

A Science & Innovation Audit for the West Midlands

June 2017

Summary Report
Key Findings and Moving Forward



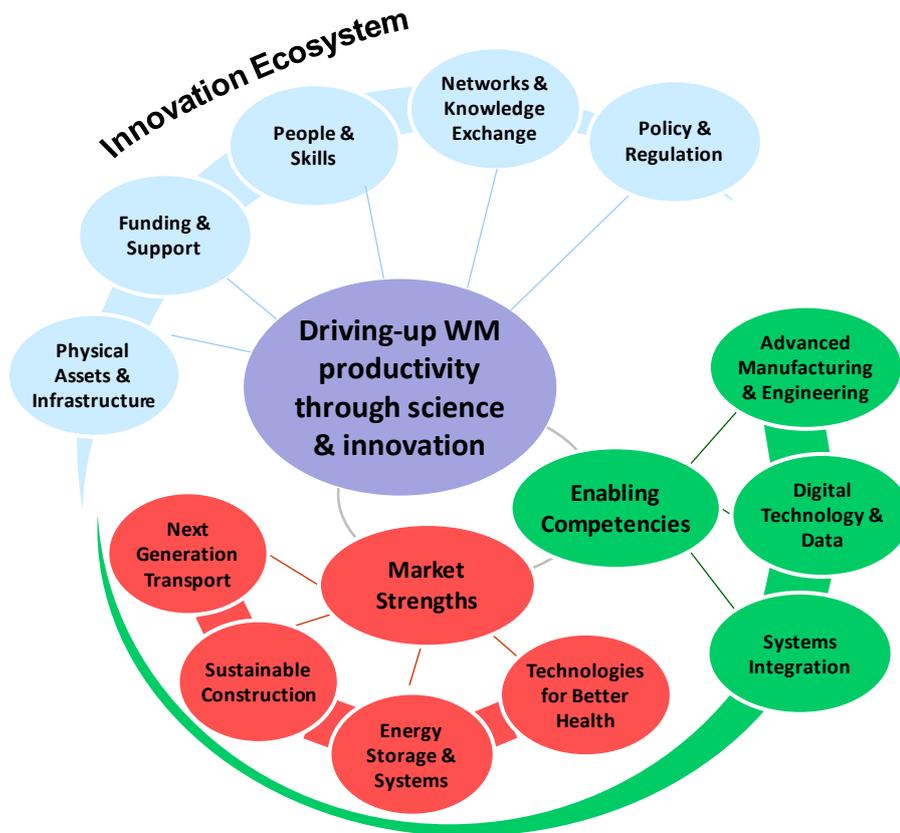
1. Key findings and moving forward

- 1.1 As the single largest functional economic area in England outside of London, and home to some of the country's leading science and innovation assets, the WM SIA area combines both scale and excellence in terms of its science and innovation offer. Building on the Midlands Engine SIA, this complementary, more granular and tailored audit was commissioned and funded by the three LEPs associated with the WM Combined Authority (Black Country, Coventry and Warwickshire and Greater Birmingham and Solihull). The purpose of this West Midlands SIA was to identify our science and innovation strengths and areas of potential for the future, to inform decision making, interventions and investments by partners and to strengthen our proposition to potential inward investors and external partners.

Key findings and messages from the SIA

- 1.2 Despite the many strengths of the **West Midlands economy**, productivity performance is persistently well below the national average level. There is no short-term fix, but leveraging our science and innovation excellence to lead to investment in new products and processes and in turn drive-up productivity is a core focus of this SIA process, reflecting the commitment of partners across the area.
- 1.3 The WM SIA area has a strong **Research Landscape** including eight universities. We are also home to two of the UK's strategically important Catapults (in High Value Manufacturing, and Energy Systems), and a critical mass of leading research translation organisations, including in advanced manufacturing, energy and healthcare innovation.
- 1.4 Importantly, whilst we value the contribution of the wide range of science and innovation assets identified in this SIA, we are also confident in recognising the importance of four key innovation system 'anchors' in the context of our SIA Framework: the universities of Birmingham and Warwick (including Warwick Manufacturing Group); the Manufacturing Technology Centre in Coventry; and Jaguar Land Rover. Together, these organisations characterise and embody the excellence in science and the commercialisation of knowledge in our area, and are responsible for much of our nationally and internationally significant science and innovation activity: for example, collectively they accounted for two-thirds of all Innovate UK funding into the WM SIA over 2010-15.
- 1.5 Crucially, the four anchor institutions also play an important role as collaborators with other organisations across the public and private sectors, as well as the research landscape (in the UK and overseas), including our other HEIs, our large and diverse SME base, and wider network of research and technology organisations. The leadership of these anchor institutions will be critical moving forward, but equally, we must also focus on strengthening this wider offer, ensuring that the diversity of our institutions, assets and expertise, is a continuing feature of our expanding and maturing innovation ecosystem.
- 1.6 The following **West Midlands SIA Framework** has been developed to highlight the way that the Innovation Ecosystem, the Enabling Competencies and the Market Strengths identified through this report interact and complement one another. Indeed, it is where the market strengths and enabling competences converge, supported by a well-developed ecosystem that

the best science and innovation in our area happens, as illustrated by case studies (Annex A to the full report).



