



# A new image for manufacturing

Why changing young people's views of the sector is key to addressing its skills challenge



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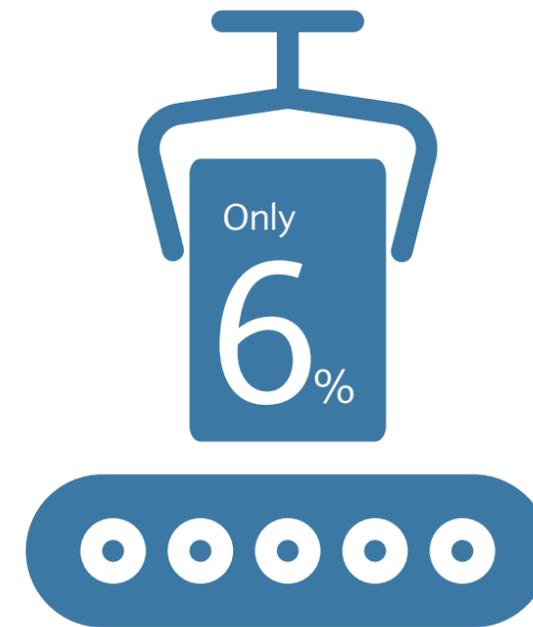
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The economic modelling in this report was based on 2016 prices, as this was the year for which the most up-to-date economic output data was available. Survey respondents aged between 16 and 23 are referred to as 'Generation Z' throughout.

# Misconceptions of manufacturing

The UK manufacturing sector must attract skilled, versatile and bright young people if it is going to continue to thrive. Barclays' new research reveals how Generation Z views this ever-evolving sector.

- UK manufacturing has yet to convince Generation Z of its potential as an employer. Just 6% of those aged between 16 and 23 are contemplating a future in the sector.
- Yet **23% are looking to digital/technology and 22% to the IT/computing fields** – suggesting young people don't realise the extent to which manufacturing now exploits advanced technology.
- Young people see the skills they could gain in manufacturing as primarily technical, such as repairing and maintaining equipment; or physical, such as strength and dexterity. Only **one third appreciate the potential for acquiring skills in advanced technology fields**, such as machine learning and big data.
- Failure to engage and inspire the new generation is set to exacerbate skills pressures on manufacturers, hitting growth and productivity. **Almost one in four businesses is finding it hard to recruit skilled workers, and one fifth have problems finding experienced staff.**
- Larger businesses are under particular pressure – 46% say skills shortages are putting strain on existing workforces.
- By targeting young people more directly – for example, through apprenticeships, graduate recruitment and partnerships with education – **UK manufacturing could boost its value by an extra £6bn a year by 2023.**
- **Every region of the UK and sub-sector of manufacturing stands to gain in output and employment**, with particularly strong growth for companies in the North West and also those in transport equipment manufacture.



of 16-23 year olds are contemplating a future in the sector.



46%

of large businesses say skills shortages put a strain on workforces.

# Executive summary

Barclays' new study reveals the added value that UK manufacturers could derive by actively targeting the youngest workers – the vast majority of whom see the sector as unappealing.

Left unaddressed, young people's indifference to manufacturing is set to inflame skills pressures that already hamper growth. At Barclays, we set out to identify solutions by looking at this issue from both perspectives: that of employers and potential future recruits.

The much-cited decline of UK manufacturing has been greatly exaggerated. The sector continues to make a significant contribution to the UK economy, currently accounting for around 10% of the value of economic output. It also provides more than 2.6 million jobs.<sup>1</sup>

In 2014, the UK Commission for Employment and Skills foresaw a slow tapering of manufacturing employment. It estimated the jobs total would drop by around 9% by 2024.<sup>2</sup>

Midway through that forecast period, the sector's jobs market seems to have defied predictions.<sup>3</sup> Between mid-2014 and mid-2018, for example, the employment total increased by around 87,000, an average of 0.8% per year.

This points to resilience. It also raises a concern, however, that in some cases staff growth may be a way of putting off investment in advanced technology. As outlined in our previous report on the [Fourth Industrial Revolution](#), speedier investment of this kind will spur efficiency and ultimately growth.

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**“Skills shortages put strain on the existing workforce, dent staff morale and harm productivity.”**

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## Skills gaps cause strain

Despite the continuing rise in job numbers, skills shortages remain an issue for manufacturers. This is because of the need to replace workers who leave the sector due to reasons including retirement, as well as demand for fresh talent to fuel growth.

Evidence suggests that these issues may be further exacerbated by applicants who lack knowledge in the STEM based subjects.

Attracting skilled engineers is a particular challenge, which The National Centre for Universities and Business (NCUB) [Talent 2050](#) programme is exploring separately. Its Phase 1 Report, supported by Barclays, reviewed existing studies and workshops to set a baseline for current and future engineering skills.

Our latest Barclays research, sampling 504 middle managers and above in manufacturing businesses across the UK, suggests that skilled tradespeople and experienced workers are in particularly high demand.

Three workforces in 10 lack the technical skills they need, such as equipment maintenance and quality control. Over one-fifth are deficient in advanced technology skills, including machine learning and big data. The shortages are particularly acute among larger firms.

The consequences are damaging. Skills shortages put strain on the existing workforce (a concern for 36% of our firms, and 46% of larger enterprises). They dent staff morale and harm productivity. For a significant minority, they have more serious consequences, including unfulfilled orders and declining revenue.

