

**Institution: University of Northumbria at Newcastle**

## **1. Context and mission**

### **1.1 Disciplinary Roots and Size**

Northumbria University's submission to REF 2021 consists of 1096 academic staff (1056 FTE) across 13 UoAs. This is three times the number of colleagues entered for REF2014 (343 FTE) and is the outcome of a strategic commitment to transforming the research capacity of the University. From genomics to glaciology; and from award-winning artists to esteemed engineers, Northumbria University is contributing to overcoming some of the most enduring challenges facing humanity and the future of the planet, from understanding the impacts of climate change to contributing to debates about what it means to be human.

Northumbria was awarded university status in 1992. Since 2008 the University has been on a transformational journey to place research, alongside education, at the heart of all its activities. This submission to REF 2021 represents an important milestone on that journey and reflects an institution in which research is pervasive and is used to drive improvement across the full range of the University's activities.

Northumbria's historic origins are in colleges of Design, Engineering and Business in Newcastle upon Tyne. Today, those disciplines are represented in the University's four Faculties and 19 departments. In addition, Northumbria has strength in both traditional areas such as Humanities and Social, Life and Physical Sciences, and in professional disciplines such as Law, Architecture and Nursing. Northumbria has 1,406 REF-eligible staff, and a vibrant community of 31,540 students globally with 24,948 on our Newcastle upon Tyne campus, including 621 postgraduate research students (PGRs).

Northumbria is a global university, with additional campuses in London and in Amsterdam, the latter launched in 2018 as a strategic response to the change in the UK's relationship with Europe. Northumbria is one of the largest providers of UK higher education in Hong Kong and Indonesia and has strategic partnerships with seven international Universities in Australia (Monash), China (Northwestern Polytechnical and Nanjing Normal), EU (Palacky, Amsterdam UAS), India (Amity) and USA (Northeastern and Michigan State).

## 1.2 Mission and Vision

Research, and education informed by that research, are the key mechanisms by which Northumbria will make its most significant impact and contribution to overcoming the greatest challenges facing the region, the nation and the world. This is reflected in the University mission to:

create and apply knowledge for the benefit of individuals, communities and the economy. Through excellent research, teaching and innovation we transform lives, making a powerful contribution to cultural and economic development and regeneration, locally, nationally and globally.

This mission can only be delivered through the highest quality research and this is at the core of Northumbria's Vision 2025 'to be a research-rich, business-focused, professional University with a global reputation for academic excellence'.

## 2. Strategy

### 2.1 University Strategy 2013-2023: Research Power with Quality

In response to RAE 2008, where Northumbria submitted 161.6 FTE, the University fundamentally reassessed its future direction and set an objective to grow both the volume and quality of its research. In REF 2014 Northumbria entered 342.7 FTE, more than doubling its submission. There was also a significant increase in quality, raising GPA from 2.15 to 2.71, which was higher than the sector institutional average. This growth in volume and quality was recognised as a stand-out result at the time when the THE noted that: 'Northumbria University expanded its research power market share, from 0.26 per cent to 0.6 per cent, after more than doubling its submission volume. It is also the biggest riser when ranked by research power'.

REF 2014 was an important milestone in the ongoing research-led transformation of the University. In 2012, Northumbria had set-out a 5-year Strategy 2013-2018, and a Vision for then 2025, with high-quality research and impact at its heart. Enhanced research performance would drive global reputation and thus the market position of the University; research excellence would drive education provision and thus student satisfaction; excellent research performance would increase income and open new revenue streams and avenues to business and economic impact.

In 2018, a subsequent phase of this transformation was established in a second 5-year University Strategy 2018-2023 under a long term vision for 2030. Again, sustained growth in research excellence was placed at the heart of the University's strategic objectives:

- Exceptional people empowered to achieve shared ambitions
- World-class research driving excellence in all of the University's activities
- Transformed student and stakeholder outcomes
- Strong global reputation and market position, with diversified revenue streams
- Organisational sustainability, efficiency and effectiveness

Success against these objectives would be measured by two research specific key performance indicators. First, to increase the number of colleagues producing internationally excellent research outputs and second, to increase research income by 40%.

