ncc
innovating
for industry

Innovation that delivers industrial impact

Proud to be part of | University of BRISTOL | CATAPULT High Value Manufacturing

We are NCC

Overview

A world-leading innovation organisation that turns cutting-edge research and technology into industrial impact.

We bridge the gap between academia and industry, helping companies of all sizes to capitalise on cutting-edge innovations to deliver more. We do this at every stage of their journey and across the entire product lifecycle, from the earliest concept to end-of-life.

Part of the **High Value Manufacturing (HVM) Catapult** and the **University of Bristol**, we've evolved from our origins as the **National Centre of Excellence in composite technology**.

We provide a gateway to world-class expertise, advanced facilities, and industrial collaboration. A not-for-profit organisation, we leverage these assets to complement our customers' capabilities, helping them to develop their people, grow, compete, and succeed through technology and product leadership.

As well as working with industrial partners, we help create the conditions that enable UK innovators and industry to thrive. This includes providing national and local decision-makers with insight and evidence to inform strategy, policy, and investment decisions.

What we do

As an extension of our customers' capabilities, we demonstrate and de-risk new product development and manufacturing to validate technologies at rate and scale.

We pull through a broad portfolio of science and engineering research to enhance existing products and processes – improving productivity, growing supply chains, and extending service life through innovative repair or extension technologies. We unlock end-stage value through recycling, repurposing, or low environmental impact disposal of critical materials.

Our mission, vision & values

→ Vision

An innovation partner to industry, we help create a sustainable, productive, and resilient future.

→ Mission

Transforming today's industries and creating tomorrow's.

→ Values

- We make a difference.
- We push the boundaries.
- We deliver excellence together.
- We care about our future.

How we help

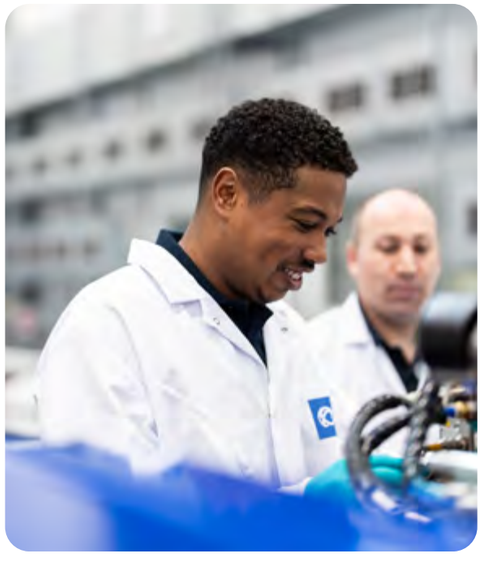
We provide businesses access to £300m state-of-the-art innovation facilities, engineering expertise, and leading research.

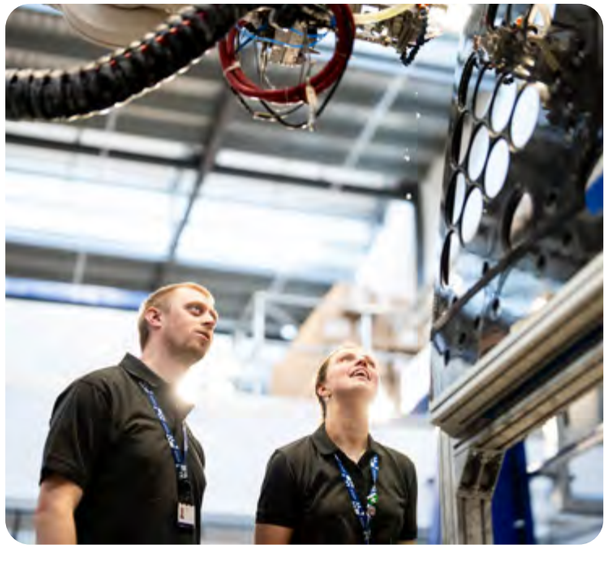
A key partner in globally significant innovation programmes, we work with businesses of every size to get new technologies, products and processes to market fast. In parallel, we support companies to develop their people and understand the skills their future workforce will need. By doing so, we create jobs, anchor supply chains and ensure UK industries stay at the forefront of global innovation.

