

**ALUMINIUM,
THE BASE METAL
FOR THE GREEN TRANSITION**

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EDITORIAL

Together, let us be bold

Dear friends and colleagues,

A quick glance at a newspaper suggests that Europe is currently short of everything except challenges. As the lessons and implications of the pandemic, the ongoing war in Ukraine, and the broader threats of climate change and environmental degradation become clearer, so does our responsibility to find solutions at a commensurate speed, scale and scope. Europe's energy system and economy will need to be transformed with a view to building a more sustainable and resilient society, and the project is already behind schedule.

All of this has profound implications for the European aluminium industry. On the one hand, the sector's significant energy consumption and associated carbon emissions, despite being on average much lower than those of our competitors around the world, have undoubtedly been part of the problem. On the other, aluminium's status as an essential material for most of the technologies needed for the energy transition means that it will inevitably be a significant part of the solution. Aluminium - light-weight, endlessly recyclable, and the world's most used non-ferrous metal - quietly underpins the green transition, from solar and wind production to batteries, electric vehicles and beyond. It is a strategic material upon which Europe will become increasingly

reliant in the pursuit of its ambition to become the world's first carbon-neutral continent.

Analysis has shown that the successful implementation of the European Green Deal will increase European aluminium demand for clean technologies to 5 million tonnes in 2040, equivalent to 30% of Europe's total aluminium consumption today. Retaining and furthering the ability to produce and recycle this material in Europe must therefore be a strategic priority for the European Union and its Member States. The alternative is growing dependence on imports, an unnecessary and unacceptable vulnerability in an increasingly fraught geopolitical environment in which traditional assumptions about supply chains and trade flows are rapidly becoming obsolete.

With this in mind, the current direction of travel is not encouraging. The ongoing energy price shock has dramatically exacerbated an existing tendency towards declining competitiveness of European industry. For primary aluminium producers in the EU, this has had devastating consequences, namely a 50% cut in production. The economic viability of the semi-fabrication and recycling sectors has also been severely compromised. Meanwhile, other leading global economies are establishing

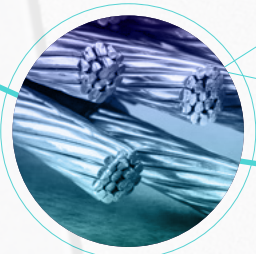
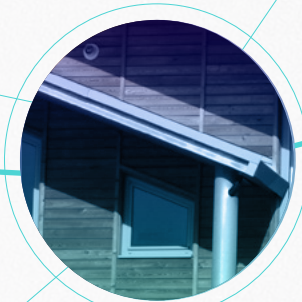
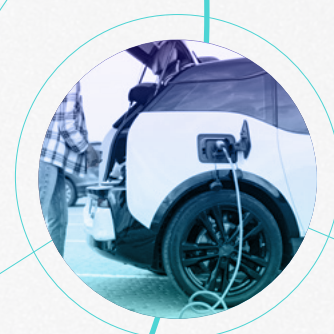
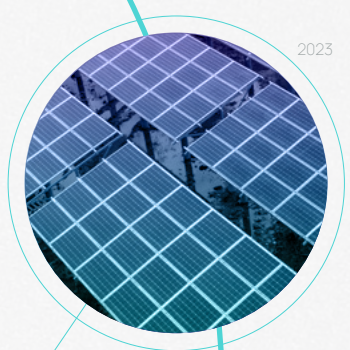
bold and assertive industrial policies to attract investments in green technologies and provide competitive advantages for the value chains needed to build them. This could incentivise companies to relocate their investments away from Europe to benefit from higher state aid and lower energy costs. Such a scenario would further undermine the European aluminium industry at a time when it is more needed than ever to help Europe achieve its wider strategic, environmental and economic aims. Europe must respond with a bold industrial agenda and a long-term vision to boost the European industrial base. In parallel, our industry can, will, and must further our own efforts to transform ourselves from a part of the problem to an integral part of the solution.

Together, let us be as bold, determined and ambitious as our challenging circumstances demand.



