



European
Commission

FUTURE OF ADVANCED MATERIALS IN EUROPE (FAME)

Workshop Report: Overcoming Barriers to
Uptake, Deployment, and Scale-up

26 – 27 November 2025 | Aveiro, Portugal

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University of Aveiro



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FUTURE OF ADVANCED MATERIALS EUROPE (FAME) WORKSHOP

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FAME – Report

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Executive Summary

Advanced materials are among Europe's ten critical technologies, essential for economic security, industrial competitiveness, and the green and digital transitions. The FAME Workshop convened stakeholders from industry, research, finance, and public authorities to identify barriers to uptake, deployment, investment, and scale-up ahead of the Advanced Materials Act (2026).

Europe excels in advanced materials research, but the main challenge is industrial scale-up and market deployment. Critical gaps exist between laboratory research, pilot and demonstration stages, and first industrial production. Advanced materials are capital-intensive, require long development timelines, and depend on specialized infrastructure, which is currently fragmented and difficult to access. Market adoption relies on application-driven development, yet Europe lacks sufficient facilities for testing and validation at scale, limiting commercialization.

Investment gaps persist at pilot and demonstration stages. While early-stage public funding is strong, private investment remains limited, as conventional venture capital poorly matches the risk profile of deep-tech materials. Public support is most effective when used to de-risk scale-up and attract private capital rather than replace it.

Regulatory complexity and fragmented requirements increase cost and delay deployment, while early integration of regulatory considerations—through approaches such as Safe and Sustainable by Design, early life-cycle assessment, and fit-for-purpose testing—reduces late-stage failures and boosts investor confidence.

Europe also faces skills shortages and limited access to industrialization expertise, while supply chain risks threaten competitiveness. Addressing these challenges requires coordinated action on scale-up infrastructure, application-driven ecosystems, investor incentives, regulatory simplification, and workforce development to ensure Europe becomes the global leader not only in inventing but also in producing and deploying advanced materials.

Europe's competitiveness in advanced materials will depend not on research excellence alone, but on its ability to scale, industrialize, and deploy advanced materials quickly, safely, and at a competitive cost.

1. Introduction

Advanced materials are important to the future competitiveness of European industries and are included in the list of 10 critical technologies to secure the European Union's economic security. As a fundamental building block of many other economic and technological sectors, advanced materials have potential applications in many of the areas critical for Europe's future.

In 2026 the European Commission will introduce the Advanced Materials Act (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52024DC0098>) to establish a strategic framework that will support all aspects of advanced materials from research and innovation to design and development and manufacturing, deployment and use. It will address key issues such as time to market, expansion of production capabilities, streamline regulatory processes, boost Europe's competitiveness and foster a more sustainable and circular economy.

Within this context and the current European landscape, the workshop FAME: Future of Advanced Materials in Europe, focusing on (i) overcoming barriers to the uptake and deployment of advanced materials and (ii) investment in advanced materials and the scaling up of their production, took place at the University of Aveiro, Portugal, on 26–27 November 2025. FAME outcomes will be used in the European Commission's planning for its Advanced Materials Act being introduced in 2026.

The event was co-organized by European Commission's Technology Council for Advanced Materials' Subgroup on Uptake and Deployment, the Portuguese ANI, University of Aveiro, IAM-I and EU-funded project InnoMatSyn.

All stakeholders of the European AdMa ecosystem, from science to industry to policymakers and funding bodies, were invited to attend. Their input is vital in shaping the future of advanced materials in Europe.

2. Objectives

- Seek agreement on how to overcome barriers to uptake and deployment of advanced materials in Europe
- Provide feedback to the European Commission to help inform the development of the Advanced Materials Act 2026
- Create networking opportunities for key advanced materials stakeholders



3. Format

The FAME Workshop was split into two sessions and used a three-panel format to encourage discussion and debate.

On 26 November, the sessions cover mainly the topics of Overcoming Barriers Faced in the Uptake and Deployment of Advanced Materials. And the session of 27 November the sessions cover mainly the topics Investments in Advanced Materials and Scaling-Up Production of Advanced Materials.



4. Program

Agenda Session A, held on 26 November, began with registration at 13h00, followed by the official opening at 13h30. The session opened with housekeeping remarks by Paula M. Vilarinho from the University of Aveiro and Technology Council Sub Group A, before a welcome address by Artur Silva, Vice Rector of the University of Aveiro. This was followed by a video welcome from Fernando Alexandre, Minister of Science and Technology, a welcome from António Grilo, President of ANI, and remarks from the European Commission delivered by Cristina Russo, Director for Global Approach and International Cooperation in R&I at DG Research and Innovation.

The afternoon continued with presentations on innovative advanced materials in the EU by Wide Hogenhout (DG RTD, European Commission), technology council recommendations on uptake and deployment of advanced materials by Sean Kelly (Nanotechnology Industries Association), and advanced materials in future electric drives by Robert Plikat (VW Group, Germany).

After a coffee break, the programme resumed with talks on EU test methods strategy by Monique Groenewold (RIVM), updated test guidelines for advanced materials by Elisabeth Heunisch (BAuA, Germany), standards for advanced materials by Charles Clifford (ISO/TC 229, NPL, UK), digital product passports for SMEs by Natalia Konchakova (DigiPass CSA), and education and skills through the Advanced Materials Academy by Krysta Martinez (EIT). The day concluded with a panel discussion on overcoming barriers in the uptake and deployment of advanced materials, chaired by Sean Kelly and featuring representatives from industry, research institutions, and public authorities, followed by closing remarks by Sean Kelly and Wide Hogenhout and the close of Day 1.

