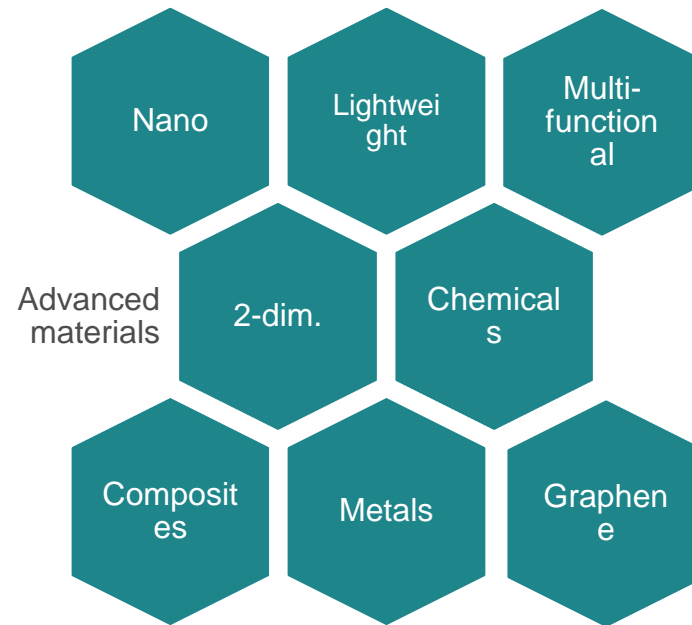




Advanced Materials R&I in the global setting – views from India

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EU Delegation to India*

Advanced materials – what does it encompass?



<https://emmc.eu/> : https://commission.europa.eu/strategy-documents/commission-work-programme/commission-work-programme-2024_en

https://commission.europa.eu/research-and-innovation_en?wt-search=yes

Advanced Materials for Industrial Leadership

KEY PRIORITIES FOR 2024

A European Green Deal

- European Wind Power Package
- 2040 climate target
- Initiative for water resilience

A Europe fit for the digital age

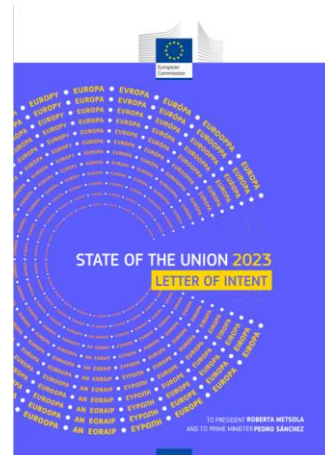
- EU Space Law
- Strategy on Space Data Economy
- Initiative to open up European supercomputer capacity to ethical and responsible AI start-ups

An Economy that Works for People

- EU Biotech and Biomanufacturing Initiative
- Follow up to the Val Duchesse Summit
- **Advanced Materials for industrial leadership**
- Initiative on rules on the European Works Council

A Stronger Europe in the world

- Strengthen partnership with Africa
- European Defence industrial strategy



Strasbourg, 17.10.2023
COM(2023) 638 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN
PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL
COMMITTEE AND THE COMMITTEE OF THE REGIONS

Commission work programme 2024

Delivering today and preparing for tomorrow

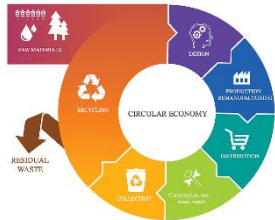
An Economy that Works for People

6.	Biotech and biomanufacturing	EU biotech and biomanufacturing initiative (non-legislative, Q1 2024)
7.	Social dialogue	Follow-up to the Val Duchesse summit (Q1/Q2 2024)
8.	Green and digital transition, open strategic autonomy	Advanced materials for industrial leadership (non-legislative, Q1 2024)
9.	European Works Council	Initiative on rules on the European Works Council (legislative or 153(2)(b), in conjunction with Article 153(1)(e) TFEU, Q1 2024, responds 'Revision of the European Works Councils Directive')



