

ECONOMY, BUSINESS GROWTH, AND SKILLS OVERVIEW AND SCRUTINY COMMITTEE

Date: 10 July 2020

Subject: Update on Innovation, Science and Graphene Commercialisation

Report of: Steven Heales Head of Innovation and Science Commercialisation Policy

PURPOSE OF REPORT

To provide an update to the Committee on innovation and graphene commercialisation matters.

RECOMMENDATIONS:

The Committee is requested to:

1. Note and review the update provided on innovation and graphene commercialisation
2. Identify any further opportunities to accelerate action to raise the research and development levels of local businesses in Greater Manchester

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BACKGROUND PAPERS:

None.

1. BACKGROUND

1.1 Since the last innovation update report to Scrutiny Committee in November 2019, the Greater Manchester Local Industrial Strategy (GM LIS) implementation is underway, translating our ambition to deliver an economy fit for the future in to action.

1.2 The GM LIS adopts the findings of the GM and Cheshire East Science and Innovation Audit, identifying ambitious priorities that will build GM's future economy around its existing science and industrial strengths and opportunities of health innovation, advanced materials & manufacturing, digital, creative & media, and clean growth. It also commits GM to increasing private sector investment in to R&D and increase take-up of national innovation funding, to support the achievement of the national target for UK spend on R&D to reach 2.4% of GDP by 2027.

1.3 The following priority actions of the GM LIS are particularly focused on harnessing the opportunities of innovation to boost productivity and growth:

- A Healthy Ageing Innovation Partnership with UK Government will realise the economic opportunities of the Ageing Society Grand Challenge and is set to be launched in spring 2020.
- Within advanced Materials and manufacturing the pioneering Graphene, Advanced Materials and Manufacturing Alliance (GAMMA) will address gaps in the commercialisation and diffusion ecosystem for graphene, advanced materials and industrial biotechnologies.
- A new wave of highly productive jobs in the city-region is being generated, contributing to Greater Manchester's ambition to become a top five European digital city-region. An emerging cyber security sector has benefited from the partial relocation of GCHQ to Greater Manchester, bringing hundreds of jobs and stimulating the growth of SMEs in this space, supported by the GM Cyber Foundry and the forthcoming Cyber Innovation Centre.
- Realising investment in innovation parks and innovation campuses across Greater Manchester that create hubs for businesses and academia to co-locate and to act as anchors for future translation research centres.
- A highly ambitious and high-impact Greater Manchester Leadership and Management programme is in development between the four Greater Manchester Business Schools and the Business Growth Hub. This is important so that existing businesses in Greater Manchester are empowered and able to access the knowledge and skills to become innovation-active and benefit from frontier growth opportunities.

2. Government policy updates

2.1 Since the General Election there have been three key policy announcements relating to science and innovation:

- the fastest ever increase in domestic public R&D spending to meet the UK target of 2.4% of GDP being spent on R&D.
- A review of the UKRI Catapult Network to examine how they can strengthen research and development capacity in local areas, improving productivity and contributing to greater prosperity across the UK.
- An ambitious Place Strategy for UK research and development will also be published in the summer to ensure funding builds on strengths of the regions.

2.2 On 01 July 2020 Government published its Research and Development roadmap which reaffirms at a high level its commitment to the announcements above, including a firm commitment to “take greater account of place-based outcomes in how we make decisions on R&D in the UK, ensuring that our R&D systems make their fullest contribution to our levelling up agenda”. Stakeholders have been invited to submit responses to this by 12 August 2020.

2.3 The Greater Manchester Local industrial Strategy sets out the framework of investment priorities and clusters of industries that present the biggest opportunities for innovation-led growth. They will form the basis of Greater Manchester’s response to these opportunities.

3. GRAPHENE COMMERCIALISATION UPDATE

3.1 The University of Manchester has set out an ambitious vision that aims to create a thriving knowledge-based economy around 2D materials. To date at least £365m has been invested across three complementary institutes that have resulted in more than 300 researchers and businesses working on the commercialisation of graphene within Greater Manchester.

3.2 The most recent investment was the £60m Graphene Engineering Innovation Centre (GEIC), which is leading rapid development and scale up of graphene and other 2D materials applications. The GEIC formally launched in December 2018 and focuses on six application areas relating to composites, energy, membranes, inks and coatings, graphene production, and measurements and characterisation.