Our strategy

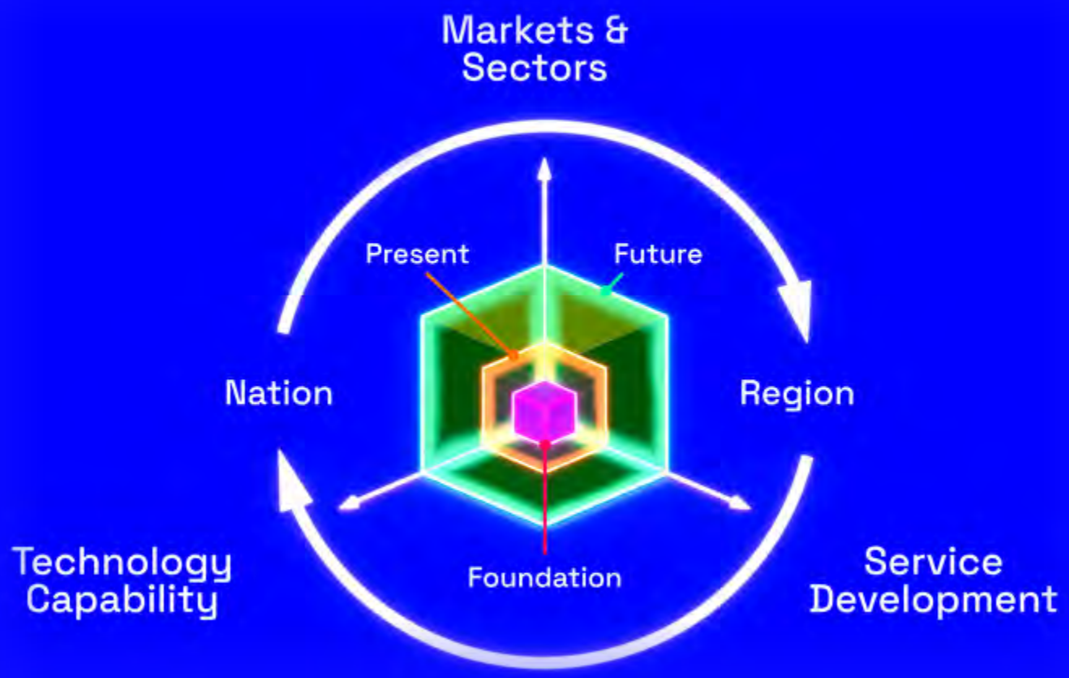
Maximising impact for the companies we support:

- Driving industrial impact.
- De-risking innovation.
- Enabling product & technology leadership.
- Shaping future industries.





Our strategy in action



Our strategic priorities define our direction and reflect our purpose:

- Expanding our capabilities to create more impact for industry today.
- Exploring how to keep future industries at the forefront of innovation.
- Shaping tomorrow's industries by developing technologies, products, and people.

Our structure

NCC's 'best of both worlds' structure underpins our success. A wholly owned, but independently operated subsidiary of the University of Bristol, we translate science and engineering research into industrial impact. Part of the UK Catapult Network, we provide researchers and innovators with insights to overcome industrial challenges.

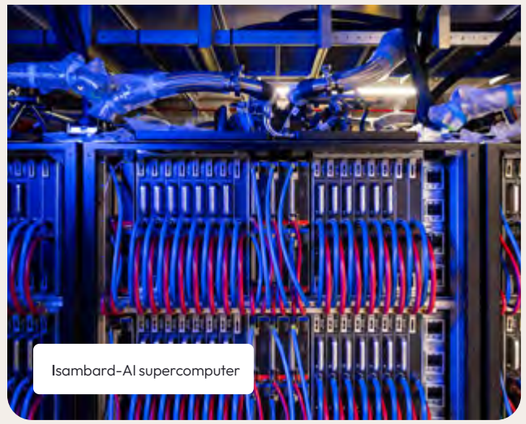
We have broad and deep academic networks with over 100 universities and numerous Research and Technology Organisations (RTOs). As part of the **HVM Catapult**, we reach across industry to both 'pull through' research and set industry-led research challenges to keep the UK at the cutting edge.

CATAPULT High Value Manufacturing

The High Value Manufacturing (HVM) Catapult is a strategic research and innovation hub for UK manufacturing, helping academia, industry and government solve the world's toughest engineering challenges. Established and supported by Innovate UK, its network of centres work together to accelerate industrial transformation, tackling key objectives in support of net zero, healthy living and national security.

