# Low Carbon Aluminium For Construction

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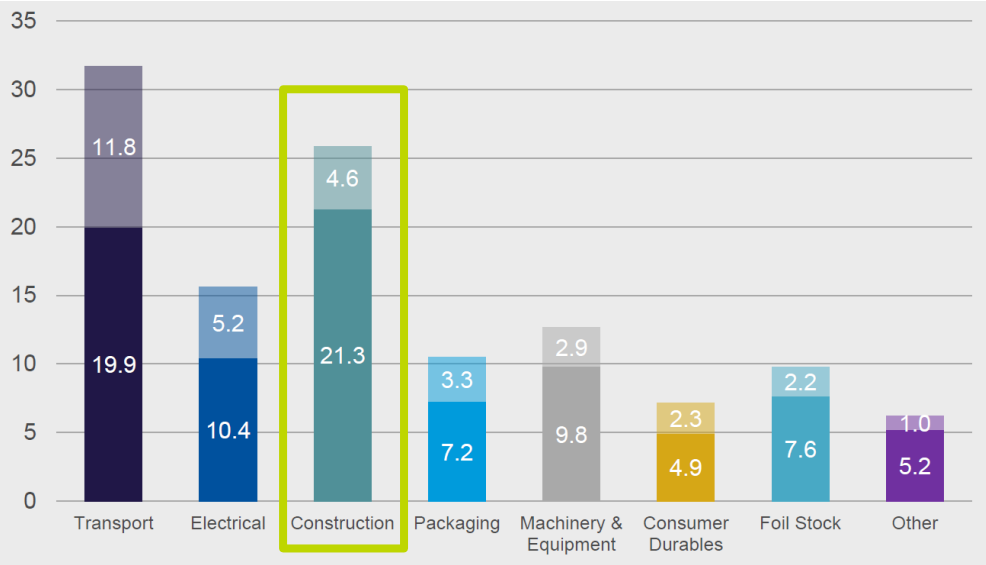
Constellium

# Aluminium the Material for Building & Construction

## Usage per sector




World aluminium semi-finished products consumption 2020 to 2030 in Mt[1]

Construction is the **second biggest use** of Aluminum in the world.

… Aluminium represents **only 1% of average weight** of a building.

## Outlook

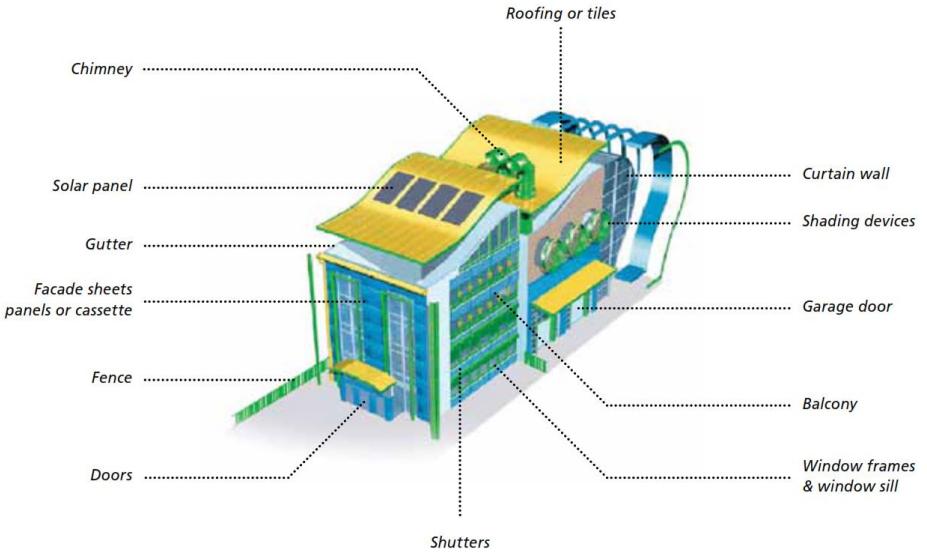
**+22%**

expected growth of aluminium demand for construction in the coming decade[1]

**20%** From China[1]

**15%** From Europe[1]

**12%** From North America[1]




Source: Sustainability of Aluminium in Buildings (European Aluminium)

