The Marches Sector Skills Deep Dive -

Advanced Manufacturing

Final Report July 2020

The Marches Local Enterprise Partnership
Herefordshire - Shropshire - Telford & Wrekin

Black Country Consortium
Economic Intelligence Unit

Contents

1. Sector Context

The advanced manufacturing sector accounts for 16.1% of the total GVA which equates to a value of £2.4bn in the Marches. With 11.4% of total jobs arising from the advanced manufacturing sector, this equates to 32,945 jobs. While 7.6% of all establishments in the Marches are in the advanced manufacturing sector which is a total of 2,715 establishments. The proportion of the jobs and establishments in the advanced manufacturing sector for the Marches is above the national base.

Defining the Advanced Manufacturing sector is not easy. The sector is so wide and varied that what may be advanced in one area may not be advanced in another. Advanced Manufacturing is the integration of technology-based systems and processes in the production of products to the highest level of quality and in compliance with industry specific standards. Paramount to Advanced Manufacturing and Engineering is a highly skilled workforce operating in lean and continuous improvement cultures. For the purposes of this report we have included all sectors of manufacturing within our definition of the sector.

As noted in the Marches Strategic Economic plan, the Marches has a significant strength in advanced manufacturing, and have specialisms in metals, machinery and automotive, particularly light weighting and composites. One of the goals for the Marches in the future is to create a global centre of excellence in advanced manufacturing, which maximises the potential of the sector. This is a major part of the local industrial strategy, and as part of this centre of excellence, the aim is for the Marches to be a successful cluster at the forefront of making and servicing 'next shape' components.

The Marches local industrial strategy emphasises that the area is already home to a high number of well-established and specialist advanced manufacturing businesses. It particularly notes that Telford is fast growing and is at the forefront of opportunities in advanced manufacturing. A crucial aspect of the local industrial strategy is that the Marches are committed to continuing to support collaboration between business and training providers to help provide the necessary skills to individuals to support the push to grow the advanced manufacturing sector.

The following table displays the GVA, jobs and establishments by the 12 sectors in the Marches.

	GVA (£m)			Jobs			Establishments (Snapshot)		
	2018	%	UK %	2018	%	Eng. %	2019	%	UK %
Advanced Manufacturing	**£2,416m**	**16.1%**	**9.7%**	**32,945**	**11.4%**	**8.5%**	**2,715**	**7.6%**	**7.5%**
Agri-Tech	£694m	4.6%	1.6%	10,730	3.7%	0.7%	6,270	17.5%	4.9%
Business and Professional Services	£4,367m	29.1%	40.0%	54,320	18.8%	24.7%	9,080	25.4%	35.2%
Construction	£887m	5.9%	6.1%	15,000	5.2%	4.6%	3,595	10.0%	11.1%
Cyber Security and Resilience	£667m	4.4%	5.0%	11,800	4.1%	4.7%	535	1.5%	1.1%
Environmental	£295m	2.0%	2.7%	3,215	1.1%	1.1%	215	0.6%	0.6%
Food & Drink	£576m	3.8%	1.6%	9,250	3.2%	1.3%	205	0.6%	0.4%
Health and Social Care	£1,241m	8.3%	7.8%	40,900	14.1%	12.9%	1,725	4.8%	5.3%
Public Sector Inc. Education	£1,044m	7.0%	6.3%	30,000	10.4%	11.3%	1,670	4.7%	4.4%
Retail	£1,860m	12.4%	10.6%	49,000	16.9%	15.3%	5,705	15.9%	16.3%
Transport and Logistics	£411m	2.7%	4.1%	9,370	3.2%	4.9%	1,100	3.1%	4.0%
Visitor Economy	£553m	3.7%	4.4%	23,100	8.0%	9.9%	2,980	8.3%	9.2%
Total	**£15bn**			**289,630**			**35,795**		

Source: ONS: Regional gross value added, Business Register Employment Survey and UK Business counts, 2019

Within this section, firstly there is analysis on the latest data of the advanced manufacturing sector overall, this is followed by a summary of the industries within this sector and then further analysis of the top ten industries.

The latest data for total GVA in the advanced manufacturing sector was £2.4bn in 2018. This sector accounts for 16.1% of the total GVA for the Marches which is above the UK average of 9.7% of the total[1].

The following table displays the total value of GVA in the Marches.

	The Marches 2017	The Marches 2018	The Marches Change (2017-2018)	The Marches 2018 % of Total	UK 2018 % of Total
Advanced Manufacturing	**£2,478m**	**£2,416m**	**-£62m**	**16.1%**	**9.7%**
Agri-Tech	£706m	£694m	-£12m	4.6%	1.6%
Business and Professional Services	£4,169m	£4,367m	£198m	29.1%	40.0%
Construction	£838m	£887m	£49m	5.9%	6.1%
Cyber Security and Resilience	£686m	£667m	-£19m	4.4%	5.0%
Environmental Technologies	£250m	£295m	£45m	2.0%	2.7%
Food & Drink	£573m	£576m	£3m	3.8%	1.6%
Health and Social Care	£1,118m	£1,241m	£123m	8.3%	7.8%
Public Sector Inc. Education	£1,037m	£1,044m	£7m	7.0%	6.3%
Retail	£1,804m	£1,860m	£56m	12.4%	10.6%
Transport and Logistics	£402m	£411m	£9m	2.7%	4.1%
Visitor Economy	£526m	£553m	£27m	3.7%	4.4%
Total	**£14.6bn**	**£15bn**	**£424m**		

Source: ONS: Regional gross value added, 2019

[1] ONS, Regional gross value added (balanced) by industry, 2019

In 2019, there were approximately 2,715 establishments in the advanced manufacturing sector[2], this accounts for 7.6% of the total establishments in the Marches which is slightly above the UK average of 7.5%.

The following table displays the number of establishments in the Marches.

	The Marches 2019	The Marches 2019 % of Total	UK 2019 % of Total
Advanced Manufacturing	**2,715**	**7.6%**	**7.5%**
Agri-Tech	6,270	17.5%	4.9%
Business and Professional Services	9,080	25.4%	35.2%
Construction	3,595	10.0%	11.1%
Cyber Security and Resilience	535	1.5%	1.1%
Environmental Technologies	215	0.6%	0.6%
Food & Drink	205	0.6%	0.4%
Health and Social Care	1,725	4.8%	5.3%
Public Sector Inc. Education	1,670	4.7%	4.4%
Retail	5,705	15.9%	16.3%
Transport and Logistics	1,100	3.1%	4.0%
Visitor Economy	2,980	8.3%	9.2%
Total	**35,795**		

Source: ONS: UK Business Counts, 2019

The average wages per job vary from £10,808 in the manufacture of other wearing apparel and accessories industry to £52,739 in the manufacture of motor vehicles industry.

Based on 2015 EMSI GVA modelled data which allows for greater sectoral breakdown the sector contributed £1.3bn in total to the UK economy. Within the advanced manufacturing sector GVA varies from £18.5m for the manufacture of electric domestic appliances to nearly £119m in the manufacture of other parts and accessories for motor vehicles.

Location Quotients (LQ)s are a way of quantifying how concentrated a particular industry, cluster, occupation, or demographic group is in a region as compared to the nation. It can reveal what makes a particular region “unique” in comparison to the national average. Higher LQs correspond to higher levels of specialisation, with an LQ above 1 indicating that the area is more specialised in that sector than Great Britain as a whole. Overall the advanced manufacturing sector has an LQ of 1.61 and out of the 124 industries within the advanced manufacturing sector, 69 are above 13. The 10 sub-sectors with the highest LQ are set out on p.10.

[2] ONS: UK Business Counts 2019. Please note, currently the ONS Business Demography dataset does not provide a breakdown by industry for all registered establishments, the breakdown can be obtained from the ONS UK Business Counts which is a snapshot (March 2019) of the Business Demography dataset.

[3] EMSI Analytics tool, 2020

The following table shows the breakdown of all the industries within the advanced manufacturing sector for establishments, average wages, GVA and the Location Quotient[4].

Industry	Establishments (2019 snapshot)	Avg. Wages Per Job	GVA (2015 Model)	2018 Location Quotient
Preparation and spinning of textile fibres	5	£17,972	£2,209,422	4.69
Weaving of textiles	0	£24,442	£295,872	0.53
Finishing of textiles	15	£18,776	£1,800,075	1.52
Manufacture of made-up textile articles, except apparel	25	£17,762	£1,296,395	0.99
Manufacture of carpets and rugs	5	£22,371	£1,028,983	1.45
Manufacture of other technical and industrial textiles	0	£19,662	£400,758	0.84
Manufacture of workwear	5	£11,679	£1,024,412	1.29
Manufacture of other outerwear	15	£11,445	£1,746,832	0.34
Manufacture of other wearing apparel and accessories	5	£10,808	£564,436	0.37
Sawmilling and planning of wood	10	£23,548	£12,549,503	4.36
Manufacture of veneer sheets and wood-based panels	5	£29,087	£1,668,964	0.48
Manufacture of other builders' carpentry and joinery	130	£23,812	£52,764,907	2.08
Manufacture of wooden containers	5	£22,642	£1,699,175	0.63
Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	30	£19,162	£5,609,981	1.64
Manufacture of paper and paperboard	0	£34,352	£8,257,251	3.42
Manufacture of corrugated paper and paperboard and of containers of paper and paperboard	10	£36,075	£3,268,654	0.45
Manufacture of household and sanitary goods and of toilet requisites	0	£41,132	£1,043,703	0.67
Manufacture of paper stationery	5	£23,932	£6,114,626	4.11
Manufacture of other articles of paper and paperboard	5	£32,228	£1,317,377	0.53
Other printing	90	£22,967	£23,067,903	1.10
Pre-press and pre-media services	15	£25,571	£2,004,429	0.72
Binding and related services	0	£19,431	£130,634	0.42
Manufacture of refined petroleum products	0	£38,524	£5,144,927	1.68
Manufacture of other organic basic chemicals	0	£33,956	£550,900	0.20
Manufacture of fertilisers and nitrogen compounds	0	£32,053	£389,398	1.36
Manufacture of pesticides and other agrochemical products	0	£36,371	£130,804	1.15
Manufacture of paints, varnishes and similar coatings, printing ink and mastics	5	£30,218	£3,061,830	0.44
Manufacture of soap and detergents, cleaning and polishing preparations	0	£21,488	£1,344,356	0.36
Manufacture of perfumes and toilet preparations	5	£19,324	£970,606	0.27
Manufacture of other chemical products n.e.c.	5	£38,242	£5,203,787	1.80
Manufacture of pharmaceutical preparations	0	£44,884	£1,976,737	0.06
Manufacture of rubber tyres and tubes; retreading and rebuilding of rubber tyres	0	£37,600	£1,120,576	0.50
Manufacture of other rubber products	10	£33,197	£18,716,597	2.70
Manufacture of plastic plates, sheets, tubes and profiles	15	£34,179	£39,736,871	3.83
Manufacture of plastic packing goods	10	£34,411	£30,005,152	3.37
Manufacture of builders' ware of plastic	40	£27,767	£19,463,628	1.12
Manufacture of other plastic products	45	£35,499	£33,876,025	2.23
Shaping and processing of flat glass	5	£29,449	£373,078	0.14
Manufacture of bricks, tiles and construction products, in baked clay	5	£33,409	£1,577,169	1.51
Manufacture of ceramic household and ornamental articles	0	£26,335	£1,408,397	0.38
Manufacture of ceramic insulators and insulating fittings	0	£30,076	£1,095,369	16.20
Manufacture of lime and plaster	0	£27,210	£833,184	2.65
Manufacture of concrete products for construction purposes	15	£40,217	£5,451,112	0.24
Manufacture of ready-mixed concrete	10	£36,678	£630,145	0.40
Manufacture of other articles of concrete, plaster and cement	5	£39,840	£2,058,876	1.55
Cutting, shaping and finishing of stone	15	£27,317	£2,832,994	0.42
Manufacture of other non-metallic mineral products n.e.c.	0	£42,116	£833,578	0.37