University of BRISTOL

The University of Bristol is ranked within the top 10 universities in the UK and 55th in the world (QS World University Rankings 2024); it is also ranked among the top five institutions in the UK for its research, according to analysis of the Research Excellence Framework (REF) 2021; and is the fourth most targeted university by top UK employers. The University was founded in 1876 and was granted its Royal Charter in 1909. It was the first university in England to admit women on the same basis as men.



Isambard-AI supercomputer

Isambard-AI

NCC is host to the UK's most powerful supercomputer, Isambard-AI. Awarded to the University of Bristol, this £225m government investment expands the opportunity for academia and industry to harness the power of artificial intelligence (AI) in fields such as robotics, climate research, and drug discovery.

Building on our deep strengths in digital engineering, NCC is investing to 'pull-through' Isambard-AI research into industrial application. This complements our ambition to harness advanced digitalisation technologies to position the UK at the forefront of digitally-enabled and high-value engineering, manufacturing, and beyond.

Our evolution

We believe in continuous innovation, investing year-on-year to expand our capabilities. Committed to supporting businesses, pushing boundaries, and creating market-leading products and processes, we've evolved from a specialist technology centre into an organisation that drives innovation across multiple technologies and growth-driving sectors.

Our expanded portfolio of capabilities is matched by growth in the number of companies we support. In 2011, we had five founding members. Today, we have over 70 member organisations and support more than 230 additional businesses each year. These range from multinational companies to small and medium-sized enterprises (SMEs). All of them benefit from our end-to-end engineering expertise.

Bristol & Bath Science Park is announced as NCC's home.

March 2010

NCC is formally opened by the then-Secretary of State for Business.

November 2011

UK Composites Strategy reinforces NCC's leadership role.

May 2016

November 2009

Government announces £16m investment to establish a National Centre of Excellence for Composites.

June 2010

Airbus, AgustaWestland, GKN Aerospace, Rolls-Royce and Vestas become NCC's five founding members.

July 2013

NCC becomes part of the High Value Manufacturing Catapult.

CATAPULT High Value Manufacturing

November 2018

Official opening of a new NCC satellite site based in Filton.

NCC announces a £36.7m UK Government investment in 10 new cutting-edge digital manufacturing technologies for composites.

December 2018

NCC becomes a Knowledge Transfer Partnership (KTP), a 'Knowledge Base' to help businesses innovate for growth.

February 2023

NCC is announced as the future home of Isambard 3, a new TOP500-class supercomputer service for AI and high-performance computing (HPC).

May 2023

New NCC secure innovation facility under development.

2025

March 2019

NCC launches a dedicated service supporting small and medium-sized enterprises.

March 2023

NCC becomes home to the West of England Space Hub - 'Space West'.

June 2025

NCC's High-Rate Manufacture Capability (HRM Cap) receives a £15.8m Government investment to expand technologies for net zero aviation.

Our impact

Growth-driving sectors

NCC is an innovation partner to the UK's growth-driving industries, from aerospace to defence and energy.

- Aerospace
- Energy
- Defence

Aerospace

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As a long-term innovation partner to aerospace primes like **Airbus and their supply chain**, we're advancing next-generation composite wing technologies. Our work sets the foundation for what's next. Deploying capabilities from material characterisation to flying parts manufacturing, we deliver industrialised and certifiable solutions for future flight.

Our capabilities have been called on by an extensive list of businesses across the global aerospace industry. This includes companies like **Rolls-Royce** to develop its next generation UltraFan engine, **Carbon ThreeSixty** to develop scalable rotor blade manufacturing for electric vertical take-off and landing (eVTOL), and **Vertical Aerospace** to deliver critical crashworthy and lightweight components.

Accelerating innovation in high-rate manufacture capability

In 2025, NCC secured a £15.8m investment in the best high-rate, composite deposition capability in the UK. This will further underpin the UK's leadership in future wing technology and support development of next-generation narrow body aircraft. The ability to accelerate innovation in high-rate large composite structure manufacturing unlocks opportunities to deliver impact for sectors beyond aerospace, including energy and defence.

