



York & North Yorkshire Sector Study

A Final Report for the
York & North Yorkshire
Local Enterprise Partnership

Sector Profiles
and Action Plan
March 2022



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Please note that all key assets, initiatives, organisations and employers referenced in the report have been compiled together into a glossary that features at the end of the report.

MANAGEMENT SUMMARY

This is the second of two reports summarising priority sectors in York & North Yorkshire (Y&NY) for the Y&NY Local Enterprise Partnership (LEP). It presents a series of profiles of the sectors agreed in stage one of the study and concludes with an ambitious five-point action plan.

AGRI-FOOD

Agri-food is an important sector for the sub-region and employment concentrations are high. Agricultural technologies are supporting food producers in their transition to more data-driven, sustainable and efficient methods. Global growth and climate change are putting pressure on production and changing consumer demand. Based on local strengths and new opportunities, four key niche/priority agri-food areas have been identified. These are (i) agri-food and food-related research, (ii) automation, robotics and AI, (iii) controlled environment agriculture and vertical farming and (iv) artisan, vegan and specialist food and drink. The future success of the agri-food sector requires investment in innovation so it can compete efficiently and at scale. Robotics, automation, AI and data are being used to increase yields, overcome productivity challenges¹ and reduce labour costs.

The Y&NY LEP area is a gateway for agri-tech research in the North. The University of York has several institutions focusing on agri-tech research, specifically crop system innovation. Furthermore, various other organisations focus specifically on food and drink research in Y&NY.

Export strengths include niche food and drink offerings that are hand-crafted, strongly Yorkshire place-based identity brands, as well as manufacturing and production-based speciality suppliers selling to global brands and major supermarkets. Vacancies and labour shortages have raised the importance of effective employment and skills measures, which include addressing the issue of low pay. The food sector has had to develop new routes to market due to COVID-19 and cope with serious labour market pressures. Alongside automation, there is a need for a skills transformation towards more highly paid and highly skilled jobs, with advanced digital skills among those required.

ADVANCED MANUFACTURING

Technology and software are driving improvements across the manufacturing industry. New advanced materials and processes, such as additive manufacturing, are revolutionising the sector. Robotics, data analytics and Artificial Intelligence (AI) are increasing efficiencies and making production decisions faster and smarter. Climate change is affecting energy-intensive manufacturing sectors, while new products that meet zero-carbon ambitions are in demand. Despite various challenges, the UK manufacturing sector has shown signs of resilience.

Local manufacturing and engineering strengths cover many sectors, including agricultural equipment, construction, chemicals and plastics, pharma, and food and drink (the largest manufacturing sub-sector). Two niche areas are modular construction and structural steels.

Some major manufacturing supply chain opportunities exist. Examples of these include Drax, who have committed to sourcing 80% of their materials from the UK supply chain, while the Siemens facility in nearby Hull will double its production capacity for offshore blade manufacturing. York also has significant rail engineering expertise.

The advanced manufacturing sector continues to attract foreign direct investment, while free trade agreements and reshoring offer good prospects for new trade opportunities. COVID-19 lockdowns and the

¹ FDSC (2019). Preparing for a changing workforce. [Available here](#).

UK's exit from the EU resulted in mixed fortunes for manufacturing sub-sectors and brought into sharp focus the need for better supply chain resilience. More highly skilled workers, particularly those with R&D and digital skills, must be developed, retained and attracted to support advanced manufacturing growth. There is sustained demand for these types of highly skilled workers, and there are many vacancies and staff shortages in this comparatively well-paid sector.

DIGITECH, DATA AND CREATIVE INDUSTRIES

Digital technologies are often deployed to support new business models, processes and/or revenue opportunities. This cross-cutting sector relates to the elements of the economy that use digital technologies, such as blockchain, data sciences, digital technology, Artificial Intelligence, quantum, automation, Software as a Service and robotics. Data, often referred to as big data, uses datasets to analyse, evaluate, inform and improve business practice. Y&NY also has a thriving and established creative sector that is increasingly adopting new and innovative practices. Whilst employment concentrations are low, the strong prospects for expansion underpin potential growth in other priority sectors.

Digital adoption has the potential to transform business efficiency, productivity and innovation. The ambition for this priority sector is to support growing digitech firms and emerging niches, including digital occupations in businesses not traditionally part of the digital sector, while stimulating more universal adoption.

Niche fintech/e-commerce firms include the lending and payment specialists forming part of a Pennine cluster and the software solutions businesses operating across an extensive range of sectors, including agri-food and the environment. There are cyber hotspots, with Scarborough the location of a GCHQ outstation of their main Cheltenham site. The creative and cultural industries of Y&NY are adopting innovative technologies, and some exciting technologies are being used to develop visitor experiences through 3D modelling, interactive learning, and actual and virtual reality. Rail sector specialisms are clustered in and around York. They include rail engineering and consultancy, signalling, transport software systems and digital rail innovation. Business, professional finance and insurance services (BPFIS) firms are important not only for their contribution to the sub-regional economy but also for their creation of vital ecosystems that support business growth in other sectors.

Investments have recently been made in the digitech ecosystem, including the new tech campus at Northallerton (C4DI) and the proposed Institute for Safe Autonomy at the University of York. This aims to find solutions to the global challenge of ensuring the safety of robotics and its associated autonomous systems. The sector offers good prospects for inward investment, and digital technologies have kept many businesses resilient during the COVID-19 era. Digitisation can play a key role in decarbonisation, for instance, by improving the energy efficiency of manufacturing or rail or by offering virtual tourism experiences. Digital tools such as smart meters, energy data analytics and supply chain auditing systems can make businesses more aware of their energy use and carbon footprint, enabling them to identify the benefits of reducing these factors. The digitech sector can provide rewarding, highly skilled and well-paid jobs, while the right support (e.g., from the third sector) may assist individuals to reduce the digital divide.

HEALTH, PHARMA AND LIFE SCIENCES

This sector includes businesses providing or manufacturing medical equipment, drugs, technologies, research information, or diagnostic services. It also covers sciences that operate with living organisms, informing the development of new therapies, vaccines, diagnostics and food. The global prospects for the sector are strong, with such developments presenting significant opportunities for the Y&NY economy. Although it constitutes a relatively minor part of the economy, it offers extremely high-value jobs and has employment concentrations above the UK average.

An expanding and ageing world population, lifestyle diseases, the emergence of MedTech and digital health services are driving consumer demand for health and wellness products and services, while considerable growth has been predicted in biopharma and e-health. The NHS is investing in telehealth, mobile health, data analytics, digitalised health provision services, R&D and genomics.

The UK is widely regarded as a global leader in advanced therapies and life sciences. The rapid development of the COVID-19 vaccine is an example of continued drug and vaccine innovation, investment and development. The key niches for Y&NY are biosciences, e-health and clinical diagnostics, as well as advanced therapies and life sciences.

In the context of growing concern about labour and skills shortages in life sciences, the sector provides a wide variety of highly skilled and well-remunerated jobs. As greater focus is placed on prevention strategies and local responsive delivery, this role will continue to grow, as will the inclusive employment opportunities it offers. The COVID-19 pandemic has highlighted the strategic importance of this sector and new opportunities for growth have been created following record levels of investment in 2020.

SUSTAINABLE ENERGY AND BIOECONOMY

One ambition of the Y&NY LEP is to be the UK's first carbon-negative region. As the global economy transitions from carbon-intensive energy sources, Y&NY is well positioned to create new opportunities in sustainable energy and the bioeconomy. This high-value and growing sector has high employment concentrations and future opportunities. There has been a global shift towards renewables and biofuels, with considerable investment being made over the last decade. The demand for energy sources will increase in both the developed and developing world.

The Drax Group's investment in carbon capture, biomass energy production and hydrogen storage created Europe's largest decarbonisation project. Drax predicted that up to 49,000 direct and indirect jobs could eventually be created by the Bioenergy with Carbon Capture and Storage (BECCS) programme,² representing a substantial opportunity. There are opportunities in hydrogen, offshore wind and solar. When fully operational, Anglo American's potash polyhalite mine outside Whitby will be the deepest mine in Europe, producing 10 million tonnes a year.

There is also a strong bioeconomy ecosystem, with several institutions focusing on the bioeconomy or producing outputs that could be considered beneficial for the bioeconomy, under the banner of Biovale. Other institutions linked to the University of York include the Biorenewables Development Centre, the York Structural Biology Laboratory, BioYorkshire, the THYME project and the Green Chemistry Centre of Excellence. As well as investing heavily in R&D and attracting overseas investment, this sector is a good fit with the region's net zero and fairer and stronger ambitions. It has been acknowledged that employment is growing strongly in renewable energy, low-carbon innovation, retrofit and clean technology. Supply chain challenges mean a clean energy transition has become central to many COVID-19 recovery plans.

Whilst technology adoption has been accelerated due to COVID-19, considerable scope for future applications remains. This sector has good inward investment prospects but is perhaps more immature in terms of its commitment to net zero, in which many low-carbon investment opportunities exist.

FIVE-POINT ACTION PLAN

This report ends by outlining a five-point action plan designed to support sustainable growth and resilience in the priority sectors. It includes the following priorities:

- **Objective 1: Green innovation - net-zero pathways and low-carbon solutions.** These measures build on the sub-region's 'Routemap to Carbon Negative', 'North and West Yorkshire Emissions Reduction Pathways' and the 'Circular Economy and Action Plan'.
- **Objective 2: Empowering people for a fairer, stronger economy.** This objective mirrors the Skills Strategy 2021-2026 but tailors the key relevant priorities to address the need of the priority sectors to enhance productivity, earnings and performance. These priorities fit the remit of the Y&NY Skills and Employability Board.

² Vivid Economics (2020). Carbon Capture at Drax: Delivering Jobs, Clean Growth, and Levelling Up. [Available at](#).

- **Objective 3: Supply chain resilience and growth and digital adoption.** These measures could be supported through the Growth Hub, using it as a platform to offer highly tailored, post-EU funding support and help businesses to build resilience in the COVID-19 era.
- **Objective 4: Strengthening R&D, science and innovation investment in the priority sectors.** This objective aims to broker strong links with research assets and expertise while stimulating and incentivising business investment in R&D.
- **Objective 5: Trade, inward investment and high-value opportunities.** This objective includes both proactive and reactive approaches, aiming to stimulate interest in priority sites and sectors with clear propositions while responding effectively to the investment enquiries received. It also builds on the sub-region's internationalisation strategy measures by taking a sectoral perspective to boost international trade.

The following map illustrates a selection of the priority sector assets identified in the report.

Sectoral Asset Map - York & North Yorkshire LEP

Agri-Food Innovation

- 1) Craven College- Skipton
- 2) Askham Bryan College of Agriculture & Horticulture- York
- 3) Nestle Product Technology Centre- York
- 4) Centre of Novel Agriculture Products (CNAP)- University of York
- 5) York Biotech Campus - Sand Hutton:
 - Centre of Innovation Excellence in Livestock (CIEL)
 - Crop Health & Protection Centre (CHAP)
 - Food and Environmental Research Agency
 - Defra
- 6) Yorkshire Agricultural Society- Harrogate
- 7) Biovale- York
- 8) Stockbridge Technology Centre- Selby
- 9) Yorkshire Food Capital, Malton
- 10) Food Manufacturing Cluster - Leeming Bar Industrial Estate

Advanced Manufacturing

- 11) Automotive, Construction & Engineering Centre- Scarborough
- 12) The Institute for Safe-Autonomy (in construction) - University of York
- 13) Structural Steel Manufacturing Cluster - Dalton
- 14) Sherburn Business Park - Selby
- 15) Yorkshire and the Humber Institute of Technology - York (other locations in Craven, Scarborough and Selby)

Digitech, Data and Creative Industries

- 16) C4DI and e-campus-Northallerton
- 17) Digital Skills Academy - Askham Bryan College-York
- 18) GCHQ Outstation-Scarborough
- 19) Network Rail's Training Centre-York
- 20) University of Coventry Campus-Scarborough
- 21) Church Fenton Creative and TV Studios-Tadcaster
- 22) Craven Arts Studios - Malton

Sustainable Energy and Bioeconomy

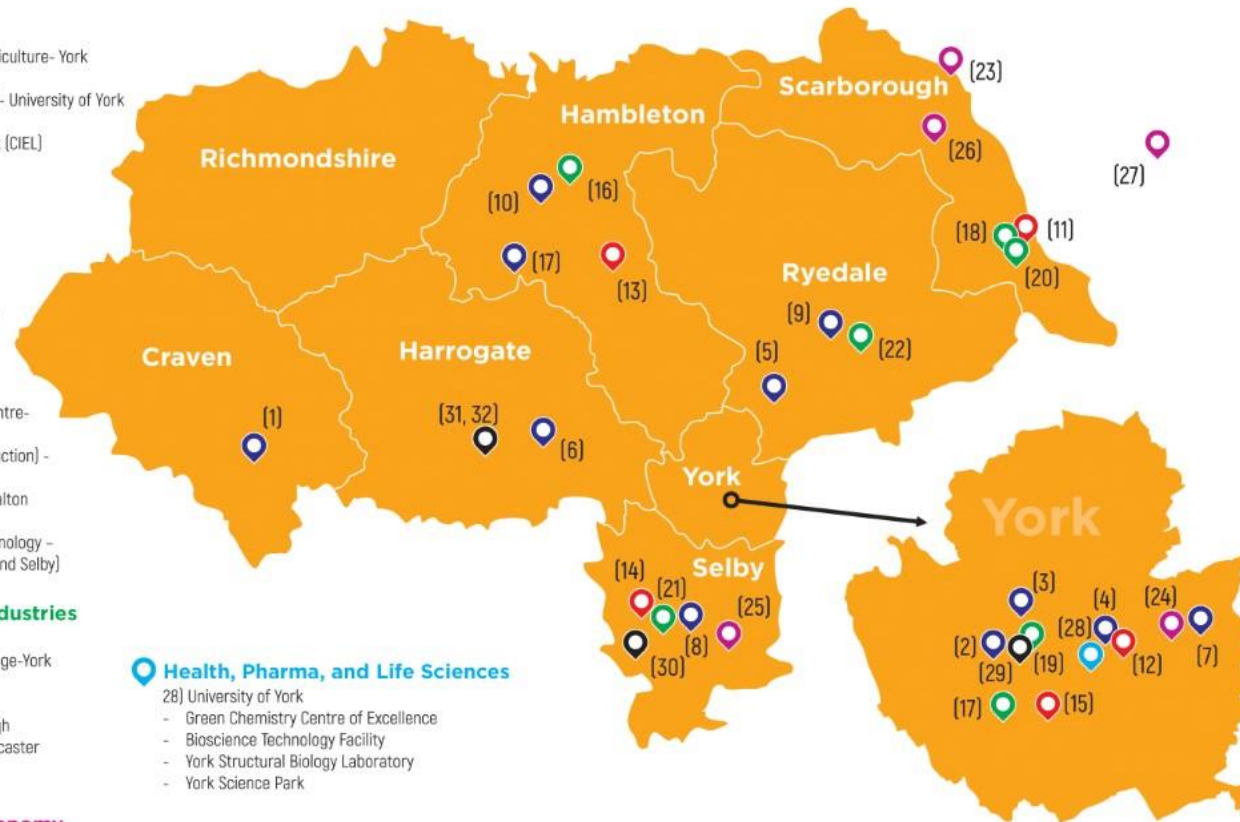
- 23) Endeavour Wharf- Whitby
- 24) Bio-renewables Development Centre - York
- 25) Drax Power Station and BECCs Programme - Selby
- 26) Anglo American Polyhalite Mine - Whitby
- 27) Dogger Bank Offshore Windfarm - North Sea

Health, Pharma, and Life Sciences

- 28) University of York
 - Green Chemistry Centre of Excellence
 - Bioscience Technology Facility
 - York Structural Biology Laboratory
 - York Science Park

Other Key Business Locations

- 29) York Central Business Park - York
- 30) Kellingley Business Park - Kellingley
- 31) Hornbeam Business Park - Harrogate
- 32) Oakwood Business Park - Harrogate



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1. INTRODUCTION

This is the second of two reports on priority sectors in North Yorkshire. The first (Interim Report (December 2021)) examined which economic sectors would potentially contribute the most to future economic growth and employment in Y&NY. Having agreed a new set of priorities, this final report presents the sector profiles and concludes with an action plan. This chapter establishes the context.

1.1. BACKGROUND

The LEP is currently developing a local response to the Government's Plan for Growth³, launched in March 2021. The Y&NY Plan for Growth will be the foundational document for priority setting, planning and prioritising funding for the next 10 years. The Y&NY Plan for Growth closely matches the government's approach, which will:

take a transformational approach, tackling long-term problems to deliver growth that creates high-quality jobs across the UK and makes the most of the strengths of the Union. We must retain our guiding focus on achieving the people's priorities: levelling up the whole of the UK, supporting our transition to net zero and supporting our vision for Global Britain.

As part of the Plan for Growth preparations, the LEP has commissioned this study to provide a coherent evidence-based rationale for identifying those sectors critical to delivering economic and employment growth (referred to as 'priority sectors'). The Interim Report outlined the suggested priority sectors, based on performance evidence, each sector's prospects and discussions with local stakeholders.

This report provides sectoral profiles, highlighting how these sectors and their associated niches will help to support economic growth and employment across the sub-region. The report provides evidence of how these sectors will support the broader-based priorities of the LEP, such as net zero and a stronger and fairer economy. The report concludes with a five-point action plan and recommendations for measures to stimulate growth and resilience in the priority sectors, attract investment and maximise the effectiveness of the ecosystems underpinning them.

1.2. SECTOR PROFILE STRUCTURE

The agreed structure for each sector was as follows:

- Headline statistics illustrating employment, gross value added and concentration
- A global perspective examining market size, predicted growth and trends
- Niches/specialisms/sub-sectors with the best prospects for economic growth and employment
- Technology development, innovation and key assets
- Internationalisation prospects and activity
- Potential contribution to broader-based LEP priorities (Greener Ambitions/Net Zero and Fairer and Stronger Ambitions)
- Labour market dynamics
- COVID-19 resilience

The profiles have informed a five-point action plan.

³ HM Treasury (2021). Build Back Better: our plan for growth. [Available here](#).

2. AGRI-FOOD

Agri-food is a broad and diverse sector that builds on innovation in traditional farming and food and drink production. The sector is active in the wider food and agricultural production value chain, from scientific research into seed and crop genetics through to new ways of growing and producing food, as well as innovations in processing and packaging. Many sub-sectors are adopting agri-tech and food innovations (robotics, Artificial Intelligence and data) and Y&NY has strong food and agri-research institutions and investment.

2.1. ECONOMIC HEADLINES – YORK & NORTH YORKSHIRE

- Across Y&NY, agri-food is a highly important sector. It employs 41,500 people, accounting for 42% of manufacturing GVA in 2017, almost three times the national average.⁴
- Employees are concentrated in Hambleton (8,000 staff), Harrogate (7,000), Ryedale (7,000) and Selby (6,000), while 4,000 are employed in Scarborough, 3,500 in Richmondshire, 3,000 in Craven and 3,000 in York.
- The employment Location Quotient (LQ) of the sub-region is high at 3.38. All the local authorities except York (0.69) have a positive LQ,⁵ although the city hosts a concentration of important food and drink producers, as well as research and development capabilities. Ryedale, Hambleton, Richmondshire and Selby have very high LQs (6.21, 4.68, 4.51 and 4.06, respectively). Craven, Scarborough and Harrogate have high LQs (2.34, 2.29 and 2.25, respectively).
- This sector accounts for 8.5% of the sub-region's GVA, the third highest of any English sub-region after Cornwall and Lincolnshire.

Agri-Food Dashboard	Y&NY
Employment (2020)	41,500
Employment Growth (2015-2019)	18.6%
GVA (2019)	£1,781 million
GVA Growth (2015-2019)	10%
Employment concentration (LQ)	3.38

2.2. KEY GLOBAL AND UK TRENDS

Food and beverage production is the UK's largest manufacturing sector. The agri-food industry contributed £127 billion to the UK economy in 2019 (6.4% of GVA).⁶ Global agri-food trade amounted to US\$1.5 trillion in 2018.⁷

Employment in the US agricultural and food research industry is expected to increase by 9% between 2020 and 2030,⁸ a trend being replicated globally as the sector experiences innovation and change similar to that of traditional sectors. Consequently, demand is growing for more highly skilled staff in UK agri-tech and food research, adding to the four million people already employed (14% of the total workforce).⁹ In the UK, 500,000 posts need filling in farming, food production and distribution.¹⁰

⁴ LCR Brexit Impact Assessment, June 2019.

