

SCIENCE, SKILLS AND INNOVATION

In The Northern Powerhouse

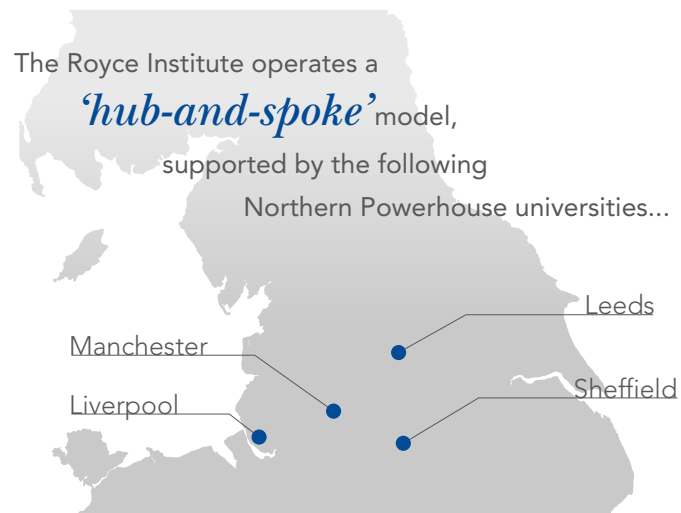
April 2020



Home to 29 universities, the Powerhouse region has seen significant investment into research and education activities across the scientific sector. Industry and university communities are collaborating to develop new materials technologies and advanced manufacturing methods which will provide huge benefits to the UK economy.

This investment is supporting business and job creation in the region, whilst widening participation in learning and research across a broad range of vocational and academic subjects, propelling a newly skilled workforce into the digital and new manufacturing era.

The Royce Institute operates a ***'hub-and-spoke'*** model, supported by the following Northern Powerhouse universities...



At the heart of the innovations in new materials science is the Henry Royce Institute – the UK's national centre for research and innovation of advanced materials. The Royce Institute operates a collaborative 'hub-and-spoke' model, with its £105m hub based at the University of Manchester. It is supported by several founding universities and research partners (or 'spokes'), which include the Universities of Leeds, Sheffield and Liverpool. All four Russell Group Universities in the Powerhouse region have made significant investments in their property estate to provide the scientific laboratories required to house the advanced scientific research equipment.



Around £2bn is also being spent on the University of Manchester's new innovation district. The innovation district ('ID Manchester') will encompass 4m sq ft of mixed-use space including large areas of public realm. The focus will be on attracting science, research, development, cultural and tech companies, along with some residential development. Overall, there is expected to be 2.6m sq ft of offices and work space. The University is currently seeking a JV partner and once a partner is selected, the JV will draw up a fresh masterplan for the site, secure planning, carry out all site-wide infrastructure works, build the site out, attract tenants and hold the site as a long-term investment asset once it completes. This process is expected to take 15 years. Diana Hampson, director of estates and facilities at the University of Manchester said:

“

[ID Manchester] is where the next generation of game-changing businesses will be nurtured, and it will bring huge economic benefits to our city region and beyond.

Our vision draws on Manchester's eco-system of ideas, discovery, research and development, and ID Manchester will provide the canvas on which all those strands can come together to take urban regeneration to a whole new level.”¹

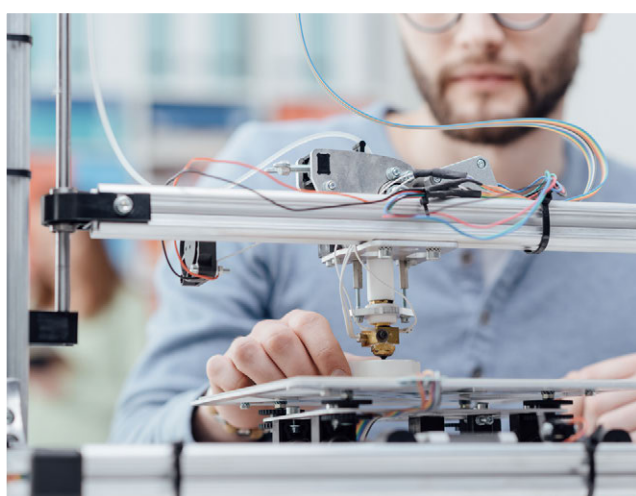
Diana Hampson, Director of Estates and Facilities at the University of Manchester



