CEAMS

Building an innovation ecosystem for advanced materials in the UK

CEAMS

INTRODUCTION

Sustainable advanced materials are designed to be better for business and the planet, boosting efficiency while cutting down on waste. CEAMS bridges the gap between pioneering research and commercial adoption, making innovation accessible to drive the materials of the future.

Our goal is to make it simple for businesses to access world class expertise and accelerate innovation, by connecting them with a community of sustainable advanced materials organisations.

Supported and delivered by our partners

THE MATERIALS INNOVATION CHALLENGE

Contextualising the challenge

Materials innovation is rapidly becoming one of the key focus areas of government investment globally. At the same time, investors and consumers are increasingly prioritising companies that demonstrate environmental responsibility.

For manufacturers and materials companies, this presents both challenges and opportunities. Sustainable advanced materials offer a path to reduce carbon emissions, meet regulatory requirements, and gain a competitive advantage – while maintaining the performance and properties that industry demands.

The UK is well-positioned to lead this transition. Our manufacturing sector contributes over £300 billion annually and supports over 5 million jobs[1], with the UK ranked as the world's 8th largest producer in advanced materials[2]. However, businesses are still facing significant hurdles in adopting new materials technologies. SMEs particularly struggle to access the research capabilities, testing facilities, and expertise networks needed to innovate and scale effectively.

Addressing the gap

This commercialisation gap has become more pressing as regulatory frameworks evolve. The UK's 2050 net zero target, Greater Manchester's ambitious 2038 carbon neutrality goal, and initiatives like the Advanced Manufacturing Plan and National Materials Innovation Strategy all demand rapid advancement in sustainable materials adoption. Companies must adapt or risk falling behind – both in maintaining regulatory compliance and keeping up with competitors. To achieve this vision of a sustainable future, we must ensure that support and guidance exists to support materials innovators not only to survive in a saturated and unclear market, but to thrive.

THE CEAMS VISION

What is CEAMS?

The Centre of Expertise in Advanced Materials and Sustainability (CEAMS) is a consortium that unites national innovation assets through a single access point. Operating out of Greater Manchester, CEAMS was created to provide businesses with a straightforward route to sustainable materials innovation and adoption, removing traditional barriers between research breakthroughs and commercial applications. Our partnership brings together the strengths of the UK's leading materials institutions to create clear pathways between research and industry.

Through our network of partners, including the High Value Manufacturing Catapult, CPI, The National Physical Laboratory (NPL), The National Composites Centre (NCC), The University of Manchester, the Henry Royce Institute (Royce), The Manufacturing Technology Centre (MTC), and Rochdale Development Agency, we connect businesses facing sustainability challenges with precisely matched expertise and capabilities.

[1] https://www.oxfordeconomics.com/resource/the-true-impact-of-uk-manufacturing/

[2] https://www.royce.ac.uk/collaborate/innovationstrategy/

The CEAMS way

Providing a unified 'front door' to these organisations means that businesses can gain comprehensive support spanning research facilities, technical expertise, regulatory guidance, and scale-up support. Business leaders work with CEAMS to navigate everything from regulatory changes to reducing carbon-related penalties. This marks a concrete step in the right direction towards simplifying the journey through the materials innovation ecosystem, in a way that is practical and scalable.

Through advances in materials technology, organisations can expand into sustainable markets and attract environmental, social and governance (ESG) focused investment. These innovations often lead to more efficient operations and create supply chains better equipped to meet future challenges.

Building on Greater Manchester's heritage of materials innovation – from industrial revolution textiles to groundbreaking graphene research – CEAMS is laying the groundwork for the sustainable materials ecosystem of the future. We unite world-class institutions under a shared vision to co-create seamless solutions to our greatest challenges through knowledge exchange and shared resources across the entire innovation journey. There is still vast potential to expand our network of delivery partners, as well as to implement this model in other industries facing similar challenges.