⁵ A positive LQ is defined by any number above 1.

⁶ Defra (2020). Agriculture in the United Kingdom. [Available here](#).

⁷ FAO (2020). The State of Agricultural Commodity Markets. [Available here](#).

⁸ US Bureau of Labor Statistics. (2021) Occupation Outlook Handbook. [Available here](#).

⁹ FDSC (2019). Preparing for a changing workforce. [Available here](#).

¹⁰ Grant Thornton (2021). Establishing the Labour Availability Issues of the UK Food and Drink Sector. [Available here](#).

Agricultural technologies are supporting food producers in their transition to more data-driven, sustainable and efficient methods. These range from tools like robotics, automation and AI to processes like Controlled Environmental Agriculture (CEA), all of which are helping to address a combination of supply-side and demand-side pressures:

- The world's population is projected to reach 9.7 billion by 2050.¹¹ Increased demand for food combined with the dietary demands¹² of a growing global middle class are contributing to a global agricultural productivity gap.¹³ Climate change can disrupt food availability, reduce access to food and affect food quality.
- Consumer tastes are evolving. Consumers in developing markets are increasing their consumption of meat and dairy products as their income levels rise and populations become more urbanised. Meanwhile, there is a continued global rise in large-scale mega-farms and genetically modified crops. In developed markets, consumers are eating less meat, driving the expected growth in venture capital funding for meat substitute businesses.¹⁴
- From 2020, the global market value of meat substitutes is expected to grow at a Compound Annual Growth Rate (CAGR) of 15.8% and exceed US\$35 billion.¹⁵ The European market grew by 121% between 2010 and 2019 to €1.4 billion. The US plant-based food market is worth \$7 billion.
- The UK meat substitute market was valued at \$489.2 million in 2019, with a CAGR forecast of 6.8% projecting that its value will reach \$726.8 million in 2025. The UK represents nearly 30% of the total European meat substitute market. In 2018, vegan products comprised 16% of all new food products launched in the UK (compared to 8% in 2015), the highest worldwide.¹⁶
- The world craft beer market is estimated to reach a value of £140 billion by the end of 2027 and the global gin market value should rise from £10 billion in 2020 to £14.85 billion by 2029, with a forecast CAGR of 4.9%.¹⁷
- Other innovations are experiencing rapid market growth. The global vertical farming market is estimated to reach a value of US\$24.11 billion by 2030, at a CAGR of 22.9% from 2021.¹⁸
- Local provenance, organic status and sustainability are increasingly important to consumers in developed economies. The UK artisan food market has grown in recent years and is expected to expand further as consumers increasingly focus more on health and nutrition, sustainability, organic, veganism and vegetarianism, innovation, local provenance and food safety.¹⁹

2.3. SPECIALISMS AND SUB-SECTORS

AGRI-FOOD AND FOOD-RELATED RESEARCH

- An estimated 2,154 people are employed in research within the sub-region and Y&NY is home to several agri-food and bioeconomy-related research centres and industrial R&D sites. The University of York is the location of the Centre for Novel Agricultural Products, the Green Chemistry Centre for Excellence and the Centre for Excellence in Livestock.
- Quorn operate their £7 million Global Innovation Centre in Stokesley, with over 100 jobs created in recent years; Nestle's Product Technology Centre employs 200 people in York.
- The ecosystem includes several membership organisations providing support via networking and partnership events, shared research and lobbying. These include Biovale and BioYorkshire.

¹¹ United Nations (2019). The World Population Prospects 2019. [Available here](#).

¹² Lloyds (2020). Cities at Risk: Building a Resilient Future for the World's Urban Centres. [Available here](#).

¹³ Virginia Tech (2018). Global Agricultural Productivity Report. [Available here](#).

¹⁴ FT (2020). Funding Boom for Faux Meat and Dairy Start-Ups. [Available here](#).

¹⁵ Polaris Market Research (2022). Plant-Based Meat Market Share. [Available here](#).

¹⁶ The Vegan Society (2019). UK Meat Alternative Market. [Available here](#).

¹⁷ The Drinks Business (2021). Craft Beer Industry will Modify and Enjoy a Revival before 2027. [Available here](#).

¹⁸ Allied Market Research (2021). Global Vertical Farming Market. [Available here](#).

¹⁹ EAGB (2021). The Future for Artisan Food. [Available here](#).

AUTOMATION, ROBOTICS AND AI

- Businesses providing digital services to agri-food companies include the real-time data management firm Glas Data, Harrogate-based food provenance software provider Authenticate IS, advanced water condensing technology company Requench and the cloud-based farm management application firm Ag Drive.
- Y&NY businesses are heavily investing in new technologies. For example, Whitworth Brothers opened a new smart mill in 2021, deploying Buhler's Mill E3 technology to drive efficiency savings through optimised production techniques. Richmond-based food manufacturer Holmesterne Foods have recently fully automated their production lines, mitigating the impact of labour shortages and allowing the firm to upskill full-time staff in other areas of the business.

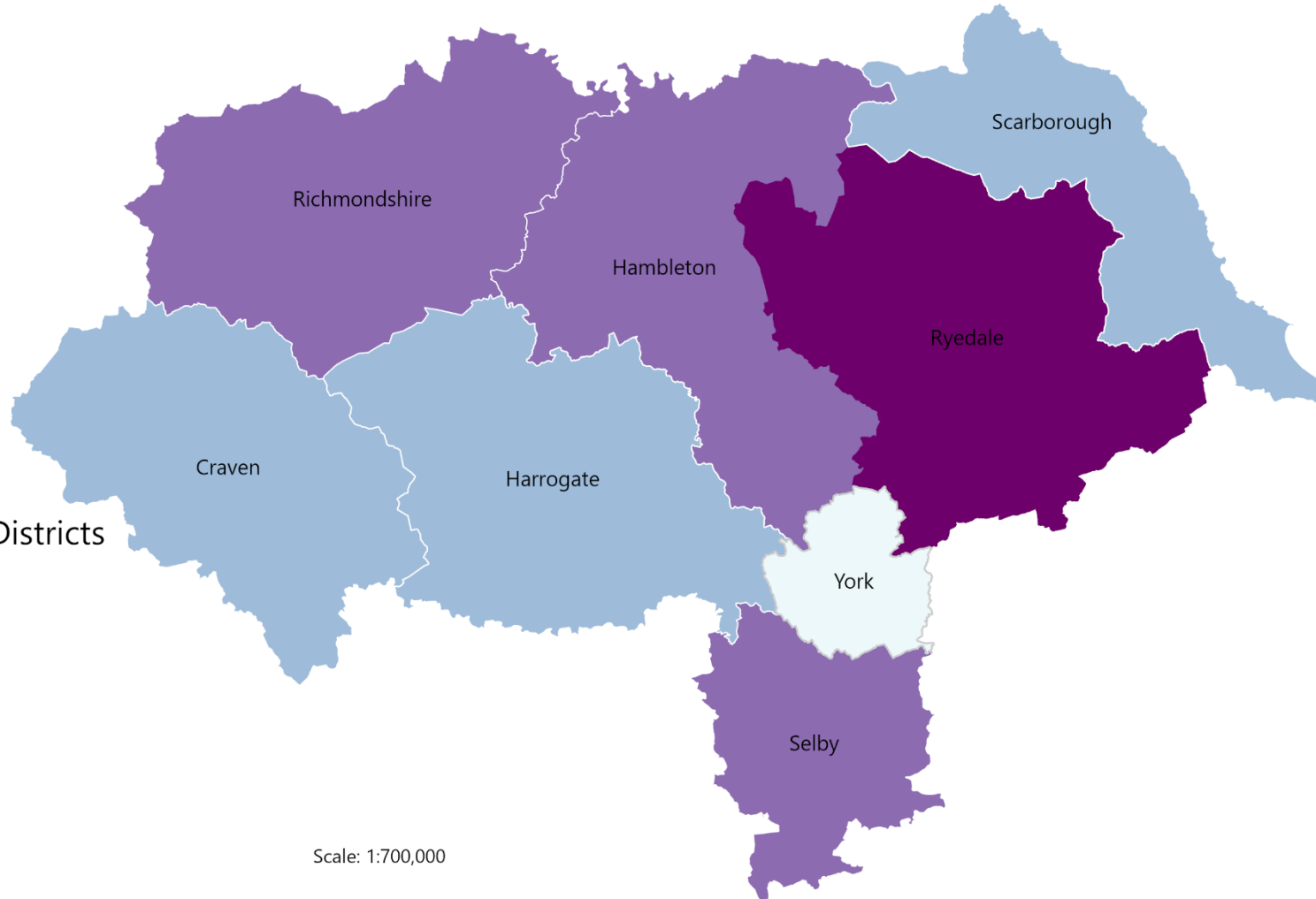
CONTROLLED ENVIRONMENT AGRICULTURE AND VERTICAL FARMING

- Y&NY is a nationally important location for Controlled Environment Agriculture (CEA) and vertical farming. Selby, home to Perfectly Fresh, APS Salad and Phytoponics, has been identified as an area of High Potential Opportunity for vertical farming as a form of CEA.
- Heck Food are investing in new vertical farming technologies on their Bedale site to provide the herbs needed for their food production.

ARTISAN, VEGAN AND SPECIALIST FOOD AND DRINK

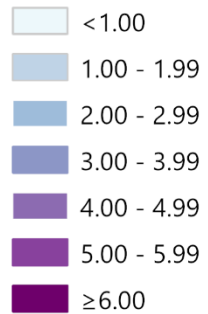
- Employment associated with non-meat and dairy food in the sub-region increased by 79% between 2015-2020, compared with the 47% increase in meat and dairy employment. Y&NY-based brands such as Heck Sausages, Breck Foods and Quorn are driving this employment growth through their investments in meat-free and plant-based products.
- Y&NY is home to a growing, and increasingly diverse, artisan and specialist food and drink sector. Deliciously Yorkshire is a membership association for Yorkshire-based food and drink producers, with over 130 of the group located in North Yorkshire. These include organic milk producer Organic Dales, Skipton-based gourmet meat company Grid Iron Meat, hand-made chocolate and ice cream producer Ryeburn of Helmsley and luxury cereal manufacturer Perfect Provender.
- The sub-region has over 100 breweries and numerous gin distilleries, employing 1,145 people and catering to the significantly higher national and international market demand for bespoke, locally sourced specialist alcohol products.

Location Quotients for the Agri-Food Sector 2020



North Yorkshire Districts

LQs



Scale: 1:700,000

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2.4. MATURE AND FOUNDATION INDUSTRIES

FOOD AND DRINK PRODUCTION, PROCESSES AND TECHNOLOGIES

- In all, 16,500 people are employed in food and drink manufacturing across Y&NY.²⁰
- This sector accounted for 42% of manufacturing GVA in 2017. In the 12 months leading up to September 2019, food and drink exports from the region totalled £1 million, a 5% increase from the previous year and a 27.8% rise from 2016.
- There is a food manufacturing cluster at Leeming Bar Industrial Estate, which is home to Yorkshire Provender, Sarnia Foods, Froneri, Wessex Foods and Holmestern Foods.
- Tadcaster has two major breweries, Samuel Smiths and Heineken-owned John Smiths. Masham is also home to two nationally renowned breweries, Theakston's and Black Sheep.

VISITOR ECONOMY

- Prior to COVID-19, the visitor economy across England generated an annual £100.8 billion, employing two million people.²¹
- In Y&NY, 48,950 jobs rely either directly or indirectly on the visitor economy. That reflects a 6% fall between 2015 and 2020, with food and beverage jobs experiencing the greatest decline (-10%), while travel agency, tour operator and other reservation services jobs were also affected (-33%).
- These jobs are well distributed across the sub-region, with 3,700 in Craven, 4,300 in Hambleton, 9,250 in Harrogate, 4,000 in Richmondshire, 4,100 in Ryedale, 8,000 in Scarborough, 2,400 in Selby and 13,200 in York.
- North Yorkshire was the most popular UK staycation destination in 2020, it has been claimed, with Whitby being the most popular town in 2020 and 2021.²²
- Increased confidence amongst the Y&NY visitor economy is reflected by several recent investments, including new hotels and holiday homes. These include the 150-bed boutique Malmaison hotel in York, the £25 million 143-bed Hampton by Hilton hotel in York, a 40-bed £5 million four-star hotel at Sandburn Hall at Flaxton, a new £1 million boutique hotel in Stokesley (Provenance Inns and Hotel group) and 190 luxury holiday homes at Raithwaite Village_Whitby.

2.5. ASSETS

The Y&NY LEP area is a gateway for agri-tech research in the north of England. The University of York has several separate institutions focusing on agri-tech research into crop system innovation.

The Crop Health and Protection Centre (CHAP) is an agri-tech innovation centre funded by Innovate UK, one of four government-funded agri-tech centres (of which two, CHAP and CIEL, operate in the region). It brings academics, farmers, businesses and scientific advisors together to develop crop system innovation. It aims to increase crop productivity by developing new and innovative agricultural technologies and encourage the market adoption of these technologies, which include sustainable soil precision approaches and problem-solving deep-water hydroponics.

The Centre for Novel Agricultural Products (CNAP)s, established in 1999, uses bioscience and genetics to maximise plant value as microbial and algal-based renewable resources, thus developing sustainable food crops and biofuels. It plays a leading role in several global and national biotechnology networks, including the High-Value Biorenewables Network and the Biomass Refinery Network. CNAP works with charities, governments and industry to develop and establish biotechnology capabilities.

Specialist higher education facilities are also located in and around the sub-region. Askham Bryan College in York operates an agri-tech innovation centre that undertakes research into animal science, ecology and conservation, equine science, farm trials, plant science and rural business, with a particular focus on dairy cattle and agri-business.

²⁰ Please note, not all of these are covered within our definition of advanced manufacturing.

²¹ Visit England (2020). The Value of Tourism in England. [Available here](#).

²² Snaptrip (2022). Staycation Statistics & Trends for 2020, 2021, 2022. [Available here](#).

There are several globally renowned research, technology and incubation centres. Fera Science Ltd at Sand Hutton near York is a world-leading science consultancy, which provides crop health services, resources, testing facilities and expertise to their partners. Fera, which employs 350 scientists and 70 PhD students,²³ collaborates with science, government and marketing partners. The facilities include ecotoxicology laboratories, aquatic laboratories, spectrometry equipment and a molecular technology unit. They focus on agri-food science, applying their significant scientific capabilities to develop and implement cutting-edge technology. The Stockbridge Technology Centre provides horticultural expertise, training and experimental crop development. It is a grower-led independent centre supported by producers and suppliers. It is also a registered educational charity and conducts trials on edible crops and seed production for pharmaceuticals.

In addition, P3P Horticultural Technology Park in Camblesforth, Selby has onsite R&D labs, CHP²⁴, vertical farming and glasshouse production. The Park houses companies such as Perfectly Fresh, which has built an R&D facility in Selby comprising two germination rooms and four test growing areas, with a further 5,000 square metre production facility becoming operational in 2020.

Furthermore, several institutions in Y&NY focus specifically on food and drink research. These include the NAFIC (National Agri-Food Innovation Campus), also in Sand Hutton, which was recently rebranded as the York Biotech Campus. Home to more than 850 scientists, it provides laboratory and office space to private and public organisations, including Fera Science. Other organisations based on the campus include the Food Innovation Network and government agencies like the Animal and Plant Health Agency and DEFRA. Apart from the excellent facilities, the co-location of so many agri-tech partners is highly advantageous for collaboration and offers inward investors an attractive proposition.

In York, Nestlé operate a Product Development Centre as part of their global research network, which was expanded in 1990. The site includes a pilot factory that can trial new confectionery in small runs. Employing 150-200 people, the centre focuses on low-sugar, lighter product development.

2.6. TECHNOLOGY AND INNOVATION

The future resilience of the sector requires investment in innovation to compete efficiently and at scale.

- Robotics, automation, Artificial Intelligence (AI) and data are being used to increase yields, overcome productivity challenges and reduce labour costs.²⁵ New methods like genetic sequencing are being deployed to improve fertilisers and growing techniques. The use of satellite imagery to enhance agricultural practices is predicted to expand significantly.
- Novel food and drink production methods are becoming more established and new ingredients are being developed. The market for seaweed-related products is forecast to grow, while the cell-based 'lab-grown' meat market is also set to be worth US\$140 billion in the next decade.²⁶ Seagrown in Scarborough has developed a pioneering seaweed farm to ethically produce a sustainable crop for a range of innovative uses, from biodegradable plastics to new sources of pharmaceuticals, cosmetics, textiles and biochemicals.
- Masham-based animal feed manufacturer l'Anson Brothers have recently signed a financial agreement with HBSC UK. They have used the funds to build an energy-efficient mill that they believe will be one of Europe's most technologically advanced, producing scientifically advanced feeds that enhance nutritional content and yield.

2.7. INTERNATIONALISATION (ACTIVITY AND PROSPECTS)

The agri-food sector is an attractive proposition for foreign investors. In Y&NY, the agri-sector has a strong export market, with heritage brands complementing innovative and speciality products.

- The UK's agri-food sector has performed successfully in terms of foreign direct investment. According to 12% of investors, the sector will be a key driver of UK economic growth in the coming years.²⁷

²³ Business Inspired Growth (2020). Annual Report. [Available here](#).

²⁴ Combined Heat and Power Plants are sustainable form of generating and reusing heat.

²⁵ FDSC (2019). Preparing for a changing workforce. [Available here](#).

²⁶ Bloomberg Green (December 2020). Lab-grown meat is getting closer to supermarket shelves. [Available here](#).

²⁷ Ernst and Young (2021). UK Attractiveness Survey 2021. [Available here](#).

- In the 12 months leading up to September 2019, food and beverage exports from the region totalled £1 million; a rise of 5.0% on the previous year and 27.1% over the past three years.²⁸
- The USA is the UK's largest export market for food and drink, with exports doubling after 2010 to US\$2.4 billion in 2019.²⁹
- China, the Middle East and India present major export opportunities as the increasingly affluent and widespread middle classes in these areas stimulate the demand for more international produce.
- Export strengths include niche food and drink offerings. These include hand-crafted, strongly Yorkshire place-based identity brands (such as Wensleydale Cheese, Yorkshire Tea and Harrogate Spring Water), as well as manufacturing and production-based speciality suppliers (alcohols, cereals and smokehouses) selling to global brands and major supermarkets.

2.8. NET ZERO AMBITIONS

Between 1990 and 2019, there was a 13% drop in UK agricultural greenhouse gas (GHG) emissions, largely attributed to a reduction in livestock and synthetic fertilisers.³⁰ However, agriculture still contributes 10% of the UK's total GHG emissions,³¹ with the most prominent sources being methane gases from livestock and nitrous oxide emissions related to fertiliser.

Agri-food stakeholders giving evidence to North Yorkshire's 2021 Rural Commission believed that agriculture can play a key role in delivering a carbon-neutral economy. New approaches can help to reduce emissions, increase carbon capture and improve biodiversity. The National Farmers Union (NFU) have calculated that the implementation of bioeconomy-based solutions in UK agriculture could reduce the sectoral emissions of CO₂ (and its equivalents) by up to 26 Mt/year.

Two Richmondshire farms were cited by Farming Minister Victoria Prentis and Chancellor Rishi Sunak as excellent examples of innovative practices being followed to enhance natural wildlife habitats.³² Eighteen Wensleydale farmers have been involved in the DEFRA Payment by Results pilot programme to stimulate local wildlife. They were given the freedom to decide how to enhance the environment on their land and provided with training and advice from Natural England and the Yorkshire Dales National Park Authority.

