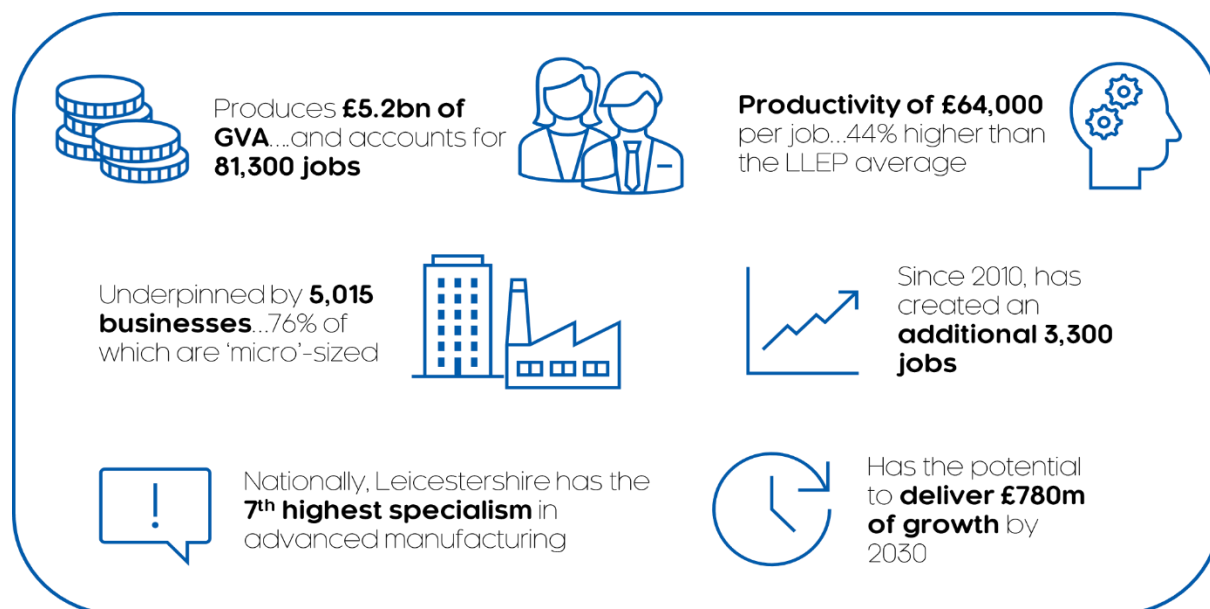


# Sector profile: Advanced Manufacturing and Engineering in Leicester and Leicestershire



Source(s): See *Economic and growth indicators*.

## Defining Advanced Manufacturing and Engineering

**Advanced manufacturing and engineering** involves the design and manufacture of advanced products as well as the application of advanced production systems.

**Advanced manufacturing involves versatile production methods that are more efficient, effective and responsive.** This contrasts with traditional manufacturing that is based on the use of dedicated plant and production lines with little or no flexibility. Sometimes referred to as Industry 4.0 - advanced manufacturing encompasses all aspects of the value chain of a product - from concept to end-of-life considerations, and relies on information communication technology (ICT) to integrate the manufacturing and business activities into a seamless efficient operation.

Products derived from advanced manufacturing and engineering include machines, devices and solutions, often utilising the latest technologies and includes subsectors such as aerospace, automotive, chemical, computing, defence, electrical electronics, environmental, infrastructure, instrumentation, control systems, mechanical, power, rail and telecoms.

## Market and economic outlook

### Global market

**The global advanced manufacturing and engineering sector has entered a period of uncertainty and changes in demand and supply patterns.** During the pandemic, manufacturing companies that produce non-essential goods have experienced a significant

reduction in staff, while those that produce essential goods have had to scale up, add product lines, and hire new workers in order to satisfy demand.

**Advanced manufacturing techniques and capabilities has advantageous for manufacturers that have had to reduce their workforce.** Many manufacturers have turned to the 'Internet of Things' (essentially the ability to track orders, components and the manufacturing process through monitoring and systems analysis) automation and product line and factory process optimization in an attempt to keep up with changes in demand. Optimization allows for cost control and profitability, which are essential for companies whose sales have been reduced.

**Manufacturers particularly impacted by Covid-19 have included aerospace manufacturers,** as airlines have wound down services and cancelled their fleet purchases until the markets experience recovery. The automotive market has also seen a decline in demand, partly due to less travel, and partly due to a loss of confidence amongst consumers.

**Advanced manufacturing will continue to adopt and implement the four foundational technologies driving Industry 4.0:** 1) Connectivity, data, and computational power; 2) Analytics and intelligence; 3) Human-machine intervention; and 4) Advanced engineering. This is also predicted to move further into "Planning 4.0" – where analytics and AI are turned into flexible, responsive operations. Looking ahead, manufacturers will likely continue to re-evaluate their workforce and investment in production technology based on shifts in demand.

## UK market

**According to the UK Government's Department for International Trade, the UK has a thriving manufacturing industry,** with investment in automation and technological advances potentially adding £275bn to the national economy each year.