Paul Voss,
Director General

01 | Aluminium, serving Europe's ecosystems



Aluminium

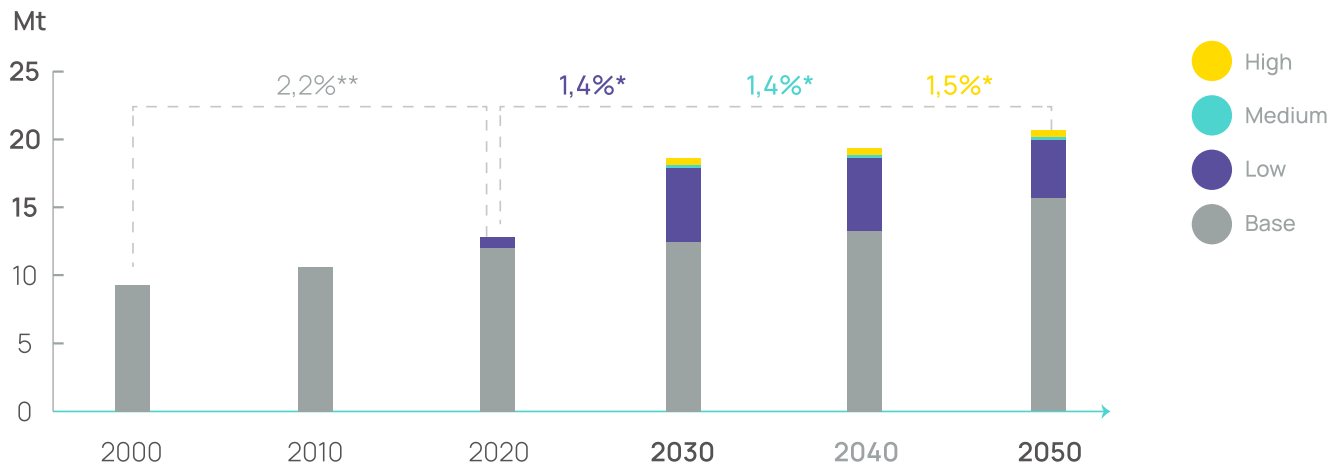
Europe has set ambitious goals to achieve climate neutrality by 2050 with the EU Green Deal. Serving six of the EU's fourteen industrial ecosystems, our metal has a vital role in switching to a sustainable energy system and a more circular economy, making it the base metal for the green transition.

Aluminium is a key component in mobility and transport, buildings, construction, packaging, aerospace, and defence. But it also is used in almost all energy generation, transmission, and storage technologies, particularly those that will deliver the energy transition, such as wind and solar power, alternative fuel cells, hydrogen production, high-voltage cables, and batteries.

As a result, Europe's 2030 energy transition will require 4 million tonnes per year of additional aluminium, rising to almost 5 million tonnes in 2040, equivalent to 30% of Europe's aluminium consumption today.

One thing is clear: without aluminium it would be impossible for Europe to achieve net zero emissions by 2050. The only question is how much of this growing demand will be met with imports from more carbon-intensive competitors around the world and how much can be **Made in Europe**.

Total European Aluminium Demand



*Compound Annual Growth Rate 2020-2050

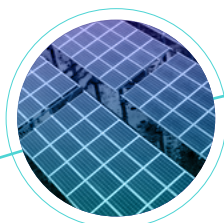
**Compound Annual Growth Rate 1990-2050



Aluminium is playing a key role in helping to realise the switch to electromobility by delivering lighter and more efficient vehicles. Ensuring that this is done with low-carbon and sustainable, or recycled aluminium produced in Europe should be a no-brainer for policy makers.

Julia Poliscanova
Senior Director, Vehicles and Emobility
Transport & Environment

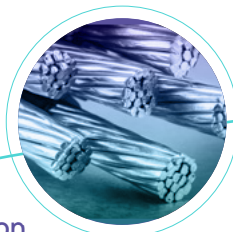
➤ Aluminium is the perfect metal for renewable energy production.



Solar Power

Aluminium is the most used metal in solar panels. It can be found in the frame that holds the panel together, the support structure that keeps it in place, and the electrical wiring that connects the cells. It's also used in the mounting systems that attach the panels to rooftops or other surfaces.

The European Commission has proposed a target of 600 GW of installed solar power capacity by 2030. To reach this goal, the installed capacity of solar power would need to increase from 170 GW to 600 GW. This will require approximately 12 million tonnes of additional aluminium between now and 2030.



