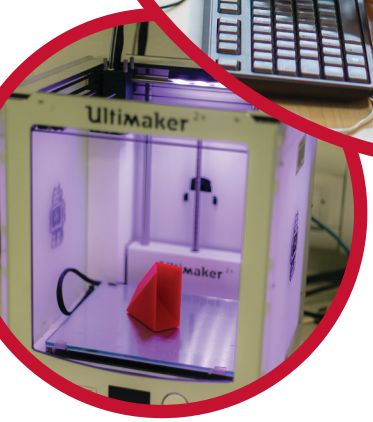

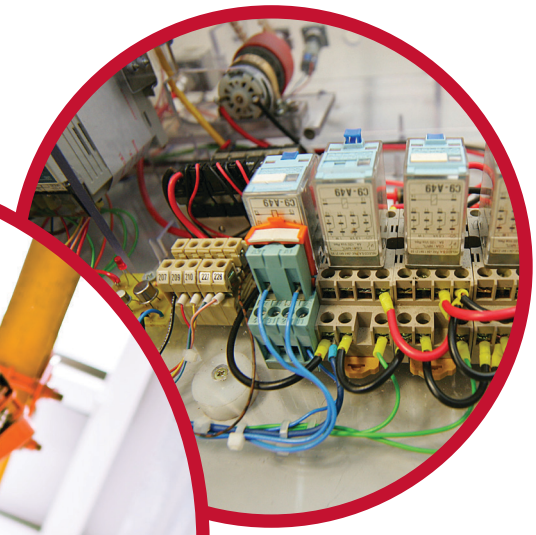

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MIDLANDS ADVANCED MANUFACTURING ACTION PLAN 2021-2024

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MIDLANDS ADVANCED MANUFACTURING ACTION PLAN

Contents

1 Executive Summary

This report presents the action plan which was developed in fulfilment of Strategic Objective 3 in the Government's Midlands Regional Action Plan 2020 - which seeks to 'position and support the Midlands as an advanced manufacturing centre of excellence'.

The development of the action plan was overseen by a Steering Group comprising representatives of Midlands industry and government agencies (EI, IDA and LEOs). The action plan aims to realise the vision espoused by the Steering Group - that the Midlands Region becomes known internationally as a Centre of Excellence in advanced and sustainable manufacturing and as an ideal location for manufacturing companies to establish and grow their business and exports.

Manufacturing industry in general is facing a range of challenges driven by increasing digitalisation and interconnectedness across manufacturing value chains and by the need to adopt sustainable production processes, while also remaining globally competitive and lean. The action plan seeks to enable Midlands manufacturing industry to address these challenges, to understand and adopt relevant technologies and to secure the workforce skills required in these areas.

The report outlines the importance of manufacturing to the Midlands (where it is proportionately a greater source of employment than nationally) and the key strengths and potential of the Midlands region, including its location advantage, attractive amenities and quality of life, strong and diverse manufacturing capabilities, skilled and educated workforce, and excellent education, research and innovation facilities and business supports.

While the vision is an ambitious undertaking it is not without parallel nationally and internationally. A number of exemplars are presented which show what can be achieved through sustained and collaborative regional planning. A number of these exemplars are suitable for immediate follow-up and potential collaboration, others of larger scale are referenced for further study and longer-term action.

The actions adopted in this plan were informed by a consultation process with manufacturing industries across diverse sectors and size from each of the four Midlands counties, with personnel from the agencies (EI, IDA, LEOs) and with Midlands groups involved in best practice networks, skills development, education and applied research including Technological University of the Shannon – Midlands Midwest (TUS – Midlands Midwest), Regional Skills Forum (RSF) and Irish Manufacturing Research (IMR).

The actions seek to build on government and agency policies and support infrastructure, including industry 4.0 and balanced regional development, and to strengthen existing Midlands business networking and collaboration. Actions are grouped into a suite of four enabling themes:

1. Education, Training & Skills,
2. Research & Innovation,
3. Support infrastructure & networks,
4. Strengthening the manufacturing industry base - FDI and Indigenous sectors.

Essential to achieving the vision is the ongoing commitment and resources needed to ensuring action plan delivery, supporting those implementing the actions, monitoring of results and refreshing the action plan where necessary. It is recommended that this work should be driven by a successor to the steering group comprising all those involved in delivering the action plan.

This action plan has focused on actions to achieve the vision of the Midlands as a location of choice for manufacturing industry. Equally important are measures to enhance the Midlands as a location of choice for work-life balance for the region's workforce and families – measures which could be enabled by **Midlands**Ireland.ie and Local Authorities.

The vision of the Midlands as an advanced and sustainable manufacturing centre of excellence is challenging but achievable as evidenced by similar achievements in other regions. This action plan lays the groundwork for achieving that vision. The long-term success of the action plan will be achieved through sustained commitment and collaboration amongst all of the Midlands regional stakeholders.

2 The Vision

The vision for the region is that by 2030, the Midlands Region is known internationally as a Centre of Excellence in Advanced Manufacturing and as an ideal location for manufacturing companies (both indigenous and FDI) to establish and grow their business and exports.

This will be achieved through:

- the growing numbers in the region of leading global manufacturing industries (both FDI and indigenous MNCs) and a dynamic indigenous manufacturing sector;
- a shared ambition amongst the region's manufacturing base for business excellence, international competitiveness, and a willingness to share knowledge with other companies in the region for mutual business advantage, and to pool their manufacturing resources in order to exploit market opportunities;
- a coordinated and collaborative region-wide ecosystem of business networks, research centres, education and training facilities and government agency actions and supports, which is interconnected with the wider national support ecosystem.

