

Advanced Materials at the Heart of Industrial Competitiveness

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Setting the Scene: EU Advanced Materials Policies and Initiatives

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Introducing the Advanced Materials Partnership, IAM4EU

Eva Schillinger, Secretary General IAM-I



Horizon Europe partnerships

CI UCTED 1. Mealth	CLUSTED 2: Culture	CLUSTER 4: Digital Industry	CLUSTED 5: Climate Energy	CI LICTED & Food Big	EUROPEAN INNOVATION
GLUSTER T. Health	Creativity, Inclusive Societies	& Space	& Mobility	economy, Agriculture, Env	ECOSYSTEMS
Innovative Health Initiative	Resilient Cultural Heritage* Social Transformations and Resilience*	Chips (formerly KDT)	Clean Hydrogen	Circular Bio-based Europe	Innovative SMEs
Global Health Partnership		Smart Networks & Services	Clean Aviation	R&I in the Mediterranean	1
Transformation of health systems		High Performance	Single European Sky ATM Research 3	Biodiversa+	EIT
Chemicals risk		Computing	Furone's Rail	Climate Neutral, Sustainable & Productive Blue Economy Water4All Animal Health & Welfare Accelerating Farming Systems Transitions Agriculture of Data Safe and Sustainable Food System	InnoEnergy
assessment		European Metrology (Art. 185)	Connected and Automated		Climate
ERA for Health		Al-Data-Robotics	Mobility		Digital
Rare diseases		Photonics	Batt4EU		Food
One-Health Anti Microbial			Zero-emission		Concerns and
Resistance		Made in Europe	waterborne transport		Heath
Personalised Medicine		Clean steel – low-carbon steelmaking	Zero-emission road transport		Raw Materials
Pandemic Preparedness		Processes4Planet	Built4People		Manufacturing
Brain Health*		Global competitive space	Color Distantializat		Urban Mobility
Institutionalised partnerships (Art 185/7) EIT KICs Co-programmed Co-funded		systems	Solar Photovoltaics*	Forests and Forestry for sustainable Future*	
		Innovative Materials for EU*	Clean Energy Transition		Cultural and Creative
			Driving Urban Transitions		Inquatrica
		Virtual Worlds*	offining of bain franchions		Water, Marine and
		Textiles of the Future*			
* Under preparation		Raw Materials for the			INCOMENCESSION IN THE REPORT OF
		Green and Digital Transition*			CROSS-PILLARS I AND I
European					European Open Science

March 2025 (Cluster 4) **Digital, Industry** and Space

ADRA Clean Steel IAM4EU → 250m€ EU budget Made in Europe Photonics21 Processes4Planet Textile

Last batch of new partnerships adopted by European Commission on March 19th, MoU signed

Objectives and expected impacts

Contribution to Horizon Europe Strategic Plan for 2025-27 EC Policy on Advanced Materials for Industrial Leadership



EU leadership in advanced materials innovation and industrial competitiveness in strategic markets

EXPECTED IMPACTS

Twin Green and digital Transitions Competitive & sovereign EU



IAMs and associated technologies



Cross-enabling tools & methodologies



Ecosystem enablers and synergies

Resilient & circular industrial value chains, from IAM design to end-of-life

High-level capabilities to accelerate the innovation cycle and respond to new requirements

A multi-disciplinary, cross-sectorial, collaborative EUwide R&I ecosystem along the innovation cycle

SRIA – Outline





IAMS AND ASSOCIATED TECHNOLOGIES

P#1 - CRM-free/lean and efficient catalysts for energy conversion and CO2 reduction

P#2 - High-conductivity and durable membranes for efficient H2 production and conversion

P#3 - Innovative concepts, designs & components for efficient H2 and thermal energy storage

P#4 - CRM-free/lean magnetic phases for high-performance permanent magnets in circular value chains

P#5 - Innovative electrodes, electrolytes, binders and separators for electrochemical energy storage.

