

HALSTON MARKETING

# Manufacturing is Coming Home

*How the global pandemic, leaving the EU and the rise of  
homegrown innovation will reinstate Britain to its  
previous mantle as the workshop of the world.*

With Thanks To:

**Hark?**

**MAKE**<sub>uk</sub>  
The Manufacturers' Organisation

**MADE  
SMARTER**

*JetSoft*  
Data Solutions for NDT

CRYSTAL  DOORS



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# Preface

*Even before the pandemic, UK manufacturers had faced some testing times dealing with a decline in demand as products continued to be sourced from overseas.*

However, as we exit the European Union, many trade agreements are changing which in many circumstances are increasing the price of imports, making those produced in the UK more appealing. This report will be reflecting back on the UK's powerhouse history and understanding our specialisms as a nation. The piece will be investigating the current changes within the market and predicting the future of the manufacturing sector and if and when we should expect to see production coming home.

Alongside in-depth research, this research will bring together expert insight and predictions to determine the future of the market.

*On behalf of all of us at Halston Marketing, we hope you enjoy reading.*



# Collaborators



Hark is an award-winning Energy Analytics and Industrial IoT company based in Leeds. Known for the innovative technology in their subscription cloud platform, they're on a mission to improve efficiency, maximise yield and reduce waste.



Make UK champions and celebrates British manufacturing and manufacturers. Together, they build a platform for the evolution of UK manufacturing. Make UK are at the cutting edge of innovation; leading the way in developing skills and driving competitive advantage for the UK.



The NW Made Smarter adoption pilot will improve the competitiveness, increase exports, and productivity of North West manufacturers and supply chains through fully-funded access to support, guidance and grant funding for the adoption of industrial digital technologies.



JetSoft is a company dedicated to improving the accessibility and efficiency of NDT information. Their products are focused on helping companies to manage their NDT data, a resource which is often poorly utilised and undervalued.



By 2022, Crystal Doors will be carbon neutral across all scopes and are bringing all of their customers, suppliers and stakeholders with them. They have won prestigious awards for their progress to date, which includes £1.5 million invested in clean energy and energy efficiency!





# 1.0 The History of UK Manufacturing



# 1.1 Industrial Revolutions

At one point in time, the UK was the pillar of manufacturing and one of the biggest powerhouses in the world.

The Industrial Revolution was the process of changing from an agrarian and handicraft economy to one dominated by industry and machine manufacturing. For Britain, this began in the 18th century and it involved the introduction of new, basic materials such as steel and iron and new energy sources through coal, the steam engine, electricity and petroleum. These triggered rapid growth in transportation, with the steamship and new railway networks. As a result of this, Britain's export value increased five-fold<sup>1</sup> during the first half of the nineteenth century. The pioneers of industrialisation came mainly from the Midlands and the North of England.

## Round 2 - The Second Industrial Revolution

The second industrial revolution began in the 20th century. Although the likes of the US and Germany had overtaken the UK, it still remained a global player and in 1948 manufacturing still accounted for around half of its national output. At this point in time, roughly 48%<sup>2</sup> of the country's economy came from manufacturing, especially oil and gas extraction and utilities. This era saw the rise of the automatic factory, where huge segments of the industry become machine-focused.

## Round 3 - The Third Industrial Revolution

There is a lot of debate around the timings of the third industrial revolution. Most cite it as being between 1990 to 2010's. Dr David Brown<sup>3</sup> explained the reason as to why we entered the third wave was the same three factors that drove the 1<sup>st</sup> and 2<sup>nd</sup>; a new energy source, a new communication system and a new financial system. This revolution was mainly driven by

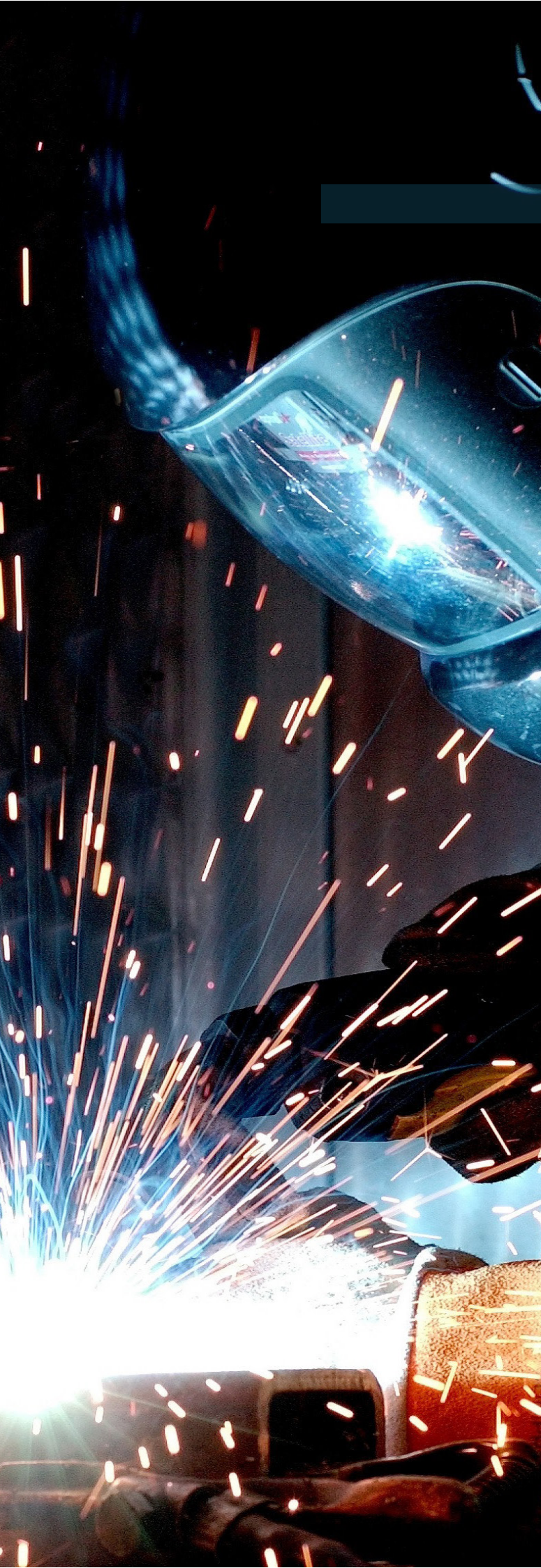
the introduction of the internet and renewable energy.

## Industry 4.0 - The Fourth Industrial Revolution

Many believe that we are now at the precipice of the fourth industrial revolution. The fourth is building on from the third with the digital revolution. It is characterised by a fusion of technologies that are blurring the lines between the physical, digital and biological spheres. The reason as to why it is classed as a separate entity to the third, is due to the sheer scale, complexity and velocity, the rate of technology breakthroughs is nothing like we have seen before.







## 1.2

# Recent Years to Present Time

Around a century and a half ago, Britain was the workshop of the world, today we are more widely known for our tertiary sectors like finance. However, contrary to popular belief, manufacturing still remains an important part of the UK economy, contributing millions of pounds each year. Whilst before we were producing basic products on a mass scale, in more recent years we have seen a shift to smaller companies entering the field, developing unique and specialist goods and services.

Although production may have declined over the years; the UK remains the ninth largest manufacturing nation in the world. In 2018, the UK manufacturing sector employed 2.6 million<sup>4</sup> people and including the indirect impact, manufacturing accounts for 15 percent of the UK economy. Manufacturing still accounts for 45% of total exports, so opposite to the common opinion that, 'the UK doesn't produce anything anymore', manufacturing is still an important component to our society.

Manufacturing as a whole, still remains strong but what we produce has very much changed. Production has moved away from mining, textiles and mass production towards more specialised products like pharmaceuticals, food production or high-tech hardware.



# 1.3

## Sector Breakdown

Manufacturing, of course, is not just a single entity, it comprises of many sub-sectors that each have their own ecosystems. In recent years, the largest manufacturing sub-sector is the production of food products and a lot of this home-based production is down to local tastes and perishability. This is closely followed by metal production, chemicals and automotive. The illustration below gives an overview of the core UK sectors and their impact on the UK economy.

### Manufacturing at a Glance

Source: The Manufacturer

|              |   |  |
|--------------|---|--|
| Aerospace    |  | <ul style="list-style-type: none"> <li>- £31bn annual turnover</li> <li>- 18% global market share</li> </ul>   |
| Automotive   |  | <ul style="list-style-type: none"> <li>- £71.6bn annual turnover</li> <li>- Accounts for 12% of UK exports</li> </ul>                                |
| Pharma       |  | <ul style="list-style-type: none"> <li>- Adds £60m to UK's balance of trade every day</li> <li>- Largest manufacturing sector for exports</li> </ul> |
| Construction |  | <ul style="list-style-type: none"> <li>- Annually adds £92bn to the UK economy</li> <li>- Provides 1 million direct jobs</li> </ul>                  |
| Electronics  |  | <ul style="list-style-type: none"> <li>- £78bn annual turnover</li> <li>- World's 5th largest for production</li> </ul>                              |
| Food & Drink |  | <ul style="list-style-type: none"> <li>- Annually adds £21.9bn to the UK economy</li> <li>- Exports worth £12.8bn each year</li> </ul>               |
| Textiles     |  | <ul style="list-style-type: none"> <li>- Annually adds £11.5bn to the UK economy</li> <li>- 3rd largest fashion employer in the EU</li> </ul>        |

## Food & Beverage

The production of food is one of the oldest in time, so it's no surprise it still dominates the market. Whilst other markets face volatility as they are usually non-essential markets (not everyone needs a new car, but they do need to eat), the food sector tends to have stable or consistent growth. In the UK, it is the largest sub-sector of manufacturing, with giants like Unilever leading the pack. The Food & Drink sector annually adds £21.9 billion to the UK economy and employs 430,000<sup>6</sup> people. There are a few big players that produce those household brands like P&G or Coca Cola but 96%<sup>6</sup> of the manufacturers in the UK are actually SMEs.

The products produced have an expansive export network that spans over 220 countries, but our biggest export regions include Ireland, USA and France (They just can't get enough of the Yorkshire Tea). Or according to data<sup>7</sup>, Whiskey, which is the most exported food-related goods out of the UK, closely followed by Salmon and Chocolate.

## Pharmaceutical

Currently there are around 190<sup>5</sup> medicine manufacturing plants in the UK, yet many are smaller specialists that often focus on early-stage materials. The pharmaceutical sector adds £60 million to the UK's balance of trade every day.

Generics are a huge proportion of the drugs prescribed in the UK, but these are predominately produced by large generic firms that are based overseas. Domestic demand is being driven by the rising prevalence in chronic diseases, which require more specialist treatments. In order to give the UK a competitive advantage, the UK Research and Innovations (UKRI) plans to shift the focus to our areas of strength which consist of academic research in fields such as biology, chemical and bio-engineering. The new facilities such as the Medicines Manufacturing Innovation Centre (MMIC) is providing access to the latest technologies to drive innovation in the UK.





## Automotive

In 2018, the UK motor vehicle manufacturing industry contributed £16.6 billion<sup>8</sup> to the economy and 8.5% of the manufacturing output. In the same year, 1.6 million vehicles were produced, 80%<sup>8</sup> of which were exported. For the years prior, the industry has achieved strong growth in employment, production, economic output and exports. However, in 2019 the automotive sector was already facing a tough year, as many UK plants planned to shut down, including Honda's Swindon location and the Ford Bridgend plant. Unfortunately, the automotive sector was struck again with the pandemic in 2020, where car production and sales came to a complete halt, not only this, the exit from the European Union has presented its own set of challenges, when you consider how many of the exports were to European countries.

