ALUMINIUM IN A LOW-Carbon WORLD

MANIFESTO REPORT | SEP. 2019
https://eurac.tv/9QKS

With the support of EUROPEAN ALUMINIUM
Just as the European aluminium industry undertakes costly efforts to decarbonise, the sector is finding itself caught up in a trade war involving Chinese dumping and US tariffs that threaten to destabilise European production.

In this Special Report, EURACTIV looks at the challenges and opportunities facing Europe’s aluminium sector, including the transition to a net-zero carbon world.
Aluminium sector illustrates close link between trade and climate policy

EU climate official: Innovation fund will help decarbonise metals production

The EU should foster true circular business models
Aluminium sector illustrates close link between trade and climate policy

By Dave Keating | EURACTIV.com

New production methods and uses are making aluminium a material of choice for European policymakers looking to decarbonise the economy. But a flood of cheap carbon-intensive aluminium from China could complicate these efforts.

An energy-intensive industry, the aluminium sector has been subject to the EU’s Emissions Trading Scheme (ETS), which forces big polluters in Europe to buy credits on the EU carbon market.

At the same time, aluminium has attracted policymakers’ attention for its decarbonisation potential – both as a lightweight material for sectors like the automotive industry and because new production processes have helped reduce emissions from aluminium plants.

Continued on Page 5
But just as these efforts are starting to pay off, a new obstacle has come up: the US-China trade war. New American tariffs on aluminium imports – which affect both Chinese and European producers – are pushing all the excess Chinese production into Europe, flooding the market.

China is now the world’s biggest producer of aluminium. But its production is up to three times more carbon-intensive than aluminium made in Europe, mainly because the electricity taken from the grid in China is largely generated from coal.

As the European Commission reads its assessment of just how much the US tariffs and Chinese imports are impacting the EU market, the industry is warning that the end result could hurt Europe’s efforts to decarbonise.

Dealing with imports in a way that respects international trade rules could be a difficult task, however.

Today, China accounts for 57% of global aluminium production, up from just 10% 15 years ago. The reason for the rapid growth is that China has heavily relied on aluminium to supply its building boom. But Beijing’s five-year plans for how much aluminium the country would need proved to be incorrect. While growth slowed, investments into aluminium didn’t. So the excess production is now being exported to the rest of the world, and now that it can’t go to America, it is flooding into Europe.

“In China, a lot of aluminium is built around a captive coal plant,” explains Per Klevnäs, an economist with the consultancy Material Economics, who has been looking closely at the decarbonisation potential of aluminium.

“They’re not buying the power from the wider grid, they’re literally running a coal plant. That model isn’t alien, other big producers in Europe have big own-generating assets. But they’re often low-carbon,” Klevnäs said.

“The issue is that lots of cheap carbon-intensive aluminium is available to buy now,” he continued. “Aluminium is a truly global commodity. Where it came from isn’t relevant in today’s markets. Whether you release 22 kilos to make one kilo of aluminium [in China] or you release four kilos [in Europe], the buyer pays the same price”.

**CLEANER ALUMINIUM**

So what makes aluminium produced in Europe so much less carbon-intensive? For the moment, it has little to do with the plants themselves and more with the electricity grids they’re drawing power from.

“Aluminium has a high use of energy, however not necessarily by producing its own CO2,” says Gerd Götz, director-general of European Aluminium, a trade association. “We are using electricity [in Europe], so we depend on the energy mix we get. That’s a very different situation globally.”

“In the northern part of Europe, we’re using hydropower. In France, we go on nuclear. But if you go to regions where we have high coal, then you go up in your carbon footprint,” Götz explained.

Because China is using 80% coal-fired energy, European plants emit overall one third less, even if some plants in Europe are running on coal power. As the carbon footprint of Europe’s energy system goes down, so too will the carbon footprint of aluminium production. That makes aluminium different from other materials like steel and glass, which don’t rely as much on electricity.

The use phase of aluminium has also attracted interest from EU policymakers looking to decarbonise the economy. Aluminium is endlessly recyclable as long as it is pure, and when used in transport, it can reduce fuel use by lightweighting vehicles.

Aluminium will also be essential for fitting the batteries of electric vehicles, Götz adds, saying this could make it an important part of the EU’s circular economy strategy.

**AN ENERGY-INTENSIVE PROCESS**

In the short term, however, the aluminium industry still has an emission problem to tackle.

While the electricity-generated part of its production makes aluminium cleaner in countries that have a low-carbon power mix, the other part of its production will require efforts at the plants themselves.

“Aluminium has two production steps: the smelter is where you make aluminium, the refinery is where you make Alumina,” or Aluminium oxide says Klevnäs. “Even if you get rid of all the emissions from power, you still have four kilos of carbon.”

“Both stages need innovation, but the one you could immediately do something about is alumina production. In this part, you make steam, and there’s no question you can make steam without using fossil fuels, but it’s more expensive.”