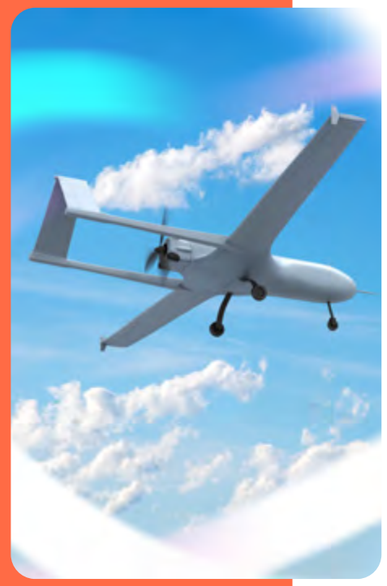
Energy

Wind energy is central to achieving the UK's energy ambitions. We're at the forefront of innovations to deliver next-generation technologies and anchor them in the UK. This includes leading work with the **Offshore Renewable Energy Catapult** to develop composite wind turbine towers for future 20MW floating turbines (**Joule Challenge**), delivering our **SusWIND** programme alongside industry partners to inform the development of a circular economy for blades and materials, and using digital technologies to identify routes to cut turbine blade manufacturing waste by up to 80% (**TURBO** programme). In 2024, **Vestas** selected NCC and the Bristol Composites Institute as one of its three global technology partners, focusing on future blade and turbine technologies.

NCC's capabilities also include hydrogen technology expertise. We achieved the UK's first successful recovery and reuse of continuous carbon fibre from a full pressure vessel; and developed a novel in-house cryostat to streamline material screening at cryogenic temperatures. With **Rux Energy**, we optimised a hydrogen storage solution using Metal Organic Frameworks (MOF), creating a lightweight tank for cryogenic temperatures that stores three times more hydrogen per volume than conventional methods.

TURBO programme

Defence



Innovation in defence is vital to UK national security. Since opening our doors, NCC has worked closely with defence customers to deliver cutting-edge products and technologies that address mission-critical challenges. We've contributed deep technical engineering expertise to collaborative R&D programmes, developed leading advanced manufacturing capabilities, and have a track record of collaborative problem solving to address complex challenges. Our enduring customer partnerships are built on trust, engineering excellence, and a shared commitment to global security.

While composites remain a foundational strength, our capability has significantly evolved. Today, we're a **centre of excellence for defence innovation** across advanced materials, digital engineering, process innovation, and systems integration. NCC is establishing a new secure innovation centre to offer further integrated solutions to accelerate programme delivery and enhance operational effectiveness.

As part of the HVM Catapult, we collaborate with the **Ministry of Defence**, defence industry primes, and SMEs to turn research into real-world impact, supporting industrial growth and increasing resilience in the UK supply chain.

Applied Research and Technology Forum for UK Defence

NCC is a regional leader with a national voice, convening the Applied Research and Technology Forum for UK Defence. It brings together industry, academia, and government to identify common challenges, drive collaboration and share expertise to unlock new opportunities for innovation.

Technology leaders from industry, innovative small and medium-sized enterprises, research centres, and academia come together to showcase innovative materials and manufacturing technologies. The forum focusses on pulling fundamental innovative technology through the mid Technology Readiness Levels (TRL 4-7) as a means of showing greater application of novel research. Technologies are explored around thematic areas such as advanced materials, digital technology, and sustainability. NCC shapes these themes through regular consultation with industry and government.

Technology leadership

A National Centre of Excellence

Pushing the boundaries of technology is core to what we do. NCC is the national Centre of Excellence for composite technologies. We underpin this with our proven track record of innovation, world-leading capabilities, and deep expertise.

We're further expanding our technology expertise by developing leading capabilities in advanced materials and digital technologies for application across the product lifecycle in multiple sectors.

Collaborating with global academic partners to identify breakthrough technologies, through to demonstrating technologies at full industrial scale with leading companies from around the world, we work across the technology spectrum to deliver step changes in technology development.

Advanced Materials

As well as continuing to pioneer composite development, NCC is committed to creating a national materials manufacturing industry. In 2024, we secured investment to build the UK's first open access manufacturing facility for continuous carbon fibre production. This carbon fibre pilot line represents a step change in UK capability, providing industry with a testbed to develop more sustainable carbon fibres, boost supply chain resilience, and de-risk investment.