Agenda Session B, on 27 November, opened with registration and a welcome to Day 2 by Paula M. Vilarinho. The morning programme addressed European competitiveness and value chain analysis with Christine Muller (JRC), followed by two sessions on investing in advanced materials by Luís Quaresma (Iberis Capital) and Almudena Trigo Lorenzo (Beable Capital). A panel on public and private investments in advanced materials, chaired by José Carlos Caldeira (INESC TEC), brought

together speakers from public authorities, investment funds, and industry. After a coffee break, the focus shifted to scale-up of advanced materials with Pierre Robert (Michelin), innovation centres and test beds presented by Ane Irazustabarrena Murgiondo (TECNALIA) and Jose M. Serra (ITQ), and public procurement discussed by Marlene Grauer (BME). A second panel on scale-up, chaired by Nelson Ferreira (Bosch Termotecnologia, Portugal), gathered representatives from industry and research organizations. The session concluded with a presentation on the InnoMatSyn project by Andreas Falk (BNN), final conclusions and next steps by Sean Kelly and Wide Hogenhout.



5. Slido Questions & Answers

5.1. Panel 1- Uptake and Deployment of Advanced Materials

Q1. What are the main challenges and barriers in deploying advanced materials in Europe?

Key message:

The dominant barrier is scale-up, followed closely by lack of pilot infrastructure and difficulty securing investment.

Summary:

- Scale-up challenges were clearly identified as the most critical obstacle.
- Insufficient pilot and demonstration infrastructure prevents materials from moving beyond the lab.
- Investment constraints are strongly linked to scale-up risk.
- Regulatory complexity, lack of standards, and high energy costs were seen as secondary—but still relevant—barriers.
- Skills shortages were ranked lowest, suggesting they are important but not the immediate bottleneck.

Interpretation:

Europe's deployment problem is structural, not scientific: materials fail at the transition to industrial scale.

Q2. What factors most influence end-user uptake of advanced materials?

Key message:

End users adopt advanced materials only when they fit existing production systems and make economic sense.

Summary:

- Compatibility with existing production processes was the most important factor.
- Cost (real or perceived) strongly affects uptake decisions.
- Lack of end-user knowledge about advanced materials is a notable barrier.

- Regulatory concerns were less decisive than practical and economic factors.
- General resistance to innovation was ranked as the least important factor.

Interpretation

End users are not inherently risk-averse; they need solutions that are affordable, compatible, and clearly beneficial.

Q3. What would most incentivise end users to deploy advanced materials?

Key message:

Economic incentives and proven performance are the strongest levers for uptake.

Summary:

- Financial incentives (tax relief, support schemes) were the top motivator.
- Demonstrated cost and performance advantages were almost equally important.
- Sustainability benefits matter, but only after economic and performance criteria.
- Regulatory simplification and procurement measures were seen as helpful but secondary.

Interpretation:

Adoption accelerates when advanced materials are both economically attractive and clearly superior in real-world applications.

Q4. Are there additional end-user barriers limiting uptake and deployment?

Key message:

Uncertainty, fragmentation, and global competition further slow deployment.

Summary:

Participants highlighted:

- Unclear cost–benefit ratios and lack of convincing demonstrations.
- Competition from cheaper materials produced outside Europe.
- Absence of harmonised test methods and standards.
- High certification and qualification costs.
- Fragmented access to testing services and multidisciplinary expertise.
- Supply chain fragility and access to raw materials.

Interpretation:

Beyond funding, confidence and clarity—technical, economic, and regulatory—are missing.

Q5. What policy measures would best encourage industry to deploy advanced materials?

Key message:

Policy must support scale-up, reduce risk, and simplify regulation.

Summary:

Respondents strongly supported:

- Dedicated funding for scale-up and pilot manufacturing.
- Economic incentives (tax relief, reduced VAT, exemptions during early deployment).
- Regulatory simplification and harmonisation across Member States.
- Stronger industry–academia collaboration beyond short project cycles.
- Joint EU–Member State initiatives with real industrial impact.

Interpretation:

Industry needs predictable frameworks and financial de-risking, not more R&D calls.

5.2. Panel 2 – Investment in Advanced Materials

Q6. Where is the biggest investment gap in the innovation cycle?

Key message:

The largest investment gap is at initial scale-up and demonstration.

Summary:

- Scale-up and demonstration stages clearly represent the highest funding gap.
- Transition from EU-funded projects to the market is also problematic.
- Early-stage research funding is not seen as the main issue.

Interpretation:

Europe's innovation system breaks down after research succeeds.

Q7. Which policy measures best help SMEs attract investors?

Key message:

Investors respond best to dedicated funds and risk-sharing mechanisms.

Summary:

- A dedicated EU investment fund for advanced materials ranked highest.
- Public–private risk-sharing schemes were also strongly supported.
- Matchmaking activities were useful but less impactful.
- Tax incentives for investors ranked lowest here—but reappear strongly elsewhere.

Interpretation:

Investors need structured vehicles, not just networking opportunities.

Q8. How can public investment increase investor confidence?

Key message:

Public money is most effective when it demonstrates viability and shares risk.

