



## An aluminium 2050 roadmap to a low-carbon Europe

Lightening  
the load

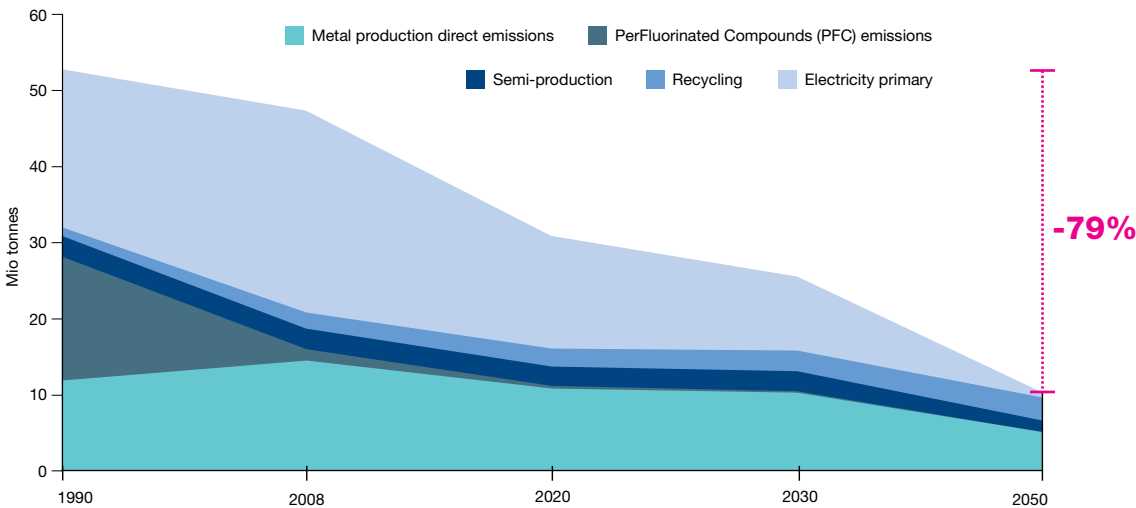
# A strong aluminium sector is a key enabler for the achievement of EU sustainability goals

In March 2011 the European Commission released its Communication 'A Roadmap for moving to a competitive low carbon economy in 2050' (COM(2011)0112), providing scenarios and targets on how different key sectors - power generation, industry, transport, buildings and construction, as well as agriculture - can make the transition to a low-carbon economy over the coming decades. This leaflet provides a synopsis of the aluminium industry's response to the challenges in that communication.

**Having already reduced its CO<sub>2</sub> equivalent emissions by a massive 50%, since 1990\*, the aluminium industry has a strong track record and is committed to further continuous improvement to help bring about a low-carbon economy in the EU. The extent to which that commitment can be realised depends on a number of factors as described below.**

**The efforts of the aluminium industry to reduce its direct emissions (-70% in absolute terms), combined with the Commission's scenario on reductions of emissions from European power generation (-92%), have the potential to deliver a total of 79% reduction in the sector's direct and indirect emissions by 2050.**

Total European Aluminium CO<sub>2</sub> Equivalent Emissions Reduction



This scenario assumes the EU electrical power sector will achieve the CO<sub>2</sub> intensity reductions projected by the European Commission, and the aluminium sector will be able to purchase that electricity at internationally competitive prices. If the conditions are favourable to continued operations and plant upgrades, the aluminium industry will invest in Europe. Retention of the industry offers the biggest emissions reduction potential in a global perspective, while safeguarding Europe's competitiveness, skills and employment.

Research into new technologies could eliminate direct emissions attributable to carbon anode consumption, currently the only technology available for the smelting/electrolysis process. The primary plants could begin to replace old technology with new non-emitting technology as soon as it becomes commercially available. This will probably occur by 2030.