**Substantial UK growth has occurred in** areas such as composite materials, low carbon technologies, digital process engineering, additive manufacturing, and robotics and autonomous systems. The UK is also a world leader in material technologies and the development of advanced materials such as graphene and other 2D materials. New technologies are set to transform productivity in the next few years, a process referred to as the 4th Industrial Revolution or Industry 4.0. The World Economic Forum considers the UK a leading country for Industry 4.0 – ranked 2nd for technology and innovation, and 1st for available financing.

**Optimism in the three months to April (2021) improved at its quickest pace since April 1973,** while investment intentions saw a strong, broad-based rebound, [according to the latest CBI quarterly Industrial Trends Survey](#). The survey of 288 manufacturers found that firms expect to increase capital expenditure on buildings, plant and machinery, product and process innovation, and training and retraining in the next year (relative to the last). In particular, investment intentions for plant and machinery were at their strongest since July 1997. Although manufacturing output was broadly flat in the quarter to April, total new orders grew at the quickest pace since April 2019 – and both output and orders growth are expected to pick up rapidly in the next quarter. Export optimism for the year ahead strengthened after successive decline over almost three years. New export orders stabilised after falling for nearly two years and are expected to hold steady in the quarter ahead.

## Business impacts of Covid-19 and Brexit

**Covid-19 has led to materials shortages, steep falls in demand, and problems with worker availability.** This has led to staff furloughs, cuts in production and redundancies. [According to Make UK in February 2021](#), 56% of 186 manufacturers surveyed had staff on furlough; half believed they will achieve full operating levels by the end of 2021, and 52% had already made redundancies. More than 60% of manufacturing firms believe the UK will return to normal by February 2022.

**Acceleration of innovation and technology adoption is the key trend.** [According to McKinsey](#), Industry 4.0 technologies were already transforming manufacturers' operations before the pandemic. Now adoption is diverging between technology haves and have-nots. After Covid-19, manufacturing and its supply chains are likely to be much more digital, as is already evident in the immediate response to the crisis. Industry 4.0 - which includes connectivity, advanced analytics, automation, and advanced-manufacturing technologies - was gaining momentum before COVID-19, helping companies transform their operations in everything from production efficiency to product customization, with improvements in speed to market, service effectiveness, and new business model creation.

**Industry leaders are leveraging Industry 4.0 solutions:** 39 percent (McKinsey, as above) have implemented a nerve-centre, or control-tower, approach to increase end-to-end supply-chain transparency, and around a quarter are fast-tracking automation programs to stem worker shortages arising from COVID-19.

**The costs and impacts of Brexit have been significant for manufacturers,** as [recent Make UK surveys](#) reveal; 9 out of 10 manufacturing companies have incurred costs due to the new arrangements with the EU, and 8 out of 10 could not prepare due to the uncertainty of what the new relationship would be like. The impacts of the new rules and trading relationship are already being felt. Eight in ten companies are experiencing some form of disruption to their supply chains (although not all of these are EU-UK related). Of those, one-third say they are seeing disruption to imports and exports to and from the EU, while only one in five say the disruptions are predominantly on imports from the EU.

## Activities and key organisations in Leicester and Leicestershire

**Leicester and Leicestershire has a rich industrial heritage,** with historic specialisms in boot and shoemaking, material processing and production and textiles and knitted goods. The precision engineering skills established through these major developments then attracted companies who were drawn by the quality and availability of skilled labour, such as Imperial Typewriters and Rank Taylor Hobson.

**Fast forward to 2021, and there is a diverse range of advanced manufacturing and engineering activities and firms,** including *Caterpillar* – who manufacture construction equipment in their Desford facility; *Sofidel*, the paper manufacturer based in Leicester, *Bostik* based in Loughborough, *General Electric*, *Benson Group* and *Ibstock*.

**MIRA Technology Park**, based in Hinckley, is a global provider of pioneering engineering, research and test services to the *automotive, defence, aerospace and rail* sectors. It is a world class centre of excellence in transport technology set in an outstanding 842-acre

campus environment. Located at the geographical centre of the UK's automotive sector, the two-million-square-foot Technology Park provides bespoke property solutions for customers by designing and delivering buildings to meet their R&D needs, alongside an existing range of flexible office, laboratory and workshop space. *HORIBA MIRA* works in close collaboration with vehicle manufacturers and suppliers around the world, providing comprehensive support ranging from individual product tests to turnkey engineering design, development and build programmes. *Bruntingthorpe Proving Ground* is the largest privately-owned vehicle test track facility in the UK and won £4m in Government funding to design and operate a new Connected and Autonomous Vehicle (CAV) test facility in 2018.

Leicester and Leicestershire has over 200 *food and drink manufacturing* businesses, including *Samworth Brothers* and *Mars Group* – both at Melton Mowbray. *PepsiCo* is one of the world's leading food and beverage companies with brands including Walkers Crisps (manufactured in Leicester), Pepsi and Quaker Oats. PepsiCo's R&D Centre in Leicester houses the company's core technical staff across R&D, engineering and technical services, and aims to drive the development of healthier foods for the European market.

Leicester and Leicestershire continues to retain its textiles manufacturing expertise, with firms such as Boden, Pantherella, Fashion Fabric Transprinters, and EBSCO.