3 Midlands Manufacturing - The Context

The contextual background to the Midlands Advanced Manufacturing Action Plan has the following elements:

Importance of Manufacturing Industry to the Midlands

Manufacturing is a bigger relative source of employment in the Midlands than nationally. The Midlands region has a solid and diverse manufacturing ecosystem with many examples of world-class Foreign Direct Investment (FDI) companies, of innovative indigenous or home-grown companies of scale – many exporting to world markets - and of a sub-supply base serving both local and international industry.

- The total number employed in the region is 128,000 of which 18% - i.e. 23,000 people - are employed in manufacturing industry (this compares to a national average of 12.5%).
- There are 44 IDA client companies in the Midlands region, employing a total of 6,308 people at the end of 2020[1]. Of these 27 are manufacturers employing approximately 3,500 people. FDI employment has grown 35% over 2016-2020 across the Midlands region:
- IDA strategy 2021-2024, 'Driving Recovery & Sustainable Growth', will continue to support this sector, with a target of 25 investments for the region during the strategy;
- Particular strengths include Life Sciences, Engineering & Industrial Technologies;
- Every 10 FDI jobs support 8 additional indirect jobs.
- There are 263 [2]Enterprise Ireland client companies in the Midlands region, of whom 197 are manufacturers, employing an estimated 10,242 people. Strong sectors include:
    - Original Equipment Manufacturers (OEMs) of engineered machinery and equipment;
    - Polymer processing, precision engineering components, automation solutions and automotive parts;
    - Food and related production is dominant amongst the indigenous sector and includes Meat Processing, Milk & Yoghurts, Bread/Pastries/Confectionery, Beverages, Petfood, Animal Feed, and Peat and Horticulture Products.
- Local Enterprise Offices (LEOs) supported 856 companies in 2020 the region, employing 4,065[3].

In addition, the following features of manufacturing further underline its importance in the Midlands:

- High export orientation;
- Higher R&D intensity;
- FDI firms tend to be high Value Add contributors;
- Manufacturers provide significant job numbers;
- Indigenous sub-suppliers to exporting manufacturers are export-enabling firms;
- Significant generator of indirect jobs.

[1] IDA Results for 2020
[2] Enterprise Ireland End of Year Statement 2020
[3] LEO 2020 Results, DETE

Manufacturing – the Challenges and Opportunities

Advanced Manufacturing / Industry 4.0

Manufacturing industry is facing what is seen as a fourth industrial revolution enabled by various 'advanced' manufacturing technologies, offering increased efficiencies, and impacting on industrial processes, supply chains, business models, work-place skills and the nature of work itself.

The relevance and rate of adoption of such advanced technologies may currently vary across manufacturing companies depending on sector and size. However, continuing trends in increased power and reduced costs of computing and sensorisation will result in more examples of digitalisation of manufacturing processes and their digital inter-connection on the factory floor, and across the value chain. Companies must consider and explore options now, before being marginalised in an increasingly data-driven value chain in their markets.
Many Irish manufacturers, particularly SMEs, compete on the flexibility of their processes rather than large-volume automation and low-cost labour. Manufacturing powerhouses in the Far East are investing substantially in flexible robotic automation to stem increasing local wage costs, and to offer customised production runs. Irish manufacturers, to maintain their flexibility advantage, must plan to do likewise. Flexible manufacturing technologies may present Irish manufacturers with opportunities of re-shoring labour-intensive activities. Companies need help in the early stage of understanding of what advanced manufacturing technologies are relevant and value-adding to them, as a prerequisite to their adoption.

Sustainable Manufacturing

An emerging challenge arises from the increasing focus on climate change adaptation and mitigation actions. Increasing environmental compliance standards, rising direct energy costs and costs relating to meeting EU climate-neutral goals present industry with significant challenges in the coming 5-10 years.

Many companies already have systems in place to ensure compliance to the standards ISO 14001 (environment) and ISO 50001 (energy management). To achieve the sustainability levels required in the future, companies will need to go much further, requiring redesign and up-grading of materials, products and processes across their value chain to ensure compliance with climate change goals. Sustainable manufacturing and circular economy will increasingly become an important part of a company's business strategy. Midlands manufacturing industry, and the SME sector in particular, need access to independent specialist expertise and to practical research, development and test facilities to address these challenges.

Business Excellence

Lean SixSigma is a well-established Business Excellence approach to organisation strategy, management and operations, through an organisation-wide culture of continuously improving processes, products and services. Appropriate use of these practices may be regarded as essential for Irish manufacturers to sustain competitiveness. Widespread adoption and increasing embeddedness across the Midlands manufacturing base is a prerequisite to achieving 'centre of excellence' status.

An Integrated Approach

To achieve the vision, the Action Plan should address the above topics in unison – measures to help companies adopt appropriate advanced and sustainable manufacturing technologies will be optimally deployed in tandem with a Lean SixSigma business culture.