Transmission and High-voltage Cables & Wires

Aluminium conductors are typically used in overhead power transmission and distribution lines, where their light weight reduces the load on towers and other supporting structures. They are also used in underground and subsea power cables at the transmission and distribution level, where their corrosion resistance is advantageous.

According to Europacable, Europe's demand for aluminium power cables is expected to grow by more than 30% by 2050. Currently, about 500 kt of aluminium are used.



Batteries

In the batteries used in electric vehicles, aluminium plays an important role in several components. The cathodes in EV batteries use aluminium foil, and the pouches that hold the cathodes in place also use aluminium. Additionally, the cell casings of EV batteries are also made of aluminium sheets. In a typical EV battery, there are between 5 and 15 kg of aluminium used. With the projected growth in the electric vehicle market, the demand for EV batteries is also expected to grow.



Solar is booming. The growth of solar is underpinned by access to aluminium. As solar becomes the backbone of Europe's energy system, it is critical to support a competitive European aluminium industry within a resilient, diversified, global supply chain.

Walburga Hemetsberger
Chief Executive Officer
SolarPower Europe



Electric Vehicles

Due to its light weight, strength, and thermal conductive properties, aluminium is used in manufacturing EV bodies, battery casings, powertrains, and other parts. This helps to reduce the overall weight of the vehicle, which improves the EV's range and performance.

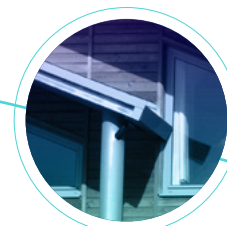
According to estimates, an electric vehicle uses around 140 kg more aluminium than an equivalent petrol or diesel car. As the demand for electric vehicles continues to grow, so will the demand for aluminium. With projections that 60% of car sales in Europe will be electric vehicles by 2030, the increased use of aluminium in these vehicles will lead to an additional aluminium demand of approximately 1.4 million tonnes per year.



Charging Infrastructure

Aluminium is the material of choice in charging stations due to its durability and easy integration of functionalities. Aluminium is a robust and corrosion-resistant material that can withstand the harsh conditions charging stations are often subject to.

As Europe aims to increase the use of electric vehicles, the need for charging infrastructure is rapidly increasing too. By 2030, it is estimated that 6.8 million public charging points will be needed. This translates to an average of 14,000 new public charging points per week, or approximately 750,000 per year. In order to meet future CO₂ emission targets and support the fast introduction of electric vehicles, the pace of charging infrastructure deployment must accelerate.



Building & Construction

Aluminium plays a vital role in the construction industry and creating sustainable, energy-efficient buildings. Its versatile properties make it an ideal material for optimising the energy efficiency of a building without compromising on quality. For example, aluminium windows, curtain walls, and ventilated facades can enhance solar gains and minimise heat leakage, making buildings more energy-efficient.

The EU's Fit for 55 package aims to make all new buildings zero-emission by 2030 and transform existing buildings into zero-emission buildings by 2050. This ambitious goal will increase the demand for aluminium in constructing green, energy-efficient buildings.

Aluminium

02

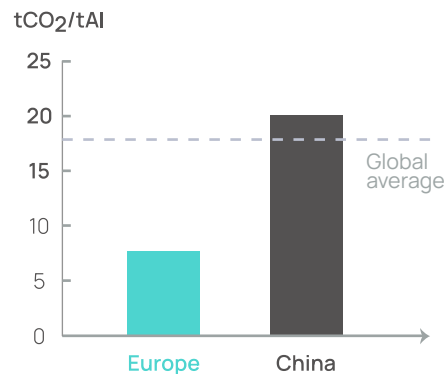
An energy transition 'Made in Europe'



Aluminium Made in Europe is among the cleanest produced aluminium in the world.

There are clear sustainability benefits in using aluminium produced, transformed, and recycled in Europe. Europe's ambitious legislation has set a high bar for environmental and social standards, enshrining the concept of best available techniques, the "polluter pays" principle, and Corporate Social Responsibility. Consequently, the European aluminium industry has an outstanding sustainability performance, with world-leading standards in environment, energy, and social areas, as well as in production and recycling technologies.