However, one area that was experiencing more positive growth was the production of electric vehicles, taking over 10%<sup>9</sup> of the UK new car market. With the new Government ruling, that the production of non-electric vehicles must

cease by 2030, many producers are switching production and are investing heavily in electric or hybrid vehicle production. Aside from this, there are new entrants in the field and those that class electric automotive production their speciality are experiencing better growth, such as Tesla. In 2008, the company was producing \$15 million<sup>10</sup> in revenue, compared with 2018 where they reached \$21 billion in revenue.

## Aerospace

Aerospace manufacturing has remained one of the UK's largest sectors, turning over £31 billion<sup>11</sup> in 2019. The UK also remains the top location in Europe for investment in 2020, according to a PwC report<sup>12</sup> and they are 7th globally. The aerospace sector continues to invest in highly skilled jobs and R&D to create prosperity, with already 31,000 jobs in design and engineering and £1.5bn<sup>13</sup> spent on R&D in 2017.

The commercial aviation sector faced massive disruptions due to the pandemic, there was a slowing down for production overall as less people were travelling, but also a lack of demand for spare parts as less maintenance was required.



## Regional Hubs

A sub-division of this that continues to take the industry to new heights, is space manufacturing including developing and building new satellites and new ground systems and components. The UK's space sector has always had strong foundations, with all 13 UK regions hosting a space organisation and 40%<sup>14</sup> of all small satellites orbiting the planet being produced by the UK. Whilst this area experienced less of an impact than the commercial side, there will still be long-term ramifications on the budget side for those dependent on the public sector. In terms of current impact, it has been more orientated around slowing down of product deliveries and mission deployments.



Whilst the UK has specialisms in terms of sectors, there are also core hubs where the production is centred. The greatest concentration of activity is in the Northern Powerhouse belt, contributing to 10% of the jobs in major cities. More specifically, the top location in 2018 for the UK's high value manufacturing was Sheffield<sup>15</sup>.

However, new analysis of data by Make UK and BDO<sup>16</sup> revealed that the south-east region is set to become the country's biggest manufacturing region, overtaking Britain's traditional industrial heartlands. The growing demand for hi-tech aerospace and electronics products, alongside food and drink, where the region is more prominent, has boosted the region's growth significantly.

Made UK Outlook Survey<sup>16</sup> presents a regional summary, comparing the change from 2019 to 2020 and highlights the top performing regions for various factors. The North East is leading in terms of output and orders, where Scotland is outperforming the rest in terms of investment.

## Regional Summary

% average balance of change 2019 Q3 - 2020 Q2\*\*

|                     | OUTPUT | ORDERS | INVESTMENT | EMPLOYMENT | OUTPUT (Next 3 Months) |
|---------------------|--------|--------|------------|------------|------------------------|
| East Midlands       | -19 ↓  | -26 ↓  | -7         | -8         | -65                    |
| East of England     | -4     | -2     | -3         | 2          | -35                    |
| North East          | 14     | 11     | -2         | 7 ↑        | -30                    |
| North West          | -11    | -7     | -9         | -3         | -40                    |
| South & East London | 3      | 8      | 5          | -1         | -11                    |
| South West          | -4     | -11    | -15 ↓      | -4         | -21                    |
| West Midlands       | -9     | -8     | -13        | -9 ↓       | -30                    |
| Yorkshire & Humber  | 0      | -4     | 10         | 10.9       | -75                    |
| Scotland            | -12    | -15    | 15         | 0.4        | -50                    |
| Wales               | 5      | -4     | -0.3 ↑     | 11         | -50                    |
| Northern Ireland*   | -61    | -48    | 26         | -9         | -100                   |

Source: Make UK Manufacturing Outlook Survey

■ Top performer  
 ■ Bottom performer  
 ↑ Improved most compared with last year  
 ↓ Worsened most compared with last year

\* Northern Ireland has been excluded from the annual and regional comparison due to an incomplete series.

\*\* Output (next 3 months) figure is the average balance of output manufacturers in each region are expecting to achieve in the quarter following 2020 Q2. These figures originate from research undertaken for Manufacturing Outlook 2020 Q2.



# 1.5

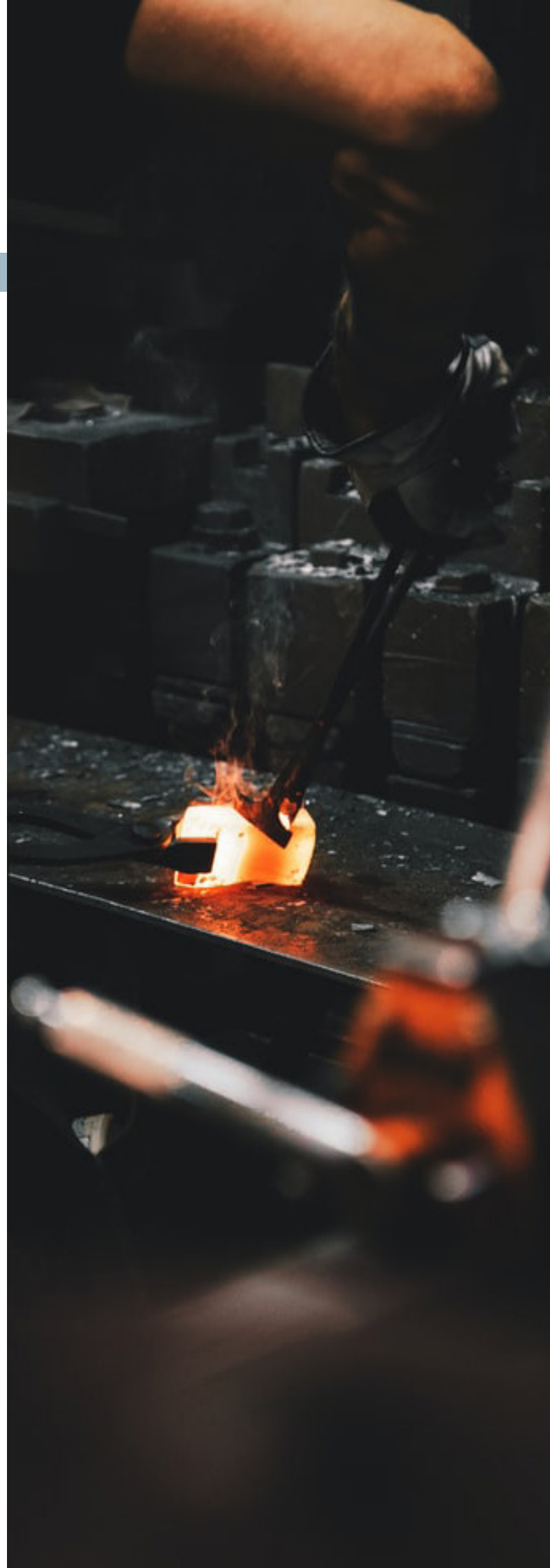
## Leaders of the Pack

In 2019, Unilever was leading production in the UK, creating £41.8 billion<sup>17</sup> in revenue per year. Overseeing over 400 brands such as P&G and Nestle, the multinational is renowned for its products. One that may not be as familiar as those household brands is Rio Tinto, which is the world's second largest metals and mining cooperation, producing aluminium, copper, coal and other precious metals. For the remaining leaders demonstrated in the graph, they reflect the core industries identified earlier, mainly concentrated in the food and pharmaceutical sector.

### Top UK Manufacturers by Production

Source: RH Nuttall

1. Unilever
2. Rio Tinto
3. GlaxoSmithKline
4. Anglo American
5. AstraZeneca
6. BAE Systems
7. British American Tobacco
8. Imperial Tobacco Group
9. Associated British Food
10. Rolls Royce





A person wearing a dark hoodie and blue jeans is sitting on a couch, looking down at a smartphone. The background is dark with warm, out-of-focus bokeh lights, suggesting an indoor setting at night. A teal horizontal bar is positioned behind the text.

## 2.0 Remerging Manufacturing



Whilst the manufacturing sector has faced some difficult times as a whole, it is now time for it to rise from the ashes and be reborn.

# 2.1 Reinventing British Manufacturing

In 2020 the pandemic created a lot of disruptions to imports and exports, total trade exports fell by £33.1 billion<sup>18</sup> between March and April and imports also dropped by £29.9 billion. This was largely seen in the machinery, transport equipment and fuel sectors.

In a survey conducted by Make UK and BDO<sup>16</sup> in November 2020, almost 9 out of 10 manufacturers said they have reviewed their supply chains in response to the pandemic, 59% stating that they planned to diversify their supply chains, and a third said they would focus on reshoring the manufacturing of goods to the UK. Richard Austin, BDO's Head of Manufacturing said:

*"The supply delays experienced by UK manufacturers at the start of the pandemic were a wake-up call, prompting many operators to confront the risks involved in over-relying on single suppliers for key components. This was particularly true in cases where suppliers were geographically very distant."*

Issues really became apparent when pharmaceutical ingredients and PPE equipment began to fall short, typically ingredients were imported from India or China as they dominate the market. However, when imports were restricted manufacturers took production into their own hands and rose to the PPE challenge, producing masks, ventilators and hospital beds in a matter of weeks. The sense of British manufacturing pride rose again.

## Being Agile in a Time of Need

When the pandemic hit the UK in March last year, the world as we know it stopped for a second. All but essential manufacturers were asked to close their doors, but those agile businesses who strived to survive, switched their services and offerings at a moment's notice.

There were multiple examples of gin distilleries switching operations to begin supplying hand sanitisers to meet the drastic spike in demand. Another switch example was from Rolls Royce, who changed their aerospace operations to producing ventilators for the NHS, and dedicated 300 employees<sup>19</sup> to work on that project.

Those businesses who pivoted their business models enabled their short-term survival alongside long-term sustainable growth. Manufacturers weren't just shifting to prevent closure, they were also adapting their offerings due to a decline in sales from their core customer base. Those selling into those contracting markets began to investigate what else they could produce or which other sectors their offering may be applicable to help mitigate the impact on their business. This adaptable mindset is something we can expect to continue in the coming years.