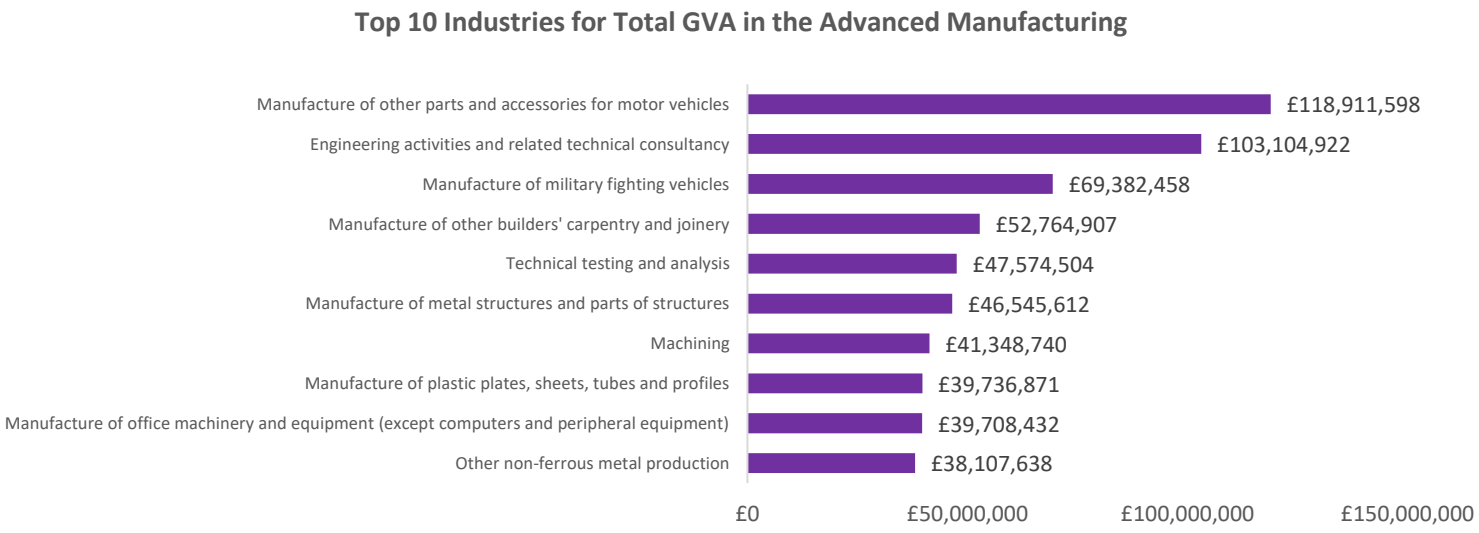
[4] Please note, there are 200 industries within the advanced manufacturing sector, however any industries that contained insufficient data have been removed which leads to a new total of 124 industries. The source of this table is EMSI Analytics tool, 2020 leading to job figures slightly varying to the total advanced manufacturing figure.

Industry	Establishments (2019 snapshot)	Avg. Wages Per Job	GVA (2015 Model)	2018 Location Quotient
Manufacture of basic iron and steel and of ferro-alloys	15	£31,336	£17,944,691	1.80
Aluminium production	0	£28,569	£19,419,271	12.69
Other non-ferrous metal production	5	£34,983	£38,107,638	21.71
Casting of iron	0	£28,605	£9,964,355	7.71
Casting of steel	0	£24,501	£2,286,908	0.76
Casting of light metals	0	£21,699	£29,262,601	12.22
Casting of other non-ferrous metals	5	£27,858	£710,763	0.69
Manufacture of metal structures and parts of structures	70	£35,758	£46,545,612	2.50
Manufacture of doors and windows of metal	20	£28,436	£16,828,620	2.05
Manufacture of central heating radiators and boilers	0	£28,110	£68,681	1.02
Manufacture of other tanks, reservoirs and containers of metal	5	£29,299	£5,347,122	2.69
Manufacture of weapons and ammunition	5	£36,582	£1,127,714	2.27
Forging, pressing, stamping and roll-forming of metal; powder metallurgy	5	£27,223	£8,839,431	1.09
Treatment and coating of metals	20	£28,609	£12,903,261	1.64
Machining	195	£27,111	£41,348,740	1.20
Manufacture of locks and hinges	10	£29,759	£3,475,400	1.34
Manufacture of tools	20	£27,786	£5,017,207	0.85
Manufacture of light metal packaging	0	£39,087	£1,948,195	1.16
Manufacture of wire products, chain and springs	5	£23,741	£2,385,321	0.87
Manufacture of fasteners and screw machine products	10	£29,802	£5,556,865	3.12
Manufacture of other fabricated metal products n.e.c.	60	£26,736	£19,236,674	1.83
Manufacture of loaded electronic boards	5	£23,777	£2,735,058	1.25
Manufacture of computers and peripheral equipment	15	£23,837	£1,875,098	2.89
Manufacture of communication equipment	15	£31,969	£6,291,882	1.03
Manufacture of instruments and appliances for measuring, testing and navigation	25	£32,775	£11,021,575	1.04
Manufacture of optical instruments and photographic equipment	0	£32,211	£28,701	0.21
Manufacture of electricity distribution and control apparatus	10	£31,271	£9,128,764	1.13
Manufacture of wiring devices	0	£29,456	£367,268	0.45
Manufacture of electric lighting equipment	10	£26,924	£2,530,073	0.53
Manufacture of electric domestic appliances	0	£27,006	£18,543	0.26
Manufacture of non-electric domestic appliances	5	£26,060	£22,421,317	3.46
Manufacture of other electrical equipment	15	£29,072	£5,313,178	0.78
Manufacture of engines and turbines, except aircraft, vehicle and cycle engines	5	£45,217	£933,180	1.63
Manufacture of fluid power equipment	5	£31,738	£1,131,625	1.91
Manufacture of other pumps and compressors	5	£35,243	£1,709,739	0.69
Manufacture of other taps and valves	5	£37,379	£9,482,940	2.21
Manufacture of bearings, gears, gearing and driving elements	5	£39,996	£45,055	0.25
Manufacture of ovens, furnaces and furnace burners	0	£31,752	£337,238	0.89
Manufacture of lifting and handling equipment	15	£31,689	£3,230,721	0.91
Manufacture of office machinery and equipment (except computers and peripheral equipment)	5	£37,428	£39,708,432	24.88
Manufacture of power-driven hand tools	0	£14,597	£4,760,695	54.80
Manufacture of non-domestic cooling and ventilation equipment	10	£37,296	£14,146,244	1.21
Manufacture of other general-purpose machinery n.e.c.	25	£32,948	£8,903,753	0.87
Manufacture of agricultural and forestry machinery	15	£33,202	£16,496,826	6.77
Manufacture of metal forming machinery	5	£33,482	£150,853	0.18
Manufacture of other machine tools	5	£32,095	£675,857	0.89
Manufacture of machinery for mining, quarrying and construction	5	£38,572	£3,604,655	0.83
Manufacture of machinery for food, beverage and tobacco processing	5	£30,261	£1,781,851	0.81
Manufacture of plastics and rubber machinery	10	£20,371	£832,700	1.80
Manufacture of other special-purpose machinery n.e.c.	10	£41,573	£19,037,795	3.31
Manufacture of motor vehicles	10	£52,739	£2,594,183	0.11
Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	15	£37,331	£7,666,582	0.96
Manufacture of other parts and accessories for motor vehicles	25	£37,170	£118,911,598	5.56

Industry	Establishments (2019 snapshot)	Avg. Wages Per Job	GVA (2015 Model)	2018 Location Quotient
Building of pleasure and sporting boats	5	£29,383	£2,263,187	0.47
Manufacture of air and spacecraft and related machinery	5	£40,405	£36,060,352	0.32
Manufacture of military fighting vehicles	0	£36,655	£69,382,458	20.24
Manufacture of office and shop furniture	10	£29,266	£9,182,911	0.83
Manufacture of kitchen furniture	15	£26,959	£3,625,239	1.07
Manufacture of other furniture	45	£22,862	£21,021,423	1.42
Manufacture of jewellery and related articles	10	£21,420	£3,081,466	2.72
Manufacture of imitation jewellery and related articles	0	£16,989	£107,008	3.07
Manufacture of musical instruments	5	£21,926	£141,188	2.54
Manufacture of sports goods	10	£23,563	£1,216,850	1.19
Manufacture of games and toys	10	£30,839	£1,607,174	1.14
Manufacture of medical and dental instruments and supplies	20	£31,545	£13,043,905	0.62
Other manufacturing n.e.c.	65	£26,440	£13,533,723	1.97
Repair of fabricated metal products	15	£29,378	£332,714	0.31
Repair of machinery	95	£37,968	£16,663,519	1.26
Repair of electronic and optical equipment	5	£30,850	£272,178	0.33
Repair of electrical equipment	10	£28,810	£585,796	0.32
Repair and maintenance of aircraft and spacecraft	10	£38,654	£1,220,056	0.60
Repair and maintenance of other transport equipment	10	£29,614	£1,569,001	0.14
Repair of other equipment	15	£23,372	£303,991	0.77
Installation of industrial machinery and equipment	35	£38,264	£15,239,877	1.46
Architectural activities	150	£31,764	£26,432,879	0.73
Engineering activities and related technical consultancy	715	£33,152	£103,104,922	0.78
Technical testing and analysis	60	£26,652	£47,574,504	2.17
Total	**2,685**	**£31,465**	**£1,320,671,807**	**1.61**

Source: EMSI Analytics Tool, 2020

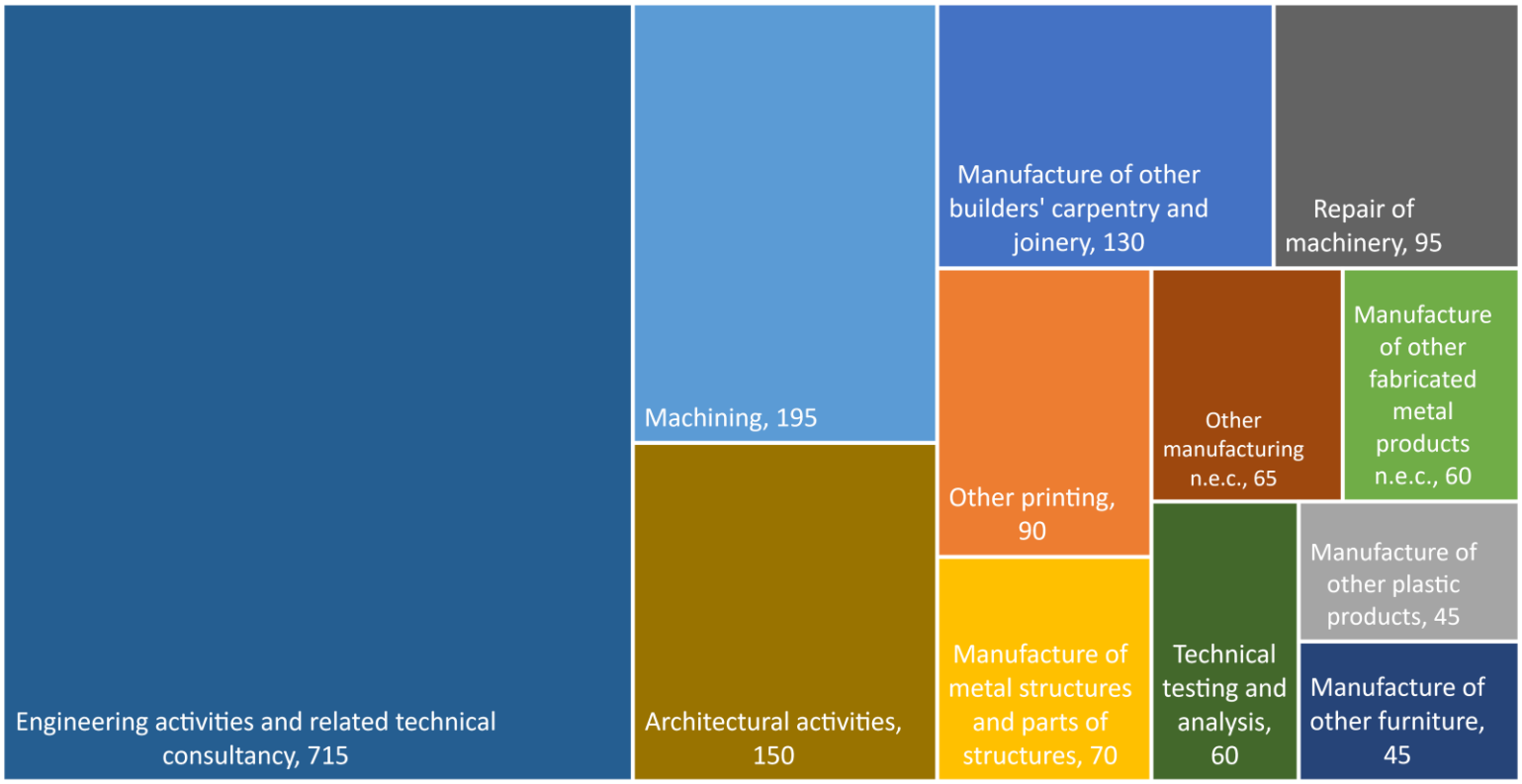
The following figure shows the top ten industries for the highest GVA produced, as mentioned previously the manufacture of other parts and accessories for motor vehicles is the highest at nearly £119m. This is followed by engineering activities and related technical consultancy at £103m and the manufacture of military fighting vehicles at £103m.