In collaboration with the University of Bristol, NCC helped develop high-performance composite materials that were tested on the **International Space Station**. The results will inform the design of future space structures, such as space stations and interplanetary spacecraft. These advances contribute to more efficient, cost-effective and resilient space missions, reinforcing the UK's position in the global space sector.

Digital

We're deploying digital technologies to improve production rates, part quality, resource efficiency, and operational performance. **CoSInC (Composite Smart Industrial Control)** is a next-generation digital manufacturing system, which integrates a laser line scanner and robotic system. It optimises virtual testing by enabling faster, consistent, and reliable scan data to validate preform inspection simulations for digital twins. The system broadens the industrial application of digital technologies to unlock value across sectors.

Transforming high-rate manufacturing

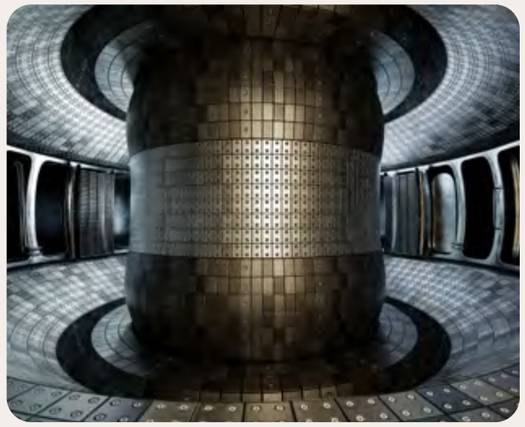
The £39.6m cross-sector ASCEND programme led by **GKN Aerospace** and **McLaren Automotive** has significantly advanced the UK's high-rate manufacturing capabilities. As part of the consortium, NCC's systems engineering expertise developed a Sustainability Maturity Level framework to foster transparent and informed supply chain discussions on sustainability, while safeguarding sensitive information. Our latest advances in high-temperature thermoplastic braiding also offer lightweight, high rate alternatives for automotive crash structures.

Technology Pull-Through

On top of delivering innovation programmes with industry partners, NCC is unique in having a **Technology Pull-Through Programme**. This programme de-risks, scales up and facilitates the industrialisation of proven low-TRL technologies by transferring them from the lab environment into our semi-industrial set-up for further testing.

Doubling energy from fusion-generated heat

NCC is collaborating with the **UK Atomic Energy Authority (UKAEA)** to develop fusion-grade silicon carbide ceramic matrix composites (SiC/SiC). The innovations reduce manufacturing costs to one-fifth and shorten cycle times. These advances enable complex shapes and thicker sections, enhancing design flexibility. SiC/SiC components can double electricity generation efficiency compared to steel designs, supporting the UK's net-zero energy goals. Unlocking high-volume materials will drive a major transformation in sectors requiring extreme temperatures, such as nuclear, defence, space, and aerospace.



Business growth

Our dedicated SME team works with companies to offer diagnostic services and identify innovation opportunities. For example:

- **SME match funding scheme** provides SMEs with up to 50% matched innovation funding. This supported **Solar Capture** to secure funding from the UK Government's Energy Entrepreneurs Fund and de-risk critical design elements.
- **Site visits** provide companies like high-end lighting supplier **Hector Finch** with actionable insights on how to address environmental impact hotspots.
- **Discovery workshops** to accelerate the route to manufacture. For example, **Limosaero Ltd** unlocked the potential of its Uncrewed Aerial Vehicle (UAV) design concept through a low-cost rapid development route to manufacture of a product demonstrator. The UAV was used in a world-first outdoor ammonia sensor mapping demonstration with the UK Centre for Ecology & Hydrology.

Almost half of the businesses we've worked with since 2020 have returned to NCC for additional support or to deliver a broader portfolio of innovation. Although the commercial impact of this varies with every company, it is estimated that within six years of investing in an enhanced product or service, turnover is likely to increase by at least 16%.[1]

About 33% of the companies we support are in the West of England, home to NCC's innovation centres.[2]