SUCCESS STORIES

CYGNET TEXKIMP

THE CHALLENGE

Carbon fibre demand exceeds supply, but recycling remains difficult due to complex processes, high costs, and industry scepticism about recycled material quality. Retaining carbon fibre's valuable mechanical properties requires extensive R&D.

THE SOLUTION

CEAMS connected Cygnet Texkimp with NCC, Royce, and NPL to develop end-to-end quality assurance and validation for recycled carbon fibre tows, integrate recycling technology with inspection capabilities, and conduct trials of real-world applications.

THE IMPACT

This collaboration reduced costs and environmental impact while building market confidence in recycled materials – a model example of bridging academic research and industrial applications for the £12 billion UK composites industry.

CHROMITION

THE CHALLENGE

University of Manchester spin-out Chromition needed to benchmark their proprietary Luminspheres™ technology – ultra-bright fluorescent nanoparticles used for disease biomarker detection – against other fluorescent materials. This required specialised flow cytometry facilities to demonstrate superior brightness and detection sensitivity for healthcare diagnostics.

THE SOLUTION

The CEAMS partner network helped Chromition develop a proposal for accessing University of Manchester's facilities and expertise. This enabled testing that was key to securing Innovate UK funding for an early breast cancer diagnosis project.

THE IMPACT

The data helped Chromition present their technology to stakeholders and investors, while the funding enabled a 2.5-year project with potential applications for less invasive cancer detection methods that could benefit thousands of patients annually.

LEADING TOGETHER

CEAMS connects industry with world-class expertise and state-of-the-art facilities across our partner network. Our integrated approach breaks down barriers to innovation, creating a straightforward path to sustainable materials adoption.

THE CEAMS INNOVATION NETWORK

Enabling innovation through collaboration

The CEAMS partnership brings together a vast network of complementary capabilities, technologies, and experts. Partners within CEAMS possess expertise across multiple technology readiness levels (TRL) with access to the best technology and the brightest minds available within the UK. With each organisation working in close partnership with one another, CEAMS offers a comprehensive service offering to innovators in advanced materials and manufacturing.

The **High Value Manufacturing Catapult**, through its centres including **CPI**, **MTC**, **NCC**, and **AMRC**, provides extensive manufacturing scale-up expertise and specialist facilities. CPI catalyses the adoption of advanced technologies, while the MTC excels in manufacturing processes and automation. The NCC offers world-leading composite materials development and testing capabilities.

The National Physical Laboratory contributes cutting-edge measurement science and engineering, ensuring new materials meet rigorous performance and sustainability standards. This validation capability is crucial for building market confidence in sustainable alternatives.

The **University of Manchester** offers comprehensive academic expertise through its research groups and specialist institutes, including SISTER and the Graphene Engineering Innovation Centre (GEIC). Additionally, it houses the **Henry Royce Institute**, which provides access to pioneering materials research facilities and extensive expertise across metals, ceramics, soft materials, and composites.

Rochdale Development Agency grounds this research excellence in commercial reality, connecting innovations with local industry needs and ensuring economic benefits are realised across the Greater Manchester region.

For materials innovators, accessing resources and technical capabilities is crucial. While CEAMS provides this, it takes a step further to provide a holistic offering, with in house teams setting an industry-leading example within business areas like project management and communications, and partner networks expanding into funding support, new channels of relationship building, and engagement with government. Our consortium partners bring with them extensive expertise on industrial applications, market access, and quality assessment, meaning they are best placed to advise companies on the next step in their journey.

The power of partnership

CEAMS streamlines access to these capabilities through a single point of contact, assembling the right combination of expertise for each business challenge. This might mean accessing CPI's biotechnology facilities to explore novel recycling methods, using NPL's advanced characterisation capabilities to validate material properties, or engaging with Royce to develop a new production process for biocompatible material coatings. CEAMS acts as a nexus point that enables the pooling of complementary competencies, minimising redundancy and matching up capability differences among the delivery partners.