## Careers fail to inspire

Our study also sought the opinions of 2,012 young people in the UK, aged 16 to 23. We are not diminishing the importance of other age brackets to the manufacturing workforce in focusing on this cohort. However, the perceptions of 7.1 million people of that age group in 2017 are worth considering – especially since their views are likely to be shared by the even younger set following them into the workforce.<sup>4</sup>

It is disheartening to discover the lack of appeal that manufacturing holds for the Generation Z demographic. Only 6% are considering a manufacturing career, a statistic that will concern everyone who has a stake in the sector's future.

I was particularly disappointed to see that the numbers of young women seeking a manufacturing career are even lower – around one third of the figure for their male peers. I believe the sector is in sore need of prominent female role models to help drive gender diversity.

It should go without saying that recruitment efforts also need to focus on diversity in its wider sense, striving to appeal to young people of all backgrounds and cultures and ensuring that potential candidates with disabilities know they will find opportunities in the sector.

### Perceptions from the past

Detailed analysis reveals that young people have an outdated view of the sector. They see it as an environment where they might gain technical skills, or be required to show physical strength or dexterity. Relatively few recognise the extent to which advanced technology now drives manufacturing.

## Skills in short supply

Manufacturing decision makers say their employees are missing:



30%

Technical skills



21%

Advanced technical/technology skills



20%

Decision-making skills



17%

Problem-solving skills



16%

Social skills



15%

Resource management skills



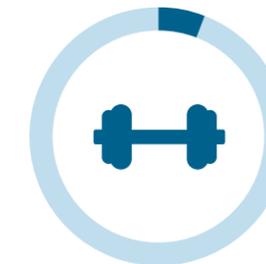
14%

Creative abilities



10%

Content analysis skills



6%

Physical abilities (e.g. physical strength, manual dexterity etc)



2%

Other



UK manufacturing could grow by over £18bn in real terms, an increase of 11.2% by 2023.

+11.2%

£18bn

There is a potential positive here. The main features young people are seeking in their career choices – opportunities to progress, good earnings, the chance to acquire digital skills, a chance to make a difference to society – might lead them naturally to manufacturing, if only they were aware.

Generating that awareness is the task that faces companies. Our report suggests some methods they might deploy, such as partnerships with education to enable them access to higher skills and to better exploit the latest technologies.

### Rewards for reaching out

The scale of the gains generated by such actions would be substantial, our economic modelling suggests. By 2023, UK manufacturing value could grow by over £18bn in real terms – an increase of 11.2%. This is £6bn per annum higher than if recruitment investment were to continue on current trends.

“I believe the sector is in sore need of prominent female role models to help drive gender diversity.”

The benefits would be spread across multiple sub-sectors, benefiting companies in every part of the country. The North could see a particular windfall in job numbers, but recruitment would also be boosted in areas with the tightest labour markets, such as the South East.

Those who work in manufacturing know what an exciting, diverse and booming sector it is. Robotics, artificial intelligence and machine learning are in the process of transforming businesses in every sub-sector at an accelerating pace. If the sector is to thrive, we must let young people in on the secret – and show them a future in manufacturing.



**Helena Sans**  
Head of Manufacturing,  
Transport and Logistics  
Barclays Corporate Banking

# Frustration on the recruitment front line

Recruitment is tough for many manufacturers, with knock-on impacts on retention and productivity. What methods are firms using to hunt down new talent?

Most commonly, inboxes are overflowing with applications – but from candidates lacking the right skills. This is the experience of more than one third of respondents.

Skills shortages – as experienced by those employers struggling in the external labour market – are distinct from skills gaps, which result from a lack of skills in an existing workforce. But the two are closely intertwined.

Together, they risk creating a vicious circle. Over one third (36%) of those companies who lack sufficiently skilled staff say they risk losing existing staff because of the extra strain placed on their workforces.

An impact on morale is a problem for 21%, while 14% have seen productivity decline. One in 10 says lack of skills is hampering their plans to upgrade technology. Again, the biggest firms are the worst affected.

At their most extreme, skills gaps have led to unfulfilled orders (8%), reduced production (8%) or falling revenue (7%).

Brexit is an influencing factor for some. While a majority of manufacturers foresee no impact on their access to technical or specialist trade skills, over 40% of companies employing more than 250 people expect to see availability worsen. Three in 10 of these larger firms have already noticed a negative impact since the EU referendum vote.

**“Many manufacturers recognise an image problem: almost four in 10 say perceptions of careers in the sector have worsened over the past 20 years.”**

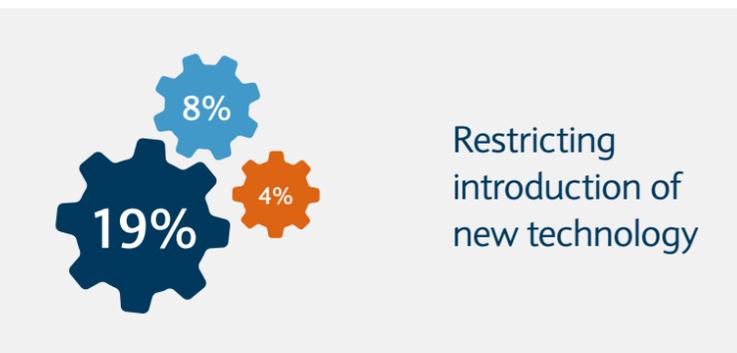
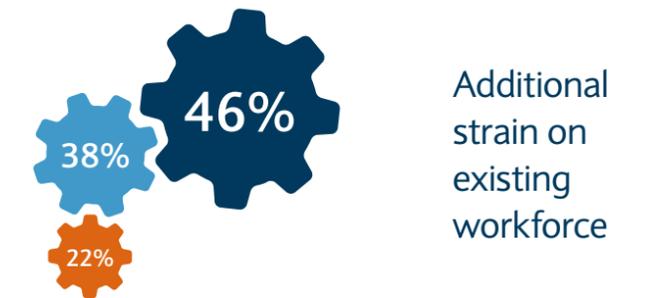
## High-tech skills gap