Key challenges for Europe

Strategic autonomy and technological sovereignty for Green Deal technologies/twin transition



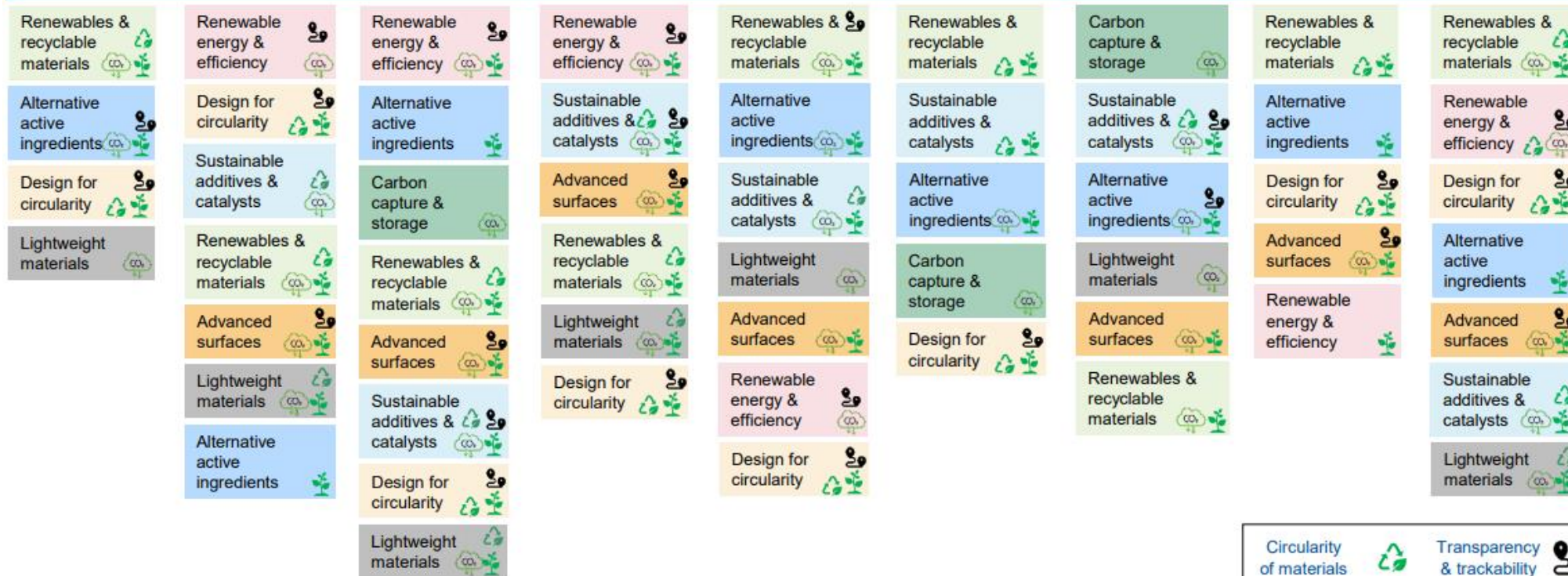
- **Materials circularity and efficiency:** less complex materials, using less (scarce) materials, cleanness of secondary materials for performance, new recovery technologies to reduce dependencies, traceability and cooperation across-value chains.
- **Digital tools as a game changer:** databases and tools to accelerate the development of new materials. First national initiatives exist: increased collaboration with **all** EU MS and accessibility to all stakeholders needed to exploit the full potential.
- **Accelerate up-scaling and deployment:** High commercialisation costs of advanced materials innovation. Technology infrastructures – opportunities for SMEs to access testing and accelerate the deployment. Continuity of development from low to high TRL and improve feedback loop between industry and academia.