Source: EMSI Analytics Tool, 2020

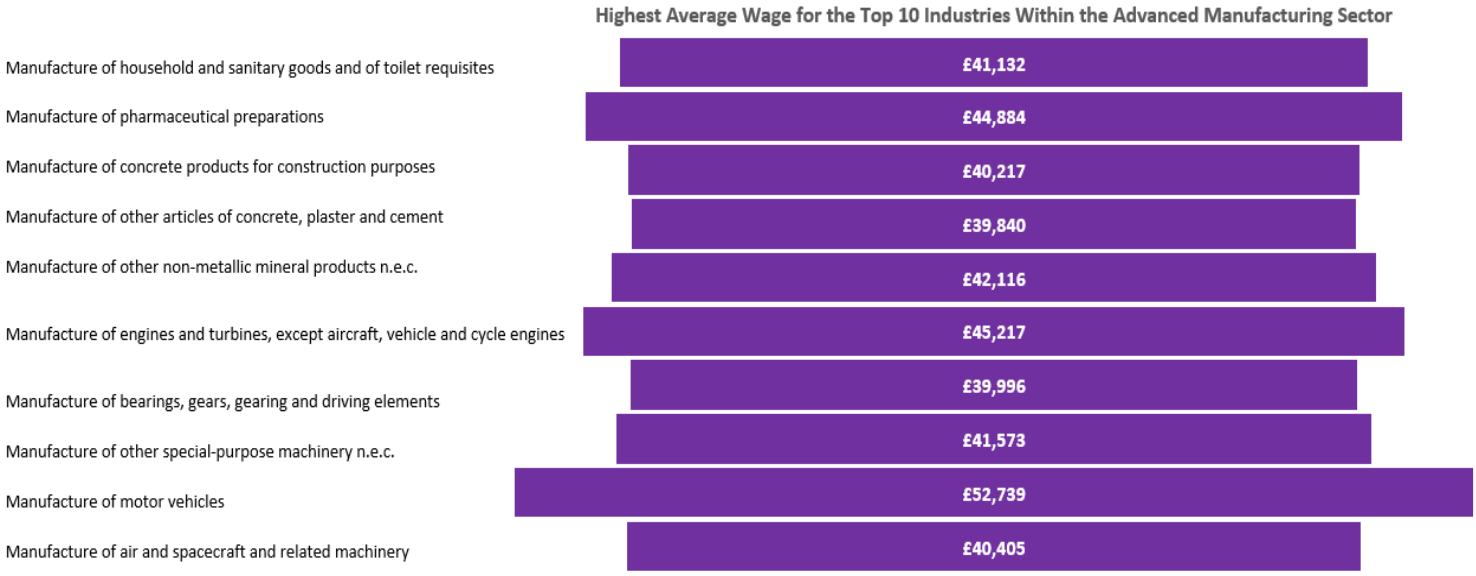
Within the advanced manufacturing sector, the industry with the highest number of establishments is engineering activities and related technical consultancy at 715 this is followed by machining with 195 establishments and architectural activities at 150.

Top 10 Industries for the Number of Establishments Within the Advanced Manufacturing Sector



Source: ONS: UK Business Counts. 2019

The highest average wages in the top ten industry selection shows the manufacture of motor vehicles the highest at £52,739, followed by the manufacture of engines and turbines (except aircraft, vehicle and cycle engines) at £45,217 and then the manufacture of pharmaceutical preparation at £44,884.



Source: EMSI Analytics Tool, 2020

The following table shows the top ten industries that has an LQ of above 1. Notably, the manufacture of power-driven hand tools industry has a substantial LQ of 54.8. This is followed by manufacture of office machinery and equipment (except computers and peripheral equipment) at 24.9 and other non-ferrous metal production at 21.7[5].

Source: EMSI Analytics Tool, 2020

[5] EMSI Analytics tool, 2020

2. Supply Side Analysis

2.1. Current Workforce Size

There was an estimated number of 32,945 jobs in the advanced manufacturing sector in 2018. This sector accounts for 11.4% of the total jobs and above the England total of 8.3%[6].

The following table displays the number of jobs in the Marches in 2018.

	The Marches 2018	The Marches 2018 % of Total	England 2018 % of Total
Advanced Manufacturing	**32,945**	**11.4%**	**8.5%**
Agri-Tech	10,730	3.7%	0.7%
Business and Professional Services	54,320	18.8%	24.7%
Construction	15,000	5.2%	4.6%
Cyber Security and Resilience	11,800	4.1%	4.7%
Environmental Technologies	3,215	1.1%	1.1%
Food & Drink	9,250	3.2%	1.3%
Health and Social Care	40,900	14.1%	12.9%
Public Sector Inc. Education	30,000	10.4%	11.3%
Retail	49,000	16.9%	15.3%
Transport and Logistics	9,370	3.2%	4.9%
Visitor Economy	23,100	8.0%	9.9%
Total	**289,630**		

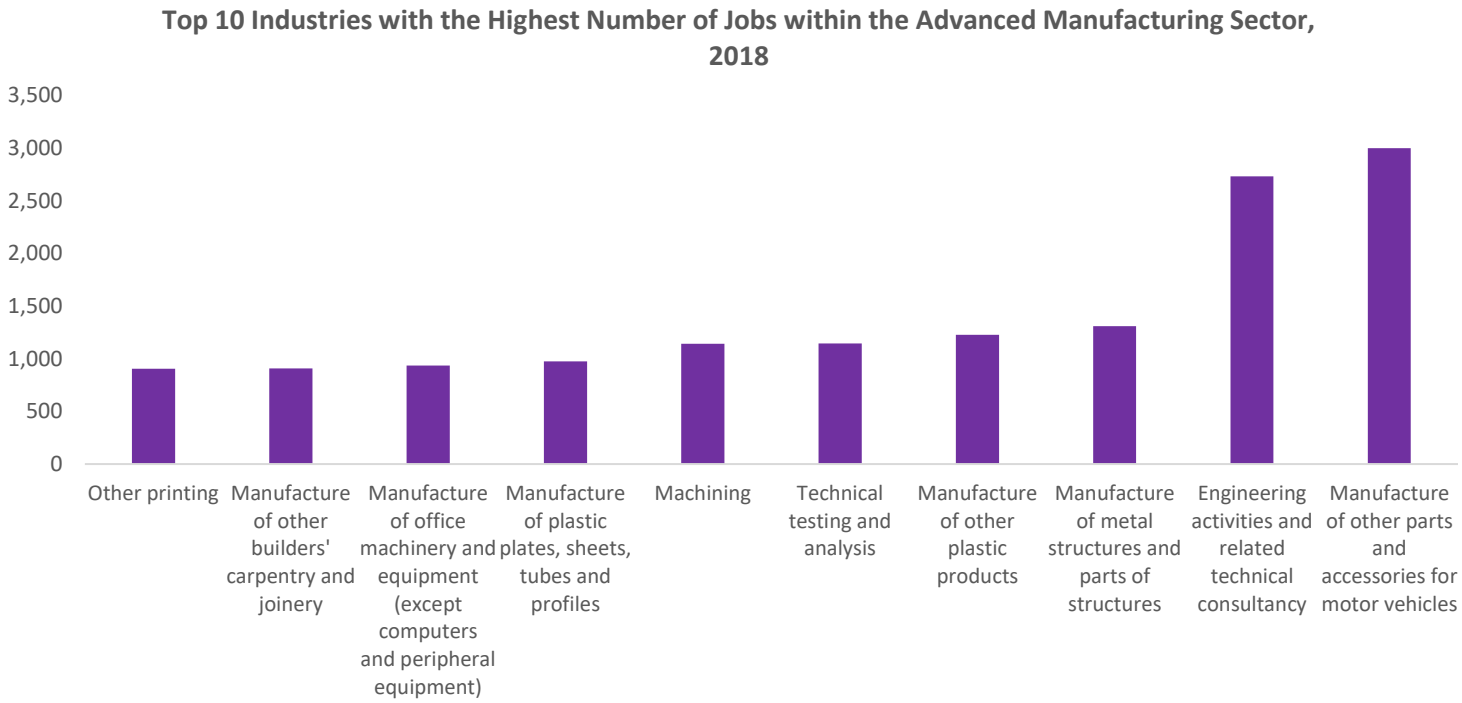
Source: ONS: Business Register and Employment Survey, 2019

Sector Analysis

EMSI provide a more detailed breakdown of jobs by industry and based on their total of 32,573 jobs in 2018. The top ten industries within the advanced manufacturing sector accounts for over 14,200 jobs which equate to nearly 44% of the total jobs.

As seen in the following graph, the top ten industries with the highest number of jobs within the advanced manufacturing sector varies from 905 in other printing and 909 in the manufacture of other builders' carpentry and joinery to 2,734 in engineering activities and related technical consultancy.

[6] ONS, Business Register and Employment Survey, 2019



Source: EMSI Analytics Tool, 2020

Occupation Analysis[7]

The Advanced Manufacturing sector is very diverse, incorporating industries such as aerospace, automotive, pharmaceuticals, chemical manufacturing and electronics. As a consequence, there is significant variation in the occupations in the sector. No occupation comprises more than 5% of the total number of jobs with most occupations only common in two or three advanced manufacturing industries.

Occupation	2018 Jobs
Packers, bottlers, canners and fillers	3,595
Production managers and directors in manufacturing	3,482
Metal working production and maintenance fitters	2,368
Elementary process plant occupations n.e.c.	1,418
Metal working machine operatives	1,252
Routine inspectors and testers	1,086
Metal machining setters and setter-operators	1,063
Welding trades	1,019
Mechanical engineers	767
Plastics process operatives	758
Engineering professionals n.e.c.	741
Assemblers (vehicles and metal goods)	629
Design and development engineers	567
Assemblers and routine operatives n.e.c.	555

[7] Occupation and industry classifications categorise occupations and industries into clearly defined groups. As such they provide a common basis for collecting, presenting, and comparing of labour statistics. **Occupational** classifications (SOC) group people based on job and tasks performed whereas **Industry** (SIC) classifications group people based on the sector of economic activity in which they are employed. For the purpose of this work we have attributed occupations to their most natural industrial sector, so for example a 'Financial Accounts Managers' whose skills are transferrable across all sectors will be contained solely within Business and Professional Services**.** Any identified skills gap for this occupation would apply to all sectors**.**

Occupation	2018 Jobs
Skilled metal, electrical and electronic trades supervisors	486
Production and process engineers	480
Paper and wood machine operatives	421
Planning, process and production technicians	381
Chemical and related process operatives	350
Quality control and planning engineers	339
Science, engineering and production technicians n.e.c.	337
Plant and machine operatives n.e.c.	324
Metal making and treating process operatives	320
Research and development managers	320
Assemblers (electrical and electronic products)	319
Electrical engineers	276
Sheet metal workers	241
Tool makers, tool fitters and markers-out	238
Quality assurance technicians	208
Electronics engineers	190
Precision instrument makers and repairers	163
Aircraft maintenance and related trades	134
Process operatives n.e.c.	129
Electrical and electronics technicians	126
Metal plate workers, and riveters	102
Rubber process operatives	80
Electroplaters	57
Boat and ship builders and repairers	46
Moulders, core makers and die casters	28
Rail and rolling stock builders and repairers	23
Smiths and forge workers	22
Total	**25,440**

Source: EMSI Analytics Tool, 2020

2.2. Existing Training Provision

Apprenticeship Starts

The total number of apprenticeships in the Marches (across all sectors) increased to 6,360 from 6,020 in 2018/19 - up 5.5% compared to 4.7% nationally.

The table below identifies the unique apprenticeship starts by area across the Marches LEP for all advanced manufacturing related subjects.