1.7 The evidence collected as part of this SIA process suggests that the various components of our *Innovation Ecosystem* are generally working well and are highly successful. Alongside our very strong asset base in both science and innovation we have a well-developed set of networks and relationships, and a longstanding policy commitment that provides fertile ground for supporting and embedding innovation behaviours across our business base.

1.8 However, continuing to build and maintain the innovation ecosystem is vital as it underpins our ability to exploit our excellent science base to improve productivity and prosperity. The following challenges to developing the innovation ecosystem have been identified throughout this report:

- The low skills levels in the region is the greatest weakness in the ecosystem
- Our ability to secure funding from the public and private sectors could be improved, including both R&D resources and funds for process scale up or capital investment required to move from R&D to increased productivity
- We need to continue to drive higher levels of knowledge exchange between the universities and business and across technology areas/sectors
- Access to ERDF monies has played an important role in helping us to build our innovation ecosystem. The loss of this source of funding could be very detrimental if no alternative is made available

- We must continue to develop our physical infrastructure to keep up, and anticipate the need for grow-on space as we encourage the growth and development of our innovative businesses
- Maintaining a geographic spread of assets and networks is also important to make it easy for start-ups to find supportive locations and for easy engagement of SMEs with science and innovation bases.

1.9 This SIA audit process has identified three **Enabling Competencies** that characterise our modern knowledge-economy, and where we have both a concentration of assets, and genuine expertise across the private and public sectors:

- **Advanced Manufacturing and Engineering:** reflecting our pervasive leading-edge technical knowledge, and practical know-how in the research and industry base, in designing, validating, producing, and servicing new products and industrial processes. The competence supports a broad and integrated range of sectors and markets – including food and drink manufacturing, automotive, aerospace, rail, electronics, construction, and energy.
- **Digital Technologies and Data:** with strengths in the area’s academic, research and industrial base in exploiting and understanding big data, analytics, simulation and modelling and the use of digital technologies and media in product, process and service development and commercialisation across the full range of markets and sectors.
- **Systems integration:** assets, expertise, and insight in the area’s academic, research and industrial base on how increasingly complex systems – including energy systems, manufacturing processes, service delivery, and logistics – can be better designed, managed and operated, to deliver improved performance and outcomes.

1.10 These Enabling Competencies underpin and support our four specific areas of market strength (see below) where there is existing excellence and major growth opportunities for the future, so they should be supported through continued efforts to develop and impact across our range of market strengths.

1.11 The four **Market Strengths** identified in this SIA range from established world class strengths, to markets in which we are just beginning to realise our full potential, but all have significant scope for on-going development that will increase the productivity of the WM SIA geography:

- **Next Generation Transport:** building on a critical mass of globally competitive businesses, and technically specialist SMEs, operating within and across a range of transport-related industries, with a focus on the automotive and aerospace sectors, and their reinforcing supply-chains. Significant opportunities for growth are provided by the next generation of rail technology, in part through links to HS2, and connections with the Midlands motorsport cluster centred in and around Silverstone.
- **Sustainable Construction:** grounded in the significant construction industry across the area, and the R&D and commercial deployment by industry of energy efficient and lower carbon building technologies, across commercial and residential construction and infrastructure, leveraging the scale and quality of our education, research and

technology transfer base. We have the opportunity to buck the trend of construction being one of the UK's least innovative sectors (BEIS Innovation Survey 2015).

- **Energy Storage and Systems:** grounded in scientific excellence across our knowledge base, we have significant potential in the development and commercial application of a range of technologies in energy storage including batteries (materials and chemistry), and hydrogen storage, and in supporting the developing of effective energy systems covering the development, deployment and use of intelligence to integrate the actions of all the components in the energy system.
- **Technologies for Better Health:** focused on developing further our nationally-significant medical technologies sector, covering the R&D, design and production of devices, diagnostics, and software as a medical device; and the growth opportunity from the application and commercialisation of our research strengths in translational medicine, and accelerated access to new drugs, treatments and health technologies, leveraging the opportunity around Birmingham's developing Life Sciences Campus.