# Aluminium the Material for Building & Construction

## Why Aluminium?

Lightweight

Ease of Fabrication and Assembly

Low Handling and Transportation Cost

High-Strengh

Air tight Doors & Windows

Surface Aspect

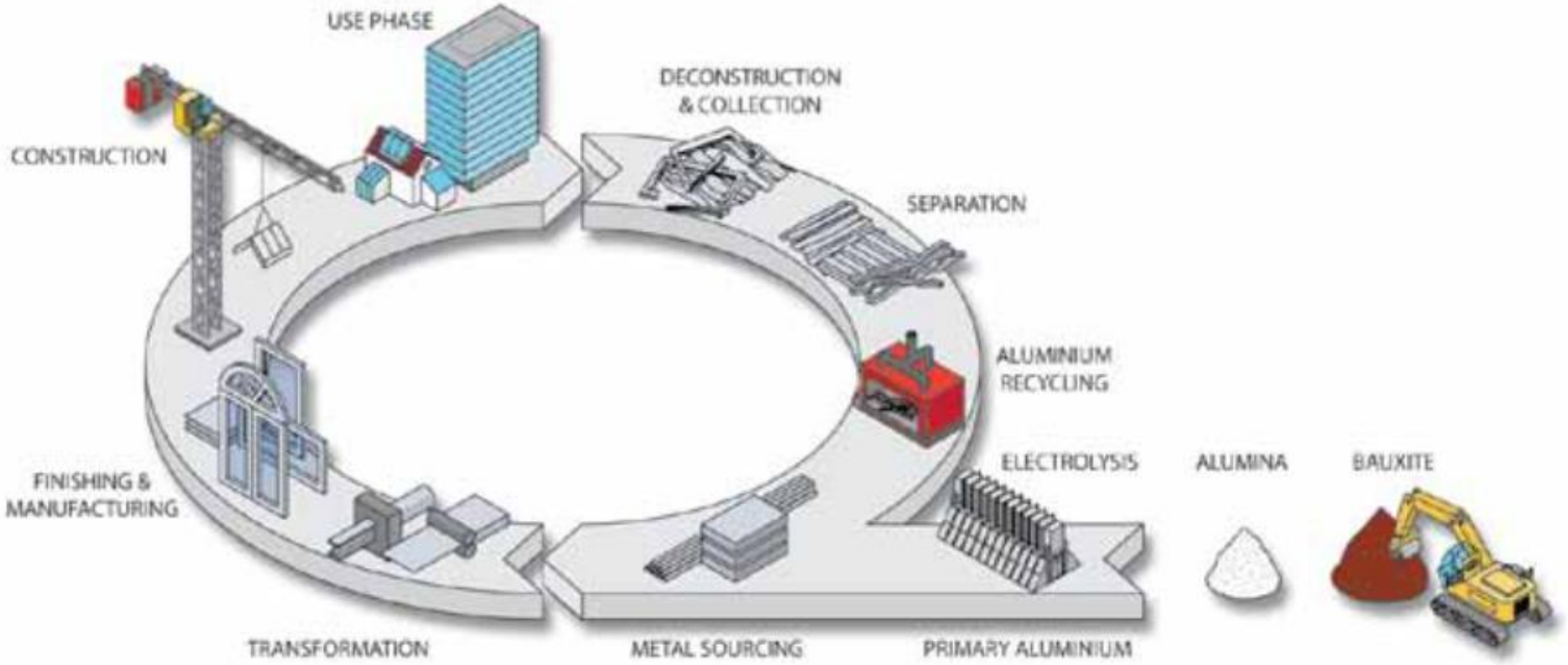
Corrosion Resistance

25-30 Years Durability without Maintenance

High Scrap Value Favoring Recycling at End of Building Life

# What about Sustainability?

## Recycling as Main Driver

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# What about Sustainability?