*“Make UK research at the end of last year found that manufacturers are looking to explore new products and services in a bid to remain agile in 2021. In fact, almost four in ten manufacturers said new product development is something their business is proactively planning for 2021. This coincides with earlier findings indicating that despite the challenging operating environment, companies are looking beyond their current offerings to explore new markets and new products.*

*We know that such diversification can be achieved, and achieved quickly. One of the lessons learnt from the pandemic has been manufacturers’ ability to repurpose production lines at speed in order to support national efforts. Manufacturers have the opportunity to build on this new-found flexibility to offer, produce and deliver new products and services to customers. With more and more businesses adopting technology to boost efficiency and drive productivity, it is no surprise that technology is being viewed as an enabler to unlock the possibility of new products, as well as new markets.”*

- Bhavina Bharkhada, Make UK

*they have faced. From remote working and social distancing to new ways of operating and delivering which are likely to stay post pandemic.*

Alphabond Technologies, Managing Director, Dylan Shaw said *“Not only has the new technology reduced manual and duplicative processes it has increased our response rates to customers. An added benefit we have seen through these challenging times, is our ability to adapt and work remotely. Remote working wouldn’t have been possible otherwise!”*

*One business found its adoption of a robot welder helped them continue operations when staff were self-isolating.*

*“Our adoption of a robot welder, through support from Made Smarter has been a success from day one. We were experiencing bottlenecks within our welding process which was causing delays in schedules. The robot has helped us overcome the delays but also helped us to continue operations at a time when some of our welders have been self-isolating, which has caused staff shortages.”*

- Julian Lopez, Export Manager, Storth

*From sales and marketing to human resources and finance, all departments have seen the benefits new technology can offer. Through 3D virtual showrooms, it’s perfectly possible to effectively give support to prospects and clients – even though it’s given remotely. Customers are even able to modify product elements and measure the sizes to see if they would fit in a real space. Plus, with geography no longer a limitation, you can actually reach new audiences and markets you wouldn’t have otherwise.*

*Many makers are using augmented reality (AR) to expand their physical world, adding layers of digital information through the likes of audio, video, graphics and text. It is helping business to identify issues – such as maintenance or health and safety concerns, as well as supporting learning and development and training.”*

- Jude Holmes, Made Smarter

## Digitalisation: The True Winner of 2020

With the complete physical closures of many businesses in the UK, digitalisation quickly became embedded into every aspect of our lives. From the rise in video calls, to the huge adoption of e-commerce. The manufacturing sector was no exception, whilst for most, it wasn’t a complete digitisation of factories, there was the introduction of automation, remote control of assets and using tech to minimise the number of staff needed in the business at any given time, to help reduce the spread.

*“We have heard numerous examples of how technology implemented pre-pandemic has supported businesses through the challenges*



Adapting to technology enables manufacturers to be more resilient to external conditions and pivot at a moment's notice, so they can make the most out of any opportunity in the market.

## Livin' La Vida Local

The manufacturing sector post-pandemic could see a shift from global to local when it comes to their supply chains.

The supply shock that started in China in February exposed vulnerabilities in the production strategies and supply chains of firms just about everywhere. Temporary trade restrictions and shortages of critical medical supplies highlighted this weakness. This has triggered a rise in economic nationalism and, as a consequence, manufacturers are under greater pressure to increase their domestic production; both in terms of their own growth but also to eliminate extra dependency on 'risky' sources.

The challenge for companies will be to make their supply chains more resilient without weakening competitiveness. Manufacturers will have to identify the weaknesses in their wider supply chain such as;

- Do they import the majority of their supplies?
- Do they require specialist components from a specific supplier?
- Are they operating a lean model?
- Do they hold safety stock?

Manufacturers will need to adapt to this new era, not completely abandoning globalisation, but having an agile structure that will allow them to adapt and be less susceptible to risks.

There is also a consumer mentality at present to 'shop locally' and this has started to seep into the B2B sector. Manufacturing close to the source of demand creates a tighter connection between supply and demand, which delivers goods quickly and enables producers to be more reactive to market demands. Whilst they may still cost more per unit, when you factor the ability to adapt and better fit orders, this avoids waste and reduces shipping costs from overseas.

## Post-Covid Growth

As the government looks to get the cogs of the UK economy moving again, manufacturing will be a powerful source of economic growth and prosperity.

Not all sectors in the manufacturing industry have been decimated by Covid-19, pharmaceuticals, medical devices, chemicals and food have remained pretty consistent and, in some circumstances, have experienced growth. For example, those in food production were grappling to meet the demands of supermarkets, with the volume sales of food and drink purchased in week ending 21 June 2020 being 11.1% higher<sup>20</sup> than the previous year.

### Top 3 Sectors by Their Contribution to:

Overall Manufacturing GVA Decline



Motor Vehicles



Mechanical Equipment



Other Transport (Aerospace)

### Top 3 Sectors by Their Relative Contribution to:

Overall Manufacturing GVA Increase



Food & Drink



Pharmaceuticals



Chemicals



Some Made Smarter partners have seen the appetite for their products soar, especially the increase in the online food segment.

*“With other food producers cutting ranges to focus on volume, customers are looking for alternatives, which has created an opportunity for us. Orders from all areas of the business have increased, which means we are producing more. There is no doubt that without investing when we did, in the way that we did, with the help from Made Smarter, we would not be able to cope with this unprecedented increase in demand. The technologies we have adopted have enabled us to develop new products quicker and we are now taking pre-orders for the first time, such is the demand.”*

- Patrick Mroczak, CEO, NutreeLife.

*“We received advice and support from Made Smarter to implement an end-of-line robotic palletiser. It was needed to help us overcome the bottlenecks we were experiencing and speed up the production process. It has proven even more invaluable recently in managing increased and fluctuating demand for our*

*yogurts as a result of the COVID-19 pandemic.”*

– Sarfaraz Akram, Chief Operating Officer at Lancashire Farm Dairies.

There are multiple predictions on how the UK manufacturing sector will recover post-Covid. Some forecasts<sup>16</sup> have revealed that it will take until 2022 for the manufacturing sector to fully recover and get back onto the same growth trajectory, but as we speak, these predictions are constantly shifting. For example, with the vaccine programme gathering pace, MakeUK/BDO<sup>21</sup> have updated their original growth forecast for 2021 from 2.7% to 3.9% as the sector pushes back with full force.

Those in the sector are optimistic about growth rates and are investigating new ways to excel their growth further.

*“The manufacturers we work with are positive about recovery and growth. Post the first UK lockdown, we saw the appetite to engage with Made Smarter increase. Now more SME’s than ever, are seeking support to implement technologies within their operations to enable*



*them to increase efficiencies, create new production lines and access new markets.*

*We surveyed over 200 manufacturing SMEs across the North West last year. More than half of them indicated that they planned to invest in new technologies before COVID-19, with three quarters believing that they will still be able to go ahead with those plans. The pandemic has demonstrated how technology can support continued operations in challenging times and business leaders have prioritised technology adoption.”*

– Jude Holmes, Made Smarter

Even before the pandemic turned the sector on its head, the introduction of technology and driving sustainability were already key talking points in the industry. Now, they have become critical for sustained growth, and they will become the tools leading Britain's recovery.

## 2.2 Bringing Production Home

Brexit has meant a move away from the single market and enter new trade agreements with the EU, that are less substantial and involve more custom and border restrictions. With this in mind, imports may no longer be the favourable option and instead businesses may start to investigate more local options.

The trade frictions created by the new post-Brexit trading agreements have added a new layer of complexity which will prompt further supply chain adjustments, and a preference may emerge to source goods and supplies closer to home.

According to research, up to £4.8bn<sup>22</sup> worth of goods for British retailers can be made locally. Brexit has made us re-evaluate and understand what the local capacity is for production. Whilst labour may be cheap elsewhere, it presents many other risks that can have a considerable

impact on the supply chain. Although the UK will never compete with international labour market, it does have a major competitive advantage and that is specialism. UK manufacturers are able to develop innovative technologies and goods that other countries can simply not manufacture. In addition to this, the increased adoption of technology can enable manufacturers to scale their production and meet a higher level of demand and in some scenarios even produce goods that were previously not possible.

Some manufacturers may also have to evaluate their supply chain model. For example, car parts and aircraft components often cross the channel multiple times before they are assembled into the finished product. Whilst luckily the UK has agreed a deal with the EU that involves no tariffs, there are some additional red tape that could delay this process and make it less effective. When you combine this growing sustainability pressures, adapting this supply chain may soon become critical.

## Regulation

One area that has been greatly impacted by the exit from the European Union, is regulation. For decades, the UK has followed the EU regulations and best practices, but by leaving, the UK no longer aligns with these regulations and until sufficient regulations are put in place that replicate the standard, it can create border frictions. For highly regulated industries like pharmaceuticals this needs to be rectified. Companies like GlaxoSmithKline and AstraZeneca prepared in advance for the changes by creating parallel batch-testing labs on the continent. Even with this medicine supply could be delayed over a month.

## Exports & European Bonds

The manufacturing sector currently accounts for 45%<sup>23</sup> of all UK exports, and remains a major contributor to the UK economy.

Export orders in Q1 2021 reported a balance of -8%<sup>24</sup>, a small decline from the previous quarter

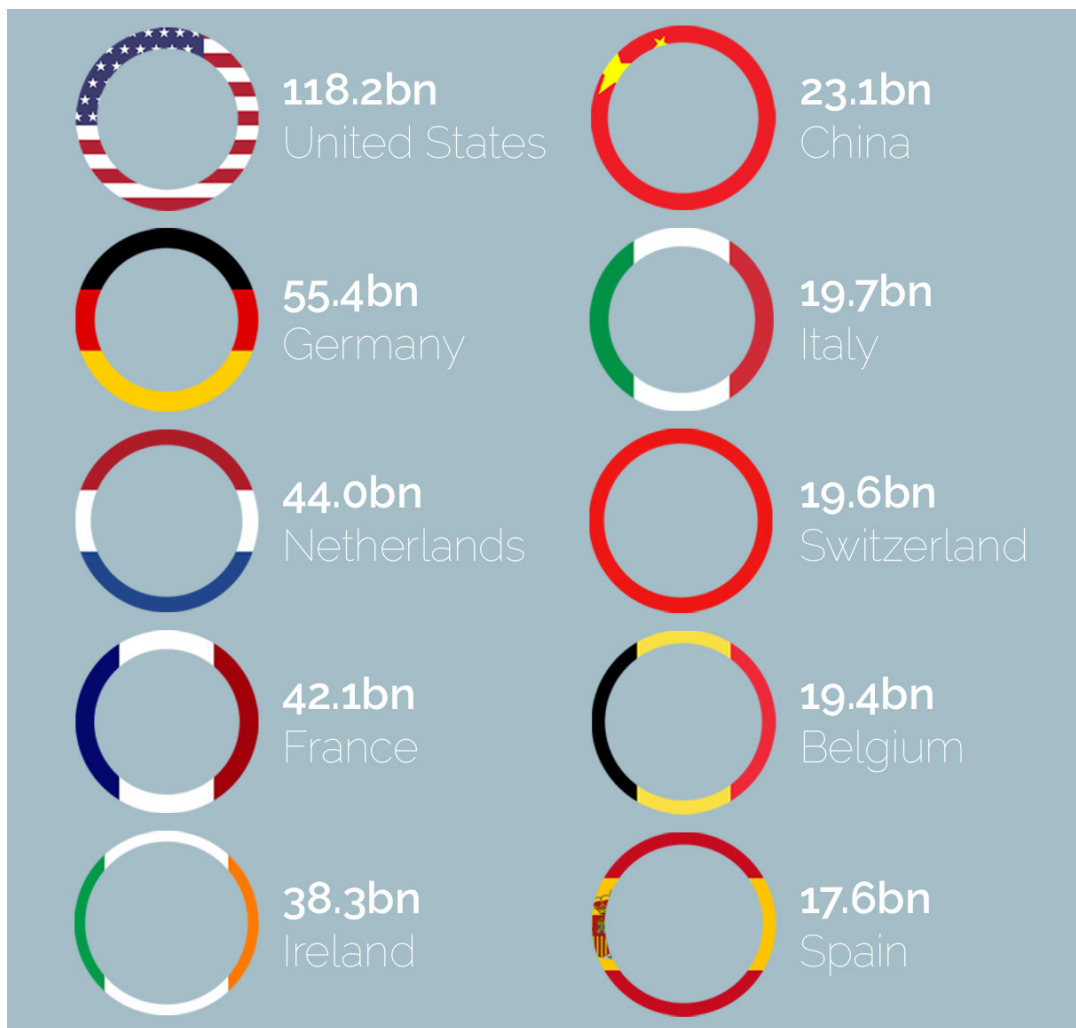
(-5%) as manufacturers face new trade barriers. Nevertheless, manufacturers remain enthusiastic about business activity going forward and forecast orders to improve over the next quarter.