Environmental challenges in the supply chain present opportunities for future innovation and specialisation:

- The Water and Resources Action Programme reported that 1.5 million tonnes of food waste was created by the UK food manufacturing industry in 2018 and eliminating this would reduce greenhouse gas emissions by up to four million tonnes.
- Around 300,000 tonnes of food manufacturing waste is discarded every year across Yorkshire and the Humber³³. The Biorenewables Development Centre is identifying solutions through collaborative partnerships between manufacturers and technology providers. For instance, GSK are now cooperating with North Yorkshire manufacturers to use waste protein and starch products.
- Independent food producers are endeavouring to reduce packaging. Yorkshire Pasta Company, launched in 2020 have developed bespoke paper packaging that is 100% recyclable.
- Other environmental initiatives across the sector include the investment by Heck Food in vertical farming to reduce carbon miles; the participation of Quorn Foods in the Climate Leadership Framework, which led to a 33% reduction in carbon emissions per tonne of food produced; and SeaGrown's crowdfunded 'Turning the Tide on Climate Change' scheme, which has grown four kilometres of carbon-rich seaweed off the Scarborough coast.³⁴

²⁸ Business up North (December 2019). Yorkshire brews up a festive storm in Scandinavia. [Available here.](#)

²⁹ Food & Drink Federation (2019). Exports snapshot. [Available here.](#)

³⁰ Department for Business, Energy, and Industrial Strategy (2019). 2019 UK Greenhouse Gas Emissions. [Available here.](#)

³¹ Department for Business, Energy, and Industrial Strategy (2019). 2019 UK Greenhouse Gas Emissions. [Available here.](#)

³² Department for Environment, Food & Rural Affairs (2020). Farming Minister Visits Innovative Yorkshire Agri-Environment Schemes. [Available here.](#)

³³ Biorenewables Development Centre (2018). Yorkshire Food Manufacturing could be Improved by Harnessing Waste. [Available here.](#)

³⁴ Seaweed is estimated to absorb twenty times more carbon acre for acre than woodland.

2.9. FAIRER AND STRONGER AMBITIONS

The sector presents several opportunities for the stronger and fairer ambitions of the LEP. The current labour shortage is being exacerbated by low wages (in comparison to retail and logistics) despite wage inflation amongst lower-paid workers. The average agricultural wage of £9.11 is still below the Living Wage Foundation's suggested hourly rate of £9.90.³⁵ The NFU claim that increased technology adoption and automation will stimulate demand for employees with digital skills, resulting in more highly paid skilled jobs with average salaries that exceed £30,000. The expanding network of community food-growing programmes provides excellent inclusive agricultural opportunities. The award-winning Yorkshire-based urban gardening organisation Incredible Edible have groups active in Skipton, York and Milford. Educational charities are using social enterprises more frequently to provide holistic learning for vulnerable groups. Ruskin Mill offer their pupils a holistic education with a focus on practical activity, arts, crafts, commerce, agriculture and nutrition. Their Clervaux Garden School in Richmondshire is a 100-acre biodynamic farm that offers therapeutic skills-based education for pupils with complex social, emotional, physical and behavioural learning difficulties.

2.10. LABOUR MARKET DYNAMICS

Y&NY is facing similar labour market challenges and opportunities to those of the UK. In 2017, 28% of food manufacturing staff were EEA nationals. Reliance on migrant labour is particularly acute in seasonal agriculture, with 99% of seasonal workers coming from the EU.³⁶ Furthermore, 25% of the workforce are due to retire in the next ten years, generating considerable replacement demand.³⁷ Grant Thornton reported that over 500,000 UK posts need filling across farming, food production and distribution³⁸. The NFU claim that labour shortages are placing pressure on the agri-food sector, which will have implications for the UK if left unaddressed.³⁹ Food and Drink Sector Council (FDSC) research⁴⁰ into labour shortages identified the importance of apprenticeships in recruiting new staff and improving the availability and volume of high-quality training providers. The Council claimed that food and drink businesses rank technological and research expertise among the three leading skills required of prospective employees.

2.11. COVID-19 RESILIENCE

The food sector has had to develop new routes to market and cope with extreme labour market pressures. COVID-19 has driven a move to online sales and e-commerce routes to market, as well as more neighbourhood shopping to accommodate people working from home.⁴¹ This presents an opportunity for producers to increase their physical and virtual sales. COVID-19 is also impacting staff numbers. Some 1.5 million migrant workers returned to their home countries during the COVID-19 pandemic,⁴² with the agri-food sector one of the worst affected. Kings College research has estimated that the region lost over 127,000 migrant workers between July 2019 and July 2020. Coupled with ongoing staffing absences due to illness, this has placed considerable pressure on agri-food businesses across the sub-region. COVID-19 has also caused wages to rise, with the NFU reporting evidence that the effects of the pandemic had added a further 6-15% to labour costs in 2020⁴³.

³⁵ NFU (2021). Establishing the Labour Availability Issues of the UK Food and Drink Sector. [Available here](#).

³⁶ Ibid.

³⁷ Ibid.

³⁸ Grant Thornton (2021). Food and beverage insights Q3 2021. [Available here](#).

³⁹ Ibid.

⁴⁰ FDSC (2019). Preparing for a Changing Workforce. [Available here](#).

⁴¹ <https://www.newfoodmagazine.com/article/129788/trends-and-challenges-2021/>

⁴² FT (2021). Foreign Workers flee UK as Pandemic and Brexit Bite. [Available here](#).

⁴³ NFU (2020). The Potential Impact of Covid-19 for the Costs of Production of UK Fruit & Vegetables in 2020. [Available here](#).

3. ADVANCED MANUFACTURING

Increasing manufacturing capacity in the Y&NY area will help those investors who want to localise their supply chains and minimise the impact of future crises. Manufacturing and engineering strengths cover many sectors, including agricultural equipment, construction, chemicals and plastics, pharma, and food and drink (the largest manufacturing sub-sector). Moreover, considerable opportunities are emerging in renewable energy and low-carbon technologies. Advanced manufacturing uses innovative technologies and methodologies to enhance competitiveness.

3.1. ECONOMIC HEADLINES – YORK & NORTH YORKSHIRE

- In total, 9,550 are employed in advanced manufacturing, with an LQ of 1.15. Ryedale has the highest LQ (2.27), followed by Selby (1.98) and Scarborough (1.26). Harrogate (0.47) and York (0.24) have the lowest.
- At 11.2%, local GVA growth (2015-2019) was the highest of the priority sectors but the average gross weekly wage was £573.20, below the UK average of £612.80.⁴⁴
- Advanced manufacturing accounts for 6.7% of GVA (£1.4 billion).
-

Advanced Manufacturing Dashboard	Y&NY
Employment (2020)	9,550
Employment Growth (2015-2019)	-3.1%
GVA (2019)	£1.4 billion ⁴⁵
GVA Growth (2015-2019)	11.2%
Employment concentration (LQ)	1.15

3.2. KEY GLOBAL AND UK TRENDS

Technology and software are driving improvements across the manufacturing industry, while climate change is affecting energy-intensive manufacturing sectors and demand is rising for new products to meet zero-carbon ambitions.

- Advanced manufacturing is developing rapidly with the onset of Industry 4.0 and new digital, AI and robotics technologies. These process innovations are used in combination with new materials. For example, additive manufacturing,⁴⁶ including 3D printing, is set to be a US\$51 billion industry by 2030, representing a 15% CAGR from 2020. It will replace more conventional methods like injection moulding, machining and casting.⁴⁷
- New materials such as graphene and '2D' (one atom in thickness) substances will drive the growth in composite and coating technologies in many manufacturing industries.
- Forecasts indicate that a new generation of manufactured products are required to meet the 2050 demands for net-zero power, transport, heating and industrial systems. This could represent £25 trillion in capital expenditure across EU-27 alone in areas of technology like electric batteries, insulation, and efficient appliances and infrastructure.⁴⁸

⁴⁴ NOMIS. Labour Market Profile (2022). [Available here](#).

⁴⁵ All sub-regional non-food/beverage manufacturing and 10% of professional, scientific and technical activities.

⁴⁶ The industrial production term for 3D printing.

⁴⁷ Metal AM (2021). AM Market Forecast to Reach \$51 billion by 2030. [Available here](#).

⁴⁸ McKinsey (2021). Opportunities for UK Business in the Net-Zero Transition. [Available here](#).

- Advanced manufacturing will support innovation in other sectors such as the growth in offsite construction (Modern Methods of Construction) and pre-manufactured buildings). The global retrofit market was valued at US\$ 142.88 billion in 2020 and is expected to grow at a CAGR of 4.5% between 2020 and 2028.⁴⁹ The UK government launched the MMC Taskforce in 2021 to accelerate the delivery of MMC homes, at a pace and scale intended to meet net zero targets.⁵⁰
- A 2020 McKinsey article highlighted the importance of the rail innovation sector to the European economy.⁵¹ Overall, 60% of the global train control and traffic management market is European, with substantial increases in passenger traffic placing pressure on the existing infrastructure.

Despite various challenges, the UK manufacturing sector has shown signs of resilience.

- It accounted for 9.6% of GVA in November 2021, with output increasing 1.2% from November 2020.⁵² This upturn follows declines in 2019 and 2020 (-1.8% and -9.5%, respectively), which have been attributed to the UK's exit from the EU and COVID-19.⁵³
- UK manufacturing productivity growth has slowed. It is no longer consistently higher than wider economic growth, as it had been before 2008. This is a result of limited automation gains; low investment and R&D; a lack of effective management and leadership; and a skills shortage.⁵⁴
- In 2018 it accounted for 65% of R&D expenditure⁵⁵ although this has declined from 84% in 1985.
- Make UK reported a strong order balance for the region, higher than any other UK region⁵⁶.
- Sixteen per cent of investors in the 2021 UK Attractiveness Survey cited the automotive and mobility sector as a key driver for UK economic growth in the coming years⁵⁷.
- The ONS reported a record number of vacancies in the professional, scientific and technical sector⁵⁸. There are currently 4.6 vacancies per 100 employees and a record four manufacturing vacancies per 100 manufacturing jobs (October to December 2021).

3.3. SPECIALISMS AND SUB-SECTORS

Manufacturing and engineering strengths cover many sectors, including agricultural equipment, construction, chemicals and plastics, pharma, and food and drink (the largest manufacturing sub-sector). There are clusters of food and drink manufacturers (e.g., Leeming Bar Industrial Estate), as well as a structural steel cluster and specialist construction organisations (e.g., within Dalton).

- Y&NY has a strong food and drink manufacturing sector. Quorn in Stokesley have just invested £7 million in a new vegan research hub. Heck Food in Bedale have invested £1.5 million in new processing machinery for their vegetarian products. Sedamyl in Selby underwent an £80 million plant expansion, taking their number of employees to 150.
- Across the sub-region, 1,200 are employed in pharmaceutical manufacturing. Skipton-based Dechra Pharmaceuticals employs over 850.

⁴⁹ Grand View Research (2021). Energy Retrofit Systems Market Size 2021-2028. [Available here](#).

⁵⁰ Inside Housing (2021). Government to Launch Taskforce to Accelerate Delivery of MMC Housing. [Available here](#).

⁵¹ McKinsey (2020). Digitizing Europe's Railways: A Call to Action. [Available here](#).

⁵² House of Commons Library (2022). Economic Indicators. [Available here](#).

⁵³ IHS Markit (2022). PMI Data. [Available here](#).

⁵⁴ House of Commons Library (2020). Manufacturing: statistics and policy. [Available here](#).

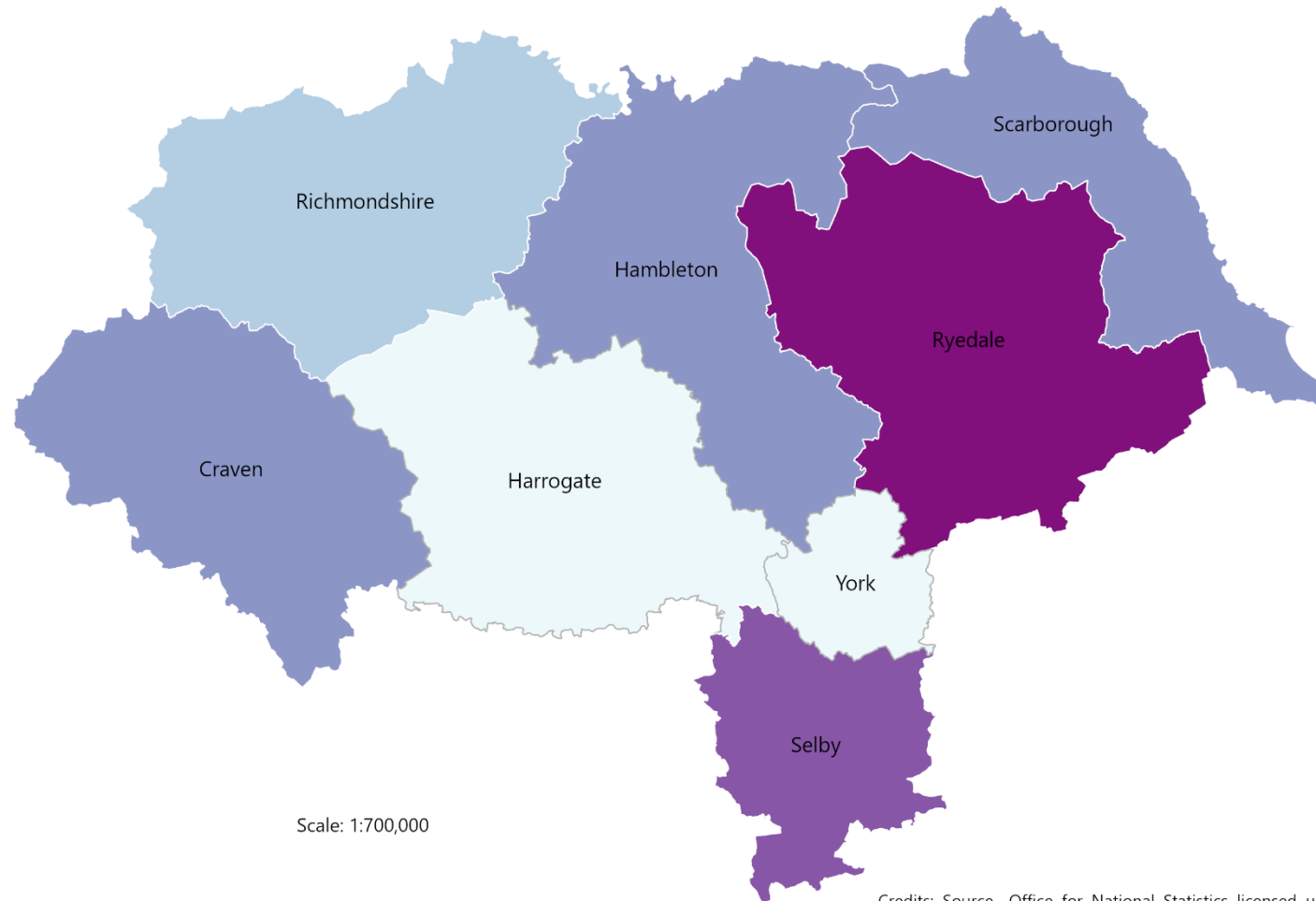
⁵⁵ House of Commons Library (2020). Manufacturing: statistics and policy. [Available here](#).

⁵⁶ Make UK (2021). Regional Manufacturing Outlook 2021. [Available here](#).

⁵⁷ EY (2021). EY UK Attractiveness Survey. [Available here](#).

⁵⁸ ONS (2022). VACS02: Vacancies by Industry. [Available here](#).

Location Quotients for the Advanced Manufacturing Sector 2020



North Yorkshire Districts

LQs

- <0.50
- 0.50 - 0.99
- 1.00 - 1.49
- 1.50 - 1.99
- ≥2.00

Scale: 1:700,000

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- In total, 1,935 are employed in plastic and chemical manufacturing. There is a cluster of plastic manufacturers in Ryedale (600 employees), including plastic injection moulding specialists Malton Plastics and sustainable plastic print producers Ryedale Group. R&D-intensive Airedale Chemicals in Craven have created over 100 new products. They produce over 80,000 tonnes of chemicals annually, supplying 200 types of chemical solutions to various industries.

Interesting specialisms have been identified in retrofit and advanced materials:

- North Yorkshire has been described as the “UK’s modular Mecca”,⁵⁹ with Legal and General Modular Homes in Sherburn-in-Elmet and Ilke Homes in Knaresborough being two of the largest modular home manufacturers in the UK.
- Kirbymoorside’s Sylatech developed a casting process that deploys 3D printing technology to produce thin-walled lightweight components for the automotive and aerospace industries.

3.4. MATURE AND FOUNDATION INDUSTRIES

STRUCTURAL STEEL

Around 2,000 people are employed in structural steel manufacturing, including 800 in Hambleton, 250 in Scarborough and 600 in York. There is a cluster of structural steel manufacturers in Hambleton. Tanfield Engineering make bespoke products for the food manufacturing and processing industry, while Hambleton Steel is a steelwork fabrication business. Severfield, a steel manufacturer with a UK hub in Thirsk, have ten state-of-the-art production lines with a weekly steel output of over 1,500 tonnes.

PACKAGING TECHNOLOGIES

York-based Intelsius offer temperature-controlled packaging services to the life sciences industry. Their 120 employees manufacture products that guarantee the temperature and biosecurity requirements for pharmaceutical products. Duraweld (Scarborough), an innovative packaging manufacturer, supply products to many sectors, including the retail, healthcare and automotive industries. They employ over fifty staff at their recently upgraded facility. New production machinery was purchased and installed with the assistance of the University of York’s Product and Process Innovation Project (PAPI).

3.5. KEY ASSETS

The Product and Process Innovation Project (PAPI) mentioned above offers SMEs engaged in developing new products grants worth up to £20,000 for new equipment, as well as workshops, business support and application guidance.

3.6. TECHNOLOGY AND INNOVATION

New advanced materials and processes, such as additive manufacturing, are revolutionising the sector, while robotics, data analytics and AI are increasing efficiencies and making production decisions.

- Made Smarter have recently launched a digital adoption drive across the region’s manufacturing and engineering SMEs to support increased productivity.
- The Drax Group’s BECCS programme will see £40 million of capital investment in 2022, with additional major investments planned over the next five years. They are committed to sourcing 80% of their materials from UK supply chains.
- A recent investment in the Siemens Gamesa facility in Hull will double production capacity for offshore blade manufacturing. Siemens Mobility have also recently built a new train manufacturing facility in Goole, East Yorkshire. These developments will offer major regional supply chain opportunities to firms in this field, creating a predicted 1,700 indirect jobs.⁶⁰

⁵⁹ RICS (2020). Why 2020 is the Year of the Modular. [Available here](#).

⁶⁰ Siemens (2021). Proudly Manufacturing New Trains for the UK. [Available here](#).

- Recent technology investments include Health Innovations opening a new site in Skipton. Valley Tankers have recently invested in a new fully automated production system, which deploys state-of-the-art welding systems to reduce production times and enhance efficiency. EJOT in Sherburn in Elmet completed a £6 million extension to their manufacturing and R&D facility in 2021. This included two new environmental testing laboratories for their advanced engineering fasteners.

3.7. INTERNATIONALISATION (ACTIVITY AND PROSPECTS)

The advanced manufacturing sector continues to attract foreign direct investment and there is evidence of new trade and reshoring opportunities.

- Of the £50.8 billion of foreign direct investment in the region during 2019, 35.7% (£18.1 billion) was in manufacturing.⁶¹ Regional companies were estimated to have invested £49.5 billion in other countries.
- Ongoing support may be required by companies heavily exposed to EU markets and the disruption from the UK's exit from the EU, while new opportunities may arise from new free trade agreements.
- Supply chains operating on just-in-time and with no in-built flexibility have failed to react to volatile markets and demand, hence the need to improve supply security and proximity to customers. Reshoring in manufacturing operations presents opportunities to expand the local manufacturing base, attract investment and create new jobs.

3.8. NET ZERO AMBITIONS

A Make UK report highlights how net zero targets can be achieved through sustainable processes and digital technologies.⁶² Net zero targets present an opportunity for the sector in terms of using lower-carbon fuels and energy-efficient processes to manufacture low-carbon products for consumers or as part of the UK's low-carbon economy supply chain. In October 2021, the M5 Group, a collaborative partnership between the UK's five largest manufacturing associations, published a report highlighting the potentially key role that advanced manufacturing could play in the UK government's net zero and Levelling Up agendas⁶³. The government's new heat and building strategy emphasises the decarbonisation of the UK's housing stock, for which the sub-region is ideally positioned due to its offsite and sustainable construction strengths. A 2021 research paper stated the UK retrofit industry must expand ten times to achieve these ambitions. With government support, the sector could be worth an annual £11 billion by the 2030s⁶⁴.