Green Deal – many new research challenges in advanced materials



New Technology & Innovation: resources and processes optimization (energy, production, performance increase), materials data, digital twins & passports, big database, AI, blockchain, mass customization, sensing, new biotechnology methods

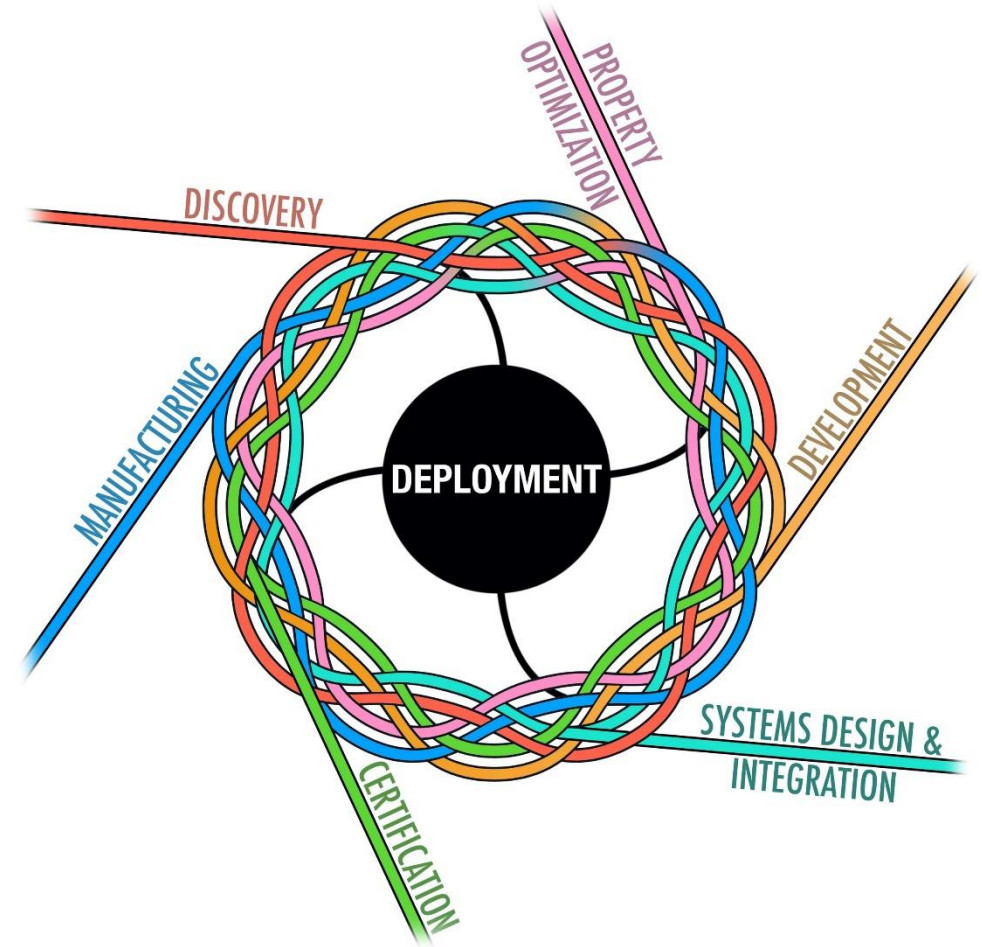
New Policies: Harmonized norms & standards, certification schemes, Eco-label compliance on all products levels, insure sovereignty & EU autonomy, lifecycle assessment



