

ELECTRIFYING

EUROPE'S ALUMINIUM INDUSTRY



Primary aluminium production is already **100% ELECTRIFIED**

THE CHALLENGE

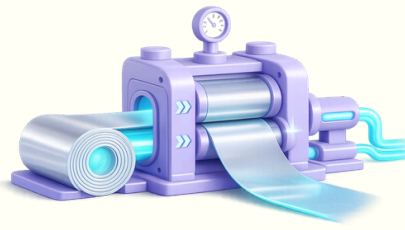
Some production steps along the value chain are still relying on fossil fuels



Alumina Refining



Aluminium Remelting

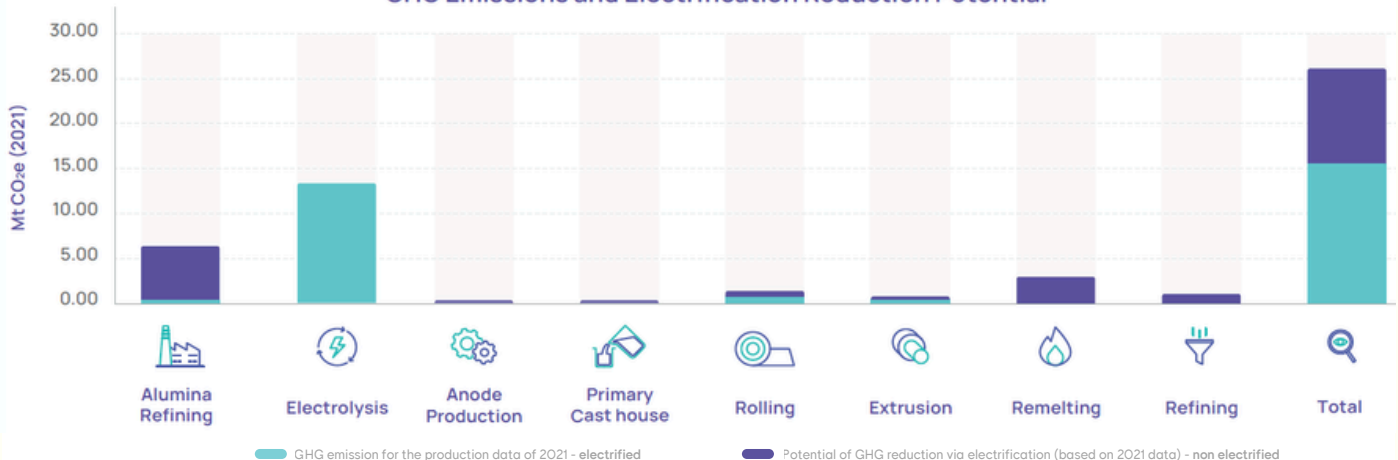


Rolling



Extrusion

GHG Emissions and Electrification Reduction Potential



KEY TECHNOLOGY INVESTMENTS TO MOVE FROM PILOTS TO REALITY



Electric Furnaces

Adapt, validate and scale electric high-temperature furnaces with technology providers for alumina processing, melting, remelting, and downstream applications



Heat Efficiency & Recovery

Capture and reuse waste heat to reduce overall energy demand and maximise electrification potential.



Thermal Energy Storage (TES)

Store renewable heat for continuous flexible operation.



Mechanical Vapour Recompression (MVR)

Demonstration projects for industrial-scale validation, specifically addressing high-temperature integration and reliability



MAIN BARRIERS

- Limited technological maturity for several high-temperature industrial processes.
- Scaling up from pilot to full industrial operation remains complex and costly.
- High capital and operating costs, with uncertain long-term electricity prices, complicating business cases
- Grid limitations, connection queues, and regional disparities in clean energy infrastructure deployment.
- Dependence on affordable, stable renewable electricity and adequate energy storage.

WHAT ENABLES THAT SHIFT IN EUROPE



Improve access to affordable, clean electricity through supporting firming tools

Facilitate support schemes that de-risk shaping and firming costs associated with matching variable electricity with baseload consumption and allow energy-intensive users to bundle clean electricity PPAs with storage.



Deploy standardised EU PPA guarantee schemes

Accelerate the rollout of the EIB PPA guarantee facility to cover all clean electricity supply and both buyer and seller default risks, specifically tailored to the high-volume requirements of electro-intensive consumers



Accelerate research and development around scaling, performance validation, and economic feasibility

Further innovation projects can help develop mature, already-proven solutions like induction heating for melting and holding to promising but still-developing options like resistance and plasma-based heating.



Reward baseload consumption, voluntary flexibility and enable fair grid charges

Establish grid tariff regimes that reward the stabilising nature of baseload industrial demand, while providing fair compensation for voluntary Demand-Side Response (DSR) without risking process safety under the proposal to future-proof electricity bills in the EU.



Streamline state aid approval

Call on Member States to fully utilise fast-track approval under the Clean Industrial State Aid Framework (CISAF) for industrial electrification, high-temperature heat pumps, and hybrid flexibility assets.



Enable high-impact industrial decarbonisation

Direct EU funding across the value chain towards the most cost and energy efficient alternatives for furnaces and boilers in alumina refining, recycling and downstream operations, electrification of remelting, holding, decoating and scrap pre-treatment in recycling operations, and downstream finishing processes such as surface treatment, curing, drying and anodising.

Simplify bidding by removing disproportionate funding-gap and decommissioning requirements that disadvantage baseload processes and hybrid systems.



Tailor the Industrial Decarbonisation Bank (IDB) to electrification

Establish grid tariff regimes that reward the stabilising nature of baseload industrial demand, while providing fair compensation for voluntary Demand-Side Response (DSR) without risking process safety under the proposal to future-proof electricity bills in the EU.