TRANSLATIONAL ENERGY RESEARCH CENTRE

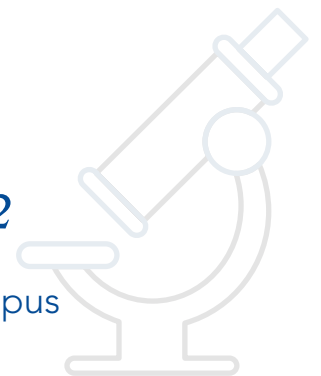
Manchester is by no means the only Northern Powerhouse city building world-class innovation hubs and research centres. The University of Sheffield is currently developing the open-access Royce Translational Centre (**RTC**) which will house state-of-the-art powder manufacture and processing facilities. The University's £81m Diamond Building opened in 2015 providing specialist teaching facilities for engineering, including 19 laboratories, a chemical engineering pilot plant, a clean room, an aerospace simulation lab and a virtual reality suite. Another research centre which is also in the pipeline and will form part of the University's Energy Institute is the Translational Energy Research Centre (**TERC**). The TERC will provide bespoke facilities that will help researchers and academics develop low-carbon technologies. Approximately 24 pieces of research equipment will be installed and commissioned within the 1,600m² building. G&T is providing Project Management services on this project.





The University of Leeds is currently developing the Sir William Henry Bragg Building. The £96m, 15,700m² building will create an integrated campus for Engineering and Physical Sciences at the university and will provide critical central teaching and social interaction spaces. The structure will include various offsite engineered units such as precast concrete columns and pre-stressed flooring units and has been designed to achieve a BREEAM 'Excellent' rating when it becomes operational.

£96m
15,700m²
integrated campus





ADVANCED MANUFACTURING RESEARCH CENTRE

The region is also seeing a renaissance in Advanced Manufacturing Parks, with the University of Sheffield leading the way with the development of a former colliery site into the Advanced Manufacturing Research Centre (**AMRC**). The centre, which specialises in carrying out world-leading research into advanced machining, manufacturing and materials for aerospace and other high-value manufacturing sectors, has attracted significant inward investment to the region from the likes of Rolls-Royce, McLaren Automotive, BAE Systems and Airbus.

Towards the east of the region, the University of Hull secured £12m of funding to build the Aura Innovation Centre (**AIC**), which will provide research facilities for major offshore wind innovations. The centre has been built to bring together university experts and 'green' companies aiming to identify opportunities to innovate and collaborate in offshore wind. The centre provides a space for businesses to develop new renewable energy technologies, create a stronger supply chain for the renewables and low carbon sectors and spearhead the Humber's low carbon and offshore wind ambitions. Boasting numerous green credentials, the BREEAM 'Excellent' rated building will offer cutting-edge research facilities such as an augmented reality and large green screen area, a materials characterisation suite, high tech 3D printers capable of printing recycled plastic and a mechanical workshop area.





LEEDS BECKETT UNIVERSITY

Leeds continues to see growth in the Arts and Sports sectors. Leeds Beckett University has invested £45m in its new Carnegie School of Sport Teaching and Research Building and is also investing £80m in a new Creative Arts building. Leeds City College is investing £57m as the home for its School of Creative Arts and Leeds Arts University is developing a new £22m building to house its Music and Film schools. The University of Leeds also has plans to develop its first out-of-town site which will be used to undertake research into High Speed Rail testing facilities.

The UK's major northern cities are investing heavily in placemaking, transportation, creative arts and the reinvention of their heritage, which is attracting people to live, work and learn in these great cities. The advent of the digital era is providing greater connectivity, helping businesses to grow within more affordable city locations. Businesses also have better access to the local skilled workforce who, in turn, are benefitting from the significant investment in the education facilities on offer to them.