Summary:

- Investing public funds in high-risk technologies to prove feasibility was seen as most impactful.
- Co-investment models ranked second.
- Access to infrastructure and financial instruments was helpful but less decisive.
- Demand-side measures (e.g. de-risking purchases) were least impactful.

Interpretation:

Public funding works best as a signal and catalyst, not as a substitute for markets.

Q9. What policy measures would most encourage investment in advanced materials?

Key message:

Tax incentives, blended finance, and reduced bureaucracy are essential.

Summary:

Respondents emphasized:

- Tax incentives for long-term private investors.
- CAPEX loans for non-profitable scale-ups.
- Joint EU–Member State initiatives.
- Clear strategic prioritisation of advanced materials.
- Simplification and harmonisation of regulation.

Interpretation:

Investment will increase when returns are clearer and risks are shared.

5.3. Panel 3 – Scaling-Up Production of Advanced Materials

Q10. What measures best facilitate scaling up production?

Key message:

Access to technology infrastructure is the single most important enabler.

Summary:

- Easier and cheaper access to pilot and technology infrastructure ranked highest.
- Harmonised standards and regulatory streamlining were also important.
- Stronger links between research and development support scale-up.

Interpretation:

Scale-up fails when infrastructure access is slow, expensive, or fragmented.

Q11. Which policy actions best support company scale-up?

Key message:

Infrastructure access outweighs all other support measures.

Summary:

- Access to research and technology infrastructures ranked far above all others.
- Outsourced pilot manufacturing and public procurement followed.
- Incubators, accelerators, and business advice were less critical.

Interpretation:

For advanced materials, machines matter more than mentoring.

Q12. What are the main challenges in accessing research and technology infrastructures?

Key message:

The biggest problem is not knowing what exists and how to access it.

Summary:

- Lack of information on available infrastructures was the top barrier.
- High access costs and lack of fit-for-purpose facilities followed.
- Geographic and language barriers were least important.

Interpretation:

Europe's infrastructure exists—but is invisible, fragmented, or inaccessible.

Q13. What EU support would best help strategically important advanced materials scale up?

Key message:

Priority access to funding and facilities is more important than procurement or certification.

Summary:

- Priority access to EU and national funding was the top choice.
 - Accelerated access to production facilities ranked second.
 - Public procurement and fast-track certification were minor priorities.
-

Q14. How can scale-up be prevented from being blocked by IPR?

Key message:

IP issues require early planning and trusted collaboration environments.

Summary:

Suggested solutions include:

- Early freedom-to-operate analysis.
 - Early involvement of IP and regulatory experts.
 - Support for patenting and IP studies.
 - Trusted environments for IP exchange.
-

Q15. What policy measures would most encourage scale-up in Europe?

Key message:

Scale-up needs funding, regulatory simplicity, collaboration, and trust.

Summary:

Participants called for:

- Dedicated manufacturing scale-up funding schemes.
- Tax breaks and fiscal incentives.
- Harmonized regulatory requirements.
- Trusted IP-sharing environments.
- Public and innovation procurement.
- Reduced administrative burden.

Overall Cross-Panel Message

Across all questions and panels, the message is consistent:

Europe's challenge is not inventing advanced materials, but scaling, financing, regulating, and deploying them efficiently.



6. Panel Discussions

Key Themes Highlighted in the Panel Discussions (from the records of the sessions)

6.1. In relation to Panel 1

How the discussion supports the aim of the event?

1. Scale-up and market uptake are the core bottlenecks

The Slido results and panel discussion clearly confirmed that:

- Scale-up is the *primary challenge* for advanced materials in Europe.
- Securing investment funding closely follows, largely because scale-up risks remain high.
- End users adopt advanced materials only if they are compatible with existing production processes, deliver clear performance gains, and are cost-competitive.

This directly aligns with the event's goal of identifying practical barriers preventing advanced materials from reaching the market, not just being developed in labs.

2. Advanced materials are not sold as materials, but as applications

A strong industry message emerged:

- *"Nobody buys advanced materials — they buy applications."*
- The lack of application development infrastructure (e.g. pilot lines, test beds, industrial demonstrators) in Europe is a major blocker.
- Concrete examples were given (e.g. no facility in Europe to manufacture and test tries using new materials).

This reinforces the event's aim to move Europe beyond R&D excellence towards industrial deployment and highlights the need for application-driven ecosystems, not just material innovation.

3. Regulatory complexity slows innovation and scale-up

Industry repeatedly stressed that:

- The issue is not safety, which industry fully supports.
- The real barrier is complex, fragmented, and costly regulatory compliance, especially for SMEs and startups.
- High administrative burden diverts resources away from innovation and discourages investment.

At the same time, regulators emphasized:

- Europe's high safety and environmental standards are a strength.
- The lack of appropriate test methods for advanced materials is a fundamental problem.
- Initiatives like Safe and Sustainable by Design (SSbD) aim to help materials fail early if needed, saving time and investment.

This dialogue directly serves the event's purpose of bridging industry and regulatory perspectives to inform a more innovation-friendly Advanced Materials Act.

4. Need for earlier regulatory integration in innovation

Key insight:

- Regulatory requirements should be integrated earlier in the innovation chain, not at market entry.
- Tools such as SSbD, OECD test guidelines, and early life-cycle assessment (LCA) can help:
 - Identify non-viable materials sooner
 - Reduce late-stage regulatory failures
 - Improve investor confidence

This supports the event's ambition to reduce time-to-market and de-risk scale-up.