Key Midlands Attributes

The Midlands has a number of intrinsic attributes which can provide the foundation to develop the region as a manufacturing centre of excellence:

- Its central location is advantageous to business, education and social travel – typically within an hour journey time to or from Ireland's neighbouring regions and major cities, ports and airports;
- Within its own region, it has an educated workforce, which is easily supplemented from labour pools in neighbour areas and cities within a short commute;
- A comparatively lower cost of living, an unspoilt outdoor and rural environment, and abundance of outdoor leisure amenities;
- Athlone, as the designated growth centre, and the principal towns of Longford, Mullingar, Tullamore and Portlaoise, together with local communities can work together to build a region-wide collaborative business environment;
- An existing strong manufacturing base with strengths in Life Sciences, Engineering and Food;
  The combined presence in the region of the Technological University of the Shannon – Midlands Midwest and of Irish Manufacturing Research (IMR) in Mullingar, a state-agency supported national research centre with a specific focus on advanced and sustainable manufacturing

Building the Midlands Advantage

These attributes can be turned into significant advantages for the Midlands by:

- Harnessing the combined power of the region's TUS – Midlands Midwest and its national manufacturing research centre at IMR;
- Ensuring that staff in the sector have access to appropriate training, skills development and education – to advance both their own careers (helping the retention of such staff in the region) and their employer's skill level;
- Using the strong links which both TUS – Midlands Midwest and IMR have with other national higher education institutes and research centres to enable Midlands companies to access the full suite of resources in advanced and sustainable manufacturing technologies, nationally and overseas;
- Creating a strong Midlands manufacturing business network to harness the combined power of the significant FDI presence with advanced manufacturing capability, successful home-grown international manufacturing companies and indigenous manufacturing and engineering companies;
- Building on its central location and proximity advantage to become a preferred location for supply chain partners, 2nd site for companies whose HQ is Dublin or other major cities, remote working hubs for employees of city-based companies;

- Harnessing the opportunities presented by the Climate Action Plan.

Key Resources Supporting Enterprise in the Midlands

The Midlands region has the following resources to support business development and indigenous enterprise:

- Enterprise Ireland's regional office in Athlone;
- IDA Ireland regional office in Athlone and business parks throughout the region;
- Four Local Enterprise Offices (one in each county);
- Eight Community Enterprise Centres located across the 4 counties;
- The Midlands Innovation and Research Centre (MIRC) at TUS – Midlands Midwest – which provides incubation facilities for knowledge-based start-ups;
- Empower Eco - sustainable business Incubation hub;
- The Cube – low-carbon innovation hub, Portlaoise;
- Two food test kitchens - Ferbane Business and Technology Park Ltd, Offaly and The Kitchens, Mountmellick, Laois; and the planned Premier Lakelands Food Hub;
- Technological University of the Shannon – Midlands Midwest - key technology strengths in materials and polymer science, engineering, bioscience and software research;
- Two EI funded Technology Gateways in TUS – Midlands Midwest– Polymer Technology and Connected Media (recently awarded significant EI funding for advanced manufacturing research equipment);
- State funded Technology Centre in advanced manufacturing - IMR - located at the National Science Park Mullingar;
- Two Educational and Training Boards, the Midlands Skills Centre and Athlone Training Centre;
- Midlands Regional Skills Forum ;
- Skillnet Business Networks including Cobotics Skillnet, First Polymer Skillnet, Space Industry Skillnet and Midland Border East Skillnet
- Midlands Engenuity Engineering Network;
- Midlands Lean network;
- ATiM (Advanced Technologies in Manufacturing) – hosted by TUS – Midlands Midwest and IMR;
- The Midlands Network of Co-working Facilities (MNCF);
- Food Academy & Food Works.

The Midlands Advantage

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LOCATION - Direct access to Ireland's


Major cities


National road & rail network


Airports


Sea-ports

And connected by 1GB/s broadband

TALENT - Within a 60 minutes commute

Workforce of **900,000**

- **49%** Under 35 years
- **41%** 3rd level qualified
- **215,000** Speak languages other than English
- **14** Third level colleges
- **187,000** Students
- **45,000** Graduates yearly

MANUFACTURING FACTS

450 Manufacturers

16,000 EMPLOYEES

- Life Sciences
- Precision engineering
- Polymer processing
- Original equipment & automation
- Food & beverage

MAJOR EMPLOYERS

Abbott, Avery Dennison, Technimark, C&D Foods, Ericsson, Steripack Group, Neueda, 3M, Teleflex, Mergon, Steris, Integra Life Sciences, Spectrum Plastics, Glenisk, Grant Engineering, Greenfield Global, Glanbia, Aubren

EDUCATION, TRAINING & SKILLS

- 200+ courses
- 6000+ undergrad & post-grad students
- 600+ international students

TUS - MIDLANDS MIDWEST

Industry skills training

- 30 apprenticeship courses
- 1039 apprentice learners

RESEARCH & INNOVATION

IRISH MANUFACTURING RESEARCH

Digitisation
Design for Manufacturing
Automation
Sustainable Manufacturing

TUS - MIDLANDS MIDWEST

Materials & Polymers
Bioscience
Software / ICT
Midlands Innovation & Research Centre

Eco-business Innovation Hubs

The CUBE
LOW CARBON CENTRE OF EXCELLENCE

empower eco
the sustainability imperative

AMENITIES & QUALITY OF LIFE

- **40%** of Dublin house prices
- **70%** of Dublin child-care costs
- **252** / **44** Primary schools, Secondary schools
- **600+** Social, cultural & sports amenities
- Extensive nature parks & amenities

BUSINESS SUPPORTS

IDA Ireland · Enterprise Ireland · Regional Skills Partnerships for Skills · Údaráis Áitiúla Éireann Local Authorities Ireland · Local Enterprise Office · Skillnet Ireland

Data sources: CSO

4 International and National Exemplars

To inform how the vision for the Midlands might be achieved, a desk-based research exercise was conducted into exemplars internationally and nationally, of what are often termed regional clusters or cluster initiatives and smart specialisations. This focused primarily on exemplars in European economies where the region, initiative or specialisation best correlated to the Midlands Region and Action Plan. Those deemed worth more detailed study are summarised below, listed in (increasing) order of their scope and scale.

