeed, between 2009-10 and 2019-20, while India produced an additional 2.130 mmt of primary aluminium, only 0.45 mmt of this additional production was used domestically for making value added products and the rest was exported. Boosting value addition domestically brings larger revenues and employment. Even as, therefore, we need to significantly expand domestic primary aluminium production and to sharply increase domestic consumption, this needs to be coupled with a far greater level of domestic value addition.

Figure 1. 3: India's trade in unwrought aluminium



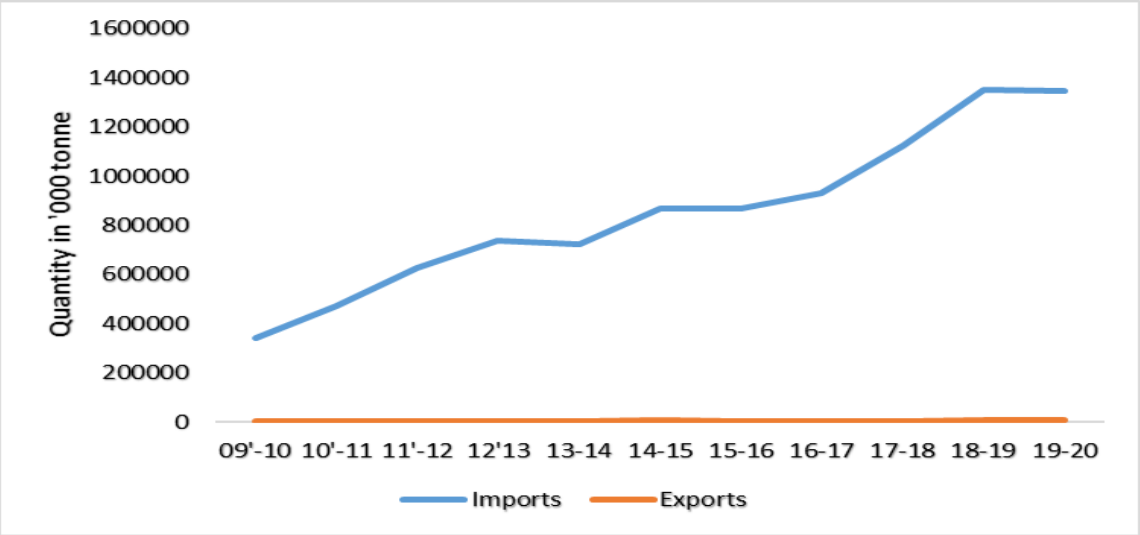
Source: Ministry of Commerce and Industry

3. Third, a good deal of value added production in India currently also takes place through the use of secondary aluminium. Out of a total aluminium consumption level of 3.676 mmt in 2019-20, 1.347 mmt was out of imported scrap aluminium, indicating a 36.6% dependance on this resource. This dependance was only 18.75% in 2009-10 but has progressively moved up. While both primary and secondary aluminium contribute towards increasing consumption, does an increased share of secondary aluminium in the mix undermine the growth of the primary aluminium segment? The Aluminium Association of India, worried about this competition, is demanding[10] a higher import duty on aluminium scrap import than the present 2.5%. On the other hand, recyclers in India

[10] See for example the news item https://www.livemint.com/politics/policy/aluminium-association-suggests-raising-import-duty-on-all-products-11576221304455.html

are demanding zero duty[11] to make its availability even wider and for making finished products more competitive. Is there a balance that needs to be maintained and if so how should that be achieved? And as for domestic scrap, how do we optimise its collection, sorting and processing so that it can account for a greater share in meeting our aluminium scrap needs?

Figure 1. 4: India's trade in aluminium scrap



Source: Ministry of Commerce and Industry

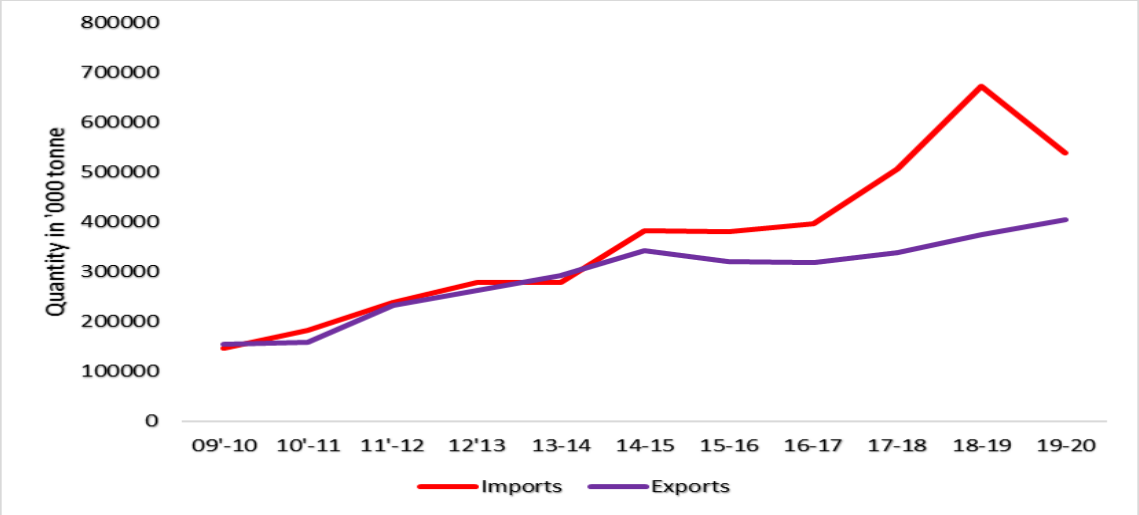
4. Fourth, India is both an exporter and importer of aluminium and its products. For several years since 2006-07, India remained a net importer of these items[12]. This position has, however, changed from 2017-18 and India has become a net exporter (See Table 1.1 in the Annexure). There is also now a steady increase in India's aluminium exports in each of the following three segments: unwrought Aluminium (HS 7601), intermediate aluminium products (HS 7603-7606) and downstream aluminium products (HS 7607-7616), even as there were some dips in 2019-20 (see Tables 1.2 to 1.5 in Annexure). While India's trade balance in unwrought aluminium has registered a substantial surplus, the trade balance has been rising adversely in the value added segments. In other words, India has not been able to extend its upstream strength to more value added products and India's imports of value added aluminium have witnessed

[11] See for example the news item of 27 September 2018, "MRAI urges govt to remove import duty from aluminium scrap" that can be accessed at the link https://www.business-standard.com/article/pti-stories/mrai-urges-govt-to-remove-import-duty-from-aluminium-scarp-118092700817_1.html

[12] The reference here is confined to HS 76 which covers aluminum and aluminium products but would not include auto parts or other items in other HS chapters even as aluminium may be substantially used in producing them.

significant increases, to an even greater degree than their respective exports. These imports are mainly coming from China and some countries with which India has an FTA. Imports from the latter come in at zero duty while the MFN duty for these value added items ranges between 7.5 and 10%. While greater competitiveness of some of those economies could be a factor, some are also recipients of export incentives and other advantages granted by their home governments. How can India turn the tables and become a competitive producer not only of primary aluminium but also of value added products downstream[13]? Is it also feasible to review these zero duties under the FTA arrangements?

Figure 1. 5: India's trade in value-added aluminium products



Source: Ministry of Commerce and Industry

5. Aside from the above, there are a host of emerging issues. The need for greater skilling of personnel in certain downstream activities like die-casting is one. The absence of a strong R&D segment in aluminium metallurgy has also been commented on by many. Increased attention given by some in the global aluminium industry towards promoting low carbon aluminium and green aluminium also cannot be ignored. Further, while the imposition of additional duties on aluminium imports into the

[13] The Annual Report 2019-20 of NALCO, a PSU, admits in page 42 that 'The major weakness of the domestic Aluminium sector is the lack of sufficient production of downstream products, although India is one of the largest producers of primary aluminium. Due to limited scope of value addition within the country, primary aluminium producers are currently exporting large quantities of primary aluminium products. At the same time, sizeable quantity of downstream products is being imported into the country, as they are not being manufactured locally. Further, the lack of investment in R&D activities and absence of research facilities also restrict the scope for product improvisation and development of world-class or niche products, which can provide the much needed competitive edge to Indian Aluminium producers in the global market'.

US on grounds of national economic security in March 2018 raised several eyebrows, it has also underlined the strategic role played by the aluminium industry in a modern economy.

The purpose of this study is to gain some insights into all these aspects by analysing trade trends in aluminium and its products in recent years. The attempt is to provide inputs for policy making towards transforming this underperforming industry to emerge as a champion strategic sector in line with an Aatmanirbharta ideals.

Section 2 of this report carries an overview of the different segments of the aluminium industry in India: the primary, the secondary and the value added. In Section 3, trade trends of aluminium and its products, all figuring under HS Chapter 76, are analysed in some detail, including the sources of their import, their export destinations and the customs duty levels in force both at the MFN level and for specific FTA partners. A brief sub-section 3A then looks at aluminium trade trends during the COVID-19 period, since these have been somewhat different than in normal years. Section 4 gives a brief survey of existing studies by think tanks and certain experts, as well as a few sponsored by the industry associations, on the subject. In Section 5, we dwell on the rather limited number of responses we received to our questionnaires for this study, apart from also flagging the viewpoints expressed publicly in the media and elsewhere by the stakeholders from the aluminium industry. In Section 6, we present a discussion of the key issues and make certain recommendations.

Section 2: The aluminium industry in India

In this section we shall briefly sketch out the various segments of the domestic aluminium industry in a manner relevant to our study. This will principally cover primary aluminium production in Section 2A, followed by an overview of secondary aluminium making in Section 2B. We shall then look at the variety of downstream products and their manufacture in Section 2C.

2A Primary aluminium production in India

Aluminium is produced industrially by electronic reduction of alumina through a smelting process termed as the Hall Heroult process. As explained in a note[14] by the Indian aluminium company BALCO, the raw materials apart from alumina are carbon, aluminium fluoride and cryolite. Aluminium is formed at 900° C even as once formed it can be quickly cooled since it has a melting point of 600° C. Smelting of aluminium is energy intensive, requiring around 13460 kwh per tonne and power costs accounts for close to 40 per cent of aluminium making. Alumina, in turn, is produced by the Bayer process involving dissolution of crushed bauxite ore in caustic soda, precipitating alumina trihydrate that is then calcined to give alumina. In all, it will require 4 mt of bauxite to produce 1.935 mt of alumina which when smelted yields 1 mt of primary aluminium.

There are four producers of primary aluminium in India. One is a public sector company NALCO. Another company BALCO has 49 per cent ownership by the government even as 51 per cent is with Sterlite industries which is a subsidiary of the Vedanta Group. The other two companies are HINDALCO run by the Aditya Birla Group and Vedanta limited run by the Vedanta Group.

All the four aluminium producing companies have integrated production facilities starting from alumina refining to running aluminium smelters. All of them also have captive power generation facilities to cater substantially to their needs. A good part of alumina produced by them is also linked to captive bauxite mines owned by these producers, although they do not fully cover their production needs. The balance is met through linkages and long-term arrangements. Some of the producers also have captive coal mines, even as they are still too few and do not cover all the fuel needs for their captive power

[14] See the link at http://www.balcoindia.com/operations/pdf/Aluminium-Production-Process.pdf

plants which are overwhelmingly coal based. Table 2.1 captures the different facilities, their locations and capacities of the four primary producers.

Table 2. 1: Facilities and capacities of the four primary aluminium producers[15]

	NALCO	BALCO	HINDALCO	VEDANTA
Coal Mines	Sourced from Talcher coal fields but not a captive field (Utkal D and E coal blocks allocated to NALCO by GoI in 2015)	Chotia (1000 ktpa) is a captive mine. But rest of the needs sourced from outside.	Coal requirements met by linkages and following captive mines: Gare Palma, Kathautia and Dumri.	Sourced from Mahanadi coal fields
Captive power plants (CPP)	Angul (coal based) - 1200 MW	Four coal based CPPs all based in Korba. 270 MW+540 MW+600 MW+300 MW	Renusagar and coal based CPPs at Hirakud, Aditya and Mahan	CPP (90 MW) at Lanjigarh and two coal based CPPs at Jharsuguda (1215 MW+ 1800MW)
Bauxite Mines	Panchapatmali and Pottangi mines	Mainpat (750 ktpa) Bodai Daldali (1250 ktpa)	Baphlimali	Has a long time arrangement with Odisha Mining Corporation for bauxite supply- Kodingamali mine
Alumina Refineries	Damanjodi (2275 ktpa)	Korba (2150 ktpa)	Renukoot Muri Utkal and Belagavi (2000 ktpa on expansion)	Lanjigarh (1800 ktpa)

[15] This table has been put together with data publicly available.

	NALCO	BALCO	HINDALCO	VEDANTA
Aluminium Smelters	Angul (460 ktpa)	Korba (570 ktpa)	Renukoot (345 ktpa) Hirakud (165 ktpa) Aditya (360 ktpa) Mahan (360 ktpa)	Jharsuguda- 2 smelters; 500 ktpa+ 1250 ktpa
Aluminium casting				Jharsuguda designed for 5,50,000 tonnes of cast products
Downstream products	1. Ingots, billets, wire rods 2. Cold rolled sheets & coils 3. Chequered sheets	1. Ingots, billets, wire rods 2. Busbars 3. Rolled products	1. Ingots, billets and wire rods; 2. Extrusions; 3. Foils 4. Branded foil wraps, windows, roofings	1. Ingots, billets, wire rods
Rolled products unit	Angul (50,000 MT)	Closed down	Hirakud (135KT), Belur (2,500tpa), Mouda, Renukoot (25,000tpa), Taloja	
Aluminium extrusions			Renukoot and Alupuram (60,000tpa)	

	NALCO	BALCO	HINDALCO	VEDANTA
Expansion planned or underway	1. High end aluminium plates 2. Rolled products, foil, extrusions & alloy wheels. 3. Spread over next 7-8 years NALCO to have Rs.30,000 crore expansion plan that would add 3.5 mtpa in Potangi bauxite mine, 1 mtpa in Alumina refining capacity and 0.5 mtpa of aluminium smelting along with 1200 MW of power.	1. To expand its smelting capacity from 570 ktpa to 1.085 mtpa	1. In the next few years company plans to raise capacity of downstream products from 300,000 mtpa to 600,000 mtpa with investment of Rs.7000 crores. Part of it will be an extrusion plant for 34,000 mtpa in Silvassa in 24 months. 2. Circles and hard alloys. 3. New scrap furnace at Hirakud	1. Construction of 1.1 mtpa smelter expansion project at Jharsuguda 2. Enhancing capacity at Lanjhigarh refinery. 3. Expansion of captive power generation capacity by 300 MW.

With a view to making the grant of mining leases more transparent through auctions, the government brought in the Mines and Minerals (Development and Regulation) Amendment Act in 2015 that has since been adopted and implemented. In the last four years or so, seven bauxite mining sites have also been so auctioned by the government[16]. None of them have, however, been taken by the four producer companies. On the other hand, the opening of coal blocks for private companies announced last year as part of the stimulus programme had evoked a better response among the aluminium producers,

[16] The list of successful bidders is available in the website of the Ministry of Mines

and both Vedanta Ltd and Hindalco Industries have won[17] coal mining sites in the auction conducted in November 2020.

Table 2.1 depicts the forward and backward integration at play by the four Indian primary aluminium companies. More relevantly to our study, it portrays the strength of India in the primary aluminium sector as it has adequate reserves of good quality bauxite and coal, all in the central belt of the country. Even as certain other global primary aluminium producers, particularly in countries endowed with rich fuel resources, have the benefit of low cost energy in this energy intensive sector, the Indian situation has its merits coupled with the country's relatively lower wage levels. All of this needs consolidation towards entrenching the concept of atmanirbharta in this sector. The PSU NALCO is also in the process of forming joint ventures[18] for the production of coal tar pitch and caustic soda which are raw materials used by the primary producers.

In the last ten years or so, India's production of primary aluminium has more than doubled from around 1.53 mtpa in 2009-10 to around 3.65 mtpa in 2019-20, catapulting it from seventh in rank in the world to the second position. This has happened mainly on account of a seven-fold increase in the capacity of Vedanta Limited even as HINDALCO has also more than doubled its production. The capacity of BALCO too has risen significantly even if not as rapidly as the other two. The capacity and production by NALCO has in comparison changed only marginally over these years. The actual production figures for primary aluminium for the last several years as also their exports during this period may be seen at Table 2.2.

[17] http://www.coal.nic.in/sites/default/files/2021-01/Notice%20regarding%20Declarartion%20of%20Successful%20Bidder_0.pdf

[18] See pages 52-53 of NALCO Annual Report for 2019-20

Table 2. 2: Production and other details of Bauxite and Aluminium

Year	Bauxite Production (Quantity in tonnes)	Aluminium (in tonnes)	
		Primary aluminium Production	Exports of unwrought aluminium (HS 7601)
09-10	14,124,093	15,25,171	2,84,900
10-11	12,722,820	16,19,455	2,66,409
11-12	13,599,566	16,67,675	2,69,925
12-13	16,507,960	17,20,427	2,99,673
13-14	22,319,148	16,67,300	4,11,228
14-15	22,493,671	20,26,803	6,85,489
15-16	28,123,789	23,54,949	8,28,640
16-17	24,745,487	28,96,629	12,23,843
17-18	22,786,106	34.00,618	16.68,660
18-19 (P)	23,687,721	36,94,342	19,56,926
19-20	N. A	36,56,130	18,65,499

Source: Metals bulletin and Indian Bureau of Mines reports of various years; and export figures from DGCIS.

All the primary aluminium producers have expansion plans [19] [20] [21] for aluminum production and for backward and forward integration. But the gestation periods for these facilities to come from a concept stage into production are long, including the time taken for securing environmental and other clearances. If the country has to move towards doubling aluminium consumption by 2025 or so, clearly a lot more of planning and speeding up of execution will be necessary. Even if all the announced capacity expansion plans come on stream, they will at most expand total capacity in primary aluminium production to 6.3 mtpa.

[19] See https://nalcoindia.com/pre-rel/nalco-to-invest-rs-30000-crores-for-expansion-and-business-diversification-union-mines-minister-shri-pralhad-joshi/

[20] See also http://environmentclearance.nic.in/writereaddata/Online/TOR/19_Aug_2017_232409673I0Q0QVTLPre-FeasbilityReport.pdf

[21] https://www.livemint.com/companies/news/vedanta-to-focus-on-purse-strings-amid-aluminum-expansion-1565098162749.html

Another detail available from a recent CII presentation is that two out of six Indian Alumina refineries are cost leaders and two more figure in the lower half of the curve for various global refineries, while the other two are in the middle of the upper half of the cost curve. While all the smelters, as per this presentation, have a high level of aluminium purity of 99.88%, none of them are cost leaders. But of the seven smelters in the country, three figure among the lower half of the cost curve, one right in the middle and three more in the upper half. It is interesting to note that in the case of China too, the aluminium producers figure across the cost curve spectrum, more on the middle or the higher end of the cost curve, even as evidence indicates that their smelting costs have been steadily coming down.

One of the weaknesses perceived by the Indian aluminium producers[22] is the volatility they see in international aluminium prices that is sensitive to change for a variety of reasons. The London Metal Exchange (LME) cash aluminium price was US$ 2395 per tonne in 2011 but reached a low of US$ 1605 by 2016, taking many world smelters out of business. Overcapacity in China and the fall in oil prices played a role in these developments. When aluminium prices rose to US$ 2111 by 2018, hopes revived but the LME price again nosedived to US$ 1770 by end 2019 following uncertainties resulting from the US-China trade war and a slowdown in China's own consumption. The onset of COVID-19 marked a further decline to around US$ 1450 by April-May 2020, but the prices have since revived. There appears to be a growing sentiment among Indian producers that they need to get linked to more value added product business in India to shield themselves against the volatility of global prices for primary aluminium. This is against the backdrop of their exporting more than half of their present primary aluminium production to overseas markets, particularly in the last few years.

The other issues highlighted by the aluminium companies in their annual reports include the threat of competition from China and the difficulties arising from rising imports of scrap and other value added products into India from FTA countries.

The Indian producers have already tried to limit their vulnerability to vagaries of raw material availability or fluctuations in electricity prices by trying to integrate their operations as far as possible. We can expect this upstream integration effort to continue, such as by also going in for more captive coal

[22] See for example the Annual Report for 2019-20 of the Hindalco Company that cites on of their businesses' weakness is that upstream business was linked global aluminium prices and theirs was a commodity product with a smaller share of making value added products.

mines. Bringing in new technology, reducing power needed for smelting a tonne of aluminium, reducing alumina refining cost or other innovations are being attempted by companies[23] to keep their costs low.

Aluminium producers have flagged issues about the limited support they receive from the government as against that received by their counterparts in other countries[24], including China. They have further made submissions to the government relating to electricity duty, elimination of coal cess and reduction in the high level of import duties on raw materials used by them - aluminium fluoride, coal tar pitch and caustic soda. Before the recent budget, they had also sought a further raise in the import duty on aluminium to 10%[25]. These are aspects we shall discuss later in the report.

The other challenge before our aluminium producers is in alloy making for various specific uses. While Indian capacities meet many of the requirements in the building and construction, consumer durables, electrical and industrial sectors, they do not extend to automotive, defence and aerospace industries. While reports suggest Indian producers are making an effort to fill the needs here,[26] [27] this will also require substantial investment in R&D activities.

Generally, alloys can be cast alloys or wrought alloys, depending on end use. Cast alloy is the alloy that is melted in a furnace with the alloying elements and poured into a mould for the required purpose. Wrought alloy is when the alloy

[23] See for example a news item on Vedanta Group's efforts https://www.business-standard.com/article/companies/vedanta-s-aluminium-cost-of-production-falls-12-in-april-december-120020701298_1.html

[24] See for example a newsitem ' Deals with government, Power companies provide Alcoa Australia a five year respite' dated March 20, 2021, in the Aluminium Insider, that refers to how the firm struck deals with electricity providers and state governments that included lowering power costs and a US$ 124 mn aid package.

[25] See for example https://www.businesstoday.in/current/economy-politics/budget-2021-aluminium-industry-seeks-raise-in-basic-custom-duty/story/428444.html

[26] See for example the interview here by the CEO of Vedanta Limited talking about his company's initiative in beginning to make Primary Foundry Alloys (PFA) for use in the automotive industry. It can be accessed at https://www.weldfabtechtimes.com/interviews/the-indian-aluminium-demand-is-growing-at-a-cagr-of-10-on-a-mid-term-basis-in-the-next-10-years-the-demand-is-anticipated-to-increase-to-over-12-million-tonnes-faster-than-the-current-6-7/

[27] NALCO has also constituted a Joint Venture Company named M/s. Utkarsha Aluminium Dhatu Nigam Limited (UADNL) with M/s. Mishra Dhatu Nigam Ltd. (MIDHANI) in August, 2019 for establishment of high end Aluminium Alloy Plant of capacity 60,000 TPA for use in Defence, Aerospace and Automobile sectors. Govt. of Andhra Pradesh has allotted 110 acres of land for the project in Nellore district. See page 53 of NALCO Annual report for 2019-20.

metal is worked in the solid form with the help of specific tools. They can have very different properties.

It may be mentioned here for better understanding that wrought aluminium alloys are categorized based on the primary alloying element added to basic aluminium. The numbering system is a 4-digit one. The first digit (**X**xxx) indicates the principal alloying element that is added to aluminium alloy i.e. 1000 series, 2000 series etc. The second digit (x**X**xx) indicates a modification of the specific alloy, and third and fourth digits (xx**XX**) are arbitrary numbers. For example, in 5183, 5 represents magnesium alloy series, 1 indicates that it is first modification of the original alloy, and 83 shows it is in the 5xxx series. The cast alloy numbering follows a slightly different numbering system but we shall not detail them here[28].

Box 2. 1: Aluminium alloy numbering and the areas of their application

Alloy number	Description
1xxx	Ninety-nine per cent pure aluminium having high thermal and electrical conductivity, corrosion resistant, low mechanical strength etc. As a result, it is used for manufacture of electrical equipment, food packaging trays, decorative products etc.
2xxx	The alloys in this series include properties ranging from high strength, toughness and resistant to atmospheric corrosion. This alloy series is a combination of aluminium-copper and are used for applications in aircraft and other aerospace equipment.
3xxx	This category is non-heat treatable. The non-heat alloys acquire strength through strain hardening. The usage includes manufacture of cooking utensils, beverage cans, rigid containers etc.
4xxx	This series is aluminium-silicon alloy which is extensively used as filler material within welding process apart from automobile industry.
5xxx	The aluminium-magnesium alloy is mainly used in manufacturing storage tanks, marine applications, building and construction activities etc.

[28] https://www.esabna.com/us/en/education/blog/understanding-the-aluminum-alloy-designation-system.cfm

Alloy number	Description
6xxx	This series is general purpose magnesium-silicon alloy used for architectural applications such as bridge construction, manufacture of heavy vehicles, marine equipment etc.
7xxx	This series is zinc alloy and is used for transportation and aerospace applications.

2B Recycled or Secondary aluminium making in India

Recycling aluminium waste or scrap has become a growing business in India, even as the sector remains largely unregulated and unorganised. The investment needs of a recycling facility are far lower compared to primary production. A google search brings forth the names of at least a hundred Indian aluminium scrap recycling companies. A few appear somewhat larger in size with claims of ISO certifications for their manufacturing processes, but others less so. All but a few of them are also in the MSME sector. The Aditya Birla group has a recycling unit at Taloja in Maharashtra with a capacity of 25,000 tonnes per annum. An MOU has also been signed by the group in 2018 with the Government of Gujarat[29] for setting up a bigger recycling unit in the state.

According to the draft non-ferrous metals recycling policy circulated by the Ministry of Mines, 30 per cent of Indian recycling companies produce 70 per cent of secondary aluminium with stringent quality measures [30] . The remaining 70 per cent of companies produce around 30 per cent and their products are largely sold to SMEs, which in turn follow stringent quality norms. In other words, the contention is that the stringency of demand has ensured that much of the industry adheres to quality conformance. The draft policy document estimates that only around 10 per cent of production, mainly of recyclers catering to extrusion manufacturers and utensil makers, may not be maintaining rigid quality norms.

The recycling of aluminium can be of home scrap, new scrap or old scrap. Home scrap is the scrap generated by an aluminium manufacturing facility in the form of trimmings or cuttings and is often recycled in the manufacturing facility itself. New scrap is also pre-consumer scrap generated by an aluminium

[29] See for example https://www.financialexpress.com/industry/hindalco-to-set-up-indias-biggest-aluminium-recycling-plants/1314099/

[30] See page 29 of https://mines.gov.in/writereaddata/UploadFile/policy27032020.pdf

product manufacturing facility, such as an extrusions maker, but which has to be sent to another unit for recycling. Old scrap refers to used and discarded scrap after the product's end of life.