Local R&D staff at Bremsin Technic's Richmond site pioneered the removal of copper and harmful metals from automotive products. The Drax BECCS programme will constitute Europe's largest decarbonisation project, with plans to store up to eight million metric tonnes of carbon annually. Drax claims that up to 16,700 jobs could subsequently be generated across North Yorkshire and the wider region, safeguarding thousands of jobs across the north.

3.9. FAIRER AND STRONGER AMBITIONS

- A recent UK government review of international retrofit supply chains concluded that a fragmented, uncoordinated retrofit supply chain, coupled with limited skills, was hindering the development of retrofit across the developed world. Opportunities for retrofit are frequently neglected during repairs, maintenance and improvement work. The report calls for retrofit manufacturers to cooperate with construction SMEs to ensure that retrofit opportunities are not missed.⁶⁵ Meanwhile, the UK

⁶¹ ONS (2021). Foreign Direct Investment, Experimental UK subnational Estimates. [Available here.](#)

⁶² Make UK (2020). Responding, Resetting, and Reinventing UK Manufacturing Post Covid-19. [Available here.](#)

⁶³ M5 Group (2021). Investing in Advanced Manufacturing is Investing in Levelling Up. [Available here.](#)

⁶⁴ Bankers for Net Zero (2021). The Retrofit Revolution. [Available here.](#)

⁶⁵ BEIS (2021). International Review of Domestic Retrofit Supply Chains. [Available here.](#)

government's Made Smarter Review identified how one million industrial workers should be upskilled to support the embedding of new digital technologies.⁶⁶

- The average local gross weekly wage for full-time employees in Y&NY is £573.20, below the UK average of £612.80.⁶⁷ Expanding the advanced manufacturing sector could help to bridge this gap. In October 2021, the average manufacturing wage was £616 per week, while the average professional, scientific and technical sector wage was £831. These were increments of 0.9% and 5.6%, respectively, between 2020 and 2021.⁶⁸

3.10. LABOUR MARKET DYNAMICS

The headlines are as follows:

- Across Y&NY, 9,550 people are employed in advanced manufacturing, including 2,000 in Selby, 1,750 in Ryedale, 1,500 in Scarborough, 1,250 in Hambleton and 1,000 in Harrogate, although staff shortages are affecting manufacturing output.⁶⁹
- KPMG reported that the engineering sector was the fourth-largest in terms of UK permanent vacancies, a 15% increase from December 2020, and the fifth-largest in terms of temporary vacancies, a 10% increase over the same period.⁷⁰ A record of four manufacturing vacancies existed per 100 manufacturing jobs from October to December 2021, a rise of 2.2% over the same period in 2020. The ONS also reported a record number of vacancies in the Professional, Scientific and Technical sector, with 4.6 current vacancies per 100 employees.⁷¹
- With 24% of UK R&D staff employed in manufacturing, the sector is research-intensive.⁷²

3.11. COVID-19 RESILIENCE

Manufacturing production was affected by the first COVID-19 lockdowns and subsequent restrictions. Ten per cent of manufacturing workers were furloughed and 50,000 were made unemployed (March 2021).⁷³ Forty-six per cent of regional manufacturers reported COVID-19-related redundancies.⁷⁴ Recent forecasts have indicated partial recovery, with the sector predicted to reach pre-COVID-19 growth rates by mid-2022.⁷⁵ Continued recovery will require resilience measures that include diversifying customer bases, reviewing supply chains, adopting digital and increasingly sustainable practices, and upskilling (see Action Plan).⁷⁶ The UK Attractiveness Survey 2020 noted that 2% of investors intended to expand their use of locally based supply chains due to COVID-19.⁷⁷ ONS research into COVID-19-resilient industries found that workers holding university degrees, masters or doctorates comprised almost 50% of all the workforce in resilient industries, emphasising the importance of higher-level skills.⁷⁸

⁶⁶ The Department for Business, Energy, and Industrial Strategy (2017). The Made Smarter Review. [Available here](#).

⁶⁷ *Op. cit.*

⁶⁸ ONS average weekly earnings by industry (2022). [Available here](#).

⁶⁹ House of Commons Library (2022). Economic Indicators. [Available here](#).

⁷⁰ KPMG (2021). KPMG and REC UK Report on Jobs. [Available here](#).

⁷¹ *Op. cit.*

⁷² ONS (2020). Labour Force Survey. [Available here](#).

⁷³ Make UK. Manufacturing Monitor 08.02.21

⁷⁴ Make UK. Manufacturing Monitor (2021). [Available here](#).

⁷⁵ Make UK and Santander. Responding, Re-setting, and Re-inventing UK's Manufacturing Post Covid. [Available here](#).

⁷⁶ *Ibid.*

⁷⁷ *Op. cit.*

⁷⁸ ONS (2021). Graduate Labour Market Outcomes during the Coronavirus Pandemic. [Available here](#).

4. DIGITECH, DATA AND CREATIVE INDUSTRIES

This cross-cutting sector relates to those parts of the economy using digital technologies such as blockchain, data sciences, digital technology, AI, quantum, automation and robotics. Digital technologies are typically used to support new business models, processes and/or revenue opportunities. Data, also referred to as big data, involves the use of datasets to analyse, evaluate, inform and improve business practice.

This wide-ranging sector presents considerable potential for the Y&NY economy across a diverse series of industries from tourism and culture to rail, financial services and manufacturing that are increasingly adopting new and innovative practices. Digital adoption has the potential to transform business efficiency, productivity and innovation. The ambition for this priority sector is to support growing digitech firms and emerging niches, including digital occupations in businesses that do not traditionally belong to the digital sector, as well as stimulating more universal adoption.

4.1. ECONOMIC HEADLINES – YORK & NORTH YORKSHIRE

- In total, 15,500 people are employed in the digitech, data and creative industries, including 6,000 in York, 4,000 in Harrogate and 1,500 in Hambleton.
- The sector has experienced significant GVA growth (10.8%) since 2015, despite a reduction in employment over the same period (-11%).
- ONS data reveals a record 5.5 vacancies per 100 employees in the ICT sector.⁷⁹
- This sector currently accounts for 2.9% of North Yorkshire's GVA, the seventh-lowest proportion of any English ITL (International Territory Level).

Digitech, Data and Creative Industries Dashboard	Y&NY
Employment (2020)	15,500
Employment Growth (2015-2019)	-11%
GVA (2019)	£612 million
GVA Growth (2015-2019)	10.18%
Employment concentration (LQ)	0.44

4.2. KEY GLOBAL AND UK TRENDS

The global digital market has been valued at US\$336 billion, with an expected CAGR of 23.6% between 2021 and 2028.⁸⁰ The World Economic Forum identified opportunities for the adoption of new digital technologies, which could be worth up to US\$100 trillion over the next ten years.⁸¹

Rapid digital growth will place substantial pressure on the supply chain. Coupled with global geopolitical events, this may present opportunities for UK-based suppliers. For instance, global supply chain constraints in the semi-conductor field are set to continue for the medium term, which will impact sectors using embedded electronics and electech (e.g., automotive, games, consumer electronics and sensors). Many countries, including the UK and the US, will be seeking to reduce their reliance on imports by turning to onshore manufacturing to increase the domestic supply of semiconductors and compound semiconductors. The digitech sector is becoming a more prominent feature of the wider UK economy, with growth outstripping that of all other sectors.⁸²

⁷⁹ Op.cit.

⁸⁰ Grand View Research (2022). Digital Transformation Market Size, Share & Trends Analysis Report. [Available here](#).

⁸¹ World Economic Forum (2018). Digital Transformation Initiative. [Available here](#).

⁸² Tech Nation (2018)

- The Department for Digital, Culture, Media and Sport estimated that 50,000 people are employed in the UK cybersecurity sector, which contributes £4 billion to the UK economy and attracts over £800 million in annual investment.⁸³ Funding for UK cybersecurity start-ups has increased by 940% since March 2020, with £496 million raised in the first half of that year.⁸⁴ With a combined estimated turnover of £2 billion, 90% of cybersecurity firms are SMEs.
- The UK government's Made Smarter Review called for the upskilling of over one million industrial workers to support the embedding of new digital technologies.⁸⁵ This review also highlights the UK's strong position in terms of AI technologies, with over 200 SMEs currently operating in this field (compared to just 81 in Germany and 50 in Scandinavia and France).

In 2020, the UK fintech industry received the second-largest amount of global venture capital investment (US\$4.57 billion).⁸⁶ According to a recent review of the UK fintech sector,⁸⁷ there are now over 2,500 UK fintech companies. The industry has the potential to create 50,000 jobs, generating £3 billion in GVA in the next three years. Over the last decade, the SME fintech sector has expanded at an average annual rate of 16%, compared to 1.3% for all SMEs. The sector comprises eight broad areas,⁸⁸ of which 50% are involved in WealthTech. Annual growth rates in this field have consistently been around 20%.⁸⁹

Software as a Service (SaaS) describes business activity that utilises centrally hosted cloud providers to host applications. The international SaaS market value is due to reach US\$94.6 billion by late 2022, with a CAGR of 16.4% from 2017 to 2022.⁹⁰ SaaS is one of the largest UK IT markets, having experienced rapid recent expansion. In 2020, it generated revenues of US\$8.18 billion, a figure predicted to rise to £10.9 billion by 2025.⁹¹

Both the UK and Y&NY have global reputations for excellence in creative tech and the arts.

- 2019 research by the Centre for Economics and Business Research (CEBR) for Arts Council England estimated that the arts and culture industry contributed £10.8 billion each year to the UK economy before the COVID-19 pandemic. GVA per worker for arts and culture was valued at £64,000, compared to £46,000 for the broader economy.⁹²
- In Y&NY, the creative, arts and entertainments sectors experienced strong growth in both GVA (35%) and employment (39%) between 2015 and 2019. Y&NY has a high concentration of libraries, museums and cultural activities, with a sectoral Location Quotient of 2.3.
- The auction house Christie's described the relationship between the arts and technology as "undergoing a dramatic transformation".⁹³ They emphasised how rapid technological advances are being embraced by the sector, highlighting the greater use of AI, virtual reality and blockchain software as examples. The world-famous North Yorkshire artist David Hockney credits new technologies with transforming his practice.

⁸³ DCMS (2021). UK Cyber Security Sectoral Analysis. [Available here.](#)

⁸⁴ Robert Walters Group (2020) Cybersecurity: Building Business Resilience. [Available here.](#)

⁸⁵ The Department for Business, Energy, and Industrial Strategy (2017). The Made Smarter Review. [Available here.](#)

⁸⁶ Tech Nation (2021). Tech Nation Report 2021. [Available here.](#)

⁸⁷ HM Treasury (2021). The Kalifa Review of UK FinTech. [Available here.](#)

⁸⁸ The eight areas are banking, RegTech, InsurTech, lending, payments, WealthTech, quote aggregators and accounting, auditing and cashflow management.

⁸⁹ Deloitte (2021). The UK FinTech Landscape. [Available here.](#)

⁹⁰ BCC Research (2020). Software as a Service Market: Technologies and Global Markets through 2022. [Available here.](#)

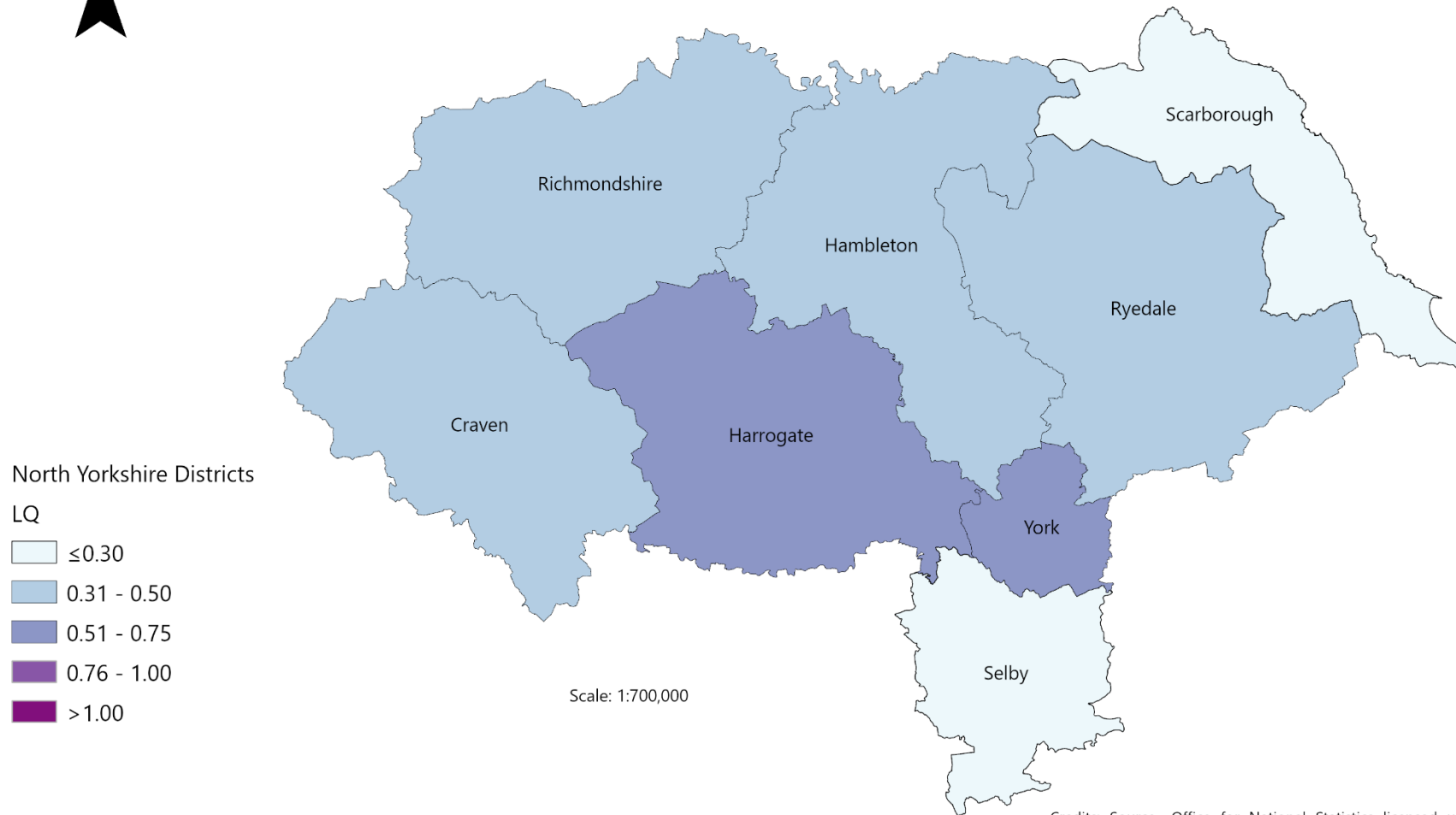
⁹¹ Statista (2022). Public Cloud Software as a Service Revenue in the UK from 2017-2025. [Available here.](#)

⁹² Centre for Economics & Business Research (2019). Contribution of the arts and culture to the UK economy. [Available here.](#)

⁹³ Christie's (2019). The Growing Relationship between Art and Technology. Page 3. [Available here.](#)



Location Quotients for the Digital Technology, Data and Creative Industries Sector 2020



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4.3. SPECIALISMS AND SUB-SECTORS

FINTECH AND E-COMMERCE

In the Pennine Region, 135 fintech firms have been identified,⁹⁴ creating a positive “halo effect”⁹⁵ that extends to nearby locations like North Yorkshire. Y&NY is home to several key fintech/e-commerce firms, including lending and payment specialists Trustpayments, Welcom Digital and Nostrum, who have a significant presence in Harrogate, as well as York-based Kodypay, recent recipients of £2.4 million in investment funds to develop their payment platform business.

SOFTWARE AS A SERVICE

Numerous local software solutions businesses operate across various sectors, including agri-food and the environment. Harrogate-based Authenticate IS offer a track-and-trace app that provides provenance information to the food industry, while Cybake Software (York) have created cloud-based bakery management software. Scarborough-based Castle Group specialise in environmental measurement and monitoring technology, in addition to software/cloud solutions. Located in York, Precision Decisions provide a range of software solutions to their agri-clients through their MiFarm platform. Paperound (Skipton) have devised an application offering a series of delegation services.

CYBER AND DATA SECURITY

Employment in cybersecurity rose by 138% across Yorkshire and the North East from 2020 to 2021, with this area comprising 18% of all UK cybersecurity roles.⁹⁶ Fifty-five per cent of the UK’s cybersecurity firms are now outside London, with 21 rapidly growing firms based in Yorkshire.⁹⁷ According to the Department for Culture Media and Sport, York has been identified as a key city in the region for cybersecurity. GCHQ, the national security intelligence agency, employs over 200 cybersecurity staff at a Scarborough outstation of their main Cheltenham site. US mining firm Anglo American have committed to creating a cybersecurity cluster in North Yorkshire, following investment in cybersecurity apprenticeships in Scarborough.

CREATIVE TECH

York City Council’s successful UNESCO City of Media Arts bid claimed that the creative industries were the fastest-growing sector in York, with 250 creative arts companies employing over 3,000 people.⁹⁸ Before COVID-19, the creative, arts and entertainments sector had grown by 39% between 2015 and 2019. In 2020, 1,250 people were employed across the creative, arts and entertainment sector in Y&NY, with 3,000 in the libraries, archives and museums/other cultural sector. Local creative and cultural firms are adopting innovative technologies. Museum Development Yorkshire offer innovation workshops, while Skipton-based AI technology firm Peel Interactive have worked with the Broughton Hall Estate, York Mansion House and Drax Visitor Centre to improve their visitor experiences through 3D modelling, interactive learning and virtual reality.

Y&NY is a renowned location for TV and film productions, while there is evidence of digital innovation linking the creative sector in York to the world beyond. For instance, York’s DC Labs World Centre of Excellence is exploring what the future might look like in 2050 if the use of AI and digital technology can be optimised.

⁹⁴ These are clustered in and around Leeds and Manchester.

⁹⁵ Deloitte (2021). The UK Fintech Landscape. Page 5. [Available here.](#)

⁹⁶ Private Equity Wire (2020). Cybersecurity becomes UK’s Fastest Growing Start-Up Sector. [Available here.](#)

⁹⁷ The Yorkshire Post (2020). Yorkshire Could Lead the Way in Cybersecurity. [Available here.](#)

⁹⁸ City of York Council (2021). York UNESCO City of Media Arts. [Available here.](#)

RAIL AND TRANSPORT INNOVATION

According to York City Council, the rail and rail-related sector employs 5,500 people in the city, while 14% of all UK rail industry jobs are located in Yorkshire and the North East. Rail companies with a presence in the city include industry-leading multinationals such as Arup and Siemens, national service providers LNER, and specialist rail innovation firms such as Omnicom Balfour Beatty, Incremental Solutions and Signature Rail. Network Rail, the national infrastructure provider, also have their Training Centre in York. Rail and automotive networks are storing higher amounts of onboard personal and enterprise data so they are considered critical national infrastructure. In rail, digital twinning will be used to monitor physical assets (for example, rolling stock and infrastructure), train movements and passenger-related information across the rail estate. York's strengths include rail engineering and consultancy, signalling, transport software systems and digital rail innovation.

4.4. MATURE AND FOUNDATION INDUSTRIES

BUSINESS, PROFESSIONAL, FINANCE AND INSURANCE SERVICES (BPFIS)

In Y&NY, 32,750 people work in BPFIS. The largest concentrations are in York and Harrogate, with 12,000 and 9,250 employees, respectively. Four thousand are employed in Craven, 2,500 in Hambleton, 2,250 in Scarborough, 1,750 in Selby, 1,250 in Ryedale and 1,000 in Richmondshire. BPFIS firms are essential not only for their contribution to the sub-regional economy but also for the vital ecosystem they create, which supports business growth in other sectors.

