

June 2026

The advanced materials sector in Catalonia

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ACCIÓ

Government of Catalonia



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Carried out by

Strategy and Competitive Intelligence Unit of ACCIÓ
CLUSTER | DEVELOPMENT

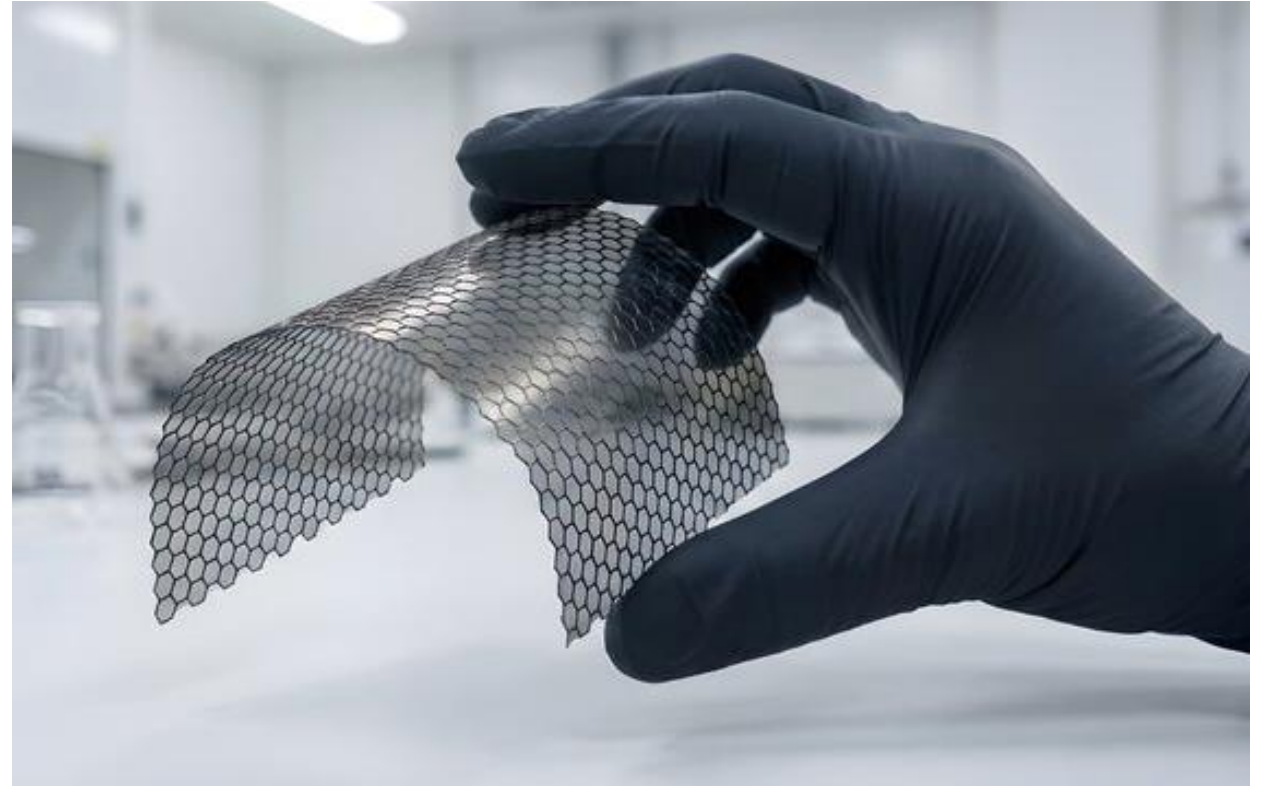
Collaboration

Business Strategy Unit
ClústerMAV

Barcelona, June 2026

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The advanced materials sector in Catalonia

1. Executive summary

The advanced materials sector, an expanding market

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The growing advanced materials sector

- Advanced materials are materials with improved or new functional properties compared to conventional materials. They are intentionally designed or modified to present superior or specific properties (mechanical, electrical, thermal, optical, chemical or functional).
- The advanced materials sector is **expected to show a compound annual growth rate of 8.1%** (2026 – 2030).
- Applications linked to the aerospace and security and defence sectors are some of the main future growth drivers of the global market.

A sector with a consolidated track record and a strong presence in Catalonia

- The advanced materials sector in Catalonia has **936 companies**, a **turnover of €3,608 million** and **9,606 people employed**.
- Compared to the 2020 edition, the sector in Catalonia has experienced a growth of 21.7% in the number of companies, 35.6% in turnover and 58.3% in the number of people employed.
- The sector includes companies specialised in various materials; however, there is a strong concentration of companies in polymers (355 companies), textiles (201 companies) and metals (197 companies).
- Companies located in the transformation and materials processing stages predominate, especially in activities such as advanced machining, metallurgy, composites, polymers or component manufacturing.
- Three main business models can be identified: industrial companies with a manufacturing-based model, companies with a technology-based model and value-added services.

The technological *know-how*, the sector's main competitive asset

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Main trends in the advanced materials sector

- The sector's main competitive asset is its technological *know-how*, but the key challenge is transferring it to the market in a scalable way.
- Diversification towards higher value-added and more technologically demanding markets (health, security, energy) is key to reducing dependence on more mature sectors or those under greater cost pressure.
- Value creation in advanced materials is gradually shifting towards applications, and not only towards the material itself.
- The recycling of complex materials (composites, multi-materials or advanced plastics) is emerging as one of the major technological challenges.
- The hybridisation of materials and technologies is becoming a key trend.
- China's growth in industrial and technological capabilities in advanced materials is accelerating global competition.
- AI can accelerate the development of new materials and optimise industrial processes, thereby reducing development time and production costs.
- Europe's dependence on raw materials and critical materials reinforces the importance of developing capabilities in advanced recycling, material substitution and new formulations.
- The main transformation drivers of the sector are clear: sustainability and circularity, digitalisation and AI, electrification, new performance requirements and advanced manufacturing.
- The exploitation of demand-pull markets (security, health and energy, among others) and the definition of business models adapted to purchasing criteria and ways of competing in the sector are decisive.