Co-designed solutions

Partner organisations convene weekly as a multidisciplinary panel to review new proposals. Each project undergoes a comprehensive triaging process that evaluates three key areas: alignment with regional and national objectives, potential sustainability impact, and current technology readiness level. During these sessions, partners identify where their capabilities intersect to create enhanced solutions. This collaborative approach ensures that projects benefit from complementary expertise. Triaging also ensures the project maintains portfolio diversity across a range of technology development stages.

Shared knowledge and resources

CEAMS facilitates knowledge exchange across the network through structured collaboration mechanisms. Regular technical forums bring together experts from different institutions to share insights and align approaches.

The partnership also enables efficient resource sharing. Rather than duplicating expensive equipment across sites, partners can access specialist facilities throughout the network. This reduces costs for businesses while ensuring access to the most appropriate tools for each stage of development.

A direct line to industry

Through RDA's coordination, these technical capabilities are matched with commercial opportunities and insight. Regular industry engagement events, skills development programmes, and funding workshops help ensure innovations translate into economic growth for the region.

This integrated approach provides comprehensive support from concept to commercial implementation. By combining world-class expertise with practical industry knowledge, CEAMS is able to create clear pathways to sustainable materials adoption while reducing associated risks and costs.

> *The CEAMS project is giving us access to machines and instruments that would otherwise be prohibitively expensive, providing more robust data that can be used to improve the product – and also convince people about the capabilities of the product.*
>
> — **DeakinBio**, a spin-out developing bio-based alternatives to ceramic tiles

This is a subhead

ACCELERATING INNOVATION

From initial concept through to market integration, CEAMS provides businesses with clear routes to overcome sustainable materials challenges. Our support unlocks new opportunities while helping companies meet growing regulatory and sustainability demands.

THE CEAMS INNOVATION PATHWAY

Synergy at our core

Establishing a project-specific consortium at the onset ensures businesses can access the specific support they require from the partners best suited to their specific issue. This multidisciplinary team represents the first engagement with CEAMS and often involves building a bespoke team of experts from across the consortium to address the specific innovation challenge.

Complementary partner capabilities provide an interconnected network of accessible support for companies accessing CEAMS, streamlining the way in which innovators work with RTOs, Catapults, Universities and technology developers.

Iteration for impact

Rigorous post-project evaluation tracks successful project delivery against assigned objectives and determines next steps for companies, which may involve iterative adjustments to teams and projects, re-engement with CEAMS, or moving on to commercialisation or subsequent activity.

