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#AdvancedMaterials

ADVANCED MATERIALS FOR INDUSTRIAL LEADERSHIP

**Jürgen Tiedje, DG Research&Innovation,
Head of Unit, Vienna 3 March 2025**



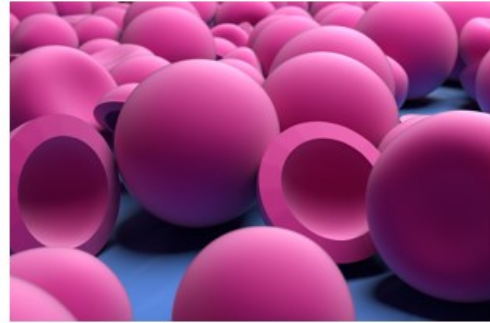
Overview

- Vision and political context at EU level
- Advanced Materials' Communication (Overview)
- Other relevant steps
- Conclusions

Vision: advanced materials stand for a wealth of solutions



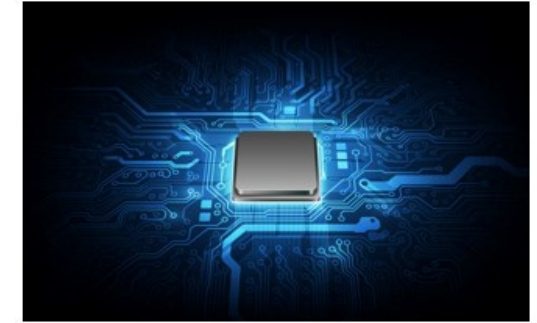
Metallic nanoparticles to enhance energy conversion in solar panels



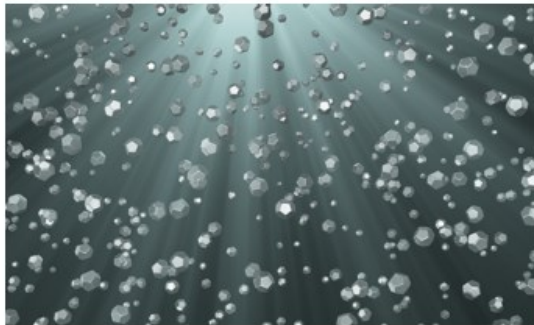
Thermochromic microcapsules absorbing and reflecting light



Sodium-ion based batteries storing energy using more abundant materials



New materials 'beyond silicon' for the next generation of chip technologies



Elastomers and nanocrystals that enable flexible electronics for smart devices



Bio-based materials with increased insulation and circularity capacity

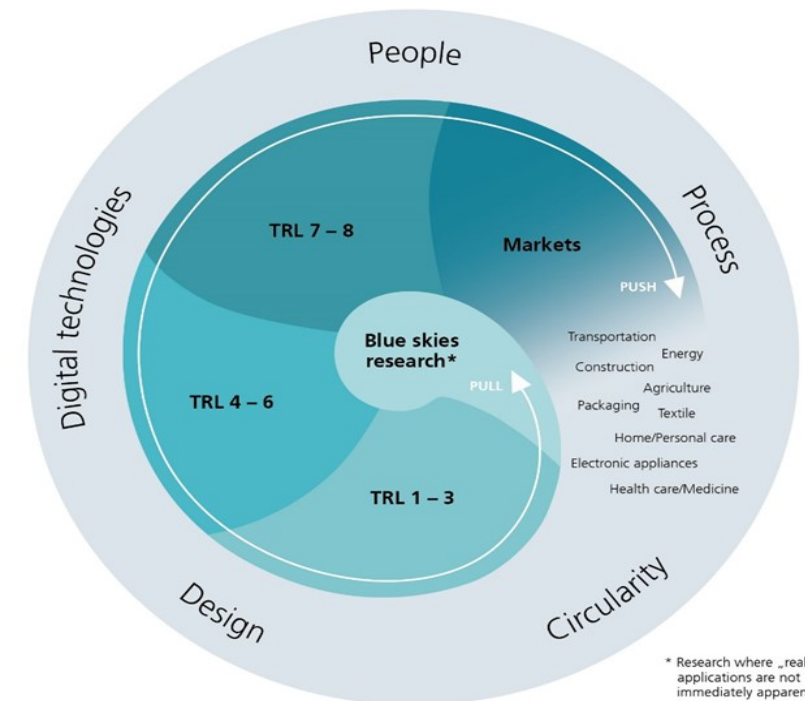


Recyclable carbon reinforced plastics for wind-mill blades, airplane wings or sports equipment.

Vision: Stakeholders call for a change : Materials 2030 Manifesto – Feb 2022

“A strong European Materials ecosystem drives the green and digital transition as well as a sustainable inclusive European society through a systemic collaboration of upstream developers, downstream users and citizens and all stakeholders in between”

“ A systemic approach is needed to develop the next generation solution-oriented advanced materials.”