As demonstrated in the graph, there is a strong European focus in the UK exports, but the USA and China still remain major markets. Whilst the free trade agreement will remain between the European Union and the UK, these growing trade frictions, can make manufacturers re-evaluate their distribution strategy and consider expanding into new territories if they haven't done so already.

As the Brexit trade deal was left to the last inning, it was difficult for manufacturers to prepare and understand what the true ramifications would be. For some manufacturers it may be an opportunity to forge new relationships further afield. Those looking to strengthen their European bonds need to remain competitive in the wider market and becoming more digitalised or sustainable could be the ticket to just that. For example, the integration of automation could allow businesses to scale up quicker to meet larger demand volumes outside of the EU.

## Where UK Exports Go

UK's top 10 export and import destinations for manufactured goods (including food & beverage)  
(£bn)







Richard Hagan, Managing Director of Crystal Doors who produce vinyl wrapped products explains how Brexit has impacted their business from an SME perspective.

“UK businesses of every size were pleased to see 2020 over and pleased to know the Brexit trade deal is finalised leaving businesses free to navigate a smooth sailing transition. Crystal Doors planned by investing over £250k of assets and materials in the last quarter of 2020 expecting the worst and hoped for the best. My first shock was only a few days back in the New Year, and another lockdown, schools closed and no tariffs to deal with, but worse. Not only extra costs for importing or exporting, but from paperwork delaying smooth trading, many ports also failed to efficiently transfer goods through. Voting to leave the European Union four years ago allowed everyone to prepare, only if manufacturing businesses knew what to prepare for. This year is not only the crisis of 2020 but compounded with several more crisis situations many manufacturers will now not survive. Manufacturers are always part of an intrinsic network of supply and consumer chains where any one broken link impacts beyond just one company. We are in this together, and together now more than ever, UK manufacturers must prioritise skills, assets, technology, supply, and consumers all in one overriding effort to shore up our industry.”

Whilst the impacts of Brexit may not be instantly identifiable, they could have been blanketed by the huge disruptions of the pandemic or they could be more slow progressing changes.

Tom Martin, CEO of Jetsoft , a software and data company that specialises in the aerospace sector delves into this further.

“We haven’t experienced any ramifications from Brexit as of yet, but we expect some later down the line. We don’t compete on price, so it is less from a cost perspective, but more from an ease of business. The attitude may be more favourable for a European client to use another European supplier that is in the trade union just out of ease. I think for the country as a whole, will experience some brain drain as the UK becomes a less attractive place to study and work, which has huge impacts on talent. There are two types of manufacturing, one based on low costs and cheap labour, the other is based around innovation and being more efficient. The UK is the later of the two and due to the specialism and innovation we need a highly talented workforce that can deliver new ideas. After Brexit, the UK needs to understand how they can still attract the best people.”

If tackled correctly there are many opportunities for manufacturers to excel in this new era. There are many emerging markets that are growing at rapid paces, which for various goods are untapped regions.







## 3.0 The Sustainable Challenge



## Manufacturing is Coming Home

Manufacturers are already in a rebuild and regrowth stage and this is an opportunity for companies to come back stronger and in some cases 'greener'. Manufacturers can refocus on their sustainability goals and deliver a green recovery.

Accounting for more than 60%<sup>18</sup> of direct industrial emissions in the UK, manufacturing is an energy-intensive industry that has been striving for decades to improve energy productivity while reducing greenhouse gas emissions.

From 1990 to 2018 emissions from manufacturing decreased by 56.7 million<sup>18</sup> metric tons of carbon dioxide, and the next decade is shaping up to be a critical period for transformation, to reach that ever crucial goal of carbon neutral by 2050.

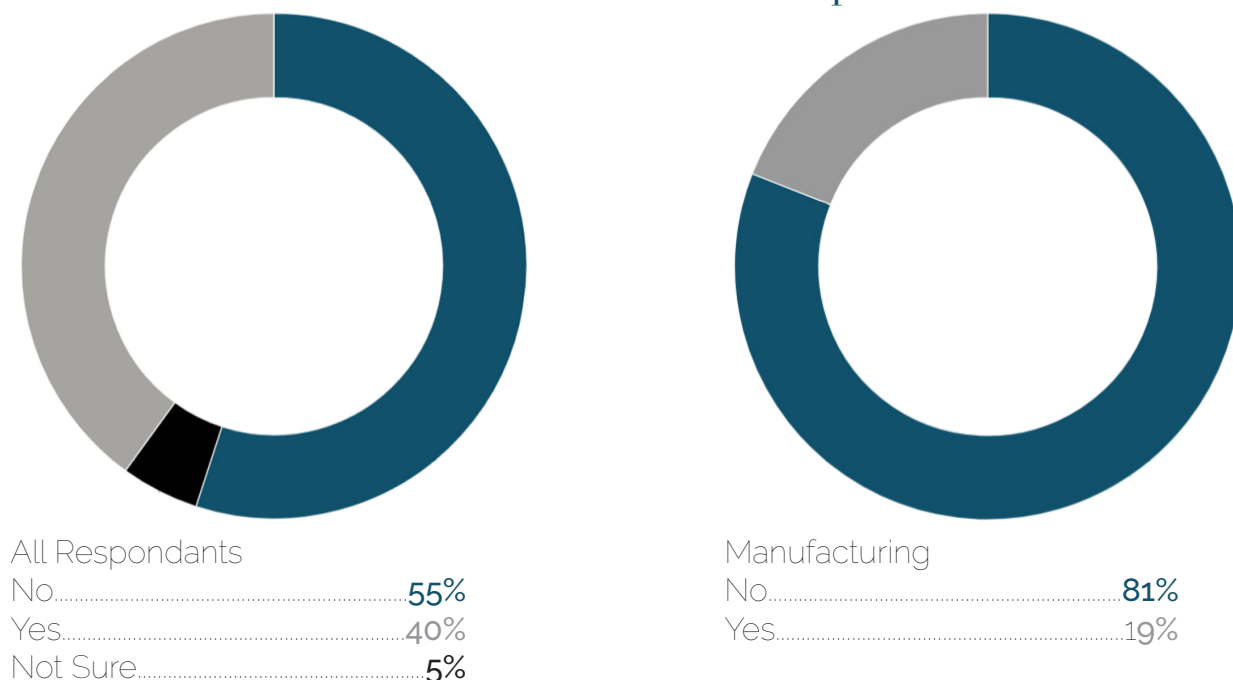
Manufacturers have proven themselves to be adaptable in a crisis, and this trait will be key when tackling the net-zero objective. Recent research shows that manufacturers are still heavily invested in driving sustainability and sticking to their goals, not allowing Covid-19 to divert their tracks.

*"Make UK research conducted just before the Covid-19 struck showed that the manufacturing industry is ready to take on the net-zero challenge with 90% of manufacturers being aware of the net-zero target. At that time nearly half were already committed to following through with concrete actions and already 30% were investing in energy efficiency measures. This trend continued through the year, with research conducted in November showing 45% of manufacturers say that infrastructure projects focusing on green energy should be prioritised to support manufacturing. And when deciding what infrastructure the country should invest in to support manufacturing, 27% of companies said ensuring infrastructure is green and sustainable."*

*But there is no denying that manufacturers are facing competing challenges. Much of their bandwidth of preparing for the end of the transition for example has been overtaken by tackling the challenges of Covid-19. But we need to ensure they are also focusing on preparing to move to net zero. There remains little support, particularly for SMEs to prepare. That said, there is no question that the green agenda is firmly on manufacturers agenda and they are of the firm view that it must remain on Government's too."*

- Bhavina Bharkhada & Brigitte Amoruso, Make UK

Fig 1: Did your organisation delay or cancel any sustainability announcements as a result of the pandemic?



In the UK, we have a combination of pioneers who are leading the way in terms of sustainability and laggards that are behind the innovation curve. The most energy efficient automotive manufacturing site in world is based in the UK; Toyota, Derby. Toyota has always been ahead of the game when it came to producing electric or hybrid vehicles, and their location in Derby has been getting progressively more energy efficient each year. According to research, they have already been able to reduce energy consumption by 77%.

Their Burnaston factory has been harnessing solar power for years, utilising their own solar farm, that has a total of 16,800 solar panels<sup>25</sup>, which produces enough power to produce 7,000 vehicles each year (or enough to brew 150 million cups of tea). By deploying its solar arrays, Toyota UK can save up to 3,800 tonnes of carbon dioxide.

Another company that is at the forefront of sustainability is Crystal Doors, a Rochdale based manufacturer who makes bespoke vinyl wrapped doors and accessories for kitchen, bedroom & bathroom retailers. In the last year alone, they've won 6 awards for their environmental goals and actions.

*"At the core of Crystal Doors purpose is to manufacture a zero environmental impact product not in isolation, but by bringing all our stakeholders on our journey. Being carbon footprint reporting to scope 1,2 and 3 is still not enough as we reach such goal later this year. Embedded carbon, cradle to cradle must also be reported to be absolute where circular economy forms a significant part of our journey. Today I drive up and down the world searching for answers, and fortunately from the comfort of my home with virtual meetings. Universities, eco warriors, standards and many organisations are all very happy to support what is a global crisis, where everyone can do something."*

— Richard Hagan, Crystal Doors

It's not only the looming legalisation pressures that should be driving sustainable change. Manufacturers are able to gain monetary and competitive advantages by becoming more sustainable in their operations. Reports suggest that when sustainability initiatives are put at the

core of the business, manufacturers have seen a 40% increase in profit margins and 30%<sup>26</sup> increased competitiveness as a result.

Tom, CEO of Jetsoft explains how commercial benefits are often the hidden driver behind sustainable practices.

*"I think the commercial benefits are still the main driver compared to sustainability, but with efficiency, you use less resources which delivers the sustainable benefits. It always reminds me of when you are a kid and your dad used to tell you to turn off the lights when you leave a room and he would always use the excuse of saving the planet, but actually it was to save of his energy bills. I think that is happening in the industry at the minute, they are using sustainability as a marketing tactic, but it is really being driven by underlying profitability."*

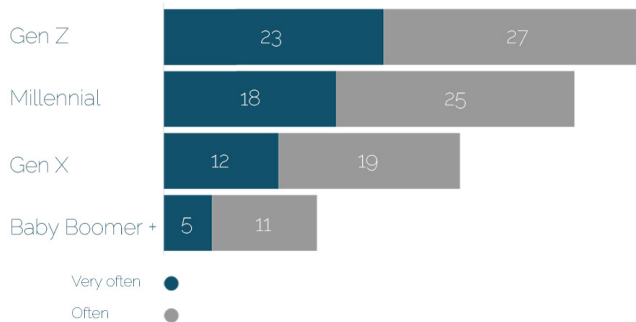
## 3.1 The Millennials - Pushing Sustainability

It is a common assumption that younger generations (Gen Z and Millennials) are more greatly concerned with global challenges. Whilst they may not necessarily live the most eco-friendly lifestyle compared to their counterparts, according to research the younger generation does have a stronger attitude towards being sustainable. They are driving sustainable consumer behaviour, but they are also promoting sustainability within businesses. In 2019, around 70%<sup>27</sup> of millennials said they would prefer to work in a company with a strong sustainable agenda.

