

TOWARDS A **GREENER AND MORE SUSTAINABLE** FUTURE IN EUROPE WITH **VANADIUM**

Vanadium is a naturally occurring, critical raw material that is key to Europe's commitment to scale up its net-zero technology objectives and meet its goal to become the **FIRST CLIMATE-NEUTRAL CONTINENT BY 2050** in a safe and sustainable way.

CONTAINED, CONTROLLED, AND RECYCLABLE

element with essential industrial uses

Vanadium pentoxide (V_2O_5), in the form of powder or fused flakes is the **MOST IMPORTANT COMPOUND OF VANADIUM** used in industrial applications in Europe including:



High-strength
steel production



Energy storage



Chemical catalysts



Vanadium chemicals



Industrial exhaust gas
treatment agent



Anti-corrosion
agent



Ceramic pigments



Lightweight
aerospace alloys



VANADIUM: A SUSTAINABLE, CARBON REDUCING, CRITICAL MINERAL

VANADIUM'S ROLE IN GLOBAL DECARBONISATION

Vanadium plays a crucial role in global decarbonisation by reducing carbon emissions in the energy, transportation and steel sectors.

- Approximately 180 million metric tons of CO₂ emissions are saved annually due to the use of vanadium microalloyed reinforcement bars (rebars) in construction.
- Vanadium flow batteries are expected to save 2.13 million metric tons of CO₂ over their 20-year lifetime
- Vanadium-microalloyed steels have a carbon footprint 5x less than aluminium and 10x less than carbon fibre composites.
- Vanadium-microalloyed steel can be recycled fully and indefinitely without loss of quality.



LOW HUMAN AND ENVIRONMENTAL IMPACT

Exposure to vanadium compounds in the general population is very limited. Where used in industrial applications, occupational exposure levels are strictly controlled.

SUSTAINABLE AND RESPONSIBLE RESOURCE MANAGEMENT

Vanadium can be sustainably recycled from vanadium-containing products and vanadium-containing steel and steel scrap. It can also be recovered from electrolytes used in vanadium flow batteries. This reduces the need for new vanadium production.



Vanadium remains on the EU's fifth and latest Critical Raw Materials List, published in 2023.