Next steps

- 1.12 The WM SIA provides **a wealth of evidence that can and should be used** to: inform policy and guide interventions; stimulate new ideas and explore new collaborations; and strengthen cases to attract investment and external partners. The WM SIA will be widely available so that it can be used by partners across the innovation ecosystem, by the three LEPs, and the WMCA.
- 1.13 **The WM SIA is particularly important for the LEPs and the WMCA** for whom the work was conducted as the findings can help partners deliver on the following core objectives:
- **Closing the productivity gap.** The SIA points in detail to market strengths and enabling competencies where support might have the greatest impact, together with evidence of areas of particular challenge in the underpinning ecosystem. The WM SIA can directly inform the work of the WMCA Productivity and Skills Commission with respect to innovation as one of the five identified drivers of productivity.
 - **In a strong WM innovation ecosystem, the 'weakest link' is a shortage of skilled people.** If we are to fully exploit the market opportunities and enabling competencies identified in this WM SIA, there needs to be a stronger connection of the innovation ecosystem with local skills interventions, further exploration of targeted education and training around the emerging science and innovation opportunities and capitalisation on scarce skills by focussed innovative capital investment.
 - **Reform of public services across the West Midlands.** The public sector is a critical part of our innovation ecosystem and in some of our market priorities and enabling competencies, partners are already actively engaging with research and innovation agendas. Continued support and collaboration could allow science and innovation to play a significant role in the public sector reform programme, not just improving efficiencies, but enabling completely new ways of delivering services. The UK Industrial Strategy looks set to place emphasis on stimulating innovation through procurement, including the extension of SBRI and driving changes in public sector procurement practices; this is an opportunity to be exploited in the West Midlands.

- **Delivery of priorities of the WMCA SEP and of the three LEP SEPs.** Innovation is a cross-cutting theme with potential to impact positively on every one of the eight WMCA SEP priorities to a greater or lesser extent. A number of the market strengths and enabling competencies identified in this report relate directly to these priorities. Likewise, innovation features in all three LEP SEPs, so the WM SIA evidence should aid the delivery of a wide range of LEP and WMCA objectives.

1.14 By **grasping the currently favourable national policy context**, there is an exciting opportunity to realise the potential identified in the WM SIA, by taking forward the following with Government and local partners:

- **Raising levels of business R&D investment** and its subsequent exploitation is a key strategic imperative for the UK, including the WM SIA area. In the context of both devolution and the emphasis on innovation and place in the emerging Modern Industrial Strategy, a dialogue with government may be timely around incentives for product and process business innovation. For example, this could include a review of tax incentives; consideration of how in policy terms the WM can focus more on demand-led and productivity-led innovation, including via the extension of SBRI, business-led 'RPIFs' and the Industrial Strategy Challenge Fund; exploration of the industry-led sector deals being developed nationally as part of the Industrial Strategy.
- **Addressing the large number of innovation inactive businesses**, effort is required to increase the inclination or capacity of businesses to innovate. In part this is linked to finance, skills and leadership, but local promotion and brokerage to help business to understand the opportunity from engaging in innovation remains key. The network and knowledge transfer activities that are strong in the WM, therefore need to be maintained and developed further. This will become more challenging with the loss of ERDF funding, unless alternative support is negotiated.
- **Stimulating and steering major collaborative research and innovation projects that realise the potential from our science and innovation base.** A number of the case studies presented in this SIA highlight where significant action is underway across the innovation ecosystem. A continued willingness of local science and innovation partners to develop ambitious, collaborative propositions at scale, will play a key role in developing the innovation platform and performance needed to drive-up our productivity. A particular current opportunity may be to develop proposals for the new Industrial Strategy Challenge Fund. The 'anchor' institutions identified in this SIA have a leadership role to play here, as well as the financial and other support that may flow through the LEPs, the WMCA, wider Midlands Engine and national funding.

1.15 Taking hold of the findings of this SIA, and acting to realise the potential identified will require **strong leadership, and appropriate governance and executive structures**. The 'anchor institutions' and other innovation ecosystem partners all have major roles to play, but the existing innovation committees (or equivalents) and resources of the LEPs will also be key, as will the proposed WMCA Innovation sub-Board, and the support structures that emerge around it.

- 1.16 The collective challenge will be to **develop and implement a whole range of complementary interventions** designed to strengthen our **Innovation Ecosystem**, exploit our well-evidenced **Market Strengths** and leverage our pervasive **Enabling Competencies**. The prize is a significant one – helping to secure sustainable improvement in our long-term productivity performance.