CASE STUDY

University of Sheffield

AMRC FACTORY 2050

The Advanced Manufacturing Research Centre (AMRC) is a world-class centre for advanced machining and materials research for aerospace and other high-value manufacturing sectors.

It is a partnership between industry and academia, which has become a model for research centres worldwide.

The research factory is designed to meet the future needs of aerospace and other high-value manufacturing industries. Airbus, Roll-Royce, BAE Systems and Spirit Aero Systems are all committed to supporting the project.

The 6,730m² industrial research base is the UK's first fully reconfigurable assembly and component manufacturing facility for collaborative research, capable of switching production between different high value components and one-off parts.

G&T is providing Project Management Services on this scheme.

CASE STUDY

*University of Leeds***SIR WILLIAM
HENRY BRAGG
BUILDING**

Royce equipment will be hosted in the new Bragg Centre - a £96m development to create a shared interaction between Physics and Engineering.

The 15,700m² building will be used for the development of energy efficient computing, telecommunications, pharmaceutical formulations, 'smart foods' and medical technologies.

Potential application areas cover almost all industrial sectors and particularly ICT, Healthcare and Energy, with multi-billion pound industries facing major transformation changes as a result of the scientific developments and discoveries ahead.

G&T is providing Cost Management and Cost Planning services on the scheme.

CASE STUDY

University of Manchester
CITYLABS 4.0

Planning consent has been given to the next phase of the Citylabs campus expansion, dubbed 'Citylabs 4.0'.

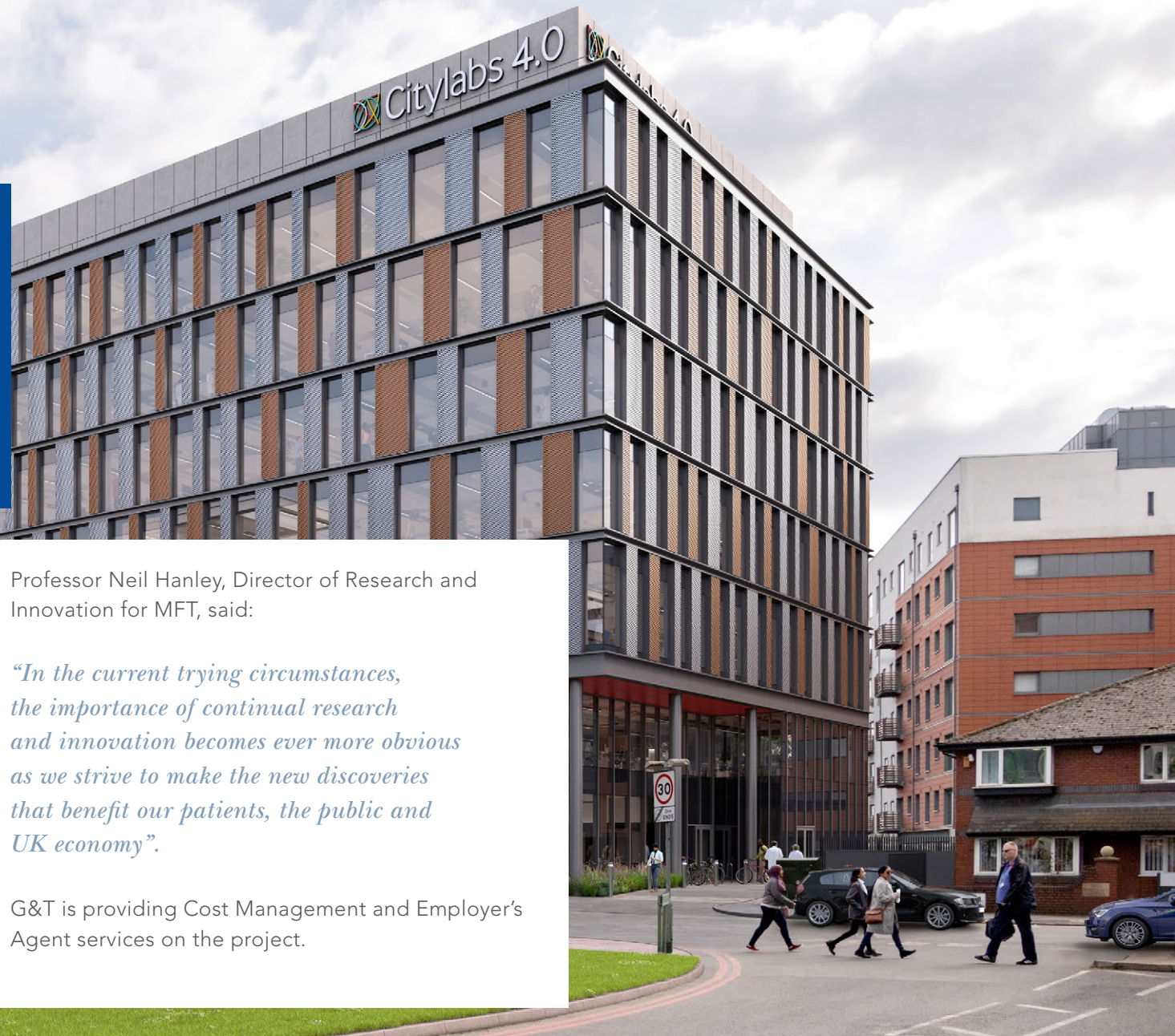
125,000 sq ft of office, lab and meeting space will be provided over seven floors and will help cement the campus as an international hub for genomics, digital health and precision medicine.