5. Infrastructure gaps: testing, standards, and metrology

Several structural gaps were highlighted:

- Lack of industrial-scale testing facilities for advanced materials.
- Slow development of standards and test methods, which lag behind innovation.
- Need for shared test beds, regulatory sandboxes, and pilot facilities accessible to SMEs.

Examples of good practice (e.g. national metrology institutes supporting SMEs) show what could be scaled at EU level.

This directly feeds into the event's goal of strengthening European research and technology infrastructures for advanced materials.

6. Skills shortage threatens Europe's leadership

A strong consensus emerged that:

- There is a shrinking pipeline of materials scientists and engineers.
- Materials science is becoming less visible at university and school level.
- Industry, academia, and policymakers all struggle to recruit skilled talent.
- Competition from “sexier” sectors (software, finance) pulls talent away.

Proposed responses:

- Strengthening advanced materials academies
- Attracting international talent
- Increasing visibility of materials science at school level
- Better alignment between industry needs and training

This supports the event's aim to ensure long-term competitiveness and workforce readiness.

7. Member States must co-shape the Advanced Materials Act

From the member-state perspective:

- The Advanced Materials Act should be co-created, not imposed top-down.
- Stakeholder input must be concrete and actionable, especially on:
 - Which regulations create unnecessary burden
 - Where scale-up funding is most effective
- National funding instruments already exist and can align with EU action.

This reinforces the event's role as a collective consultation platform for shaping European policy.

Overall takeaway aligned with the event's aim

The discussion strongly supports the core objective of the FAME / CICECO event:

Europe's challenge is no longer inventing advanced materials, but enabling their scale-up, application development, regulatory clearance, and market adoption in a competitive, safe, and sustainable way.

Key priorities identified:

- Application-focused scale-up infrastructure
- Smarter, earlier, and simpler regulatory integration
- Stronger collaboration between industry, regulators, and researchers
- Skills development and talent attraction
- Concrete input to the future Advanced Materials Act

6.2. In relation to Panel 2

How the discussion supports the aim of the event?

1. Strategic Importance of Research & Technology Infrastructures

A top-rated need identified via the Slido interactive polling was easy access to research and technology infrastructures, incubators and pilot-scale facilities — all crucial for startups and scale-ups to test, validate and industrialise materials technologies.

Panelists also stressed the importance of cataloguing and mapping these infrastructures so companies and innovators can actually find and use them as they grow.

This aligns directly with the event's aim of *reducing real barriers to advanced materials deployment*.

2. Policy Measures to Boost Scale-Up

Participants identified several high-priority policy actions to enable scale-up in Europe:

- Targeted manufacturing scale-up funding
- Transnational collaboration
- Harmonisation of regulatory requirements
- Innovation procurement

- Trusted environments to exchange IP
- These answers show a shared consensus on what structural changes are needed for Europe to remain competitive.

3. Intellectual Property (IP) and Guidance

Startups often lack IP protection experience. This was flagged as a key challenge, with speakers emphasizing early IP strategy as part of scaling successfully — again resonating with the event’s focus on *ecosystem support and readiness*.

4. Materials Supply Chain Challenges

A real-world example was given regarding critical raw material dependency (e.g., tungsten and cobalt) and how export controls and price volatility can hinder competitiveness. This discussion underscores why Europe needs robust strategies for *supply security*, which is again central to competitive scale-up.

5. Connecting Innovation, Regulation & Real-World Testing

Panelists also brought up:

- Difficulty in finding *industrial-scale testing facilities*
- The need for collaboration between large companies and startups
- Regulatory sandboxes/city labs as testing environments

These points tie back to the event aim of *breaking down practical deployment barriers* and enabling broad use of advanced materials in industry.

6. Skills & Expertise for Scale-Up

There was emphasis on not just technical skills, but *business strategy, market understanding and commercialization expertise* being vital for successful scale-up — fitting the event’s broader discussion on ecosystem readiness and capacity building.

Summary of Key Outcomes in Relation to the Event’s Aim

- Access to infrastructures and pilot plants is a *top strategic requirement* for materials scale-up.

- Policy measures such as harmonised regulations, specific funding mechanisms, and procurement support were widely endorsed as levers for growth.
- IP guidance and industrial expertise are essential enablers for startups transitioning to scale.
- Real supply chain issues for advanced materials highlight the urgency of coordinated European action.

These points reflect the core purpose of the FAME workshop: *creating actionable insights and policy recommendations to accelerate advanced materials innovation, deployment, and scale-up in Europe*, in preparation for the forthcoming Advanced Materials Act and related industrial strategies.

6.3. In relation to Panel 3

How the discussion supports the aim of the event?

1. Europe's main gap is not research, but scale-up and market transition

Across all stakeholder types (SMEs, industry, investors, policymakers), there was strong consensus that:

- Early-stage research funding in Europe is comparatively strong
- The largest investment gaps occur at two critical transitions:
 1. From lab to pilot / demonstration
 2. From demonstration to full industrial scale and market uptake

Advanced materials are CAPEX-intensive, physical technologies, unlike digital innovations. Scaling requires:

- Pilot plants
- Demonstration facilities
- Industrial equipment
- Long timelines before profitability

Direct relevance to the event aim:

Europe's competitiveness depends on addressing these "valleys of death" to ensure advanced materials actually reach the market.