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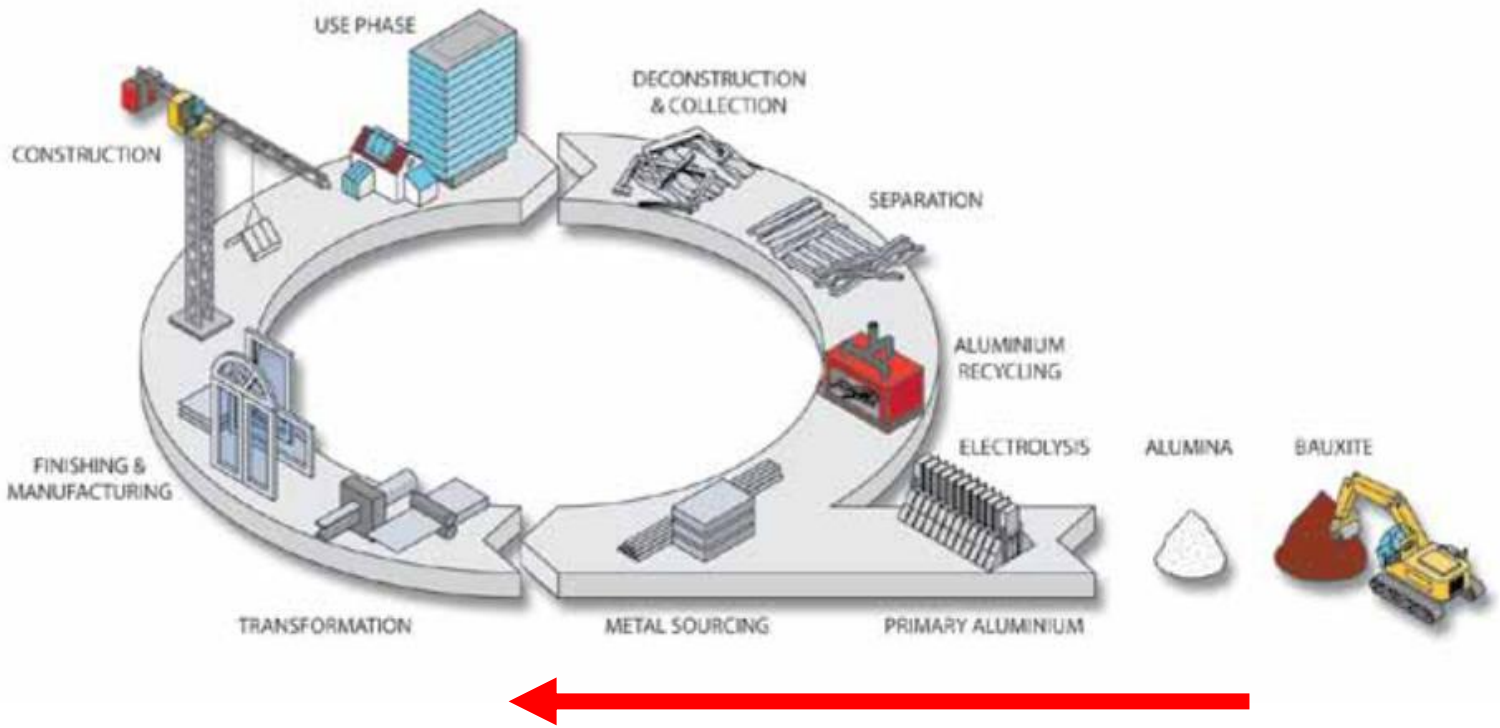


Carbon footprint of Primary Aluminium (smelted out of alumina extracted from bauxite)