Carbon Footprint Comparison



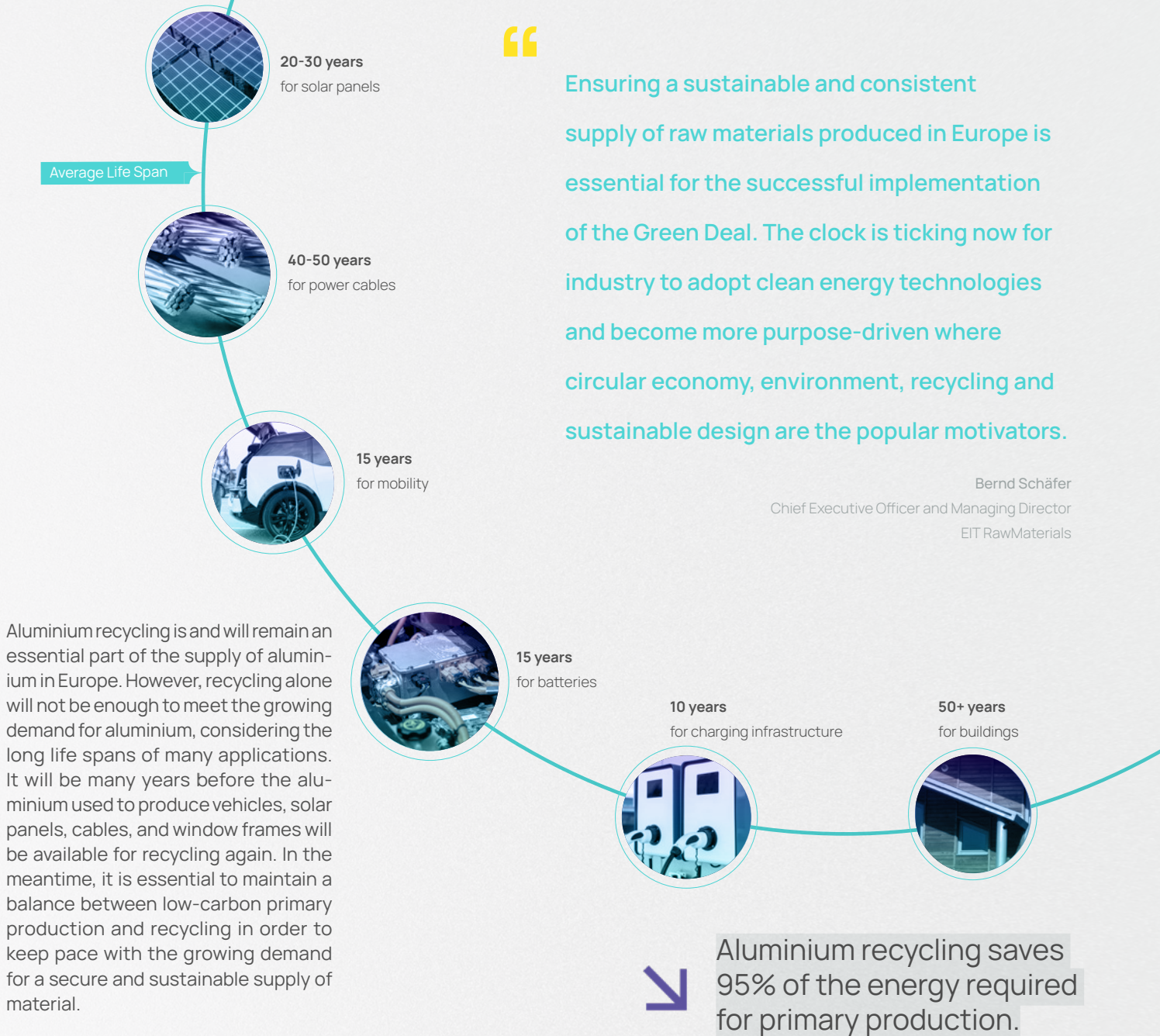
For example, the carbon intensity of European production has decreased by over 55% since 1990. As a result, the carbon footprint of Europe's primary production is much lower than the global average, at ~7 tCO₂/t compared to ~18 tCO₂/t for the global average and ~20 tCO₂/t for the Chinese average. Our semi-fabrication and recycling processes have also reduced carbon intensity, making Europe an overall best-in-class aluminium producer.