An EU Strategy by the Commission – Feb 2024

ADVANCED MATERIALS
FOR INDUSTRIAL
LEADERSHIP



Pillar V
Overall governance



Pillar I
R&I a
launchpad for
industrial
transition, and
resilience in
the EU



Pillar II
Fast track
from lab to fab



Pillar III
Increasing
capital
investment &
access to
financing



Pillar IV
Fostering the
production &
use of
advanced
materials

Calls for a general change in the EU in 2024



Enrico Letta: Much more than a market

- fifth freedom in Europe - drive the dynamics of a single market shaped by digitalization and innovation.

Mario Draghi: The future of European competitiveness

- stresses the need for tackling innovation deficit on advanced technologies in Europe - “**closing the innovation gap**”- Does this include advanced materials?

Manuel Heitor – Align, Act, Accelerate

- boosting European **competitiveness through R&I**, emphasizing the need for alignment, action, and acceleration

The policy at EU level in the next years

- « A Competitiveness Compass for the EU » – Jan 2025

[EU competitiveness - European Commission](#)

“Closing the Innovation Gap - Investing in the new growth engines”

- *“Demand for innovative **advanced materials** will increase exponentially in the coming years, attracting investments and reshaping global supply chains. The Commission will put forward an Advanced Materials Act to provide the framework conditions to support the whole lifecycle, from research and innovation to start-up creation until manufacturing and deployment.”*
- *Announcement of a proposal for an Advanced Materials Act in 2026*

Political context and future EU programmes

- « The road to the next multiannual financial framework » - Commission setting out its principles (Feb 2025) towards [Multiannual Framework Programme](#)
 - Policy-based and not programme driven budget
 - Fewer programmes and more flexibility
 - More impactful (« leveraging »)
- “Have your say” – deadline for responses by stakeholders : 6 May 2025

[EU's next long-term budget \(MFF\) – EU funding for competitiveness](#)



Pillar V

Overall governance: Technology Council for Advanced Materials



Pillar I
Advanced materials R&I:
a launchpad
for the twin
transition, EU
resilience
(EU + MS)



Pillar II
Fast track
from lab to fab
(Digital Infrastructures
(Materials Commons),
OITBs
(Technology Infrastructures))

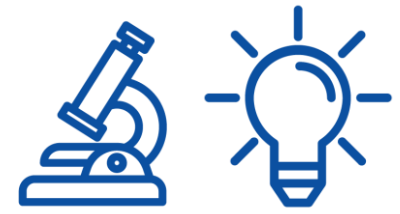


Pillar III
Capital &
financing
(including new partnership
I'M4EU; EIC,
IPCEI)



Pillar IV
Production &
use of
advanced
materials (incl.
Advanced Materials Academy)

Pillar 1- Priority setting



1. Common R&I objectives and priorities: co-created with Member States*



*see Annex to Communication for preliminary list of R&I priorities

2. Regular updates of priorities envisaged via Technology Council \Rightarrow 4 areas starting point. New workstream on health (medical devices) with workshop in Braga on 10/11 April)

3. Identification of **R&I needs for reducing dependencies of critical raw materials** with advanced materials: first workshop on 25 Feb 2025

Pillar 2 - Lab to Fab



4. Material Commons

- **European Digital Infrastructure** for advanced materials R&I
- Building on national initiatives with a strong drive from Member States – **use of HE WP25 – topic of 28 Million EUR**

5. Access to Technology Infrastructures in advanced materials

- **Single-entry catalogue**, with relevance across industry, particularly for SMEs
 - Currently, **28 available open innovation test beds**, with a funding of EUR ~320 million
 - Study focusing on national technology infrastructures starting in late spring 2025



Pillar 3: Access to capital

- **Co-programmed Partnership IAM4EU** - €500M budget (EU & private side)
 - To secure and strengthen European technology sovereignty, industrial leadership and competitiveness in IAMs in strategic markets for the twin green and digital transitions (IAM4EU's general objective)
 - Establishment of new industrial association IAM-I on 31 January and signature of MoU expected soon.
 - SRIA published: <https://www.iam-i.eu/sria-innovative-advanced-materials-for-europe/>
 - Private side association 'The Innovative Advanced Materials Initiative (IAM-I)' fully established
 - Chair of association Fabrice Stassin (Umicore)
 - Vicechairs Karim Sidi-Ali-Cherif (CEA) and Gianluca Fiori (University of Pisa)
 - Secretary-General Eva Schillinger (IAM-I).
 - More details: <https://www.iam-i.eu/>

- **Candidate IPCEI** (Important Projects of Common European Interest) on **Circular Advanced Materials**. Member States working on the design phase – national consultations with industry ongoing. Austria leading technical discussions