3.3 Bridging the Gap is an ERDF project led by the Graphene@Manchester team at the University of Manchester is focussed on supporting Greater Manchester businesses to work with the GEIC to innovate using graphene and 2D materials technology. Companies benefit from access to workshops, technical support, support with grant proposals, and access to specialist facilities to

develop a graphene product, technology or process. This project will engage with 100 SMEs in Greater Manchester by 2023 and has supported 40 SMEs as at the end of January 2020.

- 3.5 The Graphene, Advanced Materials and Manufacturing Alliance (GAMMA) is a key action arising from the Local Industrial Strategy and will address gaps in the commercialisation and diffusion ecosystem for graphene, advanced materials and biotechnologies. It will develop and deliver an ambitious plan to apply graphene and advanced materials technologies to provide solutions for the UKRI Grand Challenges of healthy ageing, artificial intelligence and data, clean growth, and future of mobility.
- 3.6 There are 110,000 people that work in the local manufacturing sector, predominantly made up of SMEs. Further growth is projected at the M62 North East Corridor which covers Bury, Oldham and Rochdale. GAMMA will link the locally rooted research excellence in advanced materials to Greater Manchester's manufacturing base, driving growth and creating a market for graphene products and services.
- 3.7 GAMMA is in the process of being formally launched.

4. PROGRESS SINCE NOVEMBER 2019 IN SECURING INVESTMENT IN GREATER MANCHESTER'S SCIENCE AND INNOVATION ASSETS

Local Science Asset Investments

- 4.1 Manchester Metropolitan University has secured a €9.6 million project, Transform-Ice, that will transform waste in to additive manufacturing materials and create a market for single-use plastic waste. This is an investment from the Northwest Europe Programme, part of the European Regional Development Fund.
- 4.2 The University of Manchester, in partnership with Manchester University NHS Foundation Trust, Health Innovation Manchester, and Manchester Science Partnerships, received £5m from Local Growth Fund, in addition to £20.6m already committed from other funds, in order to establish the Pankhurst Institute. A direct recommendation of the Science and Innovation Audit, the Pankhurst Institute will exploit GM's strengths in advanced materials, digital technology and precision medicine to drive health benefit and business growth.
- 4.3 The University of Manchester has launched an international competition to find an investment partner for ID Manchester, the city centre North Campus site based around Sackfield Street in the city of Manchester. A formal tender notice was published on 12th September 2019 seek prospective joint venture partners. It is anticipated that a partner announcement will be made in autumn 2020. The site will include 240,000 square metres of new work space and a further three acres of high quality public realm. The planned £1.5bn redevelopment has the potential to create over 6,000 high value jobs and will provide research facilities. In addition early development work has begun to explore the potential for two further innovation parks in the North and South areas of Greater Manchester.

4.4 The final Call of the European Regional Development Fund (ERDF) for Greater Manchester closed in October 2019. The following innovation initiatives have been awarded funding:-

- Print City, a £3.2m programme led by Manchester Metropolitan University to engage 150 Greater Manchester SMEs to enable them to transition to additive manufacturing methods
- Centre of Excellence in Intelligent Automation and Robotics, a £12.86m investment led by the University of Salford to engage at least 60 Greater Manchester SMEs to develop a new test hub for adoption of robotics, automation and other digital technologies in to business processes
- Artificial Intelligence (AI) Foundry, a £5.96m programme to engage at least 270 Greater Manchester SMEs to develop new AI-based business products and services

4.5 A number of further applications are currently going through approvals relating to innovation and the outcome will be known in the coming months.

4.6 The outcome of Transport for Greater Manchester's (TfGM) £20m Future Mobility Zone application was unsuccessful. Work is taking place to identify how to take forwards some of the opportunities this enabled local stakeholders to identify in relation to transport innovation.

4.7 The outcome of the Strength in Places Fund (SiPF) round two applications is expected to be known in early July 2020. GMCA provided three letters of support for applications relating to creative and digital growth, smart health diagnostics, and advanced machinery.

5. OVERVIEW OF SIGNIFICANT INNOVATION AND SCIENCE COMMERCIALISATION INVESTMENTS ACROSS GREATER MANCHESTER

Since the publication of the SIA, investments secured include:

5.1 **Greater Manchester Business Growth Innovation Services:** A £3m investment from ERDF is funding the Growth Company to support local businesses to access knowledge and investment for commercial research and innovation. The Innovation Service includes close collaboration with universities in Greater Manchester in order to simplify and coordinate business engagement. 580 businesses are on target to be supported through this programme, to 2021.