A 2017 study by Cranfield University in Bedfordshire found the most acute technical skills shortages for manufacturers were linked to the advent of Fourth Industrial Revolution (4IR) technologies – for example, in robotics, artificial intelligence and data analysis.<sup>5</sup>

Our survey underlines these findings. A fifth of businesses overall are currently experiencing skills shortages in advanced technology. This rises to one quarter for larger businesses, probably because they are more likely to have invested in 4IR.

However, three in 10 manufacturers say technical abilities (such as equipment maintenance and repair) are the most common skills that their employees lack. In each case, larger businesses feel the gap most keenly. Smaller firms are more likely to see their skillsets as complete.

## The impact of skills deficits



## Common strategies to enhance recruitment

Social media marketing  
**27% overall**  
**40% of larger businesses**

Establishing an apprenticeship scheme  
**28% overall**  
**44% of larger businesses**

Partnerships with universities  
**19% overall**  
**31% of larger businesses**

Traditional media advertising  
**25% overall**  
**26% of larger businesses**

## Recruitment tools

Manufacturers have tried a variety of strategies to help them overcome recruitment barriers.

Some 28% of respondents overall, and 44% of the largest firms, have launched apprenticeship schemes during the past five years. A similar number market their vacancies on social media platforms, including LinkedIn, Twitter, Facebook and Instagram.

Forging partnerships with universities (19%) and further education colleges (15%) are among the other strategies adopted to gain access to new talent. 16% of employers have looked for candidates outside the UK, while 14% have set up graduate schemes. Perhaps unsurprisingly, the largest companies are most likely to have invested in all of these methods.

Looking to the future, however, the numbers planning to adopt these strategies are relatively few. Only 9% see themselves making new partnerships with universities; a similar proportion will launch apprenticeships, while new graduate schemes are favoured by just 5%. One quarter of businesses have no plans to change their recruitment methods.

## How others see the industry

Many manufacturers recognise that their sector is labouring under an image problem. Almost four in 10 say perceptions of careers in the sector have worsened over the past 20 years, against three in 10 who believe the image has improved. Smaller firms are more likely to perceive a decline.

A minority of companies see it as their role to tackle misconceptions about manufacturing. 11% of firms have plans to promote the wider benefits of a career in the sector, while slightly more will aim to enhance awareness of the spread of skills that manufacturing recruits can acquire.

A focus on inspiring those who are about to enter the workplace would seem to make sense. Yet targeting the younger generation is a strategy favoured by just 8% of employers overall. Medium-sized firms (13%) are most likely to have plans to focus their efforts on this demographic.

If more firms were to find ways to connect with those in their late teens and early 20s, it could pay off handsomely – both for company-specific talent hunting and sector-wide image-building.

# A sector overlooked

Most young people are not planning a career in manufacturing – but detailed scrutiny of their mindsets reveals a more nuanced picture.

Asked what careers they are considering, members of Generation Z display a clear bias towards high-tech vocations.

The fields to which respondents aspire most are digital/technology (23%) and IT/computing (22%), with education the next most popular choice at 20%.

Manufacturing is being actively considered by just 6% of young people, trailing sectors such as healthcare, hospitality, charity and construction. Transport is equally unpopular; only the utilities sector is less favoured.

## How the sector fails

Our study attempted to tease out the reasons for manufacturing's low rating. Almost half of those who would not consider it as a career (43% of males and 52% of females) bluntly said the sector simply did not appeal to them. A further 35% believed they did not have the skills required.

The third most common reason was a lack of understanding as to what a career in manufacturing might entail – suggesting a receptive audience for detail from employers.

Concern that they wouldn't earn enough was cited by 12% of respondents, while 10% were worried about a lack of opportunity to progress their careers.

## A case to be made

Pay and progression are, in fact, among the factors most sought by young people in a potential employer: high pay levels top the list (57%), followed by a good work/life balance (48%), being able to take pride in the company (41%) and the opportunity to develop skills (40%).



## Top skills offered by a career in manufacturing:

According to manufacturing decision makers



According to young people



Pay is certainly an area where common perceptions are open to challenge. According to EEF research, average manufacturing pay is £32,467 – £3,358 higher than in the economy as a whole; all manufacturing sub-sectors except food and drink have higher average wages than the service sector.<sup>1</sup>

Many companies have a good case to make in the other top factors too. According to the employers' responses, 49% of employers (including 57% of smaller firms) believe they offer a good work/life balance; the same proportion say employees are proud to work there; and 41% say they constantly build staff skills.

### The skills they crave

Mapping the skills young people want to attain in future careers against those offered by manufacturing roles also provides useful data.

The abilities most in demand by young people are decision-making, social skills, resource management, complex problem-solving and technical skills. With the exception of the latter, these are perceived by only a minority of young people to be on offer in manufacturing. For instance, 29% see the sector as a source of decision-making skills and only 19% as an environment where social skills might be acquired.