Local Authority	2016/17	2017/18	2018/19	Change 17/18 - 18/19	% Change 17/18 - 18/19
Herefordshire, County of	220	170	210	40	23.5%
Shropshire	1,320	1,560	1,400	-160	-10.3%
Telford and Wrekin	340	260	260	0	0.0%
Total	**1,880**	**1,990**	**1,870**	-120	-6.0%

Source: ESFA Datacube, 2018/19

The number of advanced manufacturing apprenticeships decreased by 6% across the Marches in 2018/19 to 1,870. Analysis by local authority area highlights a varied picture - with the number of

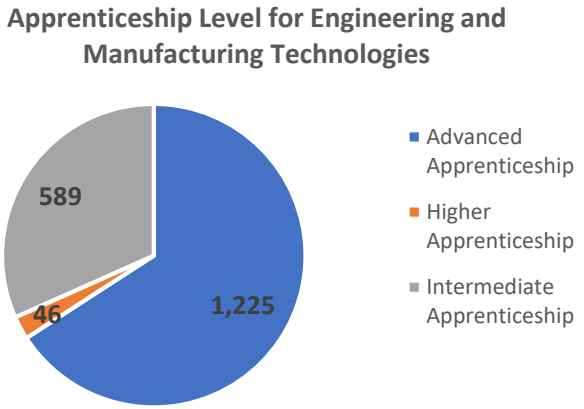
starts in Herefordshire increasing by 23.5% to 210, no change recorded in Telford and Wrekin while the number of apprenticeships fell by -10.3% in Shropshire to 1,400. Despite this fall in starts, learners in Shropshire account for 75% of all advanced manufacturing apprentices across the Marches.

The table below identifies the number of starts by each of the Tier 2 sector subject areas that combine to form the overarching 'Engineering and Manufacturing Technologies'.

Sector Subject Area	2016/17	2017/18	2018/19	Change 17/18 - 18/19	% Change 17/18 - 18/19
Engineering and Manufacturing Technologies					
Engineering	230	620	810	190	30.6%
Manufacturing Technologies	1,370	1,100	800	-300	-27.3%
Transportation Operations and Maintenance	280	270	260	-10	-3.7%
The Marches	1,880	1,990	1,870	-120	-6.0%

Source: ESFA Datacube, 2018/19

When considering apprenticeship starts by sector subject area, the only increase was recorded in 'Engineering'. Apprenticeship starts in both 'Manufacturing Technologies' and 'Transport Operations and Maintenance' fell by -27.3% and -3.7% respectively. Of particular note is the longer-term decline in apprenticeship starts for 'Manufacturing Technologies' – down 41.6% or 570 in absolute number since 2016/17.



Apprenticeships starts in Engineering and Manufacturing Technologies were more likely to be at either advanced or higher level in 2018/19 than in 2017/18. Two thirds of all starts were Advanced Apprenticeships (akin to NVQ Level 3) whilst Higher apprenticeships increased from 0.8% to 2.5%.

Source: ESFA Datacube, 2018/19

In terms of starts by provider, 93 organisations delivered apprenticeships across the Marches in Engineering and Manufacturing Technologies in 2018/19. The majority of training was provided by the 10 providers listed below, which accounted for 84%.

Provider	2016/17	2017/18	2018/19
Royal Air Force	920	1,240	1,060
Herefordshire, Ludlow, and North Shropshire College	90	70	90
SBC Training Limited	20	20	90
Telford College	120	60	80
In-Comm Training and Business Services Limited	30	50	60
Herefordshire Group Training Association Limited	40	30	50
Staff Select LTD	40	40	40
Shrewsbury Colleges Group	120	100	40
Babcock Training Limited	10	30	30
Heart of Worcestershire College	30	<10	30

Source: ESFA Datacube, 2018/19

The Royal Air Force remains by far the biggest provider in the Marches, followed by Herefordshire, Ludlow and North Shropshire College.

2.2.1. Apprenticeship Provision

A mapping and gapping exercise of all apprenticeship provision in the Marches has highlighted that there are 61 apprenticeship providers offering apprenticeships in the advanced manufacturing sector within 55 miles of the Marches. This was calculated by using the most central postcode SY8 2AF.

The supporting appendix table shows the current apprenticeship training provision for each of the standards associated with the advanced manufacturing sector across the West Midlands: 35 out of the 94 apprenticeship standards associated with the sector are being offered within 55 miles of the Marches. Most provision is held at the employer, with some courses offering apprenticeships at the training provider. A colour coding system was used to map and gap the provision, with a preference for learning at providers taking priority in the colour coding, as some providers offer both onsite and offsite learning, which would be coloured green in the matrix.

In 28 cases there were courses with only one provider offering the course across England e.g. manufacturing manager, metal casting, foundry and patternmaking technician, and textile manufacturing operative, and in 10 cases this provision was in the West Midlands (e.g. metal casting, foundry and patternmaking technician).

26 courses were not being catered for at the time of analysis anywhere across England, and an additional 11 were offered somewhere else in the country but not in the West Midlands.

Additional provision has recently been developed, including degree level apprenticeships at University of Wolverhampton and Harper Adams University.

2.2.2. Further and Higher Education Provision

Further and Higher Education providers are significant players in the training marketplace. Their role alongside private training providers is to provide opportunities for both the future and the existing workforce to access relevant training in the health and social care sector.

Specifically, there are the following major further and higher education establishments within the area:

- Herefordshire, Ludlow and North Shropshire College
- Telford College
- Shrewsbury Colleges Group
- Harper Adams University
- University Centre Shrewsbury (University of Chester)
- University of Wolverhampton
- NMITE

Higher Education (HESA)

Harper Adams University specialises in the agricultural and rural sector, whilst the University of Chester has a centre in Shrewsbury specialising in subjects aligned to medicine and healthcare, business, and education. The University of Wolverhampton has a well-established campus in the Marches, located at Priorslee in Telford, which currently specialises in engineering and University Centre Telford in Southwater which delivers education, marketing and business management. The Priorslee Campus had recently seen significant investment in its engineering facilities to support the development and delivery of new automotive, mechanical and motorsport engineering programmes. In addition NMITE, the new institute in Hereford, is developing an innovative offer in technology and engineering courses.

Qualifications and skills are on a spectrum, with many academic qualifications now having considerable employer input, and many vocational and professional qualifications being delivered by universities. There is an identified need for both detailed subject knowledge and transferable skills to be part of vocational qualifications: 'many formerly purely technical occupations are expected to show a new demand for creative and interpersonal skills' (World Economic Forum, 2016). Health and engineering are examples where such a binary divide becomes unhelpful. Employers will need all of the skills and qualifications along this spectrum, at different times and in different combinations, and learners and employees will need to be able to move along this spectrum and should be supported in doing so.

In the Marches there are three universities to serve the area. Harper Adams University specialises in the agricultural and rural sector, whilst the University of Chester has a campus in Shrewsbury specialising in subjects aligned to medicine and healthcare, business, and education. The University of Wolverhampton also has a campus in the Marches, located in Telford, this specialises in education, marketing and business management.

The table below sets out the number of students studying in these institutions in the academic year 2018/19. The data relates to all campuses not just those based across the Marches.

Sector	Harper Adams	University of Chester	University of Wolverhampton
Advanced Manufacturing	**275**	**345**	**1,445**
Agri-Tech	4,755	1,020	2,300
Business and Professional Services	135	3,020	4,060
Environmental Technologies	20	370	0
Food and Drink	160	0	0
Health and Social Care	25	4,645	4,300
Public Sector Inc. Education	5	2,925	4,655
Construction	0	0	0
Cyber	0	200	0
Transport and Logistics	0	10	0
Visitor Economy	0	1,785	2,295
Retail	0	245	0
Total	**5,375**	**14,565**	**19,045**

Source: HE student enrolments by HE provider and subject of study 2018/19

In 2018/19 there were 275 students on courses aligned to advanced manufacturing at Harper Adams, up 10 (+3.8%) since the previous year. These students accounted for 5.1% of the student body.

At the University of Chester there were 345 students studying courses in the advanced manufacturing sector, this is up by 125 (+56.8%) since the previous year. These students made up 2.4% of the student body.

The University of Wolverhampton had 1,445 students studying advanced manufacturing related courses, which made up 7.6% of its students, the highest percentage across the three institutions.

3. Demand Side Analysis

Nationally, around 2.7 million people in the UK work in manufacturing. This is equal to about 8% of total jobs in the UK and almost 11% of jobs in the Marches.

The Institution of Engineering and Technology (IET) surveyed 800 UK employers of engineering and technology staff in 2019 and found that 55% of those businesses "have experienced a lack of skills in the external market" and cite "the shortage of engineering and technical skills at a professional level as a key challenge". It is estimated that approximately 186,000 new engineers and manufacturers are needed every year until 2024. There is currently a deficit of 20,000 graduates annually.

Demand in the Marches area mirrors the shortages at a national level. Analysis of Advanced Manufacturing job vacancies in the last year (January 2019 to January 2020) reveal 55,293 total job adverts of which 9,522 were unique vacancies.

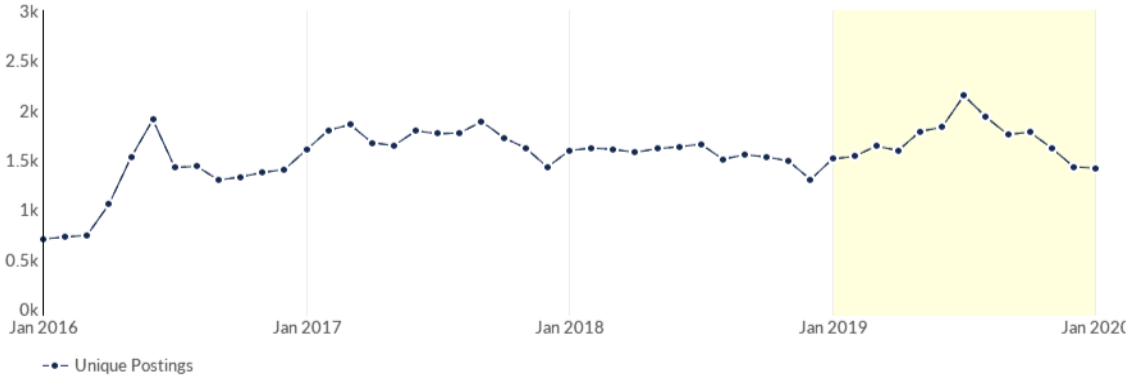
The highest demand is in Telford and Wrekin, which accounted for 39.3% of all unique vacancies, followed by Shropshire (34.9%) and Herefordshire (25.8%).

Job Postings Regional Breakdown

Local Authority	Unique Postings (Jan 2019 - Jan 2020)
Telford and Wrekin	3,745
Shropshire	3,321
Herefordshire, County of	2,456

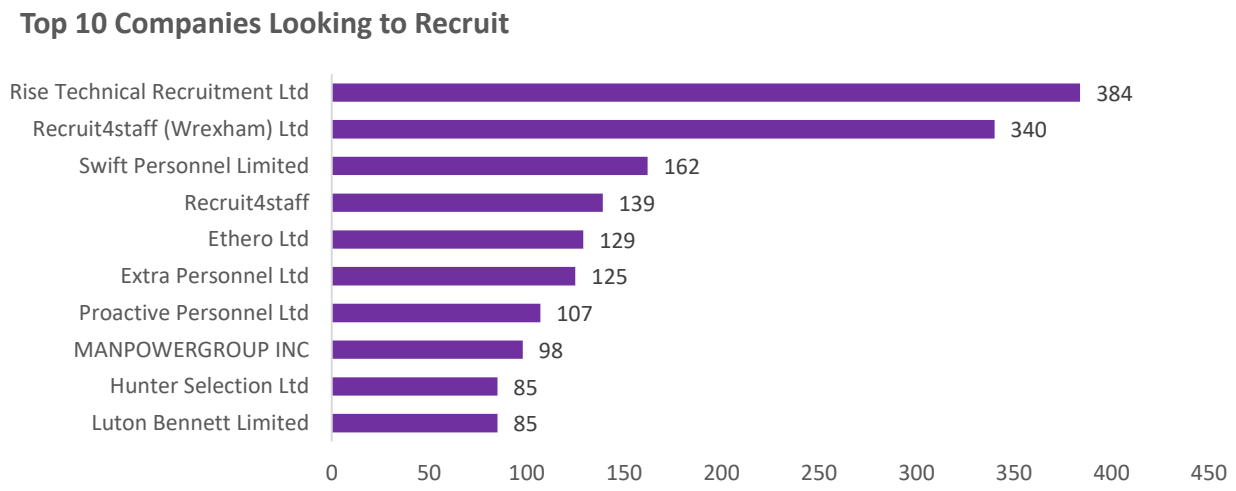
The graph below shows the long-term monthly trend for total job adverts for openings in advanced manufacturing. The number of adverts increased from 702 in January 2016 to 1,415 in January 2020. This is an increase of 101.6%.