2. Scale-up risk is the dominant barrier for both SMEs and large industry

Key messages from companies and associations:

- The largest financial drop in return on investment occurs at scale-up
- Even large companies hesitate without clear, timely ROI
- SMEs are often not bankable at the stage when CAPEX needs peak
- Mixing public, private, EU, and national funding is necessary but extremely complex

Event relevance:

Confirms that scale-up de-risking must be a central pillar of European advanced materials policy, not an afterthought.

3. Advanced materials require application-driven development

A recurring theme was that:

- Materials alone have no market value
- Adoption depends on integration into products and applications
- Scaling materials without parallel application development often fails
- Application scale-up can require as much or more investment than material scale-up

Event relevance:

Supports the event's focus on longer value chains and application-oriented ecosystems, rather than isolated materials R&D.

4. Private investment is structurally insufficient for deep-tech materials

Investors emphasized:

- Conventional venture capital models favor digital technologies with low CAPEX
- Deep-tech materials need hundreds of millions to reach scale
- Europe lacks sufficient "science equity" investors who understand materials risk
- Public funding exists, but private capital does not crowd in at the right stages

Policy relevance:

Without new financial models, Europe will continue to invent materials that scale elsewhere.

5. Tax incentives for investors can unlock private capital

A strong point of convergence:

- Tax incentives for investors (not startups) can de-risk private investment
- Proven models exist (e.g. Israel, national schemes)
- Wealthy individuals and institutional investors need clear financial upside
- Cultural arguments matter less than financial incentives

Advanced Materials Act relevance:

Investor-focused fiscal incentives could significantly increase private funding for advanced materials.

6. Public funding must focus on de-risking, not replacing markets

Public authorities and investors agreed that public money should:

- De-risk early scale-up and demonstration
- Support pilot lines, demo plants, and first-of-a-kind facilities
- Act as co-investor, not sole financier
- Enable private capital to enter earlier and with confidence

Event relevance:

Reinforces the need for blended finance as a core mechanism for market uptake.

7. Access to shared infrastructures can reduce cost and time-to-market

Key issues identified:

- Many SMEs are unaware of existing test beds and pilot facilities
- Access rules, costs, and expertise are fragmented across Europe
- SMEs often lack guidance on *which tests or scale-up routes to choose*

Shared infrastructures can:

- Reduce CAPEX needs
- Accelerate learning
- Improve techno-economic decision-making
- Enable smarter scaling choices early

Directly aligned with the event's focus on research & technology infrastructures.

8. Regulatory and administrative burden adds hidden scale-up costs

Beyond CAPEX, companies highlighted:

- Very high costs for REACH registration, certification, and permitting
- Fragmentation across 27 Member States
- Mismatch between funding timelines and depreciation rules
- Regulatory costs reaching millions of euros per product

Policy relevance:

Scale-up is slowed not only by funding gaps, but by regulatory complexity.

9. Coordination is needed—but over-centralisation must be avoided

There was broad agreement that:

- Better alignment of instruments is needed
- However, over-coordination risks delays that kill startups
- Market actors need simple, predictable frameworks, not complex layering

Preferred approach:

- Enabling frameworks (tax, regulation, procurement)
- Flexible, bottom-up funding access
- Stronger Member State involvement alongside EU instruments

Advanced Materials Act relevance:

Focus on *framework conditions*, not micromanagement.

10. Clear expectations for the Advanced Materials Act

The panel implicitly defined what success should look like:

The Advanced Materials Act should:

- Prioritise scale-up and deployment
- Support application-driven innovation
- Mobilise private capital through incentives
- Enable shared infrastructures and regulatory sandboxes
- Reduce fragmentation across Member States
- Make Europe the best place to industrialise, not just invent, advanced materials

6.4. Panel Discussion Outcomes: Event-Aligned Messages with Policy Impact

Core Message Aligned with the Event Aim

Europe's strength in advanced materials research will only translate into competitiveness if scale-up, application development, private investment, and regulatory simplicity are addressed together.

This panel strongly reinforced the strategic relevance of advanced materials and provided concrete, experience-based input for shaping the future Advanced Materials Act.

Policy-Ready Key Messages

1. Scale-up is the primary bottleneck for advanced materials in Europe

Europe performs strongly in advanced materials research, but systematically fails at scale-up and market deployment. The most critical gaps occur between lab, pilot, demonstration, and first industrial production.

2. Advanced materials require dedicated scale-up policies distinct from digital innovation

Advanced materials are capital-intensive, physical technologies with long development cycles. Current innovation and investment frameworks, largely designed for digital startups, are not fit for purpose.

3. Access to pilot, demonstration, and industrial-scale facilities is a strategic priority

Shared research and technology infrastructures—including pilot lines, demonstration plants, and industrial testing equipment—are essential to reduce risk, cost, and time-to-market, particularly for SMEs and startups.

4. Public funding must de-risk scale-up to unlock private investment

Public support should focus on de-risking early industrial scale-up, rather than substituting private capital. Blended finance models are needed to crowd in private investors at demonstration and first-of-a-kind stages.

5. Private investment in advanced materials remains structurally insufficient

Conventional venture capital models do not align with the risk profile of advanced materials. New financial instruments and investor-focused incentives are required to mobilise long-term private capital.

6. Tax incentives for investors can significantly increase private funding

Targeted tax incentives for investors, rather than startups, are an effective tool to stimulate private investment in deep-tech and advanced materials, as demonstrated in international benchmarks.