From inside the industry, the perception is very different. Most manufacturers say employees in the industry gain skills in decision-making, resource management and problem-solving. Making connections with young people would offer a chance to correct this mismatch.

### Open to persuasion?

The statistics provide further cause for hope. Persistently negative messages about the status of UK manufacturing might have been expected to influence young people's views to a greater extent. As it is, only 7% of those who do not see manufacturing as a career for them have the impression that it is a "dying industry".

Their parents seem similarly unmoved by years of headlines. 61% of the young people questioned felt their parents would support them if they decided to work in manufacturing; only 24% believed they would come under pressure to choose another career. And 42% said their parents would be proud of their working in manufacturing, while 13% disagreed.

While few may be actively considering a manufacturing career at present, the picture that emerges from closer analysis is of a generation that is open-minded and receptive to further detail about the sector.

# The extra £6bn growth prize

How could increased efforts to attract young talent affect manufacturers and the wider UK economy?

We commissioned economic modelling to compare the potential future performance of the sector, both with and without a targeted effort to connect with and harness the skills of young people.

## **SCENARIO 1: Business as usual**

To provide a basis for comparison, we created 'business as usual' projections for the UK's manufacturing business. This scenario builds on growth trends from 2011 to 2017. It assumes trends in investment, including workforce skills, continue in line with recent swings and current forecasts.

Under this scenario, the value of manufacturing output is expected to rise from just over £162.5bn in 2016 (the latest year for which baseline figures were available) to £174.6bn by 2023, based on 2016 prices. This is an increase of just over £12bn, or 7.4%.

At the same time, the total number of manufacturing jobs will increase marginally – rising by 27,000, representing a 1.1% increase.

## **Fast growing sectors**

Transport equipment manufacturing will make by far the largest contribution to the increase in value – amounting to well over a fifth of the growth across the whole of the sector.

However, the sector that will grow the fastest is pharmaceuticals, which is expected to expand by 12.6% above 2016 levels. The fuels and chemicals sub-sector will grow by 11.2%.

## **Employment changes**

Calculating the impact on jobs is another key method of measuring the outcome of economic scenarios. Here, the headline picture of little overall change masks more significant changes at sub-sector level.

For example, employment in wood, paper and printing is expected to fall by 15,000 jobs – a decline of nearly 7% – and smaller falls are also expected in basic and fabricated metals, electrical equipment and transport equipment.



On the other hand, job numbers in the manufacture of food and drink and the production of rubber and plastics are expected to grow more strongly than the UK manufacturing average.

### Boost for the North

Regionally, the North West can expect the strongest growth under the ‘business as usual’ scenario. It will experience a rise in Gross Value Added (GVA) of 8%, against 7.1% for the slowest-growing regions, London and the East of England.

In employment terms, Scotland is expected to be the overall winner, with a 3.7% increase by 2023 over 2017 levels – equivalent to 7,000 additional jobs. The East Midlands will see a 3.3% increase, or an extra 9,000 jobs.

By contrast, London will lose 13,000 manufacturing jobs, a fall of 11.9%. Other employment losers in this scenario will be the South East (11,000 jobs, a fall of 4.2%) and the East of England (2,000 jobs, 1%).

### SCENARIO 2: Action for skills

The second scenario, while based on the same growth forecasts, assumes that more manufacturers act to address skills gaps and unlock latent growth potential.

The assumption is that more companies adopt apprenticeship and graduate recruitment schemes, or forge partnerships with universities, further education colleges and secondary schools. And it assumes that some of the businesses already engaged in these activities will expand their investment in them.