Source: ACCIÓ

The advanced materials sector in Catalonia

2. Overview of the advanced materials sector

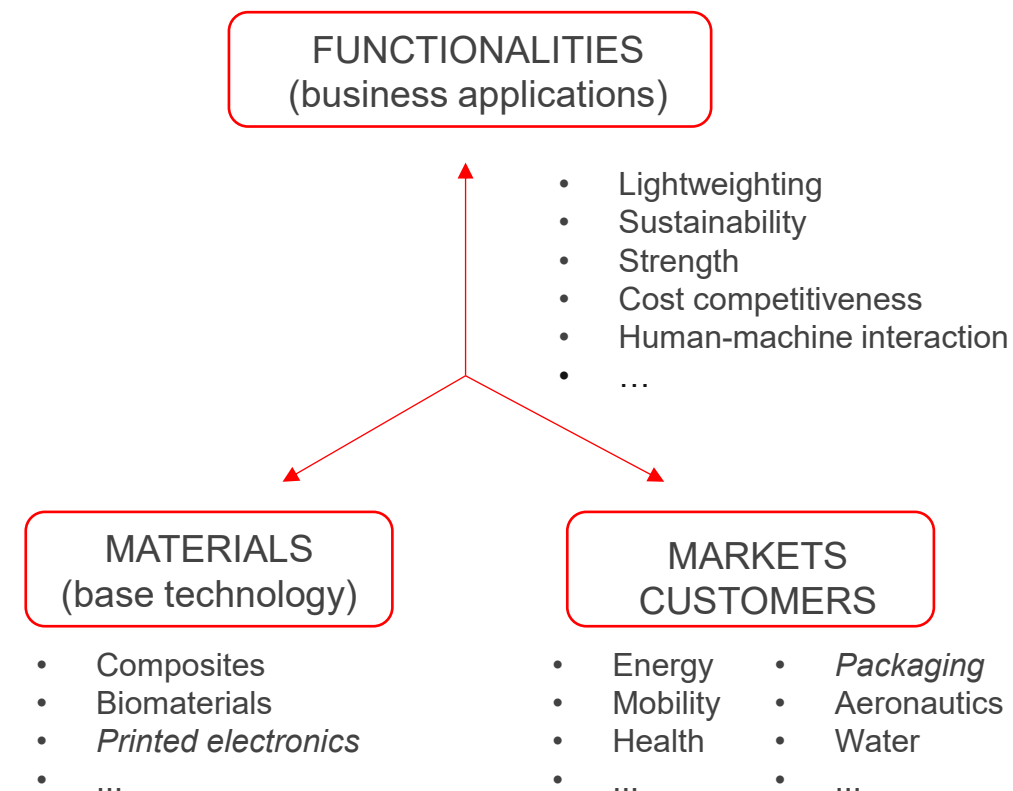
Definition of “advanced materials”

- Advanced materials are materials with improved or new functional properties compared to conventional materials.

“Advanced materials are intentionally designed and engineered materials with innovative properties and functionalities” – definition according to the European Commission

- They are intentionally designed or modified to present superior or specific properties (mechanical, electrical, thermal, optical, chemical or functional).
- They enable the optimisation of performance, efficiency, sustainability and functionality across different application areas.

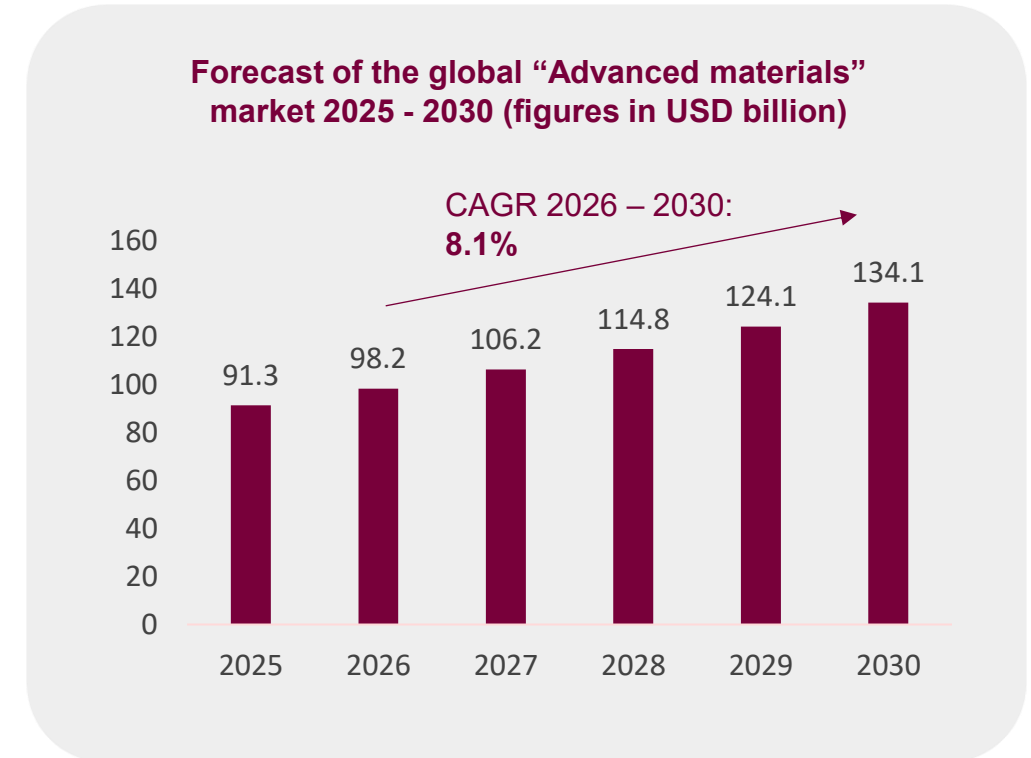
Example of segmentation variables for advanced materials



Source: ACCIÓ

Future evolution and growth expectations

- The size of the advanced materials market has grown significantly in recent years. **It is expected to increase from \$91.27 billion in 2025 to \$98.22 billion in 2026, with a compound annual growth rate (CAGR) of 7.6%.**
- The historical growth can be attributed to:
 - The expansion of aerospace and defence manufacturing
 - The increase in industrialisation and infrastructure development
 - Rising demand for durable and high-strength materials
 - The expansion of automotive production volumes
 - Technological progress in materials science research
- The size of the materials market is expected to continue growing in the coming years. **It is projected to reach \$134.03 billion in 2030, with a compound annual growth rate (CAGR) of 8.1%.**
- The growth during the forecast period can be attributed to:
 - The increase in the adoption of electric vehicles
 - The growing demand for advanced medical devices
 - The growth of renewable energies and energy systems



Source: ACCIÓ, based on data from *The Business Research Company*

Main global players

The main global players are predominantly from the chemical sector. Some of the most prominent companies worldwide in the field of advanced materials include:



Manufactures ceramics and glass microspheres as advanced materials for multiple industries.



Integrates nanotechnology into its operations and uses organic synthetic chemistry, polymer chemistry and biotechnology as core technologies.



One of the world's leading manufacturers of high-quality polymer materials and their components. Chemical plant and factory in Catalonia.



One of the global leaders in materials science. Operational centre in Tarragona.



Designs innovative and sustainable materials for new energies and technologies, resource depletion, mobility and the increasing urbanisation. Chemical plant in Barcelona.



Chemical company developing advanced sustainable applications and process innovation. Offices in Barcelona.



Leading company in chemicals, surface technologies, solutions and advanced materials for a sustainable future. Factories and centres in Catalonia.



Leading producer of carbon fibre reinforcements, resin systems and honeycomb panels for the commercial aerospace sector.



Multinational chemical company with three business divisions: Polyurethanes, Advanced Materials and Performance Products. Factory in Barcelona.



Advanced solutions that help transform industries and improve everyday life in key markets: healthcare, water, construction and processing. Factory in Tarragona.

International initiatives in the field of advanced materials

Several international initiatives of interest in the field of advanced materials have been identified:



Five of these initiatives have been analysed in detail, standing out for the diversity of materials, the variety of application markets and the shared business challenges with the advanced materials sector in Catalonia.