Notwithstanding the extent of sorting any used scrap may have undergone, it may still retain contamination with foreign elements. Various methods are employed to ensure separation before they can be remelted. But aluminium recycling is still very attractive in that the recycling process uses only 5 per cent of energy requirements as compared to the manufacture of primary aluminium. Seen from a conservation point of view as well, the scrap retains 95 per cent of energy content and recycling is both an economically and environmentally an advisable course to follow.

While the alloy composition of any new scrap is generally known, used scrap even after separation may have impurities to different degrees. The International Scrap Research Institute (ISRI) has a classification system for scrap depending on its earlier usage, alloy composition and tolerance level for possible impurities. India's imports of aluminium scrap under HS 76020100 require them to be of ISRI grades which number close to 50 as per the customs tariff rules (see Box 2.2). India's imports of 'other scrap' under HS 76020190 are quite low and it may be advisable to stop them altogether.

Recycling of used scrap involves three or four stages - collection, sorting and recovery and refining or remelting. Collection starts from households, municipal waste and other sources of waste generation which then makes its way to small and medium waste collectors and to merchants of metal waste. The stage of sorting and recovery involves shredding and various modes of separating other elements, including through eddy current separation, electro-magnetic separation, gravity separation, colour sensors and using x-rays. Few Indian recyclers, however, have the full range in their facilities.

Aluminium remelting companies mainly use aluminium scrap obtained directly from manufacturing or other scrap about whose precise composition they know. Where required, remelters also use primary aluminium for mixing to ensure that the resulting metal does not have impurities above a certain level. Remelted aluminium is mainly used for producing extrusions and rolled products.

Companies involved in refining scrap, on the other hand, can use a broader range of scrap as inputs for producing casting alloys. These then go to foundries for producing alloys of the required specifications. A large part of secondary refined aluminium gets used in the automotive industry, apart from also being used as a deoxidant for the steel industry.

India's manufacture of recycled aluminium depends for its raw material needs mainly on imported aluminium scrap which have more than doubled within a decade. From only 0.62 m tonnes of import in 2011-12, they have risen to 1.35 m tonnes in 2018-19. India principally imports ISRI graded scrap (HS 76020010), which to some extent mitigates the limitations of our recycling facilities. While domestic scrap is also known to be used, this is estimated at only 10-15% of total scrap used for secondary aluminium production in the country[31]. Domestic scrap is not as well sorted and graded and it is known to be largely used by utensil manufacturers and some extruders.

Overall estimates of metal recovery from aluminium scrap can only be broadly guessed. Level of metal recovery depends on the technology used and the grade of the input scrap. While recycling generally can yield between 70 per cent and 95 per cent of the input scrap, studies appear to show that real metal losses could be made even less than 2%, making the net metal yield 98 per cent[32].

[31] See page 27 of the document https://mines.gov.in/writereaddata/UploadFile/policy27032020.pdf

[32] See pages 14-15 of the paper 'Global Aluminium Recycling: A cornerstonnee of sustainable development' developed by International aluminium Institute, 2009, accessible at http://www.world-aluminium.org/media/filer_public/2013/01/15/fl0000181.pdf

Table 2. 3: Imports into India of aluminium scrap and their unit values

	2011-12	2016-17	2017-18	2018-19	2019-20
Imports of HS 76020010 of aluminium scrap (US$ mn)	1261.61	1400.3	2041.39	2467.34	1978.61
Imports of HS 76020010 of aluminium scrap in tonnes	6,22,989	9,29,861	11,19,769	13,48,236	13,47, 299
Unit value of imported HS 76020010 of aluminium scrap in US$ per tonne	2025.1	1505.92	1823.04	1830.05	1470.00
Unit value of imported HS 7601 of unwrought aluminium in US$ per tonne	2517.1	1856.47	2232.19	2275.19	1968.87

Source: DGCIS

In India, as noted by a Niti Aayog policy paper,[33] the present technology used by most of the small-scale operators is primitive, resulting in loss of the metal to dross and also contamination with undesired elements. It can, therefore, be estimated that domestic secondary aluminum production in 2018-19, that used both imported and domestic scrap as raw material (estimated at 1.35 mn tonnes and 120,000 tonnes respectively), must have been around 1.20-1.35 m tonnes. This works out to about 35% per cent of total primary aluminium production in the country[34]. Globally, on the other hand, secondary aluminium production in 2018 was 31.75 m tonnes that amounted to approximately 48 per cent of primary aluminium production that year at 65.56 m tonnes[35].

[33] Strategy on Resource efficiency in the aluminium sector, January, 2019

[34] As per another study 'Evolving Role of Scrap in India by Rahul Prithiani, Director – CRISIL Research' secondary aluminium demand in India was estimated at 1.1 mt in 2016-17 that constituted 31 per cent of overall demand of 3.5 mt that year.

[35] See https://alucycle.world-aluminium.org/public-access/

Aluminium scrap does not, however, come cheap. As will be seen from Table 2.4, the average CIF value per tonne of imported aluminum scrap (HS 76020010) in India in 2018-19 was US$ 1830 which was around 80 per cent of the average unit value of imported unwrought metal (HS 7601) at US$ 2275 that year. Scrap prices also keep fluctuating as per market trends of the primary metal.

That said, secondary aluminium production carries several advantages. It is environmentally more conservation friendly, using far less energy and resulting in much lower greenhouse gas emissions (in both aspects over 90 per cent less than for primary aluminium production). Secondly, if aluminium alloy castings are to be produced from primary aluminium, alloys will need to be added with the primary aluminium, which will mean extra cost. Instead, a rightly chosen aluminium cast scrap already will have the alloying elements, such as silicon, copper etc. The savings of this kind may be limited in respect of wrought alloys but even here, for example, used beverage cans are widely recycled. Secondary aluminium, being less investment intensive, also allows a wider range of SME entrepreneurs to engage in this business with significant employment potential. Furthermore, it helps in conserving bauxite reserves in the country.

The sectoral usage of secondary aluminium is also somewhat different, compared to primary aluminium, the former principally getting used in castings for automotive, white goods and, to some extent, the electrical sector. Considering India's low aluminium per capita consumption, there is a lot of room for expanding secondary aluminium production to national advantage. And for the next ten years or even more, continued sustenance of secondary production based on imported aluminium scrap may be necessary to allow for adequate aluminium-in-use stock in the country to build up before they become available as scrap after their end of life. This is because while some scrap like that from food wrapping, beverage cans and other aluminium foil packaging, has a short shelf life before becoming used scrap, scrap from the automobile or machinery and equipment sectors may come to the scrap stage only after 15 to 25 years. Scrap arising from buildings, electrical wiring and power grids would take even longer.

Aluminium scrap being precious, it is important that every effort is made towards ensuring that it is collected, sorted and processed in a well organised

and regulated manner and does not end up in landfills. India's recycling rate at around 25 per cent is quite low[36] [37].

Several developed countries have stopped importing scrap that is not only expensive but also comes with unpredictable environmental hazards. And they already have a substantial level of aluminium accrued domestically over the years to rely upon. India has considerable distance to cover to come anywhere close to reaching that stage, where domestic scrap can fully meet the needs of our secondary aluminium industry.

Box 2. 2: ISRI graded scrap[38]

Code	Description
Tablet	Clean aluminium lithographic sheets
Tabloid	New, clean aluminium lithographic sheets
Taboo	Mixed low copper aluminium clippings and solids
Taint/Tabor	Clean mixed old alloy sheet aluminium
Take	New aluminium can stock
Talc	Old can stock
Talcred	Shredded aluminium used beverages can (U) scrap
Taldack	Densified aluminium used beverages can (UBC) scrap
Taldon	Baled aluminium used beverage can (UBC) scrap
Taldork	Briquetted aluminium used beverage can (UBC) scrap
Tale	Painted siding
Talent	Coated scrap
Talk	Aluminium scrap radiators
Tall	E.C. aluminium nodules

[36] The recycling rate is defined as the total recycled metal in the country in comparison with the total available end of life scrap metal.

[37] A report by Frost and Sullivan sponsored by MRAI on 'Metal Recycling Sector, Contributor to national wealth; Current status and challenges has estimated the country's aluminium recycling rate for aluminium at around 50% even as the draft note on recycling of non-ferrous metals has pegged it around 25%.

[38] Fuller details of the scrap specifications can also be seen in the ISRI Scrap specifications circular accessible at http://www.scrap2.org/specs/1/#zoom=z

Code	Description
Talon	New pure aluminium wire and cable
Tann	New mixed aluminium wire and cable
Taste	Old pure aluminium wire and cable
Tassel	Old mixed aluminium wire and cable
Tarry	Aluminium pistons
Teens	Segregated aluminium borings and turnings
Telic	Mixed aluminium borings and turnings
Tense	Mixed aluminium castings
Tepid	Wrecked airplane sheet aluminium
Terse	New aluminium foil
Tetra	New coated aluminium foil
Tesla	Old aluminium foil
Thigh	Aluminium grindings
Tooth	Segregated new aluminium alloy clippings and solids
Tough	Mixed new aluminium alloy clippings and solids
Tread	Segregated new aluminium castings, forgings and extrusions
Trump	Aluminium auto castings
Twang	Insulated aluminium wire scrap
Twist	Aluminium airplane castings
Twitch	Fragmentizer aluminium scrap (from automobile shredder)
Troma	Aluminium auto or truck wheels
Tweak	Fragmentizer aluminium scrap from automobile shredders
Twire	Burnt Fragmentizer aluminium scrap (from automobile shredders)
Zorba	Shredded non-ferrous scrap (predominantly aluminium)
Tata	New production aluminium extrusions
Tally	All aluminium radiators from automobiles

Code	Description
Toto	Aluminium extrusions '10/10
Tutu	Aluminium extrusions dealer grade

2C. Downstream Aluminium Products

It can be estimated that there are around 4000 companies involved in the downstream Indian aluminium industry,[39] although if very small units are counted they are likely to be more. The downstream sector comprises manufacturers of both intermediate products - such as rods and bars, plates and slabs, wire rods and wires, castings and forgings - and further value added products like foils and custom made sheets, tubes and pipes, profiles and structures for a variety of uses, door and window frames, stranded wires and cables, solar panel frames and mountings, kitchen utensils, vehicle wheels and auto components, apart from a host of other items.

India's large primary aluminium producers are themselves involved, as shown in Table 2.1, in some downstream processing upto the intermediate stage and, in certain cases, even beyond. There are also a few other large companies in the intermediate and further downstream segments, but the bulk of aluminium product companies are in the SME or even micro enterprises category. Broadly, the downstream manufacturing process consists of casting aluminium into required products, or in making extruded shapes for which aluminium metal is extremely well suited, or of aluminium rolling that can produce sheets and foils and other flat items.

The casting process can be either sand casting or die casting. In sand casting, reusable or permanent sand moulds of different shapes are prepared within which molten metal is filled. In die casting, which produces casts with thinner walls and has other advantages, the moulds are permanent, made up of cast iron or steel and the molten metal is forced into the mould under high pressure (pressure die casting) or from above (gravity die casting). Die casting is used when volumes are large. More than 60 per cent of the demand for die casting in India today is from the automotive sector. Other sectors using cast products include building and construction, electrical components, telecom and computing and aerospace.

[39] The Aluminium Secondary Manufacturers Association (ASMA) itself claims to represent 3500 units in the SME sector

As per Aluminium Caster's Association of India (ALUCAST), around 600 companies are involved in the organised aluminium casting sector in the country. Another source[40] indicates there are as many as 2000 small scale aluminium casting units. These units are mostly located in clusters. The major clusters involved in the production of aluminium castings are located at Ahmedabad, Bangalore, Chennai, Coimbatore, Delhi NCR and Pune.

In the extrusion process, an aluminium alloy billet is forced through a die that has a specific cross-section to form a particular shape. A powerful ram pushes the heated metal through the die. Depending on the requirement, all kinds of shapes, angles and intricate profiles can be custom made in the form of rods, beams, angles, tubes of different cross sections etc. While extrusions are used in India significantly in building and construction, accounting for a little over 50 per cent of consumption, other sectors like transportation, consumer durables, electrical industry and industrial machinery are also significant users. Their application in the automotive industry is still limited on average to 2 to 3 kg per car in India, as against 11.5 kg in Europe. There are over 120 Indian extrusion companies with a total estimated capacity of about 650,000 mtpa,[41] the largest among them having a capacity of 128,000 mtpa. Indian companies, however, do not figure among the top aluminium extruders in the world, which are led by Norway's Hydro extruded solutions and China's Zhongwang, each of which have annual capacities exceeding 1 million tpa.

For flat rolled products of aluminium (FRP), the metal ingots are passed under high pressure rollers so that they are forced to take thinner and longer shape in the form of sheets that are then rolled into coils. To make the products strong and durable, they also undergo a quenching process. Products made include hot or cold rolled coils, plates and strips, patterned sheets and foils. Even as all four Indian primary producers are involved in making FRP items apart from several other MSMEs, a good share of domestic demand is met through imports, including for beverage can bodies or auto body sheets. While no India based producer figures among the top FRP makers in the world, Novelis Inc., which is a subsidiary of Hindalco, is the leading global producer of FRP items

[40] See the report by TERI on " Cluster profile Chennai aluminium casting industries" which can be accessed at http://sameeeksha.org/pdf/clusterprofile/Chennai_aluminium_casting.pdf

[41] These figures have been taken from the article "Applications of aluminium extrusions in the electrical, electronics and industrial sectors' by Shanker Gopalakrishnan of the Madras Consultancy Group published in the Aluminium Association of India, page 17, of Vol.18, Issue No.3, October 2018.

from all its plants. In India, Hindalco holds around 2/3rd share of the FRP market.

Drawing of wires from wire rods (latter of 9.5 mm diameter) and using them for conductor and cable manufacturing again involves a vast number of SMEs and MSMEs in India. The electrical sector remains the most dominant consumer of aluminium in India and conductors of EC grade are made of primary aluminium. Vedanta Ltd. which has a capacity of 620,000 tpa of wire rods, is the largest wire rod supplier in India[42]. In recent times it is, however, learnt that with copper winding wires getting largely replaced by thin aluminium wires (0.15 to 0.75 mm), manufacturers of thin wires substantially import aluminium wire rods due to stringent quality requirements[43].

Aluminium utensil makers form another segment of the industry. Using recycled aluminium for their production, perhaps also mixing with some ingots, the utensil manufacturers largely source the raw material from scrap traders who collect used aluminium articles domestically. They melt them into metal, get them rolled into sheets, cut them in circles or other shapes and make the required utensil in a spinning workshop. A variety of cookware is made, including non-stick pans and pressure cookers. As per the Federation of All India Aluminium Utensil Manufacturers, there are as many as 4000-plus utensil making firms[44] even as only a few of them are of any significant size.

While aluminium foils are largely made of unalloyed aluminium, imports of aluminium sheets and plates are of both alloyed (48%) and unalloyed (52%) varieties. India's present capacities in flat rolled products do not extend to beverage can bodies, wall claddings, auto body sheets and aerospace and defense requirements.

India's net imports of aluminium wire rods (HS 7605) have also shown a surge in recent years. In this case the imports are mainly of the unalloyed primary aluminium grade. As stated earlier, one reason for the rise could be the trend towards replacement of copper winding wires with thin aluminium wires. We

[42] See the article 'Vedanta's strides in electrical industry' accessible at https://www.electricalindia.in/vedantas-strides-in-electrical-industry/

[43] See the article 'Reduction of voids and with-in coil UTS variation in EC-Grade wire rods' by Vinit Mishra et al, in the Aluminium Association of India Journal, Vol.18 page 15 Issue No.1, April 2018.

[44] See the news item https://www.business-standard.com/article/markets/aluminium-utensil-sector-to-grow-20-111121400045_1.html

shall in the next section see what could be the other drivers of some of these imports.

There is also a fairly high level of import of aluminium extrusion items under HS 7610. As per a recent CII presentation[45], India's extrusion capacities do not cover a significant part of automotive, defense and aerospace needs. That said, automotive items like bumpers or wheels do not figure under HS 76 but HS 87. A look at the trade figures of these items under HS 87 do show that in some cases the imports are significant. It is, however, not clear to what extent these can be attributed to those made of aluminium. India's exports of these items are also not insignificant.

On the exports side, India has shown considerable strength in the exports of stranded wires and cables of which imports are minimal. India also has a net surplus in trade of kitchenware (HS 7615) and sundry articles of aluminium (HS 7616). This is also the case in respect of trade in drums and gas containers. We shall see this in more detail in the Section 3 dealing with trade in aluminium.

What is noteworthy is that the downstream sector is also a potential source of India's strength that can already be evidenced to some extent in respect of aluminium casting. This is an ideal sector for SMEs, particularly for instance for those located in casting or aluminium clusters. Greater skilling, if coupled with India's relatively competitive wage levels and the expected rise in domestic demand, particularly in the automotive sector, can offer considerable scope for pushing this further.

Similarly, considering the levels of imports, the extrusions and the FRP segments too appear to offer a lot more scope for domestic manufacture. To be competitive, however, particularly vis-a-vis products coming from China or the ASEAN countries, manufacturing units with larger economies of scale may be necessary in these areas.

Key take aways from Section 2

- India is well positioned to emerge as a strong aluminium hub and for aluminium to become one of its champion manufacturing sectors. It has a substantial reserve of bauxite and coal. Already the world's second largest primary aluminium producer, even if a very distant second to China, it needs rapid scaling up to boost its per capita consumption of the metal which stands at less than 3kg presently, to at least double the figure in the next five years, in order to move closer to the world aggregate of 11kg. Aluminium has many

[45] Shared with the authors

green and other positive attributes that merit such growth. It also has an important role in the economic security of the country.

- The present expansion plans of the four primary producers in the country, if implemented, could take their total capacity from 4.126 mtpa at present to 6.3 mtpa or so, which by themselves may not be enough for the doubling target. These producers are also undertaking forward and backward integration investments to bolster their position. Government policies, including on mining, have helped. But considering the tight global competition in this sector, including that arising from overcapacities in China, constant monitoring will be necessary and every effort needs to be made to keep the producers nearer the lower end of the global cost curve.

- Secondary aluminium production from scrap has come to stay in the country. It provides raw material to casting and other lines of production competitively, without having to rely on the primary aluminium option that may be more expensive for them. India may have to continue relying on imports for scrap for at least ten more years because of domestic non-availability. Ensuring compliance of imports with ISRI scrap standards would be important. Encouraging use of more advanced refining methodologies would also help. Strengthening in parallel, the collection, sorting, grading and processing of domestic scrap will be in the national interest. In due course it could pave the way for a more circular aluminium sector nationally.

- In the interim, primary and secondary aluminium have to be seen as having complementary roles. Both can play their part in pushing the aluminium consumption levels in the country.

- A good part of the 3.65 mt of primary aluminium produced in the country is being exported in the unwrought form. Value addition on this within the country can bring more export revenues, provide local employment and reduce unnecessary imports. But this will need focused efforts towards ensuring more competitive value added production, employing also economies of scale and better logistics and other support. Casting clusters with their demand coming particularly from automotive producers is one area in which India has a potential to emerge strong. Boosting investments in FRP and extrusion making will also be important considering the scale of their imports.

- Several other areas also need attention, including in alloy making and skilling as well as towards encouraging and incentivising the industry to undertake

research and technology development. Global moves toward greater use by consumers of green or low carbon aluminium also needs a watch.

Section 3. Trade trends in aluminium products and their driving elements

In this section we shall try to gain greater insight into the trade of aluminium and its products falling under HS 76. We shall take this up respectively under the four segments: Unwrought unalloyed aluminium (HS 760110); Unwrought alloyed aluminium (HS 760120); Aluminium scrap (HS 7602); and Value added products that cover the rest of HS 76.

Two broad driving elements can be detected. One is the growth in production capacities in India and in other competitive suppliers, particularly China, in the last decade and more. The second element, and this is particularly evident after the year 2010, derives from India's FTAs with the South and East Asian countries that came into force during this time. We shall examine the directions of India's imports and exports and what factors may be facilitating them. These include duty concessions under some of the FTAs and preferential trade arrangements. Certain trade remedy measures we have witnessed in recent times could have also influenced the trends.

A third driving element whose implications are still evolving stems from a set of parallel trade actions by the US in respect of aluminium and its products. They have included the following, which together had a mixed impact:

- Imposition of a 10% duty on select aluminium items (HS 7601, 7604-7609 and 7616991560 and 7616991570) under Section 232 of the US Trade Act from 23 March 2018 that affected India and most other exporting countries to the US;

- Imposition of penal duties by the US on imports from China as part of their trade war actions which resulted in different aluminium products getting slapped with additional duties ranging from 10% to 25% under Phase 2 (23 Aug. 2018), Phase-3 (24 Sept. 2018) and Phase-4 (Sept.2019) which provided greater access to other suppliers including to India; and

- Withdrawal of GSP duties for India by the US from June 2019 which took away the zero concessional duty available for most of the tariff lines under HS 76 (56 of them at 8-digit level that have MFN duties ranging from 1.5% to 6.5% but did not include certain unwrought aluminium and other items that were not GSP eligible).

Unwrought unalloyed aluminium-UUA (HS 760110)

India's export trends

- India's exports worldwide of UUA multiplied over five times from 281,256 tonnes in 2009-10 to 1.6 m tonnes in 2019-20 (see Fig 3.1). As per WITS data, India was the second largest exporter of this item in the world in 2019 behind the Russian Federation, but somewhat ahead of Canada. India's average Revealed Comparative Advantage (RCA) for this item stood at 5.43 and it has been steadily rising. (see Box 3.1).

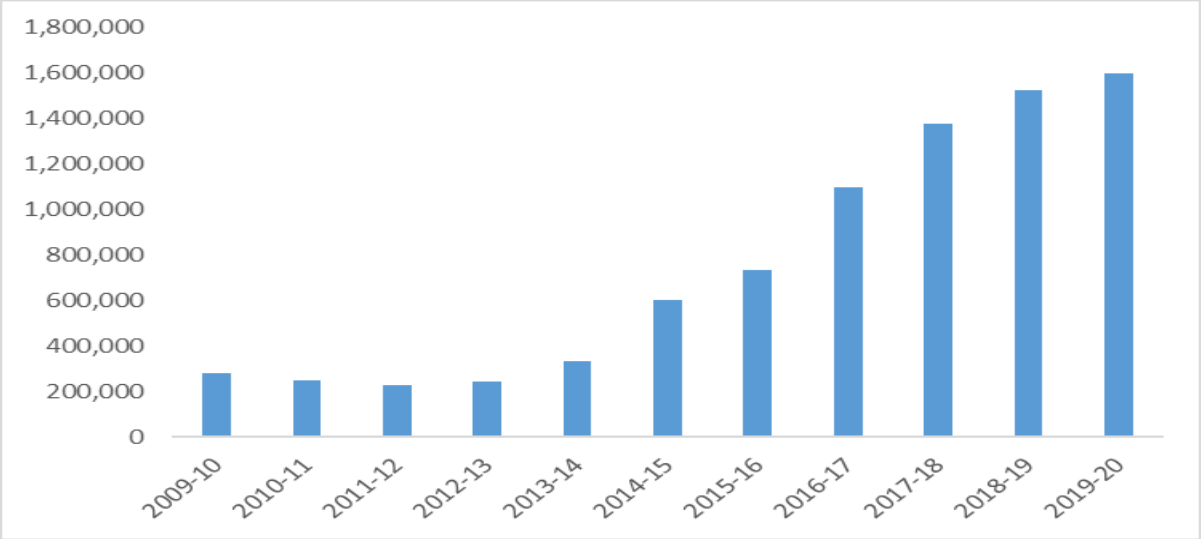
- Republic of Korea and Malaysia have been the leading export destinations for UUA from India over this period and for both these countries India is the primary source of import. Between them, Malaysia has emerged the largest importer from 2017-18 onwards and had a 42.5% share in 2019-20 while Korea had a 29.34% share. USA (4.35%), Japan (4.14%) and Taiwan (3.9%) were the other significant buyers from India in 2019-20, even as this position has been changing somewhat year to year.

- Within the UUA six-digit tariff line, India's exports have been predominantly UUA ingots (HS 76011010), and not billets, wire rods or wire bars.

- The MFN duty for UUA has remained zero in Malaysia that has a substantial downstream processing capacity. In respect of Korea, the MFN duty is 1%, which has given a slight advantage for India from the zero duty for this item under India-Korea CEPA. Yet another plausible factor is that one of the Indian producers, Hindalco, has a subsidiary Novelis that has two downstream aluminium processing plants in Korea which may be importing from India. The Indian producer took over the subsidiary in 2007. India's exports of aluminium were substantially to Singapore till 2008-09, after which Korea became a prominent importer.

India's export of UUA to the United States dipped in 2018-19 following the imposition of 10% duty under Section 232 of the US Trade Act in March 2018, but exports revived in 2019-20. Even so, India is not a major source of import for USA, Japan or Taiwan.

Figure 3. 1: India's exports of unwrought aluminium (unalloyed- HS760110)



Quantity in tonnes
Source: Ministry of Commerce and Industry

India's Import trends in UUA

- India's imports of UUA reached a peak of 197,000 tonnes in 2015-16 but thereafter have shown a decline. They amounted to only 68,229 tonnes in 2019-20, accounting for around 4% of India's export of UUA that year.

- The Gulf producers who have a substantial capacity in the energy intensive primary aluminium production have been the major source of supply, as also the Russian Federation. But Korea has steadily climbed in India's import share and in 2019-20 ranked first among all the suppliers at 22%.

- The decline in India's import volume can be largely ascribed to a customs duty hike by India for primary aluminium to 7.5% from 5% in the Union budget for 2016-17. UUA is also excluded from any tariff reduction under India's FTAs with ASEAN, Korea and Japan.

- Within the 6-digit UUA, imports have mainly been of alloy ingots even as very small quantities of wire rods and other items have been imported.