Technology Clusters

Made Smarter - UK

Made Smarter - www.madesmarter.uk was created following an industry-led review of how UK manufacturing industries could adopt and exploit digital tools and innovation. This review was commissioned by the UK government as part of their Industrial Strategy, and led by Professor Juergen Maier CBE, who is Co-Chair of Made Smarter UK. Initially piloted in 2019 in the UK North West region, it is now being rolled out as a national movement based on a collaborative programme of networking, technology advice and training actions delivered around 4 strategic pillars of leadership, innovation, adoption and skills. Organisational structures have been put in place to ensure the Made Smarter movement can be sustained and responsive to the ongoing and future needs of the UK's manufacturing industries.

It's OWL Technology Network – North Rhine-Westphalia, Germany

'It's OWL' - Intelligent Technical Systems OstWestfalen Lippe - is an industry-led advanced technologies cluster in the **Ostwestfalen-Lippe region** in Germany's state of North Rhine-Westphalia. - https://www.its-owl.com/about-us/

Established in 2012, it is an industry-led initiative, supported by Government funding, that develops the necessary infrastructure resources and supports to help industry to exploit the digitisation of industrial processes and value chains. It has 200 business partners participating in collaborative advanced innovation projects with third-level and research partners and along the companies' value chains. Its impact has been in business transformation, job creation, new start-ups, new Industry 4.0 focused research centres and new education and training courses for industry needs.

The It's OWL network has built a reputation as a benchmark for successful transformation through digitisation for SME companies in Europe, and for example helped firms with business collaborations and rapid business transformation projects to address issues caused by the covid-19 crisis.

Manufacturing Networks - UK

Made in the Midlands – https://madeinthemidlands.com/

Made in the Midlands, part of the Made in Group, has as its stated aim 'to challenge the erosion of British industry'. Established in 2009, it is an industry-funded network of manufacturing companies operating in the English midlands and Yorkshire. It has 600 manufacturers including SMEs and large companies including for example Portakabin, Schneider Electric, Jaguar Land Rover, Moog, Mazak, Siemens, etc. Its members commit to

mutual support and networking, to building supply chains with local firms, to promoting manufacturing as an attractive career and supporting apprenticeships and export development.

Make UK - www.makeuk.org/about
Make UK is a UK-wide manufacturers' organisation which exists as a representative voice of UK manufacturing, with offices in London, Brussels, and across the UK. It is similar to Ibec but with a specific focus on the UK manufacturing sector. It provides its members with advice, information and support in a range of business matters and topics of interest to members - through regional and national events, groups, and advisory boards. It provides political representation for members to UK government and regional agencies, and internationally.

Exemplars of Longer term Regional Transformation

Galway Med-tech
An excellent exemplar is the development over the last 30 years of Galway as a world leading med-tech region, where one third of Ireland's medtech workforce is employed. It has a significant FDI sector that includes several of the world's top medical device MNCs, a strong indigenous med-tech and sub-supply sector, and education and research centres in NUIG and GMIT.

Start-up and scale-up enterprises have access to several innovation, incubation and coworking spaces in Galway city and surrounding area, as well as campus incubation centres at GMIT - Innovation Hub (iHub), at NUIG - Ignite Business Innovation Centre, and Bioinnovate Ireland https://www.bioinnovate.ie/

Mondregon Business Group / Co-operative – Basque country, Spain
MONDRAGON developed from a cooperative business project launched in 1956 in the Basque region in Spain, as an initiative to promote economic development in the region through skills development, enterprise and innovation, and collaboration. MONDRAGON is a dominant business group in the region and one of Spain's largest corporations. Its global activities include 141 production facilities in 37 countries, commercial business in 53. Its Corporate Values include: inter co-operation, grassroots management, corporate social responsibility, innovation, democratic organisation, education and social transformation.
https://www.mondragon-corporation.com/en/about-us/
MONDRAGON operates in four areas: Finance, Industry, Retail and Knowledge. It has 96 separate, self-governing cooperatives employing over 81,000 persons and has 14 R&D centres.

Friuli/Venezia/Giulia Region - Italy
Friuli Venezia Giulia is a relatively small region in North-east Italy in terms of population (1.8m) but has over the last 40 years become one of Italy's more advanced industrial regions. It has a high number of advanced manufacturing companies, mostly SMEs, a strong ICT sector and several research centres and universities. This transformation is the result of numerous Government, business and 3rd level initiatives over many decades. Two initiatives of interest are:

Friuli Innovazione was set up in 1999 by the University of Udine, the Udine Industrial Association, the Fiat Research Centre, Agemont, the Pordenone Industrial Association and the CRUP Foundation (Banking Foundation). Who we are | Friuli Innovazione (friulinnovazione.it) Friuli Innovazione works to strengthen the Friuli region as a knowledge-based economy and society, to develop the necessary skills-base, and to develop advanced facilities for its region: science and technology centres, joint university-industry collaboration and technology-rich spin-off companies.

AREA Science Park, near Trieste was set up in 1982 to foster linkages between the business community and the many high-level international scientific institutions in Trieste. It is now the most important multi-sector science parks in Italy and one of the major ones in Europe.

AREA's System » Area Science Park

Set on a 150 hectare site, it has over 50 hectares of buildings, currently with 38 established units and 2,600 researchers, technicians and entrepreneurs. Operating in the park are:

- specialist research and training centres;
- research and development and service centres of outside companies;
- new companies spinning out from the specialised facilities and know-how in the Park;
- Incentives to encourage SMEs to conduct collaborative R&D using its facilities, and specialist training in technology transfer between the research community and SMEs.