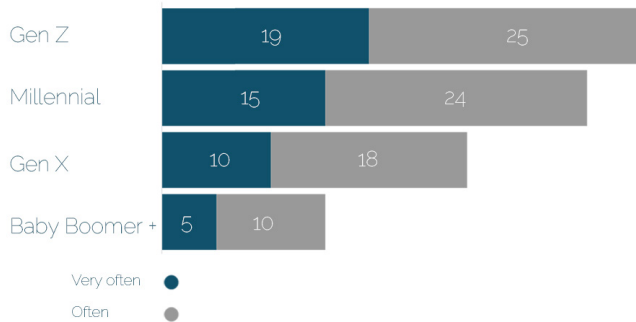


## Millennials' Attitude Towards Sustainability

### Felt ashamed about living an unhealthy lifestyle



### A lifestyle that is not environmentally friendly



*“There is definitely more scrutiny of the sustainability credentials from the younger workforce. But not just what is being done but the plans for the future. This will be the key for attracting new young talent.”*

— Bhavina Bharkhada & Brigitte Amoruso, Make UK

Furthering on from that point, Jude Holmes from Made Smarter said *“Demonstrating that your business is committed to the environmental agenda can also attract customers and increase employee motivation and satisfaction by knowing they are working for a responsible employer.”*

When you combine this enthusiasm with the fact that younger generations tend to have a stronger digital skillset, it is vital that manufacturers attract them with their sustainable ambitions. There is a huge digital skill gap in the industry, with only a minimal

number of workers in the manufacturing sector proficient with technology. Studies have stated that the UK is losing out on £63bn<sup>28</sup> a year because of the digital skills gap.

When manufacturers are considering attracting young talent, especially those of an SME size that may not have a major brand driving their attractiveness, ensuring operations are completed sustainably could become critical to attracting tech-natives into the company.

## 3.2 Technology Driving Sustainability

Speaking of tech, digitalisation is a core component of the sustainable journey. If businesses are to be resilient, then they must be efficient.

As mentioned earlier on, manufacturers are in this very delicate rebound phase and rather than just going back to old ways, they could undergo a so-called ‘green recovery’ which would put sustainability at the crux of the operations. To achieve this more efficient and optimised version of manufacturing, technology is going to play a major role.

## Innovation & Industrialisation

The majority of manufacturers already understand the benefits of digitalisation and have begun investigating various technologies that will help to optimise their operations, which in turn drives down energy consumption and emissions.

The aim of sustainability is to design and develop manufacturing processes and products that have zero-impact on the

environment. Automation, IoT, machine learning and data analytics are the enablers that will drive efficiency in manufacturing. For instance, the integration of sensors across a facility can provide real-time insight into asset usage and behaviour patterns, carbon emission level, energy consumption patterns and detect anomalies in assets. This combined with simulation systems would enable manufacturers to mitigate their environmental impact, without losing their competitive standing.

These digitalised factories are able to deliver the same product quantity and quality, for less energy, water and materials.

Mike Jeffs, the Chief Commercial Officer of Hark, who deliver an innovative energy monitoring and management solution explains how the manufacturing sector is entering a new era.

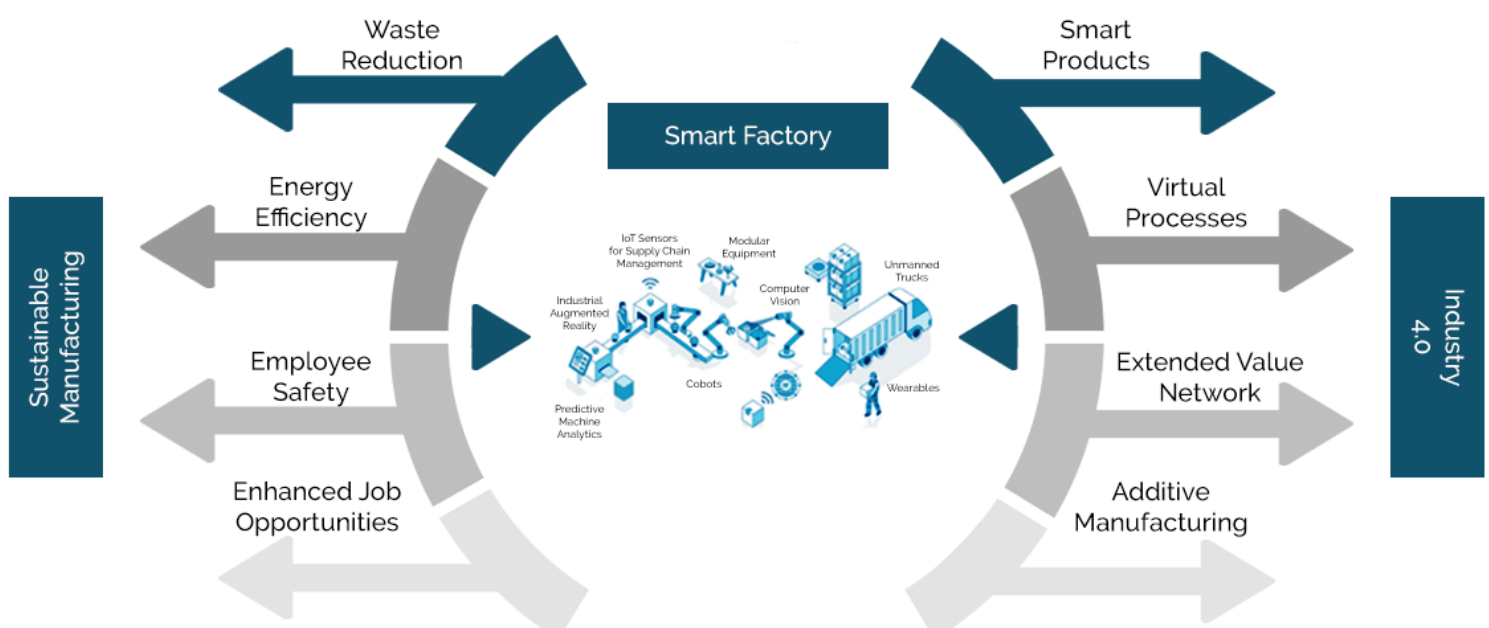
*“Manufacturing is on the cusp of a huge digital transformation. It’s been difficult to avoid the buzz phrases cropping up over the last 2-3 years; Industry 4.0, digital twins, smart manufacturing. Sustainable manufacturing interest has doubled<sup>29</sup> over the last decade. In a world where margins are being squeezed, next day supply is requested, and lower prices*

*being demanded, technology can be a real competitive advantage, and so too can sustainability.*

*According to Bill Gates, emissions are over 51 billion tonnes per year and because Co2 stays in the atmosphere for thousands of years, we’re still seeing the effects of manufacturing from years gone by on the environment around us – more volatile weather, which leads to so called ‘natural ‘disasters. Emissions come from a variety of industries and sources, transport (16%), energy (27%), industry, buildings (7%), agriculture (19%), waste and forestry. Manufacturing is the biggest segment and the most challenging to solve due to the sheer scale of what we make and produce in our economy - steel, concrete, plastics etc.*

*Greentech is vital in reversing the effects of Greenhouse gases from manufacturing but has other benefits too: increased operational efficiency, reduced operating costs, brand reputation, adhering to regulation and importantly long-term business viability. The first step in that challenge is gaining visibility and a benchmark for companies, and green tech can be the catalyst to contextualise emissions for all stakeholders in a manufacturer to enable a coordinated, integrated approach to being carbon natural.”*

## Exhibit 4: Convergence of Industry 4.0 & Sustainability to develop Smart Factory





54%

of businesses have invested heavily to reduce energy consumption in processes

78%

now collect their energy use data

71%

have invested in more efficient equipment

80%

of manufacturers are confident that Industry 4.0 will be part of their business by 2025

There are so many ways that manufacturers can integrate technology to bolster their sustainable credentials. The creation of a smart factory enables complete visibility into operations, spotting inefficiencies and waste. Harnessing smart manufacturing helps to conserve resources, whether its material, energy or water.

With such possibilities, the manufacturing sector is beginning to invest heavily in cutting-edge technologies, in the hope of seeing greater efficiency and subsequently more sustainable operations.

Jude Holmes provides direct insight on how the adoption of technology can drive efficiencies and tackle carbon reduction. She says:

*“There are a number of ways manufacturers can use technology to create better efficiencies and reduce environmental impact to help reach the UK’s ambition to have net-zero greenhouse gases by 2050.*

*Examples include: reducing waste through Digital Twin technology (which creates a digital replica of physical assets) and additive manufacturing (3D printing). Predictive analysis, gained through artificial intelligence, allows you to have a better understanding of demand. Additionally, it can pinpoint any inconsistencies and optimise production.*

*Creative Apparel, based in Stockport, is a great example of a manufacturer with sustainability at the heart of their vision, with plans to build new state of the art smart factory. It is investing in full factory digitalisation where a central IT system drives and measures smart machinery, linking production through to its customers and supply chain. Renewable energy sources including rainwater harvesting, solar power, air-source heating and eco fans will support the introduction of modern, high tech machinery to enable a more sustainable approach to production.*

*Its ambition is to quadruple production capacity, increase productivity by 30%, and reduce waste by 20%. Managing Director Phil Millar believes putting technology at the heart of growth plans will increase CAL’s turnover fourfold within five*

*years, and create 50 new high value jobs. Another manufacturer is reducing mileage and emissions through the adoption of a software package which will enable sales staff and customers to have a meeting using an online virtual showroom. Parity Medical designs and makes mobile wireless computer carts and specialist clinical computing devices for the NHS and private healthcare sector. They believe their technology solution could reduce travel by 30,000 miles and cut carbon emissions by 11 tonnes per year.”*

Steve Wood , Managing Director of Parity Medical said, *“It’s fantastic that technology can make such a difference to our business while reducing our impact on the environment and play a part in the UK’s ambitions to reduce all greenhouse gas emissions to net zero by 2050.”*

*Other SMEs have adopted technology, with the motivation of improving efficiencies or growing their business but have seen the added benefits of reducing their energy consumption, improving their energy efficiency and reducing waste. Simple actions such as installing LED lighting within your factory can reduce electricity consumption and cut the costs of your energy bills.”*

Not only does the integration of this technology bolster a company’s green credentials, it drives cost-efficiencies which at this moment in time is integral to long-term survival. Aside from this, digitalisation makes manufacturers resilient to any challenges that may arise in the market. It could enable them to pivot if there is a drop in demand for a core product or scale up quickly if there was a spike.

## 3.3

# The Drivers

For some businesses, changes will only be made when policies enforce it, but for many in the sector this doesn’t seem to be the case. Activities would show that some companies are enforcing stricter deadlines on themselves and

pursuing their sustainable goals.

Some of the drivers include; reduced costs, attracting employees who are sustainably conscious and building a stronger brand reputation.