Pillar 3: Access to capital : EIC

- **EIC** support for advanced materials - €50M accelerator challenge in 2025:
“Acceleration of advanced materials development and upscaling along the value chain”

Objectives:

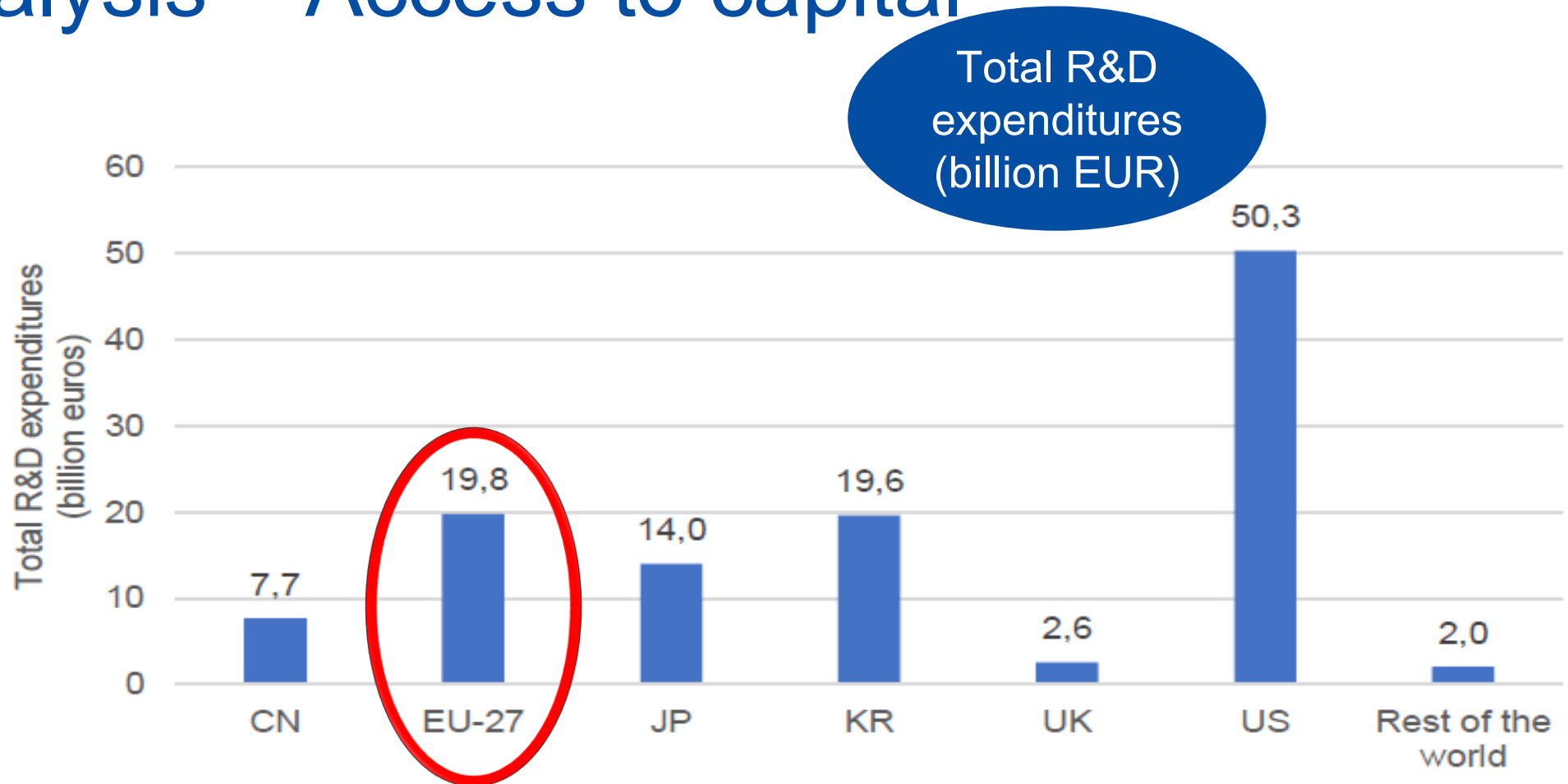
- Technologies for design, synthesis, characterisation, up-scaling, and production of advanced materials.
- Scaling up processes to reach the targeted functionalities or improved performance of advanced materials, such as surface functionalization of nanoparticles, or additive manufacturing approaches which may enable a fast integration of the advanced materials into smart devices.

Outcomes and impacts:

- Strengthen the European value chain of advanced materials in the energy, mobility, electronics, and construction application areas.
- Enable a more diversified, digitally driven, and risk-aware configuration of the European advanced materials value chain and associated processes and technologies.
- Accelerate market uptake of advanced materials in the energy, mobility, electronics, and construction industrial sectors.
- Address the EU’s industrial dependency on imports of resources, such as CRMs, for the energy, mobility, electronics, and construction sectors.