\* See EAA Sustainability of the aluminium industry 2010 report: [www.alueurope.eu/?page\\_id=160](http://www.alueurope.eu/?page_id=160)

# How do we get there?

A positive policy framework is required to enable the aluminium industry to contribute its potential for CO<sub>2</sub> emissions reductions. In particular, the primary industry in the EU cannot compete with aluminium produced in countries that do not impose CO<sub>2</sub> costs in electricity, equivalent to the EU Emissions Trading System. Owing to our global price referencing platform, the London Metal Exchange, we cannot pass through regionally imposed costs. Our industry will not survive in the EU, unless it is able to purchase electricity at internationally competitive prices.

The aluminium industry urgently requires enactment of the following EU measures:

- The assessment of **existing and future proposals on energy and climate change policies** and measures to **ensure international competitiveness**. Among others:
  - Full compensation for the indirect effect of the Emissions Trading Scheme on electricity prices is urgently needed to ensure short-term survival of the industry, as long as the rest of the world has not adopted equivalent measures;
  - **Full compensation for renewables costs.**
  - An ambitious EU industry policy giving a 25 years visibility to potential investors, including measures to develop an adequate framework. At EU level, for the industry to adopt bilateral **long-term baseload electricity contracts**.
- Support for the aluminium industry to help the EU become the best recycling society in the world, and the adoption of measures to avoid **aluminium scrap exports to less emissions-efficient regions**.
- Promotion and development of an **innovation policy** enabling the industry to retain its technological advantage over the rest of the World.
- To encourage the use of lightweighting technologies in transport to **maximise emissions reductions**.
- Implementation of a **life-cycle approach** in all environmental assessments.

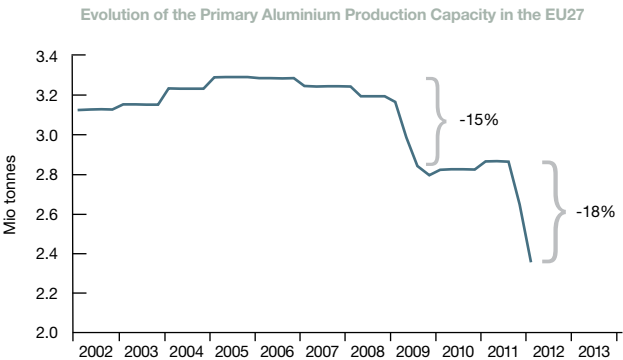
These measures are also intended to:

- Maximise the use of aluminium in packaging, therefore safeguarding **product quality** and **providing optimal protection properties**;
- Increase the use of aluminium in building, to maximise emissions reductions through improved **energy efficiency**.



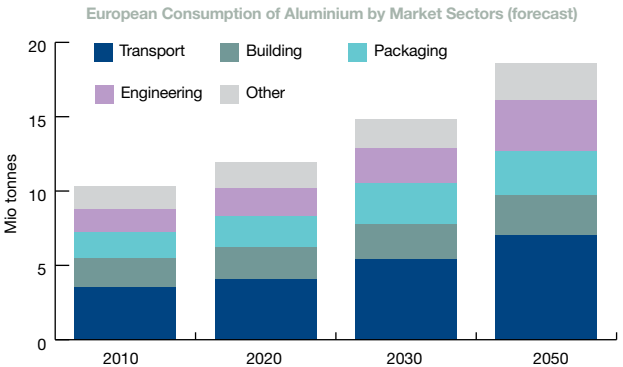
# Challenges for the 2050 scenario

**This scenario is challenged, however, by the EU's non-competitive electricity prices**, attributable to the electricity market structure and, in particular, to the cost of CO<sub>2</sub> in electricity which industry outside the EU does not bear. These factors have contributed greatly to significant carbon leakage, resulting in actual and announced closures and/or capacity reduction. This graph shows the recent and announced closures and their impact on the lost capacity.