7. Application-driven development is essential for market uptake

Materials alone do not create value. Policy support must integrate materials scale-up with application development, including downstream manufacturing and product validation.

8. Regulatory and administrative burden increases scale-up risk and cost

Fragmented regulatory requirements, high compliance costs (e.g. REACH), and slow permitting processes add significant hidden barriers to scaling advanced materials in Europe.

9. Regulatory sandboxes and trusted environments can accelerate deployment

Regulatory sandboxes and trusted IP-sharing environments enable real-world testing, faster learning, and safer interaction between innovators, regulators, and industry.

10. Skills and industrial expertise are as critical as technology

Startups often excel in technology but lack expertise in industrialisation, scaling, and market access. Policies should improve access to industrial know-how and scale-up expertise.

11. Better coordination is needed, but simplicity is essential

Improved alignment across EU and national instruments is necessary, but over-complex coordination risks slowing innovation. Policies should prioritise clarity, predictability, and speed.

12. The Advanced Materials Act should focus on deployment, not only innovation

To strengthen European competitiveness, the Advanced Materials Act must prioritise:

- Scale-up and first industrial deployment
- Access to shared infrastructures
- Blended finance and investor incentives
- Application-oriented ecosystems
- Regulatory simplification across Member States



7. Policy-Ready Key Messages from the FAME Workshop for Advanced Materials in Europe

Europe will only remain competitive in advanced materials if it becomes the best place not just to invent them, but to scale, industrialise, and deploy them.

1. Scale-up, not discovery, is Europe's critical bottleneck

Europe's challenge is no longer the generation of advanced materials, but their industrial scale-up and market deployment. Limited access to pilot lines, industrial testing facilities, and demonstrator environments remains the primary barrier to competitiveness.

Policy implication:

Prioritise EU-level and national funding for scale-up infrastructure, test beds, and industrial demonstrators, with guaranteed access for SMEs and startups.

2. Advanced materials must be supported through application-driven ecosystems

Advanced materials are not marketable as standalone products; applications drive adoption. Europe lacks facilities where new materials can be integrated, tested, and validated in real industrial products.

Policy implication:

Support application-focused partnerships between material developers, end users, and large industrial players, including shared pilot manufacturing capabilities.

3. Regulatory complexity, not safety ambition, slows innovation

Industry fully supports Europe's high safety and environmental standards. However, fragmented, complex, and resource-intensive regulatory processes disproportionately burden SMEs and deter investment.

Policy implication:

Simplify administrative procedures, harmonise requirements across Member States, and reduce duplicative reporting—without lowering safety or environmental protection.

4. Regulation must be integrated earlier in the innovation lifecycle

Late-stage regulatory failures increase cost, delay market entry, and undermine investor confidence. Early integration of regulatory requirements enables faster, safer, and more predictable scale-up.

Policy implication:

Promote early-stage regulatory guidance, Safe and Sustainable by Design (SSbD), early life-cycle assessment (LCA), and fit-for-purpose OECD test guidelines during R&D and scale-up phases.

5. Testing methods, standards, and metrology must keep pace with innovation

Innovation in advanced materials currently outpaces the development of standards, test methods, and measurement capabilities, creating uncertainty for both industry and regulators.

Policy implication:

Accelerate the co-development of standards, test methods, and metrology alongside innovation, and ensure industry involvement in OECD and ISO processes.

6. Access to trusted testing and regulatory sandboxes is essential

Industry needs safe environments to test new materials and applications at scale before full regulatory approval.

Policy implication:

Establish regulatory sandboxes, pilot zones, and real-world testing environments to allow controlled experimentation while ensuring safety and public trust.

7. Skills shortages threaten Europe's advanced materials leadership

Europe faces a shrinking talent pipeline in materials science and engineering, affecting both industry and academia. This threatens long-term competitiveness and industrial resilience.

Policy implication:

Invest in skills development across the entire pipeline, from schools to lifelong learning, strengthen advanced materials academies, and improve the visibility of materials science careers.

8. SMEs and startups require targeted support

SMEs face disproportionate challenges related to regulation, testing costs, and access to expertise, limiting their ability to scale innovations.

Policy implication:

Design dedicated SME-focused instruments for scale-up funding, regulatory support, access to testing facilities, and expert advisory services.

9. Member States must co-shape the Advanced Materials Act

The success of the Advanced Materials Act depends on active engagement by Member States, industry, and research stakeholders.

Policy implication:

Ensure a co-creation approach that integrates national funding instruments, stakeholder feedback, and sector-specific needs into EU-level policy design.

10. Success should be measured by market impact

The ultimate measure of success is not the number of projects funded, but whether Europe becomes the best place globally to develop, produce, and deploy advanced materials safely and competitively.

Policy implication:

Define clear KPIs focused on industrial deployment, scale-up success, investment attraction, and market uptake.

8. Main Outcomes and Strategic Directions

In General

The Future of Advanced Materials Europe (FAME) Workshop, held on 26–27 November 2025 at the University of Aveiro, brought together key stakeholders from across Europe’s advanced materials ecosystem to identify barriers, opportunities, and policy priorities for accelerating the uptake, deployment, and scale-up of advanced materials. The workshop was organised in the context of the European Commission’s preparation of the Advanced Materials Act, expected to be introduced in 2026.