The £35m project is a collaboration with Manchester Science Partnership (**MSP**) and Manchester University NHS Foundation Trust (**MFT**) on behalf of Bruntwood SciTech.

Professor Neil Hanley, Director of Research and Innovation for MFT, said:

“In the current trying circumstances, the importance of continual research and innovation becomes ever more obvious as we strive to make the new discoveries that benefit our patients, the public and UK economy”.

G&T is providing Cost Management and Employer's Agent services on the project.



CASE STUDY

*University of Sheffield***THE ROYCE
DISCOVERY
CENTRE**

In May 2018 planning was received to build an innovative new, research-focused building for the Faculty of Engineering.

As a major partner of The Henry Royce Institute, the university was awarded £34 million to fund the commercialisation of fundamental research into advanced metals processing.

The space will house state-of-the-art equipment for powder manufacturing and processing, enabling the local business community to investigate the feasibility of using new technologies without needing to invest in their

own equipment. Research conducted at the centre will help evolve materials discovery and processing techniques.

Six 'vibration sensitive' labs are to be provided along with a 'laser room'. A planning statement said the centre would be a 'significant and positive addition to the city'.

G&T is providing Project Management services on this project.



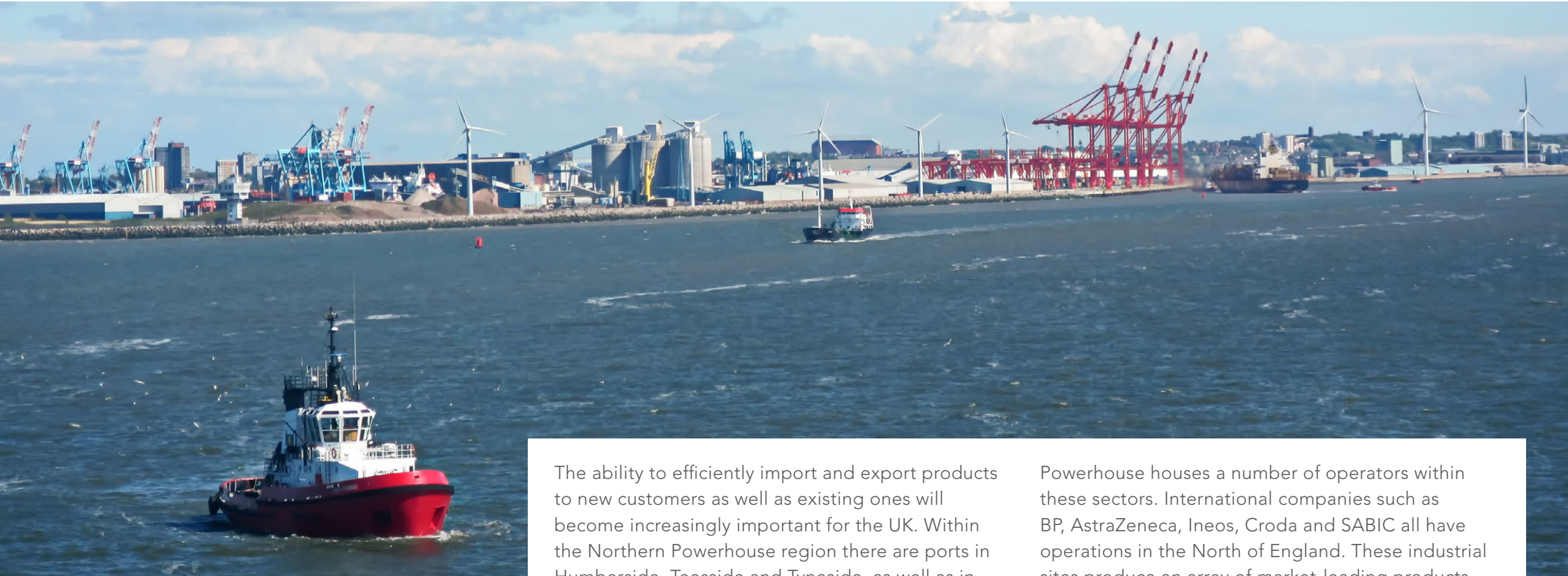
THE NORTH'S INDUSTRIAL HERITAGE

The Northern Powerhouse Partnership (**NPP**) believes that the North occupies a unique position in delivering the UK's energy requirements. Supporting the Government's Industrial Strategy is important. Getting local plans to implement national initiatives, negotiating deals via the LEPs and working together across geographies will help to deliver the ambitious goals set out in the strategy.

The mining industry in the UK has been at an all-time low since the demise of the coal industry. The Industrial Strategy goes some way to address this but it is early days for many of its higher level initiatives. In the northern region though, we are seeing a new focus with the commencement of the construction of Woodsmith Mine to extract high-grade polyhalite - a proven fertilizer. Sirius Minerals, the current operator of the mine, has approved