## **2.2 Implementation of University Strategy**

After REF 2014, and in order to meet its strategic objectives, Northumbria prioritised investment in people and infrastructure. A renewal of the academic staff base would lead to a significant growth in research intensity, capability and performance. A programme of capital investment in the physical estate, facilities and the equipment base would provide a world leading environment in which those people could operate.

REF 2014 resulted in annual mainstream QR more than doubling from £1.9M to £5.1M. Increased funding enabled greater investment in research, including in the staff base. The University made four key decisions to help shape that investment:

- to define Multidisciplinary Research Themes (MDRT) aligned to societal and global challenges and complementing disciplinary research
- to create a Vice-Chancellor's Fellow (VCF) scheme in order to invest in Early Career Researchers (ECRs)
- to create a new Academic Career Framework which aspired to 100% inclusivity in research ensuring that all staff engaged in research
- to support doctoral studentships (ca. 82 new per year) through a University/Faculty Research Development Fund Studentship Scheme.

Following REF 2014, to further realise interdisciplinary potential and address regional, national and global challenges Northumbria created 6 MDRTs. These are now: Energy

Futures, BioDesign for the BioEconomy, Extreme Environments, Global Development Futures, Integrated Health & Social Care and Human & Digital Design. MDRTs were designed to help drive critical mass by focusing staff recruitment; to generate impact; and to be the engine for strategic collaboration.

Successful examples of strategic collaborations built on the MDRTs include:

- The Northumbria led EPSRC Centre for Doctoral Training (CDT) for Renewable Energy, with Newcastle and Durham as University partners, and with 35 additional partners including Airbus and Siemens (EP/S023836/1, £5.5M, 2019-2027).
- Research England Hub for Biotechnology in the Built Environment, joint with Newcastle University (£8M, 2019-2022); the largest of only 13 projects funded nationally under the Expanding Excellence in England initiative (E3).

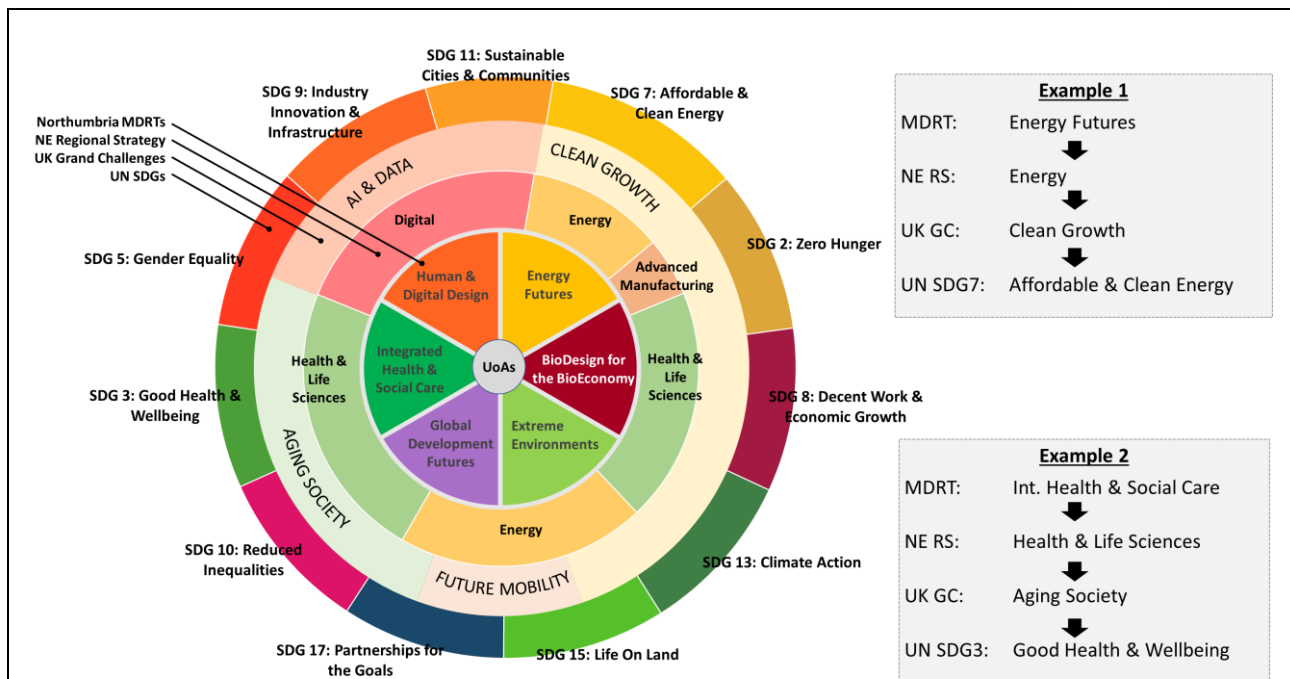
MDRTs were also a focus for staff investment. This included the VCF scheme. These are high quality research-led, cross-disciplinary thematic posts. Prior to embedding as permanent academics, Fellows are given the opportunity to focus their time on research with teaching commitments increasing over three years. As each cohort embeds, a new cohort is appointed thereby helping to drive long term change in the culture, aspirations and interdisciplinarity of our academic staff (ca. 76.7 FTE since 2016/17).