Source: ACCIÓ, based on the websites of the different companies

Top 5 international initiatives in the field of advanced materials (I)

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Initiative		 
Name	Polymeris	New Materials Cluster
Geographical scope	6 regions in France (headquarters in Bellignat, Auvergne-Rhône-Alpes)	Bavaria (Germany)
Members	590	+500
Foundation	2005	2015
Scope of activity	Plastics, rubber and composite materials	New materials and smart manufacturing
Main objective	To address the global challenges of digital and ecological transition in order to enable the development of smart, safe and sustainable products.	To accelerate knowledge and technology transfer between companies, universities and technology centres in the field of advanced materials and innovative manufacturing processes.
Areas of activity in materials	1. Advanced materials 2. Functional products 3. Circular economy 4. Manufacturing technologies 5. Future industry	1. Lightweight metallic materials 2. Fibre composites 3. Polymer properties and processing 4. Large-area processable electronics materials 5. Technical ceramics and glass 6. Functionalised surfaces 7. Technical textiles
Website	https://www.polymeris.fr/ (Gold Label)	https://www.bayern-innovativ.de/en/services/material/new-materials-cluster/

Top 5 international initiatives in the field of advanced materials (II)

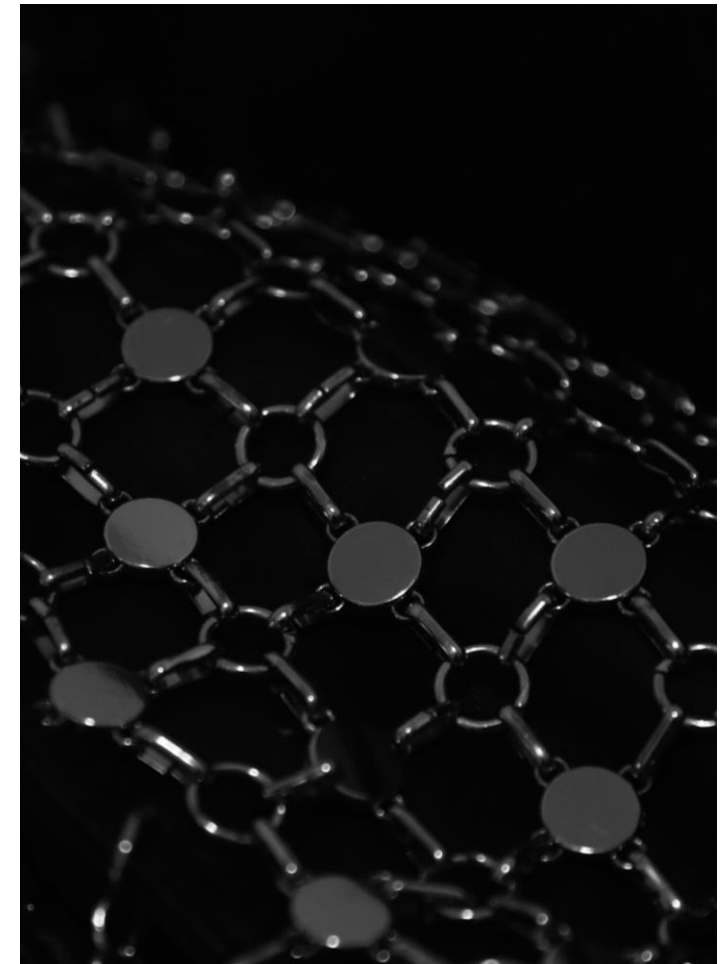
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Initiative	 DANISH MATERIALS NETWORK	 Techtera	 Catalisti
Name	Danish Materials Network	Techtera	Catalisti
Geographical scope	Syddanmark, southern and central region (Denmark)	Écully, Auvergne-Rhône-Alpes (France)	Antwerp, Flanders (Belgium)
Members	114	269	169
Foundation	2014	2005	2011
Scope of activity	Metals, ceramics and polymers	Textiles (fibres, fabrics and textile materials)	Chemistry and plastics
Main objective	To promote competitiveness through innovation in materials and manufacturing technologies.	To strengthen the competitiveness of its members through collaborative innovation and contribute to enhancing the influence of the French textile sector at both national and international level.	To actively contribute to competitive and sustainable chemical and plastics industries through work on new value chains, improved innovation capacity, knowledge pooling and the promotion of a sustainable economy.
Areas of activity in materials	1. Circular economy and recycling 2. Hybrid materials 3. Phase-change materials 4. Functional materials	1. Smart and high-performance materials 2. Circular economy and resource economy 3. Future industry and new economic models	1. Bio-based value chains (BVC) 2. Process intensification and transformation 3. Circularity and resource efficiency 4. Advanced sustainable products
Website	https://www.dmn-net.com/ (Gold Label)	https://www.techtera.org/	https://www.catalisti.be/en

Main conclusions from the initiatives analysed

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- **Evolution** towards **multi-material clusters**.
- **Sustainability** is consolidating as a central challenge and a priority area of action.
- Data-driven **sustainability** (LCA, TCO) acts as a lever for material substitution.
- **Recycling technologies** are emerging as an opportunity across the different stages of the process.
- **Segmentation** of **recycling** between industrial and end-of-life waste.
- Proximity to **demand-pull** markets becomes a critical factor.
- **Interaction** with **certification bodies** and testing capabilities is key to accelerating time-to-market.
- **Duality of specialisation**: vertically integrated manufacturers vs. cross-cutting technologists.
- **Diversification** of **business models** according to market vertical (custom, series, IP, projects).
- **Evolution** towards **complete solutions**, from components to systems with associated services.

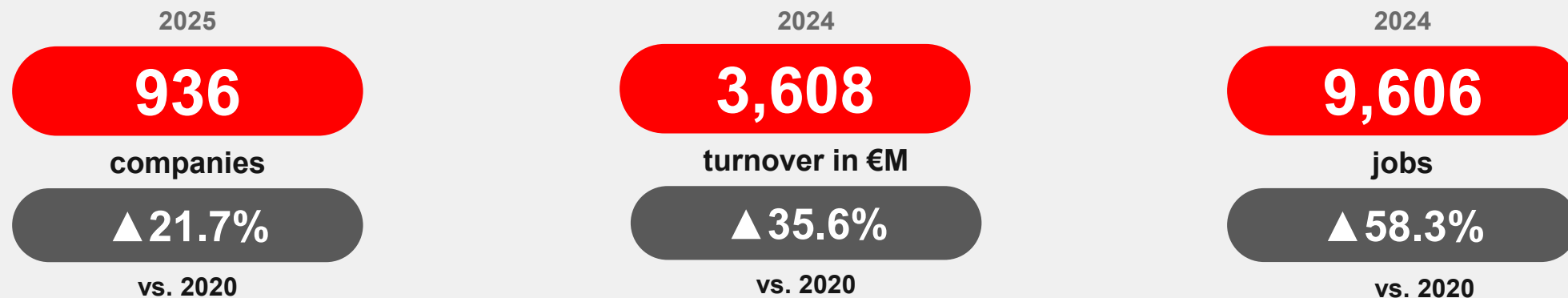


Source: ACCIÓ, based on the websites of the different companies

The advanced materials sector in Catalonia

3. The advanced materials sector in Catalonia

Key data for the advanced materials sector in Catalonia



Note: Unconsolidated turnover and employment data from the latest available year, mostly 2024 or 2023