In addition to the electricity used in refining, there are process emissions from the smelter. This is where new technologies can step in to make a big difference. For instance, a consortium called ELYSYS, a partnership between Rio Tinto and Alcoa Corporation, has developed a carbon-free smelting process, which is now being tested and scaled up.

They say the use of this new type of smelter could eliminate all direct greenhouse gases from the traditional aluminium smelting process. The technology, being developed in Canada, is expected to be ready for commercial sale in 2024.
“We can have aluminium that’s not really CO2-heavy in 10 or 15 years,” says Klevnäs.

Götz says there have already been improvements in smelters but costs may become a concern.

“There’s a linear development where we have reduced year by year CO2 in different smelters. But then you come to the limits of the process, that’s where we need breakthrough technologies. That’s where we have companies that have mid-term developments that give not only good hope but also a realistic perspective.”

“But this is something that industry can’t do on its own. It’s will require much more than Horizon 2020 programmes where we have well-running projects. Here we need to go into a different scale.”

**ANTI-DUMPING DUTIES**

According to a study published earlier this year by Material Economics, the new technologies for the production processes of these emissions-intensive industrial materials mean that getting to a zero-emissions industry is within reach, but the costs are going to be very high.

And that is why the influx of Chinese aluminium is making it harder for companies to make the necessary investments.

In a world of global competition, where is the incentive?

“In any industry, they’re doing what they’re doing for very good reasons. If you want them to change, you need to give them a better reason to do so,” says Klevnäs.

The Commission has put the market under surveillance since the US tariffs were imposed and will come forward with a report on the Chinese imports by the end of the year.

According to Götz, anti-dumping measures would be “a very clear avenue” to follow. “We see through the surveillance a very concerning picture of growing Chinese imports to Europe in some particular product groups, that’s where we hope the new anti-dumping procedure will also get some grip.”

Others have suggested import tariffs to deal with the issue, and incoming Commission President Ursula Von Der Leyen has said she will table a carbon border tax.

But because these remedies could be subject to international free trade challenges, there could be other methods.

For instance, the EU could say that all aluminium used in Europe has to have a carbon intensity below a certain level. This would not specifically exclude Chinese imports, making the measure WTO-compliant. However, experts say it would likely still present a challenge because Chinese aluminium is so carbon intensive.

As the aluminium industry tries to position itself as a key tool for decarbonisation in the future, the issue of Chinese steel is having a major effect on the debate. The Commission may keep these climate goal issues in mind when making its assessment of the situation later this year.
The production of non-ferrous metals such as aluminium is very energy-intensive, but new technologies are being developed to decarbonise the process and the European Commission is ready to finance them, says Mauro Petriccione. Mauro Petriccione is Director-General of the European Commission’s climate department. EURACTIV’s Dave Keating asked him how the EU can help metals producers decarbonise their production processes.

The EU has a goal of getting to net-zero emissions by 2050, pending approval by member states. In order to meet that goal, is Europe going to have to change the way it uses and produces materials like aluminium, steel and glass?

The European Commission’s vision for a climate-neutral economy by 2050 sets out an ambitious but achievable pathway for the EU to become the first major global economy to achieve climate neutrality. This objective – which has already been endorsed by a large majority of the Member States – brings many opportunities but also far-reaching challenges.

One of the key questions is how to address greenhouse gas emissions from our energy intensive industries while maintaining and enhancing our economic competitiveness.

Significant efforts have already been made, thanks to the EU emissions trading system as a market-based driver providing incentives to cut emissions. In fact, Europe’s industry is highly efficient and maintaining its competitiveness goes hand in hand with efficient use of resources and the development of a circular economy. EU companies need to be empowered with a first-mover advantage to become global leaders in clean innovative technologies.

To see the reductions needed to achieve climate-neutrality by 2050, innovation is key. Many of the technologies needed to further cut...
Non-ferrous metals, such as aluminium, can play a key role in the EU’s transition to a climate-neutral economy by 2050. They are essential to low-carbon transport, renewable energy generation, transmission and consumption, zero-energy buildings and resource-efficient packaging. They are endlessly recyclable and are fundamental to the circular economy, ensuring ongoing access to raw materials into the future.

Non-ferrous metals like aluminium can have numerous applications in a sustainable future, thus offering significant opportunities for material substitution for example in the energy sector, transport and buildings.

**The heavy energy use of the production process for aluminium has been criticised. What more can be done to reduce CO2 emissions at source for these plants, rather than relying on decarbonisation of the electricity grid powering the plants?**

The production of non-ferrous metals, including aluminium, is indeed very energy- and, in particular, electricity-intensive. Apart from ensuring that it is produced with green electricity, there are many more clean innovative technologies that can be deployed to reduce the greenhouse gas emissions of the sector.

Switching fuel or reaction agents could be a way forward. Low emission electrolysis, inert anodes, wettable cathodes, magnetic billet heating and improved waste heat recovery are highly innovative, energy-efficient and low-carbon technologies fit for the aluminium industry.

