ALUMINIUM
FRANCE

MONTEL FRENCH ENERGY DAYS
View from the industry: Green transition in France

ALUMINIUM : A KEY METAL FOR THE GREEN TRANSITION

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Aluminium is at the heart of Europe's green energy transition

It is used in almost all energy generation, transmission, and storage technologies: from wind and solar power to alternative fuel cells and hydrogen production to high-voltage cables and batteries. Not only is aluminium highly conductive and lightweight, but thanks to its corrosion resistance, it is also the ideal material for harsh outdoor conditions. It is easy to install, low maintenance, and durable, ticking all the boxes for renewable energy generation systems. Aluminium alloys consistently exceed other metals for mechanical stability, dampening, thermal management, and reduced weight.

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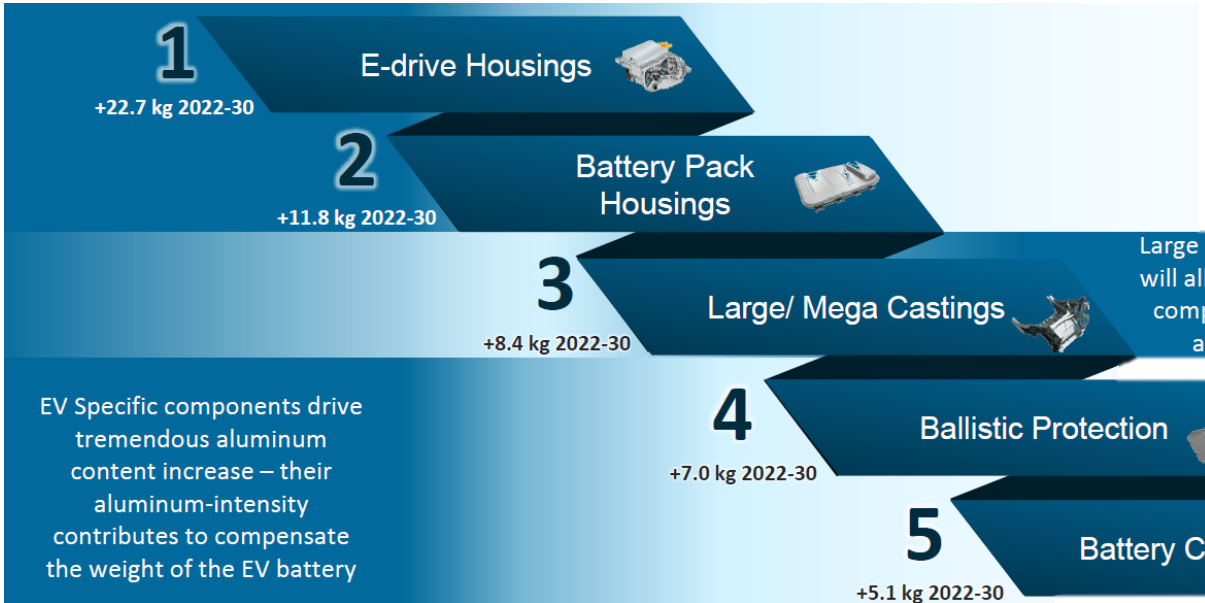
The future of mobility is electric

Aluminium helps electric and hybrid cars stay light, which is one of the most effective ways to improve a vehicle's energy efficiency. The lighter the vehicle is, the longer it can drive on one charge. Because of its thermal management properties, aluminium is also the perfect material for battery boxes, cooling systems, and energy storage. Thanks to its high strength and durability, aluminium is the material of choice for E-drive housings, large castings…