Solar Capture

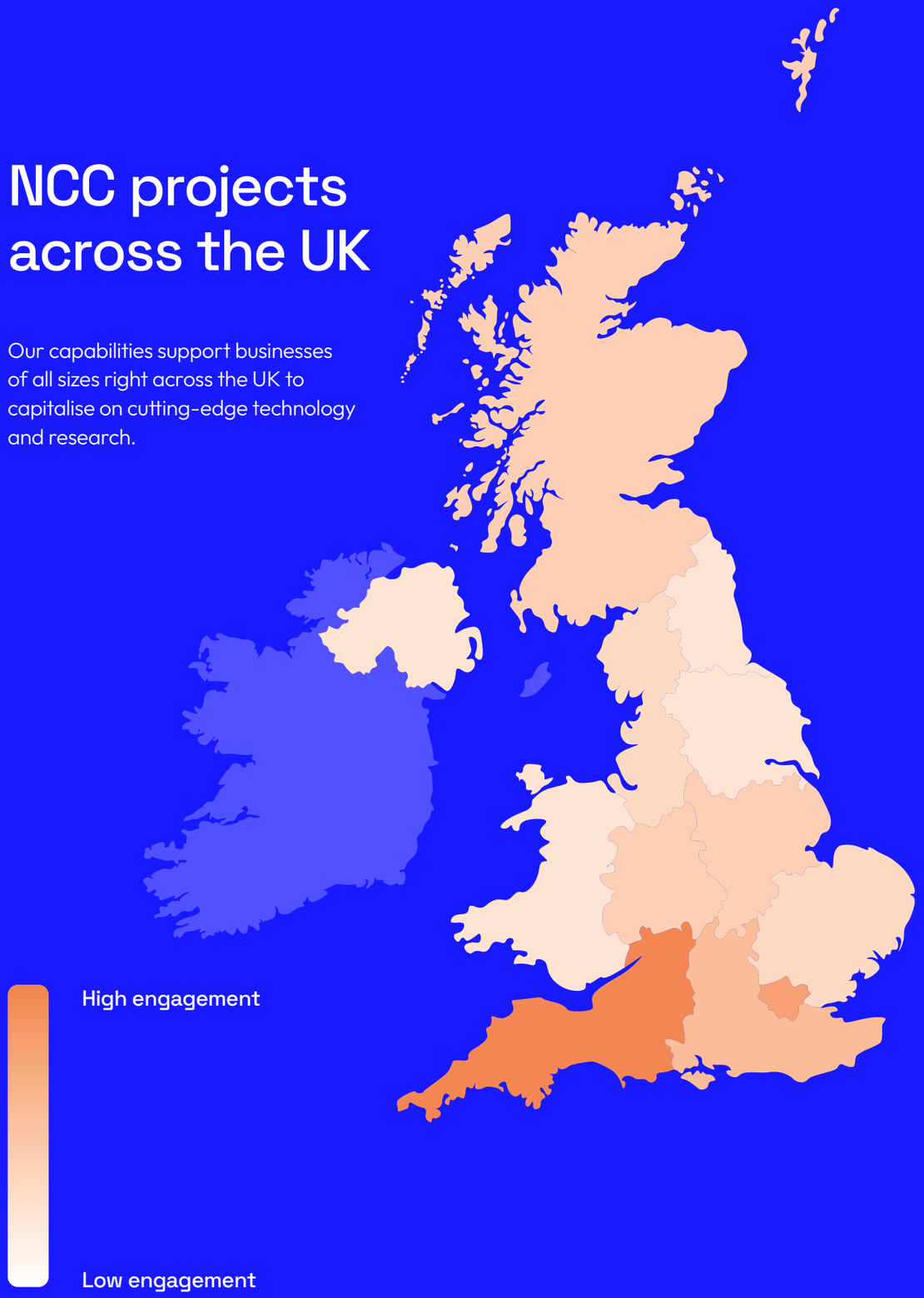
Limosaero Ltd

[1] Innovate UK commissioned report by Enterprise Research Centre and Innovation Caucus based on a survey of 300 SME businesses.

[2] While this is based on an initial estimate of NCC's annual average impact from 2017-2022, our SME support continues to grow. In 2024, NCC engaged with 560 unique SME businesses, representing 52% of total organisations engaged, and 30% of projects delivered across the business.

NCC projects across the UK

Our capabilities support businesses of all sizes right across the UK to capitalise on cutting-edge technology and research.



Plymouth Science Park Partnership

NCC and **Plymouth Science Park** have a range of joint initiatives to enhance the South-West region's position as a leader in emergent technologies.