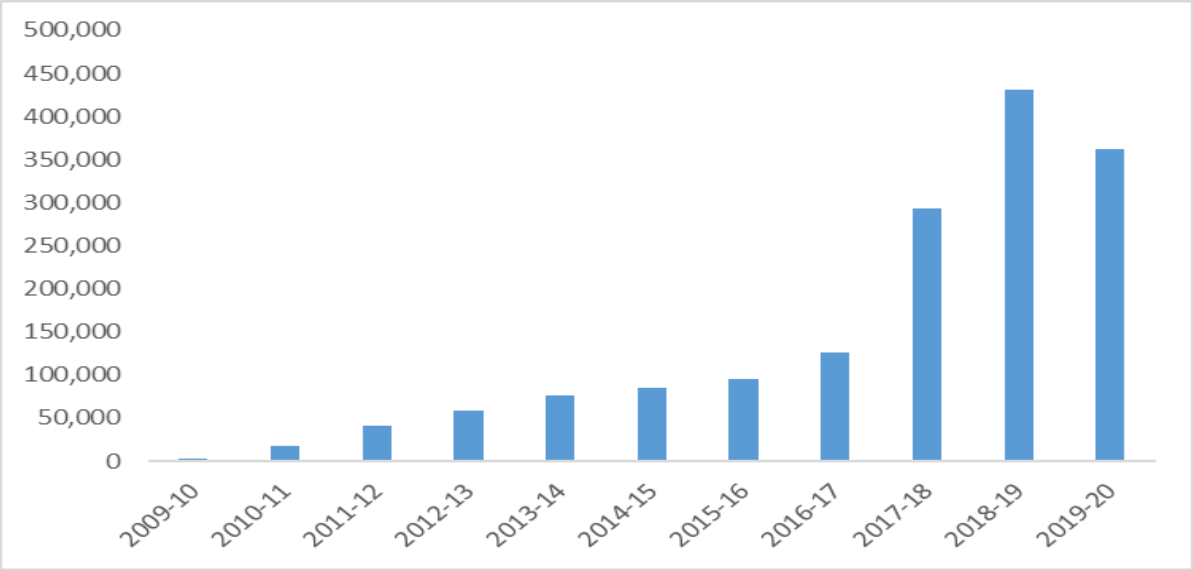
- It is also interesting that despite being the largest producer in the world of primary aluminium, with total production several times that of India, China's exports of UUA are meagre (only 76,000 tonnes in 2019 to the world) and do not also figure in any significant way among India's sources of import. Exports of primary aluminum products are restricted by Chinese government policies, mostly by export tariffs and a VAT (subject to a 17

percent value-added tax (VAT) and, in most cases, a 15 percent export tariff) [46] . These policies have incentivized the retention of primary unwrought aluminum for use in domestic wrought production.

Unwrought alloyed aluminium (UAA)- HS 760120

- India's exports of UAA have also rapidly expanded from only 3644 tonnes in 2009-10 to 361,664 tonnes in 2019-20 (see Fig 3.2). USA, Mexico, Spain and Italy have been the main export destinations in recent years even as exports have been more widely distributed. India was however only the ninth largest exporter of this item in the world in 2019. UAE, Norway, Canada, Russian Federation and Malaysia led the exporters table globally in 2019. India's aggregate RCA for this item was only 1.08 even as this index has been steadily rising in recent years and was 1.5 in 2019.

Figure 3. 2: India's exports of unwrought aluminium (alloyed- HS760120)



Quantity in tonnes
Source: Ministry of Commerce and Industry

- Within the UAA 6-digit tariff line, India's exports have been mainly of billets (HS 76012020) accounting for over 75% of exports. Some limited exports also take place of alloy ingots (HS 76012010), but not much of wire rods or other items.

[46] (USITC)- Aluminium: Competitive conditions affecting the U.S. Industry

- There are, however, no tariff concessions aiding India's exports to the main destinations, except a GSP concession by the US at 0.7% duty as against a MFN tariff of 2.67%[47]. Since June 2019, however,[48] the US has withdrawn the GSP scheme for India.

Import trends in UAA

- India's imports of UAA have risen in recent years from 99,206 tonnes in 2009-10 to 198,243 tonnes in 2019-20. They peaked in the year 2017-18 with the total imports at 276,711 tonnes.

- Malaysia has been the principal source of India's import for this item and in 2019-20 accounted for around 40% share. The Gulf exporters (Qatar, UAE and Bahrain) who have also been steady suppliers of this item to India, together accounting for another 31%. Further, Korea is showing an increasing presence in this item with a rise to a 8.5% share in 2019-20.

- India's imports of UAA have been principally of ingots and accounted for 80% share in 2019-20, with the balance mainly being billets.

- Malaysia is entitled to the duty concession on UAA under the ASEAN-India FTA as well as under the India-Malaysia CECA from 2013 onwards. This may have helped in India emerging as the principal export destination of Malaysia for this item since 2014. Korea is also benefitting from zero duties under India-Korea CEPA from 2017. On the other hand, the increase in import duties in 2016-17 from 5 to 7.5% on this item could be behind the slow decline in the share of Gulf producers.

- The aggregate unit value per ton among the major sources of import of UAA into India in 2019-20 were: Malaysia: US$ 1933; UAE: US$ 1994; Qatar: US$ 2008; Bahrain: US$ 2120 and Korea: US$ 2221. Their inter se price competitiveness were the same in 2018-19 as well.

- India has initiated anti-subsidy investigations against Malaysia on December 24, 2020 in respect of 'aluminium primary foundry ingots' under

[47] US Generalized System of Preferences Guidebook (2017)- https://ustr.gov/sites/default/files/files/gsp/GSP%20Guidebook%20August%202017_1.pdf

[48] GSP-eligible for All Beneficiary Countries (June 2018)- https://ustr.gov/sites/default/files/gsp/GSP%20eligible%20products%20for%20all%20BDC%20June%202018.pdf

HS 76012010 based on a complaint from a majority of Indian producers of the item.[49]

- On average, it is seen that unit values in the trade of UAA have been 3 to 5% higher, in some years more, than UUA. More specialised alloys do command a premium, sometimes significantly higher. It is not evident from the trade figures, however, to what extent the trade in UAA by India is of the recycled metal.

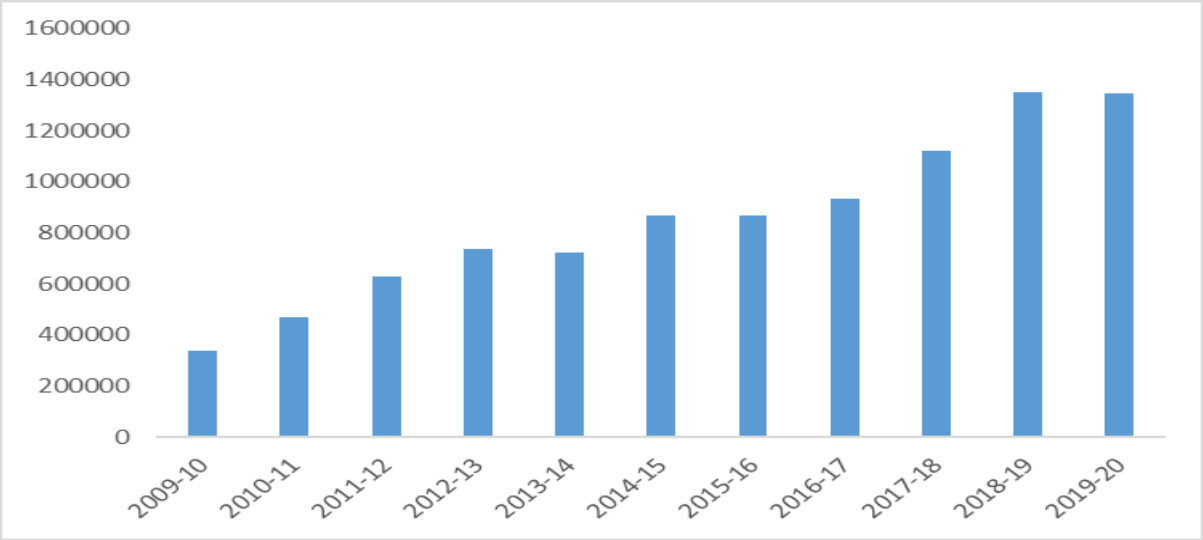
Aluminium Scrap (HS 7602)

India exports negligible levels of aluminium scrap. We shall mainly examine import trends.

Import trends in aluminium scrap in India

- India's imports of aluminium scrap from all sources have sharply risen from 339,621 tonnes in 2009-10 to 1.347 million tonnes in 2019-20 (Fig. 3.3). India was the No.1 importer in the world for aluminium scrap in 2018 and 2019, exceeding the imports of aluminium scrap by China which was the leader earlier.

Figure 3. 3: India's import of aluminium scrap (HS 7602)



Quantity in tonnes
Source: Ministry of Commerce and Industry

[49] Initiation of Countervailing Duty/Anti-Subsidy investigation concerning imports of "Aluminum Primary Foundry Alloy Ingot" originating in or exported from Malaysia- https://www.dgtr.gov.in/sites/default/files/Initiation%20notification%20%20Aluminum..%2024%20Dec%202020_0.pdf

- Till two years ago, the UK and the Gulf countries were the principal sources of import of scrap into India. The US has, however, emerged as the single largest source in 2018 and 2019 and accounted for a 24.4% share in 2019. The other major suppliers in 2019 were UK (11.17%), UAE (8.9%), Saudi Arabia (8.6%), Australia (8.4%), Netherlands (5.4%) and Singapore (4%).

- The increase in imports from the US may have been partially due to diversion resulting from the duty hike by China to 20% on aluminium scrap imports from the US as part of the retaliatory measures by China following the imposition of Section 232 duties of 10% on aluminium imports by the US in 2018.[50]

- Separately, China has also been seeking to restrict import of metal scrap into the country for environmental reasons. China initially began with a quota regime but more recently has turned to reclassifying high quality scrap as raw material rather than waste, indicating it finds continued benefit in permitting imports and recycling.[51]

Box 3. 1: The two indices used in the analysis in Section 3

There are two indices which can give some insight into the strengths at play as we analyse trade trends under HS Chapter 76. One is the Revealed comparative Advantage and the other is the Value Addition Index defined below.

Revealed Comparative Advantage (RCA) This is a simple index that can be used to provide a general indication of a country's competitive export strength in a product or a group of them. A country is said to have a revealed comparative advantage in a given product or group of products when its ratio of exports of product/ group to its total exports of all goods exceeds the same ratio for the world as a whole:

RCA = [India's global exports in the I sector /Total global exports of India]/ [World exports in the I sector / Total global exports]

In the above formula an answer greater than or equal to one would indicate that it 'reveals' a comparative advantage for India in that sector. In our case we shall not be looking at individual tariff lines but each 4-digit tariff heading for calculating the RCA. To rule out any distortions that may occur in a particular year we shall take the average of RCAs for a three-year period 2017-2019 tariff heading wise using WITS data

[50] https://www.thehindu.com/business/trade-war-makes-india-a-haven-for-aluminium-scrap-dumping/article28214476.ece

[51] https://www.argusmedia.com/en/news/2142569-china-issues-12th-scrap-metal-import-quota-tranche

Table 1: Revealed Comparative Advantage

HS CODE	RCA INDEX (2019)	RCA INDEX (2018)	RCA INDEX (2017)	AVG. OF 3 YEARS
760110	6.57	5.58	4.16	5.43
760120	1.5	1.22	1.19	1.08
7603	1.5	2.05	2	1.85
7604	0.23	0.28	0.24	0.25
7605	2.3	1.2	0.85	1.45
7606	0.43	0.43	0.43	0.43
7607	0.53	0.4	0.35	0.43
7608	0.24	0.18	0.21	0.21
7609	1.75	1.75	1.75	1.75
7610	0.14	0.16	0.18	0.16
7611	0.08	0.015	0.014	0.036
7612	0.56	0.62	0.54	0.57
7613	0.78	0.92	0.6	0.76
7614	21.6	22.5	18.5	20.9
7615	1.03	0.96	0.85	0.95
7616	1.38	1.25	1.37	1.33

Value addition Index (VAI) This is to give an idea to what extent each downstream set of products enhances value addition compared to the basic raw material, that is unwrought aluminium. So, we shall take the average revenues from both exports and imports of one particular year and determine unit values for each 4-digit tariff heading under HS 76 and compare that with the unit value for unwrought aluminium, namely, HS 7601. That then will be the VAI for that sector for that year. By taking the VAI averages for three consecutive years (we shall cover the three years 2017-20) we could get a fair idea of the degree of value addition inherent under each tariff heading. We shall use the DGCIS trade data for this purpose.

Admittedly, each of the two indices is not a very precise indicator. They however give a broad indication of comparative advantage and value addition. Tables 1 & 2 present the computations for India for recent years.

Table 2: Value Added Index

HS CODE	VAI (2017-18)	VAI (2018-19)	VAI (2019-20)	AVERAGE OF 3 YEARS
7601	1	1	1	1
7602	0.8	0.79	0.77	0.78
7603	1.48	1.48	1.62	1.52
7604	1.44	1.516	1.77	1.51
7605	1.09	1.07	1.07	1.07
7606	1.29	1.25	1.41	1.31
7607	1.78	1.77	1.96	1.83
7608	1.85	1.93	2.24	2
7609	4.06	4.14	5.24	4.48
7610	2.19	2.12	2.26	2.19
7611	7.35	9.01	11.07	9.14
7612	3.64	3.67	3.79	3.7
7613	5.73	5.3	5.63	5.55
7614	3.44	1.4	2.48	2.44
7615	2.05	2.01	2.39	2.15
7616	2.91	3.49	4.15	3.51

- Normally, the average price of standardised ISRI scrap is 15 to 20% cheaper compared to the ruling international price for unwrought unalloyed primary aluminium. But in 2019-20, presumably because of the Chinese restriction, the average scrap price was relatively less. Seen from India's own trade figures, the average price of scrap imports was 0.78% of primary aluminium in 2019-20.

- India had a zero duty on scrap imports earlier, but this was increased to 2.5% since 2013.[52] Following the hike in duties of primary aluminium to 7.5% in 2016-17, there has been a demand from primary producers for hiking the scrap import duty as well. They fear a wide duty differential between scrap and primary metal may result in a larger usage of recycled aluminium, beyond the auto sector where it normally gets predominantly used, thus posing a risk to their products.[53]

- Are all the imports under HS 76020010 fully in compliance with ISRI specifications? This is important since the imports come not only from the developed countries (close to 60%), the Gulf countries (around 20%) and ASEAN members (around 6.5%) but also from diverse other sources. Do pre-shipment inspections cover this aspect or do we only require certification that the scrap imported does not carry harmful material or emit radiations?

Trade trends in value added aluminium products (HS 7603-7616)

We shall examine the trade trends in the different value added products separately at HS-4-digit level in case of those in which India's exports or imports have exceeded US$ 50 million in recent years. The trade trends in the rest of the products will then be separately examined together. This will mean we shall separately examine trade trends in HS 7604, 7605, 7606, 7607, 7610, 7614, 7615 and 7616 and then proceed to examine the trade trends in the remaining six 4-digit tariff lines collectively.

Trade trends in HS 7604 (Aluminium bars, rods, profiles, etc.)

These are wrought products with a fair amount of value addition over primary aluminium, with the average value addition index (see Box 3.1) in India's trade at 1.51%.

[52] Evaluation of the Effects of Tariff Hikes on the Indian Aluminium Industry- Pg 10

[53] https://www.business-standard.com/article/markets/aluminium-scrap-imports-up-6-5-despite-13-slump-in-auto-production-119121701168_1.html

Export trends in HS 7604

- Exports of HS 7604 items from India were 15,919 tonnes in 2009-10. In 2019-20 they recorded 16,888 tonnes. While they did peak in 2018-19 at 25,873 tonnes, the growth has been generally tepid.

- India's principal export destinations have been US, UAE and Germany. Much of India's exports have also been of the alloyed variety of bars, rods etc., or of hollow profiles. Exports of unalloyed items have been considerably less.

- UAE and Spain are the world leaders in the export of unalloyed items, while China and Germany lead the table for alloyed items. India figures rather low in world export rankings for this item and India's average RCA index for it too was minimal at 0.25.

Import trends in HS 7604

- India's imports of HS 7604 items were 11,360 tonnes in 2009-10 and have grown to record 42,609 tonnes in 2019-20. They have generally remained at this level for the last few years.

- Imports from China have, however, grown rapidly. From only 1700 tonnes in 2009-10, they rose to 25,826 tonnes in 2019-20 accounting presently for a 60% share (see Fig 3.4). Imports from China rose significantly even as the shares of Australia and some of the Gulf countries fell. Other suppliers with smaller shares have been Korea, Malaysia and Thailand.

- Imports comprised 19839 tonnes of alloyed rods/bars etc. (HS 760129), and 7138 tonnes of hollow alloyed aluminium profiles (HS 760421) in 2019-20. But imports also took place of 15632 tonnes of unalloyed bars, rods etc., And the supply of each of these three items have been principally from China in 2019-20.

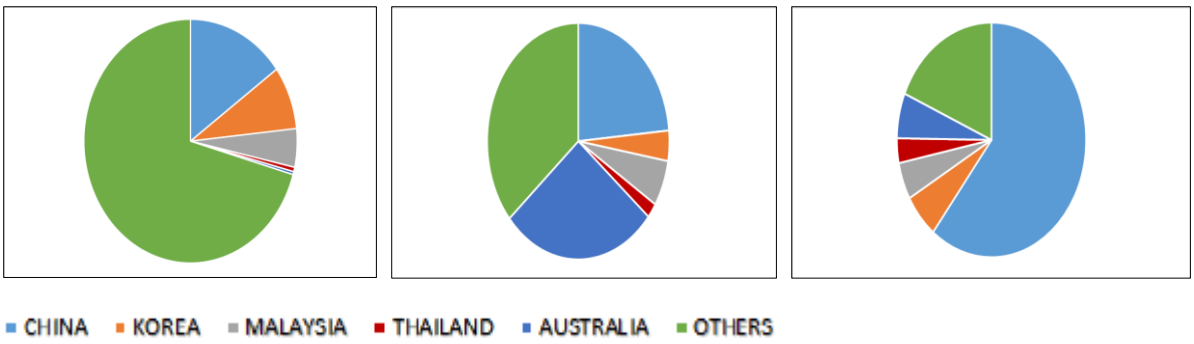
- It is also noteworthy that over 2/3rds of global production of extrusions are by China, which were evaluated at 17 million tonnes in 2015.[54]

[54] Please see https://www.commerce.gov/sites/default/files/the_effect_of_imports_of_aluminum_on_the_national_security_-_with_redactions_-_20180117.pdf

- China, however, faces anti-dumping duties for some of its extrusions in the US market. An anti-dumping investigation has also been initiated by the EU against extrusion exports by China (of certain HS lines under HS 7604, 7608 and 7610) on February 14, 2020. Such actions will have the effect of Chinese exports getting redirected to other countries, including India.

Figure 3. 4: Major import sources of India for aluminium bars, rods, profiles etc. for (a) 2009-10, (b) 2016-17 and (c) 2019-20 (quantity in tonnes)

a) b) c)



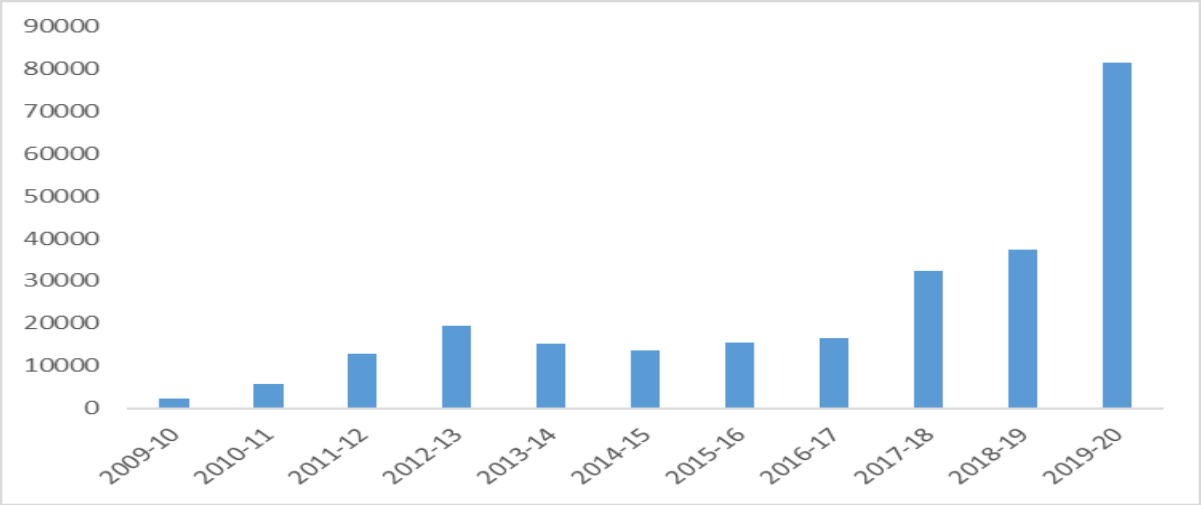
Source: Ministry of Commerce and Industry

Trade trends in HS 7605 (Aluminium wires)

Export trends in HS 7605

- India's exports of HS 7605 items were only 2203 tonnes in 2009-10 but have risen sharply in recent years to 81,428 tonnes in 2019-20 (Fig 3.5). As per WITS data, India was the eighth largest exporter of this item in the world. Russian Federation, Canada, UAE and Malaysia were the leading exporters in 2019. India' average RCA index for this item was 1.45 but showed a high of 2.3 in 2019.

Figure 3. 5: India's export of aluminium wires (HS 7605)



Quantity in tonnes
Source: Ministry of Commerce and Industry

- India's main export under this 4-digit tariff line was of HS 760511 (unalloyed wire whose diameter exceeded 7 mm), accounting for almost 90% of exports.

- Trade revenues, however, suggest that the extent of value addition in this product over unalloyed aluminium may be quite limited, at only 1.07.

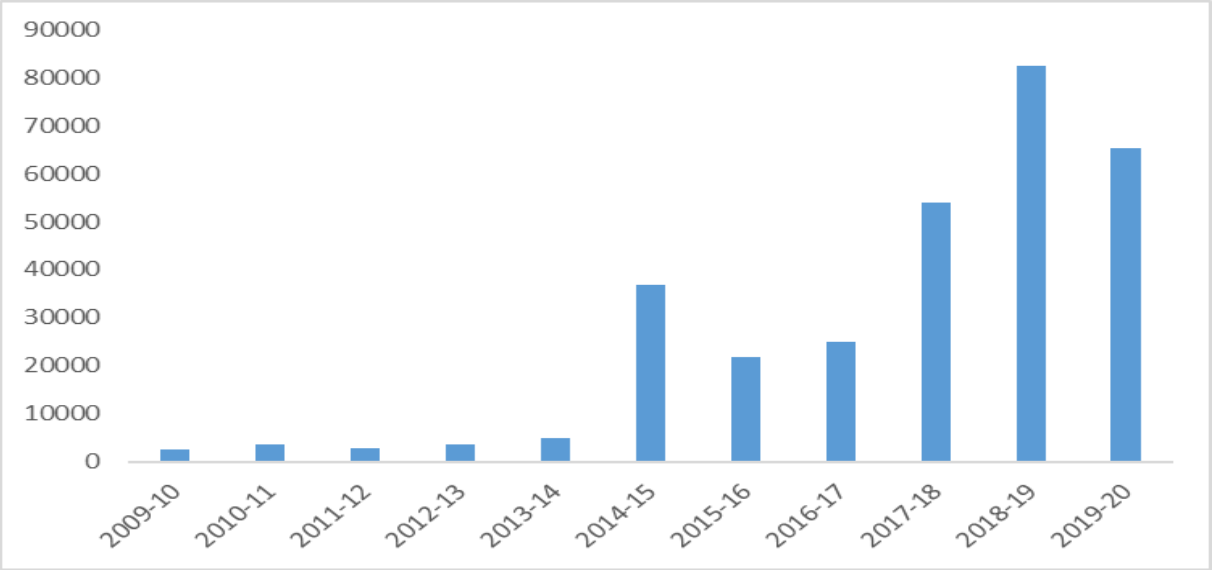
- The main export destination of India was the United States for which the exports rose to over 20,000 tonnes in 2019-20 from almost nil in 2016-17. HS 760511 was one of the tariff lines for which the GSP concession was withdrawn from June 2019. However, penal duties became applicable in respect of imports from China.

- Nepal, Brazil, Sri Lanka and certain Latin American countries also received significant exports from India.

Import trends in HS 7605

- India's imports of HS 7605 were 2605 tonnes in 2009-10 but have also climbed up in recent years and were 65231 tonnes in 2019-20. In fact, they were 82,343 tonnes in 2018-19 (see Fig 3.6). In case of imports as well, the main item has been HS 760511 which accounted for over 90% of imports.

Figure 3. 6: India's import of aluminium wire (HS7605)

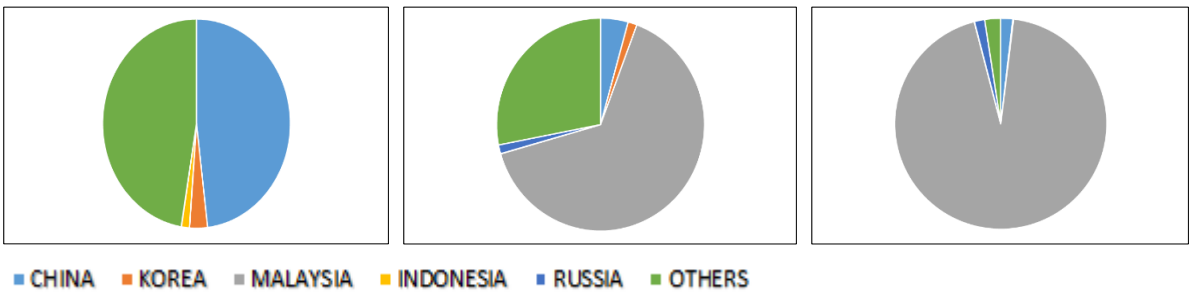


Quantity in tonnes
Source: Ministry of Commerce and Industry

- Malaysia has emerged as the single largest import source with our imports rising sharply by four times from 16,161 tonnes in 2016-17 to 65,904 tonnes in 2018-19 and 61,338 tonnes in 2019-20 (Fig 3.7). Oman and Bahrain have been among the other suppliers.

Figure 3. 7: Major import sources of India for aluminium wires for a) 2009-10, b) 2016-17 and c) 2019-20 (quantity in tonnes)

a) b) c)



Source: Ministry of Commerce and Industry

- Under both IAFTA and the CECA with Malaysia, the duty levels on HS 7605 items were reduced to zero in 2013. With India's MFN duty at 7.5% on aluminium wire imports, it has given Malaysia a significant tariff advantage vis-a-vis other suppliers. Even as India has been Malaysia's principal export destination for this item since 2014, it has now become a substantial supplier

as well with imports recording US$ 122 m in 2019-20 and over US$ 150 m in 2018-19.

- Among the supplying countries, the aggregate unit value per ton was almost the same of Malaysia and Russia in 2019-20 (former US$ 2046 and the latter US$ 2023) and in the year before. Imports from both of them were also mainly non-alloyed aluminium wires with cross-section exceeding 7 mm (HS 760511). But imports from China had significantly higher unit values (US$ 3747 in 2019-20) but these were mainly of alloyed wires less than 6 mm (HS 76052990).