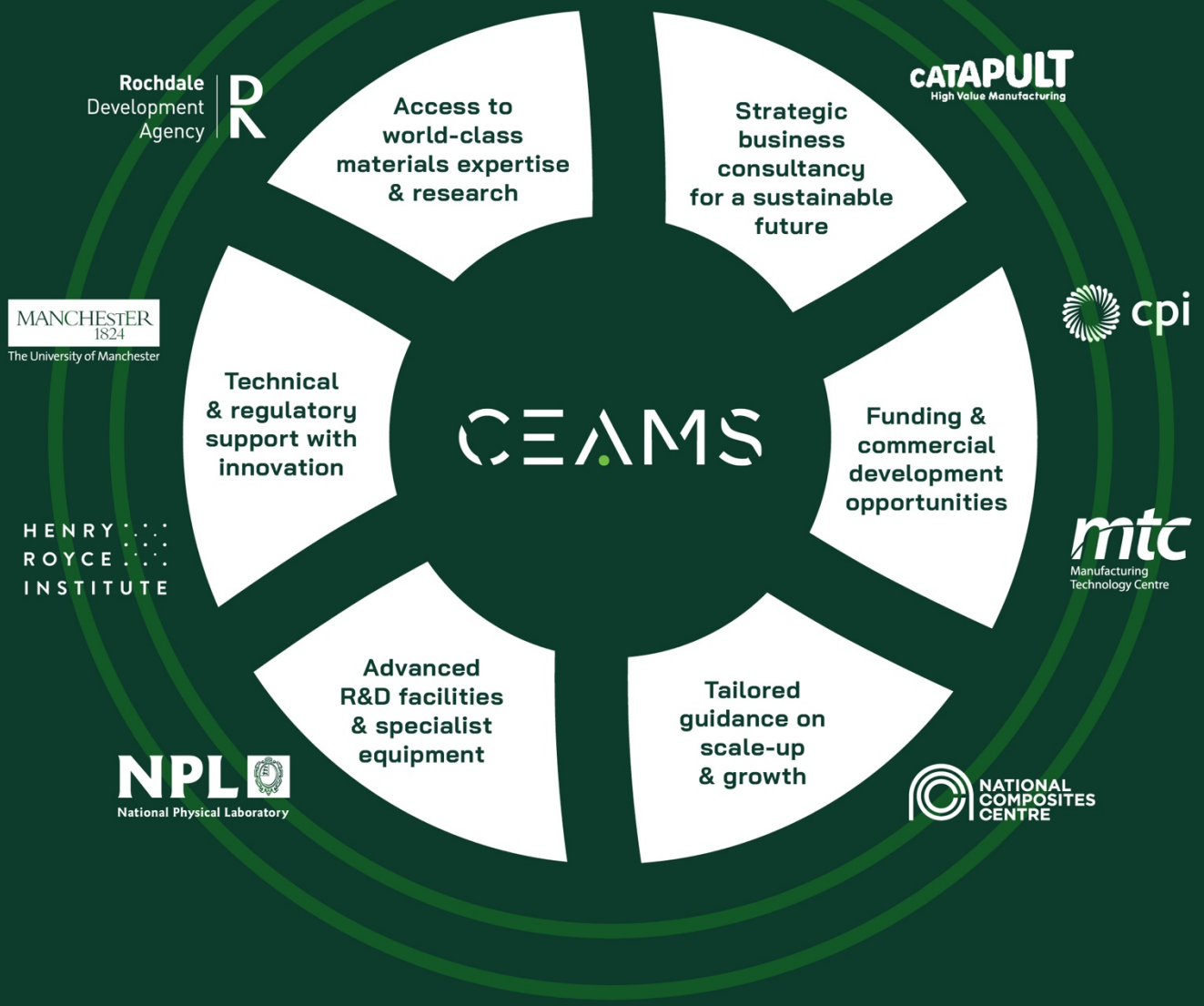
Measured cross-project impact ensures that CEAMS delivers on its objectives to support local communities and national priorities, as well as individual business and wider industry challenges, including contribution to net-zero goals, development of new best-practice for the industry, and reshoring of critical advanced materials manufacturing capabilities.

A community of innovators

With a vast network of successful project case studies under our belt, the CEAMS collaboration is building a community of successful innovators. Post-engagement, companies are well-versed in the network of support available to them from our partner organisations, and ready to take on their next challenge.

CO-DESIGNING SUSTAINABLE CHANGE

Projects are triaged according to impact, policy alignment, and technology readiness. Building a tailored team for each challenge means businesses get the support they need from the right partners.



IMPACT

Accelerates business growth by reducing costs and emissions, accelerating innovation, enhancing market competitiveness, attracting investment, and de-risking new technologies.

Drives industry-wide progress by setting sustainability standards, removing R&D barriers, tackling technical challenges, enabling circular economy practices, and strengthening supply chains.

Aligns with Greater Manchester's Net Zero goals by attracting investment, creating high-value jobs, expanding innovation in the north west, and strengthening industry-academia links.

Strengthens the UK's position as a leader in materials innovation by advancing sustainability goals, supporting reshoring, aligning with industrial strategy, and shaping evidence-based policy.

ADVANCING NATIONAL PRIORITIES

Located in Greater Manchester, CEAMS represents a strategic investment in the UK's advanced manufacturing capabilities. By helping businesses adopt sustainable materials and improve manufacturing efficiency, we contribute directly to both economic growth and environmental goals.