*“There are many drivers behind manufacturers desire to be leading the green revolution. The PM’s 10-point plan and all the recent government strategies that roughly follow the Committee on Climate Change’s recommendations for the UK’s path to the Net Zero by 2050. However, the drive for the country’s manufacturers is not only because the Net Zero by 2050 is enshrined in international law in the Climate Act, but also because the Green Industrial Revolution is seen as the path to recovery from the pandemic. Manufacturing is going to be the solution to the problem, and will be boosted by the soaring demand for the new products, and services required to decarbonise the economy.*

*For manufacturers who put sustainability at the heart of their businesses, they have seen real benefits from doing so: 40% reported increased profit margins and 30% increased competitiveness as a result. But a big driver for manufacturers is that it is the right thing to do. One-third (33%) of manufacturers reported that they are investing in green technologies in an effort to reduce emissions, acknowledging that it is the right thing to do, and one in five are doing so because their customers are demanding better environmental performance.*

*Ultimately the main driver for our manufacturers still remains the bottom line, particularly in the aftermaths of Brexit and in the midst of the pandemic. The pandemic has accelerated the thinking and we have seen that companies who have adopted more sustainable models (closer supply chains for example or less packaging or waste or taken steps to reduce their energy consumption) have been a lot more resilient during the pandemic. They have also taken the opportunity to look hard at the future and are preparing to invest in the new technologies and talent that they need for the transition.”*

– Brigitte Amoruso, Make UK



## 3.4 Investment in GreenTech

Clean technology is used to refer to any technologies that aim to improve environmental sustainability. In some circumstances it can be used synonymously with terms like 'GreenTech' which refers to renewable energy sources or new methods of recycling.

Those using CleanTech are ones that are seeking to increase performance, productivity and efficiency by maximising the positive effects on the environment. The CleanTech market is anticipated to reach \$3trillion<sup>30</sup> by 2025. CleanTech is being invested in across the board and the manufacturing sector is no exception.

*"Make UK research found that one-third (33%) of manufacturers reported that they are investing in green technologies in an effort to reduce emissions, acknowledging that it is the right thing to do, and one in five are doing so because their customers are demanding better environmental performance. Moreover, almost three in ten (28%) manufacturers said they would invest in new digital technology, such as Artificial Intelligence (AI), to be used in predictive maintenance, to save money on repairs and trips for engineers to carry out checks on site. But, importantly, manufacturers plan to invest in green technologies because of the direct benefits to their business and the impact on their bottom line. Indeed more than half (52%) of companies said they are making such investments to reduce costs, and more than one-quarter (27%) to improve production processes."*

– Brigitte Amoruso, Make UK

## 3.5 The Innovators

There is such a strong interlink between innovation and sustainability; innovation should always be a focus for any business to remain competitive in an ever-saturating market of

competitors and to continuously improve processes to become more efficient and cost-effective. But this same innovation can reduce energy consumption, drive down emissions and significantly reduce a company's carbon footprint. Below are some amazing examples of manufacturers who are coupling innovation with sustainability.

### Innocent Drinks

Innocent Drinks have made a commitment to be carbon neutral by 2030, with an ambition to reduce 10,000 tonnes of CO<sub>2</sub>e from the business by 2023. One of the ways they are going to achieve this is the launch of their new carbon-neutral factory 'the blender' based in Rotterdam. Atos<sup>31</sup> will be providing an end-to-end technology solution, that will deliver in-depth data gathering and analytics on power usage, helping them to achieve their decarbonisation objectives.

### Rolls Royce

Rolls Royce's<sup>32</sup> Civil Aerospace and Defence divisions in Derby have joined the UN's Race to Zero campaign and is aiming to reach its emissions target by 2030. As part of this plan, the manufacturer will focus on advancing key technologies, including:

- Driving step changes in the efficiency of engines and ramp up the availability of lower carbon alternative fuels.
- Build small modular nuclear power stations that can provide competitive, clean, low carbon power at scale.
- Pioneering the electrification of flight
- Continuing to deploy hybrid electric systems in the rail and marine markets.
- Delivering microgrid solutions to provide stability and back-up power, and expanding the uptake of renewables.

## Unilever

In one of their latest press releases, Unilever explains how they have built sustainability into their manufacturing DNA. They have transformed their factories so that they are powered and operated with minimal environmental impact. Since 2010, they have already reduced their water consumption by 47%<sup>33</sup> and they aim to continue increase circular models; reuse, recycle and recover to avoid excess waste. One example is how 73% of the waste produced at their Ceytea site is now being used to generate green energy.

## Arrival

UK-based start-up Arrival<sup>34</sup> have reinvented automotive operations to unlock true sustainability. Their revolutionary new method of design and production, means they can create electric vehicles, in a sustainable and scalable manner. They have created Micro-factories that use a portfolio of vertically integrated in-house technologies to maximise efficiency and produce EV's at a lower cost than traditional methods. The decentralised structure means Micro-factories can be constructed close to the demand, eliminating long supply chains and reducing their carbon footprint. The regional production also provides a 30% reduction in costs.





A close-up photograph of a hand holding a black grinding tool against a metal workpiece. A dense, bright spray of orange and yellow sparks erupts from the point of contact, filling the upper half of the frame. The background is dark and out of focus, emphasizing the industrial action.

## 4.0 Innovation is Building Growth

Driving towards Industry 4.0 will be pinnacle to building growth in the sector. Having connectivity, utilising advanced analytic, automating and implementing advanced manufacturing technology will help manufacturers optimise their operations.

Although there may be a greater demand for home grown products, at the minute UK manufacturers don't have the capacity to take on the full demand and cannot immediately scale. The transition to be able to scale up and make operations more efficient will be gradual, and digitalisation will be the right-hand man to help manufacturers to do so. Automation, AI and Robotic Process Automation (RPA) are poised to accelerate this change.

There are multiple examples of how digitisation has enabled manufacturers to pivot during the pandemic and quickly scale to produce large amounts of goods that they have previously never supplied. One example would be Project Oyster, which was a consortium on manufacturers including, Dyson, Formula One teams, Rolls-Royce, JCB, and more. All of which were being led by the High Value Manufacturing Catapult, who were tasked with the UK ventilator shortage. Each of these businesses were able to move from design to production in a matter of days.

In a recent study conducted by PwC<sup>35</sup>, it found that industrial manufacturers considered

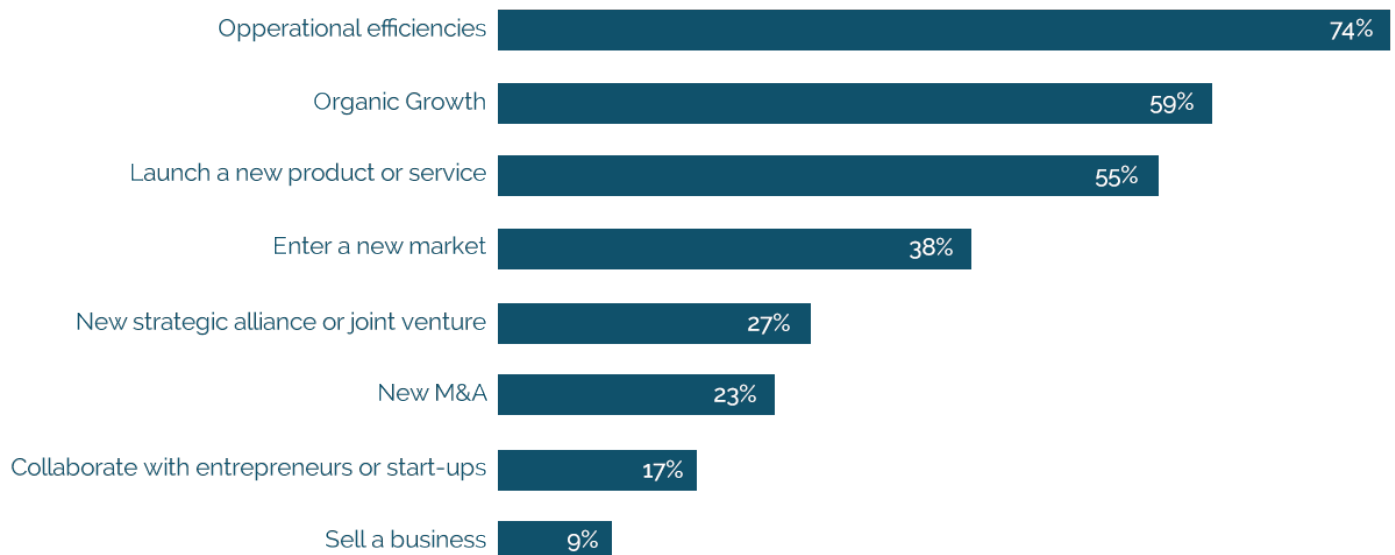
operational efficiency to the main area to drive revenue growth in the next 12 months. Whilst some manufacturers have adopted pilot programmes, there is still a lot of progress to be made when it comes to broad adoption of digital and especially when considering 'smart factories' to be commonplace.

For the level of efficiency needed to drive revenue growth, there needs to be a much higher rate of integration and digital needs to be embraced at scale. The industry was already experiencing a rapid pace of change, and the pandemic has propelled this even further, so that is a greater priority for the speed of adoption.

*"All our evidence shows that an overwhelming majority of manufacturers say Industrial Digital Technologies (IDTs) will be reality in their business by 2025 (80%). And there are a broad range of IDTs that manufacturers are adopting, including robotics and cobotics, additive manufacturing (3D printing), industrial Internet of Things, virtual and augmented reality, and artificial intelligence. Nearly a quarter of manufacturers report having successfully introduced robotics and cobotics, and 28% have introduced additive manufacturing. But technologies like artificial intelligence (which can transform areas like predictive maintenance) or virtual reality and augmented reality (which can transform sales and service activities) have seen a much lower uptake."*

– Bhavina Bharkhada, Make UK

## IM leaders look to operational efficiencies to drive revenue growth





“

Manufacturers are beginning to embrace technology and the efficiency gains that can be derived from adoption. For example, Crystal Doors recently transformed their facility using IoT, to make better decisions from data, gain efficiencies and begin to automate.

“Technology has advanced from my first simple calculator I learned mathematics with. Yes, if rubbish was entered, then the answer would be wrong. However, if my calculator today gathers masses of data, all real and relevant it is easy to save money and be more efficient. Technology such as Internet of Things allows cost effective digital recording of data to present in a way that managers see the reality, sometimes for the first time, making a sort of Eureka moment, as was the case with me. My machines were not at full capacity my employees believed, but only 14% real running time. From that point forwards, Crystal Doors is digitalizing where possible to really deliver on the profit margins and allow huge potential for sales increases year on year. Guess work for manufacturing has fortunately gone, however there are just a lot of old style managers not gone too who need the right training to succeed. Unit costs are quantifiable and easy to manage with technology, where employees enjoy their upskilling being more valued. The future of manufacturing is the adoption of digital transformation, not excuses, lack of money or next year. Action now will save many UK manufacturers, and those whose companies fail are responsible to their employees and the community.”

- Richard Hagan, Crystal Doors

”

# Home Grown Production

Embracing the digital revolution can take manufacturers past just a 'rebound' and can deliver a 'rebirth'. This pandemic has made businesses reconsider their complex globalised supply chains and investigate a closer to home strategy, but to make this change possible, digital has to play its part.

## Competition

As mentioned earlier, there is a real opportunity for the UK to build a more competitive standing against international counterparts with the utilisation of technology. We can't compete on cost, but we can compete on value.

Prioritising the rapid digitalisation and ensuring innovation is supported, sits at the heart of improving the UK's overall competitiveness. Below are just a few competitive advantages that can be derived from technological integration.

- Ability to produce unique products – Some UK innovative manufacturers already have prestige worldwide because of the unique products they create. In addition, technology will aid the production of completely unique products that others cannot replicate.
- Being more responsive to consumer needs – Shifts in demand can be quickly catered for when utilising technology and aligned with closer location means you can cater for shifts more rapidly.
- Faster turnaround times – Integrating some form of automation enables more products to be created in less time.
- Reduce waste levels and downtime – All areas of waste can be targeted with technology solutions. IoT enables energy waste to be significantly reduced and provides asset monitoring to conduct predictive maintenance, preventing unplanned downtime.