Advanced materials are recognised as one of the 10 critical technologies for Europe’s economic security and industrial competitiveness. While Europe maintains a strong position in research and innovation, the workshop confirmed a broad consensus that industrial scale-up and market deployment remain the weakest links in the advanced materials value chain.

Across two days of presentations, panels, and interactive stakeholder engagement, FAME focused on:

- Overcoming barriers to uptake and deployment of advanced materials
- Improving investment conditions and scaling-up production
- Providing structured, evidence-based input to EU policymaking
- Strengthening collaboration among industry, research, investors, regulators, and public authorities

Key Findings

Scale-up is Europe’s primary bottleneck.

Participants consistently identified the transition from laboratory research to pilot, demonstration, and first industrial production as the most critical challenge. Advanced materials are capital-intensive, require long development timelines, and depend on access to specialised infrastructure that is currently fragmented or insufficiently accessible across Europe.

Advanced materials must be developed through application-driven ecosystems.

The workshop reinforced that materials alone do not generate market value; adoption is driven by applications. Europe lacks sufficient facilities where new materials can be integrated, tested, and validated in real industrial products. Without parallel application development, materials innovation frequently fails to reach the market.

Investment gaps persist at critical stages of the innovation cycle.

While early-stage public funding is relatively strong, major gaps exist at pilot and demonstration stages, where financial risk peaks. Conventional venture capital models are poorly aligned with the risk profile of advanced materials, leading to underinvestment. Public funding is most effective when used to de-risk scale-up and crowd in private capital, rather than replace it.

Access to research and technology infrastructures is a strategic priority.

Easy access to pilot lines, test beds, demonstration facilities, and industrial-scale equipment was consistently ranked as a top requirement, particularly for SMEs and startups. Better mapping, coordination, and SME-oriented access models are needed to make existing infrastructures more visible and usable.

Regulatory complexity slows innovation and increases cost.

Industry strongly supports Europe's high safety and environmental standards but highlighted that fragmented, complex, and resource-intensive regulatory processes—especially related to testing, certification, and REACH—create significant barriers to scale-up. Late-stage regulatory uncertainty increases costs, delays market entry, and discourages investment.

Earlier regulatory integration improves outcomes.

The workshop highlighted the importance of integrating regulatory considerations earlier in the innovation lifecycle through tools such as Safe and Sustainable by Design (SSbD), early life-cycle assessment, and fit-for-purpose test methods. Early integration reduces late-stage failures and increases investor confidence.

Skills and industrial expertise are critical enablers.

Europe faces a growing shortage of materials scientists, engineers, and scale-up specialists. In addition to technical skills, startups require access to industrialisation, regulatory, and market expertise to successfully scale innovations.

Supply chain resilience is increasingly important.

Discussions highlighted Europe's dependency on critical raw materials and the vulnerability of advanced materials supply chains to geopolitical and market disruptions, reinforcing the need for coordinated European strategies on sourcing, recycling, and substitution.

Implications for the Advanced Materials Act

The FAME Workshop delivered clear, stakeholder-driven input for the Advanced Materials Act, highlighting the need to:

- Prioritise scale-up, demonstration, and first industrial deployment
- Strengthen access to shared infrastructures and testing facilities
- Enable blended finance and investor-focused incentives
- Support application-oriented innovation ecosystems
- Simplify and harmonise regulatory processes without lowering safety standards
- Address skills shortages and industrial expertise gaps
- Ensure strong Member State involvement and co-creation

9. Overall Conclusion

The central message of the FAME Workshop is clear:

Europe's challenge is no longer inventing advanced materials, but enabling their scale-up, industrialisation, and market deployment in a competitive, safe, and sustainable way.

The outcomes of FAME provide concrete, experience-based insights that can directly inform the design and implementation of the Advanced Materials Act, helping ensure that Europe becomes not only a leader in advanced materials research, but also the best place globally to produce, deploy, and commercialise them.



10. Acknowledgments

The organizers of the FAME workshop wish to express their sincere gratitude to all those who contributed to the success of this event.

We are grateful to the European Commission's Directorate-General for Research and Innovation (DG RTD)—and in particular to Cristina Russo and Wide Hogenhout—for their institutional support and for connecting the workshop's outcomes to the preparation of the forthcoming Advanced Materials Act. We also thank the co-organizers: the Technology Council's Subgroup on Uptake and Deployment, chaired by Sean Kelly; the Portuguese National Innovation Agency (ANI) and Director António Grilo; the University of Aveiro; IAM-I; and the EU-funded InnoMatSyn project, for bringing together such a diverse and high-level group of stakeholders.

We warmly thank the University of Aveiro for hosting the event and acknowledge the presence of Artur Silva, Vice-Rector, and the opening address by Fernando Alexandre, Minister of Education, Science, and Innovation. Their participation underscored the strategic importance of advanced materials for the University of Aveiro, the central region of Portugal, the nation, and the broader European landscape.

Our appreciation extends to all invited speakers, panel chairs, and panelists for their expert contributions spanning regulation, investment, scale-up, standards, education, and industrial deployment, and for fostering open, constructive dialogue across sectors. We equally thank all workshop participants—from industry, research institutions, public authorities, and funding bodies—whose active engagement in the interactive sessions and discussions contributed directly to the outcomes presented in this report.

Finally, we acknowledge the support of CICECO—Aveiro Institute of Materials and the local organizing team for ensuring the smooth running of the event. The insights gathered at FAME will serve as a foundation for Europe's continued efforts to lead in the development, production, and deployment of advanced materials.