BPFIS is a significant and diverse sector, covering international banks and insurance companies, architects, scientific research and development, employment services, rental and leasing activities, through to more traditional accountancy and legal services. Although seriously affected by the 2008 financial crisis, employment and GVA since have risen, and this area is forecast to be one of the major growth sectors in the next 15 years. York Professionals, a vibrant organisation with over 100 members, represents the city's professional services community.

4.5. KEY ASSETS

- In 2019, York was named by the European Commission's Cultural and Creative Cities Monitor as the UK's most culturally vibrant city. In 2014, it was designated a UNESCO Creative City of Media Arts.
- C4DI Northallerton, North Yorkshire, is a tech campus focusing on agriculture, food and drink, with sister campuses in Hull and Poland. The campus will support local start-ups developing innovative tech solutions in agriculture and the food industry.
- The Institute for Safe Autonomy, a major £45 million research centre, opened in 2021 at the University of York. Its specialist laboratories and testing facilities aim to find solutions to the global challenges of assuring the safety of robotics and its associated autonomous systems.
- The York Rail Innovation Community, launched in 2019 aims to foster collaboration and knowledge sharing between digital rail professionals to make York an international hub of rail innovation excellence.

4.6. TECHNOLOGY AND INNOVATION

The ongoing digital revolution means the amount of data worldwide will continue to rise exponentially until 2050 and beyond. By 2030, 572 zettabytes⁹⁹ of data will exist (ten times more than 2020) and, by 2050, there will be up to 500,000 zettabytes of data. By 2025, over 25% of that data will support increasingly sophisticated communications technologies like 5G and 6G.¹⁰⁰ This will be accompanied by the rapid expansion and development of several digital sub-sectors.

- The global cloud computing market, which includes Software as a Service (SaaS), is expected to grow to £1.17 trillion in 2030 from a base of £235 billion in 2020, a CAGR of 15.8%.¹⁰¹

⁹⁹ One zettabyte is equivalent to one trillion gigabytes.

¹⁰⁰ Towards Data Science (2020). The Future of Good Data. [Available here.](#)

¹⁰¹ Cloud Tech (2021). Cloud Computing Market to Reach £1.17 trillion by 2030. [Available here.](#)

- The adoption of cloud computing will continue as companies and organisations seek to reduce expenditure on fixed and physical IT costs (i.e., a shift from CapEx to OpEx).
- The UK's comparatively lower productivity has been partly attributed to its lower adoption rate of digital and automation technology.¹⁰² According to the World Robotics Federation, the UK is outside the leading 15 nations in terms of industrial robotic installation.
- The development and adoption of immersive technologies are set to accelerate. The company Meta (Facebook) expects a six-fold increase in global spending on VR and AR by 2024.¹⁰³

4.7. INTERNATIONALISATION (ACTIVITY AND PROSPECTS)

Fifty-four per cent of all foreign investors surveyed for an Ernst and Young (EY) 2021 UK Attractiveness Survey cited the digital economy as a key future driver of UK growth. It has been claimed that the UK needs to focus on areas in which it excels, such as digital technology, to regain its previous position as the European market leader for foreign direct investment (FDI).¹⁰⁴ Of the £50.8 billion of foreign direct investment in the region during 2019, 16.9% (£8.59 billion) was in financial services,¹⁰⁵ while 16.5% (£8.38 billion) was in information, communication, professional, scientific, technical and administrative activities.

4.8. NET ZERO AMBITIONS

Transferring business IT operations to cloud-based services can reduce a company's energy use and the need for servers and physical equipment, while carbon emissions can be reduced by as much as 98%.¹⁰⁶ Data centres hosting the cloud are large consumers of energy. Major companies, including Microsoft, Amazon, Google and Facebook have committed to completely decarbonising their data facilities.¹⁰⁷

Digital tools such as smart meters, energy data analytics and supply chain auditing systems can make businesses more aware of their energy use and carbon footprint, helping them to identify the benefits of reducing these factors. Craven-based Optima Energy Systems currently provide energy data analytic software to over 22,000 organisations. UNIFE, the representative organisation of the European Rail Industry, has argued that the digitalisation of the industry - one of York's specialisms - and the energy efficiencies it provides will be central to developed countries meeting their sustainability goals.

4.9. FAIRER AND STRONGER AMBITIONS

- A recent parliamentary inquiry highlighted the economic contribution of the creative and cultural sector in the north.¹⁰⁸ They called for a comprehensive review of the north's collective cultural value, believing this would highlight the major contribution the region could make towards levelling up.
- The recent 'State of the North 2021/22' report by the Institute for Public Policy Research (IPPR) North outlines the importance of rewarding, highly skilled and well-paid jobs in redressing the UK's north-south divide.¹⁰⁹ UK workers possessing the leading eight in-demand digital skills earn an average salary of £42,150,¹¹⁰ so the digital sector could be an excellent source of these jobs.
- According to Tech Nation, the average tech salary is up to 50% higher than the UK average (for all vacancies).¹¹¹ Whilst the average salary for all jobs fell in 2021, tech wages rose.
- Other examples of investment in digital inclusion measures include:
 - Stockport's DigiKnow Alliance, aimed at hard-to-reach groups.

¹⁰² The Department for Business, Energy, and Industrial Strategy (2017). The Made Smarter Review. [Available here.](#)

¹⁰³ Social Media Today (2021). Facebook Published New Report on the Future Opportunities of AR and VR. [Available here.](#)

¹⁰⁴ Ibid.

¹⁰⁵ ONS (2021). Foreign Direct Investment, Experimental UK subnational Estimates. [Available here.](#)

¹⁰⁶ Microsoft (2021). Sustainable Outcomes and Benefits for Business. [Available here.](#)

¹⁰⁷ Wired (2019). Amazon, Google, Microsoft: Here's who has the Greenest Cloud. [Available here.](#)

¹⁰⁸ Northern Culture (NC) (2022). The Case for Culture: What NC Needs to Rebuild, Rebalance and Recover. [Available here.](#)

¹⁰⁹ IPPR North (2022). State of the North 2021/22: Powering Northern Excellence. [Available here.](#)

¹¹⁰ DCMS (2019). No Longer Optional: Employer demand for digital skills. [Available here.](#)

¹¹¹ Op. cit.

- Tower Hamlets' digital champions project, which aims to support skills development in marginalised groups.
- The use of free online workshops, such as Google's Digital Garage network and the Microsoft Digital Skills hub, helping residents to acquire digital business skills.

4.10. LABOUR MARKET DYNAMICS

There is latent demand for skills in the digitech sector.

- The ITC sector has experienced some of the steepest recent rises in demand for staff.¹¹² ONS data reveals a record 5.5 vacancies per 100 employees in ICT between October and December 2021, an increase of three from the same period of the previous year. There was a record 4.7 vacancies per 100 in the arts, entertainment and recreation sector between October and December 2021.¹¹³
- A Tech Nation analysis illustrated how the demand for cybersecurity skills increased by 80% between 2017 and 2019, with the demand for AI skills and Cloud skills rising by 111% and 26%, respectively.¹¹⁴
- DCMS research shows digital skills are essential for two-thirds of UK occupations and in roles with a positive wage differential.¹¹⁵ The greatest regional demand was for machinery tech, digital design and productive software skills. The highest future demand will be for data analysts, productivity software specialists and programmers. The Employer Skills Survey highlights a UK digital skills deficit.¹¹⁶

4.11. COVID-19 RESILIENCE

- The digitech and data sectors have been leaders in safe, secure and effective homeworking practices. Before the pandemic, up to one-third of ICT workers regularly worked from home.¹¹⁷
- Businesses with a robust digital infrastructure and embedded digital processes have maintained high productivity during COVID-19.¹¹⁸ Deloitte have highlighted scalability, cost, remote working needs and data protection/security as vital elements of COVID-19 resilience.¹¹⁹
- Endeavouring to address the digital skills deficit and ensure businesses in Y&NY are ready to recover from COVID-19, the Luminare Education Group established the Yorkshire Centre for Training Development (YCTD) in 2021 to assist businesses and employees to improve their digital skills.
- SaaS is crucial to helping businesses make short-term adjustments in response to COVID-19.¹²⁰ In 2021, UK SaaS revenue amounted to £7.2 billion, with COVID-19 forcing the creation of SaaS remote working solutions.
- The creative industries were among the most affected by the COVID-19 crisis. In 2020, turnover fell by £77 billion and GVA by £29 billion compared to the previous year. Despite the Job Retention Scheme, the industry lost 122,000 employees and 287,000 self-employed workers.¹²¹
- York's Festival of Ideas used virtual platforms, an excellent example of how the creative sector has responded to COVID-19 and planned for a digital future. Their 2020 virtual programme reached an audience of 43,000 across 130 different countries.

¹¹² KPMG and REC. UK Report on Jobs (2021) [Available here](#).

¹¹³ ONS (2022). Vacancies by Industry. [Available here](#).

¹¹⁴ Tech Nation (2021). Jobs and Skills Report. [Available here](#).

¹¹⁵ DCMS (2019). No Longer Optional: Employer demand for digital skills. [Available here](#).

¹¹⁶ Department for Education (2020). Employer Skills Survey. [Available here](#).

¹¹⁷ ONS (2020). Technology Intensity and Homeworking in the UK. [Available here](#).

¹¹⁸ Deloitte (2021). Accelerate Digitalization to Support Resilience. [Available here](#).

¹¹⁹ Ibid.

¹²⁰ Forbes (2020). What To Expect from The Rapidly Growing (And Evolving) Software As A Service Market In 2021. [Available here](#).

¹²¹ Oxford Economics (2020). The Projected Economic Impact of COVID-19 on the UK Creative Industries. [Available here](#).

5. HEALTH, PHARMA AND LIFE SCIENCES

The health and pharmaceutical sector includes businesses that provide or manufacture medical equipment, drugs, technologies, research information or diagnostic services. The life sciences sector refers to sciences operating in the area of living organisms. This century will be driven by biotech developments and innovation, with improved biological technologies and understanding informing the development of new therapies, vaccines, diagnostics and food. Coupled with a buoyant world health and pharmaceutical market, these developments will present major opportunities for the Y&NY economy.

5.1. ECONOMIC HEADLINES – YORK & NORTH YORKSHIRE

- In total, 3,950 people are employed in the health, pharmaceuticals and life sciences sectors. This sector has an overall LQ of 1.22. Craven has an LQ of 4.23, Harrogate 1.39, Ryedale 1.15 and Richmondshire 1.12. The remaining Local Authorities all have an LQ below 1.
- GVA for this sector is £213.5 million but negligible growth has been experienced since 2015.
- The most recent UK government figures estimate that 256,000 people are employed in life sciences.¹²² Seventy-six per cent of these jobs are located outside the South East. In all, 18,200 people are employed in Yorkshire and the Humber in the life sciences sector,¹²³ the third-largest number for any region outside London and the South East.
- This sector accounts for 1% of North Yorkshire’s GVA, ranking it below the national average for English ITLs and significantly below East Yorkshire and North Lincolnshire (3.1%), Tees Valley and Durham (3.1%) and Cheshire (7.2%).

Health, Pharma and Life Sciences Innovation Dashboard	Y&NY
Employment (2020)	3,950
Employment Growth (2015-2019)	7.5%
GVA (2019)	£214 million
GVA Growth (2015-2019)	0%
Employment concentration (LQ)	1.22

5.2. KEY GLOBAL AND UK TRENDS

A rising and ageing world population, lifestyle diseases, the emergence of MedTech and digital health services are driving consumer demand for health and wellness products and services. Consumers are accelerating the pace of change in healthcare in terms of new products and innovations in diagnostics, genetics and drug development. These factors are driving new areas of growth in the pharmaceutical and life sciences industry.¹²⁴

- The global health and wellness market has an estimated value of US\$1.5 trillion and its annual growth is between 5% and 10%.¹²⁵
- The global drugs market continues to expand, with a CAGR forecast of up to 7.3% until 2026. Global medicine spending is also projected to increase by 2-5% annually and exceed US\$1.1 trillion in 2024.

¹²² Office for Life Sciences (2020). Bioscience and Health Technology Sector Statistics. [Available here.](#)

¹²³ The Science Industry Partnership. Life Sciences 2030 Skills Strategy. [Available here.](#)

¹²⁴ Deloitte (2021). 2021 Global Health Care Outlook. [Available here.](#)

¹²⁵ McKinsey (2021). Wellness in 2030. [Available here.](#)

- The DNA sequencing market is set to be worth US\$40 billion by 2030, with a CAGR of 17.5% after 2021.¹²⁶ Genetic sequencing and analysis, genetic testing and diagnostics, and genetic editing are all poised to be major growth markets.¹²⁷
- New health and wellness niches like FemTech, which are growing due to advances in hardware, software and sensing technologies, are set to expand rapidly. The FemTech market could be worth an estimated US\$3 billion by 2030.¹²⁸
- Consumer spending on mental health is likely to grow. Asian markets in particular offer considerable opportunities in this area since large markets like Japan follow the market trends of Europe and the US.¹²⁹

According to the Office for Life Sciences, the UK core biopharma¹³⁰ sector has an annual turnover of £40.7 billion.¹³¹ The UK government's recent Life Sciences 2030 Skills Strategy¹³² highlighted the sector's growth potential, stating that it could provide up to 133,000 new jobs over the next decade.¹³³ Of all these positions, 43,000 are predicted to be created in the biopharma sector.

In terms of digital health, including e-health and clinical diagnostics:

- In 2019, the global digital health market was worth approximately US\$350 billion.¹³⁴ Overall, 45% of this market involves care delivery services offering, for instance, novel therapies enabled by digital technologies,¹³⁵ digital patient consultation and online prescription services.
- In fact, every field of the digital healthcare sector is expected to expand by at least 10% per annum until 2024.¹³⁶
- According to US bank SVB, a record US\$28.2 billion was invested in e-healthcare technologies during 2021. This represents a substantial increase of US\$17.2 billion from 2020. E-health investment in Europe increased from US\$1.36 billion in 2020¹³⁷ to US\$2.58 billion in 2021.
- The Science Industry Partnership estimates that by 2030, up to 90,000 UK jobs could be created in the MedTech sector¹³⁸.
- In the UK, the NHS is the dominant customer in the country's healthcare IT and digital market, which is valued at £5 billion. This market is particularly focused on telehealth, mobile health, data analytics, digitalised health provision services, R&D and genomics.¹³⁹
- According to UK government statistics, 5% of UK life sciences employees now work in the digital health sector¹⁴⁰.

The UK is widely regarded as a global leader in advanced therapies and life sciences.

¹²⁶ Digital Journal (2021). DNA Sequencing Market Forecast. [Available here](#).

¹²⁷ The Motley Fool (2022). Investing in Genomics Stocks. [Available here](#).

¹²⁸ Pitchbook (2022). What is femtech? [Available here](#).

¹²⁹ *Op. cit.*

¹³⁰ Includes all businesses involved in the development/production of pharmaceutical products.

¹³¹ The Office for Life Sciences (2022). Bioscience and health technology sector statistics. [Available here](#).

¹³² Written in partnership with the Association of the British Pharmaceutical Industry (ABPI) and the BioIndustry Association.

¹³³ Science Industry Partnership (2021). Life Sciences 2030 Skills Strategy. [Available here](#).

¹³⁴ McKinsey (2021). Healthtech in the Fast Lane. [Available here](#).

¹³⁵ Such as the diabetes and healthcare monitoring technologies offered by [Livongo](#).

¹³⁶ McKinsey (2021). Healthtech in the Fast Lane. [Available here](#).

¹³⁷ Quarterly data suggests that [the UK accounted for 30% of all European investment deals in 2020](#).

¹³⁸ *Op. cit.*

¹³⁹ Latham and Watkins (2021). Digital Health 2021. [Available here](#).

¹⁴⁰ *Op.cit.*

- This has been attributed to the UK's unique combination of elite universities, streamlined deregulation, excellent skills base, extensive datasets, large-scale public and private sector funding, and dynamic SME sector.¹⁴¹
- The UK is home to nearly a quarter of all advanced therapy medicinal product developers, with over 70 active firms.¹⁴² As of December 2020, 12% of all global advanced therapy medical trials were taking place in the UK, developing treatments for serious life-limiting diseases and conditions such as cancer, Parkinson's and multiple sclerosis.¹⁴³
- In 2019, £4.8 billion was spent on R&D by the UK pharmaceutical sector. Twenty-one per cent of total public sector R&D expenditure was spent on healthcare (£2.6 billion).¹⁴⁴
- In October 2021, the UK government announced a £5 billion support package designed to support innovation in healthcare as part of their Life Sciences Vision.¹⁴⁵

The rapid introduction of the COVID-19 vaccine is an example of continued drug and vaccine innovation, investment and development. The biopharmaceutical industry will continue to grow, with concepts like treatment-improving antibody drugs representing a shift from the synthesis of chemical compounds to new biological drugs. With a world-leading life sciences and advanced therapies sector, the UK is ideally placed to benefit from the continued expansion in this area.

- The UK is one of the leading three destinations for clinical research and commercial early phase trials, delivering 12% of all global trials for innovative cell and gene therapies in 2019.¹⁴⁶
- The UK life sciences sector generates an annual turnover of £80.7 billion.¹⁴⁷ Employment in the sector has risen by 8% in the past decade, while annual turnover has increased by 3%.¹⁴⁸
- As part of their Life Sciences Vision, the UK government has pledged to make £1 billion of funding available to the sector.

5.3. SPECIALISMS AND SUB-SECTORS

Several niches/sub-sectors in Y&NY make major contributions to employment and growth.

BIOSCIENCES

- Skipton-based nutritional product manufacturers Principal Healthcare and Health Innovations are excellent examples of how Y&NY firms can harness the opportunities presented by the expanding bioscience economy. Principle Healthcare won the Queen's Award for International Trade in 2012 as recognition of their rapid progress since their formation in 2002 to become one of Europe's largest suppliers of nutritional products.
- Bioscience growth is not confined to human health activities. US multinational corporation IDEXX Laboratories Inc. employ 250 staff at their Wetherby site to develop veterinary medical products.

¹⁴¹ The Economist (2021). How British science came to the rescue. [Available here.](#)

¹⁴² EPR (2021). UK at the Forefront of Advanced Therapies. [Available here.](#)

¹⁴³ Ibid.

