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Critical Metals in Strategic Low-carbon Energy Technologies

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Due to the rapid growth in demand for certain materials, compounded by political risks associated with the geographical concentration of the supply of them, shortages of materials could be a potential bottleneck to the deployment of low-carbon energy technologies. Consequently, an assessment has been carried out to ascertain whether such shortages could jeopardise the objectives of the EU's Strategic Energy Technology Plan (SET-Plan), especially in the six low-carbon energy technologies of SET-Plan, namely: nuclear, solar, wind, bioenergy, carbon capture and storage (CCS) and electricity grids. The assessment identified 14 metals for which the deployment of the six technologies will require 1% or more (and in some cases, much more) of current world supply per annum between 2020 and 2030. Following a more critical examination, based on the likelihood of rapid future global demand growth, limitations to expanding supply in the short to medium term, and the concentration of supply and political risks associated with key suppliers, 5 of the 14 metals were pinpointed to be at high risk, namely: the rare earth metals neodymium and dysprosium (for wind technology), and the by-products (from the processing of other metals) indium, tellurium and gallium (for photovoltaic technologies). In addition, the work has explored potential mitigation strategies, ranging from expanding European output, increasing recycling and reuse to reducing waste and finding substitutes for these metals in their main applications. Furthermore, recommendations are provided which include closely working with the EU's Raw Materials Initiative; supporting efforts to ensure reliable supply of ore concentrates at competitive prices; promoting R&D and demonstration projects on new lower cost separation processes; and promoting the further development of recycling technologies and increasing end-of-life collection