### Growth multiplied

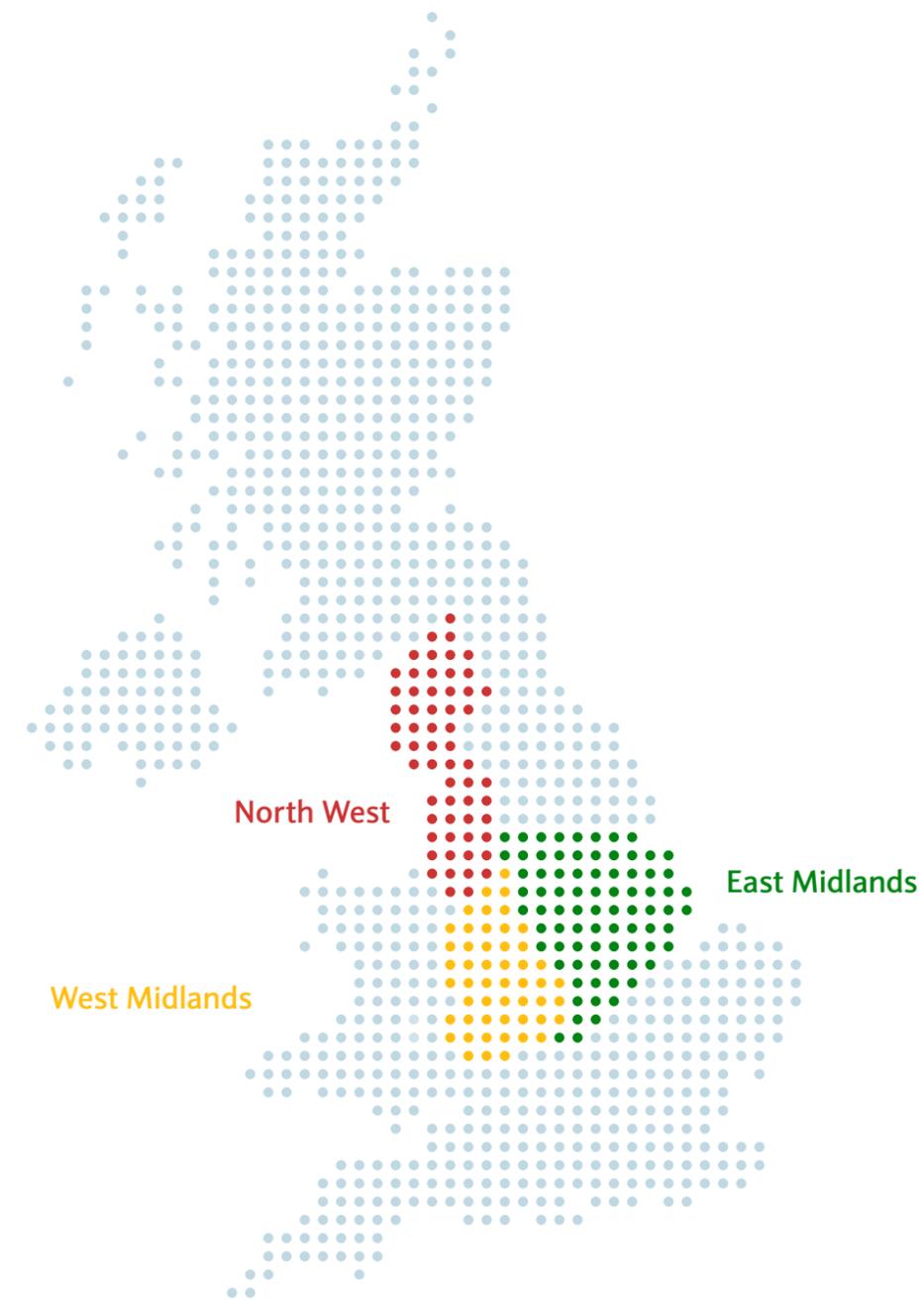
Scenario 2 foresees an increase in overall manufacturing value of £18.2bn between 2016 and 2023 – a real terms increase of 11.2%. This represents an extra £6.1bn per annum.

The sub-sectors delivering the biggest growth are the same as in the ‘business as usual’ projections, but the increases are of a different scale. Transport equipment, for example, will deliver growth of 17.5%, or £4.6bn. That’s £1.8bn above its value in Scenario 1.

Pharmaceuticals, meanwhile, will deliver annual output of £905m above that of ‘business as usual’. While these are the largest gains, every sub-sector would bolster its growth under this scenario.

“The sub-sector with most to gain in jobs terms from increased recruitment activity is food and drink manufacturing.”

## Additional manufacturing output (GVA) Scenario 2 vs Scenario 1\*



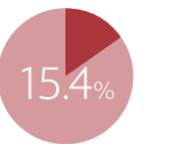
**£6.1bn**

Total UK manufacturing output

Top regions

£940m

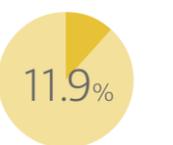
% of total



£651m



£729m



\*Per annum by 2023

## A jobs bonanza

Overall job growth under Scenario 2 is 61,000, representing a 2.5% increase over 2017 levels. This compares with just 1.1% jobs growth under ‘business as usual’.

The rubber and plastics sub-sector gains the most jobs under this scenario, with an increase of 19,000. The largest increase in proportionate terms is in pharmaceuticals, which sees an employment increase of 10.7%.

Comparing the two scenarios, the sub-sector with most to gain in jobs terms from increased recruitment activity is food and drink manufacturing. It would gain 7,000 jobs compared with ‘business as usual’.

Some sub-sectors – including wood, paper and printing, electrical equipment and transport equipment – are still forecast to shed jobs under Scenario 2. However, the rate of decline would be smaller than in Scenario 1.

## North West firms profit

While not the biggest employer, the North West is currently the region in which manufacturing contributes the highest share of value to the economy. This is due to a big concentration of high value-added sub-sectors such as chemicals, pharmaceuticals and aerospace.

This contribution would be further strengthened under Scenario 2. The North West would be the overall winner in value terms, gaining 12.2% growth (as opposed to 8% in Scenario 1). The North East (12.1%) and Wales (11.7%) would make the next largest gains.

North West manufacturers also stand to gain most value when compared with Scenario 1, followed by the West Midlands, East Midlands and the South East.

“The North West would be the overall winner in value terms, gaining 12.2% growth.”

## Regional jobs gains

In employment terms, the North West again benefits most, gaining 14,000 manufacturing jobs. The East Midlands – the region where manufacturing employment is currently most critical to the economy, providing one in eight jobs – would see the second-largest increase, gaining 12,000 jobs.

However, Scotland sees a big increase in proportionate terms, with a 5.3% employment increase over the 2017 baseline – the equivalent of 10,000 jobs. And Northern Ireland benefits from a 4.6% increase, equating to 4,000 more jobs.

London and the South East are forecast to lose jobs, though at a smaller rate than the ‘business as usual’ model. And this scenario sees the East of England turn its ‘business as usual’ employment loss into a surplus.

## A blueprint for growth

The modelling makes it clear that widening and deepening manufacturers’ involvement in strategies designed to address skills shortages could generate significant gains for individual businesses, and for the economy as a whole.