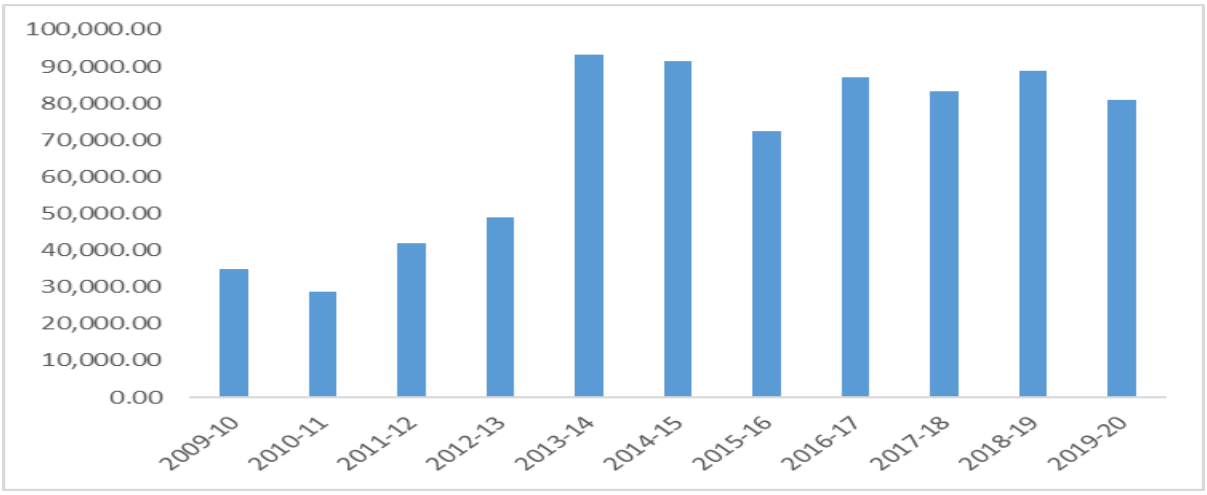
- Considering the surge in imports, India has initiated an anti-subsidy investigation against Malaysia on June 30, 2020 with reference to imports of "Aluminium Wire/Wire Rods above 7 mm dia" based on a complaint lodged by the relevant Indian producers who account for a majority of production of the item.

Trade trends in HS 7606 (Aluminium plates/sheets/strips etc., exceeding thickness of 0.2 mm)

India's export trends in HS 7606

- India's exports of HS 7606 have been around 80,000 tonnes in the last four years, up from a level of 34,000 tonnes in 2009-10 (Fig 3.8). India's export levels are however considerably below China, EU countries, UK, Turkey, Saudi Arabia and others. The average RCA index for this item is only 0.43.

Figure 3. 8: India's export of aluminium plates/sheets/strips (HS7606)



Quantity in tonnes
Source: Ministry of Commerce and Industry

- Among the items under the 4-digit tariff line, India's principal item of export was rectangular plates of aluminium alloys under HS 760612, which is globally traded far more than other lines under this heading. There have also been some exports of non- alloyed plates from India under HS 760611 and 760691. On average, the value addition involved in the item is around 31% compared to primary aluminium.

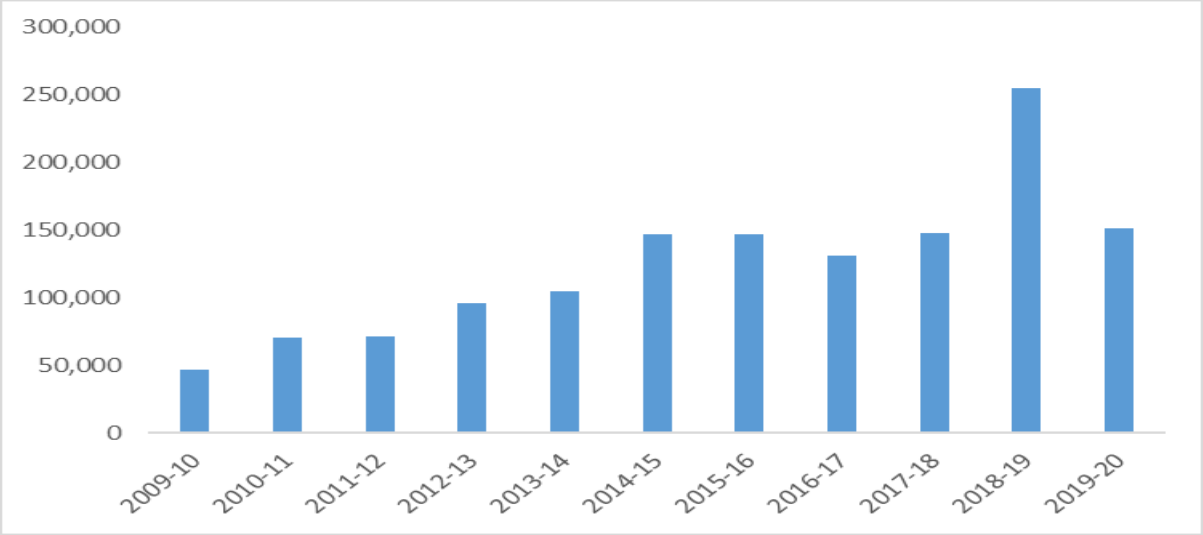
- India's principal export destinations were USA, UAE and Spain accounting for over 50% of exports. Exports to US of HS 7606 items rose from US$ 68 m in 2016-17 to US$ 133 m in 2018-19 but declined to US$ 92 m in 2019-20. Exports have also gone to Italy, Nepal, Bangladesh and Taiwan.

- The US has, however, initiated anti-dumping investigations against 18 countries including India on October 9, 2020 that covers the four tariff lines HS 760611, 760612, 760691 and 760692. Additionally, anti-subsidy measures are also under consideration on these products against four countries including India. This will certainly dampen export prospects to the US.

India's import trends under HS 7606

- India's imports of HS 7606 items have, however, seen a sharper rise from a level of 46,600 tonnes in 2009-10 to 151,000 tonnes in 2019-20. In fact, there was a surge in 2018-19 when imports shot up to 255,000 tonnes (Fig 3.9). Generally, India's imports appear evenly balanced between non-alloyed and alloyed varieties of plates under this tariff heading.

Figure 3. 9: India's import of aluminium plates/sheets/strips (HS7606)



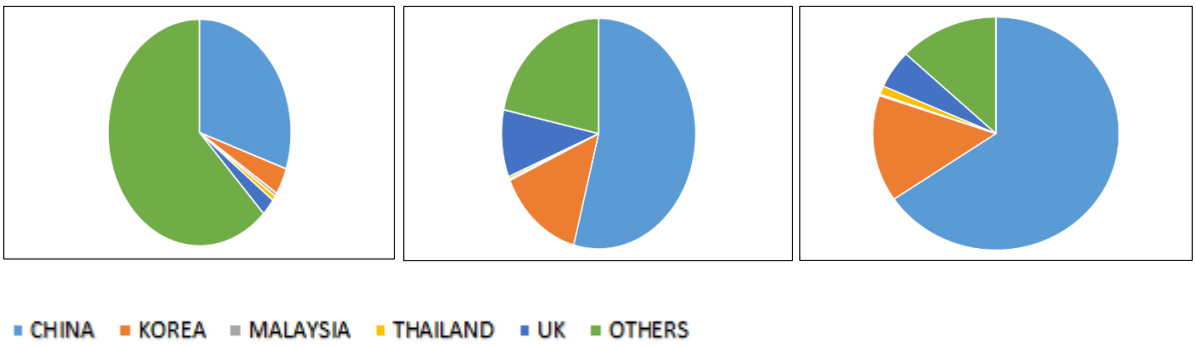
Quantity in tonnes
Source: Ministry of Commerce and Industry

- China has figured prominently among India's sources of supply and its import share has grown to 65% in 2019-20 (Fig 3.10). It was even higher at 75% in 2018-19, contributing mainly to the surge.

- Korea has been the second largest source and accounted for 15% share in 2019-20. UK, UAE, Germany and Australia have been other sources of import.

Figure 3. 10: Major import sources of India for aluminium plates / sheets / strips for a) 2009-10, b) 2016-17 and c) 2019-20 (quantity in tonnes)

a) b) c)



Source: Ministry of Commerce and Industry

- Among India's main sources of import, Korea is the only country that has duty concessions. Under the India-Korea CEPA, while the tariff lines HS 76061110 and 76069110 have been excluded from tariff reduction, duties under HS 760612 were eliminated from 2014 onwards and on HS 760691 and 760699 from 2017. Imports from Korea have been mainly alloyed plates under HS 760612.

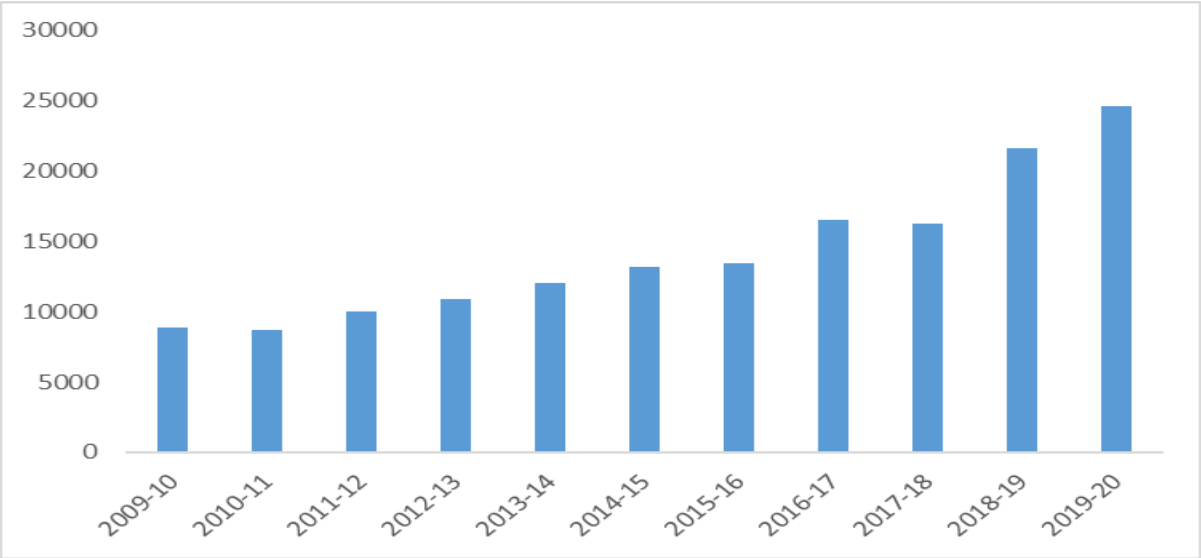
Trade trends in HS 7607 (Aluminium foils of a thickness not exceeding 0.2 mm

India's export trends in HS 7607

- India's exports of HS 7607 items were 8851 tonnes in 2009-10 which went up to 24,631 tonnes in 2019-20 (Fig 3.11). India figures fairly low in the world ranking of exporters for this item and India's average RCA for this item was 0.43 and it has seen a declining trend. China is the world leader by a wide margin compared to other exporting countries (China's domestic production of flat rolled products-HS 7606 and 7607- was estimated at 9.2

million tonnes in 2015[55]). The item involves significant value addition with the average value addition index at 1.83

Figure 3. 11: India's export of aluminium foil (HS7607)



Quantity in tonnes
Source: Ministry of Commerce and Industry

- Among the three six-digit tariff lines under this head, more than 50% of India's exports were accounted for by HS 760719 (aluminium foil not backed or rolled), followed by backed aluminium foil (HS 760720). Exports of rolled aluminium foil (HS 760711) were relatively less.

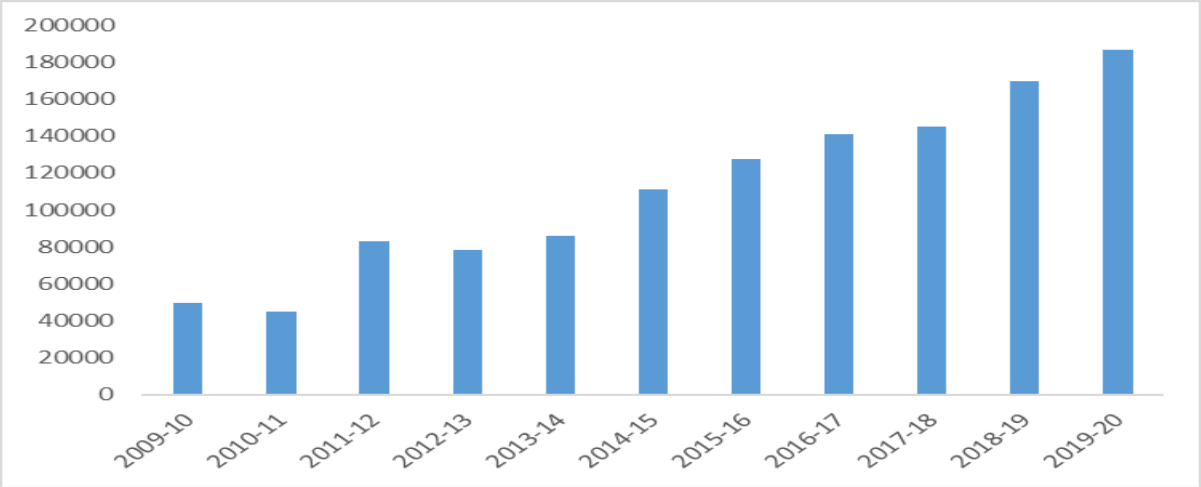
- India's exports have gone to Bangladesh, USA and Nigeria among others.

India's import trends in HS 7607

- India's imports of HS 7607 items have been substantial and have grown from 49,312 tonnes in 2009-10 to 186,573 tonnes in 2019-20 valued at US$ 577 m (Fig 3.12). India has also figured among the world's top five importers for both HS 760711 and HS 760719 in 2019.

[55] Please see https://www.commerce.gov/sites/default/files/the_effect_of_imports_of_aluminum_on_the_national_security_-_with_redactions_-_20180117.pdf

Figure 3. 12 : India's import of aluminium foil (HS7607)



Quantity in tonnes
Source: Ministry of Commerce and Industry

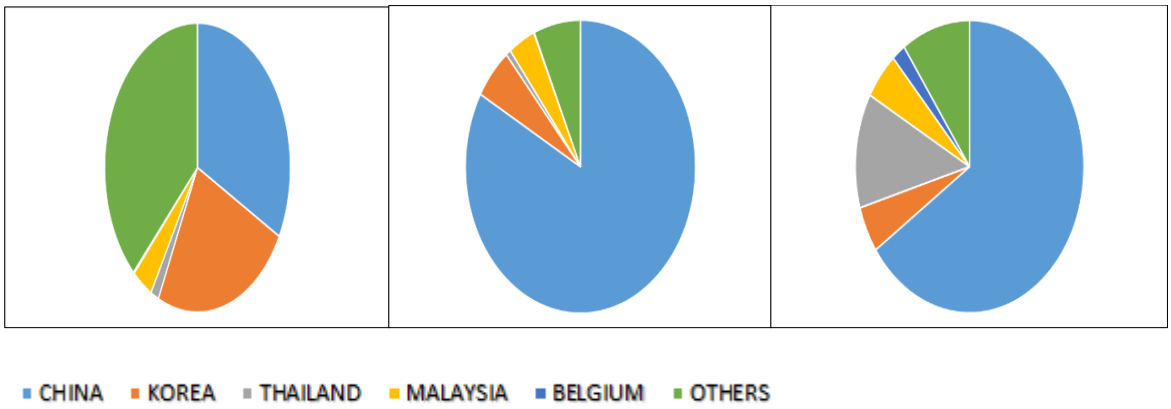
- A majority of India's imports comprising 51% were of rolled and unbacked foil under HS 760711, followed by another 36% of imports of the unrolled and unbacked variety, HS 760719, in 2019-20. The balance imports were of backed aluminium foil.

- China has acquired a dominant share over the years in India's imports, which rose to 83% in 2015-16 and the following year, but presently are around 65% of India's imports (Fig 3.13). The imposition of anti-dumping duties on aluminium foils[56] ranging from US$ 0.69 to 1.63 per kg in 2017 perhaps had a dampening effect. Thailand, Malaysia, Korea and Indonesia are now gaining greater foothold and had shares of 12.7%, 5.19%, 5.09% and 2.22% respectively in 2019-20.

[56] The aluminium foils covered by the AD measure ranged from 5 microns to 80 microns but excluded foils for certain uses including for pharmaceutical packaging, and certain industrial uses.

Figure 3. 13: Major import sources of India for aluminium foils for a) 2009-10, b) 2016-17 and c) 2019-20 (quantity in tonnes)

a) b) c)



Source: Ministry of Commerce and Industry

- For China, India is the top export market in the world by weight for both HS 760711 and 760719. India also figures among the top markets for HS 7607 items for each of Korea, Thailand, Indonesia and Malaysia.

- While China does not receive any duty concession on this item from India, duties for the ASEAN countries and Korea have been progressively reduced to zero for this item from 2013/2017 respectively, under the FTA arrangements with them.

- Unit value was the lowest for imports from China of HS 7607 items at US$ 2780 per ton in 2019-20. Unit values from ASEAN countries averaged somewhat higher at US$ 3106. Bulk of the imports from these sources were of unbacked unalloyed aluminium foil. Average unit values of imports from Korea were US$ 3655 and from Germany US$ 9350 but imports from the latter were mainly of backed aluminium foil.

- The Directorate General of Trade Remedies of India have initiated an anti-dumping investigation on June 20, 2020 in respect of aluminium foil 80 micron and below against exporters from China, Indonesia, Malaysia and Thailand based on complaints from a few Indian producers of the item.[57]

[57] Initiation of Anti-Dumping Investigation concerning imports of Aluminium Foil 80 micron and below from China PR, Indonesia, Malaysia and Thailand- https://www.dgtr.gov.in/sites/default/files/Final-Initation%20Notfication_English_Aluminium%20Foil.pdf

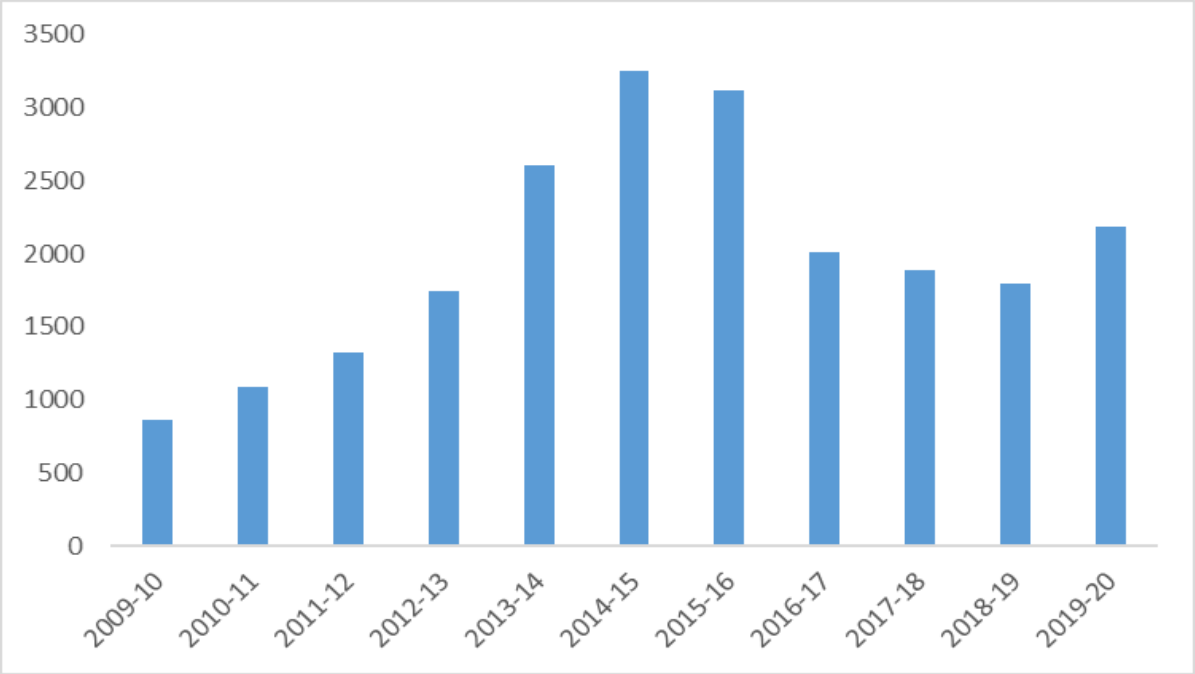
Trade trends in HS 7608(Aluminium pipes)

Products under this heading carry a lot more value addition with the average VAI index determined as 2.

Export trends in HS 7608

- India's exports of aluminium pipes amounted to only US$ 8.26 m in 2019-20, with a tonnage of 2185 tonnes, up from 864 tonnes in 2009-10 (Fig 3.14). India's exports were mostly of alloyed pipes under HS 760820. US, Canada. Netherlands and Nepal were among the countries exported to. India's RCA index for this item was also low at 0.21.

Figure 3. 14: India's export of aluminium pipes (HS7608)

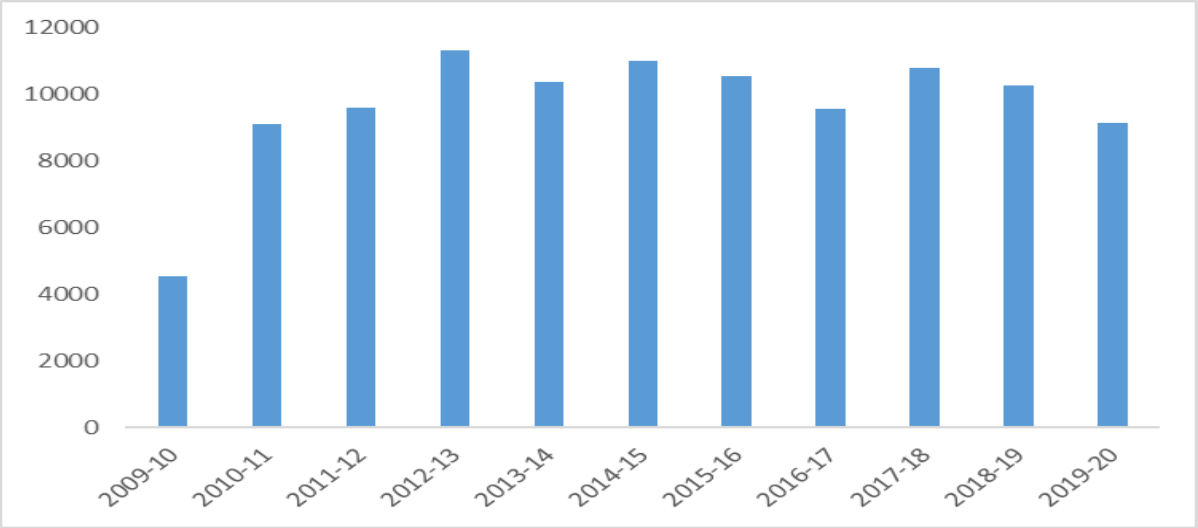


Quantity in tonnes
Source: Ministry of Commerce and Industry

Import trends in HS 7608

- India's imports of HS 7608 were relatively higher at 9138 tonnes amounting to US$ 44 m as against 4522 tonnes in 2009-10 (Fig 3.15).

Figure 3. 15: India's import of aluminium pipes (HS7608)



Quantity in tonnes
Source: Ministry of Commerce and Industry

- India's imports were mainly from China whose share in India's imports has also steadily risen and was 55% in 2019-20. China is also the world's largest exporter of HS 7608 followed by the United States and Germany.

- Korea and Thailand have been the other significant sources of import but Thailand's share has been declining. Both Korea and Thailand benefit from the duty concessions under India's FTAs.

- India's imports too have been mainly of alloyed pipes. India figures among China's top five export markets for this item and for Korea, India is the principal market for export.

Trade trends for HS 7610 (Aluminium structures)

- The value addition in aluminium structures stands at an even higher level as shown by the VAI index at 2.19.

India's export trends in HS 7610

- India's exports of HS 7610 items were 6432 tonnes valued at US$ 29m compared to 4073 tonnes in 2009-10. However, compared to an export level of 7438 tonnes in 2016-17 they indicate a decline. India's average RCA index for this item was only 0.16, the lowest among all 4-digit aluminium lines under HS 76.

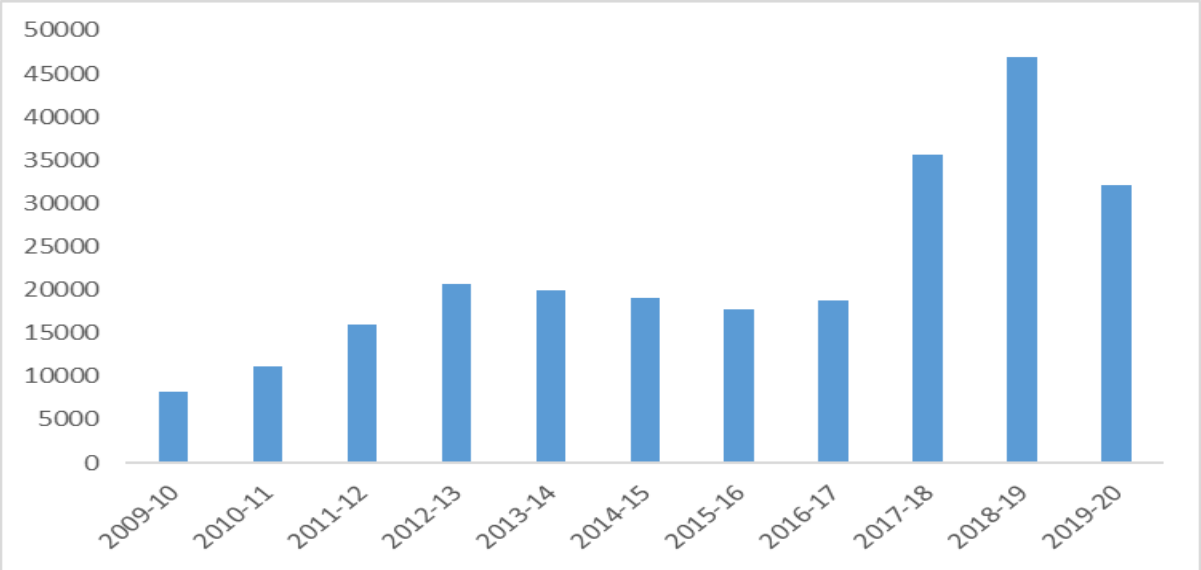
- India's principal export under this head were not doors/windows or completed structures but plates and rods and profiles for use in the structures under HS 761090.

- Almost 50% of India's exports of HS 7610 went to the United States with Sri Lanka and Nepal figuring among other markets.

India's import trends in HS 7610

- India's imports of this item have risen sharply in recent years from 8139 tonnes in 2009-10. They rose to around 47,000 tonnes in 2018-19 but declined to 32,000 tonnes in 2019-20 amounting to US$ 133 m (Fig 3.16). India's imports too, like exports, have been principally under HS 761090.

Figure 3. 16: India's import of aluminium structures (HS7610)



Quantity in tonnes
Source: Ministry of Commerce and Industry

- China is the principal source of India's import and accounted for over 70% share in 2019-20. China is also the top exporter in the world for HS 7610 accounting for over a million tonnes in 2019.

