

Striving for Sustainability

By **Myra Pinkham***

Austral Bracken Fern being planted near Alcoa's Huntly Bauxite Mine in Australia

The push for sustainability isn't anything new for the aluminium industry, but such efforts have accelerated in recent years helped by the "green" certification programs by certain groups, including the Aluminium Stewardship Initiative (ASI).

"Clearly aluminium producers are looking to promote themselves as being environmentally friendly, but to what extent that is being recognised by customers and to what degree it can be converted to a price premium remains to be seen," Sergey Donskoy, a metals and mining analyst for Société Générale, said, adding: "I believe that everyone is moving towards a lower emissions world, but the question is how quickly that can be achieved and what the eventual configuration of the industry will be."

Geordie Wilkes, head of research for Sucden Financial, points out that the aluminium industry has taken a lot of steps over the past 20 to 30 years to reduce carbon dioxide emissions. In fact, he says that it has reduced its carbon footprint by nearly 40 percent since 1995, including a sizable reduction in the electricity intensity of primary aluminium smelting, which, on average, went to about 14,000 kilowatt hours per tonne by 2017 from about 15,380 kilowatt hours per tonne in 2000.

"Over the past several years this trend has accelerated," Wilkes says. "It still has a long way to go, but we have seen both global governments and the big names in the industry are increasingly allocating time and funds to this issue, resulting in various new trademarks and initiatives."

"It is a whole value chain approach," Matt Meenan, a spokesman for the Aluminum Association, says, "I think that all companies, whether they are primary aluminium companies or are further downstream, are making efforts to either improve their technologies to improve their internal processes to save energy or to use more recycled material. All those things are part of the game."

This, Rosa Garcia Pineiro, Alcoa Corp.'s vice president of sustainability, says comes at a time when clearly governments around the world are moving to support a low carbon society and implementing, or contemplating, policies that align with the goal of reducing global carbon dioxide emissions to stop global warming. She points out that such government action is aligned with an increasing number of end-use customers who want assurances that the raw material that go into their finished good are responsibly and sustainably produced.

"At Alcoa, we believe that we can accelerate value creation by answering society's increasing demand for sustainable solutions," Pineiro says. "We believe that will benefit both our company, our stakeholders and the world." Also, she says it is the right thing to do.

In fact, Wilkes says it is such aluminium end use customers that are providing the biggest push for the industry's sustainability efforts. "Companies are becoming increasingly aware of the value of conducting business in an environmentally friendly way without greenwashing investors and consumers," Wilkes says, although he admits that the impact of the coronavirus (Covid-19) pandemic could limit the funds that companies have to make this costly transition.

"But it is part of their business now. They are well aware of the value in ESG (environmental, social and governance) credentials and initiatives, so they can't back off from it," he says. "The industry definitely needs such ESG initiatives as ASI and guidance as to how companies can become more environmentally friendly," Wilkes says.

"For sure climate change is one of society's biggest challenges, and something that is on everyone's mind," Catherine Athenes, vice president of group sustainability at Constellium says, noting that through the Paris Accord there is a common goal of limiting the temperature increase to 1.5 degrees Celsius this century, "But there are varying views on aluminium's role in that," she says.

"It is important that there isn't any green washing, that companies are not just displacing one product with another without really making a difference," Athenes points out. "At Constellium we are doing our homework, working on our own greenhouse gas (GHG) emissions, our own waste and recycling," she says. "But we acknowledge that we are just one piece of a bigger puzzle and that everyone in the industry needs to work together."

This whole sustainability argument, at least when it comes to metals and resources, plays to one of aluminium's strengths as defined by the industry, John Mothersole, director of research for IHS Markit's pricing and purchasing service, says, given the metal's physical characteristics and the realities of modern life. "There are advantages of adopting wider application of aluminium into such end use markets as packaging and transportation equipment," he says, explaining that it is downstream, especially with the use of more recycled content, where aluminium's strengths as a sustainable material really lies, noting that upstream production – everything from bauxite mining, alumina refining and aluminium smelting is a very dirty process. "Smelting, in particular, is very GHG intensive."

"Downstream, the industry is looking at some low hanging fruit to improve recycling," Meenan says, with the Covid-19 pandemic and with China not accepting as much US recycled material putting stress on the system. However, he says that the Aluminum Association has been working with several groups, including the Recycling Partnership, to further drive increases in recycling rates. "Aluminium makes a lot of sense when it comes to the whole idea of a circular economy as it is a material that can be recycled over and over again," he maintains.