The park also hosts two internationally renowned specialist facilities - the ELETTRA Laboratory used for advanced materials characterisation and development, and the International Centre for Genetic Engineering and Biotechnology (ICGEB).

Potential for Transferable Learning for Midlands manufacturing

The exemplars selected above are:

a) evidence of what can be achieved through organised and sustained collaborative effort; and
b) reference sites for further study and potential networking and relationship building. While detailed study in all cases was beyond the scope of this project, the following summarises, for the short-and medium scale exemplars, key observations and potential follow-up actions.

Galway Med-tech region is included due to the accessibility of information locally to enable further study. The transformation scale of the international exemplars Mondragon/Northern Spain and the Friuli region/North-eastern Italy merit a further more detailed study as an additional exercise.

Exemplar Name	Key Transferable Contributing Factors	Follow-up action for Midlands Manufacturing
Made Smarter	• Industry-led, Government supported • Identified industry needs in digitalisation • Developed industry focused training • Built industry-led collaborative networks & best practice sharing • Structures to sustain and adapt	• Establish contact with Made Smarter • Build working relationship • Opportunities for training, trade contacts
Made in the Midlands	• Industry-led, industry-funded • Focus on rebuilding UK midlands manufacturing • Promotes collaborative learning, networking, supply chain amongst member companies	• Establish contact with Made Smarter • Build working relationship • Opportunities for training, trade contacts
ITS OWL technology network	• Industry-led, Government supported • Similar approach as was adopted by Made Smarter • 'strong cooperation culture: local companies – global leaders and hidden champions alike – work with research institutes and business-related organisations to create a unique ecosystem' – from its OWL website	• Establish contact with Made Smarter • Build working relationship • Opportunities for training, trade contacts • Use existing contact network of IMR / EI
Galway Med-tech Region	• Task-force following Digital Equipment (hardware factory) closure in 1994 • Multi-agency and stakeholder collaboration • Educated & skilled workforce • Local supplier base • Strong local third-level • Exploited emerging medical technologies and markets	• Deeper study and analysis • Identify key strategic factors which could guide Midlands action plan implementation

5 Identifying the Priorities

To ascertain the challenges and priority issues for Midlands manufacturing, discussions took place between the author and:

Members of the Action Plan Steering group and the wider working group –

- Agencies (EI, IDA, LEO), Midlands Regional Skills Forum, Regional Enterprise Development Office;
- Midlands industry – Abbott Diagnostics, Grant Engineering, Greenfield Global, Mergon;
- Support system – TUS – Midlands Midwest, Engenuity network, CIPD, Cobotics Skillnet, IMR;
- A wider sample of Midlands manufacturing companies reflecting sectoral mix and geographical location.

A survey template was used to frame the discussions with industry. This focused on awareness, relevance and use of advanced manufacturing, sustainable manufacturing, Lean SixSigma, and state and research supports. Survey responses on these topics varied, reflecting the range of industry sectors and company sizes, and awareness and understanding level tended to relate to the individual company context.

The following is a summary of the survey respondents' key issues, in the context of adoption of advanced sustainable manufacturing technologies and Lean SixSigma:

- Insufficient examples of advanced manufacturing technologies applicable to their sector (SME, Food/Drinks etc);
- Some technologies under-utilised e.g. data analytics, cobotics, ERP / work-flow digitisation;
- Lean SixSigma not sufficiently embedded - varying level in companies, some 'stop-start' approaches;
- Sustainability - aware, mostly ISO 14000/ISO 45000 driven, rather than through company strategy;
- SMEs need advice, examples of use, practical help and more financial supports to adopt;
- Skills training needed in emerging technologies, to meet ongoing skill-set needs of industry;
- Attracting and retaining specialist staff;
- Promote and facilitate apprenticeships as a career and development route;
- Potential opportunities through more Midlands industry networking/clusters;
- Need for independent expert advice;
- At management level, need for showcasing, educating, and guidance in preparing business case;
- Agencies were well regarded, but varying engagement by companies with agency supports in Higher Education/Research organisations sector, little with EU;
- Potential opportunities through awareness of inter-agency collaborative initiatives;
- Perceived complexity of support ecosystem;
- Help for companies to explore and pilot technologies to encourage early adoption competitive advantage.

6 The Action Plan

In addressing these issues, the action plan presented in the following sections seeks to build on the advantages which the Midlands has and to lay the pathway to achieve the vision for the Midlands as a manufacturing centre of excellence.

The action plan is structured around the following enabling themes:

Theme 1. **Education, Training & Skills**
Theme 2. **Research & Innovation**
Theme 3. **Support infrastructure & networks**
Theme 4. **Strengthening the manufacturing industry base - FDI and Indigenous sector**

The successful implementation of the action plan will draw on supports available both at regional and local level and also where appropriate across the wider national infrastructure.

Support at Regional Level
Although for each action within these themes a lead organisation has been assigned, it is essential that actions command the required collaboration and support of all stakeholders in the region. To give maximum effect to this requirement, as outlined in section 7, an implementation group comprising the key regional stakeholders will be established to provide the suite of supports necessary to drive implementation of the actions at regional level in the Midlands.