- Korea is another source from which imports into India were significant at 15,790 tonnes in 2018-19 but declined to only 2400 tonnes the following year. For Korea, the duties under the India-Korea CEPA have already been reduced to zero. UAE has also been another import source for India for this item.

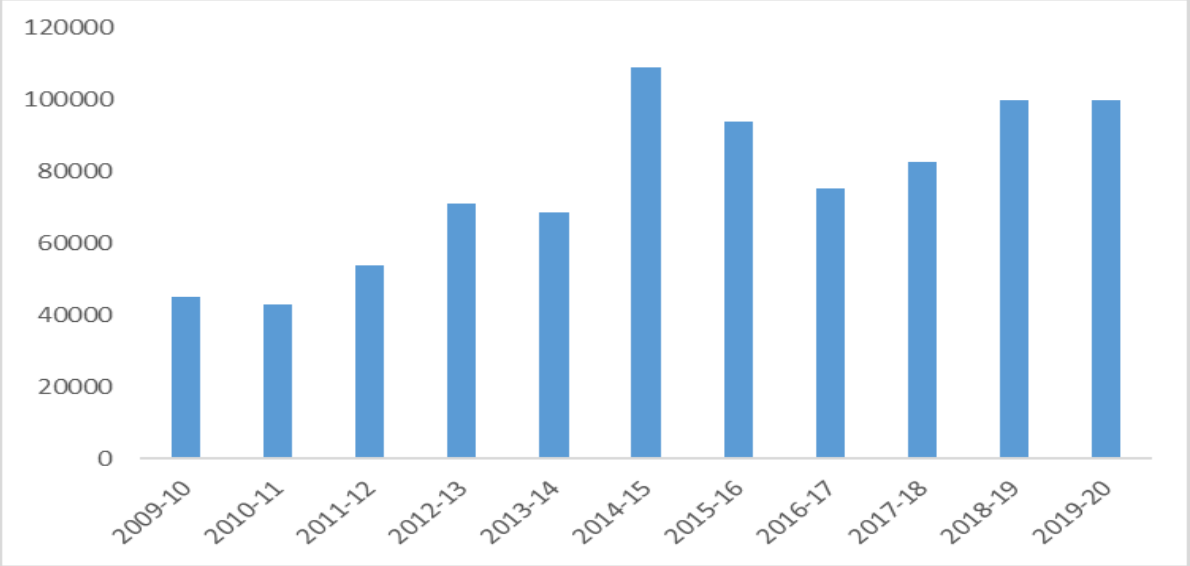
Trade trends in HS 7614 (Stranded wires and cables)

India's imports of this item have been small. We shall therefore discuss only India's export trends. The average value addition involved in stranded wires is substantial with the VAI index at 2.44.

India's export trends in HS 7614

- India's exports of HS 7614 items more than doubled from 45,114 tonnes in 2009-10 to 99,924 tonnes in 2019-20 amounting to US$ 319 m (Fig 3.17). India's strong production capacity in this area owes its origins to the emphasis given from the beginning to electrical applications in the development of the aluminium sector.

Figure 3. 17: India's export of stranded wires and cables (HS7614)



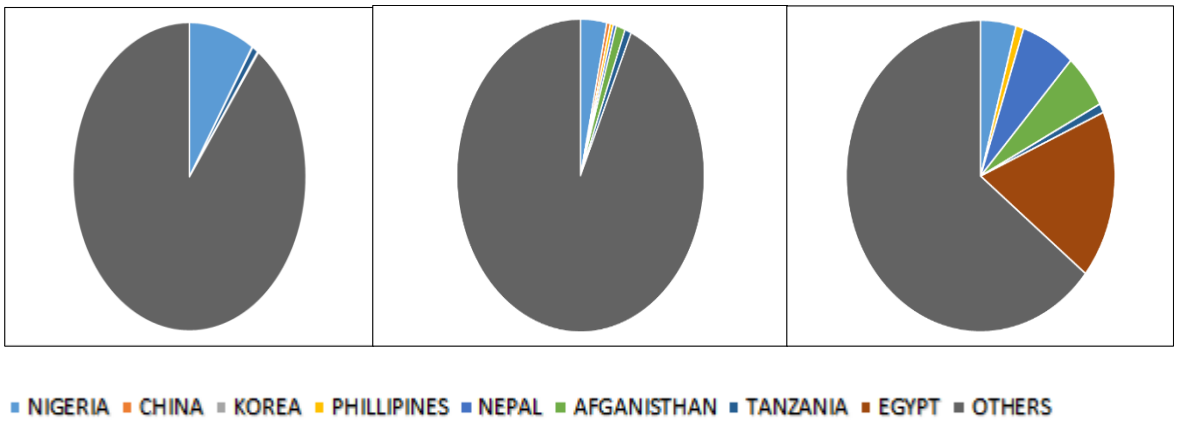
Quantity in tonnes
Source: Ministry of Commerce and Industry

- India is the second largest exporter in the world of this item behind China. India's average RCA for this item is also high and stood at 20.9, the highest for any four-digit line for India in HS 76.

- India's exports comprised both stranded wires with steel core (HS 761410) and other stranded wires (HS 761090). Principal markets for the former were Afghanistan, Egypt, Tanzania and Nepal. The key destinations for the latter were Bangladesh, Colombia, Ethiopia and a few other African countries.

Figure 3. 18: Major export destinations of India for stranded wires and cables for a) 2009-10, b) 2016-17 and c) 2019-20
(quantity in tonnes)

a) b) c)



Source: Ministry of Commerce and Industry

- China's exports under each of these 6-digit lines were twice that of India in 2018 and its export markets included Brazil, Myanmar, Egypt, US, Kenya and other ASEAN and African countries.

India's trade trends in HS 7615 (Aluminium kitchenware and utensils)

There is considerable value addition involved in products under this tariff heading, more than 100%. The average VAI index for this item is 2.15 and much of the casting for making these utensils are known to be derived from recycled aluminium in India.

Export trends in HS 7615

- India's exports of HS 7615 items added up to 17,624 tonnes in 2009-10 and have only gradually expanded to 21,732 tonnes in 2019-20 valued at US$ 94 m. India's exports were principally under HS 761510 of kitchen utensils. Exports of aluminum sanitaryware (HS 761520) were negligible.

- India was the ninth largest exporter of this item in the world, with China leading the world at over 500,000 tonnes. India's average RCA for this item stood at 0.95 even as it has improved to 1.03 in 2019.

- India's top five markets for this item were UAE, USA, UK, Saudi Arabia and Kenya. When India was a beneficiary developing country under GSP, exports

of HS7615 to the US were subject to an MFN rate of 3.1%[58] But not withstanding the withdrawal, India's exports to the US remained steady and amounted to US$ 17.90 in 2019-20. China's exports were also principally to US, Japan and other developed countries.

Import trends in HS 7615

India's imports have been relatively small and have been around 4 to 5 thousand tonnes, predominantly from China.

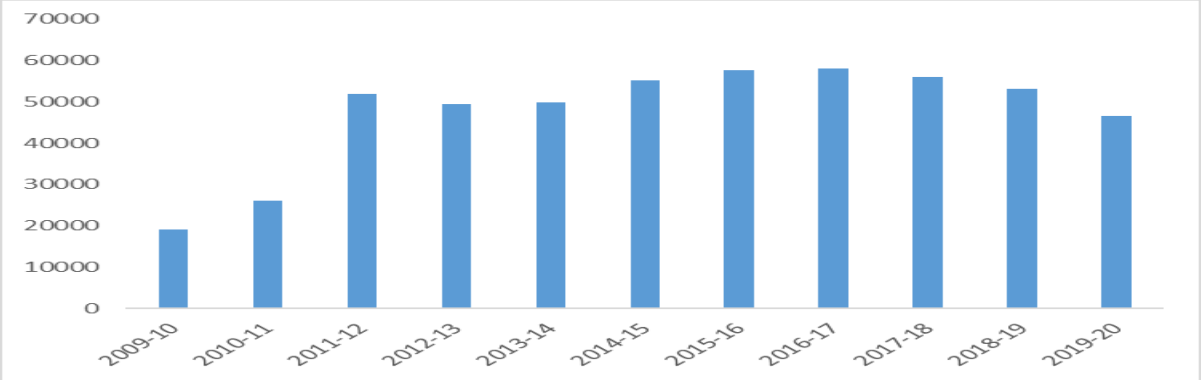
India's trade trends in HS 7616 (Other articles of aluminium)

This is a residual tariff line of other articles not dealt with in earlier paras or which do not figure under other HS Chapters like HS 87 which covers certain other items like aluminium wheels or other auto parts. While HS 7616 covers certain specific items like screws, nails etc., under HS 761610 and cloth grill, netting etc. under HS 761691, trade predominantly takes place under HS 761699, that includes castings and forgings excluded under other lines. The value addition index of the items under HS 7616 on aggregate is high at 3.51.

India's export trends in HS 7616

- India's exports of HS 7616 items grew significantly from 19,000 tonnes in 2009-10 to 46,550 tonnes in 2019-20 valued at US$ 349 m, even as tonnage wise the exports were even higher in 2016-17 at 58,015 tonnes valued at US$ 326 m (Fig 3.19). India's exports were mainly under HS 761699.

Figure 3. 19: India's export of Other aluminium articles (HS7616)



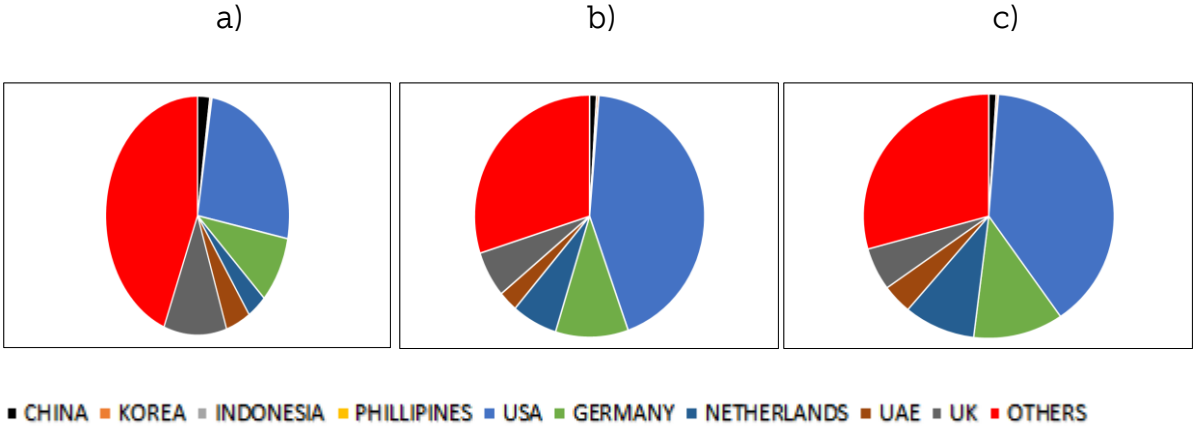
Quantity in tonnes
Source: Ministry of Commerce and Industry

[58] GSP-eligible for All Beneficiary Countries (June 2018)- https://ustr.gov/sites/default/files/gsp/GSP%20eligible%20products%20for%20all%20BDC%20June%202018.pdf

- India's average RCA for this item was 1.33 and India was the 14th largest exporter in the world with the ranking led by China with 567,000 tonnes.

- India's main market for HS 7616 was the United States, which absorbed about 40% of India's exports. The GSP withdrawal did result in some decline from US$ 153 m in 2018-19 to US$ 133 m. Exports were also made to Germany, Netherlands, UK and UAE.

Figure 3. 20: Major export destinations of India for Other aluminium articles for a) 2009-10, b) 2016-17 and c) 2019-20 (quantity in tonnes)

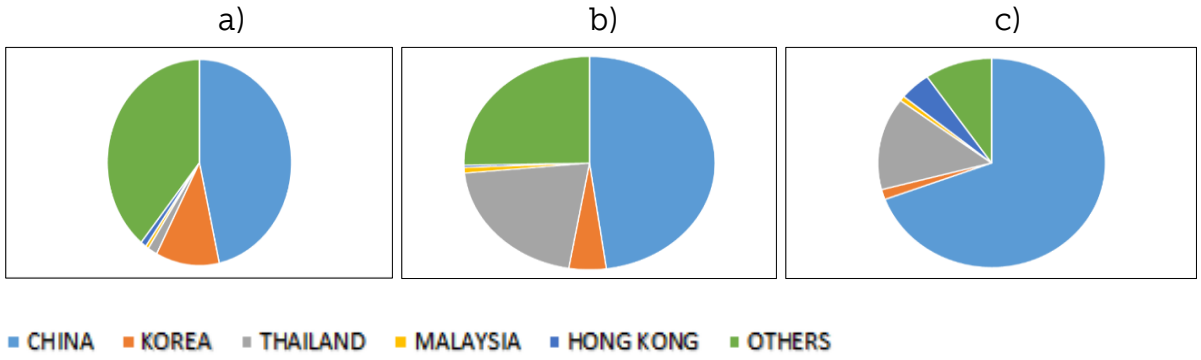


Source: Ministry of Commerce and Industry

India's import trends in HS 7616

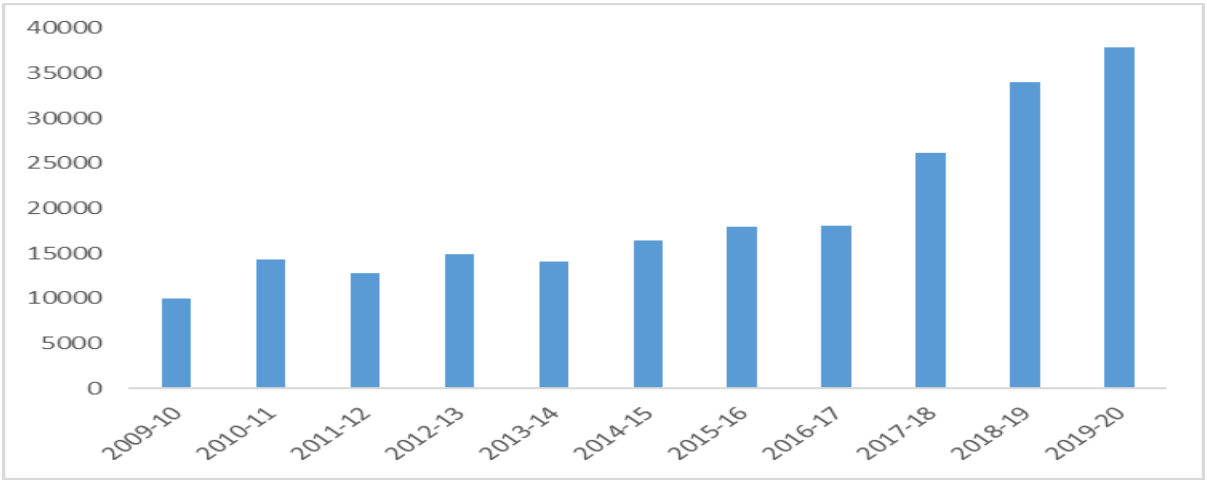
- India's imports of HS 7616 items grew more rapidly from 9921 tonnes in 2009-10 to 37,880 tonnes in 2019-20 amounting to US$ 474.71 m (Fig 3.22) Here again the items were mainly under HS 761699 but the unit values in respect of imports were even higher than what was realized in exports.

Figure 3. 21: Major import sources of India for Other aluminium articles for a) 2009-10, b) 2016-17 and c) 2019-20 (quantity in tonnes)



Source: Ministry of Commerce and Industry

Figure 3. 22: India's import of other aluminium articles (HS7616)



Quantity in tonnes
Source: Ministry of Commerce and Industry

- China accounted for the bulk of imports with a share of 70%. Thailand also had around 14% share (Fig 3.22)

India's trade trends in other items

- In the foregoing we have not addressed the trade trends in aluminium powder (HS 7603), aluminium pipe fittings (HS 7609), aluminium tanks (HS 7611), aluminium casks/drums (HS 7612) and aluminium gas containers (HS 7613). Trade in these items is limited except in respect of aluminium pipe fittings and drums about which we highlight a few aspects below.

- Noteworthy in respect of aluminium pipes is that India's exports of this item in recent years have been mainly (90%) to USA. India's overall exports of pipe fittings have also gone up from around US$ 5m in 2009-10 to US$ 26 m in 2019-20. Imports have remained at around US$ 10 m.

- India's exports of aluminium drums too have risen from US$ 10 m in 2009-10 to US$ 49 m in 2019-20. India's exports go to UAE, US, Sri Lanka, Kenya and Nepal. Imports into India were US$ 36 mn in 2019-20. China is the leading source followed by UAE and UK.

Key takeaways from the foregoing trade trend analysis

- There has been a rapid growth in recent years of India's exports of unwrought aluminium, both alloyed and unalloyed (with the latter now comprising 15-20%), that together stood at 1.96 m tonnes in 2019-20. Malaysia and Korea were the top markets for the unalloyed aluminium, with exports to the latter perhaps aided by a 1% duty preference due to CEPA. USA and Mexico were the top destinations for the alloyed aluminium. Could China emerging as the fourth largest market for the latter in 2019-20 be due to the APTA concession that took effect in 2018?

- Among value added items, significant growth is seen in India's exports of aluminium wires, stranded cables, kitchen utensils and residual items under HS 7616 including castings, in all of which India has developed stable capacities and competitiveness. Extent of value addition in wires is, however, not particularly high. Another noteworthy aspect is the perceptible growth in India's exports of rods and profiles under HS 7604 in recent years even as there was a significant decline in 2019-20.

- Around 25% of India's value added aluminium exports (HS 7603-7616) go to the United States. The imposition of Section 232 measures by the United States on imports of aluminium from India (as also other countries) in March 2018 that involved an additional duty of 10% apparently did not have any marked

Box 3. 2: Duty structure of India and certain aluminium producing countries in ASEAN and in China for HS 76

The customs duty structure in India for imports of aluminium items as set in 2008 comprised a 5% duty on unwrought aluminium, 7.5% for aluminium products figuring in HS 7603 to HS 7616. Following pressure in recent years from the domestic aluminium producers about the threat of rise in imports, the government raised the import duty on unwrought aluminium by 2.5 percentage points to 7.5% in the budget of 2016-17 and of downstream products figuring in HS 7608- 7616 to 10%. Imports of aluminium scrap has however remained at 2.5% despite calls for raising this as well. Under the FTAs signed by India with ASEAN, Malaysia, Korea and Japan, however, India committed to progressively reducing the duties on most aluminium products to zero. Only the tariff lines for unalloyed unwrought aluminium (UUA-all lines under HS 760110) were excluded from any tariff liberalisation along with two lines in HS 7606 in respect of electrolytic plates exceeding 0.2 mm thickness. Thus, while the MFN duties have progressively higher tariffs for value added aluminium products, duties under the FTAs have an inverted structure with duties on almost all value added products at zero for the FTA partners except for UUA.

The MFN customs duties of China for UUA is 5 and for UAA 7%. The duty on scrap is 1.5% and for value added products in HS 7603-7616, it ranges between 6 and 25% with select targetting (Please see Table 3.26 in the Annexure for full details on the MFN tariffs of China and a few developing countries). In fact, till 2017, its duty levels for downsteam products were higher with the maximum set at 30%. But the duty levels were reset in 2018. Under APTA, with the fourth round of concessions coming into effect in 2018, China also offers to India 20 to 35% preference on 22 eight-digit lines, and 50% on one line, in respect of aluminium products under HS 7601, 7604, 7605, 7606, 7607, 7613, 7614 and 7616. India too extends a tariff preference on 21 lines with its concessions ranged between 15 and 45%. These are mainly in HS 7601, 7604, 7606, 7607 and 7615. The minimum local value addition required for availing APTA preference is however somewhat higher than the FTAs and is 45 per cent of the freight on board (FOB) value.

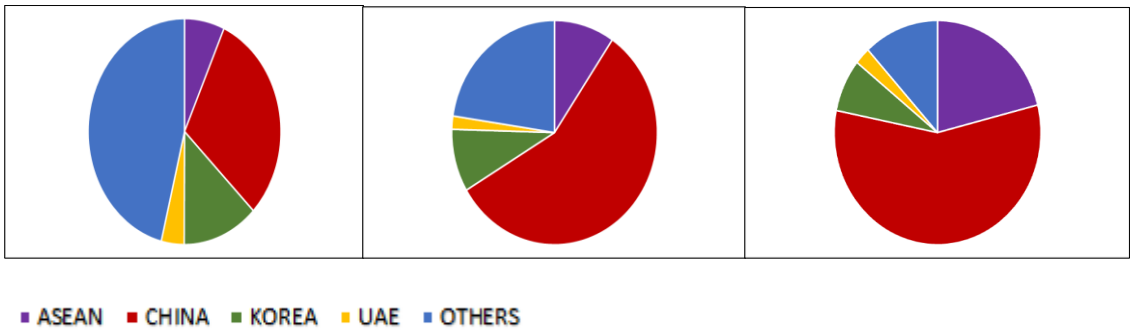
The MFN duty of Malaysia is zero for unwrought aluminium, scrap and powder but higher tariffs of 20 to 30% for most value added products. Moreover, it has excluded the value added lines HS 7604 to HS 7616 from any tariff reduction under the India-ASEAN FTA or the India-Malaysia CECA. This essentially shuts out any possible export of value added products to Malaysia by India.

The MFN duty of Indonesia is zero for unwrought aluminium and scrap but ranges upto 15% for value added items. Only for certain aluminium structures and foils the duty can go up to 20%. While some value added products will have duties on them reduced to zero for India in Indonesia under the India-ASEAN FTA, a large number of them have been placed in the sensitive category and will have final duties set at 5% .

Table 3.26 in the Annexure provides the comparative picture MFN duty levels maintained by various developing countries for the 35 six digit tariff lines in HS 76. These include tariff levels by certain ASEAN countries, Brazil, the Gulf countries and China.

Figure 3. 23: Major import sources of India for value-added products (HS 7603-7616) for a) 2009-10, b) 2016-17 and c) 2019-20 (quantity in tonnes)

a) b) c)



Source: Ministry of Commerce and Industry

effect on India as India's exports of HS 76 items went up to US$ 783 m in 2018-19 compared to exports of US$ 680m the previous year. The increase was not only on account of an increase in the export of unwrought aluminium but also of value added products from US$ 332 m in 2017-18 to US$ 410m in 2018-19. But the withdrawal of GSP treatment to India in June 2019 by the US, which was an India specific measure, saw exports of HS 76 items declining in 2019-20 to US$ 637 m and within it, of value added products to US$ 362m in 2019-20. It is possible that the penal tariffs imposed by the US on imports from China, as part of its actions under the US-China trade war during the Trump Administration, may have muted the adverse impact on India's exports to the United States. The imposition of anti-dumping/CVD duties on India's exports of common alloy sheets to the US could further dampen India's export prospects in that item.

- Other regions to which India exported value added products were Africa (18%), South Asia (13.3%), the Gulf countries (10.5%) and the EU (9%) in 2019-20.

- As for imports, what is striking is the rapid growth in imports of unwrought aluminium alloys, wires, FRPs like sheets and plates and foils and structures. Malaysia is the leading source for import of unwrought alloys and wires helped by its FTAs with India. Korea is also a significant source for certain of these items assisted also by its CEPA with India. But most prominent is the dominant share acquired by China in respect of rods and profiles, FRPs, pipes, structures, household utensils and other residual items in each of which its import market share in India is 50% or more and generally growing. China's shares in all value added aluminium imports by India aggregated to 57% by

tonnage and 48% by value in 2019-20. Import shares of major sources in tonnage terms of all value added products as they changed from 2009-10 to 2019-20 can be seen in Figure 3.23.

- An exception in terms of steady growth in imports from China was in respect of aluminium foils in which its import share declined from 83% in 2016-17 to around 65% in the following years because of anti-dumping duties levied by India on foil imports from China. The vacated space has been captured by Thailand, Malaysia, Indonesia and Korea, all of which benefit from zero duties under their FTA arrangements with India.

- What is also interesting in respect of value added products is that while the share of ASEAN countries in India's imports in 2019-20 was 21% in tonnage terms, it was only 15% in terms of value. Similarly, while the import tonnage share from China was 57%, it amounted to only 47.75% by value, indicating a relatively less unit value of imports from China. While Korea was another significant source of import, the tonnage (7.6%) and value (7%) were similar in proportion, just as in the case of UAE as well whose tonnage and value shares were at around 2.5%. But imports from the US were relatively high end items accounting for 0.7% share in terms of volume but registering a 2.36% share in value.

- China became eligible for some duty concessions on some 22 eight-digit lines in HS 76 under APTA from July 2018 onwards. No perceptible change in the trend of India's imports from China was, however, seen in these lines in 2019-20.

* India's scrap imports have also risen sharply in recent years to 1.35 m tonnes at present, and could play a complementing role in enhancing aluminium consumption domestically. The scrap imports are sourced mainly from developed and Gulf countries but there are imports from other sources as well. These are imported under HS 76020010 which are required to be adhering to ISRI specifications. Considering the diversity of sources for the scrap, getting the pre-shipment aspect to cover compliance with ISRI specifications in this regard may be important. Secondly, restrictions by China on scrap imports in the last couple of years led to some widening of the global price spread between scrap and primary aluminium (see Table 3.24 in the Annexure) and also India becoming the No.1 market in the world for aluminium scrap. China appears, however, to have reverted to importing scrap even if it now terms it raw material.

* A comparison of India's MFN duty structure as also of its FTA commitments vis-a-vis China and some of the ASEAN countries indicate significant differences (see Box 3.2 and Table 3.26)

* Most important, is the inverted duty effect as a result of India reducing its duties on most value added products to zero under its FTAs but maintaining an exclusion for primary unalloyed aluminium. As a result, both the MFN duty and the duty under the FTAs for the latter stand at 7.5%, while for the FTA partners the duty on practically all value added aluminium products in HS 76 has become zero. Malaysia particularly stands to benefit considering it has excluded all the value added items (for which MFN duties are high) from any duty reduction but has zero MFN duties for primary aluminium.

* India has also not been able to fully capitalize on the duty benefits under its FTAs for value added aluminium products. Its exports of these items amounted to only US$ 48 m to all ASEAN countries together in 2019-20 whereas imports from them significantly rose to US$ 300m which added upto 21% in import tonnage of these items. Similarly, while India's exports to Korea of value added items have been minimal, its imports from Korea accounted for 7% of imports by value and 7.6% by tonnage by 2019-20.(see also Table 3.25 in the Annexure). Nor has India's proximity to SAARC countries helped even as exports to them have been more than to ASEAN countries. India's presence in the aluminium sector in the markets of Sri Lanka, Bangladesh and Nepal is getting affected by increased imports from China.

* Finally, in respect of export incentives, India extends a uniform duty drawback and MEIS benefit to aluminium exporters, the latter applicable to several export destinations barring some developed countries. There is no differential in incentive percentages, however, whether they are for primary aluminium or for value added products.