## University and R&D expertise

**Loughborough University** offers Advanced Manufacturing Engineering and Management courses and has significant R&D expertise in advanced manufacturing and engineering, with a number of renowned research centres including: Rolls-Royce University Technology Centre in Combustion Aerothermal Systems; The National Centre of Excellence in Gas Turbine Combustion System Aerodynamics; and the Vehicle Aerodynamics Research Centre; The Caterpillar Innovation and Research Centre; the National Centre for Combustion and Aerothermal Technology and the Systems Engineering Innovation Centre.

**De Montfort University** (DMU) runs a range of degrees in advanced technology. Key technology areas include medical diagnostics, robotics, satellite mapping, home security, 'glasses-free' 3D television, aircraft manufacturing and safety, mobile communication and alternative energy.

**The University of Leicester** has world-leading research specialisms in Aerospace and Computational Engineering; and the Mechanics of Materials, as well as Bioengineering and Biomaterials, Energy, Engineering Management, Space Engineering and Transport. The University also hosts research in the cross-disciplinary groupings of: the Advanced Microscopy Centre, Biomechanics & Immersive Technology Laboratory, Dynamics, Vibration & Acoustics Laboratory, the NISCO UK Research Centre (NU-RC), and the TWI Materials Innovation Centre (MatIC).

**The University of Leicester is a major centre for space technology** which is evidenced by programmes such as G-STEP and the Satellite Applications Catapult node based at the University, and by the SpacePark development where cutting-edge research is done and business incubator facilities are provided. In terms of manufacturing-related technology, the University has developed a facility to house the UK's first commercial 3D laser measurement and modal analysis centre - the Advanced Structural Dynamics Evaluation Collaborative (ASDEC) Research Centre.

**The Manufacturing Technology Centre (MTC)** develops and proves innovative manufacturing processes and technologies in an agile, low risk environment, in partnership with industry, academia and other institutions. The organisation operates some of the most advanced manufacturing equipment in the world, and employs a team of highly skilled engineers, many of whom are leading experts in their field. This creates a high-quality environment for the development and demonstration of new processes and technologies on an industrial scale to deliver bespoke manufacturing system solutions for customers. The MTC's areas of expertise are directly relevant to both large and small companies and are applicable across a wide range of industry sectors. The MTC's members include global manufacturing companies from multiple sectors. Research partners include the University of Birmingham, University of Nottingham, Loughborough University and TWI Ltd. The MTC is part of the High Value Manufacturing Catapult which is supported by Innovate UK (formerly the Technology Strategy Board).

## Economic and growth indicators

Table 1: Summary of key economic and growth indicators for the Advanced Manufacturing and Engineering sector in Leicester and Leicestershire

	Value, 2019	% of economy total	% of economy total (UK average)
GVA (£m)	5,203	21.2%	14.8%
Jobs	81,300	14.8%	10.6%
Businesses	5,015	10.1%	7.9%
Productivity (£)	64,000	143.8%	139.8%
	Value, 2010-19	% change p.a.	% change p.a. (UK average)
Real GVA growth (£m)	-242	-0.5%	0.2%
Jobs created	3,300	0.5%	0.6%
New businesses	520	11.6%	15.0%
Productivity growth	-	-1.0%	-0.4%

Source: ONS, Cambridge Econometrics.

**Worth £5.2bn and accounting for 81,300 high-value jobs** (according to official statistics - see Table 1 above), Leicester and Leicestershire has the **7th highest specialism in advanced manufacturing and engineering in England** (ranked by location quotient out of 38 LEP areas).

**Recent growth has been employment-led, with 3,300 additional jobs created since 2010.** Accompanying productivity growth however has been subdued, contracting by 1% p.a. (2.5 times slower than the UK average), pulling down headline GVA growth (-£240m).

**Resultantly, productivity in the sector has dropped 8% below the UK average.** At the start of the decade, sectoral productivity in the LLEP area had been in line with the UK average. This gap is estimated to be costing the sector some £400m of potential growth.

**The sector comprises over 5,000 local businesses**, of which three-quarters are 'micro'-sized (employing <9 people). An additional 520 manufacturing businesses have been established since 2010.

## Additional evidence and research

Additional indicators and research on the sector in Leicester and Leicestershire show:

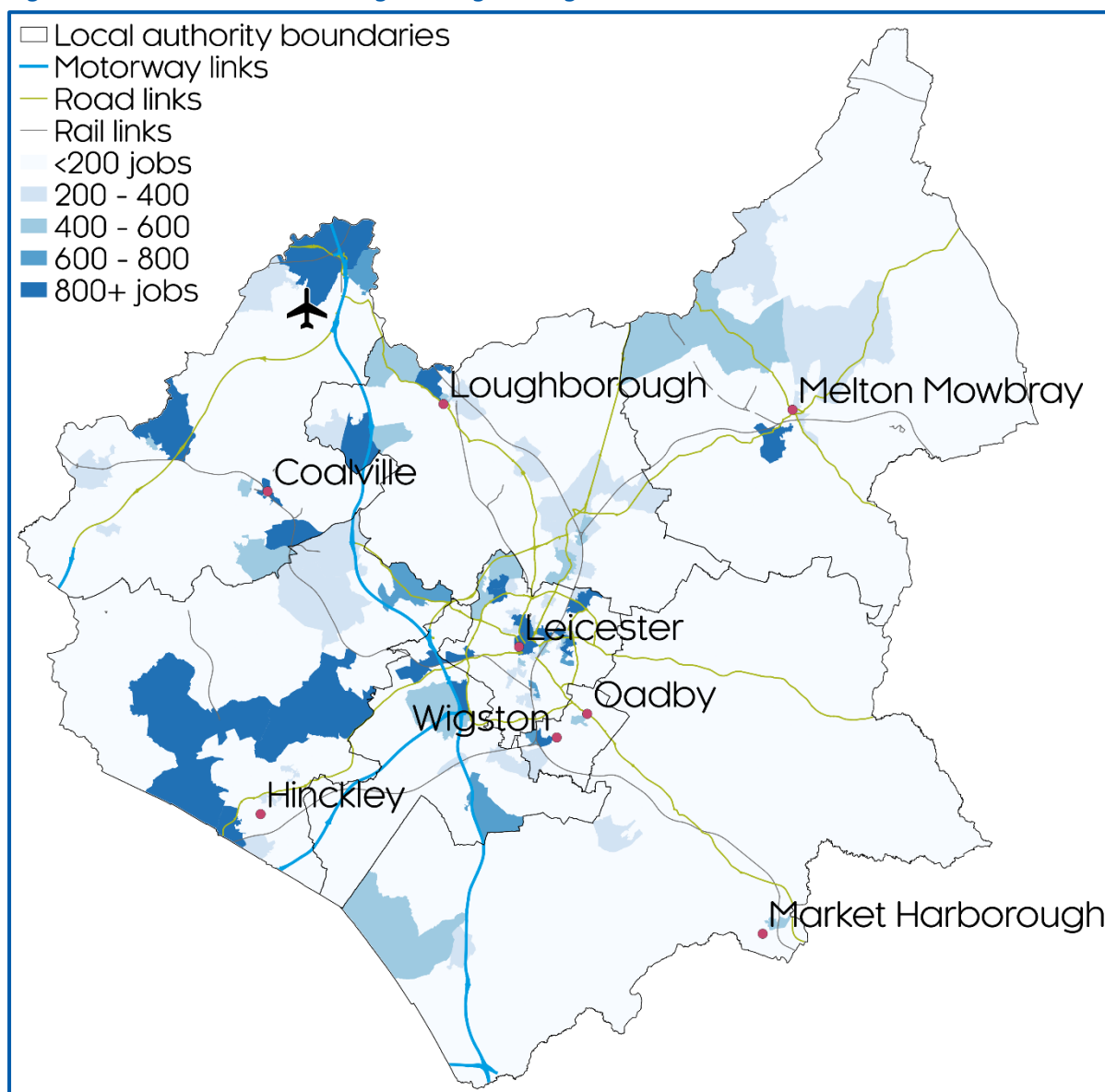
- Local producers exported £3.4bn of goods in 2019, [HMRC research found](#), though on a per worker basis this was 35% lower than the UK average. 54% of goods exports were to the EU
- Over 2014-17, the [ONS found](#) Leicestershire exhibited the 11<sup>th</sup> highest incidence of 'high growth' manufacturing firms in England (ranked out of 38 LEP areas)
- The sector helps drive £690m of R&D spend in Leicestershire, [according to Eurostat](#), though as a proportion of total GDP (1.2%) this is lower than the UK average (1.7%), and below the UK Governments target of 2.4%
- [BEIS estimates](#) the sector has helped reduce industrial CO<sub>2</sub> emissions by 44% in Leicestershire since 2005, a faster decrease than the East Midlands average (37%)



## Spatial structure and clusters

**The sector is well represented across Leicestershire**, particularly to the west of the county around the M1 and M69 corridors, as [Figure 1](#) below shows. East Midlands Airport, and its aviation and logistics-related cluster is notable to the north, whilst MIRA Technology Park and associated automotive and scientific/R&D activity is evident around Hinckley.

**Figure 1: Advanced Manufacturing and Engineering clusters in Leicester and Leicestershire**



Source: ONS, Cambridge Econometrics.