Accessing the National Support Infrastructure
Equally, the action plan is not limited to utilising the resources available in the Midlands region – where relevant, actions should facilitate access to and collaboration across the wider state support resources and infrastructure for the benefit of Midlands manufacturing. In this regard, as well as the agencies' regional offices, TUS – Midlands Midwest and IMR are responsible for the education, training and industry focused research in the region, can also facilitate access to the national infrastructure through their numerous research collaborations and networks. Examples are:

- IMR is part of the EI/IDA funded Technology Centres network.
- TUS – Midlands Midwest through its APT and COMAND centres are part of the EI funded Technology Gateways Network, and with its TU partner LIT has access to complementary strengths in manufacturing and precision engineering.
- TUS – Midlands Midwest is a partner with the SFI funded advanced manufacturing centre CONFIRM in UL, and the materials research centre AMBER hosted by TCD;
- IMR is a partner with the SFI funded advanced manufacturing centre I-FORM hosted by UCD, and with Dundalk IT in the Border Enterprise Development Fund (BEDF) supported Advanced Manufacturing & Technology Training Centre of Excellence.
- The Advanced Manufacturing Centre in Limerick (AMC) is a strategic national initiative aligned with Government's Industry 4.0 Strategy 2020-2025 and IDA Ireland's Strategy 2021-2024. The centre, the establishment of which is being supported by IDA Ireland, will be located in the National Technology park Limerick, with a targeted launch date of Q1

2022. The AMC will be an international exemplar and centre of excellence supporting Ireland-based discrete manufacturers to access, trial, adopt, deploy and scale the latest advanced manufacturing technologies, thereby enhancing competitiveness and upskilling their workforce for the future.

The Government's 'Future Manufacturing Ireland' mechanism[4] is an additional route which will enable Midlands research groups and companies to access publicly-funded advanced manufacturing facilities across the country.

Performance Tracking
Performance indicators to track progress will be developed and agreed by the Midlands Advanced Manufacturing Steering Group.

Theme 1 – Education, Training & Skills

To meet its vision, the Midlands region must have the education and training facilities to build and maintain an advanced sustainable manufacturing sector, and to provide staff training and skills upgrading, and apprenticeships, in technologies relevant to their industry. The Midlands Regional Skills Forum comprising DEASP, TUS – Midlands Midwest, Education Training Boards (ETBs), Skillnets, enterprise agencies, local authorities, LEOs, Regional Enterprise Development Office, and industry representatives, is a mechanism to ensure industry skills needs are understood and provided for. TUS – Midlands Midwest has an Industry Advisory Group with a similar purpose to help shape current and future education course content. The ETBs also have staff who focus on identifying and servicing industry training and apprenticeship needs.

An example is the ETB training programme run in conjunction with Fast Track to IT (FIT) for new entrants to Intel - https://fit.ie/course/manufacturing-technician-maintenance-skills/
Another example is the OEM apprenticeship scheme pioneered by Combilift , which is now a national Apprenticeship and available to any company - https://apprenticeship.ie/career-seekers/get-started/learn-more/engineering/oem-engineer-l6.

TUS – Midlands Midwest presents a significant opportunity to Midlands manufacturing, both in the opportunity to help mould and shape the TUS portfolio of courses and activities, and also in the additional facilities (e.g. engineering and food technology) of the Limerick campus.

It is envisaged that the Steering group (or its successor implementation group as outlined in section 7) would underpin the work involved in delivering actions below through support measures where needed to ensure success - for both the region and the action lead. Such measures may include helping to access funding schemes, business introductions, promotion/PR etc.

[4] Future Manufacturing Ireland is a new coordination mechanism being established under the Government's Industry 4.0 Strategy, to ensure coherence and optimal delivery of RD&I supports across publicly-funded centres with a dedicated focus on advanced manufacturing/Industry 4.0.

	ACTION	Lead
AM1.	Conduct a skill needs audit on Midlands manufacturers – in the areas of advanced and sustainable manufacturing – to ascertain the skill need and level and to ensure alignment with existing research, skills development and training offering within the region.	Regional Skills Forum to lead
AM2.	Develop an approach for career Progression Pathways to Sustainable Advanced Manufacturing to enable progression to higher levels.	Regional Skills Forum to lead
AM3.	Develop training courses for management in advanced /sustainable manufacturing to provide critical awareness of data analytics and oncoming technologies relevant to their specific industry.	Regional Skills Forum to lead
AM4.	Develop more modular and flexible training courses, to enable the existing workforce to upskill and reskill, through Skills to Advance, Springboard and other mechanisms, utilising the Midlands Network of Co-working Facilities where appropriate.	Regional Skills Forum to lead

Theme 2 – Research & Innovation

The presence of a Technological University campus in Athlone and the significant manufacturing research centre in Mullingar that is IMR, offers a huge opportunity for Midlands industry, which will be further strengthened by facilities in the Limerick campus of the Technological University. Independently, both entities have strong industry linkages and have technical expertise and facilities which are to a large degree complementary. Working in collaboration, these entities could serve as an advanced and sustainable manufacturing centre of excellence unique in Ireland.

It is envisaged that the Steering group (or its successor implementation group as outlined in section 7) would underpin the work involved in delivering actions below through support measures where needed to ensure success - for both the region and the action lead. Such measures may include helping to access funding schemes, business introductions, promotion/PR etc.