Northumbria created a new Academic Career Framework in 2014. Following the Stern Review, Northumbria rejected any move towards teaching-only contracts, and re-confirmed a determination that all academic colleagues carry out research. To accelerate the transformation to a research-rich University, Northumbria determines significant responsibility for research through workload allocations and research objectives as per the code of practice. This approach will allow research intensity to grow sustainably to 100% by the end of the next REF cycle.

Finally, substantial investment in Research Development Fund Studentships recognised the essential contribution that PGRs make to a vibrant research community and helped support the renewal of the academic staff base. Across the REF period Northumbria has funded 552 studentships across all UoAs.

### **2.3 Research Impact**

Our Multidisciplinary Research Themes are aligned to regional, national and international challenges in order to maximise their impact potential.



**Figure 1.** Example alignment of Multidisciplinary Research Themes to Regional (North East Local Enterprise Partnership (NE LEP) Strategic Economic Plan), National (Industrial Strategy Grand Challenges) and Global (UN Sustainable Development Goals) cultural, economic and societal challenges.

By concentrating research excellence around these grand challenges, and recognising that those problems require complex, multi and interdisciplinary solutions, Northumbria has, across multiple UoAs, produced research addressing some of the most intractable problems facing humanity.

For example, through Global Development Futures, Northumbria has been working with:

- NGOs and charities to reduce inequalities experienced by displaced youths in Uganda and to build their skills and employability (ESRC GCRF award ES/S005439/1, £790k, 2019-2021)
- The UN to develop better tracking of Female Genital Mutilation, transforming efforts to end FGM by 2030 (ICS, UoA 14)
- The World Bank to increase digital literacy within impoverished communities in Nigeria (ICS, UoA 11)

Through the Integrated Health and Social Care MDRT, Northumbria researchers have:

- Helped shape new government initiatives amounting to £22M investment to address ‘holiday hunger’ across the UK (ICS, UoA 20)
- Developed a novel diagnostic tool for the most common childhood brain tumours,

increasing the speed of diagnosis and improving the outcomes of patients (ICS, UoA 3)

Northumbria’s Research and Innovation Services (RIS) have a dedicated Impact Team that helps maximise the generation of impact across all UoAs. The team support researchers to design projects with the end beneficiaries in mind. This includes business development managers who support working in partnership with industry, for example the proposed International Centre for Connected Construction (IC3), a £44M partnership with UKRI and the North East Local Enterprise Partnership (NE LEP) including £7.5M of private investment.

RIS also support researchers to commercialise their research, through an IP/commercialization team which supports invention disclosures and patents and licensing. Examples of success include:

- Research England Connecting Capability Funding (“Northern Accelerator”, £4.9M with Durham, Newcastle and Teesside) to commercialise research and boost the region’s economy
- The creation of spinout companies such as PulmoBioMed Ltd. established with £148k of Innovate UK and £460k of additional external funding to produce and market the PBM-Hale™ breath condensate collection device for respiratory infection diagnosis and analytics, and environmental aerosol sampling.