Monthly Unique Postings



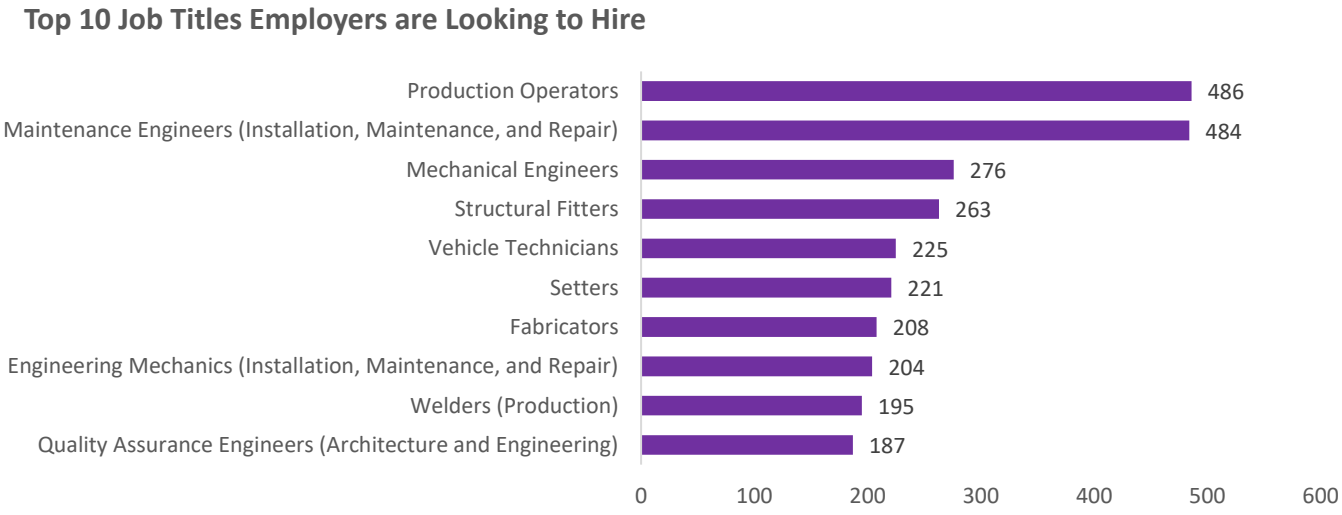
Source: EMSI Analytics Tool, 2020

The top 10 companies looking to recruit to the advanced manufacturing sector account for 17.4% of all unique vacancies posted in the Marches area.



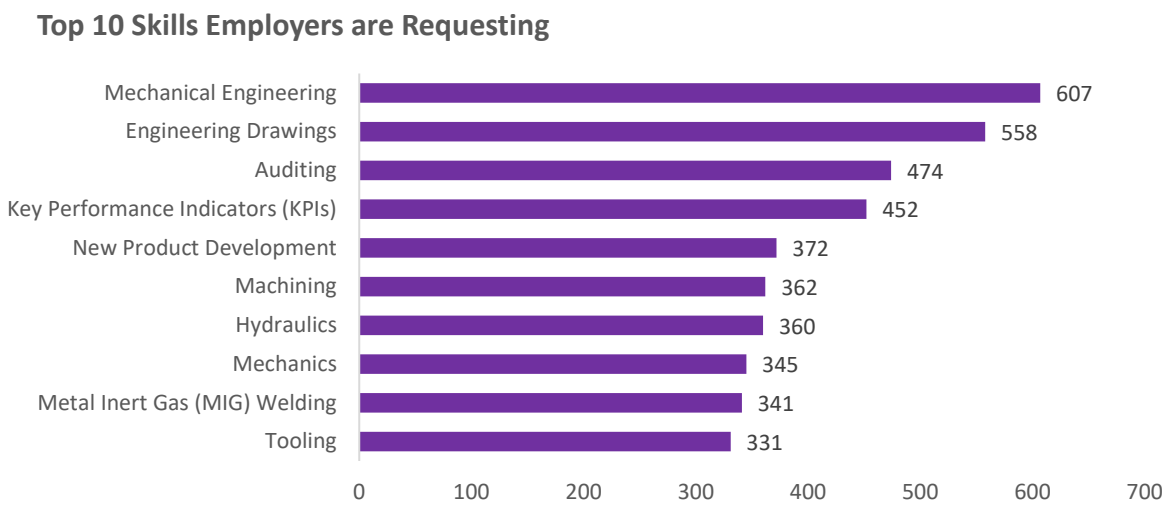
Source: EMSI Analytics Tool, 2020

The top 10 advertised job titles in advanced manufacturing accounted for 29.7% of all unique vacancies in the advanced manufacturing sector.



Source: EMSI Analytics Tool, 2020

The top requested skill was mechanical engineering, which was unsurprising given that mechanical engineers was one of the top job titles employers are looking to hire. This was followed by engineering drawings and auditing. Combined the top three skills demanded appear in 17.7% of unique job postings.



Source: EMSI Analytics Tool, 2020

3.1. Occupational Forecasts

In this section of the report we use UKSOC 4-digit 2010 classifications to understand at a granular level the types of occupations and activities required for roles within the Advanced Manufacturing sector.

Occupation	2018 Jobs	2022 Jobs	2018 - 2022 % Change	2018 - 2022 Openings	Education Level	Automation Index
Packers, bottlers, canners and fillers	3,595	3,736	4%	649	Level 1 NVQ; GCSE at grades D-G	78.6%
Production managers and directors in manufacturing	3,482	3,534	1%	580	Honours, Bachelor's degree	N/A
Metal working production and maintenance fitters	2,368	2,397	1%	306	Level 3 NVQ; A Levels	49.4%
Elementary process plant occupations n.e.c.	1,418	1,450	2%	229	Level 1 NVQ; GCSE at grades D-G	71.4%
Metal working machine operatives	1,252	1,253	0%	158	Level 2 NVQ; GCSE at grades A*-C	66.4%
Routine inspectors and testers	1,086	1,092	1%	136	Level 3 NVQ; A Levels	42.5%
Metal machining setters and setter-operators	1,063	1,071	1%	138	Level 3 NVQ; A Levels	64.8%
Welding trades	1,019	1,050	3%	150	Level 3 NVQ; A Levels	78.6%
Mechanical engineers	767	813	6%	136	Honours, Bachelor's degree	1.3%
Plastics process operatives	758	752	-1%	110	Level 2 NVQ; GCSE at grades A*-C	84.5%
Engineering professionals n.e.c.	741	761	3%	114	Honours, Bachelor's degree	3.4%
Assemblers (vehicles and metal goods)	629	620	-1%	81	Level 2 NVQ; GCSE at grades A*-C	73.5%
Design and development engineers	567	582	3%	82	Honours, Bachelor's degree	1.7%
Assemblers and routine operatives n.e.c.	555	546	-2%	65	Level 2 NVQ; GCSE at grades A*-C	57.6%
Skilled metal, electrical and electronic trades supervisors	486	496	2%	66	Level 3 NVQ; A Levels	3.5%
Production and process engineers	480	481	0%	62	Honours, Bachelor's degree	2.2%

Occupation	2018 Jobs	2022 Jobs	2018 - 2022 % Change	2018 - 2022 Openings	Education Level	Automation Index
Paper and wood machine operatives	421	425	1%	59	Level 2 NVQ; GCSE at grades A*-C	71.7%
Planning, process and production technicians	381	389	2%	57	Level 3 NVQ; A Levels	17.0%
Chemical and related process operatives	350	355	1%	52	Level 2 NVQ; GCSE at grades A*-C	55.7%
Quality control and planning engineers	339	340	0%	62	Honours, Bachelor's degree	4.8%
Science, engineering and production technicians n.e.c.	337	337	0%	44	Level 3 NVQ; A Levels	27.1%
Plant and machine operatives n.e.c.	324	323	0%	41	Level 2 NVQ; GCSE at grades A*-C	58.9%
Metal making and treating process operatives	320	327	2%	45	Level 2 NVQ; GCSE at grades A*-C	69.6%
Research and development managers	320	329	3%	47	Honours, Bachelor's degree	0.8%
Assemblers (electrical and electronic products)	319	317	-1%	40	Level 2 NVQ; GCSE at grades A*-C	72.0%
Electrical engineers	276	287	4%	44	Honours, Bachelor's degree	7.4%
Sheet metal workers	241	251	4%	38	Level 3 NVQ; A Levels	49.6%
Tool makers, tool fitters and markers-out	238	239	0%	30	Level 3 NVQ; A Levels	83.7%
Quality assurance technicians	208	206	-1%	26	Level 3 NVQ; A Levels	7.8%
Electronics engineers	190	189	-1%	24	Honours, Bachelor's degree	2.2%
Precision instrument makers and repairers	163	163	0%	20	Level 3 NVQ; A Levels	50.1%
Aircraft maintenance and related trades	134	138	3%	21	Level 3 NVQ; A Levels	38.5%
Process operatives n.e.c.	129	128	-1%	16	Level 2 NVQ; GCSE at grades A*-C	63.1%
Electrical and electronics technicians	126	124	-1%	15	Level 4 NVQ; Intermediate, DipHE, DipFE	38.6%
Metal plate workers, and riveters	102	104	2%	15	Level 3 NVQ; A Levels	76.9%
Rubber process operatives	80	72	-10%	10	Level 2 NVQ; GCSE at grades A*-C	100.0%
Electroplaters	57	56	-1%	<10	Level 2 NVQ; GCSE at grades A*-C	69.2%
Boat and ship builders and repairers	46	47	2%	<10	Level 3 NVQ; A Levels	49.4%
Moulders, core makers and die casters	28	29	4%	<10	Level 2 NVQ; GCSE at grades A*-C	64.2%
Rail and rolling stock builders and repairers	23	22	-4%	<10	Level 3 NVQ; A Levels	67.4%
Smiths and forge workers	22	21	-5%	<10	Level 3 NVQ; A Levels	71.9%
Total	**25,440**	**25,852**	**2%**	**3,791**		

Source: EMSI Analytics Tool, 2020

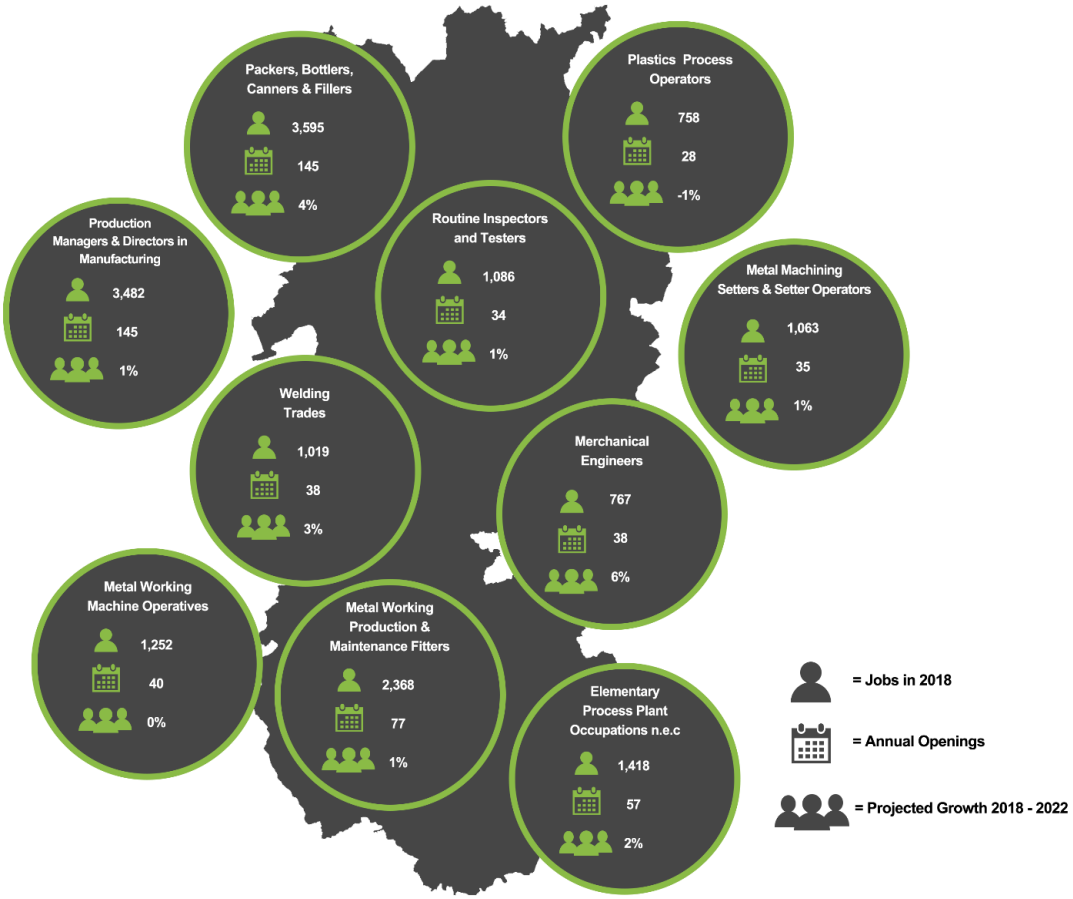
In total there are 41 occupations associated with the advanced manufacturing sector. The most jobs in the Marches are contained within 'Packers, Bottlers, Canners and Fillers', closely followed by 'Production Managers and Directors in Manufacturing'. Both roles are forecast to grow further by 2022.

