

Novel ways of substituting critical raw materials

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How to be more resourceful is a dilemma facing us all as we strive to reduce, reuse, recycle and substitute. Now an EU project is focusing on the latter with the substitution of critical raw materials.

The Critical [Raw Materials Innovation Network](#) (CRM_InnoNet) will

create an integrated community that will drive innovation in the field of critical raw materials substitution, which aims to benefit the EU industry. The coordinators of the project believe that the scarcity of critical raw materials, together with their economic importance, makes it necessary to explore new avenues towards substitutions, which can reduce the EU's consumption and decrease the relative dependence on imports.

Indeed, many people are not aware that feldspar is used in the production of television and computer screens, car headlamps and soda bottles. Silica is used in products such as tableware, ornaments, and wall and floor tiles, while speciality talc can be used to improve the performance of biological [wastewater treatment plants](#).

The project will use a number of different substitution approaches. One example is the direct replacement of one substance or material for another, with what is readily available, such as replacing [indium tin oxide](#) for [organic polymers](#) in solar panels. However, there are also innovative approaches such as replacing a material with an entirely new technology (e.g. bio-enzymatic processes replacing [metal catalysts](#)), or even a service (e.g. a leasing model for electric [car batteries](#) could allow batteries to be swapped for a charged one rather than recharged, allowing for longer recharge times needing smaller quantities of critical raw materials).

Dr Catherine Joce, Project Manager of Science and Technology, says, 'Europe is currently wholly dependent on imports of many critical raw materials which underpin industries such as electronics, aerospace and clean energy. Substitution of a material, either for a less critical resource or an entirely new technology, is one strategy to address this problem. Europe's strength in research and development means that we are well placed to discover and develop innovative substitution solutions. CRM_InnoNet seeks to build an interdisciplinary network to progress

the field of critical raw materials substitution and develop a roadmap of substitution options for technologies of strategic economic importance to EU industry.'

The project will survey current EU initiatives to produce a methodology for prioritisation of 'threatened' applications and deliver a critical raw materials substitution roadmap. A Pole of Excellence for substitution of critical raw materials will be created to provide a dynamic, open and proactive platform for the entire stakeholder community. In addition, an interactive website will be created to allow a diverse substitution community within the project. Finally, the project team, in collaboration with the Pole of Excellence, will prepare recommendations, future initiative ideas and suggested actions for policymakers.

The CRM_InnoNet consortium is comprised of recognised and experienced key actors across the value chain of substitution of critical raw materials, representing academic, research and industry bodies of relevant sectors that will ensure a wide European coverage and high potential to engage other necessary players across the European Research Area (ERA). The project is being coordinated by Chemistry Innovation Ltd.

More information: ec.europa.eu/enterprise/policies/docs/report-b_en.pdf
www.chathamhouse.org/publications/papers/view/187947

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