Through our on-the-ground presence, we act as a single front door for businesses to access the entire HVM Catapult network. The 'Innovate South West' event will provide businesses with a clear roadmap for adopting new technologies and accessing support. Key topics include sustainability, digital and AI, as well as skills development.

We believe industrial transformation is underpinned by the development of clusters in strength and scale. As part of our work to develop and grow the South West's space ecosystem, we're home to **Space West**.

SPACE WEST

This regional consortium brings together the founding partners of the **West of England Combined Authority (WECA),** the **Centre for Modelling and Simulation (CFMS)**, the **University of Bath**, the **University of Bristol,** the **University of the West of England**, NCC, and key stakeholders from industry and government.

These partners are committed to accelerating space sector growth, strengthening our national security, and improving the economy and the environment.

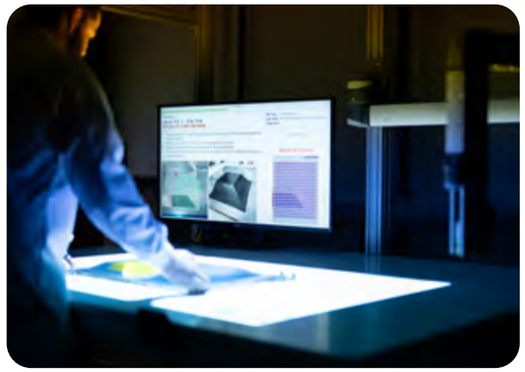
Developing digital skills

MADE SMARTER

NCC plays a prominent role in delivering the **Made Smarter** programme across the South West and Great South West regions. Through our expert guidance and tailored support, SMEs can adopt digital tools that boost their productivity, sustainability, and growth trajectories. From digitising job cards and tracking inventory in real time, to automating manual processes and integrating sensors, we help businesses identify the right solutions and implement them with confidence. As part of a national initiative, our work ensures UK manufacturers stay competitive in a constantly evolving landscape — bridging the gap between innovation and practical, scalable adoption on the shop floor.

Innovative training technologies

Working in collaboration with **Leonardo**, we designed a custom immersive workbench to improve workforce skills and cut traditional training times. Developed under our Capability Development programme, the immersive system improves manufactured part quality with real-time verification, thereby reducing defects and waste.



Foresighting future skills

Together with **Cogent Skills**, NCC founded the national **Hydrogen Skills Alliance (HSA)**. Its **Strategic Skills Plan for the UK Hydrogen Economy** sets out the scale of the industry's skills challenge. Action is now underway to ensure local workforces are equipped with the specialised skills needed to support hydrogen's growing role in the energy transition. This includes work to map the landscape of hydrogen skills, develop regional pilots for a future Hydrogen Skills Academy, and to lead a national cross-sector forum.

On behalf of HVM Catapult, NCC led the development of a series of open access hydrogen awareness modules spanning the full hydrogen value chain—**make it; move it; use it**. This was complemented by a series of skills foresighting cycles to understand future skills requirements (including cryogenic and pressurised storage tanks in bulk storage for commercial use). This will inform action to close skills gaps in the mid-term, which in turn will enable the UK to thrive in the dynamic global marketplace.

Going for Gold with Emma Wiggs

NCC early career engineers designed and manufactured an optimised paracanoe seat for Paralympic champion Emma Wiggs MBE. Using digital tools, including embedded sensor technology, it was possible to reduce material in low-stress areas and increase support where needed. The new seat was lighter, five times stiffer, and enhanced the power transferred from each paddle stroke to the boat. This boosted Emma's speed over 200 meters, contributing to her winning a Gold at Paris 2024. The capability to monitor structural health of the paracanoe seat over time has broader applications to deliver impact for the UK—be it smarter, more sustainable through-life wind turbines or hydrogen storage solutions.

Impact overview

£59m
direct gross GVA a year*.

300
businesses supported a year.

800
new jobs created & sustained a year.

90%
of businesses supported have a footprint in West England.

400
jobs sustained in the wider economy.

33%
of the footprint in West England were SMEs.

16%
faster increase in SME's turnover.

c.50
enhanced products, processes and services a year.

1400+
learners.

30+
graduates and apprentices.

This is an initial estimate of NCC's annual average impact from 2017-2022.
* Scottish Enterprise Research on the impact of innovation on enterprises.

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