

BUILDING AN ADVANCED MATERIALS INNOVATION HUB IN THE NORTH



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Ambitious sustainability targets demand that we reimagine the way goods are produced and consumed. Advanced materials are sustainable or recyclable alternatives to traditional materials that could allow industries to move towards net zero without compromising on performance and properties. The Centre of Expertise in Advanced Materials and Sustainability (CEAMS) was launched earlier this year as a consortium dedicated to driving the development and adoption of advanced materials in the UK. CEAMS serves as a central hub, connecting academia, research centres, and industry. It represents the first steps towards establishing a booming advanced materials hub in Greater Manchester, which will form part of a broader £100 million plan to grow innovation clusters across the UK.

INTERNATIONAL INSIGHTS, APPLIED LOCALLY

CEAMS is a collaborative effort that aims to boost the adoption of sustainable materials by connecting industry with pioneering research and innovation resources. It aims to accelerate the materials advancements that are crucial for building a greener future, and foster a resilient economy that focuses on longevity, efficiency, and environmental responsibility.

The vision for CEAMS draws inspiration from successful models like Brainport in Eindhoven and Tknika in the Basque Country. Brainport Eindhoven has transformed a once-struggling region into a thriving tech and design hub, centred around a 'triple helix' model of collaboration between industry, education, and government. Brainport's success comes from its ability to bring together diverse stakeholders, from entrepreneurs to

multinational corporations. Tknika has similarly demonstrated that closely aligning education with industry needs can create a skilled workforce ready to drive innovation. Meanwhile, Germany's Mittelstand network of small and medium-sized enterprises (SMEs) forms the backbone of Germany's industrial economy. Known for their focus on niche markets, long-term thinking, and strong regional ties, Mittelstand companies are often world leaders in their specific sectors.

These examples demonstrate the power of place-based innovation and specialisation – how focusing on regional strengths can drive development and create high-value jobs. They also highlight how supportive policy frameworks can catalyse private sector investment and facilitate innovation. Greater Manchester has many of the necessary components to follow in these footsteps, but it needs to do a lot more to support the

spinning out and scaling up of companies with high potential. Central to this vision is Mayor Andy Burnham's ambitious plan for Atom Valley – a commitment to building a world-class advanced materials and manufacturing cluster in Bury, Oldham, and Rochdale. The Atom Valley initiative aims to transform these outer boroughs, repurposing green belt sites to support the growth and scale-up of high-potential companies.

By adapting international models to the unique context of Greater Manchester and the broader North West, CEAMS could become a powerful catalyst for regional development, as well as the national industrial strategy. The goal is to create a self-sustaining ecosystem of startups, established companies, and research institutions driving innovation in advanced materials and manufacturing. This aligns with the Mayor's manifesto goals of ensuring that economic

prosperity benefits many, not just a few, and shaping markets rather than merely serving them.

DRIVING INNOVATION THROUGH COLLABORATION

CEAMS brings together leading institutions, including Rochdale Development Agency (RDA), Centre for Process Innovation (CPI), Henry Royce Institute, High Value Manufacturing Catapult (HVMC), Manufacturing Technology Centre (MTC), National Composites Centre (NCC), National Physical Laboratory (NPL), University of Manchester, and University of Sheffield's Advanced Manufacturing Research Centre. Each partner contributes unique strengths, from academic expertise and industry know-how to modern research facilities and specialist machinery.

A well-connected network of experts can overcome the hurdles that often slow down the adoption of advanced sustainable materials through knowledge exchange, resource sharing, and joint projects, allowing businesses to tap into the latest research and development breakthroughs. For example, the University of Manchester's expertise in graphene research complements the advanced manufacturing capabilities of MTC, while NPL's measurement capabilities ensure the reliability of new materials and processes. Rochdale Development Agency provides crucial local context and connections, so that innovations are grounded in regional needs and opportunities.

The impact of this approach can be seen in our recent work with Cygnet Texkimp in carbon fibre recycling. Carbon fibre has

widespread applications in aerospace, automotive, and other high-tech industries, but it is difficult to recycle because of its complex structure and varied streams of waste. Many in the industry are sceptical about recycling methods and whether recycled carbon fibre can match the quality of virgin materials. CEAMS connected Cygnet Texkimp with composites industry experts at the NCC, advanced materials researchers at the Henry Royce Institute, and the measurement capabilities of NPL to develop a comprehensive pathway for recycling carbon fibre and testing the quality of the resulting material.

Improving the carbon fibre recycling process means reduced costs and environmental impact for manufacturers, as well as increased market confidence in recycled materials. It also increases the UK's autonomy in critical materials and gives us a glimpse into a truly circular economy.

THE ROLE OF SCIENCE IN SHAPING POLICY AND LEGISLATION

Having a consortium of experts on hand can be incredibly useful in shaping policies and legislation around advanced materials at both a local and national level. By serving as a bridge between academia, industry and government, they can provide evidence-based insights that ground policy decisions in scientific understanding and technological feasibility. This could begin to address the current dichotomy between national strategy and devolution by making sure that initiatives in materials science contribute to both local

economic growth and national competitiveness.

CEAMS has the potential to simultaneously drive the UK's regional development agenda, advance industrial strategy, and support sustainability goals. If we can leverage Greater Manchester's unique strengths in areas like graphene and sustainable materials as a springboard for a Mittelstand-like network of specialised SMEs, this will create high-value jobs, attract investment and talent to the region, and accelerate the transition to more sustainable industrial practices. From a broader perspective, this would also demonstrate the importance of a new long-term thinking culture among government, partner companies and institutions – one of stable and predictable funding for the research community and private sector that leads to conscientious innovation.

Specialist expertise becomes particularly valuable in cases where regulations push for materials to be revamped – for instance, the need for more sustainable fire-retardant furniture and building insulation materials. It can also play a role in shaping skills policies in order to prepare the workforce for future manufacturing challenges. Initiatives like CEAMS are a promising model for placing science at the heart of the solution to our industrial and environmental challenges.

A PROMISING FUTURE FOR UK MATERIALS

CEAMS is already showing promise in supporting businesses in adopting advanced sustainable materials, unlocking new market opportunities, and mitigating environmental impact.

It is set to establish the beginnings of a successful advanced materials network in Greater Manchester, which will add to the region's rich materials history and cement its spot as a key innovation hub in the UK. It is also bringing in new private sector funding into the region – demonstrating that government backing of such initiatives can stimulate inward investment.

With a new parliament bringing new opportunities, there is a chance to make a real difference through funding and support for specialist consortiums and innovation hubs across the country – CEAMS and the broader Atom Valley initiatives are already demonstrating the impact that this could have. To fully capture the massive potential of advanced materials and become a global leader in the sector, devolved long-term funding is needed to continue building on these foundations for a supportive innovation ecosystem that delivers tangible impact.

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