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Particularly it has been moves to lightweight such transportation equipment as cars, trucks and trains that gives aluminium an edge on the sustainability front, Bjørn Kjetil Mauritzen, Hydro's head of sustainability, says, noting that such lightweighting results in lower energy consumption, therefore, less GHG emissions.

On the downstream end of the industry, Gregory Wittbecker, senior analyst for CRU, observes that the trend for increased use of recycled aluminium content has been going on since the 1980s, even before sustainability was a buzzword, and that trend has never backtracked and have actually been accelerating, especially given that over the past two years scrap prices have been selling at very attractive discounts to virgin metal and that today most can sheet is being made from 70-80 percent recycled content and could, at least in theory could be made 100 percent from scrap.

Athenes says that while increased use of post-consumer recycled content helps to limit emissions, it isn't the answer to everything. "There isn't enough scrap to cover all of today's demand, so there is still a need for primary metal," she explains.

That said, the recycling of aluminium cans is one of the earliest examples of the aluminium industry's sustainability efforts, Fiona Solomon, ASI's Chief Executive Officer, says. She points out that in recent years the industry has been especially focused on ways to support responsible sourcing throughout the aluminium value chain, including setting up structured standards and certifications through such initiatives such as ASI, which helps companies and stakeholders come to an agreement as to what good practices look like.

"We are seeing more companies becoming ASI certified," Solomon says, with an uptick across the entire aluminium value chain. She notes that the ASI has a structure that enables everyone in the supply chain to come to the table to contribute to the organisation, including the implementation of industry standards. She notes that last year ASI had more than 50 certifications, up from 10 in 2018, when the program was first implemented. Likewise, its membership has gone from just a dozen companies five years ago to 126 members as of June 15 with expectations that it will continue to grow strongly.

Solomon admits that historically there have been other types of certification in the aluminium sector, "But ASI certification covers a much broader range of sustainability issues than many other more technical standards," she says. "It is a way for companies to grasp the bigger picture of what the sustainability challenges are throughout the value chain," she says, adding that it enables everyone to work towards a common set of goals.

Pineiro says given that ASI is the most recognised and respected organisation to verify responsible and sustainable production, she sees it as an important consideration for both producers and end use customers, adding that Alcoa has decided to pursue ASI certifications because doing so aligns with the work it has been doing across it business. She notes that the company already has 10 ASI certified locations and Chain of Custody certification and is working to certify more locations and future differentiate its product.

ASI is in the process of looking at how it could expand and improve its standard. "Ultimately ASI want to lift all boats, to ensure that sustainability principles are implemented as broadly as possible in the global value chain," Solomon says.

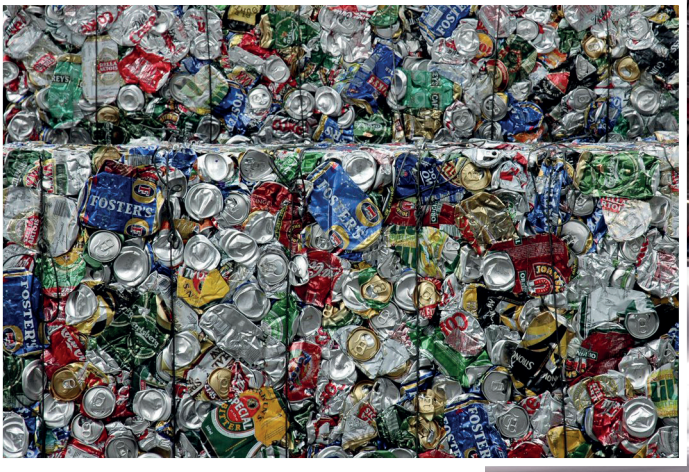
"It isn't yet at the point where the ASI certifications cover the entire value chain," Athenes maintains. "But that needs to happen." She explains that the certification is a very good tool to check where you are in terms of sustainability credentials and practices, noting that when Constellium, which is one of the founding members of ASI, was doing this in its Singen, Germany, plant, it realised that it didn't have a lot of information on the impact of the biodiversity of the site. "Now we partner with a local NGO to better understand what our impact could be and how to mitigate it."

"We are looking for bigger chunks of both the aluminium industry and its end use markets to get involved," Athenes says. "But one big question is which comes first, the chicken or the egg. It is a complex value chain, so it will take some time, but we are starting to see the dots get connected."

Meenan says that, at least anecdotally, that more customers are becoming more aware of that ASI certification provides certainty that the aluminium they buy is produced in a responsible and sustainable way, therefore providing companies with such certification a competitive edge given that there is always pressure on the big consumer brands to have sustainability advantages that they could tout.