→ **4tonCO2/tAl (hydro power)**

→ **20tonCO2/tAl (coal power)**

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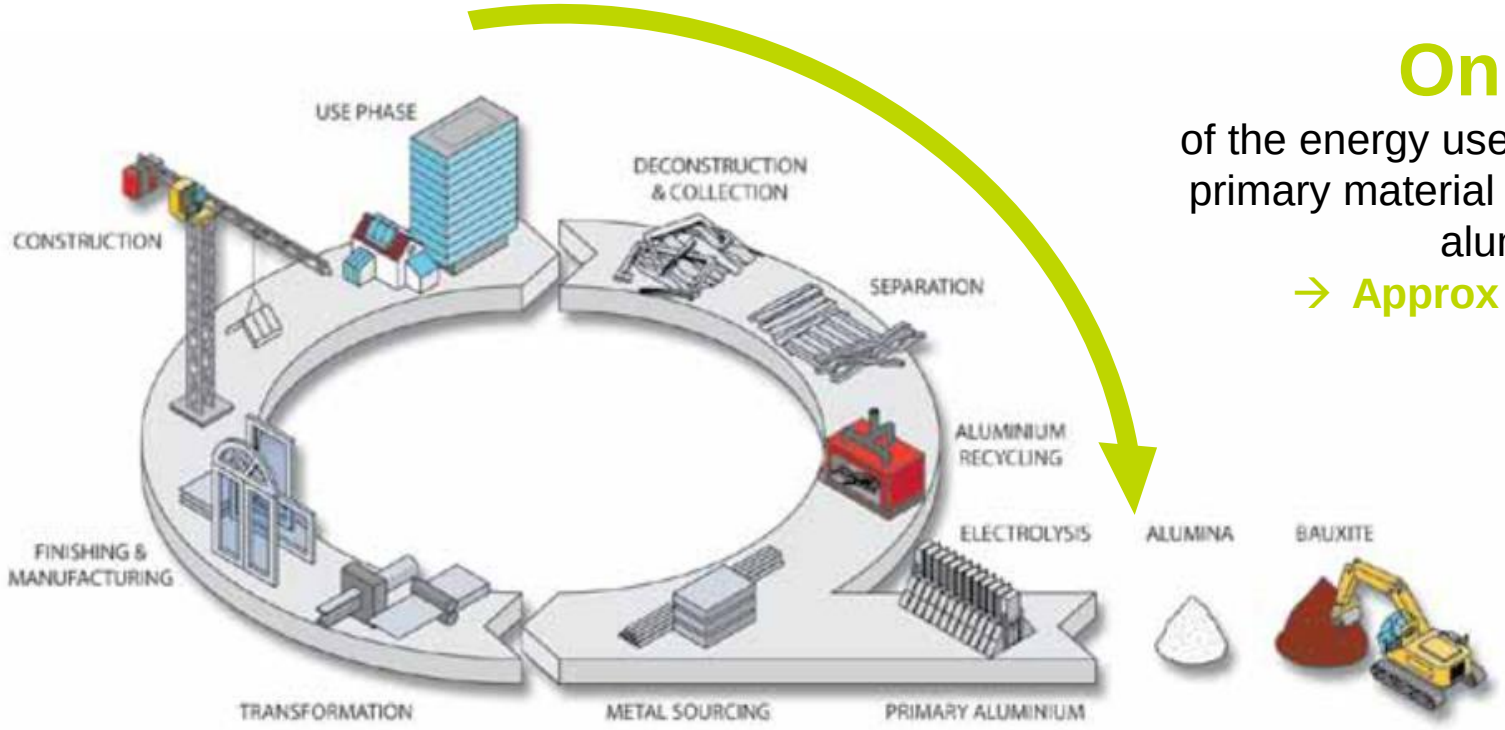


**Only 5%**

of the energy used in the production of primary material is required to recycle aluminum .

→ **Approx 0.5ton $CO_2$/tAl**

Carbon footprint of Primary Aluminium (smelted out of alumina extracted from bauxite)

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When buildings are deconstructed, 96% of the aluminum is collected and recycled… mostly in other industries.