POLICY IN PRACTICE

Made in Greater Manchester

The UK's Industrial Strategy involves the creation of dedicated investment zones for advanced materials. Atom Valley is part of this effort to create a manufacturing mega-cluster in the Northwest. CEAMS provides the innovation infrastructure needed to attract and retain advanced materials SMEs crucial for sustained growth. This aligns with the National Materials Innovation Strategy's emphasis on building a strategic advantage in advanced materials to safeguard the UKs leadership within this vital sector.

Our location is particularly significant in relation to addressing economic disparities within Greater Manchester. As former Bank of England Chief Economist Andy Haldane has pointed out, these inequalities are often higher within city regions than between larger regions. By expanding advanced materials innovation beyond Manchester's Oxford Road corridor into the northern boroughs, CEAMS helps create more equitable access to economic opportunities within an area with a rich industrial history, fostering greater interconnectedness between the city region and outer boroughs. With the expert guidance of Rochdale Development Agency, CEAMS is contributing to the next decade of growth for this area.

Our work also supports Greater Manchester's 2038 carbon neutrality target by helping businesses adopt advanced sustainable materials and implement more efficient manufacturing processes. City regions like Greater Manchester play an important role in driving both economic growth and sustainable industrial development. With the appropriate resources and targeted support, devolved regions can become powerful engines for transformation within the materials sector.

Our national outlook

The Industrial Strategy identifies advanced manufacturing as a critical growth sector for the UK. Programmes like CEAMS are critical to ensuring that this sector reaches its full potential, with SMEs often driving forward new methods of materials manufacturing and University spinouts leading on the creation of new novel materials that will power the manufacturing industry of the future.

In terms of realising this national ambition, it is clear that no individual company or government can tackle the immense challenges of sustainability and circularity of materials. This instead requires active collaboration between government, RTOs, academics and universities, the SME community, and the investment community, all of which are represented within the CEAMS collaboration.

Shaping the future of sustainable materials

CEAMS is continually evolving to meet tomorrow's challenges while building on today's successes. Our focus areas reflect the pressing needs of industry: developing circular economy solutions, advancing sustainable composites, and creating new materials that combine environmental responsibility with enhanced performance.

We are expanding our technical capabilities through new partnerships, developing targeted programmes to solve industry challenges, and creating the optimal environment for advanced sustainable materials research and innovation. Our unique approach to supporting innovators through reducing project cost and thoughtful allocation of public funding helps support both established companies and high-tech startups. We are also helping to incentivise cluster growth by engaging with companies that have previously struggled to access support through other means.

The strength of CEAMS lies in how our partnerships amplify individual capabilities, while creating new ones. When research breakthroughs meet manufacturing expertise, new materials move more quickly from laboratory to production. When measurement science combines with industrial knowledge, innovative materials gain market acceptance through validated performance standards. When academic excellence connects with regional development, theoretical advances translate into real economic opportunities. These synergies, accessible through a single point of contact, create a uniquely efficient innovation ecosystem.

By thoughtfully and comprehensively integrating individual strengths to minimise duplication of effort and maximise engagement, the resulting impact is more than the sum of its parts. These partnerships deliver practical value at multiple levels. Individual companies gain streamlined access to innovation support, reducing the cost and risk of adopting sustainable materials. The region benefits from accelerated economic development and new high-value jobs. And the UK strengthens its position in advanced materials innovation while progressing toward sustainability goals.

CEAMS

CATAPULT
High Value Manufacturing

MANCHESTER
1824
The University of Manchester

cpi

NATIONAL
COMPOSITES
CENTRE

mtc
Manufacturing
Technology Centre

HENRY
ROYCE
INSTITUTE

NPL
National Physical Laboratory

Rochdale
Development
Agency

University of
Sheffield
AMRC
Advanced Manufacturing
Research Centre