## Regional employment boosts

Additional manufacturing jobs by 2023 under Scenario 2, compared to control (Scenario 1)

### UK TOTAL: 35,000 JOBS

#### FOOD, DRINK, TOBACCO



#### BASIC & FABRICATED METALS



#### OTHER MANUFACTURING



# Is collaboration the key to bridging the skills gap?

After identifying a manufacturing skills gap in the Shropshire area, a group of employers joined forces to create a new training centre that tackles the challenge.

The skills gap is an issue facing businesses across the UK, with repercussions for productivity, competitiveness and economic growth.

In Bridgnorth and the surrounding area, attracting skilled workers was holding back business's plans to both scale up and extend their scope.

“Recognising that cannibalising other firms’ workforces was not a sustainable solution, a group of employers sought to create a centre of excellence to train future employees,” explains Matt Snelson, Managing Director of The Marches Centre of Manufacturing and Technology, which launched in September 2017.

## A strong foundation

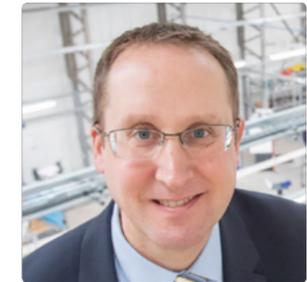
The Centre is an opportunity to educate a workforce in the skills that the industry needs, taking it right back to basics and providing a grounding that graduates from university engineering degrees lack, he explains. It also offers a clear route of progression for students, which combines academic learning with tactical experience.

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“The Centre is an opportunity to educate a workforce in the skills that industry needs”

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“Now in our second year, we’re looking to welcome six new cohorts, each with a maximum of 15 people,” says Matt. “At the moment, half are school leavers – most post A-Level – with the remainder being returners to employment.” Some individuals have no hands-on experience of engineering; others are looking for new skills. “Each student is employed by a local business for the duration of his or her apprenticeship, but spends three days a week with us for two years, and one day a week for the following two and a half years.”



**Matt Snelson**  
Managing Director  
The Marches Centre of  
Manufacturing and Technology



## The value of apprenticeships

For students (and parents), the Centre demonstrates the value of the apprenticeship route as an alternative to university, Matt explains. “Academically speaking, our students complete levels 2 and 3 with us, and can then pursue a degree. Rather than paying upwards of £9,000 a year in tuition fees and graduating with a student loan and no job, our learners are paid, have no tuition fees and are employed throughout.

“It’s not just about shifting perceptions of the apprenticeship scheme of course; it’s also about changing attitudes towards manufacturing amongst young people themselves.” Manufacturing is one of the most technologically advanced industries in the world, but one of the things that holds the UK back in terms of fully embracing automation and digital technology, is a lack of skills.

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**“Rather than paying upwards of £9,000 a year in tuition fees and graduating with a student loan and no job, our learners are paid, have no tuition fees and are employed throughout.”**

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## Changing perceptions

“We need to show young people that manufacturing today isn’t about dirty factories and physical strength,” adds Matt. “It involves robotics, automation and using computers to design, build and test. If we can attract young people with an interest in a career in technology, we can build the skills employers need to invest confidently in the latest plant and equipment.”

To achieve this, the Centre is reaching out to young people by targeting schools and colleges with existing design technology and engineering courses. “Over the summer, we ran two kids’ clubs for 9-13 and 14-16 year olds, where children learned theory through practical application. They then used CAD technology and micro:bit to design and program an item, then used hand tools and equipment to build their design,” he says.

“The enthusiasm from kids and parents was fantastic and we’re hoping to attract sponsorship to extend the programme to a wider audience.” The programmes focus on awareness rather than results, although one of the 16 year olds who attended has subsequently started an apprenticeship at the Centre.

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**“If we can attract young people with an interest in a career in technology, we can build the skills employers need to invest confidently in the latest plant and equipment.”**

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## Capturing the imagination of potential students

The programme plays an important role in inspiring the next generation by encouraging school and college groups to visit both its own facilities and those of local employers – and for engineers from those businesses to spend time in local schools. “It’s all about capturing young peoples’ imagination and creating an excitement about manufacturing,” says Matt. “That buzz extends to other areas we’re looking at, including SME catapult-style support for firms looking to re-shore their manufacturing capabilities, and heritage engineering to retain skills that have served the region for generations.”

The Marches Centre and training facilities like this are a win-win for employers seeking skilled workers, for students wanting employment combined with training in a trade for life, for parents searching for a viable career for their kids and for the local and national economy. The future of UK manufacturing is dependent on the investment of all these stakeholders in narrowing the skills gap.

# Transferring knowledge helps manufacturers address the skills gap

The Knowledge Transfer Partnerships (KTP) programme has been helping UK businesses to improve their competitiveness and productivity through the better use of knowledge, technology and skills for the past 40 years. Each KTP is a three-way partnership between a company, recent graduate and an academic team, such as Queen's University Belfast.

The Knowledge Transfer Partnership (or KTP) operated by Queen's University Belfast and the Northern Ireland Technology Centre, has been pioneering innovation in the manufacturing industry for decades. Bringing together research capability and practical application, the programme creates benefits for businesses, students and the sector as a whole and is helping to address the industry's skills gap.

"Businesses typically approach us with the seed of an idea and we build that into an opportunity," says Colm Higgins, Head of the Northern Ireland Technology Centre (NITC). "Key to that process is ensuring that the quality of the application is maintained, that the project is innovative and that it will push the company, the university and/or knowledge more generally to another level," adds Lorraine Marks, Acting Head of KTP at Queen's University, Belfast.