Source : Ducker

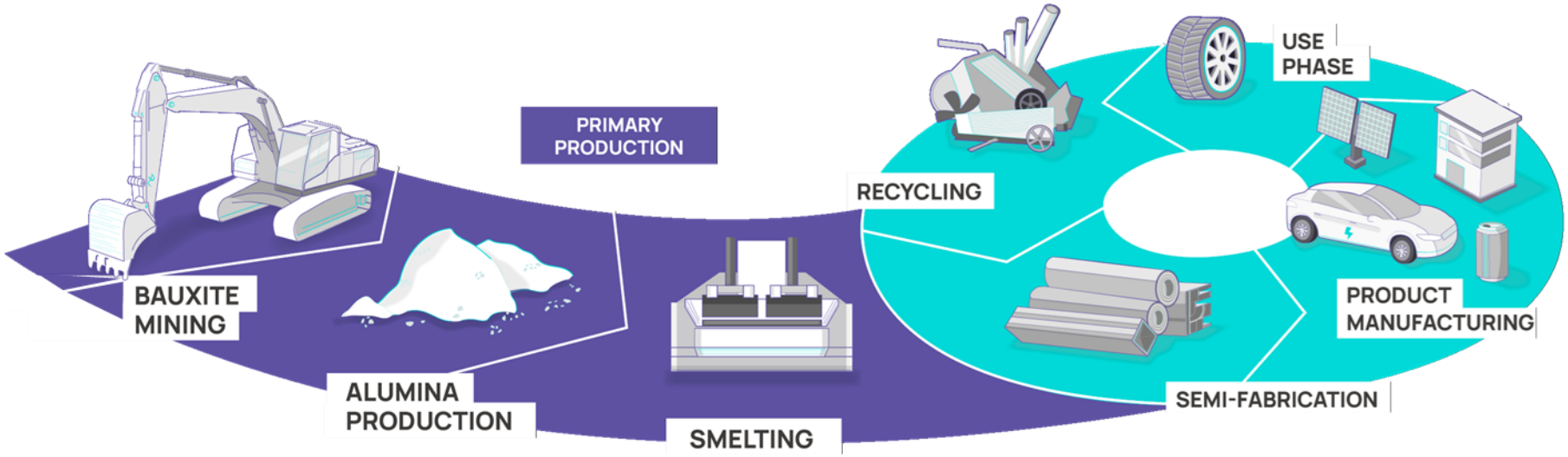
ALUMINIUM : A KEY METAL FOR THE GREEN TRANSITION

E-drive housing

Source : Ducker

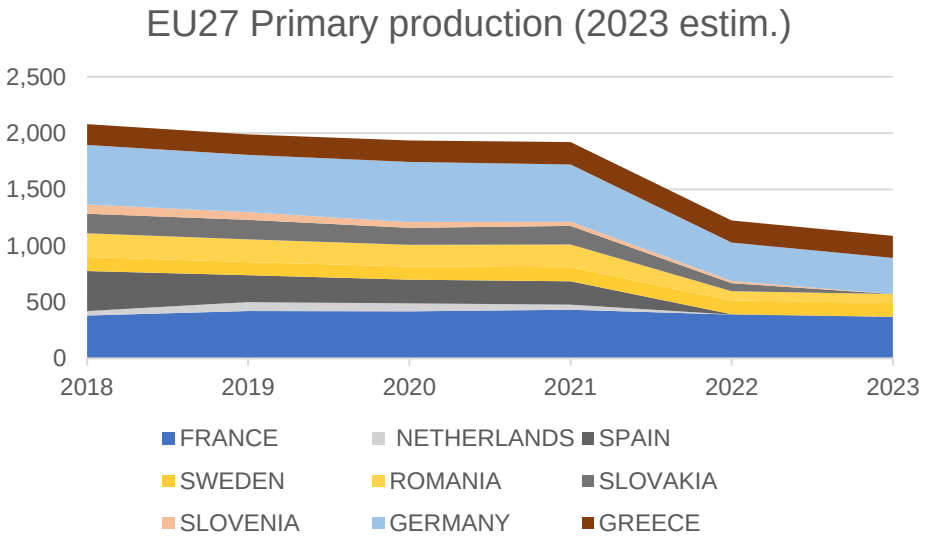
2 PRIMARY ALUMINIUM INDUSTRY in EU

ALUMINIUM : AFTER PRIMARY PRODUCTION
CIRCULAR & RECYCLABLE AT 100%



Primary aluminium smelting is very electro-intensive : 14 MWh / ton