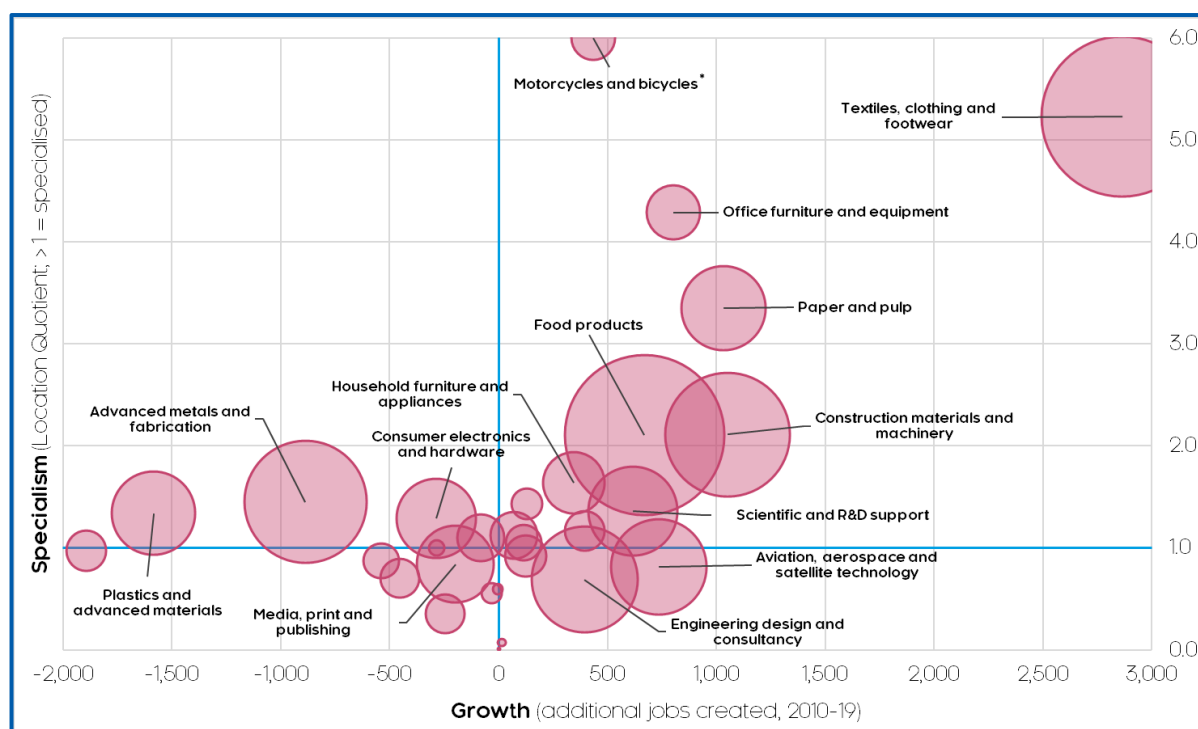
**Reflecting its industrial heritage, Leicester also retains a sizeable share of manufacturing activity**, particularly within food, drink and textiles. [According to the Centre for Cities](#), of 64 UK cities Leicester has the 12th highest concentration of manufacturing activity. Market towns such as Coalville, Loughborough, Melton and Ashby also retain notable clusters, often reflecting local specialisms and assets.

## Industry structure and specialisms

Leicester and Leicestershire has a diverse and resilient manufacturing base, represented by some internationally-recognised and growing specialisms, as Figure 2 below shows:

- **Textiles, clothing and footwear** - 12,900 jobs, £760m GVA: a large and fast-growing activity, has created more jobs than any other manufacturing discipline since 2010
- **Motorcycles and bicycles** - 1,000 jobs: has doubled its workforce over the past decade, and is the most specialised activity - across all sectors - in Leicestershire
- **Food products** - 12,800 jobs, £870m GVA: also highly specialised, with particular strengths in confectionary, snacks, beverages and prepared meals
- **Construction materials and machinery** - 7,700 jobs, £460m GVA
- **Office and household furniture and equipment/appliances** - 3,400 combined jobs
- **Aviation, aerospace and satellite technology** - 2,600 jobs; has more than doubled in size over the past decade
- **Advanced metals and fabrication** - 7,500 jobs, £430m

Figure 2: Local specialisms and growth within Advanced Manufacturing and Engineering



Source: ONS, Cambridge Econometrics. Note: Size of bubbles relate to size of activity (in jobs terms). Bubbles above the blue horizontal indicate a specialism. Bubbles to the right of the blue vertical indicate growth (in jobs terms).

## Sector prospects in Leicester and Leicestershire

### Economic impact and recovery from Covid-19 and Brexit

The Covid-19 pandemic and the end of the EU transition present significant challenges but also some opportunities for the sector. During a difficult 2020, GVA losses could total £410m locally, though this will be inconsistent within the sector e.g. the market for



pharmaceuticals/medicinal could be buoyant, in contrast to automotive and aerospace. As [Table 2](#) below shows, the contraction could be marginally more severe in Leicestershire compared to the UK average.

**From 2021 onwards, there is the potential for a robust recovery**, with post-Covid rates of growth expected to be 3 times faster than the previous decade, driven by stronger productivity growth and higher research intensity, with automation and digitisation further accelerated post-pandemic. The £780m of potential growth by 2030 will more than offset the losses of 2020.

**Table 2: Covid-19 impacts and recovery prospects for the Advanced Manufacturing and Engineering sector in Leicester and Leicestershire**

Forecasted Covid-19 impact (2020)			
	Value, 2020	% change	% change (UK average)
GVA impact (£m)	-412	-7.9%	-7.7%
Jobs impact	-800	-1.0%	-1.6%
Productivity impact	-	-7.0%	-6.2%
Forecasted Covid-19 recovery (2021-30)			
	Value, 2021-30	% change p.a.	% change p.a. (UK average)
Real GVA growth (£m)	783	1.5%	1.8%
Jobs created	-3,300	-0.4%	-0.3%
Productivity growth	-	2.0%	2.2%

Source: Cambridge Econometrics Spring 2021 Forecasts.

**Employment is forecast to continue along its longer-term (pre-Covid/Brexit) decline**, with 3,300 fewer people working in the sector by 2030. Yet with an aging workforce, reduced migrant labour and sectoral shifting, demand for employment will continue to be strong; [UKCES expects](#) because of such replacement demand, across the East Midlands region, approximately 53,800 manufacturing roles will need to be filled over the next 5 years.