Of the 41 occupations listed above, 22 are expected to grow, seven are predicted to undergo nominal change (+/- in absolute numbers) and 12 are likely to contract.

Of the 12 occupations forecast to shrink, seven employ fewer than 200 people. These occupations also invariably score heavily on the automation index (the automation index captures an occupation's risk of being affected by automation). Indeed, the occupation forecast to contract the most, 'Rubber Process Operatives' (-10%) has an automation reading of 100%; whilst the occupation predicted to expand the most 'Mechanical Engineers' (6%) has a risk to automation of just 1.3%.

In addition to 'Mechanical Engineering', the other occupations expected to grow the most include 'Engineering Professionals n.e.c.', 'Design and Development Engineers', 'Research and Development Managers' and 'Electrical Engineers' - emphasising a strong correlation between those occupations and higher-level and technical qualifications. These occupations also score much lower on the automation index.

The Marches Top 10 Advanced Manufacturing Occupations



3.2. Job Forecasts by Industry

Overall, based on EMSI job projection model, the advanced manufacturing sector is projected to increase by an estimated 119 jobs to 32,692 by 2022.

Out of the 124 industries, 61 are projected to decrease in the number of jobs by 2022, with technical testing and analysis the highest by 170 jobs down to 975. There are 5 industries that are predicted to remain at the same amount of jobs and 58 industries that are predicted to increase in the number of jobs by 2022.

The following table shows the change in number of jobs by 2022 where available for the industries within the advanced manufacturing sector.

Industry	2018 Jobs	2022 Jobs	2018 - 2022 Change
Engineering activities and related technical consultancy	2,734	3,036	302
Manufacture of metal structures and parts of structures	1,310	1,417	107
Manufacture of other plastic products	1,227	1,325	98
Machining	1,141	1,232	91
Manufacture of basic iron and steel and of ferro-alloys	398	467	69
Manufacture of plastic packing goods	835	893	58
Manufacture of made-up textile articles, except apparel	251	306	55
Manufacture of weapons and ammunition	287	333	46
Manufacture of kitchen furniture	197	242	45
Manufacture of paper and paperboard	287	328	41
Manufacture of fluid power equipment	129	165	36
Other printing	905	939	34
Manufacture of other chemical products n.e.c.	204	238	34
Manufacture of other furniture	518	546	28
Finishing of textiles	133	160	27
Manufacture of other special-purpose machinery n.e.c.	329	355	26
Manufacture of jewellery and related articles	146	170	24
Other manufacturing n.e.c.	377	398	21
Manufacture of computers and peripheral equipment	192	212	20
Manufacture of lifting and handling equipment	179	198	19
Installation of industrial machinery and equipment	308	327	19
Manufacture of central heating radiators and boilers	50	67	17
Casting of iron	271	287	16
Manufacture of machinery for mining, quarrying and construction	103	119	16
Manufacture of perfumes and toilet preparations	45	59	14
Manufacture of tools	122	136	14
Manufacture of soap and detergents, cleaning and polishing preparations	38	49	11
Manufacture of sports goods	58	69	11
Repair and maintenance of aircraft and spacecraft	106	117	11
Weaving of textiles	36	46	10
Manufacture of other technical and industrial textiles	38	48	10
Manufacture of paints, varnishes and similar coatings, printing ink and mastics	60	68	8
Repair of machinery	507	515	8
Manufacture of other pumps and compressors	85	92	7
Manufacture of other machine tools	43	50	7
Manufacture of fertilisers and nitrogen compounds	26	32	6
Manufacture of wire products, chain and springs	68	74	6
Manufacture of other general-purpose machinery n.e.c.	203	209	6
Manufacture of imitation jewellery and related articles	23	29	6
Manufacture of refined petroleum products	149	154	5
Manufacture of other organic basic chemicals	15	20	5
Manufacture of other fabricated metal products n.e.c.	542	547	5
Manufacture of electric lighting equipment	83	88	5
Manufacture of ovens, furnaces and furnace burners	22	27	5
Manufacture of games and toys	50	55	5
Preparation and spinning of textile fibres	135	139	4
Manufacture of ready-mixed concrete	23	27	4
Manufacture of fasteners and screw machine products	154	157	3
Manufacture of optical instruments and photographic equipment	10	13	3
Manufacture of electric domestic appliances	21	24	3
Manufacture of bearings, gears, gearing and driving elements	22	25	3
Architectural activities	545	548	3
Manufacture of pesticides and other agrochemical products	35	37	2
Manufacture of ceramic household and ornamental articles	17	19	2
Manufacture of musical instruments	24	26	2

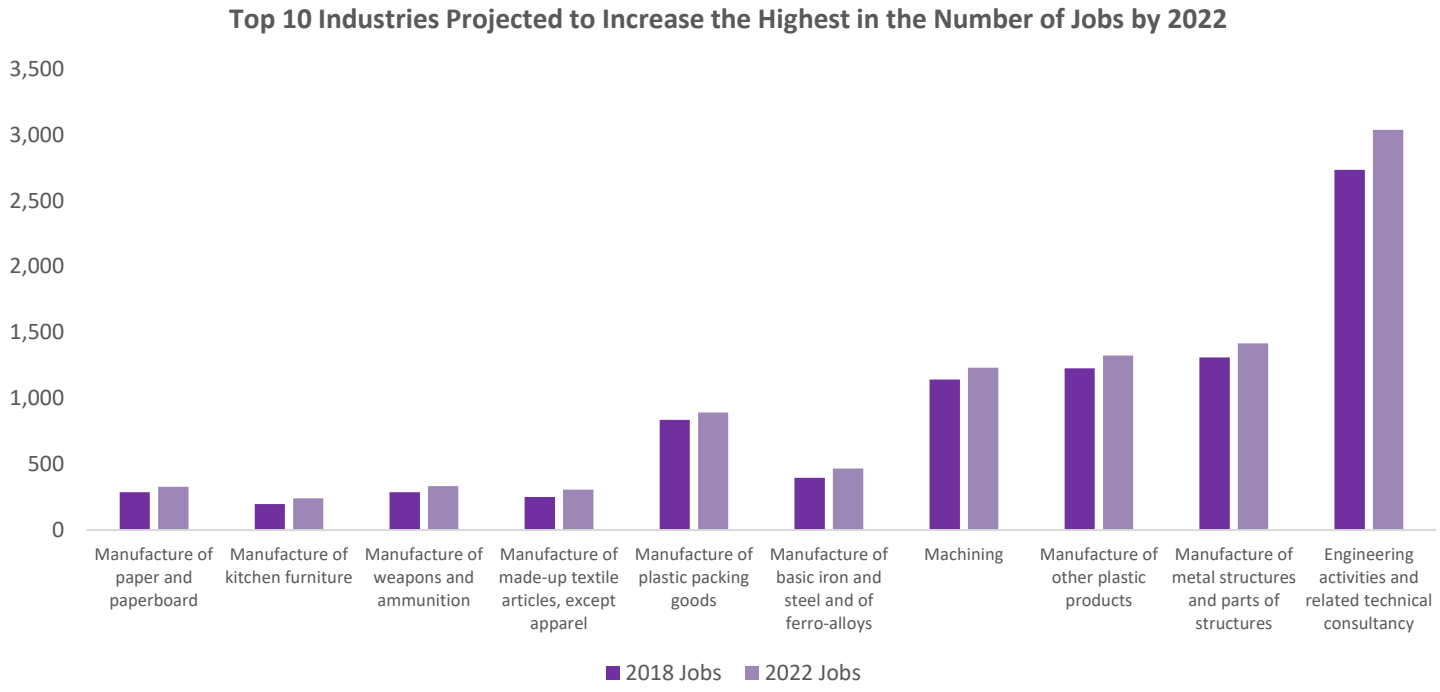
Industry	2018 Jobs	2022 Jobs	2018 - 2022 Change
Manufacture of medical and dental instruments and supplies	212	214	2
Manufacture of metal forming machinery	11	12	1
Manufacture of office and shop furniture	139	140	1
Manufacture of pharmaceutical preparations	19	19	0
Shaping and processing of flat glass	17	17	0
Casting of steel	11	11	0
Manufacture of agricultural and forestry machinery	461	461	0
Manufacture of machinery for food, beverage and tobacco processing	56	56	0
Manufacture of veneer sheets and wood-based panels	24	23	-1
Binding and related services	16	15	-1
Manufacture of lime and plaster	13	12	-1
Manufacture of electricity distribution and control apparatus	169	168	-1
Manufacture of wiring devices	16	15	-1
Pre-press and pre-media services	50	48	-2
Aluminium production	509	507	-2
Manufacture of other tanks, reservoirs and containers of metal	132	130	-2
Forging, pressing, stamping and roll-forming of metal; powder metallurgy	201	199	-2
Repair of electronic and optical equipment	15	13	-2
Manufacture of wooden containers	38	35	-3
Manufacture of ceramic insulators and insulating fittings	47	44	-3
Casting of light metals	653	650	-3
Casting of other non-ferrous metals	16	13	-3
Repair of fabricated metal products	18	15	-3
Manufacture of other wearing apparel and accessories	15	11	-4
Manufacture of other articles of concrete, plaster and cement	18	14	-4
Manufacture of plastics and rubber machinery	48	44	-4
Repair of electrical equipment	19	15	-4
Repair of other equipment	33	29	-4
Manufacture of bricks, tiles and construction products, in baked clay	59	54	-5
Manufacture of engines and turbines, except aircraft, vehicle and cycle engines	265	260	-5
Building of pleasure and sporting boats	35	30	-5
Repair and maintenance of other transport equipment	17	12	-5
Manufacture of other electrical equipment	92	86	-6
Manufacture of carpets and rugs	56	49	-7
Manufacture of rubber tyres and tubes; retreading and rebuilding of rubber tyres	22	15	-7
Manufacture of concrete products for construction purposes	37	30	-7
Manufacture of other non-metallic mineral products n.e.c.	23	16	-7
Other non-ferrous metal production	649	642	-7
Manufacture of light metal packaging	57	50	-7
Manufacture of motor vehicles	88	81	-7
Manufacture of workwear	28	19	-9
Manufacture of other outerwear	33	24	-9
Manufacture of other taps and valves	189	180	-9
Cutting, shaping and finishing of stone	36	26	-10
Manufacture of locks and hinges	75	65	-10
Manufacture of loaded electronic boards	107	97	-10
Manufacture of household and sanitary goods and of toilet requisites	39	28	-11
Treatment and coating of metals	353	342	-11
Manufacture of corrugated paper and paperboard and of containers of paper and paperboard	100	88	-12
Manufacture of other articles of paper and paperboard	48	36	-12
Manufacture of power-driven hand tools	304	290	-14
Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers	150	136	-14
Sawmilling and planning of wood	343	328	-15
Manufacture of instruments and appliances for measuring, testing and navigation	568	548	-20

Industry	2018 Jobs	2022 Jobs	2018 - 2022 Change
Manufacture of other builders' carpentry and joinery	909	887	-22
Manufacture of communication equipment	138	113	-25
Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	79	53	-26
Manufacture of paper stationery	136	106	-30
Manufacture of air and spacecraft and related machinery	253	220	-33
Manufacture of non-domestic cooling and ventilation equipment	262	225	-37
Manufacture of doors and windows of metal	363	320	-43
Manufacture of military fighting vehicles	571	519	-52
Manufacture of non-electric domestic appliances	120	65	-55
Manufacture of other rubber products	392	307	-85
Manufacture of builders' ware of plastic	523	417	-106
Manufacture of other parts and accessories for motor vehicles	2,999	2,893	-106
Manufacture of office machinery and equipment (except computers and peripheral equipment)	936	823	-113
Manufacture of plastic plates, sheets, tubes and profiles	974	846	-128
Technical testing and analysis	1,145	975	-170
Total	**32,573**	**32,692**	**119**