¹⁴⁴ HM Treasury (2021). £5 billion Package in R&D to Spur Innovation in Healthcare. [Available here.](#)

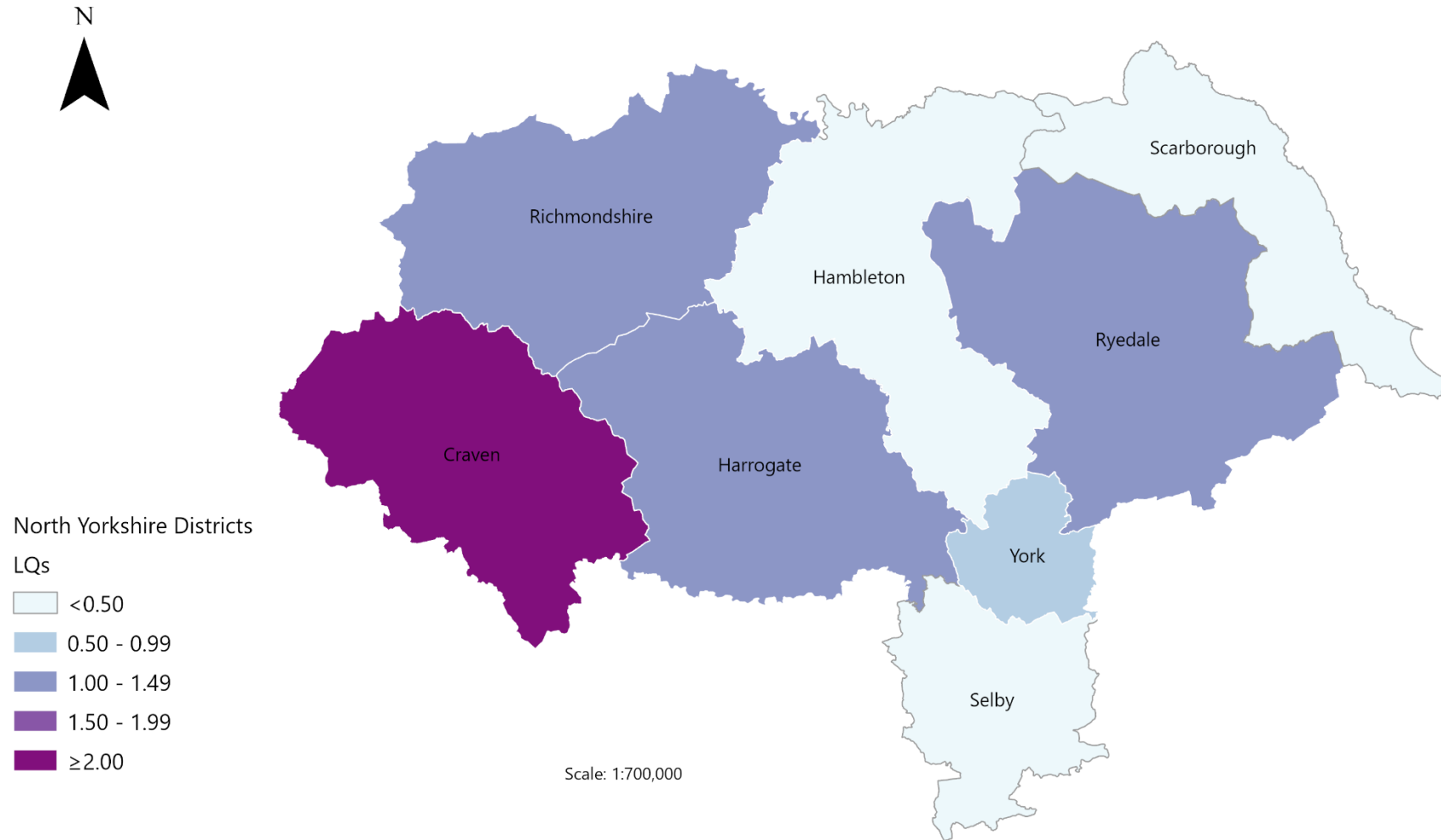
¹⁴⁵ Ibid.

¹⁴⁶ Department for Business, Energy & Industrial Strategy (2021). Life Sciences Vision. [Available here.](#)

¹⁴⁷ The Office for Life Sciences (2019). Bioscience and health technology sector statistics 2019. [Available here.](#)

¹⁴⁸ The Science Industry Partnership (2020). Life Sciences 2030 Skills Strategy. [Available here.](#)

Location Quotients for the Health, Pharma and Life Science Innovation Sector 2020



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E-HEALTH AND CLINICAL DIAGNOSTICS

Science Industry Partnership data states the region has the second-largest cluster of MedTech activity outside the South East.¹⁴⁹ There are numerous examples of recent development and growth:

- York-based medical diagnostic firm Abingdon Health reported a turnover of £11.6 million in 2021 (a 123% increase from the previous year). At the start of 2020, they invested in their York and Doncaster manufacturing facilities to meet the extensive demand for COVID-19 lateral flow testing.
- Northallerton-based MedTech firm GI UK Medical recently secured £650,000 to develop their gastroenterology products.
- Award-winning Medtech firm PCMIS have created a cloud-based patient management system. Their base at the University of York Innovation Centre facilitates their ongoing partnership with researchers at the university. IT-IS International in Hambleton develop life science technologies and software systems. In 2020, they were purchased by the Australian clinical diagnostic firm Novacyt for £10.1 million.

ADVANCED THERAPIES AND LIFE SCIENCES

There is a burgeoning ecosystem of medical research, innovation and investment in Y&NY:

- Since 2004, £40.4 million has been awarded by Innovate UK (IUK) to 'Ageing Society, Health and Nutrition' R&D projects across Y&NY. This constituted 90% of all IUK R&D awards during this period.
- The Northern Alliance Therapies Centre was established in 2018. This brought together a consortium of 20 industrial, NHS and academic organisations to develop the systems and infrastructure needed to establish a northern ecosystem of advanced therapy organisations.
- University of York academics are undertaking a range of advanced therapy research. Dr Paul Genever is the lead scientist of Arthritis Research UK's Tissue Engineering Centre. Dr Gonzalo Bruno's research focuses on gene treatment to prevent muscle loss in immobilised patients. Professor Jenny Southgate has developed the world's only laboratory-grown urothelium.¹⁵⁰
- Sand-Hutton-based human skin microbiology specialists Labskin have recently doubled their lab and office presence and expanded their workforce to 30.
- Labcorp in Harrogate specialise in preclinical and clinical pharmaceutical development. More broadly, the corporation supported the development of many of the leading 50 pharma drugs in the international market. Labcorp employ 1,400 staff at their Harrogate site.
- The expanding healthcare and pharma cluster in Skipton now hosts a manufacturer of advanced wound care products (Systagenix), nutritional supplement providers Principle Healthcare and Health Innovations, veterinary pharmaceutical manufacturers Dechra, and eye-care specialists Hilco Vision.

5.4. KEY ASSETS

- The Biotech Campus in York comprises around 382,000 square feet of specialist facilities across 82 acres. The campus is the place of work for 1,000 people, and it features fitted wet and dry labs, office and write-up space, and specialist manufacturing facilities for science, technology and product commercialisation. Its particular specialisms are agri-tech, food biotechnology, environmental, medical, healthcare and diagnostic work.
- The York Structural Biology Laboratory (YSBL) at the University of York conducts ground-breaking research in protein science that leads to new medical drugs and therapies, as well as advances in industrial processes and sustainable energy.
- The York Biomedical Research Institute, also based at the University of York, has over 90 researchers and focuses on advanced discoveries in biomedical science.

¹⁴⁹ Science Industry Partnership (2020). Life Sciences 2030 Skills Strategy. [Available here](#).

¹⁵⁰ The cell layer that lines the inside of the bladder.

5.5. TECHNOLOGY AND INNOVATION

The COVID-19 pandemic has accelerated investment in several parts of the sector,¹⁵¹ building on the pre-pandemic innovation and growth.

- Across the globe, digital transformation will continue to drive productivity improvements across this sector, in terms of delivering health and wellness services and compressing R&D times for the development of new drugs.
- According to Deloitte, customer preferences and their difficulties accessing face-to-face appointments are “driving the development of digitally enabled, on-demand and seamlessly connected patient doctor interactions”.¹⁵²
- AI technology and the greater capacity to use deep learning to mine large datasets will lead to breakthroughs in drug discoveries and in the medical imaging industry, enabling anomalies and diseases to be identified earlier.
- Biometric technologies via mobile devices for identification and authentication when accessing health and medical services will continue to become more widespread.
- Wearable technologies to monitor bodily signs and functions will progress as sensor, imaging and communications technologies become cheaper and more effective. The barriers to ingestible and implantable sensors are making less feasible the mainstream introduction of new in-body monitoring procedures and the acquisition of new biological data insights.
- Current healthcare models will struggle to resolve many modern provision challenges, including cost, access, quality and efficiency; therefore, novel solutions must be developed.¹⁵³

5.6. INTERNATIONALISATION (ACTIVITY AND PROSPECTS)

Ernst and Young identified life sciences as one of the strongest-performing UK sectors for FDI, with COVID-19 significantly impacting foreign investor preferences.¹⁵⁴

- The health and well-being industries were identified by 34% of international investors surveyed as key drivers of UK economic growth.¹⁵⁵ The life sciences sector attracts annual inward investment worth £1 billion.¹⁵⁶
- In 2020, inward investment in the UK’s AI industry rose by 17%, more than in the rest of Europe combined.¹⁵⁷
- There has been a trend to reshore advanced manufacturing capacity to offset global supply chains risks as a result of the COVID-19 pandemic. Currently, over 80% of pharmaceutical ingredients come from India and China, with markets like the US and Europe increasingly reliant on them for active pharmaceutical ingredients (APIs). To decrease foreign dependencies, there is a growing tendency to reshore, that is, bring production back onshore.¹⁵⁸

5.7. NET ZERO AMBITIONS

Sustainable activity and commitments are also increasing across the sector. Nine leading national pharmaceutical associations outlined a joint industry statement in 2021 in response to the COP26 Climate Summit to support climate commitments.¹⁵⁹ The measures included investment in R&D of greener products; increasingly sustainable manufacturing and distribution practices; carbon emissions targets for supply chains;

¹⁵¹ Deloitte (2021). Global Health Outlook. [Available here](#).

¹⁵² Ibid. Page 1.

¹⁵³ Ibid.

¹⁵⁴ Op.cit.

¹⁵⁵ Op. cit.

¹⁵⁶ The Science Industry Partnership (2020), Life Sciences 2030 Skills Strategy. [Available here](#).

¹⁵⁷ The Office for Life Sciences (2020). Life Science Industrial Strategy. [Available here](#).

¹⁵⁸ Op. cit.

¹⁵⁹ ABPI (2021). Drive to Net Zero: How Pharmaceutical Companies are Helping the Fight Against Climate Change. [Available here](#).

the use of renewable energy sources; reductions in water use and the installation of energy efficiency technology. In all, 80% of national biopharmaceutical association members¹⁶⁰ have set net zero or carbon-neutrality targets.

5.8. FAIRER AND STRONGER AMBITIONS

As it is expanding and provides a wide variety of highly skilled and well-remunerated jobs, this sector has the potential to make a significant contribution to the LEP's fairer and stronger ambitions.

- The BioIndustry Association highlighted the diverse nature of the industry, stating that it offers excellent opportunities for high-quality jobs across many fields, including data analytics, research, bioprocessing, regulation and clinical delivery.
- The sector is one of the UK's most productive, with an average GVA per worker of £104,000.¹⁶¹
- BioYorkshire aim to support the levelling up agenda and post-COVID-19 recovery through the creation of 4,000 highly skilled jobs across the county.

Recent concerns have been expressed about labour and skills shortages.

- Industry groups such as the Science Industry Partnership (SIP) have raised concerns that the current skills infrastructure across higher and further education will be unable to meet the skills challenge presented by global economic trends. A recent Employer Skills Survey stated that up to 33% of current UK job vacancies are unfilled because of a lack of appropriate skills.¹⁶²
- The SIP called for a far more diverse and inclusive approach to recruitment that would focus on lifelong learning and partnerships with education and training providers. The group requested earlier engagement with young people to support inclusive recruitment practices.
- The UK government are funding life sciences apprenticeships via the UK Apprenticeship Levy. As part of this scheme, funding worth £1.5 million has been provided for the Advanced Therapies Apprenticeship Community (ATAC). The ATAC was established to train young people in the skills required for working in advanced therapies.
- The third sector plays a vital role in delivering local healthcare. As greater focus is placed on prevention strategies and local responsive delivery, this role will continue to grow, as will the inclusive employment opportunities it offers. Across the region, 28.5% of Third Sector Organisations (TSOs) were involved in primary care delivery. Of these, 31.8% were supporting people with mental health conditions, 26.3% were supporting people with physical health conditions and 26.1% were supporting those with physical disabilities.¹⁶³

5.9. LABOUR MARKET DYNAMICS

The recent SIP Life Sciences Skills Strategy¹⁶⁴ identified skills gaps in immunology, genomics and clinical pharmacology, although such specialist skills are required for the design and manufacture of new innovative therapies. The sector experienced a 9% rise in jobs between 2010 and 2019, at a CAGR of 0.9%.¹⁶⁵ As of 2019, the UK advanced therapies sector employed 1,500 people, and it has been estimated that by 2035, the sector could be worth £10 billion to the UK economy and employ over 18,000 people.¹⁶⁶

¹⁶⁰ Covering the UK, the EU, the US, Canada and Japan.

¹⁶¹ *Op. cit.*

¹⁶² *Op. cit.*

¹⁶³ Joseph Rowntree Foundation (2016). Third Sector Study in Yorkshire and the Humber. [Available here.](#)

¹⁶⁴ *Op. cit.*

¹⁶⁵ The Office for Life Sciences (2019). Bioscience and Health Technology Sector Statistics 2019. [Available here.](#)

¹⁶⁶ Alliance for Regenerative Medicine and BIA (2019). Leading Innovation: The UK's ATMP Landscape. [Available here.](#)

5.10. COVID-19 RESILIENCE

The COVID-19 pandemic has highlighted the strategic importance of this sector and created new opportunities for growth, following record levels of investment in 2020.¹⁶⁷

- The role of digital technology in treating COVID-19 has been extensively proven, and the UK has developed one of the world's most sophisticated rapid genome sequencing capabilities.¹⁶⁸
- There has been a major increase in global health technology investment¹⁶⁹ since the outbreak of COVID-19.
- New medicines for the prevention, treatment and aftercare of COVID-19 will continue to be in high demand, including disease identification and (rapid) testing.
- Greater pressure on the capacity of the NHS due to the pandemic, an ageing population, health inequalities and shortages of medical professionals will lead to greater demand for private healthcare for certain treatments. Surgery waiting times will continue to lengthen, so remote pay-as-you-go consultations with doctors via mobile devices are likely to become more common.
- As they played a critical role in the UK's pandemic response, industries related to pharmaceuticals experienced higher turnover from March to December 2020 compared with the same period in 2019. Turnover in pharmaceutical preparations manufacturing grew by 19.4%.

York-based medical diagnostics company Abingdon Health started to produce lateral flow rapid tests. Their recent floatation on the London Stock Exchange raised £22 million and they are now planning a global expansion programme.

¹⁶⁷ DIT (2021). Invest document, Biopharmaceutical's proposition. [Available here](#).

¹⁶⁸ The Wall Street Journal (2021). How the UK Became a World Leader in Sequencing the Coronavirus Genome. [Available here](#).

¹⁶⁹ Latham & Watkins (2021). Digital Health 2021. [Available here](#).

6. SUSTAINABLE ENERGY AND BIOECONOMY

The Y&NY LEP has the ambition to be the UK's first carbon-negative region. The aim is to be carbon-neutral by 2034 and carbon-negative by 2040. Y&NY has considerable expertise in the use of bio-based products for sustainable energy production, complementing other forms of non-bio-based renewable energy. The bioeconomy refers to economic activity derived from bio-based products and processes.¹⁷⁰ Up to 60% of the physical inputs to the global economy could be produced biologically using different applications.¹⁷¹

As the global economy transitions from carbon-intensive energy sources, greater reliance will be placed on renewable and sustainable sources. Y&NY is well positioned to benefit from the new opportunities in sustainable energy and the bioeconomy.

6.1. ECONOMIC HEADLINES – YORK & NORTH YORKSHIRE¹⁷²

- This sector¹⁷³ accounts for 12.3% of North Yorkshire's GVA. This is the fifth-highest proportion of any of England's ITLs and more than double the national proportion (6.1%).
- In this sector, GVA grew by 6.1% and significant employment growth has been experienced since 2015 (15.7%).
- This sector employs 29,000 across the sub-region, which has a high LQ of 1.93. Selby and Ryedale both have very high LQs for this sector (3.61 and 3.54, respectively). Scarborough, Richmondshire and Harrogate have positive LQs (1.78, 1.43 and 1.28, respectively).

Sustainable Energy and Bioeconomy Dashboard	Y&NY
Employment (2020)	29,000
Employment Growth (2015-2019)	15.7%
GVA (2019)	£2.6 billion
GVA Growth (2015-2019)	6.1%
Employment concentration (LQ)	1.93

6.2. KEY GLOBAL AND UK TRENDS

The global sustainable energy market is valued at US\$881.7 billion and forecast to grow to US\$1,977.6 billion by 2030 at a CAGR of 8.4%.¹⁷⁴ Policy, consumer and market responses to climate change have driven investment in sustainable energy and continue to reduce costs, relative to those of fossil fuels.

¹⁷⁰ BBSRC (2022). Building the Bioeconomy. [Available here](#).

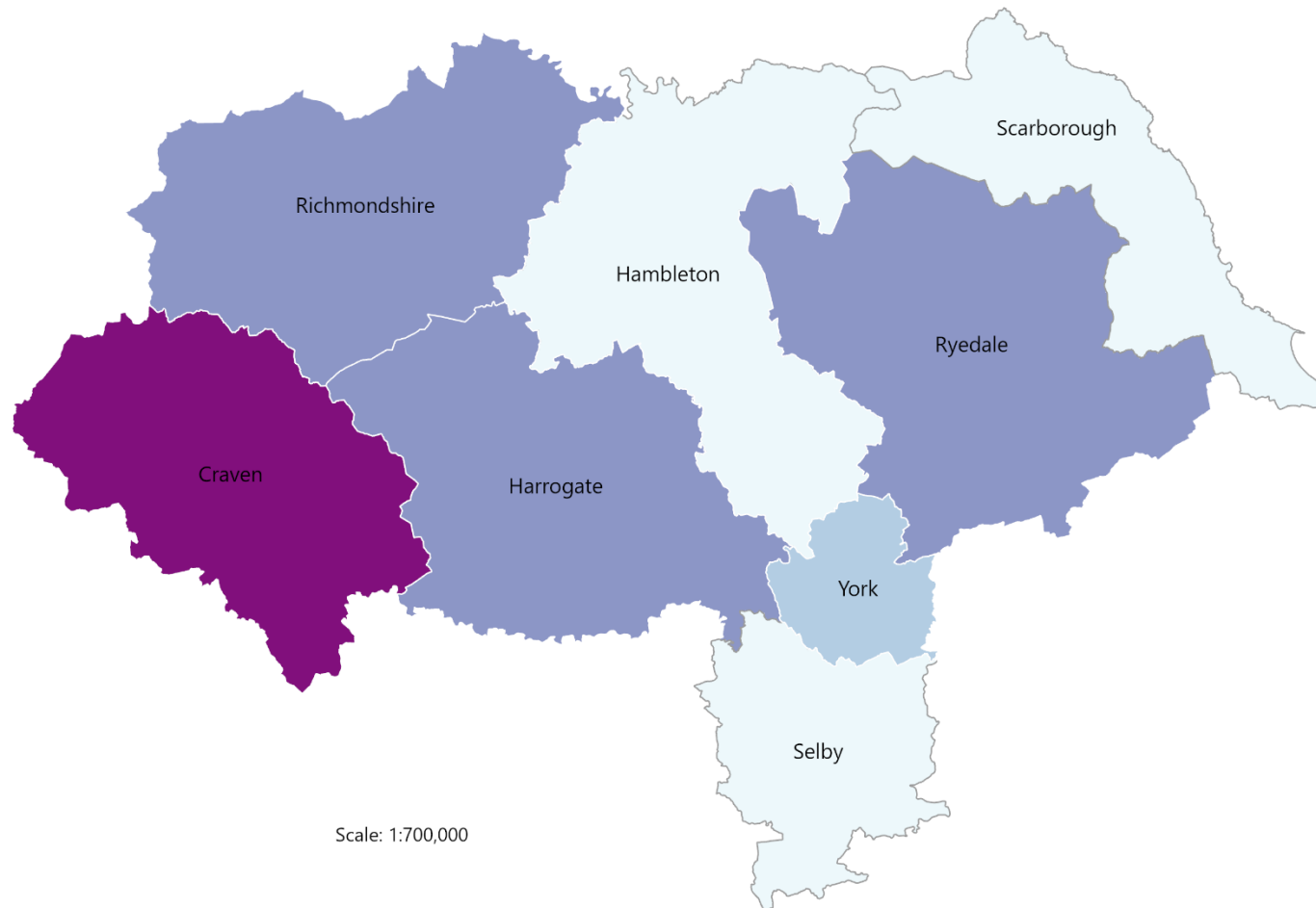
¹⁷¹ Bio East (2021). Bioeconomy. [Available here](#).

¹⁷² Please note that all these figures come from the [UK government's Bioeconomy and Science Audit definition](#) of the bioeconomy. This is a broad definition that includes bio-based manufacturing, agri-food, and waste disposal.

¹⁷³ Using the [UK government's Bioeconomy and Science Audit definition](#)

¹⁷⁴ Allied Market Research (2021). Renewable Energy Outlook. [Available here](#).

Location Quotients for the Health, Pharma and Life Science Innovation Sector 2020



North Yorkshire Districts

LQs

- < 0.50
- 0.50 - 0.99
- 1.00 - 1.49
- 1.50 - 1.99
- ≥ 2.00

Scale: 1:700,000

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The global shift to renewables and biofuels is reflected in the global expansion of these sectors.