## Encouraging ambition

With innovation very much at the forefront of the KTP, Queen's University Belfast and the NITC work closely with businesses to scope out the future technology that can be utilised. "Throughout the 6-8 week application process, we encourage companies to think bigger and to be more ambitious," says Colm. In many cases that can be a whole new strategy, particularly for smaller firms. For many, innovation can be daunting, but as well as pushing the boundaries of what's possible, it's about considering what they can realistically achieve and what's cost-effective. In that respect, the NITC's sessions on using R&D tax credits have proved popular, particularly in offsetting high upfront costs.

"The advanced manufacturing skills that many of our graduates have, and which are needed to effectively deploy innovative technological solutions, can be hard to recruit, particularly for SMEs."

Colm Higgins



Lorraine Marks  
Acting Head of KTP  
Queen's University, Belfast



Colm Higgins  
Head of the Northern Ireland  
Technology Centre (NITC)



Knowledge Transfer Partnerships are funded by UK Research and Innovation and are part of the Government's industrial strategy.

UK Research  
and Innovation

## Accessing advanced skills

For many of the businesses Colm and Lorraine encounter, project ideas could create significant growth, but many recognise that they don't have the resources, skills or capabilities to develop the innovation or implement it. With the industry's skills gap a national issue, Colm explains how the KTP is helping to address it. "The advanced manufacturing skills that many of our graduates have and which are needed to effectively deploy innovative technological solutions, can be hard to recruit, particularly for SMEs. The KTP offers access to these skills, embedding a graduate within the business who has the capacity to deliver the innovation and R&D required."

The KTP is very much a win-win for both businesses and graduates, and can be especially useful for SMEs. Often attracted by large firms, such as Jaguar Land Rover, Rolls Royce or Bombardier, graduates can overlook SMEs and, says Lorraine, miss out on opportunities. "Far from being old school, many SMEs are keen to adopt innovation but can't attract the skills or funding needed to achieve that. That's where the KTP can help. Graduates employed by SMEs typically get a more hands on experience of processes from start to finish, so they can decide where they best fit."

As well as showcasing SMEs interested in innovation, the KTP gives graduates an opportunity to shine and be noticed. "Generally, the KTP will be focused on a high-profile project and the graduate will be seen as driving that within the business," says Lorraine.

## Up-skilling a wider workforce

As well as marrying up SMEs hungry for the skills to utilise the latest technology that will allow them to compete with highly skilled graduates keen to develop their research into practical application, the KTP has had the additional benefit of up-skilling the region as a whole.

"The graduates don't go into a business and work in isolation. Graduates are fully embedded for 2-3 years, tasked with keeping the project focused, but also with disseminating and transferring knowledge throughout that time," says Colm. This up-skilling of the existing workforce is a crucial element in the on-going success of the projects initiated by the KTP

Looking ahead, the success of the collaborative approach adopted by the aerospace sector is being used to support the food and drink sector. "In 2017, around 40% of the sector's 24,328 employees were citizens of other EU countries (excluding the UK and Ireland), and 3.5% were from non-EU countries," says Colm. "With Brexit looming, the need to automate is creating a sense of urgency, and collaborative KTPs are attractive, allowing us to bring new skills and digital processes into the sector."

## Creating the workforce of the future

New state of the art facilities are also on the horizon, helping the team reach a wider audience to showcase advanced manufacturing as a career choice for graduates and students interested in a technology-focused future. "Industry 4.0 is not coming; it's already here," explains Colm. "Businesses need to adopt digital technology and pursue innovation to compete. The KTP can support them through providing resources and skills to do that confidently."

## Supply chain success

One of the KTP's big success stories has seen a collaboration between 10 companies within the supply chain of global aerospace business, Bombardier. As Bombardier increased its use of the latest digital technology, the need to take its smaller suppliers on the journey became increasingly important. Tighter process integration and an ability to share files across digital platforms would boost efficiency, but for some of the small precision engineering suppliers, this was a struggle.

"Many of these firms had grown organically from one man bands and had lower end CNC tools," says Colm. "When one of them approached us, we could see that this was an issue for other suppliers too and that an overarching, collaborative project could best help them meet the needs of the OEM."

Starting out with five companies, there are now 10 companies working together as part of the KTP. "Across the lifetime of the project, the graduates transformed what began as a consultancy exercise into tangible benefits," explains Lorraine. "The individual companies gained the skills and capabilities they needed to be as effective as Bombardier required."

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**“Many SMEs are keen to adopt innovation but can't attract the skills or funding”**

**Lorraine Marks**

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The businesses also realised the benefits of collaboration, Colm adds: "The project allowed them to meet and talk openly about the issues they faced. They were all accessing and developing the specific skills they needed, so they weren't competing for talent and it even provided them with a louder collective voice when talking to Bombardier."

# Inside the factory walls

Thanks to the efforts of local companies during Bradford Manufacturing Week, nearly 2,500 secondary school pupils gained valuable insight into what goes on inside modern manufacturing premises. Christeyns, a producer of chemicals for commercial laundries and other important business sectors, was among the manufacturers that took part.

When three long-serving members of staff retired simultaneously from Bradford-based Christeyns, 100 years of experience left the building with them.

And while there is no substitute for experience, the Christeyns management team had long been preparing for such an event.

“When I joined the company eight years ago, I found we had a tremendous amount of expertise,” recalls Managing Director Nick Garthwaite, “but it was all invested in people in their mid-40s upwards. There was also a shortage of young talent coming into the business, so I didn’t need any convincing that this was something we needed to address urgently.”