Source: ACCIÓ, based on SABI

Sizing of the value chain of the advanced materials sector in Catalonia

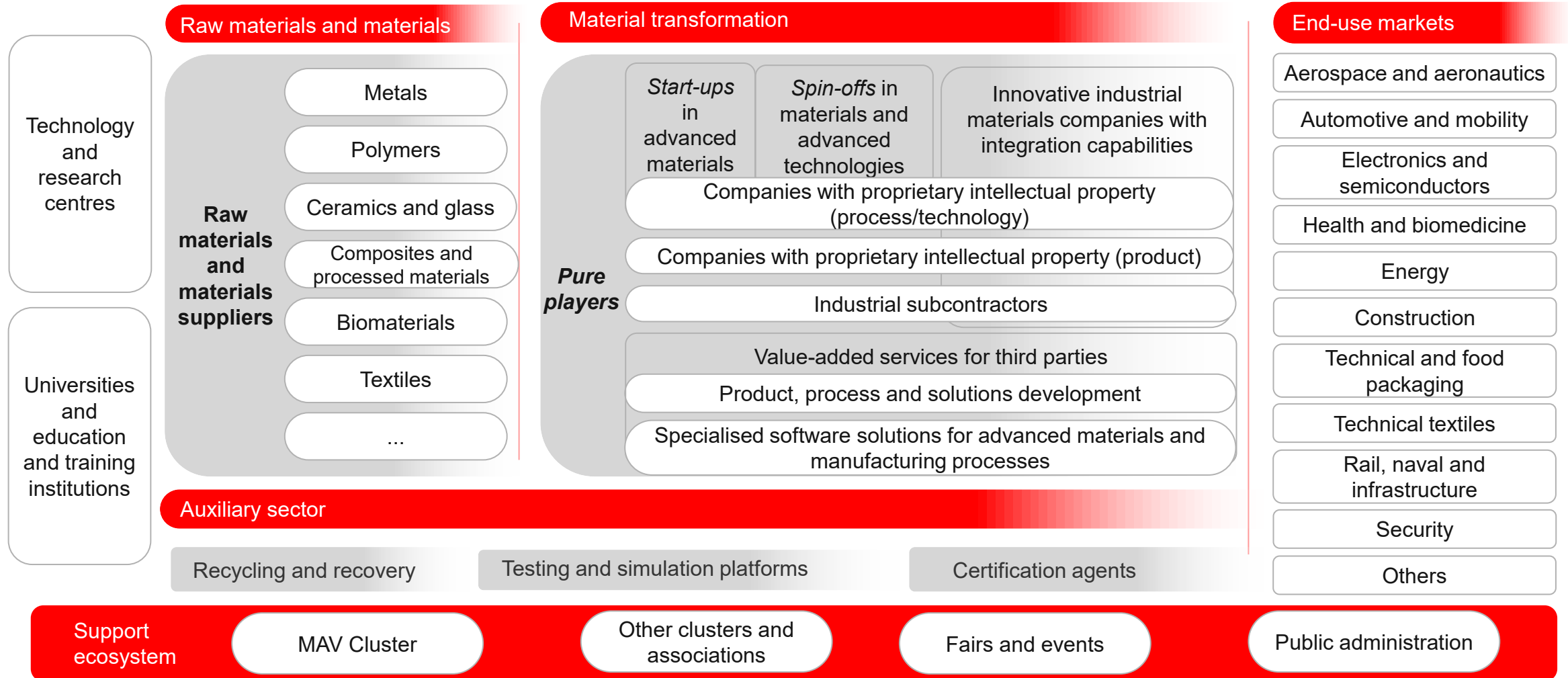
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	No. of companies	% of companies	Weighted turnover (in €M)	% of turnover	Number of employees	% of employees
TEXTILE	201	21%	427.8	12%	1,475	15%
POLYMERS	355	38%	1,970.2	55%	4,420	46%
METALLIC	197	21%	561.3	16%	1,384	14%
COMPOSITES AND PROCESSED MATERIALS	47	5%	281.4	8%	786	8%
CERAMICS AND GLASS	65	7%	87.1	2%	352	4%
BIOMATERIALS / NATURAL MATERIALS	31	3%	173.3	5%	839	9%
OTHERS	40	4%	106.4	3%	337	4%
Grand total	936	100%	3,608.0	100%	9,606	100%

Source: ACCIÓ, based on SABI

Value chain of the advanced materials and advanced manufacturing technologies sector in Catalonia

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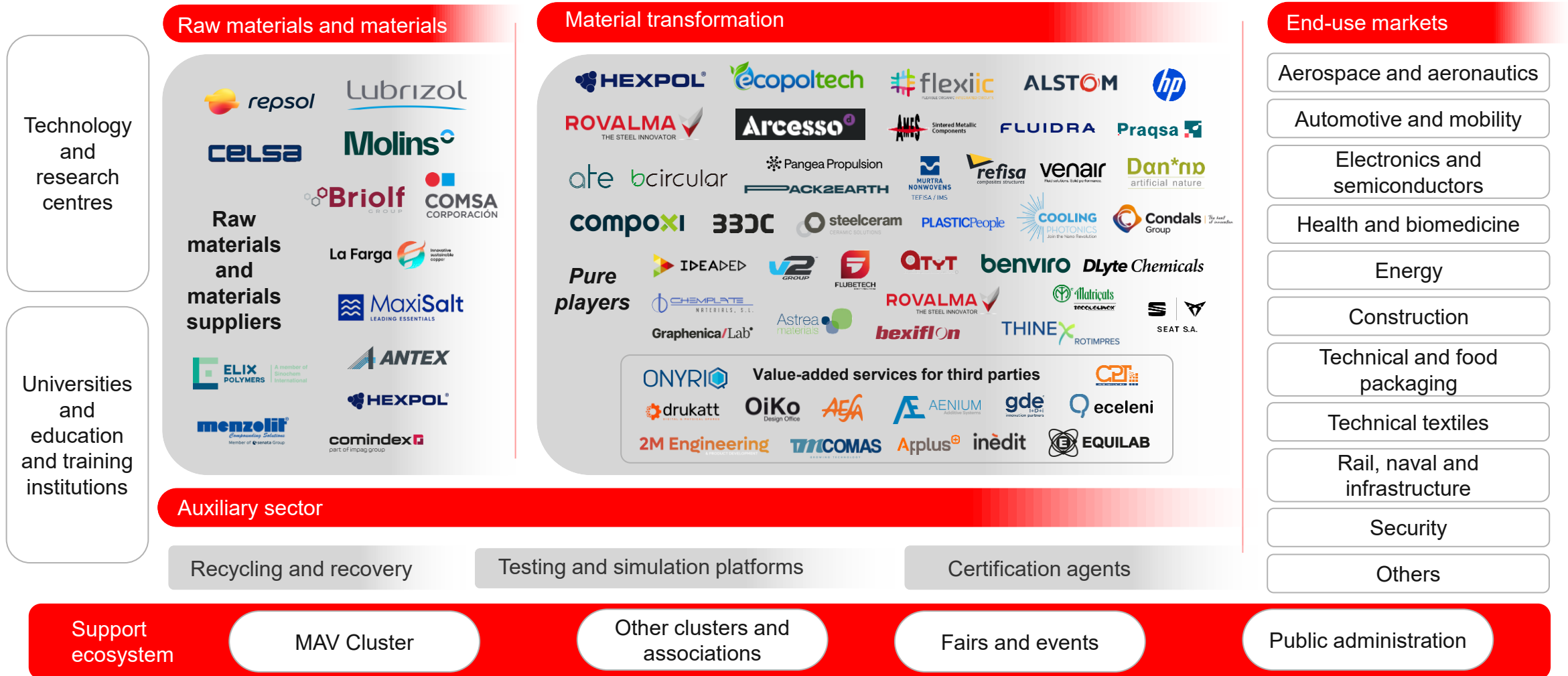


Note: Shaded categories have been considered in the sector mapping

Source: ACCIÓ

Value chain of the advanced materials and advanced manufacturing technologies sector in Catalonia

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Note: Partial, non-exhaustive representation of some of the main actors for each of the ecosystem categories