Source: EMSI Analytics Tool, 2020

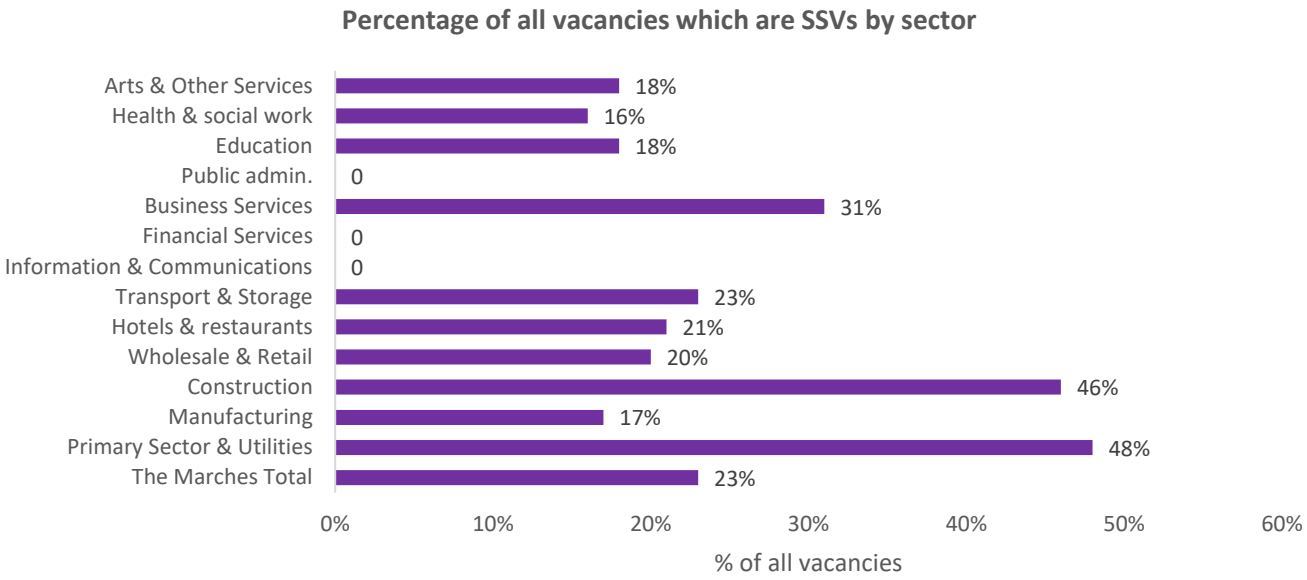
Within the advanced manufacturing sector, engineering activities and related technical consultancy is projected to increase the highest by an additional 302 jobs by 2022 to reach 3,036 jobs. This is followed by the manufacture of metal structures and parts of structures by an additional 107 jobs to 1,417 in 2022. Future development is likely to be impacted by changing legislation and consumer demand as environmental considerations affect the automotive supply chain.

The following graph shows the top ten industries that are projected to increase by the highest amount by 2022.



Source: EMSI Analytics Tool, 2020

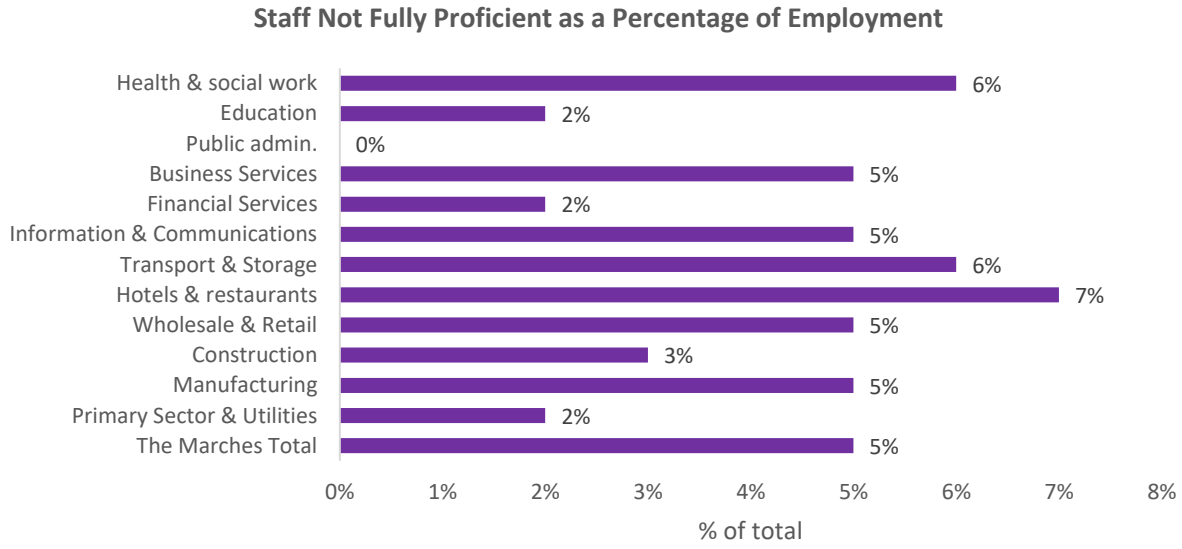
3.3. Sector Skills Shortages



Source: Employer Skills Survey 2017, LEP Summary Tables

23% of all vacancies are skills shortage vacancies, compared to 22% nationally. The graph above highlights the acute problem of skills shortage vacancies in certain sectors.

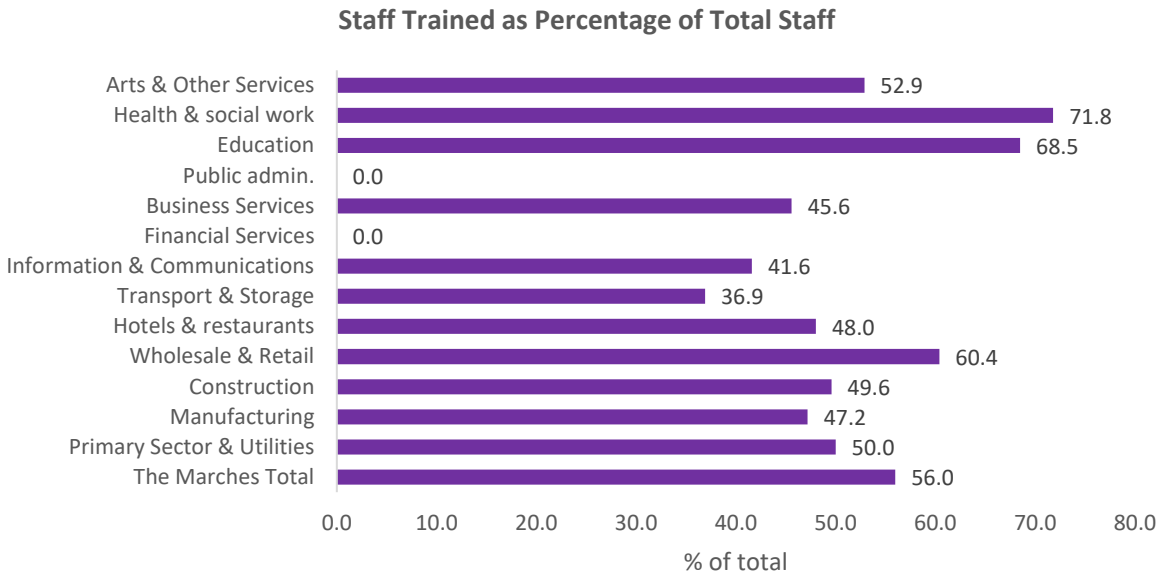
Advanced manufacturing, defined in the graph as manufacturing, has a skills gap of 17%. This is a lower level than other sectors in the Marches, so employers do not have a large problem of hiring to fill skills gaps.



Source: Employer Skills Survey 2017, LEP Summary Tables

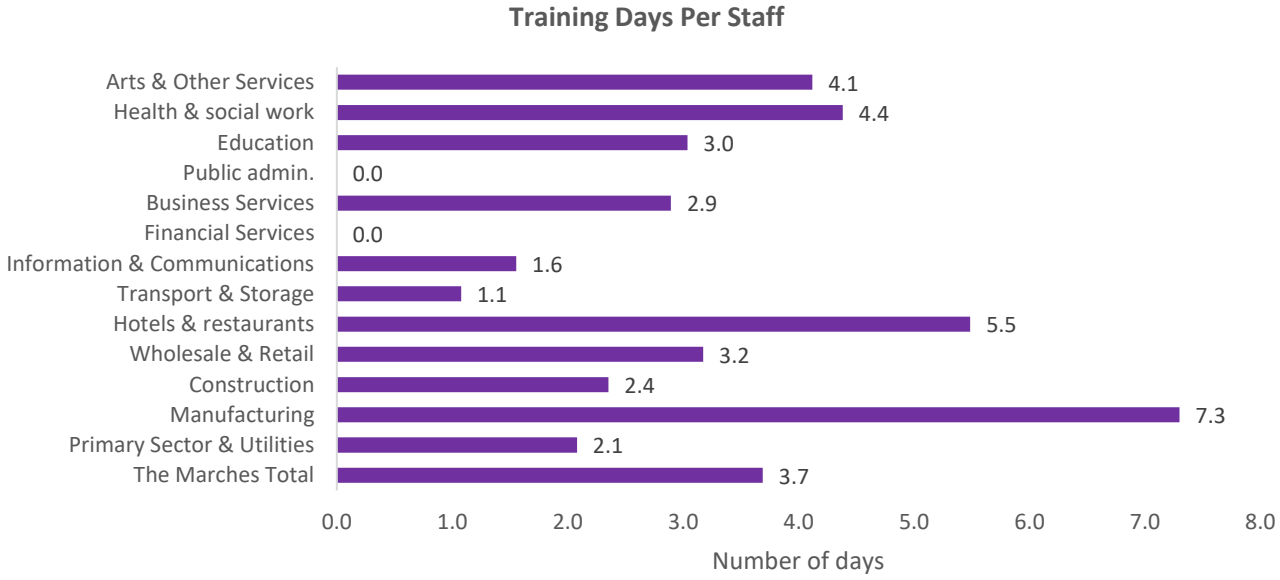
5% of staff are not fully proficient in the Marches, compared to 4% nationally. In the advanced manufacturing sector, 5% of staff are not fully proficient.

This sector does not have a big problem with skill shortages within the current employment base, this may be due to successful hiring of candidates with sufficient skills, or employers investing in training to train up staff who lack vital skills.



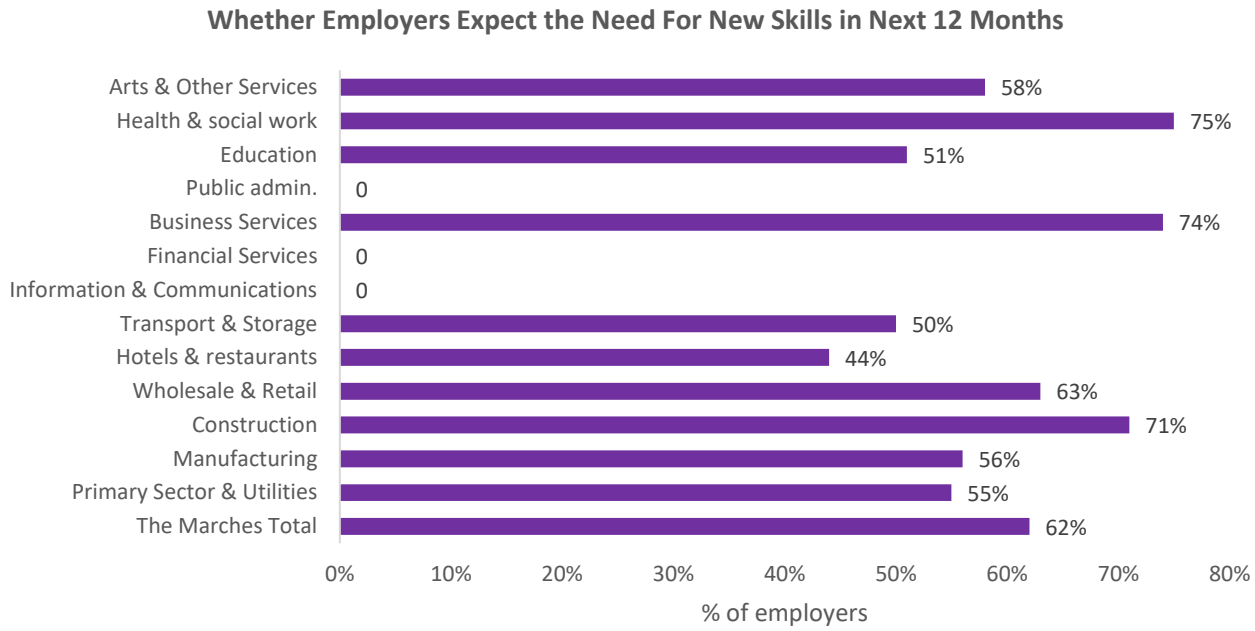
Source: Employer Skills Survey 2017, LEP Summary Tables

In the Marches, 56.0% of staff are trained as a percentage of all staff, compared to 62.2% of staff in England. 47.2% are trained in the advanced manufacturing sector, which is a low level. This may be due to a variety of reasons, e.g. training being too expensive or not having the capacity/time to train staff.