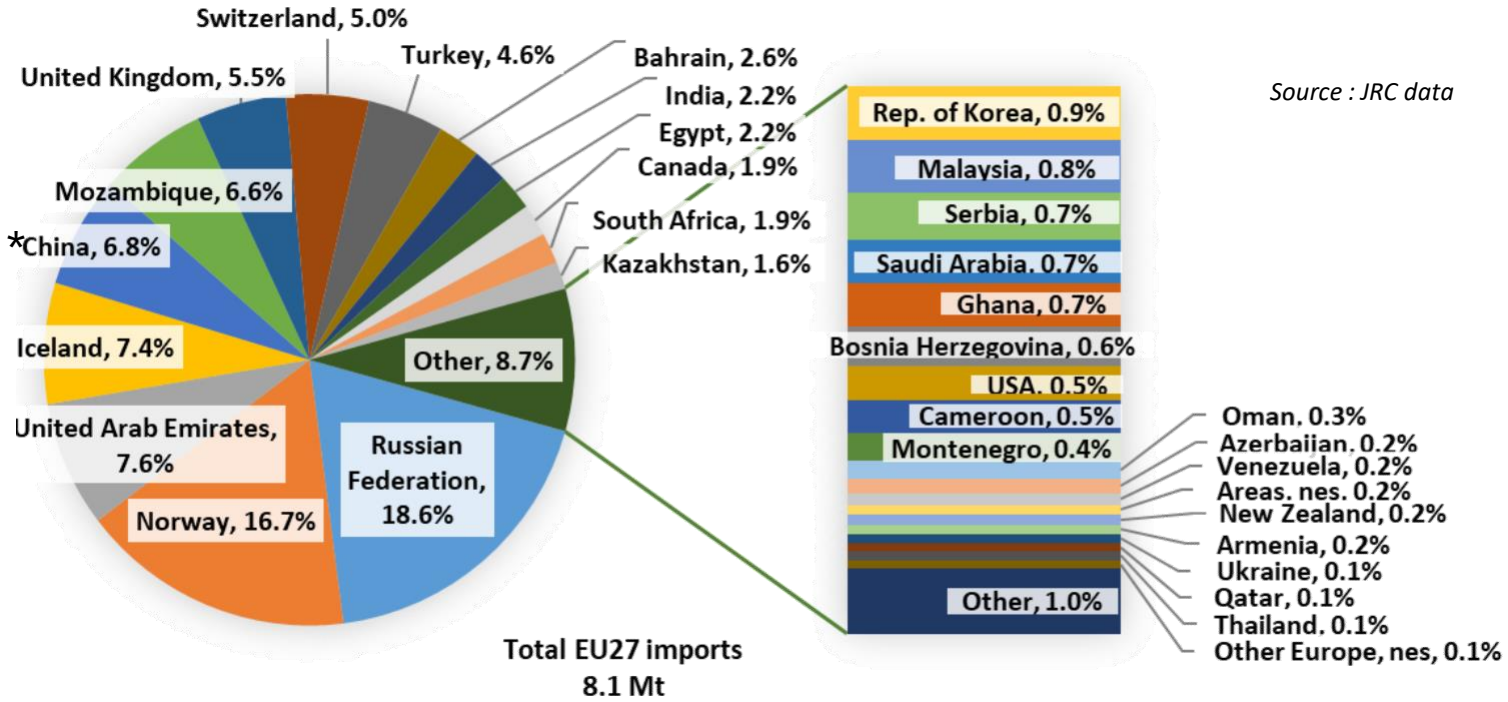
Due to the energy crisis, EU has lost half of its primary production



Source : European Aluminium

Primary producers continue to suffer severely from the energy crisis. In 2022, several smelters were fully curtailed (e.g. Spain, Netherland, Slovakia, Slovenia), or partially curtailed (Germany, France, Romania…).