## Skills needs and challenges

**The sector will increasingly rely on technical, STEM-based skills** – to operate advanced and digitised machinery and production processes – as well as softer and interpersonal skills, alongside management aptitude – to manage and oversee complex supply chains and greater employee autonomy – [according to research by UCKES](#).

[As part of this research](#), they expect that almost half (44%) of the East Midlands manufacturing workforce will require higher-level (QCF4+, typically STEM-based) qualifications by 2024, up from just a quarter a decade ago.

Uncertainty relating to the availability of migrant labour could also push up demand for lower-skilled, manual-based roles, whilst the sector has the potential to continue providing

good, well-paid opportunities for those without higher-level qualifications, particularly through vocational and technical training routes.

If the supply for such skills and qualifications are not forthcoming, already high skills shortages and gaps could be exacerbated in the sector; [according to the 2019 UK Employer Skills Survey](#), 14% of manufacturers in Leicester and Leicestershire experienced skills shortages, with almost three-quarters (70%) of local vacancies in the sector hard-to-fill - the highest of any sector.

## Appendix A: Sector definition and sources

Data has primarily been sourced from [Cambridge Econometrics LFM](#). For a full and detailed overview of definitions, sources and forecasting methodology, please refer to the Technical Summary report accompanying this profile.

The sector has been defined using 5-digit [Standard Industrial Classifications \(SICs\)](#), detailed as follows. These have been informed by government and/or industry recommended definitions, and aim to capture as much of the sectors value chain as possible:

- 10110: Processing and preserving of meat
- 10120: Processing and preserving of poultry meat
- 10130: Production of meat and poultry meat products
- 10200: Processing and preserving of fish, crustaceans and molluscs
- 10310: Processing and preserving of potatoes
- 10320: Manufacture of fruit and vegetable juice
- 10390: Other processing and preserving of fruit and vegetables
- 10410: Manufacture of oils and fats
- 10420: Manufacture of margarine and similar edible fats
- 10511: Liquid milk and cream production
- 10512: Butter and cheese production
- 10519: Manufacture of milk products (other than liquid milk and cream, butter, cheese) nec
- 10520: Manufacture of ice cream
- 10611: Grain milling
- 10612: Manufacture of breakfast cereals and cereals-based foods
- 10620: Manufacture of starches and starch products
- 10710: Manufacture of bread; manufacture of fresh pastry goods and cakes
- 10720: Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes
- 10730: Manufacture of macaroni, noodles, couscous and similar farinaceous products
- 10810: Manufacture of sugar
- 10821: Manufacture of cocoa, and chocolate confectionery
- 10822: Manufacture of sugar confectionery
- 10831: Tea processing
- 10832: Production of coffee and coffee substitutes
- 10840: Manufacture of condiments and seasonings
- 10850: Manufacture of prepared meals and dishes
- 10860: Manufacture of homogenised food preparations and dietetic food
- 10890: Manufacture of other food products nec
- 10910: Manufacture of prepared feeds for farm animals
- 10920: Manufacture of prepared pet foods
- 11010: Distilling, rectifying and blending of spirits
- 11020: Manufacture of wine from grape
- 11030: Manufacture of cider and other fruit wines
- 11040: Manufacture of other non-distilled fermented beverages
- 11050: Manufacture of beer
- 11060: Manufacture of malt
- 11070: Manufacture of soft drinks; production of mineral waters and other bottled waters
- 12000: Manufacture of tobacco products
- 13100: Preparation and spinning of textile fibres
- 13200: Weaving of textiles
- 13300: Finishing of textiles

13910: Manufacture of knitted and crocheted fabrics  
 13921: Manufacture of soft furnishings  
 13922: Manufacture of canvas goods, sacks etc  
 13923: Manufacture of household textiles (other than soft furnishings of 13921)  
 13931: Manufacture of woven or tufted carpets and rugs  
 13939: Manufacture of carpets and rugs (other than woven or tufted) nec  
 13940: Manufacture of cordage, rope, twine and netting  
 13950: Manufacture of non-wovens and articles made from non-wovens, except apparel  
 13960: Manufacture of other technical and industrial textiles  
 13990: Manufacture of other textiles nec  
 14110: Manufacture of leather clothes  
 14120: Manufacture of workwear  
 14131: Manufacture of men's outerwear, other than leather clothes and workwear  
 14132: Manufacture of women's outerwear, other than leather clothes and workwear  
 14141: Manufacture of men's underwear  
 14142: Manufacture of women's underwear  
 14190: Manufacture of other wearing apparel and accessories  
 14200: Manufacture of articles of fur  
 14310: Manufacture of knitted and crocheted hosiery  
 14390: Manufacture of other knitted and crocheted apparel  
 15110: Tanning and dressing of leather; dressing and dyeing of fur  
 15120: Manufacture of luggage, handbags and the like, saddlery and harness  
 15200: Manufacture of footwear  
 16100: Sawmilling and planing of wood  
 16210: Manufacture of veneer sheets and wood-based panels  
 16220: Manufacture of assembled parquet floors  
 16230: Manufacture of other builders' carpentry and joinery  
 16240: Manufacture of wooden containers  
 16290: Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials  
 17110: Manufacture of pulp  
 17120: Manufacture of paper and paperboard  
 17211: Manufacture of corrugated paper and paperboard; manufacture of sacks and bags of paper  
 17219: Manufacture of paper and paperboard containers other than sacks and bags  
 17220: Manufacture of household and sanitary goods and of toilet requisites  
 17230: Manufacture of paper stationery  
 17240: Manufacture of wallpaper  
 17290: Manufacture of other articles of paper and paperboard  
 18110: Printing of newspapers  
 18121: Manufacture of printed labels  
 18129: Printing (other than printing of newspapers and printing on labels and tags) nec  
 18130: Pre-press and pre-media services  
 18140: Binding and related services  
 18201: Reproduction of sound recording  
 18202: Reproduction of video recording  
 18203: Reproduction of computer media  
 19100: Manufacture of coke oven products  
 19201: Mineral oil refining  
 19209: Other treatment of petroleum products (excluding mineral oil refining petrochemicals manufacture)  
 20110: Manufacture of industrial gases