Source: Employer Skills Survey 2017, LEP Summary Tables

On average, employees in the Marches have 3.7 training days. In the advanced manufacturing sector this is much more at 7.3 training days. Given that the advanced manufacturing sector has many high skilled roles, the 7.3 training days might be an intensive training course to equip employees with the much-needed skills the sector demands.



Source: Employer Skills Survey 2017, LEP Summary Tables

62% of employers in the Marches expect the need for new skills in the next 12 months, this is the same as national levels. In the advanced manufacturing sector 56% of employers expect new skills from employees. Upskilling may be the preferred solution to this problem – that is, training current employees with new skills to ensure they can keep up with a changing work environment e.g. enhancements in digital technology. Upskilling may be cheaper for employers and more attractive, with a chance to 'grow their own'.

4. Supply vs Demand

4.1. Provision Review

In this section of 'Supply vs Demand' we will concentrate on the most significant areas of misalignment and gaps across the sector. Identifying which courses are currently over-supplying the labour market, which areas of labour market demand is currently being met and where there might be areas of opportunity for the development of new skill provision.

Discipline	Completers 2019	Annual Openings	Gap Between Demand and Provision	% Jobs Growth (2019-2022)
Manufacturing	93	391	298	1%
Metal Work	1	187	186	1%
Printing	6	33	27	1%
Civil Engineering	4	30	26	3%
Wood Crafts and Furniture Making	12	31	19	-0%
Ceramics and Glass Manufacturing	7	17	10	-2%
Upholstery	0	5	5	0%
Mining and Extraction	0	46	46	2%
Packing	0	169	169	3%
Engineering	2,549	478	-2,071	2%
Motor Vehicle Maintenance and Repair	346	169	-177	5%
Welding and Fabrication	135	42	-93	1%
Production and Manufacturing Engineering	136	63	-73	1%
Plant Operations	87	31	-56	1%
Heavy Equipment Maintenance and Repair	18	1	-17	-4%
Mechanical Engineering	79	71	-8	2%
Fashion, Textiles, Footwear and Leather Manufacturing	14	13	-1	2%

Green: Areas where the provider base already offers courses, but the data indicates that there may be room to grow these to meet employment demand.

Blue: Courses the provider base does not currently offer, indicating that there is potential for creating new courses to meet these skills needs.

Yellow: Areas where the data suggests that the provider base is currently oversupplying the labour market to a significant level.

Skills provision that is aligned to local jobs and industry demand not only helps providers with their Ofsted inspection but also helps to ensure learners are best placed to get employment using the skills they have learned, supply employers with the skills they need and support growth in the local and wider economy.

This provision review identifies areas of misalignment in the Marches for the advanced manufacturing sector:

Strengths (course areas that are well met compared to industry demand)

Course areas which have a gap between supply and demand, where that there is less provision than supply is possibly where there is still potential to increase provision locally. These include the

disciplines highlighted green in the table, e.g. manufacturing, metal work, printing, civil engineering, wood crafts and furniture making and ceramics and glass manufacturing.

Disciplines in the green section of the table that also have a net positive change in jobs in the next few years are seen as extra strengths to the area, e.g. manufacturing, metal work, printing, civil engineering.

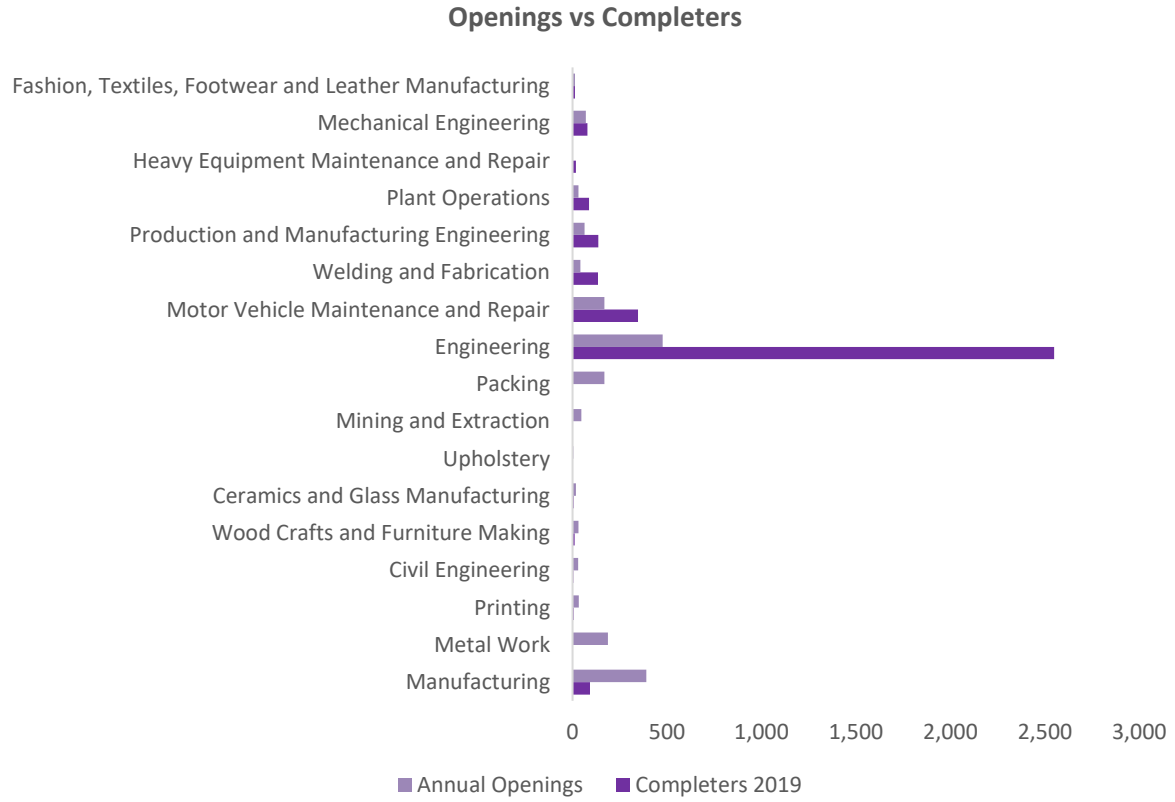
Opportunities (course areas that are currently under supplied compared to demand)

Other opportunity areas include those highlighted in blue with a small gap, as these are the disciplines which are sought after but have no provision locally. There is room for courses to be developed in these disciplines to meet local employer needs, e.g. upholstery, mining and extraction and packing.

Threats (course areas that are well met or oversupplied compared to industry demand)

Disciplines with too much provision and not enough employer demand will lead to an oversaturated supply of labour in certain disciplines. Graduates from these courses will find it difficult to find employment locally, and may have to move out of the area to find work in their field. People skilled in this discipline might have to upskill or retain in other disciplines to find work elsewhere. Courses in this group include those highlighted in yellow e.g. engineering, motor vehicle maintenance and repair, welding and fabrication, production and manufacturing engineering, plant operations, heavy equipment maintenance and repair, mechanical engineering, fashion, textiles, footwear and leather and manufacturing.

The best way to implement change is to prioritise interventions based on biggest misalignments and gaps. Disciplines with a low uptake e.g. those in blue, need extra resources to highlight the opportunities in these occupations. **These strengths, opportunities and threats can be clearly identified in the graph below**



Source: EMSI Analytics Tool, 2020

4.2. Future Drivers of Skills

Looking forward, according to UKCES future drivers of skills within the Advanced Manufacturing sector will include:

- Accessing finance to bring new products and technologies to market, which is increasing the focus on business development skills among senior managers.

- Increasing investment in R&D, which is stimulating demand for highly skilled graduates and increasing collaboration between research centres and industry.

- Meeting low carbon policies and legislation, which is increasing investment in energy-efficient technologies and driving research in lightweight materials.

- Maximising export opportunities, which is considered a major growth opportunity for UK manufacturers.

- Taking advantage of potentially transformative enabling technologies, such 3D printing, composites and robotics, which could potentially transform the sector.

In response, the High Value Manufacturing (HVM) Catapult, a group of manufacturing R&D centres in the UK, with partners from the National Physical Laboratory (NPL) and support from the Gatsby Foundation, have worked to identify and capture good practice on the development of the future workforce. Their work identifies that currently just 6% of those aged between 16 and 23 are contemplating a future in advanced manufacturing yet 23% are looking to digital/technology suggesting young people don't realise the extent to which manufacturing now exploits advanced technology such as machine learning and big data.

They also believe that the rapid pace of technological change demands more modular and flexible training courses that can be used to upskill and reskill the existing workforce. Curriculum development undertaken in partnership between education providers produce highly modularised courses, together with a responsive teacher training system, ensures that content and pedagogy can promptly accommodate changes in skills needs.

4.3. Impact of Brexit

Analysis by the House of Commons Library suggests that 42% of UK exports were in manufacturing in 2018, and that Brexit has already and will have a large impact on the sector, where some manufacturers are concerned about future investment, cross border supply chains, and access to foreign labour. A large number of UK manufacturers employ citizens from the European Union in their businesses, but once free movement ends, a decrease in the availability of EU nationals may worsen the existing skills shortage.

The findings of the recent Marches Growth Hub: Brexit Preparation Report, which surveyed 93 businesses from the advanced manufacturing sector seems to suggest that they are more concerned about Brexit when compared to other industries. For example, 83.9% (78) were aware of the latest HMRC guidance. Overall half of businesses interviewed from the advanced manufacturing sector had considered the potential impact of Brexit on them (64.5%), and additionally 67.7% had considered the potential impact of a change in the UK / EU trade relationship on their suppliers and customers.

4.4. Impact of Covid-19

Covid-19 is having and will continue to have an impact on all business sectors. Digital technology has helped businesses continue to operate by enabling virtual working and addressing skills issues through online tools and training opportunities where appropriate. Predicting how that might impact on businesses in the future is difficult but methods of doing business will change and in some cases that might alter the requirements on digital technology and change skills and training requirements.

Potential vulnerabilities to supply chains may provide opportunities for reshoring and near shoring which may increase demand for manufacturing production skills. This may also offer opportunities for businesses to consider innovation and diversification into new products and markets.

5. Conclusions

5.1. Summary

Although the Advanced Manufacturing sector is expected to decline in size up to 2022 both in the Marches and nationally, the sector is still widely reported to be an area of significant *potential* growth. This growth is likely to be due to the increasing use of technology to generate efficiencies in the production process, and employers developing innovative new products that can be traded internationally.

This ever-evolving sector needs to embrace new and improved technologies. However, this means that workers need to be able to keep up with these market and technological changes. The modern advanced manufacturing workforce needs to have a completely different set of skills than the one required just a few years ago, and a lack of proper training will contribute to the widening skills gap in the industry.

Growing the manufacturing workforce will potentially lead to higher levels of innovation and productivity, allowing manufacturers to stay competitive and to contribute to both the Marches and UK's economy. Reducing a skills shortage that has been years in the making may be a challenge for many; nonetheless, knowing where this gap is coming from and how it can affect advanced manufacturing, will help businesses, workers, students and organisations to work towards a solution together.

5.2. Recommendations

The evidence presented in this report indicates manufacturers are struggling to upskill their current workforce with the current quantity and quality of provisions available, and also the anticipated increase in recruitment pressures linked to the pace of technological change.

In order to address this, increasing the number of apprenticeships in manufacturing is a start. Apprenticeships help to increase awareness of the industry and to dispel the many misconceptions surrounding it and allow young people to have first-hand, on-the-job experience of the manufacturing world.

Other ways may include helping businesses build partnerships with universities and other further education colleges to identify placements for students. This collaboration may also help garner innovation in new product design and delivery whilst also potentially offering access to specialist equipment.

Longer-term increased working with schools and better engagement with young people to shape and improve their perceptions of advanced manufacturing will help to build a workforce for the future. This could potentially be done by working in tandem with external delivery partners like the Careers and Enterprise Company or Chamber of Commerce.

Finally, consider new ways to market careers in the advanced manufacturing sector to young people. This may involve digital campaigns targeted specifically at the desired age group showing how businesses within the sector match their own career aspirations.

5.3. Action Planning

It will be the responsibility of the Marches Local Enterprise Partnership (LEP) and its key stakeholders to review the recommendations, develop a strategy and agree an action plan to address the challenges and opportunities identified within this report.