

BIG BOOST FOR ALUMINIUM MAKERS

The aluminium industry is set to witness a big boost in demand with the growth pipeline provided by the home-grown electric vehicle industry **By Ashish Sinha**

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HE BUZZ AROUND ELECTRIC VEHICLES (EV) has turned the spotlight on an otherwise staid aluminium industry. The silvery white metal, not just the cheapest but also one of the lightest, is much sought after by the EV and the aerospace industry as it helps reduce the overall weight of the structure while maintaining the strength. The Tesla cars models, for instance, use nearly 200 kg of aluminium to limit their overall weight to around 2,000 kg.

In fact, the automobile industry

has been one of the biggest consumers of aluminium. It is not just used for making the frame and body of vehicles, but also electrical wiring, wheels, ABS brakes, transmission, air conditioner condenser and pipes, and in engine parts like pistons, radiator and cylinder head. Use of aluminium, instead of steel, enhances performance, safety, fuel efficiency and durability, and also renders many environmental benefits, say experts.

So, how is aluminium useful for EVs? “The demand for aluminium in EVs is going to be primarily driven by the need for light weighting,” says Ajay Kapur, CEO – Aluminium & Power & MD – Commercial, Vedanta. “EVs are currently range constrained. A 100 kg reduction in the weight of an EV can translate into an additional 10-15 per cent increase in range. And increased range is critical to drive higher EV adoption and close the gap with ICE vehicles,” adds Kapur.

Experts say very soon aluminium





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**NAVEEN MEHTA, President
(Operations) at Jindal Aluminium.**

Your take on the increased use of aluminium in EVs.

The demand for aluminium in EVs is going to be primarily driven by the need for light weighting. EVs are currently range constrained. A 100 kg saved on any EV can translate into an additional 10-15 per cent increase in range. And increased range is critical to drive higher EV adoption and close the gap with ICE vehicles. Plus, aluminium is significantly cheaper and easily available compared to alternatives like carbon fibre-reinforced composites and titanium.

What will the growth of EV market in India mean to a company like Vedanta Aluminium?

Domestic production of aluminium for usage in EV can significantly impact the total costs in the EV ecosystem. Beyond domestic landscape, Indian aluminium manufacturers like Vedanta are also well set to contribute to the global EV ecosystem. The value-additions to aluminium done by Vedanta can also help realize scale benefits and dis-intermediate the value chain, leading to overall lower cost. In fact, we are in the process of setting up a Centre of Excellence at our aluminium smelter in Jharsuguda, to closely collaborate with the auto industry and develop new products to be a part of the India EV growth story.

Do you have anything in the works especially for the EV industry?

We are also evaluating partnerships with start-ups and third-party experts to develop cutting-edge aluminium applications specific to EVs and auto industry of the future, like aluminium air battery technology.

How much aluminium do you currently supply to the auto industry?

We supply ingots, billets and Primary Foundry Alloy (PFA) to the domestic automotive industry. PFA is one of our most sought-after value-added products, used in the manufacturing of alloy wheels. We supply nearly 50 KTPA of aluminium to the domestic automotive industry, primarily for alloy wheels. We have recently launched the Aluminium Cylinder Head Alloy, which leverages material design to increase efficiency of internal combustion engines, helping automakers adhere to emission norms efficiently.

How are you gearing up to meet the growth challenge once the EV segment picks up?

The strategic focus for aluminium players, including Vedanta, is to drive higher sales in the domestic market. Keeping all of the above factors in mind, Vedanta is making large investments to increase total production capability and production capabilities of value-added products with high-end applications, such as EVs.



“WE ARE DEVELOPING CUTTING-EDGE APPLICATIONS FOR EVs”

Ajay Kapur, CEO, Aluminium & Power and MD, Commercial, Vedanta tells Ashish Sinha on how the domestic aluminium industry can help the growth of electric vehicles in India? Excerpts:

will also be used for creating the EV infrastructure besides its increased usage in the electric vehicle itself. “With charging stations and battery casings put together, aluminium extrusion usage can increase up to 80 kg per vehicle on average,” says Naveen Mehta, President (Operations) at Jindal Aluminium. “As the automobile manufacturers bring out design evolution in multi-material EVs, they will continue to increase the use of aluminium. The downstream aluminium manufacturing industry is ready for this and working hard to offer the best alloys and solutions to meet the EV manufacturing requirements for both the vehicles and associated charging infrastructure,” adds Mehta.

