

Materials for Energy Transition

It is estimated that by 2050 up to 85% of all electricity could be generated by renewable sources, but in order to achieve this, we need to implement green technologies on a global scale. Green technologies like wind turbines, solar panels, and rechargeable batteries rely on raw materials sourced from the Earth. Just recycling the materials in current circulation cannot match the increasing global demand, so we need geoscientists, passionate about the environment, to find and extract more of these critical raw materials in a responsible and sustainable way.



Photovoltaic (PV) cells are solar panels that generate electricity directly from sunlight. They are primarily composed of silicon, but they also require elements such as copper, indium, germanium, gallium and cadmium to increase their durability, improve light absorption and conversion to electricity.

The average 3MW wind turbine contains almost 5 tons of copper wiring, 3 tons of aluminium, 1200 tons of concrete and 2 tons of Rare Earth Elements (REEs) needed to make strong permanent magnets in the generators.

Rechargeable lithium-ion batteries are key components of the energy transition as they are used in electric vehicles. Lithium is a metal predominantly extracted in Argentina, Chile and Australia either from hard rock or from lithium brines using evaporation pools.

Critical metals for a green energy transition include copper, lithium, graphite, cobalt, aluminium and nickel as well as rare earth elements (REEs) such as neodymium and dysprosium. We do not have enough of these metals in current circulation to meet increasing global demands so they must be extracted responsibly and sustainably from the Earth.

