

Aluminium Scrap Recycling A Cost-effective Solution

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To improve India's competitive advantage in the world market, scrap management is set to become a major contributor to sustainable economic growth and prevention of the re-processing industry from decay. The issues in the scrap industry are high capital cost for shredder and separation equipments, weight enhancement tactics by contamination by the suppliers, poor availability due to consumer ignorance. Aluminium scrap recycling and consumption is steadily increasing over the years due to its inherent advantages. In the US, production of recycled aluminium has risen to 4 million tonnes in the last 20 years and share of recycled metal is about 40 per cent of overall supply compared to 22 per cent in 1975.



Advantages of Aluminium Recycling

Aluminium recycling is much lesser capital intensive than primary metal production as the process requires only 5 per cent of energy, between 13-15 thousand units of power is used for producing one ton of aluminium through primary route, used for primary aluminium production. Besides this, the economically viable secondary aluminium (recycling) plant capacity will be at least 12-15 thousand tons per annum where as in the case of primary metal it will be in the range of 100-150 thousand tons. Modern recycling is eco-friendly. By recycling, around 0.6 million tons of bauxite per annum can be preserved for the future (i.e. about 20 per cent of

Aluminium scrap is largely used in utensil and casting sector for automotive industry.

Recycling of used metals, be it scrap or secondary articles, has assumed significance especially in the developing countries like India where re-processing, on one hand, is needed to meet the raw material deficit, while, on the other hand, has posed a great ecological concern. Amid signs of challenges and threat, metallurgists are exploring solutions that can resolve both issues. Scrap is commonly used as raw materials for ultimate metals production. Most prevalent uses of scrap recycling is in copper, aluminium and steel where metal extractions chose to be the economical option. But, scrap collection and

are confined to metal processors only since half a decade. Thus, trading of, so called hazardous metals has been controlled abundantly thus, putting a cap on the free movement of scrap from one country to the other. Although, scrap traders representative bodies have represented to the government repeatedly with single point agenda – to make import free for traders – the government has ignored the issue so far. Thus, the scrap imports to India have been restricted. Domestic generation of scrap is not fully channelized as almost 100 per cent metals used in rural India is either buried underground or thrown unnoticed without realizing the economic value attached to it. Thus, the scrap collection system within the country remained an issue that needs



today's consumption) for around 1.4 million tons of aluminium.

Aluminium can be recycled infinitely, without loss of any chemical or physical properties of the metal. By expanding remelt networks, aluminium is being considered as a sustainable alternative during an entire lifecycle—from primary product through use, to re-melting and reuse. The remelting and recycling of aluminium is not only an important activity but it is also an important environmental issue. About 70 year old aluminium industry in India has been successful in aluminium recycling because of the industry's access to segregation and identification of alloys that helps separating aluminium efficiently.

shipment thereof remain problematic for environmental concerns whereby the importer needs to prove that the consignment contains no hazardous materials including metals, minerals and chemicals. Management of scrap would grow faster through extensive care on the urgent need for organized scrap processing, improvement in understanding between recycler & consumer and increased awareness of safety & environmental damage. Recycling industry needs to gear up to meet the projected growth in the automobile industry may be through increased capacity & adoption of newer technologies to improve quality.

Regulatory Issue

Unlike earlier times, scrap imports

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extensive debate. In many countries, government and industry sponsored campaigns are well established, for the organized collection of used products, to aid this recycling process. Materials such as aluminium are always extracted for use in products.

Energy Saving

Recycling of aluminium scrap saves around 93 per cent of the energy needed for primary metal. The energy required to produce one tonne of aluminium in a modern smelter will be around 15500 units of electricity, whereas the energy required for melting scrap is only around 1200 units in thermal energy. It is less capital intensive (Rs 100 – 125 crore per lakh tonnes) and is estimated to cost only 34

per cent of Greenfield aluminium smelter. A considerable portion of the capital resources saved would be in hard foreign currency for import to know-how and equipment. The lead time for setting up a recycling facility is around 12 months and is far lower than that of new smelter (@ 4 years for Greenfield projects and two-and-a-half years for brownfield) Aluminium scrap can be recycled infinitely without any loss in property. Using recycled metal is cheaper. Modern recycling is eco-friendly. By recycling, around 6 lakh tonnes of bauxite per annum can be preserved for the future (i.e. over 30 per cent of today's consumption) for around one lakh tonne of aluminium. Unlike primary smelters, the secondary operations are environmentally benign. Recycled

stakeholders are working overtime to bring the recycling industry onto full stream by educating consumers about the value of aluminium but they should also set up scrap collection centers throughout the country to recover used aluminium. Secondary aluminium sector constitutes nearly 40 per cent of total aluminium consumed in India and has been rapidly growing. In the beginning of this century, experts of aluminium sector undertook a major drive to boost the production of aluminium through secondary route which was very nominal at that point of time. The energy and capital intensive secondary aluminium sector witnessed the phenomenal growth of up to 20 per cent in the beginning and today, contributes significantly to the total aluminium usage of the country. With

Secondary metal differs from its virgin partner due mainly to recycling of seconds and scrap for the purpose of application other than the use of virgin metal. The utilization of secondary metal meant only for cost-effective output for the same life rigidity and versatility of metal. Growing economy of India and rising income of average middle class have opened opportunities for modern means of living and a dramatic change in lifestyles for which a lot of usable luxuries have become necessities and thereby, a potential increase in aluminium consumption in the recent past. Per capita consumption of aluminium in India is still abysmally low at 0.7 kgs as compared to 6.5 kgs of China, 29.5 kgs of Italy, 31.6 kgs of Germany, 31.9 kgs of US and 32 kgs of

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aluminium in Europe, USA and Japan are used in making aluminium sheet and coils which, in turn, are used in beverage cans, building, transport, cookware etc. Similarly, most extruded and cast aluminium products are made from the recycled metal. This leads to most economical application of primary (thereof pure) aluminium.