[Acceleration of advanced materials development and upscaling along the value chain - European Commission](#)

Analysis – Access to capital



Pillar 4 - Production & Use

Working with **public procurers** to boost the use of advanced materials

WP25 (cluster 4) – Europe-wide consortium of public procurers to define unmet procurement needs for solutions based on advanced materials

Launch **Advanced Materials Academy**

EIT – KICs – launch planned Q4 2025

Improve **standards** in collaboration with CEN/CENELEC/ETSI & ISO

Study planned for second half of 2025

Analyse **production, use & patent** landscape of advanced materials

Study on production and use – Study to be launched in spring 2025

Study on patent landscape – to be launched in 2025

Pillar 5: Technology Council (Governance)

- Composed of Member States representatives (research, industry), R&I stakeholders - including industry
- Takes the form of a high-level coordination group
- Objective:
 - Identify **common objectives and priorities for advanced materials R&I**
 - Facilitate collaboration among Member States, Commission and stakeholders
 - Provide advice and steer in the implementation of the Commission communication

Link:

[Technology Council for Advanced Materials holds Inaugural Meeting - European Commission](#)

Other relevant steps: Cluster 4 WP 2025



Topic	Instr	Partnership	Budget
IAMs for monitoring, maintenance, repair in construction sector	RIA	IAM4EU	30 M€
IAMs for sealants and coatings in manufacturing	IA	IAM4EU	30 M€
IAM Innovation Procurement	CSA		2 M€
Materials Commons for Europe	IA		28 M€
IAMs for photonics enabling low-power telecommunication	RIA	IAM4EU	10 M€
IAMs for flexible electronics	RIA	IAM4EU	15 M€
Safe and Sustainable by Design	IA/RIA		45 M€

Other relevant next steps in 2025

Chemicals Strategy for Sustainability (CSS)

- phase out the most harmful (not only SVHCs) substances and
- substitute, as far as possible, all other substances of concern, and otherwise minimise and track them.



New approaches to tackle releases and emissions across all life cycle stages, and move towards zero-pollution for air, water, soil and biota.

CSS Action Plan

Develop safe and sustainable-by-design (SSbD) criteria for chemicals



Stakeholder input



The EU Green Deal



Zero pollution



Climate neutrality



Circular economy

Caldeira et al. (2022). Safe and Sustainable by Design chemicals and materials Review of safety and sustainability dimensions, aspects, methods, indicators, and tools. <https://doi.org/10.2760/879069>

Caldeira, et al. (2022). Safe and Sustainable chemicals by design chemicals and materials - Framework for the definition of criteria and evaluation procedure for chemicals and materials. <https://doi.org/10.2760/487955>

Caldeira et al. (2023). Safe and Sustainable by Design chemicals and materials - Application of the SSbD framework to case studies. <https://doi.org/10.2760/329423>

European Commission. (2022). Commission recommendation of 8.12.2022 establishing a European assessment framework for 'safe and sustainable by design' chemicals and materials. Brussels, 8.12.2022 C(2022) 8854 final <https://eur-lex.europa.eu/eli/reco/2022/2510/oj>

Abbate et al. (2024). Safe and Sustainable by Design chemicals and materials - Methodological Guidance. <https://publications.jrc.ec.europa.eu/repository/handle/JRC138035>

Other relevant steps in 2025

- Feb 2025 : [Commission publishes new report "Towards a European policy for technology infrastructures" | European Research Area Platform](#)
- New initiative on [Artificial Intelligence \(AI\) in Science - European Commission](#) at EU level given the developments in US and China
 - Google DeepMind <https://deepmind.google/public-policy/ai-for-science/>
 - Microsoft [MatterGen: A new paradigm of materials design with generative AI - Microsoft Research](#)
 - Open AI [OpenAI has created an AI model for longevity science | MIT Technology Review](#)



Other relevant next steps

- **Coordination Action « InnoMatSyn »** on Advanced Materials
 - led by BIONANONET
 - Kick-off meeting: 4/3 in Vienna
- Seeking more cooperation with M-ERANET and ELN
- Enhanced dialogue with Japan on advanced materials

Conclusions

Advanced materials can offer a wealth of **solutions and therefore there will be an increasing demand**. We should :

- **accelerate** advanced materials research & technology development
- **scale up** R&I and manufacturing capacities in the EU
- **step up** the industrial uptake of advanced materials in the EU
- **improve** access to capital in the EU

PLEASE ENGAGE !



Thank you

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Advanced Materials for Industrial Leadership -
European Commission (europa.eu)