Satisfying the increased demand via imports instead of producing in Europe would generate at least an additional 40 million tonnes of CO₂ yearly. This amounts to additional and unnecessary pollution equivalent to the yearly CO₂ emissions of a country like Finland, and all this at the expense of Europe's society and economy.

Satisfying increasing aluminium demand with imports would lead to

40Mt CO₂

which is the equivalent to the yearly CO₂ emissions of a country like **Finland**



03

An industry committed to a green future


In addition to providing a fundamental material for the green transition, the European aluminium industry is continuously adjusting its sustainability objectives in line with Europe's increasing ambitions. Starting with climate change, the most pressing challenge of our time, we are currently setting a science-based decarbonisation pathway to net zero by 2050 that covers all segments of our industry.

Energy is the lifeblood of aluminium but also an indirect source of greenhouse gases. That is why reducing our energy consumption across the entire value chain is a priority. We will do this by implementing breakthrough technologies as soon as commercially available, avoiding greenfield investments in old technologies wherever possible, and accelerating retrofit programs. Investments in renewable electricity generation through long-term power purchase agreements are another important way to minimise our environmental impact.

The carbon footprint of European aluminium production is already well below the world average. We will maintain this leading position while ensuring that the aluminium sourced in third countries for the downstream industry complies with Europe's environment, health and safety standards.

In addition, we are also committed to boosting circularity. Our current goal is to move towards sourcing 50% of our supply from post-consumer recycling by 2050. We support regulations that foster high end-of-life recycling rates and high-quality recycling, and we engage with customers to design alloys and products that are maximally recyclable.

Finally, the highest overall ESG sustainability standards will be applied across the entire aluminium value chain, from sourcing raw materials to managing end-of-life products. To fulfil this commitment, full traceability of the material produced, transformed, and recycled within Europe will have to be ensured.



Aluminium Made in Europe
is a low-carbon alternative
to imported aluminium.



04 | Benefits of a thriving aluminium industry

The European aluminium industry is committed to helping make the Green Deal a success story. To do so, we also need an aluminium success story, one **Made in Europe!** This means addressing the European aluminium industry's lack of competitiveness in the global market due to market conditions, unfair trade, and high energy costs. The unlevel global playing field has already led to numerous plant curtailments across the continent, leaving Europe increasingly dependent on high-carbon imports from countries with which it does not have strong import relationships. Stopping and even reversing this trend is an ambition worth fighting for.

As the energy crisis has shown, by relying on imports, Europe is at risk of supply disruptions that can severely impact the success of the green transition. Becoming increasingly import-dependent on a material that is strategic to the EU's Green Deal is unwise at best and an existential risk at worst. For Europe to preserve its strategic autonomy, we should aim to maximise the share of supply from European primary and recycled metal.

Maintaining a strong and sustainable European aluminium industry does not mean rejecting trade or collaboration with other countries. As Europe is import-dependent for primary aluminium, until European production can meet the growing demand, strategic partnerships with third countries must play a vital role in supplementing the raw materials necessary for aluminium production, while promoting more sustainable standards for all parties involved. We simply need to make thoughtful choices guided not only by short-term economic expediency but also strategy, vision, and values.



In 2022, Europe curtailed 50% of its primary aluminium production capacity.

In short, European industries must be protected through robust green industrial policies that incorporate both domestic production and strategic partnerships. We have identified below the decisive short and long-term actions needed for the European aluminium industry to thrive and succeed.

- Stability of the energy supply for the sector at affordable prices.
- Deployment of renewable power generation capacity.
- Support for industrial recovery and restart of curtailed capacity.
- Support for "climate compatible" industrial investments.
- Financial support for R&D and deployment of new technologies.



Industrial demand for wind energy is growing quickly. But public authorities aren't awarding enough permits to keep up with demand. Slow and inefficient permitting processes are holding up the build-out of wind. This in turn slows down the transition to net-zero for many of Europe's key industries such as aluminium.

Giles Dickson
Chief Executive Officer
WindEurope





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**European
Aluminium**
ANYTHING BUT BASIC