Digitisation of design of advanced materials

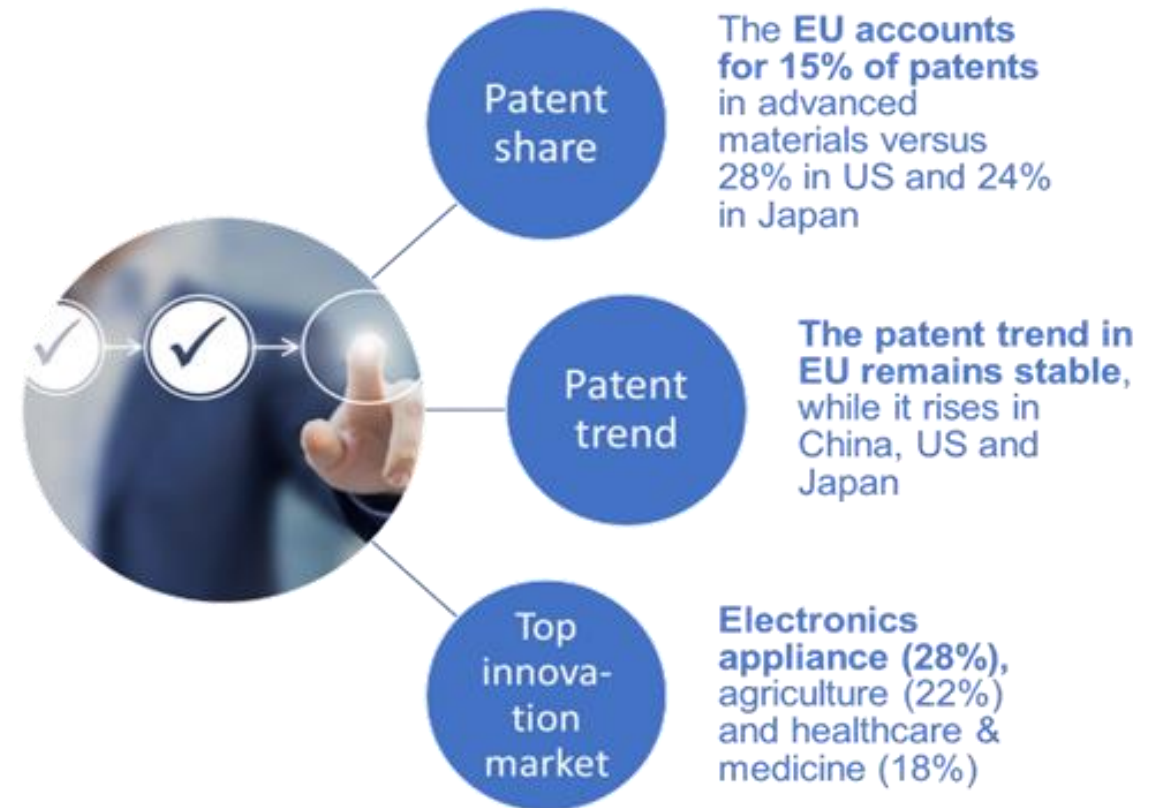
Example US

- **US:** Materials Genome Initiative www.mgi.gov
- The 2021 strategic plan identifies three goals to expand the impact of the initiative over the coming five years:
 - Unify the Materials Innovation Infrastructure (MII), a framework of integrated advanced modeling, computational and experimental tools, and quantitative data
 - Harness the power of materials data
 - Educate, train, and connect the materials research and development workforce