20120: Manufacture of dyes and pigments  
 20130: Manufacture of other inorganic basic chemicals  
 20140: Manufacture of other organic basic chemicals  
 20150: Manufacture of fertilisers and nitrogen compounds  
 20160: Manufacture of plastics in primary forms  
 20170: Manufacture of synthetic rubber in primary forms  
 20200: Manufacture of pesticides and other agrochemical products  
 20301: Manufacture of paints, varnishes and similar coatings, mastics and sealants  
 20302: Manufacture of printing ink  
 20411: Manufacture of soap and detergents  
 20412: Manufacture of cleaning and polishing preparations  
 20420: Manufacture of perfumes and toilet preparations  
 20510: Manufacture of explosives  
 20520: Manufacture of glues  
 20530: Manufacture of essential oils  
 20590: Manufacture of other chemical products nec  
 20600: Manufacture of man-made fibres  
 21100: Manufacture of basic pharmaceutical products  
 21200: Manufacture of pharmaceutical preparations  
 22110: Manufacture of rubber tyres and tubes; retreading and rebuilding of rubber tyres  
 22190: Manufacture of other rubber products  
 22210: Manufacture of plastic plates, sheets, tubes and profiles  
 22220: Manufacture of plastic packing goods  
 22230: Manufacture of builders' ware of plastic  
 22290: Manufacture of other plastic products  
 23110: Manufacture of flat glass  
 23120: Shaping and processing of flat glass  
 23130: Manufacture of hollow glass  
 23140: Manufacture of glass fibres  
 23190: Manufacture and processing of other glass, including technical glassware  
 23200: Manufacture of refractory products  
 23310: Manufacture of ceramic tiles and flags  
 23320: Manufacture of bricks, tiles and construction products, in baked clay  
 23410: Manufacture of ceramic household and ornamental articles  
 23420: Manufacture of ceramic sanitary fixtures  
 23430: Manufacture of ceramic insulators and insulating fittings  
 23440: Manufacture of other technical ceramic products  
 23490: Manufacture of other ceramic products  
 23510: Manufacture of cement  
 23520: Manufacture of lime and plaster  
 23610: Manufacture of concrete products for construction purposes  
 23620: Manufacture of plaster products for construction purposes  
 23630: Manufacture of ready-mixed concrete  
 23640: Manufacture of mortars  
 23650: Manufacture of fibre cement  
 23690: Manufacture of other articles of concrete, plaster and cement  
 23700: Cutting, shaping and finishing of stone  
 23910: Production of abrasive products  
 23990: Manufacture of other non-metallic mineral products nec  
 24100: Manufacture of basic iron and steel and of ferro-alloys  
 24200: Manufacture of tubes, pipes, hollow profiles and related fittings, of steel

24310: Cold drawing of bars  
 24320: Cold rolling of narrow strip  
 24330: Cold forming or folding  
 24340: Cold drawing of wire  
 24410: Precious metals production  
 24420: Aluminium production  
 24430: Lead, zinc and tin production  
 24440: Copper production  
 24450: Other non-ferrous metal production  
 24460: Processing of nuclear fuel  
 24510: Casting of iron  
 24520: Casting of steel  
 24530: Casting of light metals  
 24540: Casting of other non-ferrous metals  
 25110: Manufacture of metal structures and parts of structures  
 25120: Manufacture of doors and windows of metal  
 25210: Manufacture of central heating radiators and boilers  
 25290: Manufacture of other tanks, reservoirs and containers of metal  
 25300: Manufacture of steam generators, except central heating hot water boilers  
 25400: Manufacture of weapons and ammunition  
 25500: Forging, pressing, stamping and roll-forming of metal; powder metallurgy  
 25610: Treatment and coating of metals  
 25620: Machining  
 25710: Manufacture of cutlery  
 25720: Manufacture of locks and hinges  
 25730: Manufacture of tools  
 25910: Manufacture of steel drums and similar containers  
 25920: Manufacture of light metal packaging  
 25930: Manufacture of wire products, chain and springs  
 25940: Manufacture of fasteners and screw machine products  
 25990: Manufacture of other fabricated metal products nec  
 26110: Manufacture of electronic components  
 26120: Manufacture of loaded electronic boards  
 26200: Manufacture of computers and peripheral equipment  
 26301: Manufacture of telegraph and telephone apparatus and equipment  
 26309: Manufacture of communication equipment (other than telegraph and telephone apparatus and equipment)  
 26400: Manufacture of consumer electronics  
 26511: Manufacture of electronic instruments and appliances for measuring, testing, and navigation, except industrial process control equipment  
 26512: Manufacture of electronic industrial process control equipment  
 26513: Manufacture of non-electronic instruments and appliances for measuring, testing and navigation, except industrial process control equipment  
 26514: Manufacture of non-electronic industrial process control equipment  
 26520: Manufacture of watches and clocks  
 26600: Manufacture of irradiation, electromedical and electrotherapeutic equipment  
 26701: Manufacture of optical precision instruments  
 26702: Manufacture of photographic and cinematographic equipment  
 26800: Manufacture of magnetic and optical media  
 27110: Manufacture of electric motors, generators and transformers  
 27120: Manufacture of electricity distribution and control apparatus