Source: ACCIÓ

Ecosystem of the advanced materials and advanced manufacturing technologies sector in Catalonia ²⁰

Clusters

ACCIO

cluster catalonia

Vigència: 30/12/2026

Generalitat de Catalunya

Mav

MATERIALS AVANÇATS DE CATALUNYA

Modacc

cluster català de la moda

CREC

Cluster de residus de Catalunya

LIGHT MOBILITY CLUSTER

PACKAGING X CLUSTER

in-move

Cluster de Mobilitat y Logística Multimodal

secpho

ciac

Clúster de la Indústria d'Automoció de Catalunya

Education and research centres

ELISAVA

UNIVERSITAT DE VIC

UNIVERSITAT CENTRAL DE CATALUNYA

Elisava Research

UNIVERSITAT DE BARCELONA

MICMAB

INSTITUT DE CIÈNCIA DE MATERIALS DE BARCELONA

CIM UPC

Centre Català del Plàstic

CIT UPC

CENTRO DE INNOVACIÓN Y TECNOLOGÍA

UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

NANOMOL

CENTRE OF NANOTECHNOLOGY AND MOLECULAR MATERIALS

CPT

MORE THAN COATINGS

ICN2

Institut Català de Nanociència i Nanotecnologia

UAB

Universitat Autònoma de Barcelona

CEMIC

Centre d'Enginyeria de Microsistemes per a Instrumentació i Comunicacions

in²

Institut de Nanociència i Nanotecnologia

UNIVERSITAT DE BARCELONA

Universitat de Girona

Campus Compòsits

ICIQ

Institut Català d'Investigació Química

ICFO

IQS

UNIVERSITAT RAMON LLULL

DIOPMA

Centre de Disseny i Optimització de Processos i Materials

IREC

Shaping Energy for a Sustainable Future

cnm

Centro Nacional de Microelectrónica

CSIC

Materfad

Centre de materials

Centro de materiales

Materials centre

Barcelona

intexter

IBEC

Institute for Bioengineering of Catalonia

Leading events and trade fairs

EXPOQUIMIA

Encuentro Internacional de la Química y las Industrias de Proceso

MWC

Barcelona

4YFN

Connecting Startups

CONSTRUMAT

EQUIPLAST

Encuentro Internacional del Plástico y el Caucho

BATTERY & ES TECH

BATTERY & ENERGY STORAGE EUROPE

Plastics & Rubber

Paint & Coatings

ADVANCED FACTORIES

EXPO & CONGRESS

Technology centres

eurecat

Centre Tecnològic de Catalunya

LEITAT

managing technologies

Infrastructures

ALBA

ZF

CONSORCI barcelona

ZONA FRANCA

Note: Partial, non-exhaustive representation of some of the main actors for each of the ecosystem categories
Source: ACCIÓ

Profile and strategic focus of the advanced materials sector

- The advanced materials companies identified show a high degree of technological and product sophistication, with significant innovation dynamics.
- A distinction can be made between companies specialised in materials and companies specialised by market segment.

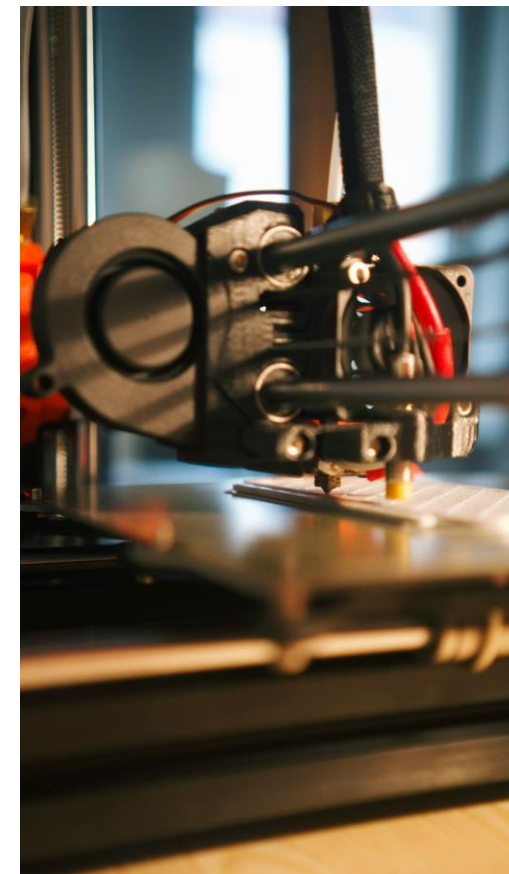
Companies specialised in materials

- They tend to compete based on their know-how in formulation or processing, which they apply across various sectors and market niches.
- They possess deep material expertise and proprietary formulation capabilities as competitive advantages.
- They often do not have large-scale industrial production capacity.

Companies specialised by market segments

- They tend to exhibit a greater degree of vertical (industrial) integration.
- They may act as integrators and have the capability to hybridise different types of materials.

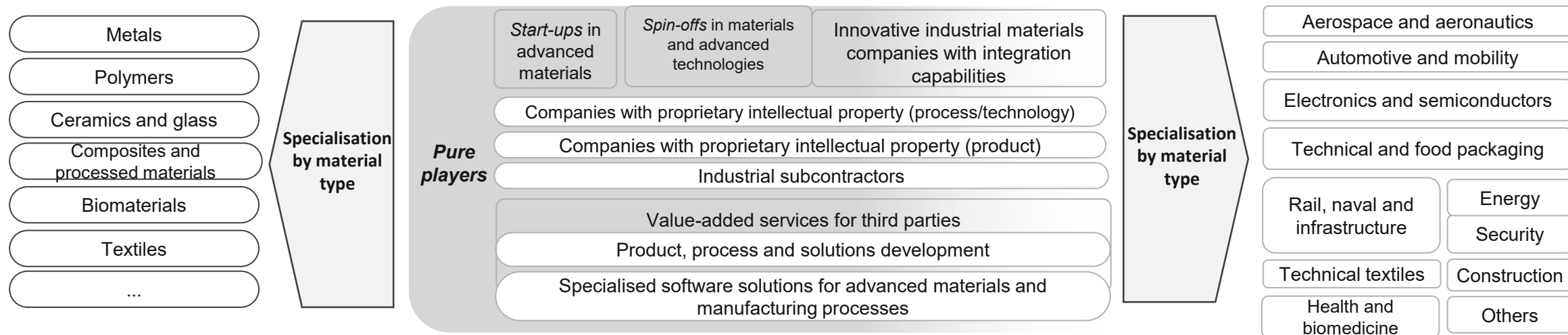
There is a greater predominance of technological specialisation strategies based on capabilities and proprietary *know-how* in a material, as opposed to specialisation by business segment.



Source: ACCIÓ

The value chain of the advanced materials sector

- The main demand-pull sectors for advanced materials are: **health, energy, construction, industrial applications, aerospace, automotive, rail, cosmetics and security.**
- Companies focused on applications show a greater degree of vertical integration and a stronger capability to hybridise materials.
- Companies operating in transformation and processing stages predominate (advanced machining, metallurgy, composites, polymers and component manufacturing).
- There is a limited presence of base material producers, resulting in dependence on global supply chains.
- The development of new materials is relatively uncommon within companies and is concentrated mainly in research centres, spin-offs and chemical companies.
- There are companies with capabilities in formulation and the development of high value-added materials.