11. Annexes

Annex 1 – The program

Tabela: FAME program

FAME - part one - Future of Advanced Materials in Europe		
Time	Session	Speaker
26/Nov	Day 1	Overcoming Barriers Faced in the Uptake and Deployment of Advanced Materials
13.00	Registration	
	Chair	Paula M. Vilarinho
13.30	Official Opening	
13.30	Open (housekeeping)	Paula M. Vilarinho, University of Aveiro & Technology Council Sub Group A Member Paulo Jorge Ferreira, Rector of the University of Aveiro
13.35	Welcome by University of Aveiro	Fernando Alexandre, Minister of Science and Technology
13.42	Welcome from the Minister of Science and Technology (Video)	
13.49	Welcome from ANI	Antonio Grilo, President ANI
	Welcome from the European Commission	Cristina Russo, Director for Global Approach & International Cooperation in R&I in DG Research and Innovation of EC
13.56	Innovative Advanced Materials in the EU	Wide Hogenhout, DG RTD European Commission
14.05	Session 1	
	Uptake and Deployment of Advanced Materials - Technology Council Recommendations	Sean Kelly, Nanotechnology Industries Association & Technology Council Sub Group A Chair
14.15	Advanced Materials in Future Electric Drives	Robert Plikat, VW Group, Germany
14.35		Javier Bonilla, The European Construction and sustainable built environment Technology Platform (ECTP), Acciona Construction, Spain
14.50	Advanced Materials in Construction	
15.05	Coffee Break	
	Regulations for Better Access to the Market: The EU Test Methods Strategy	Ester Kardinaal, Ministerie van Infrastructuur en Waterstaat, The Netherlands
15.30	Up to date Test Guidelines for Advanced Materials for Better Regulation and Access to the Market	
15.45		Elisabeth Heunisch, Federal Institute for Occupational Safety and Health (BAuA), Germany Charles Clifford, Chair ISO/TC 229 Nanotechnologies and National Physical Laboratory (NPL), United Kingdom
16.00	Standards for Advanced Materials	Natalia Konchakova, Helmholtz-Zentrum hereon GmbH and Coordinator of the DigiPass CSA, Germany
16.15	Digital Product Passports: Accelerating Industrial Uptake for SMEs	

16.30	Education and Skills: The Advanced Materials Academy	Krysta Martinez, European Institute of Innovation & Technology, EIT
16.45	Panel 1: Overcoming Barriers Faced in the Uptake and Deployment of Advanced Materials	Sean Kelly - CHAIR- NIA Robert Plikat Javier Bonilla, Acciona Construction, Spain Stephan Schunk (BASF) Rosita Cottone, Bundesministerium für Forschung, Technologie und Raumfahrt, Germany Ester Kardienaal Elisabeth Heunisch Charles Clifford (NPL) Natalia Konchakova, DigiPass CSA, Germany
18:00	Conclusion of Day 1	Sean Kelly/ Wide Hogenhout
18.15	Day 1 close	
27/Nov	Day 2	Bridging Capital and Capability: Investing in the Scale-Up of Advanced Materials
08:15	Registration	
	Chair	Paula M. Vilarinho
08.50	Welcome 2nd day	Paula M. Vilarinho
09.00	European Competitiveness and Value Chain Analysis	Christine Muller (JRC)
09.15	Investing in Advanced Materials	Luís Quaresma (Iberis Capital)
09.30	Investing in Advanced Materials 2	Almudena Trigo Lorenzo (Beable Capital)
09.45	Panel 2: On Public/ Private Investments in Advanced Materials	José Carlos Caldeira (Chair, INESC - TEC, Portugal) Alexander Pogany (MS- Austria) Luís Quaresma (Iberis Capital) Almudena Trigo Lorenzo (Beable Capital) Eva Schillinger (IAM-I) Francesco Bonnacorso (Be Dimensional)
10.45	Coffee Break	
	Chair	Sean Kelly
11:00	Scale-up of advanced materials	Pierre Robert (Michelin)
11.20	Innovation Centres and Test Beds	Ane Irazustabarrena Murgiondo (TECNALIA) Jose M. Serra (ITQ)
11.50	Panel 3: On scale-up of Advanced Materials	Nelson Ferreira (Chair, Bosch Termotecnologia, Portugal) Esther Hurtos (EURECAT) Pierre Robert (Michelin) Ane Irazustabarrena Murgiondo (TECNALIA) Jose M. Serra (ITQ) Cristina Fernandes (Palbit)
12.50	Public Procurement	Marlene Grauer (BME)
13.05	Bringing the EU Together: InnoMatSyn Project	Andreas Falk (BNN)
13.20	Conclusion and Next Steps	Sean Kelly/ Wide Hogenhout
13.30	Lunch and close/link to second part of the joint event	

Annex 2 – Slido questions and answers

Annex 3 – The Presentations

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Annex 4 – The video & the Photos

<https://photos.app.goo.gl/X3UYjVDVS6jeoNDEA>



Executive Summary Teaser

This report presents the outcomes of the FAME Workshop, highlighting a clear conclusion - ***Europe's bottleneck in advanced materials is not research, but scale-up and deployment.***



Scale-up & Industrialization :
Crossing the valley of death



Investment:
De risking investment & smart financing



Regulations:
Simplify and harmonise regulatory processes



Building:
Shared infrastructure, skills boost & co-created innovation for the Advanced Materials Act!

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