27200: Manufacture of batteries and accumulators  
 27310: Manufacture of fibre optic cables  
 27320: Manufacture of other electronic and electric wires and cables  
 27330: Manufacture of wiring devices  
 27400: Manufacture of electric lighting equipment  
 27510: Manufacture of electric domestic appliances  
 27520: Manufacture of non-electric domestic appliances  
 27900: Manufacture of other electrical equipment  
 28110: Manufacture of engines and turbines, except aircraft, vehicle and cycle engines  
 28120: Manufacture of fluid power equipment  
 28131: Manufacture of pumps  
 28132: Manufacture of compressors  
 28140: Manufacture of other taps and valves  
 28150: Manufacture of bearings, gears, gearing and driving elements  
 28210: Manufacture of ovens, furnaces and furnace burners  
 28220: Manufacture of lifting and handling equipment  
 28230: Manufacture of office machinery and equipment (except computers and peripheral equipment)  
 28240: Manufacture of power-driven hand tools  
 28250: Manufacture of non-domestic cooling and ventilation equipment  
 28290: Manufacture of other general-purpose machinery nec  
 28301: Manufacture of agricultural tractors  
 28302: Manufacture of agricultural and forestry machinery (other than agricultural tractors)  
 28410: Manufacture of metal forming machinery  
 28490: Manufacture of other machine tools  
 28910: Manufacture of machinery for metallurgy  
 28921: Manufacture of machinery for mining  
 28922: Manufacture of earthmoving equipment  
 28923: Manufacture of equipment for concrete crushing and screening roadworks  
 28930: Manufacture of machinery for food, beverage and tobacco processing  
 28940: Manufacture of machinery for textile, apparel and leather production  
 28950: Manufacture of machinery for paper and paperboard production  
 28960: Manufacture of plastics and rubber machinery  
 28990: Manufacture of other special-purpose machinery nec  
 29100: Manufacture of motor vehicles  
 29201: Manufacture of bodies (coachwork) for motor vehicles (except caravans)  
 29202: Manufacture of trailers and semi-trailers  
 29203: Manufacture of caravans  
 29310: Manufacture of electrical and electronic equipment for motor vehicles  
 29320: Manufacture of other parts and accessories for motor vehicles  
 30110: Building of ships and floating structures  
 30120: Building of pleasure and sporting boats  
 30200: Manufacture of railway locomotives and rolling stock  
 30300: Manufacture of air and spacecraft and related machinery  
 30400: Manufacture of military fighting vehicles  
 30910: Manufacture of motorcycles  
 30920: Manufacture of bicycles and invalid carriages  
 30990: Manufacture of other transport equipment nec  
 31010: Manufacture of office and shop furniture  
 31020: Manufacture of kitchen furniture  
 31030: Manufacture of mattresses  
 31090: Manufacture of other furniture

- 32110: Striking of coins
- 32120: Manufacture of jewellery and related articles
- 32130: Manufacture of imitation jewellery and related articles
- 32200: Manufacture of musical instruments
- 32300: Manufacture of sports goods
- 32401: Manufacture of professional and arcade games and toys
- 32409: Manufacture of games and toys (other than professional and arcade games and toys) nec
- 32500: Manufacture of medical and dental instruments and supplies
- 32910: Manufacture of brooms and brushes
- 32990: Other manufacturing nec
- 33110: Repair of fabricated metal products
- 33120: Repair of machinery
- 33130: Repair of electronic and optical equipment
- 33140: Repair of electrical equipment
- 33150: Repair and maintenance of ships and boats
- 33160: Repair and maintenance of aircraft and spacecraft
- 33170: Repair and maintenance of other transport equipment
- 33190: Repair of other equipment
- 33200: Installation of industrial machinery and equipment
- 35210: Manufacture of gas
- 58110: Book publishing
- 58120: Publishing of directories and mailing lists
- 58130: Publishing of newspapers
- 58141: Publishing of learned journals
- 58142: Publishing of consumer, business and professional journals and periodicals
- 58190: Other publishing activities
- 61300: Satellite telecommunications activities
- 61900: Other telecommunications activities
- 64202: Activities of production holding companies
- 71121: Engineering design activities for industrial process and production
- 71122: Engineering related scientific and technical consulting activities
- 71129: Other engineering activities (not including engineering design for industrial process and production or engineering related scientific and technical consulting activities)
- 71200: Technical testing and analysis
- 72110: Research and experimental development on biotechnology
- 72190: Other research and experimental development on natural sciences and engineering