Section 3A: Aluminium trade during the COVID-19 period

This has merited a separate sub-section since trade in aluminium products, along with perhaps a few other items, has taken place on somewhat different lines during the very challenging COVID times compared with India's earlier trade trends. While the pandemic is still around at the time of writing, economic recovery has begun and trade is slowly limping back to normal. So, some analysis may be appropriate but this is limited to looking at trade in HS 76 items during the April-November 2020 period for which trade figures are available presently.

Primary aluminium smelting is a continuous process that cannot be abruptly stopped or started. So, the output by the four Indian primary aluminium producers during the COVID period was largely as per their capacity but for some scaling down of production by one producer, Hindalco. As per the Ministry of Mines[59], production of unalloyed primary aluminium totalled 2.657 mt for the first nine months of the financial year 2020-21 (April-December), as against the total production of 3.044 mt during the same period in 2019-20, implying a 12.7% decline. But the performance of the downstream aluminium sector, which is largely populated by the SMEs, was affected more deeply by the lockdown that has shown signs of recovery only beginning with the third quarter of 2020-21.

This also gets captured in India's external trade in aluminium products. Because of the inability of the downstream industry to absorb the primary aluminium produced, much of the production had to be exported[60]. And India's exports of unwrought aluminium (HS 7601) for the first eight months of 2020-21 were 1.545 mt, the highest so far for this period, and 20.8% more than the corresponding exports in 2019-20. This amounted to 66% of primary aluminium produced during this period. The export realisation was however only US$ 2.72 bn, which while being higher compared to the previous year, was lower than the US$ 2.97 bn realised for the first eight months in 2018-19. This is because the aluminium prices dipped sharply in April and May of 2020 (LME prices then were in the range of US$ 1450) before recovering in the following months. India's unit price per tonne for HS 7601 exports was the lowest in May 2020 at US$ 1579 whereas by November 2019 these had climbed up to US$ 1931.

[59] See https://www.mines.gov.in/writereaddata/UploadFile/December%202020%20Summary.pdf

[60] See also https://www.bloombergquint.com/business/billionaire-birla-s-hindalco-plans-to-sell-65-aluminum-overseas

As for the export destinations of this primary aluminium, while Malaysia, Korea and the US continued to take the top three slots, surprisingly, China emerged as the fourth largest with India exporting US$ 231 mn comprising mainly of ingots. In normal times, very little of primary aluminium gets exported to China because of its surplus capacity and duties but this spurt in export was evident during the five months from May to September 2020 before exports dropped to marginal levels from October onwards.

India's exports of value added aluminium products (HS 7603-7616) declined somewhat from US$ 939 m in the first eight months of 2019-20 to US$ 860.62 during the same period in 2020-21. Three items however bucked the trend. Most impressive was a 56% increase in exports of aluminium wires (HS 7605) during this period that fetched US$134 m. There were also some increases in India's exports of aluminium foil (HS 7607) and aluminium drums (HS 7612), perhaps due to the heightened packaging and storage demands of the COVID period. That two of the primary producers are domestically leaders in the manufacture of wires and foils also perhaps made it possible. But in respect of most of the other value added products India's exports were significantly lower. These included three other large items, namely plates, stranded wires and 'other items' that included forgings and castings.

The performance on the import front was more negative, reflective of a contraction in domestic demand. India's imports of HS 76 items declined from 1.47 mt in the first eight months of 2019-20 to 1.171 mt in the corresponding period of 2020-21 (-20.5%). The dip was even deeper (-25%) if compared to the corresponding figures for 2018-19. And the decline was seen across all the four digit lines in HS 76 including in respect of import of aluminium scrap, even as, tonnage wise, scrap imports showed a limited decline of only 12.8%, after a sharper decline in the first five months. On the other hand, imports of value added items like profiles, wires, plates, foils and 'other items' whose main import sources have been China and certain ASEAN countries showed declines ranging from 35 to 50%. Was this due to production disruptions in those countries, or a lack of demand domestically because of reduced building, construction, infrastructure and other activities or due to a higher level of import monitoring at the Indian end or had something to do with trade defence actions initiated on some of the products during these months, was unclear. It could also have been due to a combination of these factors.

While the reduced level of value added imports could be welcome from one perspective, in that it is a continuation of steady improvement in balance of trade in HS 76 since 2017-18, it is not evident that the situation led to any increased usage of domestically produced aluminium for making value added

products. And what is more, it certainly led to less consumption domestically of aluminium (by 27%) during this eight month period amounting to 1.733 mt[61] as against 2.368 mt during the same period in 2019-20.

[61] Computed using figures for primary aluminium production for these eight months from Ministry of Mines added with import tonnenage of HS 76 items but reduced thereafter by exports.

Section 4: Recent studies on Aluminium: Key findings and recommendations

This section will highlight some of the key findings and policy recommendations in a few recent studies on aluminium. It will cover a study published by the Niti Aayog (NA) in 2018, a paper published by the Centre for Public Policy Research (CPPR) in 2017, the draft policy note on recycling of non-ferrous metal scrap put out by the Ministry of Mines in March 2020 and presentations by India's two leading industry associations, CII and FICCI. In addition, a few relevant findings in the report of the US Department of Commerce (USDOC) in a recent investigation on the US aluminium industry will also be flagged.

Study by Niti Aayog: Titled 'Need for an aluminium policy in India' by V.K. Saraswat and Aniruddha Ghosh[62], the NA study has pointed to the versatility of the aluminium metal and its growing applications in a variety of sectors including in several defense, aviation and security related sectors. The study makes a compelling case for increasing domestic consumption of the metal by also drawing attention to the significant backward and forward linkages of aluminium and the multiplier effect it can have on national development. It points out that the GDP per capita of a country is closely relatable to its aluminium usage. Aluminium's lightweighting of autos and railways can bring significant energy savings. It is also a much favored metal in buildings, construction and has several applications in critical infrastructure. Aluminum availability is key in wind, solar and energy storage batteries. It is regarded a strategic metal in the defence and aerospace industries.

The study argues that the foregoing and related factors have led several countries globally to accord the aluminium industry a priority status in their development plans and to provide a favorable eco-system for its growth. The study, therefore, recommends formulation of a National Aluminium Policy for India that will identify growth targets for demand augmentation and capacity addition in the near, medium and long term and map out a vision.

The study has further examined the issues plaguing the development of the industry in India on five different aspects- energy, mining, infrastructure, lack of domestic scrap recycling and trade policy.

In its recommendations, the study calls for the aluminium sector to be accorded core status similar to coal, crude, steel, power etc., Underlining the

[62] See https://niti.gov.in/writereaddata/files/document_publication/niti_aluminum_upload.pdf

need to reduce high power and other input costs involved in producing aluminium, it calls for reforms in coal and mining auctions so that mandatory environment and other clearances are either done before the auctions or a single window clearance is made available post auction for the awardees to obtain them speedily. It also argues for a distinctive energy policy for aluminium and other energy intensive sectors so that they are not burdened with payment of carbon tax through cesses or other duties. The study further urges power to be made available to the industry at globally competitive rates. Priority access for the sector to infrastructure such as railway rakes is another aspect underlined.

The NA study urges the government to come out with a metal recycling policy that will encourage a high degree of domestic recycling (85%) by 2025. It also suggests a parity in rate between import duties on primary metal and on scrap to encourage domestic recycling but it has not amplified how this could impact on the current scrap availability. As for trade in aluminium products, it calls for domestic producers to be encouraged towards producing high end aluminium products and exporting value added products. Pointing to cases of inversion in duties resulting from some of India's FTAs, particularly vis-a-vis Malaysia, the study urges caution on trade policy while negotiating such agreements.

Study by CPPR, Kochi: The study by CPPR has sought to examine the effects of tariff hikes announced in the budget for 2016-17 on aluminium and its products. The study[63] provides a good overview of the evolution of duties in the aluminium sector in India since the introduction of the Aluminium Control Order in 1970 and how these had been progressively changed/reduced over the years to 5% for primary aluminium and 7.5% for value added products in 2008 before their hike in 2016.

Two important points are forcefully made among the recommendations of the study. First, the hike could result in hampering leveraging of consumption opportunities of aluminium given the rapid growth of applications using downstream products of aluminium. The paper draws attention to the very wide gap between India's per capita consumption of aluminium and the global average as also the very limited number of applications in India (around 300) as against 3000 globally and appeared to suggest that the hikes could restrain progress towards closing these gaps. Second, it also has drawn comparisons between the numbers employed in the production of primary aluminium which are very limited, which it estimated at 85,000, as against several lakhs in

[63] The full version of the study can be viewed at https://www.cppr.in/wp-content/uploads/2017/06/Evaluation-of-the-Effects-of-Tariff-Hikes-on-Indian-Aluminium-Industry.pdf

the downstream sectors and how making primary aluminium (or scrap) available to them in a duty free regime for aluminium products and scrap could make the latter more competitive and generate greater economic good. In this regard however it does not take into account the strategic nature of the industry for a large country like India and the essentiality of having a sizable primary production capacity within the country.

Draft policy on recycling of nonferrous metals of March, 2020: The draft policy note[64] of the Ministry of Mines, intended to elicit comments from the public, focussed principally on the challenges posed by a very underdeveloped recycling sector in the non-ferrous metals area and seeks to direct the policy towards obtaining greater efficiency and a circular economy in the aluminium sector. It exhorted increased recycling since secondary aluminium capacity can be created at less than 10% capital cost of a primary smelter and substantially improve the carbon footprint. The study provided guidance for establishing an appropriate legislative, administrative and institutional framework for aluminium recycling. It targetted achieving a 50% recycling rate by 2025 from the current 25% by evolving a responsive ecosystem with specific roles for the government, aggregators of scrap, scrap processing centres, manufacturers using aluminium and the public.

On export-import, the draft puts down as an objective to conceive and implement progressive policies for import of scrap with a view to significantly value-add both for domestic demand as well as exports. It called for banning of export of scrap containing critical raw materials (CRM) and removal of restrictions and facilitating import of crucial scrap and technologies for creation of value-added metals & alloys that are imported. The draft also noted that imports of scrap will keep growing before it will reach a peak point and will gradually reduce thereafter with increasing domestic scrap supply. This is because of a very low per capita consumption in India and aluminium products mostly have long life usage. The draft also sought review of FTA provisions in respect of ASEAN and Japan that had given rise to an inverted duty structure.

Importantly, the draft dwelt on standards to be observed by the recycling industry and lays out various responsibilities for them. It required aluminium scrap, particularly since 90% of requirements is imported, to be checked for radiations and ensuring that no harmful material got into processing. Pollution control measures also required strict observation along with making usage of finest accessible technology for melting the scrap. And it proposed end products from secondary aluminium should be certified by BIS or the

[64] The note is accessible at https://mines.gov.in/writereaddata/UploadFile/policy27032020.pdf

Jawaharlal Nehru Aluminium Research Development and Design Centre (JNRDDC).

The draft has however now been finalised and a revised framework issued by the Ministry of Mines[65]. The framework includes setting up of a Metal Recycling Authority which will inter alia prescribe quality standards for each stage - input scrap, for the processing of scrap, for the final recycled metals and the minimum infrastructure required for recycled metals.

A CII presentation on Vision 2030 for Aluminium Industry This presentation by CII[66] covers the various segments of the aluminium industry, regarded one among the ten champion sectors to push for growth, and suggests a vision and roadmap for it for 2030. The vision projects the capacity of the domestic aluminium industry to go up from 4 mtpa to 12 mtpa during this time with exports too rising from 2.3 mtpa to 4 mtpa by then and domestic consumption to expand to 8 mtpa. It envisages zero imports by 2030 with team India developing itself as a global export base across the value chain with a high value added downstream sector dominated by SMEs and MSMEs. It sees all this as possible considering that India is among a few countries globally having all the features of an efficient aluminium producer.

Looking at the various challenges for the industry in meeting these targets, it dwells on its high cost structure, the steady decline in the share of domestic producers in consumption, the regulatory uncertainties facing the industry, the supportive policies needed to increase domestic downstream consumption, the absence of BIS standards, the FTAs without protection clauses and the skill shortages in downstream segments. It then goes on to make suggestions across the three pillars of primary aluminium, aluminium scrap and downstream sectors towards enhancing their competitiveness and creating an efficient and circular economy.

As for primary aluminium, it recommends inclusion of aluminium as the 9th core industry, announcement of a national aluminium policy that can attract investments and inclusion of domestically manufactured aluminium and aluminium products in the public procurement order- PPP-MII Order 2017. It urges shorter approval process for mines within 1-2 years with simplifications in the process. A separate power policy for energy intensive industries is sought apart from addressing issues relating to coal cess, electricity duty and the obligations towards renewable power. Improvement in logistics is another

[65] https://mines.gov.in/writereaddata/UploadFile/NFMScrapRecyclingFramework3.pdf

[66] Shared with the authors of this report

aspect flagged with suggestions for recategorisation of class for different aluminium related items from fuel needs to bauxite and alumina.

The presentation also made several specific suggestions in relation to trade calling for an import monitoring system such as for steel with a provision to raise import duties in case of a surge. To guard against misuse of FTAs, it urges strict monitoring of ROO adherence and a look at other possible taxes such as border adjustment tax. It further calls for far lower duties on raw materials used by the industry such as pet coke, aluminium fluoride and coal tar pitch. To enhance export competitiveness, it has sought a hike in the MEIS benefit from 2% to 5% and for the RoDTEP scheme, when announced, to adequately remit the unrebated central and state duties and taxes that it assessed at 15% of aluminium production.

As for the second pillar of aluminium scrap, the presentation considered the present share of 34% by recycled aluminium in domestic consumption as higher than the global average of 30% and attributed it to the duty differential of 5% between primary aluminium and scrap. It called for duty on scrap to be raised to 7.5% and BIS standards be set and enforced for minimal aluminium content and also limiting non-metallic wastes.

The third pillar, and perhaps the most important one, is on promoting the value added segment in which it has identified packaging, buildings and construction and defense and aerospace as particular focus areas in each of which India's present manufacturing capacity meets only part of the domestic needs. Here the presentation makes specific suggestions for improving the demand that may make manufacturing more viable, for improving skill capacities so that imports are not unnecessarily resorted to, setting standards in the absence of which indiscriminate imports rise and provision of incentives for investment in defence and aerospace related items that have somewhat limited demand.

Notwithstanding its seemingly comprehensive coverage, the CII presentation does come across as conveying mainly the perspective of the primary aluminium industry. That India has to have a substantial and rapid accretion of aluminium in use, from both primary and secondary routes, before it can work towards a circular economy is not adequately dealt with. Nor is a development path laid for the recycling industry that has its own merits and could address several applications on which primary aluminium need not be wasted. This is even as observation of standards all around is a very necessary and a valid concern.

A FICCI Avalon group study on non-ferrous metals, 2018

This joint study by FICCI and the Avalon group[67] preceded the CII study and gave an overview of the various non-ferrous metals including aluminium. While their description about the aluminium sector including about capacities, consumption and usage will not be repeated here, a point that received particular focus in the study was the adverse impact resulting from the FTAs which had given rise to an inverted duty structure and a sharp rise in imports. It highlighted that while India exported mainly primary products to ASEAN countries it imported back finished products/scrap which had also risen at a fast pace. India's imports of aluminium wire (HS Code 7605) from Malaysia increased from 13 tonnes in 2012 to 15,354 tonnes in 2016. The imports of aluminium scrap (HS Code 7602) had increased by almost 200%.

The import duties on some key ingredients used for aluminium manufacturing were higher than the primary metal itself and the inverted duty structure was having an adverse impact. Both caustic soda and aluminium fluoride attracted a duty of 7.5%, while alumina and coal tar pitch had an import duty of 5%. The duty on the finished product, primary aluminium, was also 5%. This, it noted, was in contrast to China, which imposed no import duty on Alumina.

The study also provides an international perspective, mainly of China, of how the non-ferrous metals industry has been promoted. These included according an important status for it domestically, promotion of metal in end-use industries, adoption of a cluster development approach, availability of cheap and abundant power and provision of export incentives. The study argues for similar incentives for India producers. In its Vision 2030, it called for aluminium to be kept out of RCEP apart from seeking reduction of duties on all raw materials to the lowest level possible. It also sought preference to domestic manufacturers in government procurement.

The study also observed that the import of scrap metal, as a proportion of total aluminium imports and as a proportion of domestic consumption, was getting disproportionately high. Noting the two fold reasons for it - inconsistency of enforcement of regulations governing such imports and the non-availability of scrap domestically- it urged the government to come up with a well-defined end of cycle norms and more consistently enforce regulations to reduce scrap import and close the gap between demand and supply of scrap.

[67] Accessible at http://ficci.in/spdocument/22947/Non-Metal-Report.pdf

Report of US Commerce Secretary on aluminium under Section 232 of US Trade Expansion Act

The US Commerce Secretary Wilbur Ross launched an investigation to determine the effect of imported aluminium on US national security under Section 232 of the US Trade Expansion Act in April 2017 and the final report was published[68] on 18 January 2018. The products covered by the investigation included unwrought aluminium (HS 7601) and all the value added products under HS 7604 -7609 as well as aluminium castings and forgings that were imported under the tariff line 'other aluminium products' covered by HS 7616. Based on the recommendations contained in the report, President Trump imposed an additional duty of 10% on imports of these items from most countries including India, effective March 23, 2018.

Several countries have taken the US to the WTO, challenging the legality of the measure. Certain countries have also imposed retaliatory duties on the US. What is however of relevance here are some of the findings in the report which provide insights about the strategic nature of the aluminium industry to the US but which has wider relevance, including for India.

The report underlined the importance of maintaining the commercial viability of the industry to enable it to participate in the procurement by defence, which was in relative terms a small share but a critical one. Supply of high purity aluminium was essential to the production of high performance aluminium alloys used in various defense applications. These included ground weapons system, defense aircraft systems, space applications including launch vehicles, satellites and missiles, propellants for solid booster rocket mortar and defense naval systems, including high speed vessels.

The commercial viability of the industry is also what enabled the aluminium companies to engage in research and product development. The report, for example, noted that more than 90% of all alloys used in the aerospace industry were developed through research by the American company Alcoa.

Secondly, the findings in the report also shed light on the policies and practices followed by China. It noted that China's industrial policies encouraged development and domination of the entire aluminium production chain. They were further intended to stimulate the export of aluminium processed into sheets, plates, rods, bars, foils and other semi-manufactures and to target

[68] See https://www.commerce.gov/sites/default/files/the_effect_of_imports_of_aluminum_on_the_national_security_-_with_redactions_-_20180117.pdf

development of increasingly sophisticated and high value product sectors, such as automotive and aerospace.

The report specifically referred to an excise tax imposed by China that created a disincentive for the export of primary aluminium ingots and billets. It provided tax rebate on exports of semi-finished or finished aluminium products. This helped in rapidly developing its aluminium industry and capturing a large share of world imports in value added aluminium products. The report also noted that while several aluminium producers in the world were countries with lower energy costs, China was an exception where energy costs were higher than in the US and overall production costs of aluminium in China were equal to that of US producers.

Finally, it is also relevant to note that the almost last minute duty waiver issued by Trump Administration on imports of aluminium from UAE on January 19, 2021, was revoked by the new Biden Administration on February 1, 2021, effectively therefore continuing with the Section 232 tariffs on aluminium imports from UAE. The American Primary Aluminium Association has noted[69] that 'The revocation by the Biden Administration will ensure that America's primary aluminum industry is protected against foreign aluminum imports while preserving America's national security interests'. It also signals that no immediate review of these duties by the Biden Administration may be on the cards, at least for a while.

[69] See https://apnews.com/press-release/pr-newswire/business-global-trade-economy-3c2311f70a9162cb63c33d990e7cf2bb

Section 5: Questionnaire survey and other industry viewpoints

This study had hoped to base its findings not only on the basis of statistical research and archival material, but also on responses to questionnaires circulated to stakeholders in the different segments of the Indian aluminium industry. Separate and detailed questionnaires were prepared for companies belonging to the three different segments - primary aluminium manufacturers, recyclers and producers of value added products. Likewise, separate questionnaires were also sent to the industry associations dealing with primary aluminium, recycling and manufacture of value added products.

The questionnaires sought to elicit information about the profiles and product ranges of the different companies as well as information about perceived issues faced by them in the manufacturing process, including those relating to electric power, raw material imports, domestic availability of inputs, labour costs and skill availability, technology processes, financing and cost of credit, tariff related aspects and other issues constraining or hampering smooth and competitive production. In addition, it also sought details about competition between the primary and secondary aluminium tracks, factors that may be inhibiting greater participation in downstream production, competition from imports including from FTA partners and whether there were also marketing, pricing and logistical hurdles. The level of institutional support and the state of the aluminium industry in India were the other aspects on which queries were posed.

Unfortunately, however, the questionnaire response from industry was very poor. Perhaps the timing was not conducive as the companies were focussing on how to address the severe impact of the pandemic. It is also possible that industry representatives, at least those belonging to certain segments, were reluctant to be forthcoming because of their preoccupation with investigations relating to trade remedy measures sought against certain imports.

That said, the three responses received, one from a manufacturer of extrusions, one from ALUCAST representing the aluminium casting industry and another from the Materials Recycling Association of India (MRAI), were quite detailed and specific and they also responded to follow up queries that were addressed to them. What we shall do therefore is to briefly describe each of their responses below. In addition, we shall also describe the viewpoints of three primary aluminium producers based on their latest annual reports or publicly expressed concerns, extracts from a recent press interview with India's leading extrusions maker and the differing viewpoints of the Aluminium Association of India

(AAI) and the Aluminium Secondary Manufacturers Association (ASMA) on certain duty related issues, as seen from press reports.

Response from an aluminium extrusions manufacturer

This was from a manufacturer with a turnover of close to Rs. 200 crores who sourced ingots and billets of primary aluminium domestically to produce HS 7604 items. The respondent company conveyed there were constraints in the quality of Indian billets, which lacked in lustre and shine and in having consistent homogeneity. Availability of grid power was important for their production. While labour was not an issue, availability of credit and its cost were issues to some extent. But competition from imports, particularly from China and other FTA partners that were cheaper, and lack of availability of inputs at competitive prices, were the most important factors constraining further expansion in production. Lack of availability of technology at competitive rates and not being sure about return on investments were other considerations. While the company sold all its products domestically, there were issues in exporting to overseas markets. High logistic costs and price competition from third countries came in the way of exporting to third markets. Indian products were also comparatively of lower quality.

The company conveyed that it was not entirely satisfied with the present status of the aluminium industry in India and welcomed the opening of coal mining to the private sector. It also conveyed that it would be very helpful to have a nodal agency in the Ministry of Mines or another department which could, inter alia, track global developments in aluminium, promote usage of aluminium domestically, co-ordinate with all stakeholders, provide marketing support in international markets and undertake an annual review of taxes and import duties. It should also institute rigid quality control on imports of aluminium products. The company further regarded devising and implementing regulations for economically and environmentally viable ways of scrapping aluminium as important to some extent.

Another extrusions manufacturer, Jindal Aluminium, which describes itself as India's largest extrusions manufacturer (they also make some FRPs), has argued that shrinking margins for downstream aluminium producers, no incentives for value addition to aluminium within India and declining domestic market share due to increasingly subsidised aluminium imports, were the major issues faced by the downstream aluminium producers. Mr. Pragun Jindal Khaitan,

Vice Chairman of the company, has stated[70] that domestic aluminium was sold at LME price with an additional custom's duty of 7.5% on an import parity basis. He has called for necessary government measures to ensure that customs duty was lower at the raw material stage and increased as you go up the value chain. This will also help increase value addition within the country by consuming domestic raw material and also support employment generation. He further added that recoverable metal played a crucial role in sustainability and the current import duty of 2.5% on recyclable aluminium was just right and should not be increased. He suggested that the government should deepen the downstream aluminium industry by forming regional aluminium manufacturing and processing clusters, make dedicated aluminium research and training facilities to build a deeper talent pool and encourage grassroots entrepreneurs to plug into the aluminium industry.

Response from Aluminium Casters' Association (ALUCAST)

ALUCAST is an association of 249 aluminium die-casting companies for automotive and electrical industries and related items. Typically, these industries relied for only up to 30-40% of their raw material needs from domestic sources, with the balance met from imports. The proportion of raw material requirements was in the ratio of 20% primary aluminium (from primary players), 80% aluminium alloy or cast alloy scrap. The imports were needed because of lack of quality (in terms of standardisation) and adequate availability of casting scraps, and other assorted scrap. Further, that imported cast alloys made from scrap aluminium material is also cost effective. Furthermore, sellers of virgin/primary material must look at their cost structure if they wanted die-casters to increasingly use their material.

There are presently 600 die-casting firms in the organised sector and 25 to 35% of cast products are exported in one form or the other. Concerns did exist at times on account of imports, especially from China. The Association however stated they did not have any problems on account of inverted duty structure. They would nevertheless like duties on scrap to be set at a maximum of 5%. Lowering the GST rates and reducing excise duty on automobiles will help boost production of value added items.

As for future development, ALUCAST projected the die-casting industry to grow by 35% by 2025, compared to 2020 and by 45% or so by 2030. Growth areas will be primarily high pressure die-casting in end use sectors like automotives,

[70] The interview with the Financial Express can be seen at https://www.financialexpress.com/industry/policy-recognition-of-downstream-aluminium-segment-will-be-a-win-win-for-economy/2191078/

aerospace and electrical industry. Aluminium was a future metal of remarkable importance driving e-mobility. ALUCAST further suggested that entry into the die-casting segment should be encouraged with quality players while ensuring that SMEs were not left in the lurch. Companies should also be encouraged to engage in R&D and substantial tax breaks extended to those effectively entrenched in this regard. Having die-casting technology parks with a cluster approach to manufacturing, testing and research would be extremely beneficial. Getting universities to offer degree courses in die-casting would further help.

Response from Materials Recycling Association of India (MRAI)

MRAI is an association of recyclers of a whole host of items including plastics, steel and non-ferrous metals with a membership of 1200 companies. According to MRAI, there are around 3500 MSME recycling units recycling 1.35 million tonnes of aluminium scrap with a capital investment of Rs.50,000 crores and providing direct employment to around 5 lakh people.

MRAI pointed out that recycling did not deplete natural resources like bauxite, coal and water and did not produce harmful effluents like red mud etc., and the gaseous emissions were also far less compared to production from virgin ore. In view of these factors, several western countries were making it compulsory for all manufacturers of consumable metal products, including of aluminium, to include minimum content of recycled metals. While China was considering a ban on import of metal scrap three years ago, after considering its value it has shifted all kinds of scrap into 'raw material' category from July 2020.