- Total investment in hydrogen projects is forecast to surpass US\$300 billion by 2030. This figure comprises 228 major projects announced in the value chain, of which 85% are in Europe, Asia and Australia. Industrial hydrogen demand is forecast to grow by 44% by 2030.¹⁷⁵
- The global bioenergy market was valued at US\$344.90 billion in 2019 and is projected to be worth US\$642.71 billion by 2027 at a CAGR of 8.0% during the forecast period.¹⁷⁶
- Carbon capture, utilisation and storage is an emerging and growing market set to be valued at US\$7 billion by 2030, representing a CAGR of 13.8% from 2021.¹⁷⁷
- By 2030, over 205 GW of new offshore wind capacity will increase global capacity to 234 GW.¹⁷⁸
- Bioenergy accounts for roughly 10% of the world's primary energy supply. Predictions indicate that this will increase by 28% over the next five years.¹⁷⁹

Demand for sustainable energy sources will rise in the developed and developing world:

- Sustainable aviation fuels will become more widespread as their cost reduces. They produce 70% fewer carbon emissions than traditional aviation fuels and waste-to-jet fuel companies can considerably reduce the amount of waste sent to landfill.¹⁸⁰
- Off-grid solar power will continue its growth in markets with poor grid connectivity, alongside continued worldwide investment in solar farms and rooftop arrays.

The UK and Y&NY are well placed to benefit from these global trends:

- The annual turnover of the UK industrial biotechnology and bioenergy sectors was £2.9 billion in 2013/14 and this is forecast to increase to £8.6 billion by 2035.¹⁸¹
- According to IPPR, the north generates over 50% of the UK's renewable energy. Yorkshire and the Humber have experienced a 4% rise in renewable energy production since 2003.
- Wind and solar energy production currently account for 60% of the global growth in sustainable energy production. Wind and solar generated 30% of the UK's electricity in 2020.
- Sustainable technologies such as carbon capture and hydrogen energy production would potentially support up to 200,000 jobs across the UK.

6.3. SPECIALISMS AND SUB-SECTORS

In the sustainable energy and bioeconomy sector, several niches/sub-sectors have the potential to contribute significantly to employment and growth across the sub-region.

BIOENERGY WITH CARBON CAPTURE AND STORAGE (BECCS) AND BIORENEWABLES

In the UK, production levels of bioenergy and waste sources rose from 2.3 million tonnes in 2000 to 124.1 million tonnes in 2020.¹⁸² For instance, 49,000 tonnes of miscanthus were used in UK power stations in 2018/2019, up from 32,000 tonnes in 2014/2015. Yorkshire and the Humber is the second largest miscanthus producer of all regions in the UK.¹⁸³

Drax estimate that their focus on carbon capture, biomass energy production and hydrogen storage, in addition to the creation of Europe's largest decarbonisation project, will secure the jobs of their 3,400

¹⁷⁵ McKinsey (2021). Hydrogen Outlook. [Available here.](#)

¹⁷⁶ IEA (2021). Hydrogen: More effort needed. [Available here.](#)

¹⁷⁷ Allied Market Research (2021). Carbon Capture, Storage, and Utilisation Market. [Available here.](#)

¹⁷⁸ Global Wind Energy Council (2020). Offshore Wind to Surge to Over 234 GW by 2030. [Available here.](#)

¹⁷⁹ IEA (2021). Global Biofuels Demand. [Available here.](#)

¹⁸⁰ Velocys (2022). Velocys to Meet Drax to Discuss Negative Carbon Emissions. [Available here.](#)

¹⁸¹ HM Government (2018). National Bioeconomy Strategy (now withdrawn). [Available here.](#)

¹⁸² BEIS (2021). UK Energy in Brief 2021. [Available here.](#)

¹⁸³ Department of the Environment, Food and Rural Affairs (2021). Official Statistics. [Available here.](#)

employees. Research commissioned by Drax predicted that up to 49,000 direct and indirect jobs could eventually be created through the BECCS programme.¹⁸⁴

HYDROGEN, OFFSHORE WIND AND SOLAR

- Endeavour Wharf in Whitby Harbour supports the Dogger Bank offshore windfarm development, offering an operations and maintenance base. Whitby is the closest serviceable port to the windfarm and offers maintenance ships 24-hour access. Dogger Bank A and Dogger Bank B will have a combined capacity of 3.6 gigawatts when fully operational, making this the world's largest offshore windfarm. As of 2021, the project had created almost 3,000 UK jobs, including a large proportion in Y&NY and neighbouring areas, opening potential markets for local companies.¹⁸⁵
- Several large solar farms have been constructed across the sub-region, including over 90,000 panels across 200 acres of farmland near Easingwold. The 34.7 MWp farm, the region's largest, will generate electricity for Warrington. The project, led by Norstar in conjunction with European Energy, is currently developing 14 solar farms, mainly in Yorkshire, the North East and Lincolnshire.¹⁸⁶ There are also plans for solar developments in Richmond.¹⁸⁷ Gridserve's new £62 million solar farm in Easingwold is the first in the UK to deploy an innovative form of sun-tracking technology.
- As previously mentioned, the Drax Group has made a strategic decision to invest £3 billion in hydrogen and sustainable biomass power production, with a focus on becoming carbon-neutral by 2030.

6.4. MATURE AND FOUNDATION INDUSTRIES

MINING INNOVATIONS

When fully operational, Anglo American's potash polyhalite mine outside Whitby will be the deepest mine in Europe and produce 10 million tonnes a year. So far, £530 million has been invested in the project, which incorporates a 23-mile tunnel from the site to a Teeside Port.¹⁸⁸ The extracted polyhalite will be used as an environmentally friendly organic low-chloride fertiliser. The owners have highlighted their belief that the innovative mining process is relatively simple, non-chemical and low-energy. The project is expected to create up to 1,000 direct jobs. It is anticipated to support another 1,500 in the supply chain and wider economy.

6.5. KEY ASSETS

Under the banner of Biovale, several institutions focus on the bioeconomy or produce outputs that can be considered beneficial for the bioeconomy. Associated with the University of York, this non-profit organisation promotes the Yorkshire bioeconomy by improving value from biowastes and advanced biorefining. Biovale aims to develop Yorkshire into a strong bioeconomy with a focus on renewable raw materials and low-carbon agriculture. Several other institutions are linked to the University:

- The Biorenewables Development Centre (BDC) helps businesses to devise ways of converting plants, microbes and biowastes into profitable biorenewable products. The BDC allows SMEs to test their innovative technologies using their cutting-edge facilities, conduct biorenewable research, and test and scale-up green processes. It offers a broad variety of biological and chemical research services across the biorenewables supply chain.
- The York Structural Biology Laboratory (YSBL) investigates the use of molecules to probe cellular biology, software and methods development and the exploitation of enzymes in biocatalysis. Facilities include a wet laboratory with the capacity for gene cloning and sequencing.

¹⁸⁴ Vivid Economics (2020). Carbon Capture at Drax: Delivering Jobs, Clean Growth, and Levelling Up. [Available here](#).

¹⁸⁵ SSE (2021). Hundreds More Green Jobs Created by Dogger Bank Wind Farm. [Available here](#).

¹⁸⁶ The Yorkshire Post (2020). Norstar to play its part in Britain's green energy revolution. [Available here](#).

¹⁸⁷ Richmondshire Today (2020). Plans unveiled for huge solar farm near Richmond. [Available here](#).

¹⁸⁸ FT (2021). Anglo American Flags Major Changes to Multibillion-Pound UK Fertiliser Product. [Available here](#).

- BioYorkshire is a project led by the University of York, Askham Bryan College and Fera Science to develop bio-based supplies of fuel, chemicals and materials. The aim is to help more than 800 start-ups and spinouts to create 4,000 skilled jobs by 2030, generating £5 billion for the North.
- The THYME project (a £5 million collaboration between the Universities of Teesside, Hull and York known as the Mobilising Bioeconomy Knowledge Exchange) aims to simplify and enable knowledge exchange and attract inward investment to the bioeconomy. The consortium has already been awarded £1 million in research grants.
- The Green Chemistry Centre of Excellence conducts leading research into microwave chemistry, alternative solvents, clean synthesis and bio-based mesoporous materials, producing spinouts such as Starbons Ltd (a firm that carbonises starch).

In addition, Drax plan to invest £40 million at their Selby plant in 2022 as the first phase of their bioenergy with carbon capture and storage project.

6.6. TECHNOLOGY AND INNOVATION

As a technology-heavy sector, sustainable energy and bioeconomic growth will rely greatly on R&D and innovation development and investment. According to Innovate UK, the clean growth and infrastructure sector in Y&NY has received only £250,000 in UK government innovation grant funding since 2004.¹⁸⁹

6.7. INTERNATIONALISATION (ACTIVITY AND PROSPECTS)

EY research shows that 19% of foreign investors regard cleantech as a growth opportunity for the UK.¹⁹⁰ While this was a fourfold increase from 2018, it was low compared to the figure of 39% for the rest of Europe. Sixty per cent of investors stated that sustainability policies are important when selecting areas for investment. Thirty-six per cent of investors expected that cleantech and renewable energy generation would be the key factor driving future economic growth across Europe.¹⁹¹ This sector provides an opportunity for the sub-region to leverage its strengths in sustainable energy production, agri-food and advanced manufacturing.

6.8. NET ZERO AMBITIONS

The International Energy Agency believe that to have a chance of limiting the rise in global temperatures to 1.5°C, 90% of world energy will need to be generated by sustainable sources by 2050¹⁹². They predict that the current rate of transition to sustainable energy sources must be doubled to achieve global net zero by 2050.¹⁹³ Therefore, any greener ambitions in Y&NY will rely extensively on this sector.

- The European Commission outlined the potential contribution the bioeconomy sector could make towards sustainability goals. They highlighted how the sector could diversify supplies of food, feed and raw materials whilst creating employment and rural development.¹⁹⁴
- Y&NY has assets to support further sustainable energy sources. 1,910 hectares of farmland is dedicated to miscanthus production and 433 hectares to short-rotation coppices.¹⁹⁵ The Knabb's Ridge and Rusholme windfarms produce a combined total of 40 MW of electricity. Endeavour Wharf in Whitby is the closest serviceable port to the North Sea windfarms at Dogger Bank.
- Drax produce 12% of the UK's renewable electricity. Drax claim their BECCS programme will be removing eight million tonnes of CO₂ from the atmosphere annually by 2030 (20% the amount the Parliamentary Climate Change Committee believe is needed to achieve net zero by 2050).

¹⁸⁹ Innovate UK (2021). Innovate UK Funded Projects Since 2004. [Available here](#).

¹⁹⁰ *Op. cit.*

¹⁹¹ *Op. cit.*

¹⁹² IEA (2020). Renewables 2020. [Available here](#).

¹⁹³ IEA (2020). Renewables 2020. [Available here](#).

¹⁹⁴ European Union (2020). Developing a Circular, Sustainable and Transformative Bioeconomy. [Available here](#).

¹⁹⁵ Both are the second-largest amounts for any UK region. Miscanthus and short rotation coppice farmland are used for energy production.

6.9. FAIRER AND STRONGER AMBITIONS`

Increasingly a source of highly skilled and stable jobs, this sector will contribute extensively to the LEP's 'fairer and stronger' ambitions. The Association for Renewable Energy and Clean Technology estimated that 140,000 people in the UK were employed in the renewable energy and cleantech sector in 2020. This is predicted to rise to 330,000 by 2035.¹⁹⁶ The National Bioeconomy Strategy identified the sector's geographic spread as one of its main strengths, with employment provided across coastal, rural and urban communities.¹⁹⁷ The third sector is also a highly active participant in sustainable development activities, from food waste to community energy projects.

6.10. LABOUR MARKET DYNAMICS

Growing demand for employment and skills in the sustainable energy and bioeconomy sector could lead to skills shortages in some occupations. However, the new opportunities to replace lost employment in traditional energy industries could affect an 18% fall in employment by 2040 (Oxford Economics). The sustainable energy and bioeconomy sector employs 8,528 people across the region, a figure that could rise to 20,500 by 2035.¹⁹⁸ In all, 41.8% of this employment derives from wind energy (compared to 37.2% across the UK). The largest expansion in renewable energy jobs in the region is predicted to come from wind energy and bioenergy sources.¹⁹⁹ Since 2014, 6.2% of the UK's renewable energy jobs have been situated in the region, while up to 47,800 direct and indirect jobs could be created in carbon capture and storage and hydrogen production and related activities.²⁰⁰

6.11. COVID-19 RESILIENCE

COVID-19 and national lockdowns suppressed international energy demand from some business and transport sectors, but the UK is facing an energy supply and price challenge as the economy recovers.

- The energy sector was badly affected by COVID-19, with energy use suppressed by 4% in 2020. Nevertheless, economic stimulus packages and vaccine rollouts led to greater economic activity in 2021 and a corresponding 4.6% rise in energy use.²⁰¹
- Significant fluctuations in wholesale oil and gas prices have led to several high-profile business failures in the sector. Supply chain challenges mean that clean energy transition has become central to COVID-19 recovery plans.²⁰² The IEA estimates that governments have committed US\$470 billion to clean energy measures as part of their economic responses to COVID-19.²⁰³

¹⁹⁶ REA (2021). Review 21. [Available here](#).

¹⁹⁷ HM Government (2018). National Bioeconomy Strategy (now withdrawn). [Available here](#).

¹⁹⁸ IEA (2021). Review 21: Renewable Energy View. [Available here](#).

¹⁹⁹ *Op. cit.*

²⁰⁰ *Op. cit.*

²⁰¹ Forbes (2022). Failed UK Energy Suppliers Update. [Available here](#).

²⁰² IEA (2021). Exploring the Impacts of COVID-19 on Global Energy Markets, Resilience, and Climate Change. [Available here](#).

²⁰³ IEA (2021). Sustainable Recovery Tracker. [Available here](#).

7. ACTION PLAN

This chapter introduces a suggested five-point action plan designed to support sustainable growth and resilience in the priority sectors.

OBJECTIVE 1: GREEN INNOVATION - NET-ZERO PATHWAYS AND LOW-CARBON SOLUTIONS

These measures build on the sub-region's 'Routemap to Carbon Negative', 'North and West Yorkshire Emissions Reduction Pathways' and the 'Circular Economy and Action Plan'.

P1	<p>Support. Low-carbon opportunities and waste minimisation solutions can be created through the development of a 'green innovation accelerator', building on and complementing the work of the Yorkshire Circular Lab. Impartial advice/reviews should be included to help:</p> <ul style="list-style-type: none"> • Farmers/growers reach net zero by creating a circular agri-food sector. • Decarbonise manufacturing operations. • SMEs become more resource-efficient and resilient. 	LEP Lead
P2	<p>Promote. Support a series of ambitious pilot challenge projects under the accelerator with key partners. Examples include:</p> <ul style="list-style-type: none"> • Industrial decarbonisation/greenhouse gas removal projects, such as that of Drax, using captured carbon from surrounding industries. • Deep social and council housing retrofit projects with local authorities. • Pharmaceutical and healthcare low-carbon innovations. • Electric vehicle charging and solar. 	LEP/Drax/ LAs/
P3	<p>Inspire and promote. Use the accelerator to profile low-carbon good practice and exemplars. Use local companies/third-sector bodies to inspire others, for instance, through video case studies. This could include:</p> <ul style="list-style-type: none"> • Reducing packaging in agri-food (e.g., Yorkshire Pasta) • Reducing food miles and waste (e.g., Heck, BDC) • Energy conservation (Quorn) and climate change mitigation (Seagrown) • Developing the low-carbon supply chain. 	LEP/ Growth Hub
P4	<p>Invest and transition. Secure investment for energy transitions by:</p> <ul style="list-style-type: none"> • Supporting place-based investments, including circular towns, community renewable energy and district heat networks. • Leading the development of bio-based manufacturing and construction and supporting biomass and anaerobic digestion projects. • Considering a memorandum of understanding with Drax that would maximise the mutual benefits from their bioenergy with carbon capture project. • Working with Siemens on offshore wind supply chain opportunities. 	LEP/Various
P5	<p>Strengthen. Use the green innovation accelerator to support local supply chains, develop skills, build infrastructure, secure investment and drive policy changes to enable the transition to a low-carbon economy.</p>	LEP/LAs/ Various

OBJECTIVE 2: EMPOWERING PEOPLE FOR A FAIRER, STRONGER ECONOMY

This objective mirrors the Skills Strategy 2021-2026 but tailors the key relevant priorities to address the priority sectors' requirements to improve productivity, earnings and performance. These priorities fit the remit of the Y&NY Skills and Employability Board.

P1	Inspire: Ensure young people are equipped to make informed decisions about education, training pathways and jobs/careers in the priority sectors by cooperating with local businesses to offer all young people meaningful encounters.	LEAs (County/ York)/ Y&NY Skills and Employability Board
P2	Develop: Ensure employers in the priority sectors can access the skills to grow highly productive and inclusive workplaces, including: <ul style="list-style-type: none"> • Technical skills that support innovation and business growth, including apprenticeships and short-course employer-led training. • A new graduate retention scheme to connect SMEs to talented, hard-working graduates and working with the University of York on enhanced links to firms in the priority sectors. • Supporting employers to realise workforce potential, including leadership and management in under-represented groups. • Ensuring employers' skills needs are understood and addressed in the Local Skills Improvement Plan. 	Y&NY Skills and Employability Board /NY Apprenticeship Hub/HE/FE/ LEP
P3	Invest. Support skills infrastructure development, including: <ul style="list-style-type: none"> • High-quality facilities that focus on developing skills in priority sectors/areas such as low-carbon and digitech. • The promotion of existing and new facilities like the Career and Enterprise Company, Askham Bryan College's Digital Skills Academy, Northallerton's Digital Skills Hub and the Yorkshire Centre for Training Development (FE/employer collaborations). • Continuing to leverage and promote skills/careers funding applications from sources such as the National Skills Fund, the Getting Building Fund and the Shared Prosperity Fund. 	Y&NY Skills and Employability Board / LEP/ Growth Hub
P4	Support. Opportunities for all: <ul style="list-style-type: none"> • Use devolved adult education budget funds to support pathways into priority sectors, including those experiencing labour shortages (e.g., digitech and cyber, agri-food and culture) • Address barriers to employment and progression in the priority sectors • Support new business formation in the priority sectors • Use social value in procurement to promote local employment opportunities. 	LEP/ Y&NY Skills and Employability Board/ Growth Hub

OBJECTIVE 3: SUPPLY CHAIN RESILIENCE AND GROWTH AND DIGITAL ADOPTION

These measures could be supported through the Growth Hub, using it as a platform to offer highly tailored support post-EU funding and help businesses to build resilience in the COVID-19 era.

P1	Support. Signpost tailored and specialist resilience support to help businesses to adjust to and compete in the COVID-19 era. This could include firms that have changed their business models to develop new markets.	LEP/ Growth Hub
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P2	Support. Consider the development of a supply chain development programme, for example, with the Chartered Institute of Procurement and Supply Chain (CIPS) or perhaps with regional partners, to encourage innovation and best practice in supply chain resilience. Use trusted intermediaries to offer reactive and proactive services to cope with disruption and economic shocks, for instance, risk identification and management, supply chain configuration, contract and demand management.	LEP/ CIPS
P3	Support. Offer digital boot camps or short, intensive training digital workshops and help employees to develop basic or advanced digital skills. Ensure tech entrepreneurs can exploit the appropriate growth, sector and trade programmes.	LEP/ Growth Hub
P4	Advise. Offer impartial advice to firms on how best to enhance their reliability and performance covering and plan for new technologies: (a) broadband connections (b) cybersecurity and (c) technology adoption to boost business productivity.	LEP/ Growth Hub
P5	Support. Ensure hands-on tailored advice and support are available to new entrepreneurs in the priority sectors in the Growth Hub's 'Starting your business' portfolio. Ensure growth managers can offer capital assistance and other support (such as succession planning or leadership and management) to the priority sectors' more established firms that aim to grow and/or scale up.	LEP/ Growth Hub

OBJECTIVE 4: STRENGTHENING R&D, SCIENCE AND INNOVATION INVESTMENT IN PRIORITY SECTORS

This objective aims to broker strong links with research assets and expertise, as well as stimulate and incentivise business investment in R&D.

