Rare earth metal shortages could hamper deployment of low-carbon energy technologies

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Following the release of a Commission report on critical raw materials in 2010, scientists at the Joint Research Centre (JRC) highlighted in a new report that five metals, essential for manufacturing low-carbon technologies, show a high risk of shortage. Reasons for this lie in Europe's dependency on imports, increasing global demand, supply concentration and geopolitical issues. The report recommends actions to prevent shortages and thus allow a smooth implementation of the Commission's Strategic Energy Technology (SET) Plan, aimed at accelerating the development and deployment of low carbon technologies.

European Commission Vice-President Antonio Tajani, Commissioner for Industry and Entrepreneurship, said: "European companies need to have a secure, affordable and undistorted access to raw materials. This is essential for industrial competitiveness, innovation and jobs in Europe. Today's report highlights that we are on the right track with our raw materials strategy".

Following the Commission's report on critical raw materials at EU level last year, the JRC has now carried out an in depth analysis of the use of raw materials, especially metals, in the six priority low-carbon energy technologies of the Commission's SET-Plan: nuclear, solar, wind, bio-energy, carbon capture and storage and electricity grids.

The study Critical Metals in Strategic Energy Technologies reveals that five metals commonly used in these technologies – neodymium, dysprosium, indium, tellurium and gallium – show a high risk of shortage. Europe depends on imports for many of these, for which there is rapidly increasing global demand and limited supply, often concentrated in a few countries with associated political risks. Furthermore, they are not easily recyclable or substitutable.

A large-scale deployment of solar energy technologies, for example, will require half the current world supply of tellurium and 25% of the supply of indium. At the same time, the envisaged deployment of wind energy technology in Europe will require large amounts of neodymium and dysprosium, (about 4% of the current global supply each) for permanent magnet generators, which could only be eased if the supply of such metals in the future is increased, which may not be simple. Virtually the whole European supply of these metals comes from China.

The report considers possible strategies to avoid or mitigate shortage of these metals, including promoting recycling and reuse and looking into substitution by other less critical materials. Further measures could be alternative technologies and even increasing Europe's primary production, for example by opening new or dormant mines.

Similar studies will be made by the JRC in the near future on other energy technologies that also use strategic metals, such as electric vehicles, electricity storage, lighting and fuel cells.

More information: The report, Critical Metals in Strategic Energy Technologies, can be downloaded from this page: setis.ec.europa.eu/newsroom/li … -energy-technologies

European Commission report on critical raw materials: ec.europa.eu/enterprise/polici … ritical/index_en.htm