Globally, on average around 250 kg of aluminium is believed to be used in each EV. The aluminium demand by

EV makers was about 250 KT (kilo metric tonnes) in 2018 globally and is expected to top out at 10 MTPA (million metric tonnes per annum) by 2030. The EV penetration in India is expected to be around 10-20 per cent in 2030, and it will be driven by four factors — regulations, incentives and investments by the government, cost competitiveness of EVs, investment by OEMs, and charging infrastructure, says Kapur.

How much aluminium is being consumed by non-EV automakers today? In the non-EV segment, the average aluminium consumption is about 50-70 kg in a car and 20-30 kg in a bike. Domestic aluminium producers supply around 50 KTPA out of a total of 110 KTPA of primary consumption. “As of now, there is no change in the design of a car between EV and ICE, so average demand is almost the same across both segments,” says Kapur.

Aluminium-air Batteries?

As per reports, researchers in South Korea have already made public the development of a new high-energy aluminium-air flow battery that is more efficient than gasoline-powered engines. Experts say the key is replacing and not recharging the depleted battery packs. The new aluminium-air flow batteries produce electricity by reacting with oxygen in the ambient air instead of from an electrical source. Among the advantages of aluminium-air batteries are that they can hold greater charge, weigh less and cost less than the lithium-ion battery.

In India, as per news report, a local company retrofitted a Mahindra e2o with aluminium-air batteries at a cost of about Rs 2.5 lakh. It is claimed that Log9’s metal-air batteries can go up to 1,000 km if water is topped up every 300 km.

Recently, Indian Oil Corporation

entered into a joint venture with Israel-based battery technology startup Phinergy to develop aluminium-air battery systems for EVs and stationary storage, as well as hydrogen storage solutions.

“The JV plans to manufacture aluminium air systems in India and provide a boost to India’s ‘Make in India’ programme. At the same time, recycling of aluminium will help India in becoming ‘Atmanirbhar’ for energy requirements,” says Dharmendra Pradhan, Minister for Petroleum and Natural Gas.

Indian Oil Phinergy, as the JV is called, plans to manufacture aluminium air batteries in India by sourcing the raw materials domestically. Leading automakers, including Maruti Suzuki and Ashok Leyland have already signed letters of intent with Indian Oil Phinergy to commercially deploy the battery solutions.

VERY SOON ALUMINIUM WILL ALSO BE USED FOR CREATING THE EV INFRASTRUCTURE BESIDES ITS INCREASED USAGE IN THE EVs

Experts say since the aluminium-air batteries cannot be recharged, wide availability of battery swapping stations would be needed if large-scale usage of aluminium-air battery is being planned. The aluminium-air battery powered EVs are said to offer a range of 400 km or more per battery compared to lithium-ion batteries which currently offer a range of 150-200 kilometres per full charge.

Aluminium Challenges

Reducing margins, lack of incentives for value addition, and a shrinking market share as aluminium imports receive subsidies are among the significant issues the downstream aluminium producers are facing today. “With a 13 per cent export incentive

available to them, the Chinese are dumping downstream products in India,” says Mehta of Jindal Aluminium. “With government support and sops, we can support the EV industry better and contribute to its faster and successful growth,” Mehta adds.

In the EV space, cost of production is a key driver. As per Kapur of Vedanta, the current costs of manufacturing aluminium are higher for the Original Equipment Manufacturers than comparable ICE vehicles. “Domestic production of aluminium for usage in EV can significantly impact the total costs in the EV ecosystem. As primary aluminium imports into India are taxed at 7.5 per cent duty, in addition to working capital implications and forex implications of imports, domestic aluminium will be critical for the scaling of domestic EV landscape with

lower costs,” says Kapur.

However, beyond the domestic landscape, domestic aluminium manufacturers like Vedanta are also well set to contribute to the global EV ecosystem.

“We are in the top quartile of cost efficiency in aluminium production and India is an exporter of aluminium given the strong cost position. We can potentially play a leading role in providing high quality raw material at competitive costs to the global EV industry,” says Kapur, CEO – Aluminium & Power and MD – Commercial, Vedanta.

Therefore, the growth of domestic EV industry in India is also set to boost the demand of ancillary segments, aluminium being one such major metal that India produces in a cost-effective manner. Policy-makers will need to pay more attention to every aspect of the EV industry in order to see any significant results. **BW**

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