Source: ACCIÓ

Types of companies and business models in the advanced materials sector

■ The nature of the different types of companies identified shapes both the strategic approach and the challenges faced:

- **Scientific spin-offs** are built on a high level of technological knowledge, but often lack a business strategy, particularly regarding markets, business models and scalability. Their main challenge is to transfer technology to the market and establish a solid management and financing structure.
- **Start-ups in the materials field**, whether science-based or not, demonstrate a high degree of versatility and tend to apply their knowledge across multiple sectors. Their challenge is to focus growth, prioritise markets and scale industrially without losing innovative capacity.
- **Innovative SMEs** have strong industrial capabilities and introduce technological differentiation to compete in high-value niches. Their challenges include maintaining continuous innovation, diversifying markets and connecting with scientific and technological stakeholders.
- The **R&D or innovation departments of large user companies** have access to resources, but do not always focus on advanced materials. Their challenge is to align materials projects with their corporate strategy and turn them into tangible competitive advantages.

■ Three main business models can be distinguished:

- **Industrial companies with a manufacturing-based model**: These are industrial companies, mainly subcontractors, that manufacture on demand, predominantly in short production runs.
- **Companies with a technology-based model**: Companies that develop technology and commercialise it with sales or licensing models.
- **Value-added services**: Providers of specialised technology-based services such as product, process and solution development, among others.

Beyond the superior performance of advanced materials, differentiation strategies based on factors such as sustainability and customisation can also be identified.

Source: ACCIÓ

Business specialisation and competitive differentiation factors

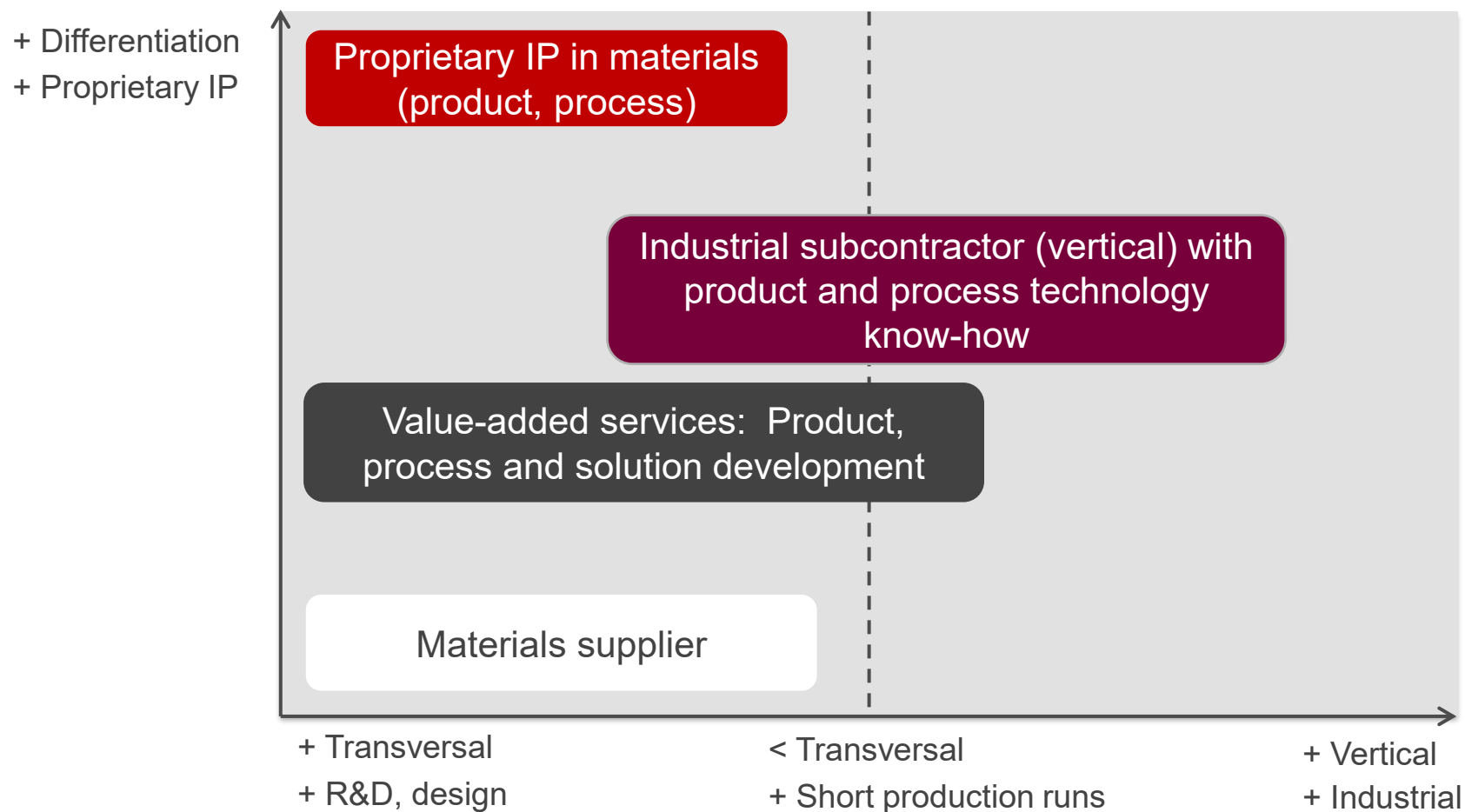


- A significant presence of companies with industrial capabilities can be observed in the region, particularly in transformation and processing activities. These companies typically operate in short or medium production runs and have a high degree of specialisation, serving demanding industrial sectors such as aerospace, security, medical devices and high-performance automotive components.
- At the same time, there is a notable group of companies highly specialised in technological development and materials engineering, focused on the design, formulation and development of advanced solutions. This segment of companies often accounts for a significant share of the innovative capacity within the value chain in Catalonia.
- Diversification strategies towards new sectors or industrial applications have been identified, with the aim of leveraging materials expertise or processing technologies to expand markets and reduce sector dependence.
- Among the main competitive differentiation factors are:
 - Deep knowledge of materials and advanced processing technologies
 - Positioning in industrial niches with demanding material requirements
 - Production flexibility and the ability to adapt to short runs
 - Sustainability as a growing driver of innovation (more sustainable materials, energy efficiency or recyclability)

The sector stands out for its specialisation in material transformation and application technologies, with companies focused on demanding industrial niches and a more limited presence in the production of base materials.

Source: ACCIÓ

Strategic options for companies in the advanced materials and advanced manufacturing technologies sector (I)



Source: ACCIÓ

Strategic options for companies in the advanced materials and advanced manufacturing technologies sector (II)

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Key success factors by strategic option

Proprietary IP in materials (product, process)

- Sustained capability in advanced R&D and technological development.
- **Intellectual property strategy (patents, *know-how*).**
- Access to **innovation funding** (capital, public projects, venture capital).
- **Technology transfer and industrial scaling** capabilities.
- Development of competitive advantages based on **differentiated technologies or new materials**.

Value-added services: Product, process and solution development

- **Applied R&D capability** in materials, processes and design.
- Cross-sector knowledge of different industries and applications.
- Technical team with expertise in **materials engineering, simulation and prototyping**.
- **Co-development capability with customers** (co-design).
- Technological infrastructure: laboratories, pilot facilities, prototyping or additive manufacturing.