Other methods could include the development of new, high performing alloys and compounds, establishing new circular value chains, reducing losses of aluminium and avoiding the need for downcycling, researching technologies for carbon capture and use, and creating a market for green products.

We are aware that the deployment of such technologies requires significant investments, which is why the EU is also providing the means to do so. The Innovation Fund, for instance, is one of the first EU funding instruments to tangibly support the vision of a climate-neutral Europe by 2050. It will pool together some €10 billion – depending on the carbon price – from the auctioning of 450 million allowances from 2020 to 2030, as well as any unspent funds from the current NER300 programme.

The fund will be one of the world's largest financing programmes for demonstration of innovative low-carbon technologies, helping to drive these technologies to the market. It is open to innovative low-carbon technologies and processes in energy intensive industries – such as aluminium – including products substituting carbon intensive ones, carbon capture and utilisation, construction and operation of carbon capture and storage, innovative renewable energy generation and energy storage. The first call for proposals is planned for 2020 and will be followed by regular calls until 2030.

**Will the ETS continue to serve as the main policy tool to motivate emissions-intensive industries to put in place cleaner production practices? What other tools are being considered?**

The EU ETS remains a key policy tool for the cost-effective reduction of greenhouse gas emissions. As part of the EU’s 2030 policy framework for climate and energy, the strengthened ETS is triggering a stronger carbon price signal to encourage low carbon investment decisions in our power sector and industry. The ETS is also providing the revenues for the new Innovation Fund as well as the Modernisation Fund.
Aluminium is by nature a circular and thus permanent material: whether it’s in a car, a building or a single beverage can, aluminium is fully and infinitely recyclable, maintaining its original properties no matter how many times it is processed and used. Furthermore, recycling aluminium saves 95% of the energy used in primary production and achieves an equivalent reduction in CO2 emissions.

Roberta Niboli is CEO at Raffmetal and Vice-Chair of European Aluminium.

There is a strong recycling business in Europe with over 220 recycling plants, many of which are small and medium-sized enterprises and family-owned businesses. About 8 million tonnes of scrap is recycled in Europe each year, which includes process and run-around scrap.

The European recycling industry has the potential to grow significantly. Our Vision 2050 report shows that in the coming decades, demand for aluminium will remain strong. With supportive policies for our sector by 2050, recycled aluminium and primary aluminium are expected to meet almost equal shares of total European aluminium demand, which is forecasted to reach around 18 million tonnes.

We understand that this growth must go hand in hand with decarbonisation. With impressive aluminium recycling rates of over...
90% in transport and building and about 65% in packaging, the European aluminium industry is already making a significant contribution to the circular economy. 75% of all the aluminium ever produced is still in use today.

To achieve 100% recycling of all aluminium containing products, however, we must maximise the collection and improve the sorting of valuable resources from the end of life of products. EU legislation will have a significant role to play in realising this ambition. In our recent I+ Manifesto, we have highlighted our main recommendations to policy makers.

One flagship measure is to encourage smart design to make traceability, disassembly and recycling easier and more cost-efficient. Sorting should preferably be done by specific product and by alloy family. It implies higher investments in modern waste treatment centres, using the latest sorting technologies, including sensor-based and robot sorting systems.

The review of Waste Shipment Regulation is a golden opportunity to simplify the shipment of waste across the EU. One of the changes should be adding new green listed codes for waste where needed, for example for coated or uncoated windows, doors, curtain walls, and other framing profiles which mainly consist of aluminium and plastic. Bureaucracy should not provide additional hurdles for European recycling plants.

Europe should also find efficient ways to address the issue of scrap leaving the European Union. Around one million tonnes of aluminium scrap is exported to non-European countries, and around four million End of Live Vehicles (ELVs) per year are deregistered without a certificate of destruction, probably being illegally exported. The upcoming revision of the ELV Directive should fight against the illegal exports of ELVs by introducing an improved registration/deregistration system. It should also keep the focus on waste prevention and high recycling ambitions. Besides, to ensure high quality recycling, scrap exported out of Europe should be treated by recycling facilities complying with Environment, Health and Safety (EHS) standards equivalent to the ones we have in Europe.

Last but not least, the possible interface between chemical, product and waste legislation should ensure that the use of raw materials such as aluminium will not be jeopardised. Chemicals policy should prefer the risk-based approach rather than hazard as a measure of exposure.

We expect the next European Commission to adopt a Circular Economy Action Plan 2.0 within the first 100 days of its mandate and hope to see our recommendations integrated into this new plan. Of course, there is also a clear role for our industry to further increase and optimise the recycling of aluminium through, for example, design for recycling, closer collaboration with the value chain and promoting the responsible use and consumption of aluminium whether from primary or recycled sources. All solutions that keep aluminium in the loop are worthwhile to consider because the metal we preserve today will likely remain in service forever.