a £405m takeover offer from Anglo American to rescue the company from administration and provide the funds necessary to complete the mine and bring it forwards to the operations stage.

There are plans to build two 1,600m deep shafts and a 40km underground tunnel from the shaft site which will transport the material from just outside Scarborough to Teesside. These mine shafts are being constructed using an innovative system never previously used in the UK. At Teesside there will be a plant to process the polyhalite before the product is shipped via an upgraded port to customers world-wide. The mining is expected to go on for many decades as the polyhalite is currently the largest deposit in the world. This has enormous benefits for the Northern Powerhouse region.



The ability to efficiently import and export products to new customers as well as existing ones will become increasingly important for the UK. Within the Northern Powerhouse region there are ports in Humberside, Teesside and Tyneside, as well as in Liverpool. Each of these ports may see an increase in the volume of goods passing through them in the coming years. As such, investment will be required to develop these ports to improve their ability to be able to deliver higher volumes and provide more storage for products prior to shipping and on arrival before onward journeys.

In a different vein, the chemical and process industries are continually evolving and the Northern

Powerhouse houses a number of operators within these sectors. International companies such as BP, AstraZeneca, Ineos, Croda and SABIC all have operations in the North of England. These industrial sites produce an array of market-leading products and receive regular investment in new plant and facilities.

Not only is the Northern Powerhouse a big player in the chemical field, it is also home to nuclear power facilities such as Sellafield, as well as a new proposed power station on the island of Anglesey. The North is also leading the market in terms of alternative energies such as offshore wind and bioenergy.