Industrial subcontractor (vertical) with product and process know-how

- Deep knowledge of the **product and material production process, combined with a strong understanding of its application in the customer sector** (automotive, aerospace, health, etc.).
- Industrialisation capability and production of **highly complex short or medium production runs**.
- Integration into the **customer's value chain** as a technology partner.
- Sector-specific certifications and the ability to comply with demanding standards
- Automation and optimisation of production processes to reduce costs and lead times.

Materials supplier

- Production efficiency and economies of scale in materials manufacturing.
- Ability to ensure **consistent quality and industrial certifications** (ISO, regulated sectors).
- **Reliable logistics and stable supply** for industrial customers.
- Understanding of material applications to adapt specifications to customer requirements.
- Integration into **industrial supply chains** as a recurring supplier.

Source: ACCIÓ

Examples of applications by companies identified in the mapping by market



AUTOMOTIVE

Bio-circular ABS engineering thermoplastics for interior components

Sintered metal parts (bearings, filters, friction components)

Organic printed electronics chips



HEALTH AND BIOMEDICINE

Antibacterial coatings and biodegradable materials

Smart nanocapsules for oncology therapies

Sintered materials for bone substitutes and prostheses

Biocompatible and biodegradable functional polymers

Additively manufactured dental prostheses

Spinal implants



CONSTRUCTION

Recycled steel with low CO₂ emissions

Phase-change materials for thermal storage and regulation

Recyclable polyurethane solid surfaces with advanced properties



ENERGY

Multilayer photonic films for passive cooling

Depolymerisable resins for wind turbine blades

Photovoltaic and protective coatings to improve the durability of wind turbines and solar installations



SECURITY

Antiballistic and flame-retardant recycled fabrics

Composites for military vehicles and lightweight armour



AERONAUTICS AND AEROSPACE

Hybrid metal and carbon fibre structures

Satellite structures and telecommunications reflectors

Note: Non-exhaustive list of examples

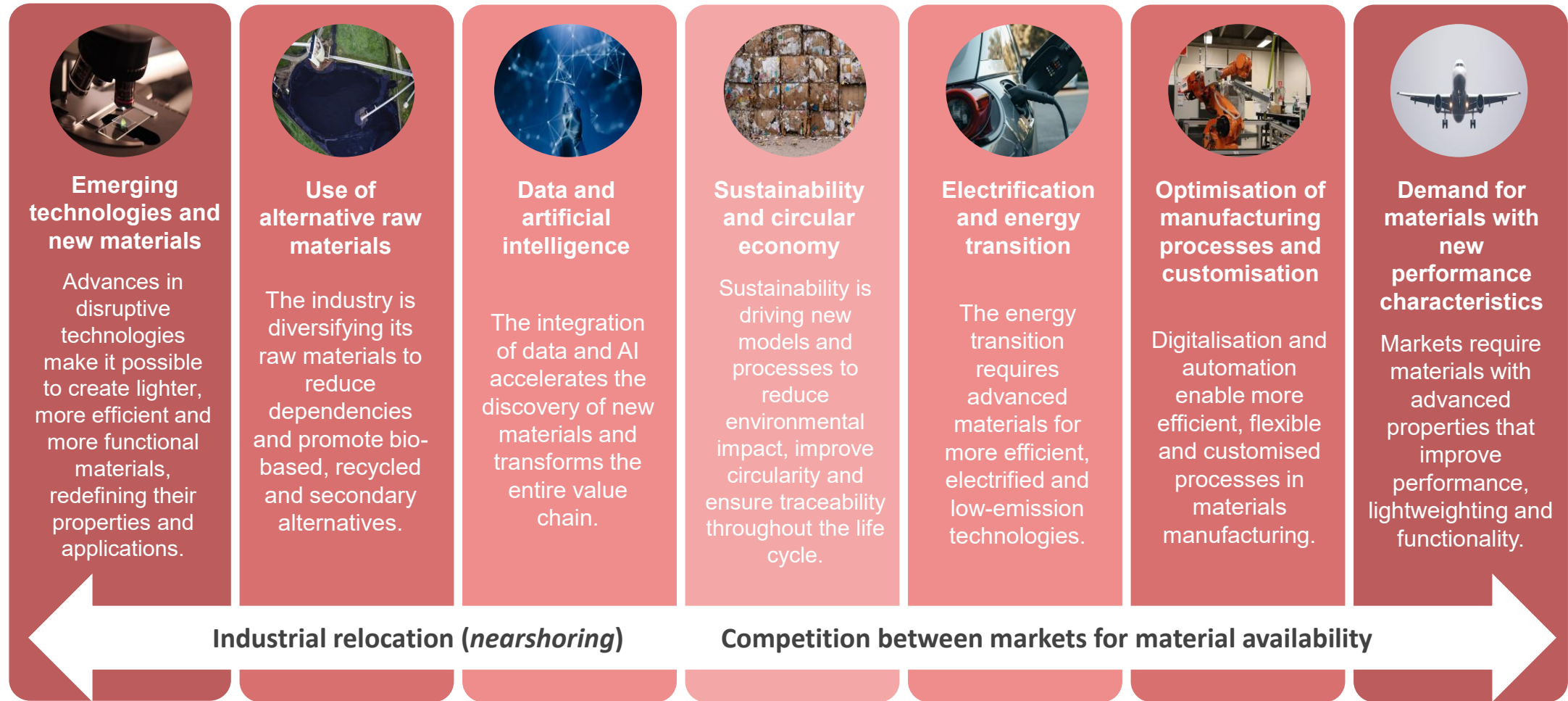
Source: ACCIÓ

The advanced materials sector in Catalonia

4. Challenges, trends and changes in the sector

Trends and business changes affecting the advanced materials sector

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R&D&I / industry push
(technological/industrial drive)

Demand pull
(demand-driven growth)

Diagnosis of the advanced materials sector (I)

STRENGTHS

- Concentration of innovative companies with sophisticated solutions and, in some cases, proprietary patents
- Presence of leading scientific centres, research groups and research infrastructures in materials (ICN2, ICMAB, IREC, DIOPMA and the Synchrotron, etc.)
- Presence of innovative companies across different materials fields (textiles, metals, polymers and ceramics, etc.)
- Know-how, patents, processes and certifications that protect established players
- Ability to apply materials knowledge in multiple industrial sectors
- Strong positioning of some companies in sustainability as a differentiation factor
- R&D capabilities and experience among many companies, together with success in securing competitive public funding
- Presence of companies operating in highly demanding sectors and providing technologically advanced solutions (e.g. Motorsport and health)
- Existence of a highly diverse industrial base that can act as a first market for new materials
- Industrial know-how in materials transformation and advanced manufacturing processes

Source: ACCIÓ

Diagnosis of the advanced materials sector (II)

WEAKNESSES

- Limited company size, restricting investment capacity, scalability and access to global markets
- Low level of technology transfer from R&D projects to industrialised market solutions
- Limited knowledge of end markets and their demand drivers or materials-related challenges, with a predominance of specialisation based on technology/materials
- Limited number of integrator companies or large local industrial players capable of acting as demand drivers for the adoption of advanced materials in the main application markets
- Difficulties in accessing specialised funding to industrialise technologies
- Few projects focused on developing local manufacturing capabilities and generating industry, with a stronger focus on generating IP than on industrial capabilities
- Lack of international positioning of Catalonia in the advanced materials sector
- Dependence on R&D projects or public funding in some cases
- Predominance of niche technology companies with limited integration into industrial value chains
- Limited collaboration between companies working with different materials

Source: ACCIÓ

Diagnosis of the advanced materials sector (III)