- Improved product design and quality – Not only can the operations be improved; the final product can be as well.
- Greater potential for a wider product range – Technology-enabled operations means diversification is easier and switching from one product line to another can become autonomous.
- Being closer to the customer – Rather than having to import, a greater proportion can now be produced in the UK due to efficiency gains.
- Sustainable credentials – Technology can reduce manufacturing waste and help manufacturers on their path to carbon neutral, which in the future will become more integral in buying decisions.

The integration of technology can help shape and strengthen the manufacturing sector and is key to bringing manufacturing home.





## 4.1 Technology Adoption

From an outsider perspective, the manufacturing sector may not be the most digitally advanced sector, but the inside is showing a different story. There's still some progress to be made, but there are many in the sector that have begun embracing the next-generation of technology, with 50%<sup>36</sup> already integrating technology that will improve productivity.

Those being supported by government initiatives are experiencing even higher rates of adoption. "Almost 75% of SME manufacturers supported by Made Smarter with digitalisation are putting data and systems integration at the heart of their productivity and growth plans. They are embracing industrial digital technologies to connect their disparate systems and unify data residing in different sources.

Integrating a variety of systems and consolidating data sources is allowing business leaders to spot trends in production and labour, correct maintenance and quality issues, and minimise safety, business risk and operational downtime throughout their production. The benefits of these can be seen in the entire supply chain eco-system."

– Jude Holmes, Made Smarter

These productivity gains can also be critical to manufacturers international competitiveness.

*"One of the main drivers for digitalisation is the need to retain the international competitiveness of the UK manufacturing sector. Other countries – such as Germany and Japan – have extensive support systems in place to help their manufacturing SMEs modernise, and it is important that their UK counterparts are not left behind. But only 9% of manufacturers in the Make UK Bouncing Back Smarter: Innovation Monitor survey agreed that the UK was in a leadership position compared to other countries when it comes to the adoption of IDTs. Perhaps reflecting this, only 15% of manufacturers agreed that it would be possible*

### Technology Adoption:



**50%**

of manufacturers are embracing next-generation technologies to boost productivity.



**Two thirds**

view technology disruption as a threat to their current business model.



**90%**

report obstacles in realising their digital strategies.



**No.1**

Talent and quality of infrastructure are the top drivers for international manufacturers to invest in the UK.



**67%**

of FMCG, retail and technology manufacturers are seeing a shift towards demand-driven product runs.



**No.1**

availability of talent is viewed as the main obstacle of realising the benefits of Industry 4.0.

*to realise the full potential of IDTs without Government support.*

*The other driver has been impact of the Covid-19. Manufacturers took quick and significant steps towards digitalisation when the pandemic struck, with nearly half moving to digital working practices within two weeks of lockdown, according to new research. With just a fortnight's digital installation and planning, 94% of companies said they had staff working successfully from home in industries often associated with manual tasks and an extremely high proportion of production-based work."*

- Bhavina Bharkhada, Make UK

## Sector Analysis

Some areas of manufacturing are more ahead of the curve than others, when it comes to digitalising their operations, and there are some discrepancies between which industries are embracing which form of technology. For example, pharmaceutical manufacturing is leading the way when it comes to utilising AI, whereas automotive is more focused on robotics and automation, to automate parts of their production line.

### Automotive

The automotive sector has already been undergoing massive changes that is being driven by Industry 4.0. Over the past 30 years the industry has invested billions into advanced technologies and solutions. The integration of the likes of IoT, robotics, AI and VR have allowed automotive manufacturers to become more efficient and agile.

One key industry example has to be Tesla, who are disrupting industry norms, taking a completely new approach to manufacturing. Only being founded in 2003, they have quickly shifted from an EV start-up to an industry leader, making \$34.51 billion<sup>37</sup> in revenue in 2020 (and that was in 2020!)

Both the Fremont factory and Gigafactory are some of the most advanced in the world. These sites utilise robotics throughout, either on the

assembly line, but also to move materials around the site, and these can navigate freely through the use of digital maps and sensors to detect obstacles.

Elon Musk talked about the realisation of "how important it is to build the machine that builds the machine".

Not only has the industry had to deal with the largest decline in production they have ever possibly experienced and rebound predictions are still a while away as stockpiles of cars remain unsold. They are simultaneously dealing with the massive upheaval preparing for the switch to electric and hybrid vehicles, which has meant for many huge changes to their production lines.

### Food Production

Whilst food production remains the UK's largest manufacturing sector, we still import twice<sup>38</sup> as much, particularly fresh fruits and vegetables. To tackle one of our biggest import areas, the UK would have to begin producing a higher quantity of fruit and vegetables all year-round. For some goods this simply won't be possible, especially when following traditional production methods.

The integration of technology can kill two birds with one stone, delivering efficiency gains for cost-saving and automating aspects of the factory could make it more agile to switch production lines.

Food makers are having to constantly adapt their processes to keep up with the changing market. The combination of more e-commerce food shopping and new food trends, means producers need to be more agile. As food is such an expansive supply chain, technology is able to be integrated at all stages, not just in the production facility. From satellites that monitor crop yields or robots that can package food, there is so much potential in this sector. And with an ever growing population, food manufacturing is going to need to keep up.

This innovation is not restricted to those multinational businesses either, SME's in the





area are seeing major production improvements. For example, chocolate makers Frairs<sup>39</sup> is experiencing huge spikes in productivity due to automating their processes. This integration enables the firm to increase its output from 30kg to 250kg a day, a 733% increase, alongside making it three times cheaper to produce the same amount.

## 4.2 Barriers Preventing Adoption

Whilst there are some incredible examples of how technology is revolutionising manufacturing, not everyone has jumped on the bandwagon just yet.

After research into hundreds of manufacturers, Make UK have identified major barriers that are preventing manufacturers from adoption.

*“The key barriers to adoption of technology have remained consistent over the past two years: action on skills, change management, impartial advice and financing models are needed to overcome them. The main change is that more manufacturers reported finance as a barrier in 2020 than they did in 2018, when previously asked. This may be because the 2020 survey was carried out during the COVID-19 pandemic when manufacturing – and the economy as a whole – was experiencing a profound economic downturn.*

*However, we know high up-front costs are a big barrier to adoption of technology. Despite the Government providing financial support for innovation in various ways, principally through fiscal incentives (such as tax credits or allowances) and through grants channelled through bodies such as Innovate UK, Make UK’s policy work has identified that Grand Challenges funded by the Innovate UK are not fitted for the SMEs, due to the complex and highly competitive nature of its grant allocation process. Compounding this problem is that awareness of many Government support measures for innovation is extremely low. The Government funding schemes are often not easy to understand for a busy CEO of a SME and its applications processes are too grand for them to swallow. We need to make them simpler.”*

– Bhavina Bharkhada, Make UK

Another core piece of research conducted by Made Smarter highlighted additional barriers that are preventing companies from beginning their digital journey.

*“There are a whole host of barriers preventing SMES from adopting technology. SME leaders are often juggling many things and don’t always have the time to focus on strategy and growth planning, due to the day-to-day need to react.*

*Manufacturers cited that a lack of capital/funds to invest was their core barrier in a Made Smarter survey. Followed by external factors, lack of time, lack of understanding of the technologies and lack of in-house skills.*

*We often hear from business leaders that the rhetoric around technologies is very confusing,*



*which is why at Made Smarter we explore the business challenges the SME is facing rather than the technology solution itself. The potential technology solutions are selected once the core business challenges have been identified.*

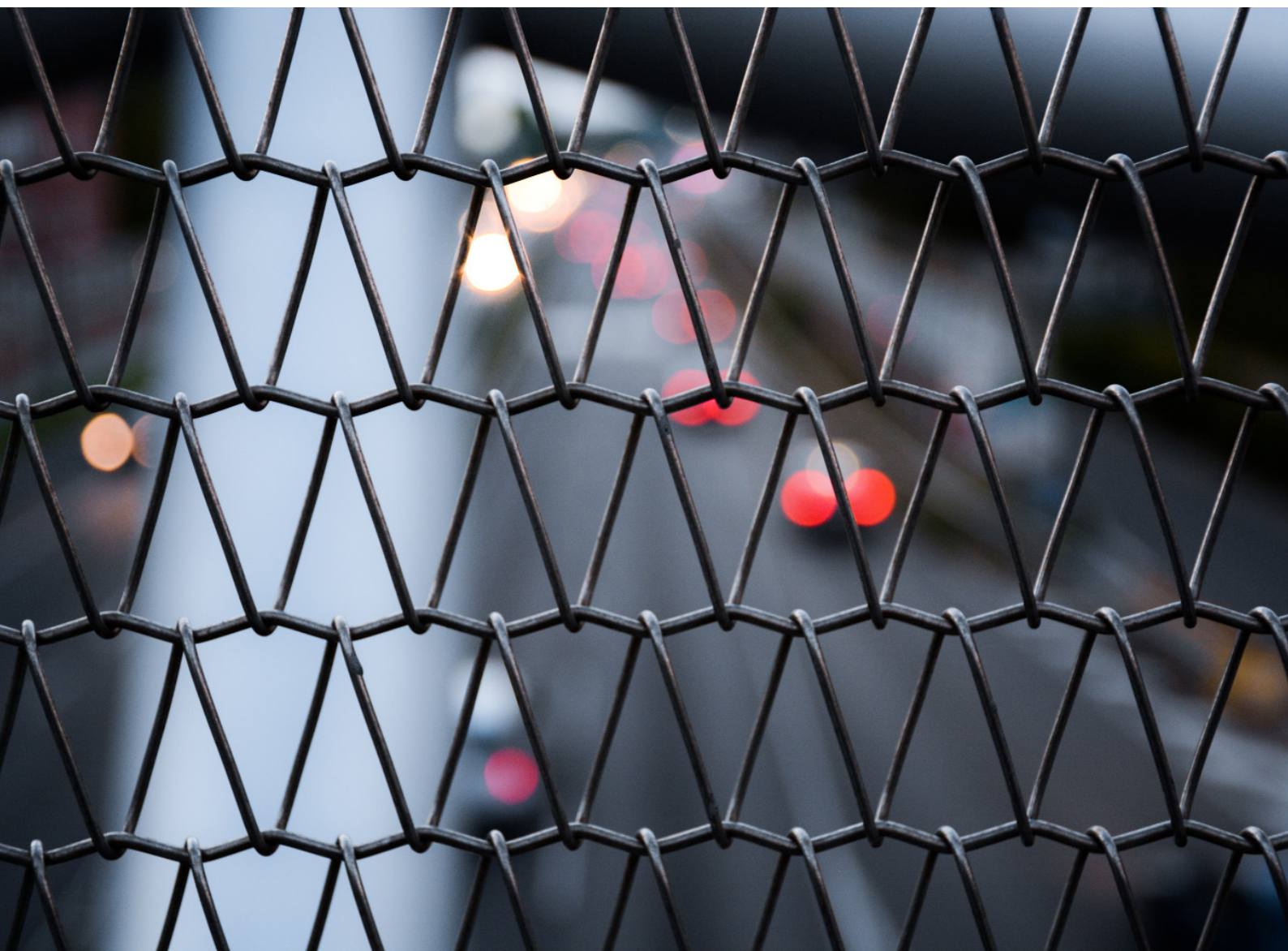
*Business leaders who have adopted digital tools have often found that not having digital as part of their overall business strategy has led to disconnected hardware and software, which provides its own set of challenges. One of the key starting points we find for many businesses is connecting their systems. This provides them with clearer data in order to make better decisions.”*

– Jude Holmes, Made Smarter

These barriers are those found across the board, but there are those that are sector specific, with different industries facing their own challenges. Some areas may face greater regulatory barriers than others, for instance the pharmaceutical is one of the most regulated and integrating a new form of technology is a slow process that is covered in red tape.