**Great Opportunity !**

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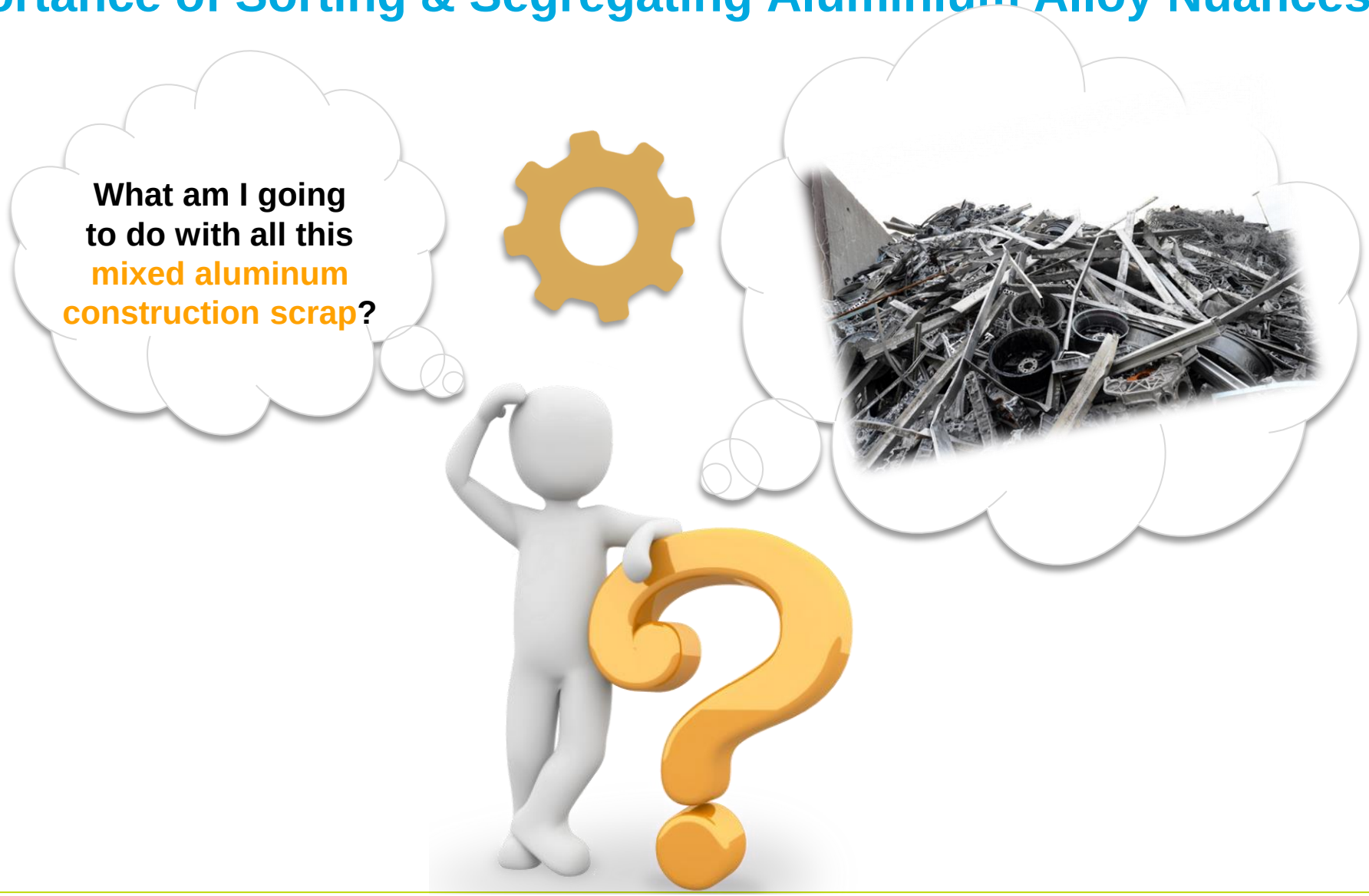
# Importance of Sorting & Segregating Aluminium Alloy Nuances



# Importance of Sorting & Segregating Aluminium Alloy Nuances

… We sort glass
by colour !!!

# Importance of Sorting & Segregating Aluminium Alloy Nuances

… We should segregate aluminium by nuances!

# Closed Loop Recycling Extrusions Across Businesses

Efforts made in closed loop recycling will support establishing a **truly circular economy.**

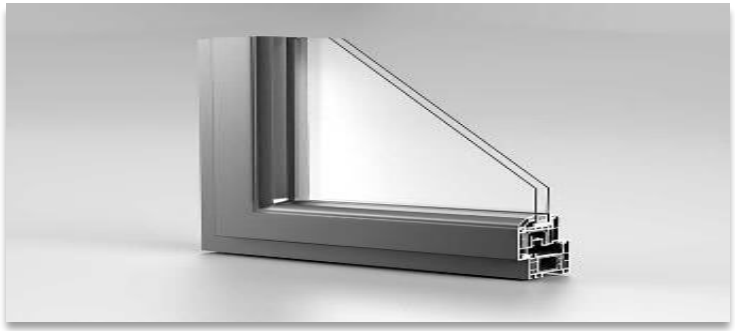
**Anodised window frames:** intolerant to impurities – recycling into same product with strict sortation