 $\mathsf{P\#6}$ - IAM-enabled surfaces & interfaces for multifunctional components & products

P#7 - IAMs for lightweight, durable and sustainable structural systems

P#8 - IAMs for energy efficient, multi-functional, photonic, electronics, spintronic, and quantum technologies

P#9 - IAMS based on (Design for) recyclable polymers/polymeric composites

 $\mathsf{P\#10}$ - IAMS as PFAS alternatives or based on PFAS alternatives on PFAS alternatives

CROSS-ENABLING TOOLS AND METHODOLOGIES

 $\ensuremath{\mathsf{P\#11}}\xspace$ - FAIR and semantic interoperable digital materials data space

P#12 - Predicting performance and lifecycle of materials

P#13 - Valid test methods supporting the implementation of SSbD

P#14 - Data management & curation for efficient SSbD

I-INTRODUCTION

- 1. Innovative Advanced Materials
- 2. Functionality, Performance and Disruption
- 3. Safety, Sustainability and Circularity

II-INNOVATIVE ADVANCED MATERIALS AND ASSOCIATED TECHNOLOGIES

- 1. Priority areas
- 2. R&I Priorities (P#1-10)
- 3. Overarching needs & challenges

III-CROSS-ENABLING TOOLS AND METHODOLOGIES

- 1. Materials knowledge valorisation through digitalization (P#11)
- 2. Materials modelling, characterisation and testing (P#12)
- 3. Embedding Safe & Sustainable by-Design (P#13-14)

IV-ECOSYSTEM ENABLERS AND SYNERGIES

- 1. Stakeholders' collaboration (P#15)
- 2. Fostering the production, use & re-use of advanced materials (P#16-18)
- 3. Standards & norms (P#19)

ECOSYSTEM ENABLERS AND SYNERGIES

- P#15 New business models
- P#16 Synergy with the "Advanced Materials Academy"
- P#17 Networking and widespread use of technology infrastructures
- P#18 LRI, OITB and MAP integration
- P#19 Contributions to further development of standards and norms

IAM-I membership (GA Jan '25)





262 members
26 Countries (7 EU13; 5 AC)

WGs & TFs



...under implementation...



<u>Seven Working Groups</u>

- WG#1 AI, Materials digitalization & Data management
- WG#2 Resilient & circular value chains
- WG#3 Materials Innovation Markets (CONSTRUCTION)
- WG#4 Materials Innovation Markets (ELECTRONICS)
- WG#5 Materials Innovation Markets (ENERGY)
- WG#6 Materials Innovation Markets (TRANSPORT)
- WG#7 Materials Innovation Markets (HEALTH)



Four Task Forces

- TF#1 Education & Workforce
- TF#2 Standards & Norms
- TF#3 Infrastructures, support to SMEs & Upscaling
- TF#4 Policies, Funding & Strategy beyond HE

BECOME A MEMBER!

IAM-I Application to become members:



https://www.iam-i.eu/become-a-member



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Stay tuned!

https://www.linkedin.com/company/iam-i/

https://www.iam-i.eu/



Panel Discussion

Gerd Löhden Nicola Piccirelli Kostas Kostarelos



Gerd Löhden, Evonik, Germany



"Advanced materials are the crucial enabler for a number of key technologies for the green transition, such as green H2, Carbon Capture and Batteries as examples.

Being at the beginning of the value chain and therefore the first ones to invest into new, not yet existing markets, we need the right conditions to contribute to a green competitive industry."



Nicola Piccirelli, Safran, France



"Advanced materials are essential to the aeronautics industry for the development of high-performance products that are more durable, and more eco-friendly.

Competitiveness in the field of advanced materials requires a collaborative approach at the European level to ensure sustainability and sovereignty, which are vital for the aeronautics industry."



Kostas Kostarelos, Catalan Institute for Nanoscience and Nanotechnology (ICREA/ICN2), Spain and University of Manchester, UK



"Europe has the opportunity to lead the translation and use of advanced materials in technology spaces and markets of high-value/worth generation (e.g. medical).

We must break the stereotype 'Europe-for-Regulation / US (and now China)-for-Innovation' but assure safe, sustainable and socially-acceptable use of advanced technologies.

Encouragement for dual use of advanced materials and technologies is full of challenges and should be paired by careful communication and engagement of all stakeholders opportunity for town hall meetings and other forms of direct action and engagement can accelerate this urgently needed dialogue."



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Fireside Chat

Maria Cristina Russo, Director for Prosperity, DG Research and Innovation, European Commission



Q&A