**2.4 Performance Against the University Strategy**

Northumbria’s submission of 1,056 FTE (75% of all REF-eligible staff) to REF 2021 represents the outcome of this strategy. The research capacity of the University has been transformed:

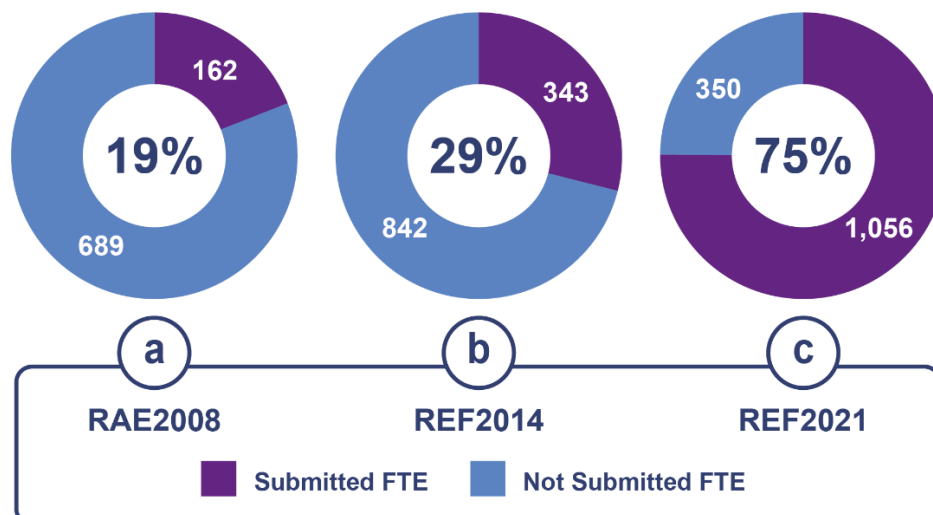


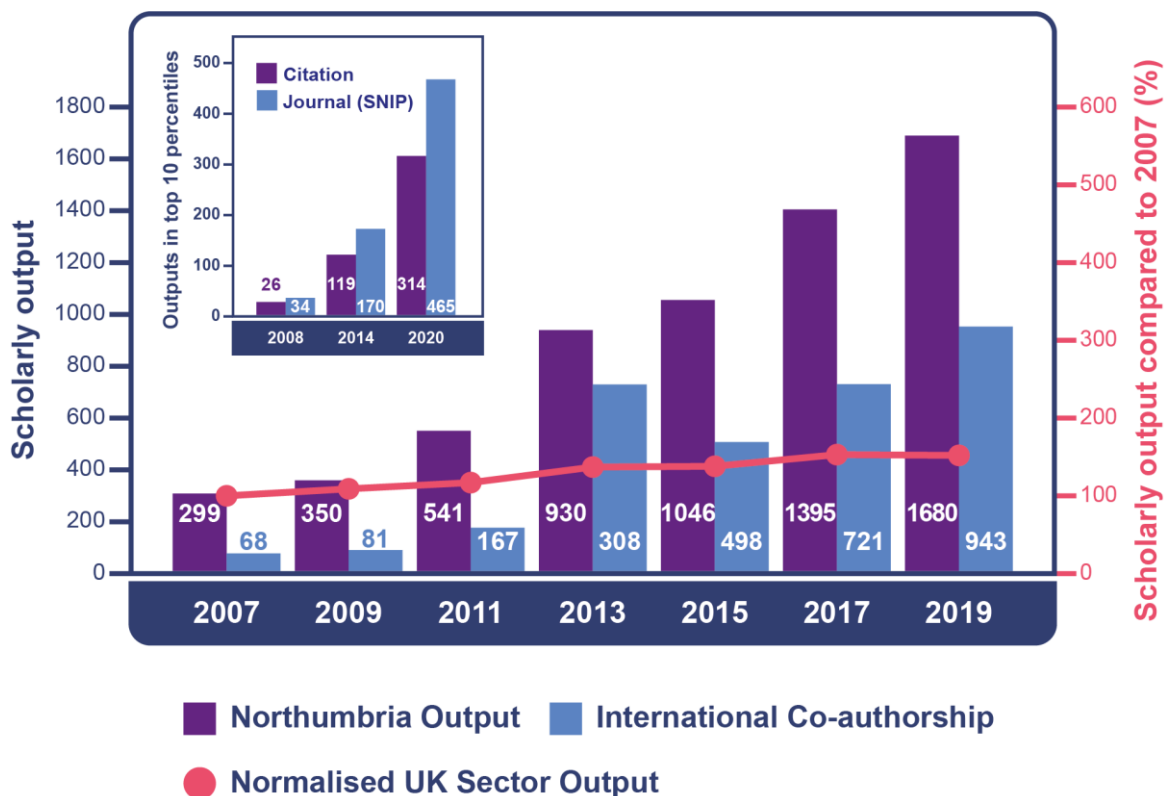
Figure 2. Increase in NU research capacity – Percentage of REF-eligible staff FTE submitted.