	ACTIONS	Lead
AM5.	TUS – Midlands Midwest and IMR invited to develop and explore further collaborative funding opportunities to enable increased collaboration within the region e.g. collaborative R&D; certified industry training programmes; facilities for early-stage prototyping and production scale-up (including linkages with other education and training providers); 'test before invest' in selected advanced /sustainable manufacturing technologies.	ATiM | TUS – Midlands Midwest| IMR to lead
AM6.	Through the Enterprise Ireland funded Industry 4.0 Regional Technology Cluster delivered by TUS – Midlands Midwest, with collaborators including IMR, to identify advanced and sustainable manufacturing technologies relevant to Midlands manufacturers, including SMEs and LEO clients, and build supportive R&D capabilities in TUS – Midlands Midwest and IMR.	ATiM |TUS – Midlands | IMR to lead
AM7.	Encourage Midlands industry involvement in international research collaborations in advanced and sustainable manufacturing through targeted promotion of EU & National funding opportunities.	IMR to lead supported by EI | IDA | LEOs
AM8.	TUS – Midlands Midwest and IMR, in conjunction with Skillnets and other service providers invited to collaborate on technology showcasing programme to promote awareness and understanding of advanced manufacturing technologies – such as cobotics, data analytics, additive processes. Ensure TUS – Midlands Midwest and IMR's facilities are recognised, accessible and utilised among Midlands SMEs and LEO clients.	TUS – Midlands Midwest | IMR to lead
AM9.	Ensure that Midlands food companies are aware of Technology Gateways expertise and test facilities in Food Technology available to the region.	Technology Gateways - TUS – Midlands Midwest to lead supported by EI | LEOs
AM10.	Explore the feasibility of grouping SMEs and/or LEO clients to pool Innovation Vouchers to undertake advanced manufacturing / sustainable manufacturing collaborative projects.	ATiM to lead supported by EI | LEOs

Theme 3 - Support infrastructure & networks

The support ecosystem available to Midlands manufacturing companies summarised in section 3 is extensive. A mechanism which is easily accessible to companies and which provides a map or 'navigation aid' through the complexity of the support system is required. This would assist in increasing the level of engagement of companies with the state agencies and their support systems, and in showcasing the region's capabilities in advanced and sustainable manufacturing. It would also assist in collaboration between various elements of the system.

There is also significant capability in the private sector in the Midlands in advanced manufacturing systems, equipment and expertise which is relevant to the Midlands manufacturing base.

A frequent barrier cited by SMEs in the adoption of unfamiliar advanced manufacturing technologies is the capital investment risk for them, and the perception that there is insufficient state financial incentives or supports to mitigate that risk. This issue warrants a focused investigation.

However, an array of State support systems exists to help companies – business expansion, Collaborative R&D supports (vouchers and Partnerships), company R&D supports, Lean Business/Operational Excellence, R&D training, Green Programme, etc. Targeted promotional campaigns can help to highlight how these supports can be used by companies to adopt advanced sustainable manufacturing processes.

It is envisaged that the Steering group (or its successor implementation group as outlined in section 7) would underpin the work involved in in delivering actions below through support measures where needed to ensure success - for both the region and the action lead. Such measures may include helping access funding schemes, business introductions, promotion/PR etc.

Support infrastructure

	ACTIONS	Lead
AM11.	Use targeted promotional campaigns to assist Midlands manufacturing companies, including SMEs and LEO clients, who wish to adopt advanced and sustainable manufacturing technologies, to understand and use state funding mechanisms.	IMR to lead supported by EI | LEOs
AM12.	IMR in conjunction with networks such as the ATiM (Advanced Technologies in Manufacturing) Cluster, Engenuity cluster, to encourage increased collaboration between members/ client companies to exploit opportunities arising from the need for flexible, secure, near-shored supply-chains.	IMR | ATiM

Support networks

Several networks exist in the Midlands-Midlands Regional Enterprise Plan Steering Committee, Skillnets, Lean, Engenuity, TUS – Midlands Midwest Industry Advisory Group, Regional Skills Forum etc), focusing on specific topics of relevance to Midlands industry. An effective well-run business network system can provide the backbone of the 'manufacturing centre of excellence' vision for the Midlands - in developing and strengthening inter-firm collaborations to tackle market opportunities, and increasing the adoption of appropriate technologies and manufacturing practices. Through peer-to-peer learning, companies can more effectively identify which part of the technology set or best practise is a priority for their particular operation. The business network strengthens the voice of industry to agencies and to Government.

Network-based activities need ongoing development, co-ordination and marketing across the Midlands manufacturing base. This may be best achieved through an industry-led Midlands manufacturing network.

Building the region's reputation as a centre of excellence requires additional pro-active marketing and promotional measures - indeed building the reputation and establishing the capability should become self-reinforcing. For this reason, it is recommended that a communication strategy is developed with the goal of promoting the Midlands as a location for advanced and sustainable manufacturing.

It is envisaged that the Steering group (or its successor implementation group as outlined in section 7) would underpin the work involved in delivering actions below through support measures where needed to ensure success - for both the region and the action lead. Such measures may include helping to access funding schemes, business introductions, promotion/PR etc.

	ACTIONS	Lead
AM13.	Establish, encourage, and support the Midlands Manufacturing Network (MMN) (in co-operation with agencies, Ibec, Chambers of Ireland across the region). Indicative activities of the network include the following: • Develop a communication strategy to promote the Midlands as a location for advanced manufacturing, including testimonial videos from regional industry leaders. • Compile case-studies which showcase industry successes in adoption of advanced manufacturing. • Lunch n' Learn events - showcasing best international models relevant to the vision and adopt best practices for the Midlands manufacturing base. • Partner with regional networks/initiatives in international locations – UK, EU – to facilitate business contacts, knowledge sharing and enable company exchange visits.	IMR /TUS – Midlands Midwest | ATiM to lead supported by EI | IDA | LEOs