MRAI contended that primary aluminium was not a substitute for secondary aluminium and any restriction on import of scrap will lead to more import of value added secondary ingots and billets. Primary aluminium was 20 to 30% more expensive than aluminium scrap and pressuring greater use of primary aluminium, where it was not necessary, will make the final product economically unviable. And primary metal prices in India had nothing to with that of scrap importation. As elsewhere globally, they followed the LME benchmark. Primary producers in India decided on domestic price based on LME plus premium plus applicable customs duty on primary ingots (presently 8.25%).

On quality issues, MRAI has argued that only good and pre-processed quality, meeting ISRI specifications, was being imported into India with pre-shipment inspection certificate issued by DGFT nominated agencies before loading from the exporting country. The quality of domestic scrap was far inferior to that of imported scrap. Lack of quality control by smaller manufacturers of kitchen

utensils or of auto products produced for the aftermarket, which finally ended up in scrap for recycling, made the scrap quality inferior. It would be best if import of scrap was allowed till there was adequate amount of domestic scrap and till the quality of domestic scrap was on par with that of imported scrap.

On customs duties, MRAI has pointed out that the existing unfavorable tariff structure was not favouring unlocking the full potential in enhancing the usage of aluminium. Most governments across the world had zero import duties on scrap. Coupled with lower production and energy costs, the producers of those countries offered tough competition to India on items such as castings, particularly in the context of inverted tariff structure vis-a-vis FTA partners. MRAI has urged the government of India to bring down the tariff on scrap from 2.5% to zero. The GST on metal scrap was also high at 18% which needed to be brought down to 5% or should be classified under Reverse Charge Mechanism method. Further MRAI has suggested that customs valuation should be as per transaction value and not as per the methodology applied by the customs.

As for FTA partners, MRAI has suggested the extreme step of suspending imports of finished/semi-finished items coming through the CEPA/ASEAN FTA routes for giving relief to domestic producers. While that may not be feasible, MRAI also suggests reviewing the FTAs and taking corrective action.

Finally, as for future development of the industry, MRAI suggests that the government should give free or subsidised land to aluminium recyclers near ports so that they can form recycling zones/clusters that would help them cut down on logistics costs.

Views of primary aluminium producers from published sources

What would be very important for our study is also how the primary producers have looked at their strengths and weaknesses in recent times and how they have assessed the opportunities for their companies and possible threats. Hindalco, which is in the private sector and is a dominant player both upstream and in some value added products, considers its business model as generating healthy cash flows. In its annual report for 2019-20[71] it also projects its Utkal alumina refinery - that is undergoing capacity expansion by 500 kilo tonnes to reach 2.0 million tonnes - as the world's most economical and efficient alumina producer. The company, however, perceives its essentially commodity product profile with a smaller share of value added products as a

[71] The report can be accessed at http://www.hindalco.com/upload/pdf/hindalco-annual-report-2019-20.pdf

weakness and is showing increased focus on the latter. This will also enable it to be more delinked from LME prices.

The Hindalco annual report also assesses immense headroom for further growth of the aluminium industry in India and forecasts rising aluminium consumption in the building and construction, automotive, packaging and transportation sectors. While all this indicates a growing demand for value added products, threats too exist in terms of competition from China and rising imports of scrap and other value added products coming from countries with which India has FTAs. Another concern voiced is regarding changing aluminium prices globally and the price volatility of raw material. Domestic availability/shortage of bauxite and coal is also flagged, though this does not appear a threat on the immediate horizon.

The public sector company NALCO also appeared positive in its 2019-20[72] annual report about the growing domestic market for aluminium which it expected to rise by CAGR of 3.2% in the coming years. In its view, India's abundant coal reserves could boost the industry assisted also by the 'Make in India' campaign. It, however, saw the lack of sufficient production of value added products as a major weakness. Due to limited scope of value addition within the country, primary producers were exporting large quantities of primary aluminium. At the same time, sizable quantities of downstream products were being imported. Another perceived weakness by the company was lack of investment in R&D activities and absence of research facilities. This restricted the scope for product improvisation and development of world class niche products which can provide the much needed competitive edge to Indian aluminium producers in the global market. Yet another area of recognised weakness was the dependence on coal for power generation, which was neither environmentally friendly nor competitive.

The NALCO report flagged opportunities arising from developments in the transportation industry, advances in aluminium manufacturing technologies and processing equipment and increasing usage of aluminium in various industries such as building and construction and foil and packaging. On the side of threats, the report pointed to the competition arising from duty free or preferential duty based imports from FTA partners. Secondly, there could be a crackdown by governments against environmental hazards associated with discharge of effluents like red mud or air pollution due to coal based power plants. Finally, with the economic slowdown resulting from COVID lockdown, prices could come under pressure since production had not declined as much.

[72] The report can be accessed at https://nalcoindia.com/wp-content/uploads/2020/09/NALCO_-Annual-Report-2019-2020-1.pdf

(While this was the case for some months with the prices reaching a trough in June 2020, aluminium prices since have risen past US$ 2000 per tonne. This does not, therefore, appear to be an immediate concern).

The CEO of the primary producer Vedanta Ltd., Mr. Ajai Kapur, in a press interview[73], was even more bullish about the future aluminium demand in India expecting it to grow at a CAGR of 10% on a mid-term basis. This higher than estimated growth compared to a 6-7% GDP growth rate will arise from growing urbanisation and the infrastructure, automobile, aviation and power sectors. To meet this demand, Mr. Kapur said that India would need an additional 8 mt with 4 lakh crores investment. The domestic production needed to grow to create self-sufficiency and the country should not be dependent on imports.

Mr. Kapur said that the aluminium industry was presently struggling with increasing imports. Despite having a sufficient capacity to meet the domestic demand, 60% of domestic consumption was met through imports of which 60% was scrap resulting in foreign exchange outgo of US$ 5.5bn. India had become a dumping ground for aluminium. 70% of scrap imports are used by the automotive industry. Despite the slump in demand due to global economic slowdown, China had not cut production. It was the only country in recovery mode and will start aggressively pushing its inventory at cheap prices once the situation improved, with India as the main target.

The differing viewpoints of AAI and ASMA

This section will not be complete if we do not flag the differing viewpoints publicly expressed by the Aluminium Association of India (AAI) and the Secondary Aluminium Manufacturer's Association (ASMA). ASMA reportedly had a meeting with the Minister for Commerce and Industry on December 28, 2018 and filed a petition following a media statement that the ministry may be in favour of hiking the import duty on aluminium. The petition[74] stated that such a hike will favour only the three major primary producers while disregarding the entire downstream sector in India. They insisted that there had been no surge in import of primary aluminium and hence increasing the duty on it was irrelevant. The already given protection of 7.5% import duty resulted in the primary aluminium being sold in the domestic market at a rate

[73] See the interview at https://www.weldfabtechtimes.com/interviews/the-indian-aluminium-demand-is-growing-at-a-cagr-of-10-on-a-mid-term-basis-in-the-next-10-years-the-demand-is-anticipated-to-increase-to-over-12-million-tons-faster-than-the-current-6-7/

[74] See the news item at https://www.alcircle.com/news/asma-files-a-petition-in-the-commerce-ministry-against-hiking-import-duty-on-aluminium-and-scrap-40860

that was 14% higher than international prices. According to them, the primary industry enjoyed benefits like cheaper energy and to compete with them for marketing of finished products was unfair for the entire industry. That will only make them non-competitive in the export market. They also claimed that the primary producers were unaffected by the ongoing trade war between US and China. The Association requested that the customs duty on downstream products be increased to 20% to counter the incentives given by China so that local downstream producers could survive.

AAI had most recently, just ahead of the budget for 2021-22, sought government support in tiding over what it called a challenging phase for the Aluminium industry by rising imports, declining domestic market share, increasing production and logistics costs, with these challenges further compounded by COVID-19. In its memorandum[75] to the government, it sought an increase in the basic customs duty on both primary aluminium and aluminium scrap to 10%, elimination of the cess on coal and correction of the inverted duty structure on critical raw materials for industry value chain like aluminium fluoride and coal tar pitch. It was further stated that the interests of downstream industry also needed to be safeguarded by raising the duty on various downstream products to 10% and 12.5% from 7.5% and 10% respectively. The memorandum also pointed to the absence of any stringent tariff and non-tariff barriers to check scrap imports which had created a precarious situation for the Indian Aluminium industry and was challenging its sustainability. Such high levels of imports despite domestic capacity were also not in the spirit of the country's vision to become an Atma Nirbhar Bharat.

Summary pointers

What is evident from the foregoing is that while the various segments of the industry visualise strong opportunities for the growth of the aluminium industry in the country and the imperative need for the country to increase its presence in the value added product segments, there are very differing perceptions about inter se duty protection to be accorded, the role to be played by scrap imports and secondary production and what the roadmap should be in bringing about enhanced aluminium usage levels in the country. We shall discuss them in the next section and draw up some recommendations for the future.

[75] See the news item https://www.businesstoday.in/current/economy-politics/budget-2021-aluminium-industry-seeks-raise-in-basic-custom-duty/story/428444.html

Section 6: Discussion and Recommendations

The object of this study is to provide inputs to policy making in transforming the underperforming domestic aluminium industry. Based on the analysis and the different perspectives presented in the foregoing sections we shall now discuss the key challenges which are exemplified, in a nutshell, in the following rather anomalous situation:

1. India is the second largest producer of primary aluminium and exported 53.6% of production in 2019-20 (the percentage exceeded 60% during the first eight months of 2020-21). According to WITS data India is also the second largest exporter in the world of unalloyed unwrought aluminium after the Russian Federation;

2. Yet, India is the largest importer of aluminium scrap, accounting for around 36% of aluminium consumption in the country;

3. Still India figures low in the manufacture of several value added aluminium items; we import them far more than we export.

4. In respect of aluminium extrusions and FRP, two of the largest value added intermediate products [76], Indian manufacturers are nowhere in world rankings. Their competitiveness is also low.

5. India's consumption of the metal, regarded as more climate friendly and green, at less than 3 kg per capita, is quite low globally with aggregate consumption per capita standing at 11 kg.

In a McKinsey study on manufacturing in India titled 'A new growth formula for manufacturing in India' last year [77], it had listed eleven high potential manufacturing chains. One of them related to 'Metals and basic materials' and was put under the category of 'established but underweight value chains' that needed transformation to be able to contribute to greater domestic consumption, export growth and import localisation. From the anamolous situation earlier described, the aluminium industry certainly falls in this category and needs transformation.

There are three broad segments in the aluminium industry: the primary aluminium producers, the recyclers who use aluminium scrap as their main raw material and the manufacturers of value added aluminium products who

[76] They account for 32% and 31% of world usage
[77] https://www.mckinsey.com/industries/advanced-electronics/our-insights/a-new-growth-formula-for-manufacturing-in-india

substantially depend on primary aluminium for their production. While this segmentation is not mutually exclusive, since all the primary aluminium producers also double up as producing some value added products and several recyclers also use some primary aluminium in their production mix, but the classification is still very relevant for our discussion. As seen in Section 5, the viewpoints and the policy choices preferred by the stakeholders clearly differ depending on the segment they largely belong to, even as there appeared to be a consensus on several other points.

It is in fact noteworthy that the primary aluminium producers are themselves seeing lack of sufficient production of value added products as a major weakness. Their plans underway to also make investments in augmenting such production to reduce their vulnerability to LME prices should ease matters to some extent. But that will not be enough however. Issues perceived by other producers of value added products will need careful consideration as also those raised by the recycling industry. The primary aluminium segment itself also needs planning and strategising for the future.

Need for a balance between the three segments

First, therefore, is the need for the right balance between the three segments. Overly protecting one segment or proposing an excessively strict regulation of another segment of the industry may risk in the outcome continuing to be anomolous as at present. For a large country like India a strong primary aluminium industry is critical. At the same time the country should try and benefit fully from low energy recyling, even using imported scrap, if that can be cost effective for certain applications. This is particularly so when the domestic recycling sector is still at a nascent stage. And lastly, most important, India should get the full benefits of employment and added revenues from undertaking value addition in the country and export them wherever possible than exporting more than half of primary aluminium produced as in the present.

Need for an aluminium policy

Second, there is a compelling case for India to embrace greater aluminium usage for economy wide benefits beyond the 300 or so applications presently. An aluminium policy that outlines such a vision will be helpful as suggested in a Niti Aayog report[78]. According core sector status to aluminium will help in giving the sector priority attention domestically, including in navigating through logistical bottlenecks. As earlier argued in this report, aluminium metal

[78] https://niti.gov.in/writereaddata/files/document_publication/niti_aluminum_upload.pdf

has a critical role in several strategic sectors and in advancing the country's economic security.

Such an aluminium policy also has to fix national targets for production and consumption for the next 10/15year period and outline possible ways for achieving them. Even if all the announced capacity expansion plans of the existing primary aluminium plants come on stream they will utmost enhance total capacity in primary aluminium production to 6.3 mtpa in a few years from now. The aluminium policy should also address and define the complementary space that can be usefully taken up by the recycling sector. Likewise, enhancing value addition within the country deserves due attention in the vision document.

Strengthening the primary aluminium segment

As for the primary aluminium segment, such an aluminium policy should seek to strengthen the position of the primary aluminium producers enabling them to become more competitive by reducing input costs, particularly power related costs, to stay at the lower end of the cost curve of global suppliers. Imposition of coal cess or electricity duty on these producers need reconsideration. Reducing the effect of inverted duty impact on inputs such as aluminium fluoride, coal tar pitch and caustic soda also needs action. One primary producer is also taking the route of establishing a subsidiary for producing two of these inputs, caustic soda and coal tar pitch, which may help. Mining leases once awarded require quick follow up. It does not help in all such accretion to manufacturing costs to occur while trying later to protect them with high levels of duties that have other adverse effects[79].

Setting up aluminium product clusters around smelters can provide a ready market for the primary aluminium produced and reduce logistic costs and supply delays. The aluminium park under implementation at Angul boasts of units in the park directly getting molten aluminium from the smelter of NALCO. If the concept also allows the units in the park to receive the primary aluminium at close to international prices rather than only be price takers, it will have a greater chance of success. If successful, such parks could be replicated close to the other primary aluminium production plants with great benefit.

[79] Aluminium producers worldwide typically get support from their governments or belong to states that are well endowed on the energy front. Even recently the Australian government extended an assistance package to Alcoa Australia to lower power costs. See for example https://aluminiuminsider.com/deals-with-government-power-companies-provide-alcoa-australia-a-five-year-respite/

According recycling a rightful complementary role in the aluminium industry

Are aluminium scrap imports displacing use of primary aluminium imports? And what about the duty differential?

While MRAI affirms that primary and secondary aluminium are two different tracks altogether, with the latter largely used for casting purposes, even ALUCAST has said that sellers of virgin/primary material must look at their costing structure if they wanted die-casters to increasingly source their material. So, there are some for whom the cost differential makes a difference and decides their preference. But that said even during the years 2013-14 to 2015-16, when the import duty differential between aluminium scrap and primary aluminium was only 2.5%, scrap imports did not decline. But the 5% duty differential between the two since 2016-17, which has perhaps encouraged even more downstream producers to resort to scrap imports (see Tables 1.4 and 1.5 in the Annexure) in the last three years, could again be narrowed if duty on primary aluminium is brought down to 5%. This is however not a recommendation to increase the duty on scrap from the present 2.5% to 5% to narrow the differential.

Should there be a restraint on import of scrap? The draft for a national framework for recycling of non-ferrous metals issued in March 2020 required aluminium scrap to be checked for radiations and for ensuring no harmful material gets into processing. This was particularly necessary since scrap imports are coming into the country from a variety of sources. This is presently being done through pre-shipment certification requirements but limited to checking radiations. That they conform to ISRI specification will also be useful to confirm.

The draft has however now been finalised and a revised framework has recently been issued by the Ministry of Mines[80]. The framework includes setting up of a Metal Recycling Authority which will inter alia prescribe quality standards for each stage - input scrap, for the processing of scrap, for the final recycled metals and the minimum infrastructure required for recycled metals. While some oversight and regulation of the recycling industry which has so far been unorganised is useful, it is hoped this regulation at every stage by the newly created Metal Recycling Authority will not overly constrain them[81]. Rather the

[80] https://mines.gov.in/writereaddata/UploadFile/NFMScrapRecyclingFramework3.pdf
[81] It is also interesting that China is taking a somewhat different route to regulating scrap imports by issuing a list of authorised importers of aluminium and copper scrap. See https://aluminiuminsider.com/beijing-names-26-new-approved-importers-of-scrap-aluminium/

authority should also usefully play a promotional role for this segment. The aluminium casting industry, which is substantially dependent on recycling, is one of India's strengths aiding the Indian automobile sector and the Authority's actions should help in upgrading and further strengthening it and not otherwise.

Casting clusters already exist in some form in India (Chennai, Pune and Gurgaon) near auto hubs, close to their customer base. MRAI is also suggesting recycling clusters near ports that can reduce transport costs. If the metal recycling authority framework comes into play, such clusters could facilitate oversight of implementation of the standards set by the authority, besides also providing central utilities including for design and research and development.

But two other measures will be important for regulating the trade in scrap. First, will be to disallow imports of scrap taking place under HS 76020090 which are scrap other than those conforming to ISRI specifications. Second, to conserve scrap for domestic use, will be to disallow export of any aluminium scrap, a recommendation also mooted by the draft policy.

Strategy for increased value addition

A chief reason cited by some of the domestic producers for exporting large quantities of primary aluminium is the limited scope for value addition within the country. A strategy to overcome this will need to work on all the three elements: increased domestic consumption, larger exports of value added products and import substitution.

Around 530,000 tonnes of value added aluminium products are being imported into the country now annually. This is also the case with imports of unwrought aluminium alloys which are being imported at around 200,000 tonnes per annum. Much of them, particularly from ASEAN countries and China, are of relatively lower unit values (as seen in Section 3) that should fall within the realm of domestic manufacturing and localisation. Aluminium clusters if well structured can bring down costs and help. Further, areas in which India already has some export strengths, such as wires, cables and castings will need consolidation. In areas like FRP and extrusions in which India's RCA is quite low, strategies will be required to make them competitive and provide scale. At least two lines of value addition, in respect of making specialised aluminium alloys and FRP, could be included under the government's production linked incentive (PLI) scheme since they will meet the objectives set out for it[82], just as for speciality steel. Finally, value addition can also come through greater R&D

[82] https://www.pib.gov.in/PressReleseDetailm.aspx?PRID=1671912

efforts by the aluminium companies. There are many specialised areas both in alloy making and product making. Skilling and training including in areas like die-casting have been highlighted by some of the respondents. A value addition strategy will have to encompass them as well.

It is also worth pondering by the industry how Korea and Malaysia, which are the two top export destinations for India's primary aluminium, can be fairly strong on producing value added products for export, including to India, while India is unable to use its strength in primary aluminium production in accessing more fully its FTA markets for value added products. While Malaysia may have excluded such products from duty reduction under its FTAs with India but what about India's exports to other FTA markets. Strengthening India's competitiveness in an area in which India has significant inherent strengths is essential.

Further, India's export incentive schemes will have to accord greater priority for value added exports rather than having a uniform rate for all the products in HS 76. A strong value addition strategy can help transform the underweight aluminium industry into a champion one for the country.

Tariff structure for the aluminium sector

Different segments of the industry are seeking duty reductions or duty increases suiting their interests as was evident before the last budget. A stable and graded duty structure with a lower duty for raw material or primary input is what is widely practiced and would be important for India as well. A 7.5% duty on unwrought unalloyed aluminium (UUA) that is generally bulk traded is high as a base and a progressive reduction to 5%, the duty level before 2016, will be important at the first stage even as every supportive measure is taken, as already indicated, to keep the Indian primary producers at the lower end of the cost curve of global suppliers. No other major primary aluminium producing country[83] has a duty level of 7.5% on UUA (MFN duties of China and the Gulf countries are 5% but most others less. Brazil is the one closest with 6%). India has its own strengths in the metal production that should not be discounted. Some of our alumina refineries are declared as the lowest cost producers.

Also, the high input cost for domestically procured primary aluminium has been flagged as a key constraint by value added producers. While primary aluminium is getting substantially exported, and this will mean it is being exported at international prices, domestically it is, as per responses received,

[83] See Table 3.26 of the Annexure giving MFN tariffs of China and a few other developing countries for HS 76 items at 6-digit level.

being sold at LME price plus 7.5% import duty plus a premium. Value added producers allege this is making it uneconomical for them. While the government will need to assist the primary producers in bringing down their production and energy costs in order to stay competitive in a capital intensive industry, value added production cannot be competitive if the manufacturers of the latter start with a higher input cost. And they will certainly not be export competitive.

The duty level on aluminium scrap at 2.5% should also not be increased further. As a comparison, duty in China for scrap is 1.5% and in several other countries zero.

The duty levels on value added products could be pegged at 7.5% and in certain cases 10%.

But irrespective of the level of duties for UUA, that this duty level determines the price at which it is arbitraged domestically creates a problem. In China, despite the primary producers getting protected by a 5% duty, if they export they are constrained to pay an export tax which compels them to sell domestically. In India export incentives are given for their export. While every effort needs to be made to enable domestic primary aluminium producers to reduce their costs and be competitive, the value chain domestically will not develop if the basic raw material for value addition is not competitively available. While this study does not recommend placing curbs on India's primary aluminium exports, this option may need consideration if primary aluminium does not become available to value added producers at close to international prices.

Also the manner in which China targets the duties may have some relevance for us. Its highest level of duties (25%) has been reserved for aluminium doors and windows under HS 761010.

Inverted duty structure

The inverted duty structure vis-a-vis India's FTA partners is certainly posing a huge constraint because under these FTAs import duties on all HS 76 items have been reduced to zero except for unalloyed unwrought aluminium (HS 760110) which has been excluded from any tariff reduction. Remedying this will require revising the FTAs. This can be attempted but the FTA partners, even if they agree, will seek compensation elsewhere for such a proposal.

Need for vigilant trade administration

Effective administration of trade should be accompanied by close monitoring towards ensuring there is no dumping or subsidisation. It has already been pointed out in the analysis in Section 3 that certain imports were coming in at low unit values. Further, both the US and the EU have in recent times taken trade remedy measures on extrusions, sheets and foils from China and certain other countries, that could see trade diversions.

Trade administration should also ensure there is strict adherence to rules of origin[84] by parties claiming FTA benefits. Misclassification will also require to be prevented. The latter would be particularly important in view of the significant duty differential between UUA and UAA for FTA partners.

The recent DGFT notification requiring pre-registration of imports[85] provides another tool to ensure transparency and monitoring. Implementation should however not result in delays for regular/authorised importers.

Should NALCO be privatised?

It is not clear if NALCO will be shortlisted anytime soon by the government for privatisation[86]. While such a move may bring further infusion of capital and a more professional management, in a segment of the industry that is capital intensive, this has been a profit making venture with substantial backward and forward integration and playing a useful role in a strategic area. It boasts itself as one of the most competitive bauxite and alumina producers across the globe. While its present capacity is only a little over 10% of the total capacity in the country of primary aluminium, NALCO also has significant expansion plans for the future[87]. Handing it over to a private investor could be a national risk with effectively only two other private players in this strategic segment presently. The government had earlier owned BALCO but 51% share of it had been sold to Sterlite industries, now controlled by Vedanta Group, in 2001. So, NALCO is the only company in which the government has control. And there too only around 51% is owned by the government. So any further divestment

[84] The new CAROTAR rules should help here. https://www.cbic.gov.in/resources//htdocs-cbec/customs/CarotarBrochure_8thOct2020.pdf;jsessionid=8BC59CDF2ADAE3A8AEDD9FA7AA7A76FC

[85] See the DGFT notification https://content.dgft.gov.in/Website/dgftprod/1b6ab9f3-256f-4a35-a899-6595c4eda5d2/Notification%2061%20English%20PDF.pdf

[86] See the recent newsitem https://www.business-standard.com/article/economy-policy/govt-s-privatisation-drive-likely-to-kick-off-with-profit-making-psus-121030500041_1.html

[87] See https://nalcoindia.com/pre-rel/nalco-to-invest-rs-30000-crores-for-expansion-and-business-diversification-union-mines-minister-shri-pralhad-joshi/

by the government will mean ceding direct control altogether. China's overcapacity in this sector and its propensity to aggressively push its commercial interests will need to be guarded against. An arm of the industry which can also be used to push forward research and development may be necessary to be retained under the government control. It can continue to play a wider role including in terms of conducting research on specialised aluminium alloys for defense and strategic purposes as directed by the government. Whether there will be a similar interest by a privatised NALCO is a question. A key issue we are also concerned in the whole report is the price at which aluminium is sold to value added producers. If NALCO gets privatised price collusion may become easier.