Tom Martin, of Jetsoft, a solution that enables the improvement of quality control processes explains the exact barriers he faces when engaging clients to adopt.

*“From our perspective, we provide a very niche product that doesn’t have too many competitors and the client probably hasn’t come across our type of solution before. So, educating the market is the biggest barrier we face, and we have to explain the benefits they can gain from using our technology and how they can utilise it. Aside from this, we work with a highly regulated area of the advanced manufacturing sector and high regulation tends to mean lower adoption rates.”*





## 4.3 Digital Skills

In order to achieve a successful 'rebirth' that allows them to come back fighting, manufacturers require team members with the right skillset. At the minute, the training and development of staff, it's not keeping pace with the ever-growing digital adoption and for many finding the right talent is extremely difficult.

*"Digital skills have been of paramount importance in effectively responding to the crisis in the short-term, and will be as important, if not more so in transforming manufacturers to respond to the aftermath of the crisis in the longer-term. In fact, almost two-thirds (64%) of manufacturers had undertaken training to improve digital skills in the last 12 months. Acquiring digital skills isn't just a short-term benefit. Make UK research found that a lack of digital skills remains the biggest barrier to adoption of Industrial Digital Technologies (IDTs)."*

- Bhavina Bharkhada, Make UK

Ironically the reason for the skills gap could also be the solution. Digital technology could allow the training process to be completed faster and more effectively and allow shop floor workers to perform more complex tasks. Manufacturing runs of the back of specialised skill sets, some of which can take can years to fully train.

There are a few ways that technology could speed up this process. For example, real-time analytics of facilities could help members make more informed decisions and the latest innovations in no-code means members can make floor-ready applications without any training in software development.

Jude Holmes talks about how the Made Smarter initiative is helping SME's close their digital skills gap.

*"There are ways you can bridge the skills gaps with support from programmes like Made Smarter. Our digital technology internship programme matches SME manufacturers looking to adopt technology to a digital native to help them with their adoption."*

*Meanwhile, undergraduates, masters and PhD students, as well as graduates from UK universities, are benefitting from paid work experience, valuable hands-on practical work experience, a taste of a potential career path, and a foot in the door of a forward-thinking company or industry. I suspect this culture of transformation, agility and iterative implementation will remain long after the pandemic."*







## 5.0 What's Next?



## Manufacturing is Coming Home

There's no argument that the pandemic has caused massive disruptions, but there's still debate as to what the future will hold.

Some in the sector are optimistic for a strong rebound, others are considering this time as a way to transform and diversify and of course there are still those that are more pessimistic about the future and think that a return to pre-covid production levels is still a long way away.

One core change that has strengthened the sector over the past year and for the future ahead is the ability to quickly adapt.

*“The trend we are seeing across the sector is a move towards agility and resilience. An agile manufacturing sector is one that is able to swiftly respond to shocks that interrupt the natural order of a commercial system. These can be global shocks, such as the pandemic or the financial crisis over a decade ago, or smaller, more specific shocks such as localised natural disasters.*

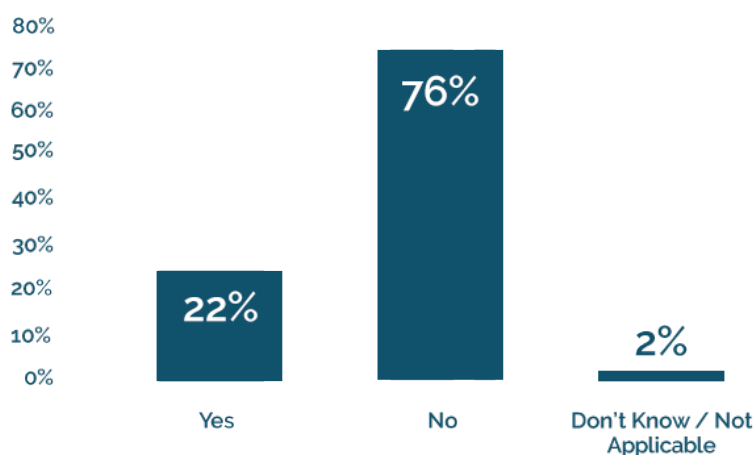
*And manufacturers are more aware of these challenges today than they were one year ago and as such have opened the door to investing in people, innovating new products, expanding into new markets all the while prioritising resilience in the industry to build agility. The latter has risen up the to-do list of many business owners over the last year. Businesses that successfully develop a strategy that advances these four key areas will find themselves more agile in the face of future shocks.*

*The pandemic has in fact provided an opportunity to reconsider our approach to building resilience, working cross-sector. If building agility can improve one aspect of a business's functions in one particular sector, it can be done elsewhere. More specifically, it can improve productivity by embracing greater digitalisation, building a strong industrial base and transitioning to a sustainable economy. “*  
– Bhavina Bharkhada, Make UK

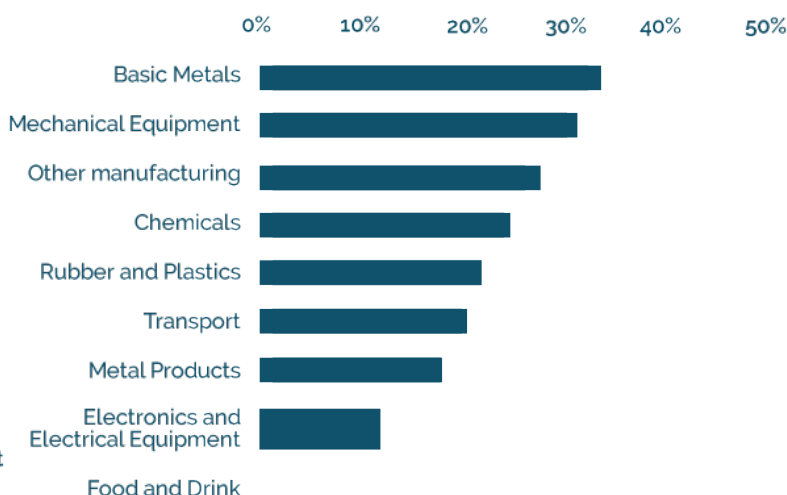
In a report published by BDO<sup>39</sup> in November 2020, it found that despite short-term actions to reduce costs, 27% of SME manufacturing businesses fear they will run out of cash by the end of 2021.

## Viability of Manufacturers Business

ARE YOU CONCERNED ABOUT THE MEDIUM TERM VIABILITY OF YOUR BUSINESS?



VIABILITY BY SUB-SECTOR BREAKDOWN



This viability particularly affected those in basic metals and mechanical equipment industries. However, many did take action to protect their business in the short-term and 80% are reassessing their strategies for long term sustainability.

Tom Martin of Jetsoft, provides his predictions for the future of the aerospace sector.

*"I think the aerospace sector has real potential for rebound. Initially we thought that due to less people flying, there is less planes in the sky and we thought that airlines would hang onto their plane assets for longer and therefore fewer plane purchases. But actually, we have found that instead of trying to consistently maintain them until flights pick back up, they are actually decommissioning these planes. So, when there is a pick up of international flights, they are going to need to buy new planes. We have also started to sell into test houses that test components for manufacturers. These are testing parts for the likes of Space X, Blue Origin and Virgin and we have seen significant investment going into drone taxis or vertical take-off taxis, so there is more manufacturing for these new generation of aircrafts."*

Many businesses consider the Covid vaccine rollout to be critical to their rebound, with hopes to a return to a version of normality. In another BDO report, 95%<sup>41</sup> of manufacturers predicted that their business would fully recover within a year of the vaccine becoming available, with the remaining 5% expecting this in the next 1-3 years.

It's not just the pandemic manufacturers need to consider in their recovery phase, there is the elephant in the room of Brexit, which has sort of become a secondary thought in comparison to the last year. As of January 2021, the UK finally left the single market and it was replaced with the EU-UK trade and cooperation agreement (TCA) which is far less substantial. As immediate impacts, the UK GDP growth fell by 2.9%<sup>42</sup> and 20.3% of exporters were facing border disruptions and delays at customs.

As the UK manufacturing sector is so heavily reliant on exports, these border disruptions

## Brexit Disruption on the UK Economy:

UK GDP GROWTH  
JANUARY 2021

-2.9%

VALUE OF FALL IN  
UK EXPORTS TO EU  
JANUARY 2021

£5.6bn

SHARE OF EXPORTERS  
EXPERIENCING  
DISTRIBUTION AT UK  
BOARDS FEBRUARY 2021

£5.6bn

could have ripple effects across the industry. Some of those most greatly affected include textiles, chemical and electrical manufacturing, which according to KPMG's<sup>43</sup> predictions could see output at the end of 2021 between 6-12% lower than in Q4 2019 due to bottlenecks in the supply chain, border friction and falling investment.



This drop in exports replicates those many manufacturers who are heavily reliant on EU customers and how they may have to readjust their distribution strategies to look further afield, to the likes of the MENA or APAC. Targeting those more emerging markets offers great opportunities for those that deliver specialist goods that cannot be replicated in the region, such as advanced robotics or cutting-edge medical devices.

Whilst a proportion of businesses have been experiencing delays at borders, this goes both ways, so those importing into the UK are also facing similar disruptions. These delays and additional red tape could make imports look less appealing and as discussed earlier on could prompt consumers to look more local.





# Conclusion

We can only predict and debate the future outlook of the manufacturing sector, but one thing's for sure, the UK manufacturing sector will always put up a fight!

As the last year has proven, the manufacturing sector is resilient and those who embrace change can expect a strong future in the coming years. Innovation and sustainability are going to be pinnacle to UK manufacturing growth, delivering a unique, competitive advantage.

As the old saying goes, hope for the best and prepare for the worst. Manufacturers need to take this time to reevaluate the last year and how their business have been impacted, alongside their target market. Understanding where threats and opportunities lie and mitigate where possible. Actions highlighted in the report that could strengthen a manufacturers position in market include;

- Integrating technology for productivity and efficiency gains
  - Driving towards carbon neutral
  - Building a digitally trained workforce
- Diversify their offering, target market or region
  - Having an agile operating model

The manufacturing sector should aim higher than a recovery, it should aim for a rebirth.

## Manufacturing is coming home!



# HALSTON MARKETING

## Manufacturing is Coming Home

*How the global pandemic, leaving the EU and the rise of homegrown innovation will resinate Britain to its previous mantle as the workshop of the world.*

Interested in finding out more? Let's chat.

We'd love to set up a call to discuss how we can help your business achieve its goals and stay at the forefront of your industry. Jessica, our Senior PR and Content Manager, is excited to speak further with you.

Jessica has several years experience in PR and Content, during which time she has created countless numbers of heavy research pieces, competitor analysis', persona documentation and market research. She's passionate about all things heavy industry and the future of marketing within, and even better, she loves helping businesses realise their potential.

Reach her on **0113 350 2038** or at **[jessica@halston.marketing](mailto:jessica@halston.marketing)**



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