	• Investigate the potential for a Midlands capital investment vehicle (similar to the WxNW syndicate which operates in the Western region) to provide investment capital options for manufacturing start-ups. • Establish working relationships and opportunities to share best practice with overseas examplars as indicated in section 4. • Develop annual schedule of site visits to best-in-class sites in Ireland, UK and EU to showcase advanced /sustainable manufacturing technologies for industry of all scales.	
AM14.	Explore the potential for collaboration across the schools outreach programmes - IMR's 'manufacturing as a career' schools outreach project, Offaly Vex-robotics, and Midlands Science - so as to further enhance the awareness of STEM (Science, Technology, Engineering and Maths) subjects and manufacturing in Midlands schools.	IMR | Steering Group
AM15.	Investigate the potential to work with and build on IMR's 'Covid-response' supply chain initiative, which addressed sub-supply challenges through inter-company collaboration, into a wider Midlands manufacturing initiative, in conjunction with the Agencies IDA, EI and LEOs.	IMR | Steering Group
AM16.	Support and develop existing networks - such as the Engenuity, ATiM (Advanced Technologies in Manufacturing) Cluster or Midlands Lean Network – to supplement adoption of advanced/sustainable manufacturing amongst SMEs and LEO clients.	ATiM to lead supported by EI | IDA | LEOs

Theme 4 - Strengthening the Midlands manufacturing industry base

The agencies EI, IDA and LEOs have extensive supports for developing their respective client-bases, and have recently published strategies which include regional development measures that will strengthen the Midlands industry base.

The opportunities presented by advanced manufacturing technologies could be enhanced through interagency measures, as proposed in preceding theme 2. This can help drive more inter-company and company-research centre collaborations on new technologies, with potential for new commercial outputs. The cross-fertilisation of ideas between these collaborators can also generate new start-up companies. If the Midlands is to strengthen its manufacturing base, it must also have a pipeline of new manufacturing start-ups – which for various reasons is nationally low in comparison to other startup sectors (ICT, Food). The presence of both TUS – Midlands Midwest, the incubation centre and the IMR Mullingar facility provide a base on which to build such a pipeline.

It is envisaged that the Steering group (or its successor implementation group as outlined in section 7) would underpin the work involved in delivering actions below through support

measures where needed to ensure success - for both the region and the action lead. Such measures may include helping to access funding schemes, business introductions, promotion/PR etc.

	ACTION	Lead
AM17.	Complete the feasibility study and concept development for a Midlands Technology Campus at TUS – Midlands Midwest , and progress to completion of design and planning, and secure necessary funding to enable building commencement.	TUS – Midlands Midwest
AM18.	Assist companies in conjunction with Agencies and encourage collaborative applications across the Midlands and TUS – Midlands Midwest and IMR to compete for Disruptive Technologies Innovation Fund awards.	Agencies | TUS – Midlands Midwest| IMR | ATiM
AM19.	Enhance the reputation and leadership profile of Midlands manufacturing through increased participation by Midlands companies in European programmes such as the European Digital innovation Hub, Manufuture, Platform Industrie 4.0[5]	IMR
AM20.	Encourage Midlands manufacturing companies, including SMEs and LEO clients, to incorporate sustainable technologies and practices into their business with the support of EI Green Business Offer / LEOs Going Green initiative.	EI | IDA | LEOs
AM21.	Explore funding opportunities to enhance incubation/innovation centres and examine mechanisms to facilitate an increase in the number of manufacturing start-ups throughout the Midlands.	ATiM TUS – Midlands Midwest | IMR | LEOs

[5] European Digital innovation Hub https://ec.europa.eu/digital-single-market/en/digital-innovation-hubs-dihs-europe
Manufuture www.manufutre.org
Platform Industrie 4.0 - https://www.plattform-i40.de/PI40/Redaktion/EN/Dossiers/international-cooperations.html

7 Action Plan Implementation & Monitoring Function

It is essential for the successful implementation of this Action plan that the work of the Steering Group has continuity. The existing MREP AM Steering Group, in its existing or revised format, and to also include TUS – Midlands Midwest and IMR as key action leads, should remain in place. This group will oversee and guide action plan delivery. It will review and agree performance indicators and relevant targets, monitor results and refresh the plan over time. The group may need to seek a baseline study of relevant activities in the region to assist in setting suitable targets on agreed performance indicators. It is envisaged that the steering committee would meet on a quarterly basis.

As already mentioned, the group has an important role in supporting delivery of the actions and in supporting the development of funding applications including those needed to secure resources to implement actions in this action-plan. It should also serve as a forum to increase collaboration amongst Midlands regional stakeholders, and to enable increased awareness and dissemination of advanced manufacturing resources and activities.

8 Concluding Remarks

The Midlands Action Plan to develop the Midlands region as a manufacturing 'Centre of Excellence' sets out a bold vision but one that is achievable. The actions presented in this document lay the foundation towards achieving that vision. Many of them align with actions already tabled in the Government's Industry 4.0 Strategy.

A suite of actions which address business and technology issues alone is not sufficient to ensure that the Midlands can achieve its vision of being a 'sustainable and advanced manufacturing' location of choice.

To attract and retain the workforce and talent needed, measures are also needed to give the Midlands a premium 'work-life balance' for the region's workforce and families – e.g. public transport, educational, social, sports and cultural facilities, remote working hubs, and digital, power and other infrastructural elements. This might include initiatives undertaken by **Midlands**Ireland.ie and Local Authorities to bolster the Midlands region as an attractive location in which to live and work.

The plan draws on the valuable contributions from the Steering Group members, the wider Working Group and from Midlands manufacturing industry clients of Enterprise Ireland, IDA Ireland and LEOs, who generously gave their time and insights.

Its implementation will require persistence and determination, and commitment, co-operation and adequate resources from all those operating or supporting manufacturing interests in the Midlands region, in particular its key regional stakeholders who have the scale and capacity to demonstrate and drive the benefits of collaboration. It will also require robust ongoing monitoring, periodic review, and re-alignment to match changing business environment, and ultimately replacement with a successor plan.

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