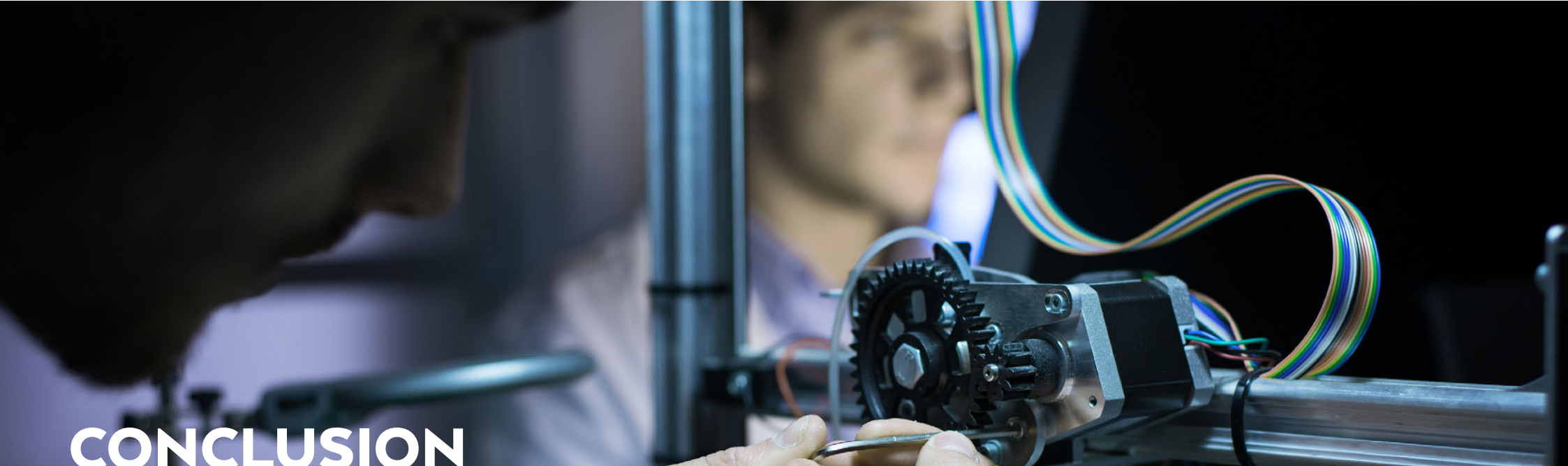
CASE STUDY

SALTEND CHEMICALS PARK

BP's chemical manufacturing facility in Hull is one of its most innovative operations, producing acetic acid and acetic anhydride. These organic chemicals are used in a range of applications such as paints, washing detergents and food preservation.

G&T has worked on the BP Chemical Park at Saltend for more than 20 years, providing a variety of cost consultancy services.

G&T has managed the maintenance contract and any new projects over this period. We also work with BP's technology centre on new pilot plants and facilities.



CONCLUSION

The historical ‘technology gap’ in the North (as measured by Patents per Worker and R&D spend) has stabilised since the early 2000s². More opportunities and ideas are now being exploited which is being driven by the growing science, research and innovation base in the region.

In 2016 the Northern Powerhouse Independent Economic Review³ set out an overview of the North’s prosperity, productivity gaps and described its competitive advantage and sector strengths. It identified four ‘prime’ economic capabilities or priority areas, which will form the core of future economic growth:

Advanced manufacturing	Energy
Digital	Health Innovation

The NPP will support the development of these collective strengths of the northern economy, helping to rebalance productivity and prosperity in Britain. Although these areas are ripe for growth in the North, the region has a wide range of sectoral strengths, as evidenced by the growing number of industry clusters that are creating positive economic spillovers.

The regional economic impact of establishing strong ‘innovation clusters’ should not be underestimated. These interconnected ecosystems produce dense knowledge flows from universities to businesses, drive innovation and entrepreneurship and increase productivity and employment in the Powerhouse region. The North has successfully built up a world-class industry and research base, underpinned by shared research centres and close working relationships between some of the country’s leading universities and industry. The seeds have been planted, but to fully flourish and reach its immense potential, the region needs a strong (and locally administered) industrial strategy, as well as further policy and investment support.

²<https://www.transportforthenorth.com/wp-content/uploads/Northern-Powerhouse-Independent-Economic-Review-Executive-Summary.pdf>

³<https://www.transportforthenorth.com/wp-content/uploads/Northern-Powerhouse-Independent-Economic-Review-Executive-Summary.pdf>

THANK YOU