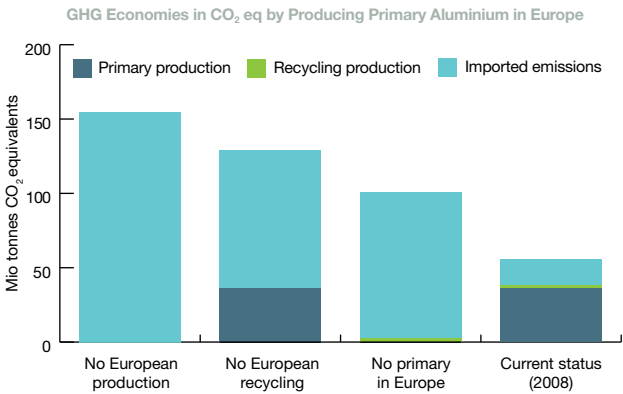


## Using and producing aluminium in Europe saves resources

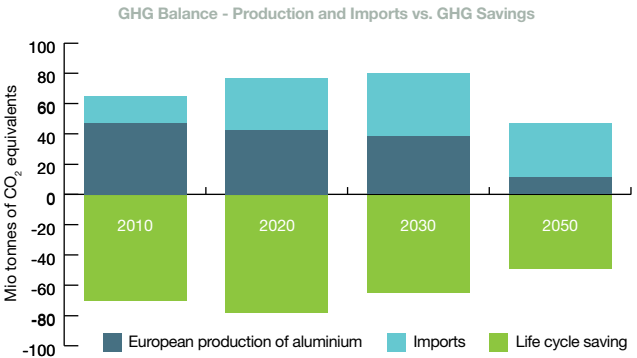
**The consumption of aluminium products is growing** in Europe (and worldwide), thanks to aluminium's properties and its endless recyclability. If the current loss of competitiveness and closure of primary smelters is not reversed, Europe will become increasingly dependent on imported primary aluminium. This may, in the long run, also negatively affect the fabrication of semi-finished products.



Without European aluminium primary production and recycling, and based on the average worldwide energy mix, Europe would be responsible for **178% more emissions**, as the imported metal would have a larger CO<sub>2</sub> footprint than the displaced EU production. Recent development of European and global emissions data indicates that this number will increase further.



The sector's total emissions are more than compensated for by the emissions reductions obtained through **the use of aluminium in transport, as reductions from vehicle emissions attributable to aluminium lightweighting save 70 million tonnes of CO<sub>2</sub> per annum**. When considering the whole product life-cycle, additional emissions reductions are also achievable in applications such as packaging (i.e. longer shelf life) or energy efficient buildings (both new and renovated).

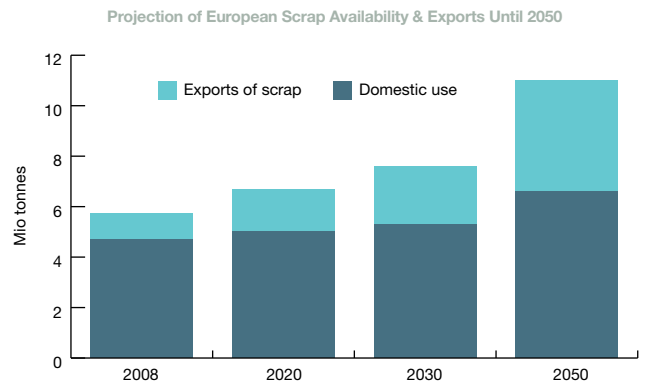


Note: The savings of specific CO<sub>2</sub>/kg aluminium, attributable to aluminium in automotive and transport applications is projected to decline after 2030, owing to increased efficiency of engines and power trains.