## Bespoke, flexible apprenticeships

Working with a local provider, Christeyns created a foundation apprenticeship scheme that, over two years, gives young recruits a taste of every function within the organisation, from engineering to chemistry. Two foundation apprentices have progressed to full apprenticeships in electrical and mechanical engineering. The firm currently has 10 apprentices – a high proportion of the 130-strong workforce.

“We acknowledge that youngsters have a very wide choice of jobs and careers,” Nick says, “but finding applicants has not been an issue.” Christeyns ensures that the salary and benefits package it offers young trainees is above the minimum laid down by government, and uses social media and local college links to find potential recruits. Typically, there have been over 100 applicants for the annual apprenticeship intake. The company takes a pragmatic approach when it sees someone that doesn’t quite fit the conventional apprenticeship approach, changing the programme in order to accommodate the candidate.



**Nick Garthwaite**  
Managing Director  
Christeyns



To bring skilled workers into its commercial laundry business, Christeyns took a different approach, working with recruiters and advertising partners to bring young people into the division from a wide variety of sectors.

“Fortunately, the company has an excellent reputation in the sector, so attracting interest in the various roles was not too difficult. The challenge is making sure we deliver a stimulating programme that’s fit for purpose, both for them and for us,” says Nick.

## Showing pupils modern manufacturing

Keen to ensure the wider sector is able to replicate this success, Bradford Chamber of Commerce founded Bradford Manufacturing Week – an initiative that Nick led. The event was held in October, with over 2,500 students from schools getting involved in factory tours, work experience and other activities with a number of leading Bradford manufacturers.

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**“Manufacturers can’t expect schools to deliver work-ready students for them. The schools don’t know what a modern manufacturing environment looks like.”**

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To encourage companies to take part, a number of tools were created that helped companies overcome any barriers. For example, a “Health and Safety” checklist and audit that ensured manufacturers knew how to host young students safely while on their premises.

Critically, the week gave young people a chance to see the reality of manufacturing, by bringing them inside workplaces they might otherwise have felt held little promise. “Manufacturers can’t expect schools to deliver work-ready students for them,” Nick says. “The schools don’t know what a modern manufacturing environment looks like.

“We gave our students stimulating tasks – like developing a new cleaning detergent, and devising a manufacturing and marketing plan to pitch to our directors. The pupils were inspired, and the fact that they were in an old Victorian mill building became irrelevant.”

## Bringing on existing talent

Christeyns is careful not to overlook existing employees. Experienced staff are encouraged to take courses in subjects of interest. Four years ago, for example, the whole company completed a course in “manufacturing excellence”.

Meanwhile, a new Emerging Leadership Programme has been designed to sharpen management potential. “It’s not possible in our small business to promote everybody to managerial roles, but we can give people the chance to extend themselves and learn leadership skills,” Nick says.

He is convinced that Christeyns’ substantial investment in training is well spent, even if not every recruit is likely to spend decades with the company.

“We have to allow for the fact that we might not be able to deliver on all the aspirations of young people – but that should not stop us spending money on training them,” he concludes. “If they decide to go, they’ll go with our blessing.”

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**“It’s not possible in our small business to promote everybody to managerial roles, but we can give people the chance to extend themselves and learn leadership skills.”**

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# Strategies for success

Manufacturers of all sizes and across all sub-sectors can address their skills gaps by finding access to new talent – and the investment needn't be huge in financial terms.



**An apprenticeship** is a long-term investment, but the right recruit can pay off in the form of new skills for your business. Most companies report benefits in productivity. If your business has not taken on an apprentice in the past year, you may be [eligible for a grant](#) to help you do so.



**Universities and further education colleges** are keen to offer students for placements, but the partnership potential goes much further. Most higher education institutions now have teams dedicated to business liaison. They could help you to identify academic partners, secure funding for an innovation project, or carry out research for which you lack in-house skills or time. They may also offer access to specialist equipment.



**Consider new ways to market your business to Generation Z**  
Devise campaigns that appeal to 'digital natives', with an emphasis on mobile and app channels. Demonstrate how your company meets the top aspirations young people have for future employers, as revealed in our research. If possible, involve the target age group in drafting recruitment materials. And think of eye-catching ways to make your business stand out from the crowd, such as interactive displays tailored for careers events.



**For businesses lacking in-house expertise** to develop an idea, a [Knowledge Transfer Partnership](#) may be the solution. It creates three-way collaboration between a business, a university or research organisation, and a suitably qualified graduate, to help realise an innovation project.



**A partnership with local schools** can help to deliver a skilled future workforce, while raising the profile of your business locally and going some way towards challenging misconceptions about manufacturing. It's important to agree mutually beneficial goals – consider working through an external delivery partner or supporting an existing scheme. The CBI produces a [guide](#).

# About the author

For further information and to find out how our sector-specialist team can support your business, please contact Helena Sans, Head of Manufacturing, Transport and Logistics.



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Helena has more than 20 years of corporate banking experience, with over 10 years in debt financing and solution roles before she joined Coverage as Industry Director for the Retail & Wholesale Sector. In summer 2018, she became Head of Manufacturing, leading a team of sector specialist Relationship Directors in addition to having responsibility for the sector nationally. Helena is passionate about helping to support the growth and strength of the sector – from profile, to people, to productivity.

To find out more about how  
Barclays can support your business,  
please call **0800 015 4242\*** or visit  
**barclayscorporate.com**

\*Calls to 0800 numbers are free from UK landlines and personal mobiles, otherwise call charges may apply. To maintain a quality service we may monitor or record phone calls.

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