"We don't see ASI certification as being a competitive thing," Solomon says. "Obviously, certain companies look at this as a way to differentiate themselves, but we provide these tools equally to everyone. It is up to individual companies to make use of that.

Wittbecker points out that primary aluminium producers are also able to increase the sustainability of their products by integrating some recycled content back into their smelters – blending scrap int their virgin metal. "But that isn't widespread," he says. "Instead, the big initiatives taking place on the primary side is producers focusing their attention on offering lower carbon products," with a number of companies, including Alcoa, Rio Tinto, Hydro and Rusal, rolling out branded virgin metal products that only have about 4 tonnes of carbon per tonne of aluminium produced compared with the standard industry average of about 12-13 tonnes of carbon per tonne of aluminium. He notes that these offerings are predicated on their ability to use renewable energy, particularly hydroelectric power.





"Using more green energy is definitely a way to help aluminium to get a lot greener, to help the industry to reduce its greenhouse gas (GHG) emissions," Wilkes admits. "But doing so is a long, tricky process given that success in doing this involves many factors, including energy storage and whether plants are located near hydroelectric, solar and wind power generation facilities."

Donskoy maintains that right now, the only workable green solution is hydropower. "But not everyone has access to hydropower. Those that do have such access are able to get ahead of the game and are naturally at an advantage." He says that nuclear power could be any alternative solution, but it involves a large investment. "We aren't in the position yet for other renewable energy solutions, such as wind power, to power aluminium smelters," he says, "Although maybe we will eventually get there."

"The question remains how the entire industry, particularly those without such capabilities, can reduce their GHG emissions in an economic and sustainable way," Athenes says, maintaining, "As of today there aren't enough aluminium smelters that are fueled by hydropower to supply global consumption needs."

That isn't to say that some aluminium companies haven't made a bit of progress. Mauritzen says that last year – one year earlier than anticipated – Hydro, which achieved a goal set in 2013 to be carbon neutral from a lifecycle analysis standpoint for the metal that it produces. Hydro recently announced a second sustainability goal – to reduce its GHG emissions by 30 percent by 2030 through contributions from all of the company's different business areas – bauxite, alumina, energy, primary metals, rolled products and extruded solutions.

Mauritzen observes that already 70 percent of Hydro's power comes from renewable sources (hydropower and wind power), and that it has five smelters in Norway that are 100 percent renewables based, which has contributed to its ability to reduce it GHG emissions. He adds that as part of its efforts Hydro has introduced two new branded low carbon products into the market—CIRCAL, a recycled product that contains a minimum of 75 percent recycled, post-consumer scrap and REDUXA, a primary metal that through the use of renewable power has a carbon footprint that is less than a quarter of the global average.

Donskoy says the holy grail for the aluminium industry is technologies that could enable companies to produce aluminium using inert anodes, therefore entirely doing away with carbon dioxide emissions during smelting. He says, "If the technologies that are currently being tested by Alcoa, Rio Tinto and Rusal prove to technologically feasible and possible to commercialize, companies will not only stop producing carbon dioxide, but will emit oxygen instead – something that is almost unthinkable at this point." He said he isn't sure how much of a competitive edge these companies will achieve, as once the technology is proven it will probably be adopted by all aluminium companies.

One example of this technology is the Canadian based ELYSISTM joint venture that Alcoa and Rio Tinto formed in 2018. Pineiro says that the process that the joint venture has developed is now producing small quantities of carbon-free metal in a pilot plant. "We are now working to scale up the ELYSISTM technology to industrial scale. Then the process can be marketed for potential retrofits of existing smelters or the construction of new ones," she says, adding that ELYSISTM technology licenses are expected to begin to be offered in 2024.

Wittbecker says that Rusal is working on a similar technology that might be brought to market in 2023. This, Wilkes pointed out, comes on the back of Rusal recently introduced its ALLOW low carbon footprint product line and its target for 95 percent hydropower or other carbon-free power generation for its production by 2025. "These efforts are a step in the right direction, both for these companies and for the industry," Wilkes says.

"I sense that everyone is aware of climate change and what it could mean for their business operations in the longer term," Mothersole says, adding that he believes that the industry's recent sustainability moves have been a combination of both concerns about the environment and a push to be more competitive, supported by a push from governmental regulations and the fact that sustainability arguments play into some of aluminium's strengths.

This will also continue to support sustainability efforts, such as ASI. "The aluminium industry is refreshingly very committed to sustainability. People in the industry are deeply passionate about the environment," Solomon says. "It is in aluminium's DNA to provide a culture in which an initiative like ASI can really be embraced. We believe that we will see a strong growth trajectory ahead." ■