And continue to import massively aluminium from outside EU27



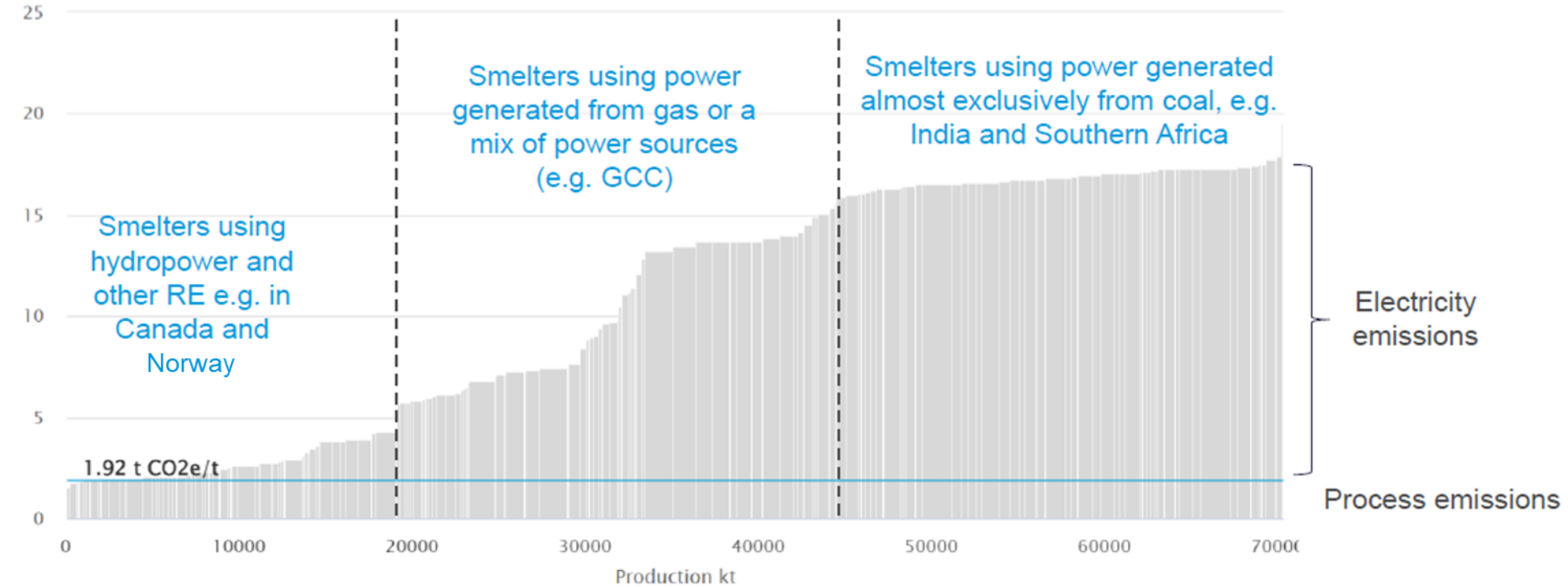
Source : JRC data

* *: China represents ~60% of global Al primary production*

And continue to import massively aluminium from outside EU27

From countries where the energy mix is by far more carbonized compared to European average, mainly based on gas or coal.

Source : CRU emissions analysis



3 ALUMINIUM INDUSTRY : OPPORTUNITIES IN THE GREEN TRANSITION

Faced with these difficulties, the aluminium industry need to reinforce its partnerships to be successful

Partner with electricity producers

cPPAs : as baseload consumers, aluminium smelters have a very good vision of their long-term electricity needs. They are therefore ideal candidates for signing cPPAs directly with producers, potentially aided by state guarantees mechanisms.

Aluminum is the single most widely used material in solar power applications, including in solar frames, wires, and their support structure.
Aluminium is also used widely in on-shore and off-shore wind power farms, including tower platform components, transformer stations, and turbines.