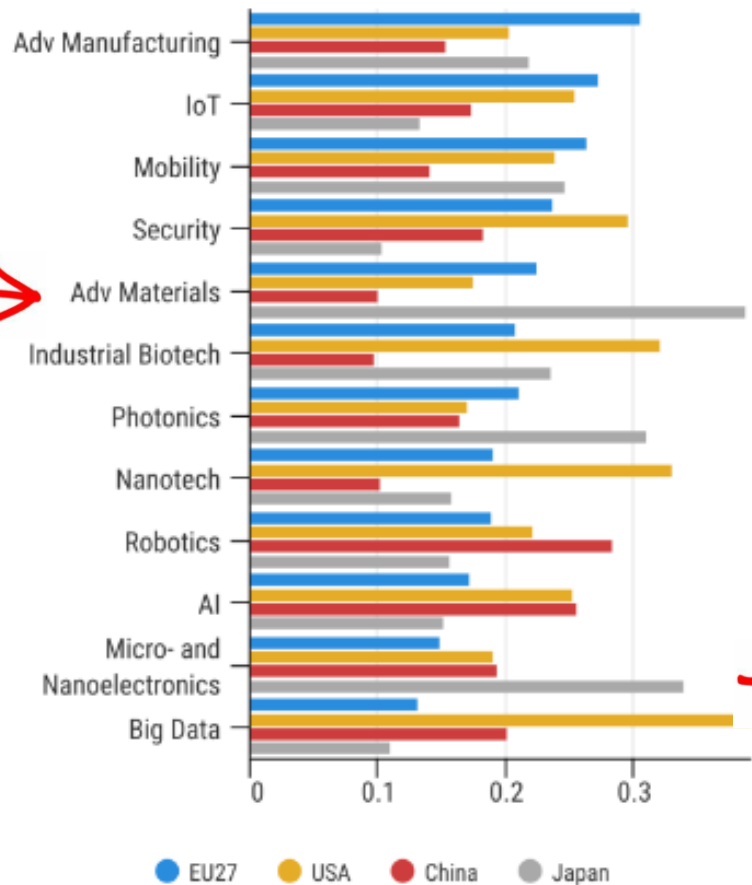
Advanced materials

- R&D&I investments and trends in advanced materials
- Start-ups and innovation leaders.



European competitive edge: EU really still leading? Existing studies say yes

Share of global patent applications, 2017



Transversal technologies	Keywords	Innovation ²	Production ³	Adoption ⁴	Average
Next-level automation	Industrial, collaborative, and professional robots; additive manufacturing; virtualization	0.6	1.0	0.7	0.8
Future of connectivity	5G, Internet of Things	0.7	0.7	0.3	0.6
Distributed infrastructure	Cloud, edge computing	0.2	0.1	0.7	0.3
Next-generation computing	Quantum computing, neuromorphic software	0.5	n/a	n/a	0.5
Applied AI	Robotic process automation, optimized decision making, natural language processing, computer vision, speech technology	0.5	<0.1	0.8	0.4
Future of programming	Software 2.0, no-code and low-code programming	0.3	<0.1	n/a	0.2
Trust architecture	Blockchain, zero-trust security/cybersecurity	0.3	0.3	0.6	0.4
Bio Revolution	Biomolecules, biosystems, bio-machine interface, biocomputing	0.8	0.4	0.5	0.6
Next-gen materials	Nanomaterials, composite materials	0.7	2.0	1.2	1.3
Future of cleantech	Solar power, wind energy, hydropower, nuclear, electric vehicles, hydrogen	1.3	0.4	1.2	1.0
Average		0.6	0.6	0.7	

Source: Technopolis Group, 2020

McKinsey Global Institute (September 2022).
Securing Europe's competitiveness: Addressing its technology gap.

India

- **Ranked 3rd** out of 181 countries in material sciences and advancements.
- **Specific R&I programme on Advanced Materials like the EU?**
 - Mission on Nano Science and Technology (Nano Mission):** under Department of Science and Technology (DST)
 - Clean Energy Material Initiative:** low-cost clean energy materials
 - Integrated Clean Energy Material Acceleration Platform: Solid-State -- International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad**



**WORKING GROUP 1 (WG1): “Strategic Technologies,
Digital Governance and Digital Connectivity”**

EU-INDIA TRADE AND TECHNOLOGY COUNCIL



Working Group on

“Strategic Technologies, Digital Governance and Digital Connectivity”

- A work plan for 2023-24 has been adopted with key 6 focused areas
- **EU-India TTC Working Groups** met in May and will meet to look at operational aspects

**1. Microelectronics and supply chain
resilience → MoU on Semiconductors**

2. Telecom and IT standardization

3. Digital Skills

**4. High Performance Computing and
Quantum Technologies**

5. Digital Public Infrastructures (DPI)

6. Artificial Intelligence

Get in touch



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