# Continued growth in recycling will play a key role

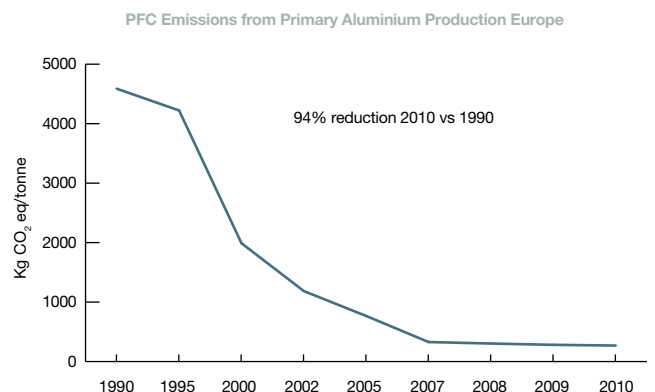
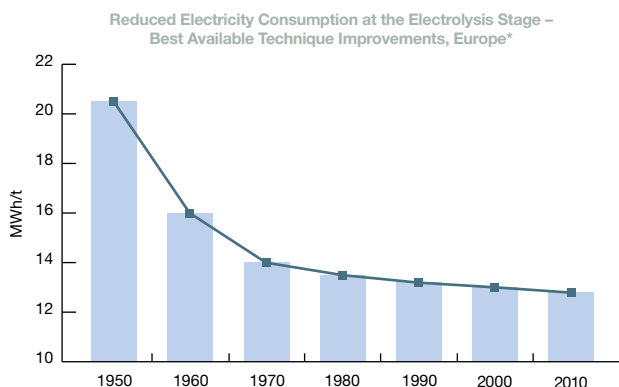
Recycling is critical to sustainable development. It allows resources to be saved and waste to be reduced. Used aluminium is valuable; it is easily and endlessly recyclable without loss of quality. Both recycled and primary metal will be needed to meet projected increased consumption of aluminium in Europe. Just as for primary aluminium smelting, the conditions must be right to facilitate the growth of recycling in Europe. This is all the more important given that **recycling aluminium saves up to 95% of the energy required for primary production.**

In this context, it is essential to reverse the dramatic increase in the export of **aluminium scrap from Europe. The importers in other regions are “capturing” a key European resource.** Exported aluminium scrap should be considered as exported European electricity, without compensation for the embodied CO<sub>2</sub>.



# Building on already impressive power and emissions intensity reductions

As primary aluminium smelting is highly power-intensive, power constitutes up to 40 per cent or more of smelter operating costs. Therefore, the industry is driven to minimize power consumption, as illustrated below. As further efficiencies are limited by existing technology, medium-term emissions reductions from power use will be dependent, primarily, on obtaining cleaner power at internationally competitive prices. **As the industry has also reduced direct emissions as far as is possible with existing technology, further direct emissions reductions are dependent on the anticipated technology breakthrough.** Further cost burdens imposed by policy on the sector would hasten neither further direct emissions reduction nor power use reductions and would only result in increased carbon leakage.



\*Total electricity consumption includes a number of additional consumptions



# The benefits of a permanent material

The demand for aluminium products is steadily increasing year by year. Why? On top of worldwide demographic growth and higher purchasing power in emerging countries, aluminium product consumption is also growing in Europe because aluminium is replacing other materials thanks to its unique combination of properties, such as lightweight, strength, corrosion-resistance, durability, ductility, formability, conductivity and endless recyclability. We cannot fly, travel by high speed train, high performance car or fast ferry without it. We cannot get heat and light into our homes and offices without it. Our society depends on it to preserve food, medicine and provide electronic components for our computers.

**Aluminium is part of our daily lives because it offers intelligent solutions to our needs!**

## Aluminium industry key facts and figures

Europe (excluding Russia) 2010		Imports into Europe	
Direct jobs .....	255.000		
	Mt	Mt	% of total consumption
Mining .....	3.2	11.9	79%
Refining (alumina) .....	6.5	4.5	41%
Primary production .....	4.4	3.8	30%
Recycling .....	4.3		
Production of semis			
Rolled products .....	4.5		
Extrusions .....	3.1		
Castings .....	3.4		
Wire, slugs, powder .....	1.2		

## About the EAA

The European Aluminium Association (EAA) was founded in 1981 and represents the aluminium industry in Europe. It encompasses primary aluminium producers, downstream manufacturers, producers of recycled aluminium and national aluminium associations representing the manufacturers of rolled and extruded products in 18 European countries. Other associations, the Organisation of European Aluminium Recyclers (OEA) and the European Aluminium Foil Association (EAFA), are also members of the EAA.

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