European Commission

COMMUNICATION ON ADVANCED MATERIALS FOR INDUSTRIAL LEADERSHIP

27 February 2024

A STRONG EUROPEAN ECOSYSTEM FOR ADVANCED MATERIALS

Advanced materials are engineered materials with innovative properties and functionalities. They are key for European competitiveness and the green and digital transitions. The demand for advanced materials is expected to significantly increase in the coming years, for instance for the production of renewable energy, batteries, zero-emission buildings, semiconductors, medicines and medical devices, satellites, space launchers or planes.

Advanced materials are crucial building blocks for the EU's resilience and open strategic autonomy. They are on the list of ten critical technology areas for the Union's economic security.

ADVANCED MATERIALS EXAMPLES

- Metallic nanoparticles to enhance energy conversion in solar panels
- Sodium-ion batteries provide cheaper, more sustainable energy storage
- Thermochromic microcapsules can absorb or reflect light in construction materials to automatically adapt indoor temperature in buildings
- Elastomers and nanocrystals enable flexible electronics for smart devices

CHALLENGES TO BE ADDRESSED

- Fragmentation of the research and innovation (R&I) ecosystem
- Increasing private investment needs
- Increasing circularity and material efficiency needs
- Long innovation processes and an insufficient level of digitalisation
- Disconnect between innovative research and uptake in industrial applications and processes
- A lack of testing and experimentation facilities
- Need for harmonised standards
- A lack of skills

ACTIONS FOR A EUROPEAN ADVANCED MATERIALS ECOSYSTEM

Pillar 1:

European R&I for Advanced Materials, EU resilience and open strategic autonomy

- Establishing joint objectives and priorities with Member States and industry on R&I investments
- Updating regularly the priority areas to take into account new developments and common needs
- Addressing R&I needs to replace critical raw materials

Pillar 2:

Fast track from lab to fab

- Developing the 'materials commons', a sustainable EU digital infrastructure for advanced materials R&I
- Providing access to technology infrastructures and open funding possiblities, including for SMEs

Pillar 3:

Increasing capital investment and access to finance

- Mobilising funding - Horizon Europe partnership - €500 m in 2025-2027
- Working with the Joint European Forum on "Important Projects of Common European Interest"
- Boosting the take-up of advanced materials with European Innovation Council support
- Ensuring that EU funds reinforce and steer investments in technology development and deployment.

Pillar 4:

Fostering the production & use of advanced materials

- Working with public procurers to boost the use of advanced materials
- Creating an Advanced Materials Academy
- Promoting standards
- Analyse production, use and patent landscape

Pillar 5:

Overall governance framework

- Establishing a Technology Council on Advanced Materials with Member States, countries associated to Horizon Europe and industry

MORE INFORMATION:

Advanced Materials for Industrial Leadership

EU funded research results in advanced materials

PDF: ISBN 978-92-68-11327-1, doi:10.2777/401624, KI-05-24-023-EN-N

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