THREATS

- Dependence on access to raw materials from global supply chains and the resulting exposure to price volatility, geopolitical instability and restrictions on access to raw materials and critical materials
- Intense global competition, particularly from Asian ecosystems, with China strengthening its position in the advanced materials sector
- Risk of commoditisation and loss of differentiation in some segments
- Importance of mature sectors as the main customer markets (e.g. automotive), with limited growth prospects
- Competition between sectors for access to raw materials
- Shortage of specialised talent in advanced materials, regulatory and quality experts
- High barriers to entry in some demand-pull sectors and long time-to-market linked to regulations and certification requirements (health, security, aerospace, etc.)
- Lack of in-house industrial capability to scale advanced materials into end-use applications
- Acceleration of materials development in highly integrated ecosystems (USA, Asia)
- Some companies pursuing multi-location production strategies for reasons of cost, talent availability and proximity to demand

Source: ACCIÓ

Diagnosis of the advanced materials sector (IV)

OPPORTUNITIES

- Support for business diversification into new application markets
- Industrial reshoring and strengthening of European value chains
- Strengthening the cluster's positioning in all areas related to processes and technologies linked to materials (potential evolution of the cluster's name to *Advanced Materials & Manufacturing Cluster*)
- Development of the security, aerospace, health and renewable energy markets (photovoltaics, hydrogen and wind power) as growth sectors with demand-pull potential for advanced materials
- Positioning of Catalonia in the biotech and medtech fields, with a developed ecosystem and the presence of customer companies (laboratories and pharmaceutical sector), as well as in mobility segments (rail and automotive)
- Application of AI and digitalisation in materials formulation and manufacturing (digital passport, traceability, automated processes) based on sector-specific criteria (e.g. proprietary cloud solutions)
- Growing demand for more sustainable materials as an opportunity to introduce new materials into traditionally conservative sectors (e.g. construction)
- Interaction with the waste sector and promotion of joint innovation initiatives in the recycling of complex materials
- Support for the decarbonisation and sustainability of manufacturing processes
- Identification of critical players in priority market segments (e.g. medical specifiers, OEMs and Tier 1 suppliers in the wind energy sector)
- Potential to develop industrialisation capabilities in specialist niches and short production runs Support for the development of industrial scale-up opportunities
- Development of materials with new performance characteristics, functionalisation, greater conductivity and potential for material hybridisation Integrated vision of material and process
- Increasing demand for lightweight and high-performance materials
- Links with the chemical and petrochemical hub of Tarragona and its major global players

Strategic challenges in the advanced materials and advanced manufacturing technologies sector (I)

MARKET DEVELOPMENT



1. Improving market knowledge of priority business segments to enable greater specialisation
2. Supporting diversification into high-growth, value-added markets with stricter requirements (security, health, aerospace, etc.) and access to specialised industrial distribution channels
3. Overcoming market barriers (awareness among specifiers, difficulty in being accepted in Tier 1 and OEM processes due to switching cost and risk)
4. Positioning within global value chains and gaining access to OEMs

BUSINESS MODEL and CORPORATE GROWTH



1. Supporting strategic orientation (especially spin-offs) and understanding of new business models in the advanced materials sector
2. Supporting the definition of business models based on technology (sales, licensing, etc.) versus manufacturing
3. Advancing industrial scaling and establishing strategic alliances for the industrialisation of solutions
4. Increasing company size to improve scalability and competitiveness

DATA, DIGITALISATION AND ARTIFICIAL INTELLIGENCE



1. Access to data on advanced materials for AI applications
2. Digitalisation and integration of AI across the materials lifecycle (AI-designed materials or molecular simulation, quality and manufacturing control, predictive maintenance, etc.)
3. Traceability and collaboration in implementing new data-based tools (e.g. digital building passport)

Source: ACCIÓ

Strategic challenges in the advanced materials and advanced manufacturing technologies sector (II)

SUSTAINABILITY, RECYCLING AND CIRCULAR ECONOMY



1. Development of infrastructure, technology and business models for circularity and cost-competitive material recovery (e.g. chemical recycling)
2. High technical complexity of recycling advanced and multilayer materials (e.g. resins, composites)
3. Addressing the unfavourable price gap between virgin and recycled materials
4. Need to generate demand and application markets for recycled materials
5. Extension of product lifespan and eco-design of materials
6. Ensuring competitive performance of sustainable materials without loss of functionality
7. Understanding legislation and regulations affecting sustainability and recycling areas

RAW MATERIALS



1. Ensuring access to raw materials (e.g. dependence on large groups, competition between sectors)
2. Access to recycled raw materials in sufficient quantity and quality
3. Valorisation of industrial by-products and use of alternative raw materials

MULTIFUNCTIONALITY AND SYNERGIES BETWEEN MATERIALS



1. Compatibility between materials and combination of functionalities (material hybridisation / solutions combining different materials)
2. Optimisation of processes and interaction between technologies and process machinery
3. Integration with electronics (e.g. printed sensors, smart surfaces)
4. Growing relevance of lightweight materials

Source: ACCIÓ

Strategic challenges in the advanced materials and advanced manufacturing technologies sector (III)

INNOVATION AND PRODUCT DEVELOPMENT



1. Collaborative R&D in higher TRL projects addressing customer market challenges (lightweighting, new performance features, energy storage, among others)
2. Ecosystem cooperation in innovation to facilitate innovation processes with industry and complement capabilities
3. Co-innovation to adapt designs and processes with customer application sectors
4. Improving technology transfer to market Lab-to-production gap (TRL 6 to 9)
5. Reduction of time-to-market and support in product testing, certification and experimentation
6. Knowledge of new technological trends and promotion of R&D projects with driving markets.

TALENT, FINANCING AND ECOSYSTEMS



1. Lack of hybrid profiles (science + engineering + market vertical expertise)
2. Difficulty accessing private financing due to long return horizons
3. Collaboration with other initiatives and integration as a provider of technological know-how with other clusters

Source: ACCIÓ

The advanced materials sector in Catalonia

5. Success stories

Success stories of Catalan companies in the advanced materials sector



Company focused on the development, manufacturing and **commercialisation of implantable surgical devices based on biocompatible advanced materials.**

It is positioned as a success story due to its focus on replacing traditional materials with higher-performance alternatives, as well as its use of technologies enabling high levels of personalisation.

It has more than 80,000 implanted patients in 25 countries and operates in areas such as cardiac surgery, spinal surgery and neurosurgery.



ONYRIQ was founded in 2016 to address **a gap in applied polymer research.**

The company develops and researches new polymer materials. Its main research lines include circular economy and sustainability, health and medical devices, as well as materials for 3D printing.

Among its proprietary technologies are polyolefin depolymerisation, depolymerisable epoxy resins and fluorine-free omniphobic coatings.



SME founded in 2010, **specialising in advanced polyurethanes.**

It operates with a high level of vertical integration, covering material development and machinery engineering through to mould creation, painting, process industrialisation and final product manufacturing.

It is specialised in technically demanding application markets, including housings for different types of equipment.



REFISA is an industrial company **specialised in the design, engineering and manufacturing of composite structures and components for the railway sector.**

It acts as a technological and industrial partner for leading European railway manufacturers. Its model focuses on providing integrated solutions covering technical consultancy, design, engineering, manufacturing, integration and lifecycle project support.

Thank you!

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More information about the sector, news and opportunities:

<https://catalonia.com/key-industries-technologies/technologies-in-catalonia>