Challenges

The self sufficient Indian aluminium industry is heavily reliant on recycling despite scrap collection yet to gear up fully. Experts are of the view that the country needs to streamline recovery of aluminium used as that can be converted into secondary aluminium and sold at the price comparable to primary products. Industry

the lack of government support in the form of tax cuts on imports of scrap and residues due to primary producers' influence at the government level, the growth has not taken the speed as it would have been otherwise. Still, experts believe that the current decade would be an era of secondary aluminium in India. The need for recycling was felt to utilize the potential of scrap in terms of cost effectiveness, suitability for envisaged products without economic degradation and additional sources of metal. Recycling is carried out worldwide not only for the purpose of cheaper source of raw material but also as a cost-effective means of secondary metal production.

Japan. This opens an enormous opportunity for secondary producers to offer good quality products at comparatively lower than primary producers' prices.

Today, there are about 1000 unorganized sector players across the countries which are operating with much lesser capacity spread primarily in Gujarat, West Bengal, Maharashtra and Tamil Nadu. With the merger of the three major aluminum scrap recyclers i.e. Indian Aluminium, Pannar Aluminium and Century Extrusions with Hindalco Industries and Indian Foils with Sterlite Industries, the sentiment in scrap processing sector changed totally. Now, seconds and scrap generated by the private aluminium

major Hindalco Industries are primarily used for captive consumption by the group subsidiaries. Apart from that the remaining demand is met by imports of scrap from various countries including China, US and UK.

Now, secondary turned primary producers including Hindalco Industries and Sterlite Industries together control over 70 per cent of the market for extrusions and foils. Other secondary players from organized sector include Bhoruka Extrusions, PG Foils, Shri Narmada Aluminium, Sudal Extrusions, Alumeco India, Pankaj Aluminium Industries and Galada Power. Of them, a majority of them avail the tax holidays benefit for 10-15 years by setting up plants in remote Maharashtra and Gujarat. India



produces roughly 0.6 million tons of secondary aluminium through captive processing of seconds and scrap imports. The country imports scrap to the tune of about 1.3 million tons every year which is used vehemently through foundry and extrusion industry.

Since primary players produce aluminium at much lower costs vis-à-vis the landed cost of imported aluminium that is used by most secondary players, the margins of primary producers increase if they undertake secondary processing themselves. The primary industry has thus started integrating downwards.

The secondary rollers and extruders in the Indian aluminium industry either purchase the primary

metal (billets and blooms) from domestic producers or import the same and process the metal at their own fabrication plants into semi- or fully-fabricated products.

Scrap Import

The country has to depend solely on imports for its scrap consumption as domestic generation is almost nil. Experts are of the view that the government machinery should come forward to put a system in place where domestic generation of scrap would be channelized resulting in less dependence on imports. But, the large secondary producers are drawing their own trumpets for their own sake of interest and not for the industry. As the scrap producers are not organized and neither any powerful representative

bodies like associations, have come forward for voicing their concerns to the government or the primary producers who have good control over government machinery as far as decision making for aluminium sector is concerned, this sector has been barred from reaping real benefits of economic liberalization of the country. Hence, the individual voices remained unheard at the decision making processes. Resultantly, the secondary aluminium producers in India live up with whatever minimum they get.

Therefore, the secondary aluminium producers have to depend upon imports of aluminium scrap from different countries including UAE, Iran, South Africa, China, Taiwan, Nigeria,

USA, Spain, Australia, Malaysia and European countries to name a few. As processing units mainly exist in Western and Northern region of the country, a majority of scrap is imported through Jawaharlal Nehru Port (JNPT) in Mumbai, Chennai and Delhi. This scrap is used by domestic foundry and extrusion sectors to produce various aluminium products including some for auto grades.

Conclusion

Aluminium scrap recycling is environmentally benign – no fluoride emissions – prevents waste. Efficient aluminium scrap, dross and powder material handling can eliminate the risk of fire hazard. The scope of aluminium scrap or dross recycling is very bright. In developed countries the recycling

Per capita consumption of aluminium in India is still abysmally low at 0.7 kgs as compared to 6.5 kgs of China, 29.5 kgs of Italy, 31.6 kgs of Germany, 31.9 kgs of US and 32 kgs of Japan. This opens an enormous opportunity for secondary producers to offer good quality products at comparatively lower than primary producers' prices.

level of 95 per cent in automotive sector and 85 per cent in building construction and 50 per cent in packaging is targeted. This would be useful for reducing negative effects on environment as well as to save energy and cost. But, the recycling in India is yet to take its full length. But, due to longer life cycle and lower per capita consumption of aluminium in India, the percentage of comeback is very less. If the country has to achieve real growth then it would have to take a lesson from Japan, who banned primary aluminum production completely, to speed up the scrap recovery and recycling system mechanism properly in place.

