

currENT welcomes the Critical Raw Materials Act proposed by the European Commission on 16 March 2023. It is critical that the EU identifies and secures delivery of all the raw materials that will be necessary for the transition to a fully decarbonised economy.

### **Copper to become a bottleneck for Net-Zero**

The availability of copper is inevitably going to become one of the key bottlenecks for reaching Net-Zero in time, as it will be key for e.g. the deployment of electric vehicles and increasing the capacity of the transmission and distribution system. In scenarios developed by S&P<sup>1</sup>, annual copper demand is expected to double by 2035 (from 25 MMt to 50MMt) and continue to grow until 2050 (53MMt).

This is why Europe needs to do everything possible to use copper as efficiently as possible by accelerating the development of new, innovative enabling technologies for the transition with improved circularity, using less raw materials and, reduced resource intensity.

### **Superconducting transmission technologies are a more efficient use of materials**

currENT members are currently developing superconducting transmission technology that would be commercially available from around 2030. These would reduce the materials use of energy transmission dramatically. To carry one kA one metre, superconducting cables requires 7 times less copper than conventional, copper-based power cables.

Additionally, superconducting transmission technology will be able to transfer 5 or 6 times as much energy as conventional HVDC technology at a given voltage level. Alternatively, the technology can transfer the same amounts of energy at a much lower voltage level. This is associated with far fewer environmental impacts and raw materials use than conventional copper-based cable. Meanwhile, significant savings in materials would accrue from far smaller related infrastructure, e.g. from significantly smaller offshore collector stations needed in lower voltage systems. For example, a modern 2.4 GW, 525 kV offshore collector station weighs more than 15,000 tons and cost up to € 1 billion. A collector station for a superconductor cable that can carry the same amount of energy would operate below 100 kV and weigh and cost about one third.

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<sup>1</sup> [S&P Global | The Future of Copper: Will the looming supply gap short-circuit the energy transition? – July 2022](#)

### **Grid enhancing technologies can increase efficiency of existing grid**

At the same time, Grid Enhancing Technologies, such as Dynamic Line Rating, Modular Power Flow Control Systems, new sensor technologies, as well as Advanced Conductors can help move more power through existing lines, thus increasing grid capacity very quickly, and increase the efficiency of the power system. As the high demand for copper is going to become a bottleneck to reach Net-Zero in time, any technologies that can increase the efficiency of the existing grid, can help relieve the high demand for copper, particularly in the short term.