Faced with these difficulties, the aluminium industry need to reinforce its partnerships to be successful

Partner with grid operators: contributing to network balance

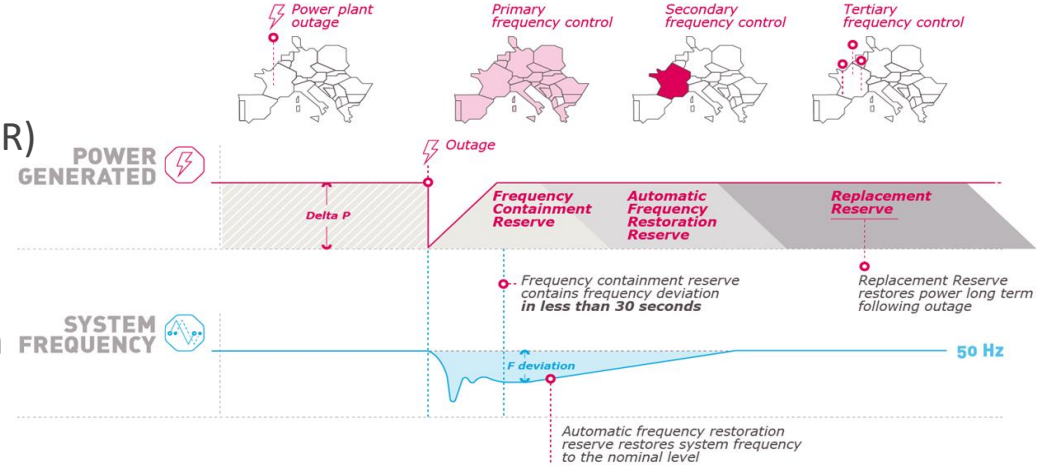
Capacity Mechanism

Manual Frequency Restoration Reserve (mFRR)

Frequency Containment Reserve (FCR)

Frequency Restoration Reserve (aFRR)

Interruptible load : Ability to interrupt consumption in less than 5 sec for more than one hour



Thanks to aluminium's superior conductivity-to-weight ratio compared with copper, almost power systems depend on a vast grid of high-voltage aluminium wires and cables. Aluminium has been used in high-voltage transmission lines since 1945 and is the most economical way to transmit electric power today.

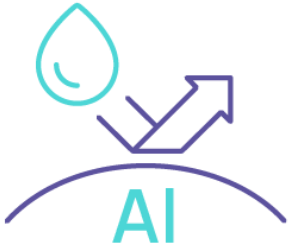
Faced with these difficulties, the aluminium industry need to reinforce its partnerships to be successful

Partner with the territory

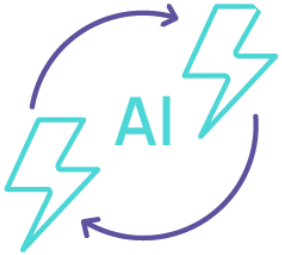
The Dunkirk example

A coordinated implementation of industries active in the Green Transition in the area helps to develop these partnerships :

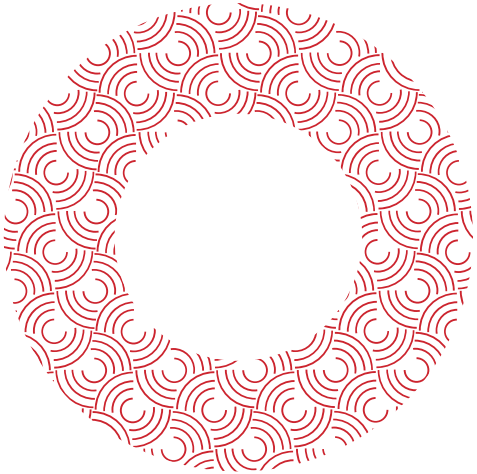
- Electricity generation (2 EPRs in Gravelines, off-shore wind farm, …)
- Pipe to collect CO_2 from the industrial sites to the port
- A hydrogen hub,
- EV batteries production and recycling facilities (using aluminium)
- Waste heat recovery…



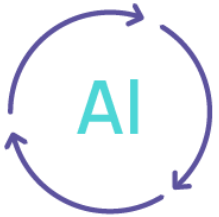
Protective



Conductive



Lightweight



Recyclable

CONCLUSION

The Green Transition is a unique opportunity for the Aluminium Industry
BUT long term, competitive and decarbonized electricity is a prerequisite
In order to be successful