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Annexure

Table 1.1: Trade in aluminium (all HS 76 items) in USD million

Year	Exports	Imports	Balance
09-10	1040.56	1523.38	-482.82
10-11	1243.35	2221.92	-978.57
11-12	1499.49	2963.30	-1463.81
12-13	1600.79	3205.97	-1605.18
13-14	1914.59	3086.65	-1172.06
14-15	2833.47	3739.75	-906.28
15-16	2614.54	3429.00	-814.46
16-17	3223.05	3477.62	-254.57
17-18	4775.76	4523.07	252.70
18-19	5703.34	5456.06	247.28
19-20	5091.50	4396.11	695.39

Source: DGCIS (Ministry of Commerce and Industry)

Table 1.2: Import-export of aluminium products (in 1000 tonne)

	7601		7602		7603-06		7607-16	
Year	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
09-10	240703.91	284900.23	339621.27	1959.56	62919.76	54843.38	83404.89	99064.91
10-11	228248.86	266409.38	470274.21	2398.53	93540.75	52853.52	89080.67	106594.42
11-12	242533.10	269924.70	627672.22	4455.27	101266.75	76956.08	136828.45	154992.85
12-13	308279.06	299672.79	738469.81	3790.73	140632.19	92238.84	138183.52	170970.23
13-14	348888.54	411227.76	721630.17	3416.01	137756.31	129026.51	140096.42	163561.74
14-15	343427.82	685489.41	869479.75	5443.55	215134.41	126131.91	167284.74	215948.85
15-16	421963.69	828639.68	867472.28	4738.70	197511.26	116947.54	183590.91	203119.59
16-17	422355.28	1223842.61	931278.90	4173.53	200870.63	124442.42	196082.45	194534.50
17-18	360846.51	1668660.16	1121435.67	4851.72	246165.01	140143.06	260372.77	198125.39
18-19	316962.15	1956926.07	1348970.54	5939.28	379388.13	155813.76	292559.82	219180.65
19-20	266471.59	1961099.91	1347923.08	6107.74	263017.2	182000.7	275054.1	220932.1

Source: DGCIS (Ministry of Commerce and Industry)

Note: HS 7601→ Unwrought aluminium, HS 7602→ Aluminium scrap, HS 7603-7606→ Aluminium intermediate product, HS 7607-7616→ Aluminium downstream products

Table 1.3: Import-export of aluminium products (in US$ million)

	7601		7602		7603-06		7607-16	
Year	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
09-10	438.90	550.43	495.87	3.66	221.1	149.19	367.51	337.28
10-11	557.13	665.46	894.16	5.20	335.78	164.68	434.83	408.01
11-12	610.49	655.53	1271.19	10.53	403.85	227.38	677.78	606.05
12-13	696.69	653.69	1356.84	7.50	493.52	255.28	658.93	684.32
13-14	742.92	849.33	1253.70	5.78	443.57	337.59	646.46	721.89
14-15	778.90	1586.10	1552.43	10.33	649.75	337.84	758.71	899.18
15-16	797.90	1444.94	1325.99	6.69	557.64	294.83	747.47	868.08
16-17	784.11	2145.25	1402.18	5.72	537.27	298.07	754.06	774.04
17-18	805.49	3548.37	2044.01	8.15	715.55	374.22	958.03	845.04
18-19	721.15	4282.20	2468.72	10.19	1062.23	427.16	1203.95	983.79
19-20	524.65	3651.99	1979.38	9.27	732.17	437.79	1159.90	992.43

Source: Ministry of Commerce and Industry

Table 1.4: Balance of trade in aluminium products (in 1000 tonne)

Year	7601	7602	7603-06	7607-16
09-10	44,196.32	-3,37,661.71	-8,076.38	15,660.02
10-11	38,160.52	-4,67,875.68	-40,687.23	17,513.75
11-12	27,391.60	-6,23,216.95	-24,310.67	18,164.40
12-13	-8,606.27	-7,34,679.08	-48,393.35	32,786.71
13-14	62,339.22	-7,18,214.16	-8,729.80	23,465.32
14-15	3,42,061.59	-8,64,036.20	-89,002.50	48,664.11
15-16	4,06,675.99	-8,62,733.58	-80,563.72	19,528.68
16-17	8,01,487.33	-9,27,105.37	-76,428.21	-1,547.95
17-18	13,07,813.65	-11,16,583.95	-1,06,021.95	-62,247.38
18-19	16,39,963.92	-13,43,031.26	-2,23,574.37	-73,379.17
19-20	16,94,628.32	-13,41,815.33	-80,016.48	-54,121.98

Table 1.5: Balance of trade in aluminium products (in US$ million)

Year	7601	7602	7603-06	7607-16
09-10	111.53	-492.21	-71.91	-30.23
10-11	108.33	-888.96	-171.10	-26.82
11-12	45.04	-1,260.66	-176.47	-71.73
12-13	-43.00	-1,349.34	-238.24	25.39
13-14	106.41	-1,247.92	-105.98	75.43
14-15	807.20	-1,542.10	-311.91	140.47
15-16	647.04	-1,319.30	-262.81	120.61
16-17	1,361.14	-1,396.46	-239.20	19.98
17-18	2,742.88	-2,035.86	-341.33	-112.99
18-19	3,561.05	-2,458.53	-635.07	-220.16
19-20	3,127.34	-1,970.11	-294.38	-167.47

Source: DGCIS (Ministry of Commerce and Industry)

Note: HS 7601→ Unwrought aluminium, HS 7602→ Aluminium scrap, HS 7603-7606→ Aluminium intermediate product, HS 7607-7616→ Aluminium downstream product

Table 1.6: Unit value in US$ million in trade in aluminium products (per 1000 tonne)

	7601		7602		7603-06		7607-16	
Year	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
09-10	1.82	1.93	1.46	1.87	3.51	2.72	4.41	3.40
10-11	2.44	2.50	1.90	2.17	3.59	3.12	4.88	3.83
11-12	2.52	2.43	2.03	2.36	3.99	2.95	4.95	3.91
12-13	2.26	2.18	1.84	1.98	3.51	2.77	4.77	4.00
13-14	2.13	2.07	1.74	1.69	3.22	2.62	4.61	4.41
14-15	2.27	2.31	1.79	1.90	3.02	2.68	4.54	4.16
15-16	1.89	1.74	1.53	1.41	2.82	2.52	4.07	4.27
16-17	1.86	1.75	1.51	1.37	2.67	2.40	3.85	3.98
17-18	2.23	2.13	1.82	1.68	2.91	2.67	3.68	4.27
18-19	2.28	2.19	1.83	1.72	2.80	2.74	4.12	4.49
19-20	1.97	1.86	1.47	1.52	2.78	2.39	4.22	4.49

Table 3.1: Top export destinations for aluminium unwrought – not alloyed (760110)

2014-2015	Qty	2015-2016	Qty	2016-2017	Qty	2017-2018	Qty	2018-2019	Qty	2019-2020	Qty
Korea RP	234930	Korea Rp	303327.4	Korea RP	403926	Malaysia	360237	Malaysia	425611	Malaysia	680343
Mexico	147988	Malaysia	108398.2	Malaysia	154060	Korea RP	345792	Korea RP	226142	Korea RP	469291
Bulgaria	53778	Mexico	58675	Italy	76540	U S A	102630	Turkey	202359	U S A	75387
Colombia	24082	Taiwan	42830	Mexico	59473	Turkey	96310	Mexico	88863	Japan	66329.3
Croatia	21025	U S A	32676.93	Turkey	49436	Japan	63731	Taiwan	80771.1	Taiwan	62661.3
Turkey	15538	Singapore	25171	U S A	38641	Italy	60744	Japan	77947.5	Brazil	51419
Taiwan	13960	Indonesia	23363	Taiwan	38281	Bangladesh Pr	45810	Singapore	73203	Thailand	35912.2
U S A	13402	Japan	22605	Japan	37588	Mexico	40470	Italy	72706.3	Singapore	29346
Montenegro	8893	Turkey	22104	Bangladesh PR	34530	Singapore	37796	Thailand	46343	Bangladesh PR	23020.5
Vietnam Soc Rep	7893	Brazil	19775	Indonesia	31396	Taiwan	32441	Brazil	41934	Baharain IS	19950.1

Source: Ministry of Commerce and Industry
Quantity in tonnes

Table 3.2: Top import sources for aluminium unwrought – not alloyed (760110)

2014-15	qty	2015-16	qty	2016-17	qty	2017-18	qty	2018-19	qty	2019-20	qty
UAE	93983.81	Russia	50092.6	Oman	72704.7	UAE	22395.64	UAE	16034.73	Korea RP	14972.7
Oman	27368.8	UAE	44522.8	UAE	42408.8	Oman	22377.87	Oman	9147.61	Oman	14407.9
Russia	19419.44	Oman	43346.7	Bahara in IS	8346.17	Tajikistan	17733.48	Baharai n IS	6525.6	Baharai n IS	13543
South Africa	4704.96	South Africa	35308	Tajikis tan	8250.26	Baharain IS	7485.4	Korea RP	5751.87	Russia	9858.55
China P RP	2864.17	Australia	3188.14	South Africa	6943.6	Malaysia	5092.33	Malaysia	3143.09	Nigeria	3305.44
Nigeria	2674.5	Venezue la	2590.81	Austral ia	4627.67	Saudi Arabia	4034.51	South Africa	2860.39	South Africa	2880
Baharain IS	1526.33	Saudi Arabia	2443.43	Indon esia	2981.53	Australia	1348.44	China P RP	1962.59	China P RP	2154.93
Indonesi a	1000	Baharai n IS	2089.28	Qatar	2812	Nigeria	1134.91	Hong Kong	1632.78	U A E	2039.58
Vietnam Soc Rep	844.65	China P RP	2076.67	Iran	2752	China P RP	727.69	Nigeria	821.99	Venezue la	1293.81
Australia	537.17	Argentin a	2006	Malays ia	2355.35	Unspecifie d	550.96	Russia	793.85	Netherla nd	996
Singapor e	374.23	Singapo re	1862.09	Korea Rp	817.4	Singapore	375.2	Australia	632	Zambia	722
Libya	242	Nigeria	1827.97	Japan	500	Iran	300	Zambia	331	U S A	685.1

Source: Ministry of Commerce and Industry
Quantity in tonnes

Table 3.3: Top export destinations for aluminium unwrought – alloyed (760120)

2014-15	Qty	2015-16	Qty	2016-17	Qty	2017-18	Qty	2018-19	Qty	2019-20	Qty
Turkey	16207	Mexico	40056	Mexico	27643	U S A	55833.7	U S A	145083	U S A	68327
Mexico	15911	Turkey	21627	Spain	14969	Spain	55582	Spain	64396	Mexico	45541
Korea RP	8164	Spain	5775	Korea RP	14450	Mexico	31879	Mexico	38770	Spain	31709
Taiwan	5375	Korea RP	5505	U S A	10428	Italy	26827.3	Italy	27550.7	China P RP	28342
Iran	5213	Iran	3973	Italy	8170.2	Turkey	18781	U K	24933.8	Italy	26903
Israel	4400	Oman	3626	Taiwan	7361.5	Korea RP	15120	Netherland	19690	Netherland	18702
Bulgaria	4318	Brazil	2471	Oman	4625	U K	11646.7	Bulgaria	13677	Korea RP	18178
Italy	4269	Albania	2332	Israel	4536	Israel	9944.01	Israel	12038.2	Israel	15645
Brazil	3300	Saudi Arabia	1225	Turkey	4529	Bulgaria	9390	Taiwan	10379	U K	10530
Spain	3114	U S A	1115	Brazil	4516	Oman	8486	Poland	9876.4	Oman	10160
U S A	2966	Taiwan	1077	Indonesia	4357.6	Netherland	7477	Korea RP	9849.5	Taiwan	9019.6

Source: Ministry of Commerce and Industry
Quantity in tonnes

Table 3.4: Top import sources for aluminium unwrought – alloyed (760120)

2014-2015	Qty	2015-2016	Qty	2016-2017	Qty	2017-2018	Qty	2018-2019	Qty	2019-2020	Qty
Malaysia	53851.7	Malaysia	63239.31	Malaysia	93615	Malaysia	112807	Malaysia	110516.38	Malaysia	81428.8
U A E	31792.1	U A E	43905.32	U A E	43143	Qatar	45414	Qatar	44151.11	Qatar	26922.7
Baharain IS	27329.9	Qatar	30265.48	Qatar	38650	U A E	35821	U A E	31672.07	U A E	22031.3
Thailand	27216.5	Baharain IS	26773.29	Bahar ain IS	29967	Bahar ain IS	29870	Baharain IS	21462.34	Korea RP	16882.9
Qatar	19268.9	Thailand	21299.7	Thailand	15179	Thailand	14812	Korea RP	15857.8	Bahar ain IS	12645.7
China P RP	9033.37	China P RP	8261.05	Vietnam Soc Rep	9117.9	Australia	9983.3	Thailand	13395.65	Thailand	7044.78
Nigeria	3812.5	Nigeria	7888.74	Australia	6208.2	Korea Rp	7933.6	Australia	5565.39	Hong Kong	6045.59
Australia	3150.72	Australia	5178.05	Oman	5254.9	Vietnam Soc Rep	4780.7	Ghana	4802.82	Austr alia	4865.86
Russia	1463.45	Vietnam Soc Rep	3699.79	Nigeria	4257.6	Ghana	3313.8	Sri Lanka Dsr	4024.9	Vietnam Soc Rep	4781.94
Vietnam Soc Rep	1260.33	Singapore	2075.05	China P RP	4221.9	Sri Lanka Dsr	3257.3	Vietnam Soc Rep	3820.5	Singa pore	3770.41
Angola	1092.89	Venezuela	1340.08	Korea Rp	3583.2	Myanmar	1600	Singapore	1967.35	Sri Lanka Dsr	3278.87
Sri Lanka Dsr	1061.37	Sri Lanka Dsr	1024.44	Saudi Arabia	3380.1	U K	1174.4	Myanmar	1048	Saudi Arabia	1380.7

Source: Ministry of Commerce and Industry
Quantity in tonnes

Table 3.5: Top import sources for aluminium scrap (7602)

2014-2015	Qty	2015-2016	Qty	2016-2017	Qty	2017-2018	Qty	2018-2019	Qty	2019-2020	Qty
Saudi Arabia	109986.	U K	110705.6	U K	130439.17	U K	163083.13	U S A	259332.8	U S A	329536.2
U K	107836	U A E	109418.81	Saudi Arabia	120685.04	Saudi Arabia	142569.88	U K	159207.26	U K	150668.1
U A E	106091	Saudi Arabia	107095.08	U A E	103768.76	U A E	107852.72	U A E	140021.35	U A E	119226.8
U S A	72995	U S A	77103.06	U S A	73857	U S A	104456.04	Saudi Arabia	128353.46	Saudi Arabia	113303.3
Netherland	56943	Australia	59633.15	Australia	65420.34	Australia	85150.15	Australia	84825.53	Australia	73543.66
South Africa	41351	Netherland	53414.62	Netherland	55501.89	Netherland	59839.88	Netherland	63411.84	Netherland	63209.23
Australia	36526	South Africa	42195.46	South Africa	39228.51	South Africa	39112.98	Singapore	52570.06	Singapore	53790.88
Belgium	35612	Germany	23727.68	Germany	29004.02	Germany	30423.81	South Africa	38389.93	South Africa	37735.75
Germany	30613	Singapore	21580.68	Singapore	24916.97	Singapore	28348.99	Hong Kong	31829.18	Hong Kong	30767.41
Kuwait	21444	Belgium	21456.06	Nigeria	22690.57	Belgium	24237.63	Germany	27661.58	Germany	25853.2
Nigeria	17054	Nigeria	20863.4	Kuwait	20125.63	Kuwait	23207.07	Kuwait	24281.73	Kuwait	24789.2
Singapore	14495	Kuwait	20452.84	Belgium	19044.56	Nigeria	21642.96	Israel	20221.81	Malaysia	23187.61

Source: Ministry of Commerce and Industry
Quantity in tonnes

Table 3.6: Top 5 export destinations of HS7604

Country	2016-17	2017-18	2018-19	2019-20
USA	958.58	3,234.13	4,796.31	3,549.00
UAE	2,047.25	1,993.75	1,738.94	1,298.03
Germany	451.51	1,212.11	2,540.01	1,542.36
Canada	569.95	1,425.97	1,252.88	1,574.34
Italy	955.01	1,489.35	1,640.13	407.75
Total	17,447	20,855	25,872.83	16,887.80

Table 3.7: Top 5 import sources of HS7604

Country	2016-17	2017-18	2018-19	2019-20
China	10,098.18	11,506.82	18,395.38	25,825.88
Australia	11,861.05	7,511.10	3,699.56	2,651.82
Korea	1,782.52	1,814.95	2,008.24	2,607.61
Malaysia	2693.92	61.92	9.34	2,174.15
UAE	3,571.27	3,305.31	3,101.74	916.96
Total	42,887.24	41,523.79	38,384.76	42,609.04

Table 3.8: Top 5 export destinations of HS7605

Country	2016-17	2017-18	2018-19	2019-20
USA	64.56	4,296.58	7,873.41	20,206.79
Nepal	4,162.75	5,322.02	6,351.93	9,791.82
Brazil	2,022.35	2,201.65	3,137.83	5,786.30
Sri Lanka	785.56	1,086.86	1,456.20	2,920.43
South Africa	2,456.65	1,320.87	148.12	2,493.65
Total	16,386.28	32,429.77	37,303.67	81,427.65

Table 3.9: Top 5 import sources of HS7605

Country	2016-17	2017-18	2018-19	2019-20
Malaysia	16,161.08	37,724.29	65,903.63	61,338.20
China	1066.47	1113.13	1500	1,192.75
Russia	334.47	4.06	986	1027.28
Oman	3414.54	6395.41	5889.32	513.7
Bahrain	950.03	3174.49	3863.55	305.49
Total	24,909.00	53,910.00	82,342.87	65,231.35

Table 3.10: Top 5 export destinations of HS7606

Country	2016-17	2017-18	2018-19	2019-20
USA	31,515.84	39,723.23	49,025.70	36,546.40
UAE	14,762.98	10,873.08	7,587.77	8,150.39
Spain	7.00	1,876.88	4,194.67	3,885.65
Italy	1,687.67	1,644.05	4,049.18	3,872.74
Nepal	2,471.97	2,536.97	3,326.60	3,282.02
Total	86,978	83,371	88,955.16	80,943.74

Table 3.11 Top 5 import sources of HS7606

Country	2016-17	2017-18	2018-19	2019-20
China	70,771.20	85,944.96	190,944.11	98,916.23
Korea	18,580.35	23,079.96	23,392.72	22,334.45
UK	12,310.76	12,858.03	9,783.14	7,984.93
UAE	533.83	706.57	7,309.43	5,832.82
Germany	5,688.42	4,843.61	4,097.17	4,532.13
Total	130,723.52	147,851.39	254,716.54	151,023.28

Table 3.12: Top 5 export destinations of HS7607

Country	2016-17	2017-18	2018-19	2019-20
Bangladesh	3,529.68	2,918.77	2,931.71	4,135.90
USA	621.17	1,058.82	3,393.88	2,844.16
Nigeria	1,041.30	980.43	1,066.04	1,157.16
Ireland	824.43	356.89	755.40	1,068.05
Nepal	642.18	757.06	941.56	841.14
Total	16,538.20	16,250.28	21,608.03	24,631.04

Table 3.13: Top 5 import sources of HS7607

Country	2016-17	2017-18	2018-19	2019-20
China	117,505.76	96,271.31	111,220.17	121,954.65
Thailand	986.62	5,746.39	11,305.79	23,641.86
Malaysia	5,329.11	6,979.98	8,232.45	9,700.73
Korea	7,941.76	15,329.18	9,278.10	9,506.75
Indonesia	885.83	6,692.62	11,521.74	4,147.74
Total	141,174.75	145,368.63	169,987.52	186,572.69

Table 3.14: Top 5 export destinations of HS7608

Country	2016-17	2017-18	2018-19	2019-20
USA	634.06	573.68	635.51	558.51
Canada	99.04	59.7	136.36	269.2
Netherlands	325.21	262.61	235.54	211.45
Nepal	104.72	105.33	131.9	156.05
Sri Lanka	245.57	111.48	47.32	113.46
Total	2007.46	1886.6	1797.37	2185.3

Table 3.15: Top 5 import sources of HS7608

Country	2016-17	2017-18	2018-19	2019-20
China	3,894.24	4,526.55	5,386.74	5,096.70
Korea	2,690.54	4,248.96	2,807.24	2,566.95
Thailand	1,307.36	587.86	406.79	329.78
Total	9,579.36	10,817.59	10,274.89	9,138.11

Table 3.16: Top 5 export destinations of HS7610

Country	2016-17	2017-18	2018-19	2019-20
USA	3,164.12	4,036.72	3,581.23	3,298.94
Sri Lanka	153.75	290.88	383.33	627.9
UAE	630.93	397.58	309.57	521.8
Qatar	1.94	169.46	243.24	247.44
Canada	492.18	165.56	294.75	152.57
Total	7,438.04	7,282.85	6,173.27	6,432.07

Table 3.17: Top 5 import sources of HS7610

Country	2016-17	2017-18	2018-19	2019-20
China	10,038.84	18,117.68	22,183.87	23,580.75
UAE	1,470.73	4,635.76	4,760.20	2,547.36
Korea	2,069.45	6,776.85	15,790.61	2,401.72
Germany	764.05	1,359.72	536.28	421.04
Japan	938.24	385.89	43.18	9.42
Total	18,808.68	35,671.57	46,939.58	32,172.03

Table 3.18: Top 5 export destinations of HS7614

Country	2016-17	2017-18	2018-19	2019-20
Egypt	-	240	9,117	17,423
Nepal	305	3,395	3,785	6,493
Afghanistan	887	9,139	9,968	5,640
Nigeria	2,563	1,268	5,846	4,247
Tanzania	639.73	3,161.59	3,693.24	941.95
Total	75,140	82,844	99,924	99,789

Table 3.19: Top 5 import sources of HS7614

Country	2016-17	2017-18	2018-19	2019-20
Belgium	-	27	132	-
China	122	105	213	114
Vietnam	153	22	379	-
Japan	127	259	-	-
Korea	28	1,367	-	-
Total	440	1,842	759	176

Table 3.20: Top 5 export destinations of HS7615

Country	2016-17	2017-18	2018-19	2019-20
UAE	4134	3,782	3,734	3,589
USA	2,741	2,905	3,568	3,055
Saudi Arabia	1,445	1,063	1,133	1,723
UK	1,470	1,184	1,512	1,683
Kenya	919	887	1.371	1,315
Total	18,588	17,518	20,472	21,732

Table 3.21: Top 5 import sources of HS7615

Country	2016-17	2017-18	2018-19	2019-20
China	2,987	4,479	4,837	3,396
Nepal	183	257	235	219
Thailand	14	60	180	116
UAE	11	109	169	95
Vietnam	48	132		
Total	3,395	5,267	5,577	4,022

Table 3.22: Top 5 export destinations of HS7616

Country	2016-17	2017-18	2018-19	2019-20
USA	25,096	26,043	23,307	18,193
Germany	5,933	5,805	5,542	5,403
Netherlands	3,731	3,870	3,593	4,292
UK	3,551	3,390	2,876	2,618
UAE	1,574	1,683	1,599	1,812
Total	58,015	55,936	53,168	46,551

Table 3.23: Top 5 import sources of HS7616

Country	2016-17	2017-18	2018-19	2019-20
China	8,636	12,725	20,542	26,265
Thailand	3,764	5,105	5,682	5,411
Hong Kong	63	58	469	1,687
Taiwan	341	2,863	1,816	194
Total	18,047	26,129	34,029	37,880

Source: Ministry of Commerce and Industry
Quantity in tonnes

Table 3.24: Table to determine spread between UUA and scrap

Year	Exports of HS760110 in US$/tonnage	Unit value of exports of HS760110	Imports of HS760110 in US$/tonnage	Unit value of imports of HS760110	Average unit value of HS760110 of imports & exports	Imports of HS76020010 in US$/tonnage	Unit value of imports of HS76020010	Column1
2014-15	1373.39/600,649	2286	343.04/156,326	2194	4480/2= 2240	1549.49/866432	1788	0.798
2015-16	1256.87/733,427	1713	352.67/197,394	1787	3500/2=1750	1324.82/866,735	1529	0.874
2016-17	1906.29/1,098,036	1736	287.09/157,058	1828	3564/2=1782	1400.03/929,861	1505	0.844
2017-18	2891.84/1,375,927	2101	187.75/84136	2232	4333/2=2166.5	2041.39/1,119,769	1823	0.8414
2018-19	3302.70/1,525,711	2164	113.89/51002	2233	4397/2=2198.5	2467.34/1,348,236	1830	0.832
2019-20	2965.31/1,599,436	1854	130.13/68229	1907	3761/2=1880.5	1978.61/1,347,299	1469	0.78

Table 3.25: Balance of trade in Aluminium and its products with Republic of Korea and ASEAN

	Exports from India (In US$/tonne)				Imports into India (In US$/tonne)			
	ASEAN		Republic of Korea		ASEAN		Republic of Korea	
	2009-10	2019-20	2009-10	2019-20	2009-10	2019-20	2009-10	2019-20
HS760110	239.5	1411.68	4.96	872.61	2.73	0.5	1.3	27.84
	-128791	-761974	-3539	-469291	-1239	-251	-561	-14973
HS760120	1.04	25.8	0.02	35.33	73.41	186.65	1.28	37.5
	-505	-13243	-4.13	-18178	-39119	-97127	-218	-16883
HS7602	0	0	-	8.43	17.65	136.09	0.29	1.6
	-3	0		-5722	-10953	-87258	-215	-1126
HS7603-7616	US$27mn	US$48mn	1.13	6.21	US$ 49.52	US$ 299.9	65.28	138.12
	(9948 tonne)	(15,013 tonne)	(320 tonne)	(2,328 tonne)	(9,832tonne)	-113193	-18612	-40888
TOTAL	267.9	1485.14	6.11	922.64	143.31	623.16	68.15	205.06
	-139244	-790229	-3863	-495519	-61143	-297829	-19872	-73870

Table 3.26: MFN duty levels maintained by various developing countries

	Saudi Arabia	India		Vietnam	Brazil	China	Malaysia	Qatar	Brazil	Indonesia	Oman	UAE
	Year											
HS CODE	2018	2018	2017	2018	2018	2017	2017	2017	2017	2016	2016	2016
760110	5	7.5	5	3	6	5	0	5	6	0	5	5
760120	5	7.5	5	3	6	7	0	5	6	0	5	5
760200	5	5	2.5	0	0	1.5	0	5	0	0	5	5
760310	5	7.5	5	0	6	6	0	5	6	0	5	5
760320	5	7.5	5	0	6	7	0	5	6	2.5	5	5

	Saudi Arabia	India		Vietnam	Brazil	China	Malaysia	Qatar	Brazil	Indonesia	Oman	UAE
760410	5	7.5	5	7.5	12	5	25	5	12	3.33	5	5
760421	5	7.5	5	10	12	5	25	5	12	5	5	5
760429	5	7.5	5	8.33	8.67	5	25	5	8.67	11.67	5	5
760511	5	7.5	5	10	12	8	25	5	12	10	5	5
760519	5	7.5	5	10	12	8	25	5	12	10	5	5
760521	5	7.5	5	3	12	8	25	5	12	10	5	5
760529	5	7.5	5	3	12	8	25	5	12	10	5	5
760611	5	7.5	5	0	7	6	30	5	7	10	5	5
760612	5	7.5	5	2.4	8.67	6	30	5	8.67	6.67	5	5
760691	5	7.5	5	0	12	6	30	5	12	10	5	5
760692	5	7.5	5	3	12	10	30	5	12	10	5	5
760711	7.5	7.5	5	0	7	6	25	5	7	20	5	5
760719	8.5	7.5	5	3	7	6	25	5	7	10	5	5
760720	8.5	7.5	5	3	12	6	30	5	12	10	5	5
760810	8	10	10	3	14	8	25	5	14	5	5	5
760820	8	10	10	3	8	8	25	5	8	5	5	5
760900	5	10	10	3	14	8	5	5	14	5	5	5
761010	12	10	10	15	16	25	25	5	16	20	5	5
761090	12	10	10	11	16	6	25	5	16	20	5	5

	Saudi Arabia	India		Vietnam	Brazil	China	Malaysia	Qatar	Brazil	Indonesia	Oman	UAE
761100	5	10	10	5	16	12	20	5	16	10	5	5
761210	12	10	10	20	16	12	20	5	16	10	5	5
761290	12	10	10	15	12.5	21	20	5	12.5	10	5	5
761300	5	10	10	3	16	9	5	5	16	10	5	5
761410	5	10	10	12.5	12	6	30	5	12	10	5	5
761490	5	10	10	12.5	12	6	30	5	12	10	5	5
761510		10	10	26	16	16.5	30	5	16	15	5	5
761511	12	10	10	30	16	18	12.5	5		15	5	5
761519	15											
761520	12								16			
761610	5	10	10	20	14	10	20	5	14	5	5	5
761691	5	10	10	20	14	10	5	5	14	5	5	5
761699	5	10	10	17.86	14	12.5	20	5	14	6.25	5	5

Source: WITS

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