5.2 **Additive Manufacturing:** The UK is a world leader in additive manufacturing capability and is at the forefront of developing technology and commercial use cases. Manchester Metropolitan University's Print City is a leading regional 3D printing and digital manufacturing centre. Recognising its high potential for growth, Manchester Metropolitan University has directly

invested funding to provide facilities that enable SMEs to undertake small scale production and build mould making capability.

- 5.3 **Made Smarter:** The national Industrial Digitisation Review identified potential for up to 3% annual growth in the manufacturing sector through adoption of industry 4.0 applications across the UK manufacturing base. The review found that small and medium firms remain particularly reluctant to adopt new technologies, citing concerns of cybersecurity and a lack of common standards.

In response, Made Smarter was launched in November 2018. The 30 month £20m North West pilot, led by the Growth Company and regional business growth hubs, is supporting local enterprises to adopt industrial technology and management practices in order to boost productivity. It will enable engagement with 3,000 SMEs and aims to increase GVA by £115m.

- 5.4 **Energy House Two:** The University of Salford's Energy House is the only full-scale building in an environmental chamber in Europe, and the only full-scale test facility in a controlled environment in the world. In response to high demand from industry to access this facility, £16m funding has been secured, of which 8.2m is ERDF for Energy House Two. A larger two chamber facility with a higher degree of sensor sophistication and the ability to replicate more environmental conditions enables engagement with 100 local enterprises to 2020. Importantly, the increased scale and sophistication of the facility offers opportunities for further engagement with international firms recognising the excellence at the University of Salford.

- 5.5 **Fuel Cells:** Hydrogen is the most abundant element on Earth and hydrogen fuel cells are the rapidly advancing technology set to revolutionise commercial and domestic energy. The Hydrogen Fuel Cell Innovation Centre at Manchester Metropolitan University enables rapid prototyping for hydrogen-related fuel cell technology. £3.9m funding has been secured through ERDF to enable engagement with 50 local enterprises to 2020 to increase innovation and the adoption of this new technology.

- 5.6 **Digital Arts:** Greater Manchester has the largest digital sector outside London, employing 40,000 people in approximately 6,000 businesses and creating £2.7bn GVA in 2016. In order to drive further growth, Manchester Metropolitan University alongside GMCA have invested in the new £35m Manchester School of Digital Arts (SODA). This new school on the Oxford Road Corridor will bring together disciplines from multiple faculties to create the digital designers, producers and content makers of the future, as well as offering a wide range of training for employees across Greater Manchester and beyond. The nationally significant School of Digital Arts (SODA) opens in 2021 and will address the skills and R&D needs of digital and creative industries.

- 5.7 **Cyber Security:** Greater Manchester is growing as a centre for digital excellence, as evidenced by the opening of a Government Communications Agency site (GCHQ) in 2019. The Cyber Foundry, a partnership between the University of Manchester, Manchester Metropolitan University, the University of Salford and Lancaster University has secured £3.2m of ERDF to deliver a programme of cyber innovation support and growth for SMEs in Greater Manchester.

The CyberFoundry will support 45 GM businesses into university collaboration and provide support to 50 local enterprises to 2021.

5.7.1 A GCHQ Safe Citizen Digital Accelerator is working with 15 companies to leverage unique technical infrastructure and facilities, including the Vodafone 5G Innovation Lab, to generate life impact solutions for vulnerable groups across the region, empowering and connecting citizens through ingenious use of technology. This is led out of The Landing at MediaCity in Salford.

5.7.2 Work is underway on the fit out for a Cyber Innovation Centre, a £10m project being created to facilitate the growth of cyber security businesses in the region in the light of GCHQ's investment. The Centre will be the cyber embassy for Greater Manchester and the wider region, providing collaborative space in which companies, universities and government can share best practice to tackle cyber threats. This approach is influenced by the models already in operation in Cyber London (CYLON) and Mach37 in the USA.

5.8 **Precision Medicine:** The GMCA has provided a £3m loan facility, alongside a £21m investment from Manchester City Council, in support of the creation of a world-leading precision medicine campus in the Corridor Manchester Enterprise Zone. The joint project with global diagnostics firm QIAGEN, is forecast to create and support up to 1,500 jobs and add £140m to GM's economy over a decade.

5.8.1 This project will anchor the life sciences sector in GM, by attracting related small and medium-sized enterprises to the Applied Health Innovation Campus, attracting and retaining university graduates, and reinforcing the city's reputation at the cutting edge of innovation. The development of new diagnostic tests aimed at earlier detection of disease, and the development of personalised treatments, will benefit the residents of GM.

6. RECOMMENDATIONS

6.1 The recommendations are set out at the front of the report.