**Lacquered profiles:** surface treatment helping tolerance to impurities – production of low $CO_2$ richer alloys or recycling into itself with sortation

**Automotive products**: Higher strength alloys designed to be tolerant to impurities - recycled into themselves or help reusing other alloys with sortation

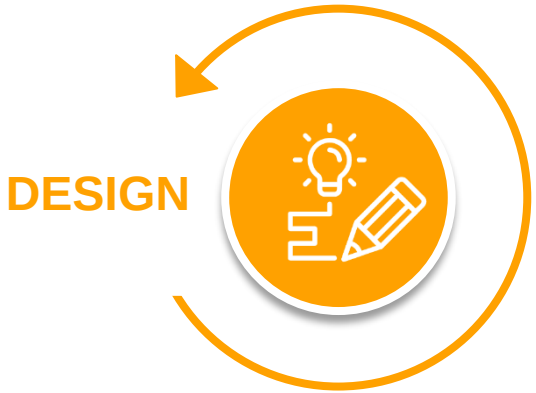
**Engine blocks:** Very high silicon aluminium alloys with high level of impurities – Recycled into themselves but very difficult to recycle in any other product

# Closing The Loop For Infinite Recycling

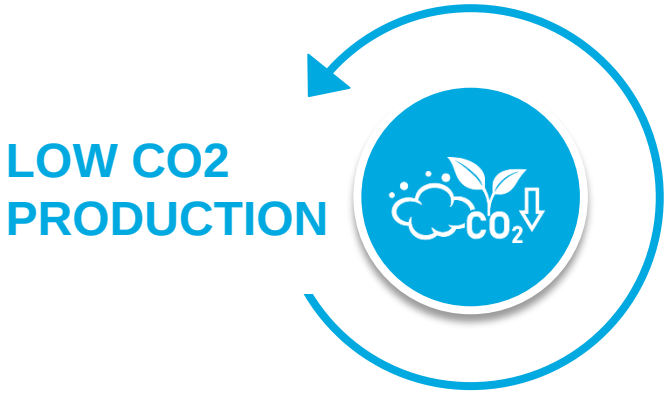


- **Aluminium**
  - **75 %** of Aluminium produced over last century is still in use
  - On average each part of aluminium has been recycled **7 times**
  - Closing the loop to recycle aluminium alloys into themselves maintain their properties
- **Building and construction**
  - 40% of aluminum only is made out of recycled material  for a technical potential over 90%
  - 25% only for highly demanding applications owing to low impurity requirements (e.g. anodizing)
- **Design**
  - >80% of a product's environmental footprint is decided in the design phase
  - Promote applications allowing use of recycled material and avoiding downgrading into other products

# The Low Carbon Aluminium Way




- Develop and deploy scrap tolerant alloys solutions
- Guide & support or customer in using the best alloy solutions
- Integrate alloy End of Life recycling in initial design
- Reduce number of alloy families and non-compatible material mix whenever possible




- Sourcing primary aluminium smelted with low $CO_2$ emission
- Transition to low carbon energies for remelting and transforming aluminium (hydrogen, green electricity)
- Energy waste reduction across the production (recover and reuse lost heat from our processes)
- Use our plants to generate energy (solar panels on our production buildings)


- Minimise use of primary metal
- Collect and reuse all production scrap at all manufacturing & construction steps
- Prepare End of Life & segregate aluminium products at deconstruction
- Develop automated technologies to sort and purify scrap streams to upcycle aluminium wherever possible
- Promote initiative for efficient collection and sorting

# What does Constellium do?

## Some Examples.

Constellium leading £10m CirConAl recycling project (UK) with the whole supply chain to deliver low carbon aluminium extrusions to the industry.

Recycling center construction work starts in Constellium Neuf Brisach (FR) with an expectation to provide an additional ~130kt of recycling capacity by 2025.

Green electricity generation using Constellium facilities as at our Singen plant (DE).


First Movers Coalition

By joining FMC we pledge that by 2030 10% of our primary aluminium purchases will be near-zero emissions and at least 50% of all the aluminium we use will come recycled sources.

www.constellium.com