Priority		Lead
P1	Support. Assist R&D centres to exploit existing and new connections with businesses in priority areas such as crop health and protection, novel agricultural products, agri-food science, CEA/vertical farming (e.g., hydroponics, aquaponics and aeroponics), food and drink, manufacturing and digitech.	LEP/R&D Intermed- iaries
P2	Invest. Secure capital funding for new equipment, revenue funds and premises that can be used to exploit business collaboration and R&D links with local firms.	LEP/UoY
P3	Inspire and promote. Ensure sub-regional programmes are available to support new product and process development once ERDF programmes end.	DIT
P4	Inspire and promote. Exploit public and private funding, collaboration and support programmes to develop and enhance innovation activities. These include regional EU/international initiatives like Horizon Europe; ²⁰⁴ national support programmes such as UKRI, the UKRI Industrial Strategy Challenge Fund, KTN and the Global Challenges Research Fund; and regional/sub-regional activities managed by, for example, Y&NLEP, York University, Bioeconomy funding (anaerobic digestion), Biovale, CHAP and the EGS/DIT Internationalisation Fund.	LEP/R&D Intermed- iaries
P5	Support. Enhance understanding of private-sector R&D support and opportunities for each priority sector by (a) inviting innovation intermediaries to promote support that can be used to access new markets and opportunities and (b) promoting R&D grant funding calls.	LEP/Growth Hub

²⁰⁴ Review sector-specific opportunities through Horizon Europe. [Available here](#)

OBJECTIVE 5: TRADE, INWARD INVESTMENT AND HIGH-VALUE OPPORTUNITIES

This measure includes both proactive and reactive approaches, stimulating interest in priority sites and sectors with clear propositions and responding effectively to investment enquiries received. It also builds on the sub-region's internationalisation strategy by adopting a sectoral perspective to boost international trade.

Priority		Lead
P1	Prepare. Develop inward investment marketing collateral to promote R&D assets and inward investment opportunities in priority sectors. Identify sector ambassadors to promote the sub-region's priority sectors. Work with intermediaries to generate priority sector inward investment enquiries.	DIT/EY/ LEP/ LAs
P2	Inspire and promote. Work with the priority sectors' key stakeholders like the Food and Drink Federation (FDF), the Engineering Employers Federation and the National Farmers Union. Identify a limited number of global events, with the support of DIT, to promote the sub-region. Consider appropriate priority trade missions with the Northern Powerhouse programme to explore the potential in new markets, incorporating R&D-led initiatives into the public and private sector.	DIT/LEP
P3	Inspire and promote. Showcase Y&NY as the Northern gateway to agri-food for interested parties and as a test bed for trials, products, and services.	DIT/ LAs/LEP
P4	Target. Focus FDI activity on the limited number of High-Performance Opportunities. Outline the size and potential of the limited number of other specific commercial opportunities (their supply chain, skills, sub-regional expertise and assets). Research and evaluate emerging markets, such as the alternative protein market, to identify how the region can be used to attract new inward investors by promoting suitable employment sites, science and manufacturing skills, among other features.	LEP/DIT
P5	Target. Exploit new distribution channels across the priority sectors by accessing the increasing use of e-commerce platforms in the US, the Middle East and China, as well as the global growth in online purchasing by discerning customers.	DIT/LEP
P6	Support. Encourage small and micro-businesses to enrol in the DIT Export Academy so they can sell to customers worldwide with confidence.	DIT/LEP
P7	Invest. Consider intensifying the reach of the Northern Powerhouse (NPH) Key Account Management Programme (KAM) to increase investment by foreign-owned businesses and strategically important priority sector businesses.	NP/LEP
P8	Promote. Raise the profile of the priority sectors by curating high-quality content for inclusion in profile-raising programmes (e.g., Tech Nation's 'Net Zero').	LEP
P9	Support. Improve the experience of businesses in priority sectors seeking support that corresponds to their position in their export journey. Consider sign-posting support by export propensity, sector and market.	LEP/DIT

8. GLOSSARY

Abingdon Health	Abingdon Health are a York-based manufacturer of lateral flow diagnostic tests.	Weblink
ABPI (Association of the British Pharmaceutical Industry)	UK trade association that represents over 120 UK pharmaceutical businesses.	Weblink
Advanced Therapies Apprenticeship Community	UK wide apprenticeship programme designed to train and upskill trainees for work in advanced therapies.	Weblink
Ag Drive	York software company that has developed an agricultural cloud-based app that supports farmers.	Weblink
Airedale Chemicals	North Yorkshire supplier and manufacturer of chemicals, surfactants, phosphates, and phosphonates.	Weblink
Anglo-American	UK based mining multinational that are developing a potash and polyhalite mine near Whitby.	Weblink
Animal and Plant Health Agency	DEFRA executive agency that works to safeguard animal and plant health.	Weblink
APS Salad	The UK's largest supplier of British tomatoes, they deploy a wide variety of innovative technologies across their seven UK sites.	Weblink
Arts Council England	Government funded body that support the performing, visual and literary arts across England.	Weblink
Arup	British based multinational design, planning, engineering, architecture and consultancy firm.	Weblink
Askham Bryan College	Specialist land-based 16-19+ college situated just outside York.	Weblink
Biomass Refinery Network	An industrial and academic collaborative community focused on developing new processes for the conversion of biomass into sustainable fuel and other materials.	Weblink
Bio Yorkshire	A University of York initiative focused upon supporting new jobs and sectoral growth across Yorkshire's green sector.	Weblink
Biorenewable Development Centre	An open access R&D facility that supports collaborative work between bio-based academics and bio-based industry.	Weblink
Biovale	Membership organisation that supports the bioeconomy across Yorkshire and the Humber.	Weblink
Black Sheep	Masham-based brewery that produces over 70,000 barrels of real ale annually.	Weblink
Breck Foods	Meat free frozen and chilled food manufacturers located in Selby.	Weblink
Bremsen Technics	Europe's leading supplier of automotive brake friction products with a facility in Brompton on Swale.	Weblink
Broughton Hall Estate	Historic house near Skipton with a number of holiday homes located within their estate.	Weblink

C4DI	Northallerton technology campus that serves innovative business working in the agricultural and food sectors.	Weblink
Career and Enterprise Company	National body created by the Department of Education in 2015 to support careers education across English schools and colleges.	Weblink
Castle Group	Environmental measure and monitoring specialists with a site in Scarborough.	Weblink
Centre for Excellence in Livestock	The UK's livestock innovation centre, it works on introducing innovative technologies and processes into livestock production.	Weblink
Centre for Novel Agricultural Products	Bioscience research centre based at the University of York that focused upon harnessing the power of nature to develop new products and processes.	Weblink
Clervaux Garden School	Ruskin Mill run school based on a biodynamic farm for young people with complex social, emotional, behavioural and learning difficulties.	Weblink
Crop and Health Protection Centre	One of four UK Agri-Tech Innovation Centres that works with scientists, farmers and technical experts to advance crop productivity and yield across the world.	Weblink
Cybake Software	Bakery management software platform providers with an office in York.	Weblink
Dechra Pharmaceuticals	Global veterinary pharmaceutical business with a facility in Skipton.	Weblink
Department for Food and Rural Affairs (DEFRA)	Government department responsible for environmental protection, food production and standards, agriculture, fisheries, and rural communities.	Weblink
Deliciously Yorkshire	Membership organisation that supports the food and drink industry across Yorkshire.	Weblink
Department for Digital, Culture, Media and Sport	Government department responsible for culture and sport across England and the digital economy and some areas of the media across the UK.	Weblink
DIT (Department for International Trade)	Government department responsible for striking and extending trade agreements between the UK and foreign countries and encouraging increased foreign investment and trade.	Weblink
Drax Group	Selby based power generation and biofuel supply chain business with over 3000 employees.	Weblink
Drax BECCS Programme	Bioenergy, carbon capture and storage programme at Drax aiming to remove eight million tonnes of CO2 from the atmosphere every year.	Weblink
Duraweld	Packaging and stationary manufacturer and supplier located in Scarborough.	Weblink
EGS/DIT Internationalisation Fund	Grant funding from the Department for International Trade of between £1000 and £9000 to support increased international trade.	Weblink

EJOT	Specialist construction fastener manufacturers based in Sherburn in Elmet.	Weblink
European Commission's Cultural and Creative Cities Monitor	European Commission monitoring service support efforts to place culture at the heart of Commission policy making.	Weblink
Fera Science Ltd	Interdisciplinary centre of excellence focused upon investigating and solving problems within plant and bee health, crop protection, sustainable agriculture, food and feed quality and chemical safety within the environment.	Weblink
Food and Drink Federation	Membership body for UK food and drink manufacturers.	Weblink
Food and Drink Sector Council	Industry led government partnership focused upon a more productive and sustainable food and drink sector.	Weblink
Food and Drink Innovation Network	Community of innovation professionals working with the food and drink sector.	Weblink
Froneri	International ice cream manufacturers based in Leeming Bar with over 10,000 employees worldwide.	Weblink
General Communication Headquarters (Scarborough)	A Scarborough outstation of the UK's intelligence and security operation.	Weblink
GI UK Medical	Distributor of endoscopy products to the UK healthcare industry.	Weblink
Glas Data	Sogware firm providing a data dashboard platform for use within the agricultural industry.	Weblink
Global Challenges Research Fund	UK Research Institute fund that supports research that is focused upon the challenges faced by developing countries.	Weblink
Google Digital Garage	Non-profit free programme run by Google designed to help people improve their digital skills.	Weblink
Green Chemistry Centre for Excellence	University of York academic facility focused upon green and sustainable chemical research.	Weblink
Grid Iron Meat	Online meat retailer specialising in British native breed North Yorkshire sourced meat.	Weblink
Gridserve	British technology enabled energy solutions business with a solar farm near Easingwold.	Weblink
GSK (GlaxoSmithkline)	British multinational pharmaceutical company headquartered in London.	Weblink
Hambleton Steel	Structural steel fabricators and installers located in Hambleton.	Weblink
Hampton by Hilton (York)	York hotel located near York Minster and the River Ouse.	Weblink
Harrogate Spring Water	Bottled spring water company owned by French multinational food producer Danone.	Weblink
Health Innovations	Skipton based manufacturer of vitamins, minerals and nutritional supplements.	Weblink
Heck Food	Family run sausage and burger business who produce pork, chicken, and meat free plant-based products.	Weblink

High-Value Biorenewables Network	Collaborative network of academics and industry professionals working with the biorenewable sector.	Weblink
Hilco Vision	US global eye care and eyewear solutions business with a facility based in Hawes.	Weblink
Holmesterne Foods	Privately owned food manufacturing company with two manufacturing plants in North Yorkshire.	Weblink
Horizon Europe	The European Union's key funding programme for research and innovation.	Weblink
IDEXX Laboratories Inc	US multinational veterinary, livestock and poultry product manufacturer and distributor with a facility in Wetherby.	Weblink
Ilke Homes	Knaresborough sustainable modular home manufacturer	Weblink
Incredible Edible	Urban gardening project that focuses on bringing people together to produce local food.	Weblink
Incremental Solutions	York based software firm that provides big data analytic services to the rail industry.	Weblink
Intelsius	Packaging solution firm that designs and manufactures industry compliant cold chain and sample-controlled packaging.	Weblink
IT-IS International	Life science product development company located in Stokesley.	Weblink
John Smiths	Tadcaster brewery that produces a range of real ales including John Smith's, the UK's bestselling bitter.	Weblink
Knabb's Ridge Windfarm	Electricity generating site near to Felliscliffe capable of producing 16MW of electricity.	Weblink
Kodypay	Technology company located in York that provides point of sale software products through an app-based technology.	Weblink
KTN (Knowledge Transfer Network)	Innovate UK initiative that links innovators with new partnerships and opportunities.	Weblink
L'Anson Brothers	Manufacturer of animal feedstuffs based in Masham.	Weblink
Labcorp	US multinational that operates one of the largest clinical laboratory networks in the world.	Weblink
Labskin	Human skin microbiology specialists supporting cosmetic, personal care, medical device and pharmaceutical firms with bespoke R&D services.	Weblink
Legal and General Modular Homes	Construction arm of one of the UK's leading financial service groups developing and building sustainable modular homes.	Weblink
Made Smarter	UK Government initiative that connects UK manufacturers with digital tools, innovation and skills they need to implement production improvements.	Weblink
Make UK	Representative organisation for engineering and manufacturing firms across the UK, formerly known as the Engineering Employers' Association.	Weblink
Malmaison Hotel (York)	Boutique hotel located within the centre of York.	Weblink

Malton Plastics	UK trade plastic injection moulding company based in Pickering.	Weblink
Microsoft Digital Skills Hub	Post Covid Microsoft initiative to help 25 million people acquire new digital skills through free content, instruction and job seeking tools.	Weblink
MMC Taskforce	Ministry of Housing, Communities, and Local Government taskforce focused on accelerating the implementation of modern methods of construction across the UK.	Weblink
Museum Development Yorkshire		Weblink
National Bioeconomy Strategy	UK government strategy that aimed to bring government, industry and research together to support the growth of the UK bioscience and biotechnology industries. Withdrawn in November 2021.	Weblink
National Farmers Union	Members industry association that represents farmers and growing businesses within the UK.	Weblink
Network Rail Training Centre	Training centre for staff working for the national rail infrastructure provider, Network Rail.	Weblink
Northallerton Digital Skills Hub	Collaboration between Hambleton District Council, the University of Sunderland and York College to provide an education hub focused upon digital skills.	Weblink
Northern Alliance Therapies Centre	Consortium of twenty industry, NHS and academic organisations focused upon developing the systems and infrastructure required to support cell and gene therapies across the North of the UK.	Weblink
Northern Powerhouse Key Account Management Programme	A network of over 300 partners that share businesses success stories and news in attempt to drive further job creation and growth across the North of England.	Weblink
Norstar	Easingwold based renewable energy firm.	Weblink
Nostrum	Lending software provider based in Harrogate.	Weblink
Novacyt	Anglo-French biotechnology group focused upon the provision of clinical diagnostics, recently acquired IT-IS International.	Weblink
Omnicom Balfour Beatty	Rail innovation and engineering firm with an office in York, recently entered into a collaborative partnership with the University of York to develop new Artificial Intelligence computer software for the rail industry.	Weblink
Optima Energy Systems	Advanced energy management and analytics software provider based in Skipton.	Weblink
Organic Dales	Nidderdale based organic milk and dairy product provider.	Weblink
P3P Horticultural Technology Park	A new energy centre in Selby producing heat, CO2, and electricity for adjacent food growers and the national grid.	Weblink
Paperound	Skipton based software provider with a marketplace platform providing intern resources for SMEs.	Weblink

Peel Interactive	Skipton software developers, programming and 3-D modelling firm producing interactive content for clients.	Weblink
Perfectly Fresh	Vertical farming business growing salad produce in Selby.	Weblink
Phytoponics	Hydroponics growing system manufacturers based in Selby.	N/A
Precision Decisions	Agricultural specialist firm that supports farmers with software and engineering technologies, based in Shipton-by-Beningborough.	Weblink
Principal Healthcare	Provider of vitamins, minerals, and nutritional supplements based in Skipton.	Weblink
Product and Process Innovation Project	Innovation network supporting SMES across York, North Yorkshire and the Leeds City Region with capital grants to support the development of new products or services.	Weblink
Provenance Inns and Hotel Group	York based hospitality businesses with seven pubs and hotels across North Yorkshire.	Weblink
Quorn Global Innovation Centre	Innovation centre based at Quorn's headquarters in Stokesley focused upon producing new meat-free products.	Weblink
Raithwaite Village	Private holiday home complex located in Whitby.	Weblink
Requench	Harrogate based firm that have developed an efficient condensing technology for producing potable water in arid climates.	Weblink
Rusholme Windfarm	EDF owned 12 turbine windfarm near Selby capable of producing 24MW.	Weblink
Ryeburn of Helmsley	Helmsley based ice cream manufacturer.	Weblink
Ryedale Group	Sustainable plastic print production firm in Kirkbymoorside.	Weblink
Samuel Smiths	Family-owned brewery located in Tadcaster; it is the oldest brewery in Yorkshire.	Weblink
Sandburn Hall	Hotel and leisure complex located near Flaxton.	Weblink
Sarnia Foods	Food and drink manufacturer that provide food services to major retailers.	Weblink
Seagrown	Sustainable seaweed farm off the Scarborough coast, they provide seaweed for use in biodegradable plastics, pharmaceuticals, cosmetics, textiles, and biochemicals.	Weblink
Sedamyl	Manufacturer of starches, sweeteners, proteins, and alcohol for use in food and beverage industry.	Weblink
Severfield	Structural steel specialist with multiple sites across the UK, including Thirsk.	Weblink
Siemens Gamesa	Renewable energy component manufacturer/service provider with an offshore blade factory in Hull.	Weblink
Siemens Mobility	German rail control system firm with a rail technology office in York.	Weblink

Signature Rail	Global provider of innovative rail solutions with a rail services office in York.	Weblink
Starbons Ltd	Spin out from the University of York's Green Chemistry Centre of Excellence that uses innovative scientific techniques with starch to extend the shelf life of materials.	Weblink
Stockbridge Technology Centre	An independent agricultural and horticultural centre of excellence that supports growers and suppliers.	Weblink
Stockport DigiKnow Alliance	Council sponsored digital skills network of Stockport based community groups, organisations and individuals that support people across the town to improve their digital skills.	Weblink
Sylatech	Kirkbymoorside based engineering solutions firm that specialise in the manufacturing of thin wall lightweight components.	Weblink
Systagenix	Skipton based manufacturer of advanced wound care products, recently acquired by global healthcare company Scapa.	Weblink
Tanfield Engineering	Designers and manufacturers of protective stainless steel and polycarbonate screens and guards for the food manufacturing and processing industry. Based in Leeming Bar.	Weblink
Tech Nation	Government sponsored body/national network for tech entrepreneurs, companies & leaders.	Weblink
The Institute for Safe Autonomy	University of York institute focused upon ensuring that robotics, their software, and their communications are safe.	Weblink
Theakstons	Independent family-owned brewery located in Masham.	Weblink
Thyme Project	Collaboration between the Universities of Teeside, Hull and York to support and boost the bioeconomy across Yorkshire, the Humber and the Tees Valley.	Weblink
Trustpayments	International unified payment technology group with an office in Harrogate.	Weblink
UKRI (United Kingdom Research Institute)	UK Government public body that directs research and innovation funding across the UK.	Weblink
UNIFE (Union des Industries Ferroviaires Européennes)	European association for rail supply companies.	Weblink
Valley Tankers	Specialist tanker manufacturer (Sherburn in Elmet).	Weblink
Water and Resources Action Programme	Charity that promotes and encourages sustainable resource use across the world.	Weblink
Welcom Digital	Harrogate software firm that design and develop a digital lending platform.	Weblink
Wessex Foods	Leeming Bar based fresh meat, fish, poultry and shellfish supplier.	Weblink

Whitworth Brothers	Independent family-owned milling business, one of the largest flour millers in Europe with a mill in Selby.	Weblink
York Biomedical Research Institute	University of York institute focused upon advancing discoveries in biomedical science.	Weblink
York Biotech Campus	Biotech hub located at Sand Hutton that houses a variety of biotech, food, environmental, medical, healthcare and diagnostic organisations (formerly known as the National Agri-Food Innovation Campus).	Weblink
York Mansion House	Official residence of the Lord Mayor of York.	Weblink
York Rail Innovation Community	Community group formed by professionals working within the rail industry leveraging and supporting the development of local knowledge and expertise.	Weblink
York Structural Biology Laboratory	University of York biological chemistry research laboratory that supports collaboration between academic and industrial partners.	Weblink
Yorkshire Centre for Training Development	A training centre that offers bespoke training packages for the business community and employees at Leeds City and Harrogate Colleges.	Weblink
Yorkshire Circular Lab	University of Leeds programme focused upon supporting communities, government bodies and companies to transition toward a circular economy.	Weblink
Yorkshire Provender	Northallerton based soup manufacturing business.	Weblink
Yorkshire Tea	Internationally renowned tea blend produced by family-owned tea and coffee merchants Taylors of Harrogate.	Weblink



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