Northumbria has exceeded all targets relating to the development of research in the 2013-2018 strategy and is on-track to exceed 2018-2023 strategy targets.

**Performance Against Strategy:**

- 75% of cat. A staff (1,056 FTE in REF 2021 compared to 343 FTE , 29%, in REF 2014) (2018 target = 60%). (Fig. 2)
- RGCI more than doubled (£4.6M to £10.0M) over the REF 2021 period (HESA return) (2018 target = double RGCI over 5 years).
- 17.1% p.a. increase (£3.4M to £8.8M) in user-led research and consultancy over the REF 2021 period (HESA return) (2018 target = 15% p.a.).

Northumbria has also significantly increased the wider influence of its research. A greater proportion of outputs appear in the world’s most cited and prestigious journals, and with an increase in international co-authorship (Fig. 3). Northumbria output has increased year-on-year to 544% of its 2007 position, compared to a national increase of 151%. Further evidence is given by the increase in research awards (Fig. 9).



**Figure 3.** Growth in Research Output and its Influence. Scholarly research output (all types) 2007-2020 with UK sector comparator (right axis normalized to Northumbria in 2007) and international co-authorship (left axis only). Inset: Northumbria outputs (all types) in world-top 10% by citations, and outputs (excl. Books) in world-top 10% journals. (Source: Scopus data using sector-agreed metrics; <https://snowballmetrics.com>)

Northumbria is now 27<sup>th</sup> in the UK, and within the top 175 universities (top-15%) worldwide, for research citations. (Source: THE World University Rankings 2020 and 2016).

### **2.5 Research Integrity, Open Research and Open Data**

The University Research Ethics Committee (REC), a sub-committee of Research and Knowledge Exchange Committee (RaKE), ensures that University policy in the areas of research integrity and ethics are reviewed regularly and align with sector best practice. Northumbria subscribes to the UK Research Integrity Office and actively participates in the North East Ethics and Integrity Forum. REC undertakes rigorous self-assessment against the expectations set out in the Concordat to support Research Integrity and reports these findings annually to the Board of Governors, a report published on the Northumbria website. Expectations around good practice in research are communicated through University-wide training. This is supplemented at discipline-level by Departmental Ethics Leads who meet regularly as an Ethics Steering Group to review current practice, address training and development needs, and ensure policies are operationalised effectively.

The Scholarly Communications Group (also a subcommittee of RaKE) drives Northumbria's approach to creating an open research environment and ensures that the University is engaged and responsive to developments such as Plan S, rights retention and transformative publishing deals. Northumbria is committed to the aims and principles of open research and has issued an open research statement alongside which existing open access policies will be reviewed. Northumbria is a signatory of DORA. The University has an institutional repository for research data (Figshare) promoting the principle and supporting infrastructure for open research data.

### **2.6 Future Strategy**

The University will extend the achievements of this REF period over the next decade through continued strategic investment. Investment will be driven by quality in line with core strengths, and will sharpen interdisciplinary focus. We will ensure the future sustainability of our research base by investing in:

- People:
  - Making 285 appointments of high-quality researchers by 2024
  - Further development of the Academic Career Framework (ACF) and the introduction of a new title of Assistant Professor to replace Senior Lecturer



- Transforming disciplines (such as Nursing and Design) where research intensity has traditionally been lower, achieving 100% research intensity by the end of the next REF cycle
- Infrastructure:
  - Our financial forecasts to 2023 include between £16M and £23M per annum in capital expenditure. This will be divided between ongoing investment in extant infrastructure, for example expansion of our Multi-Omics Lab and High-Performance Computing provision; and strategic investment in STEM, for example IC3 which includes a forecast £5.2M capital investment in a c. £44M partnership with UKRI, industrial partners and North East Local Enterprise Partnership.
  - Further investment in PGR studentships to enhance our research culture and capacity, develop our own next generation of researchers, and support the achievement of a 1:1 ratio with staff submitted to the next REF.

### 3. People

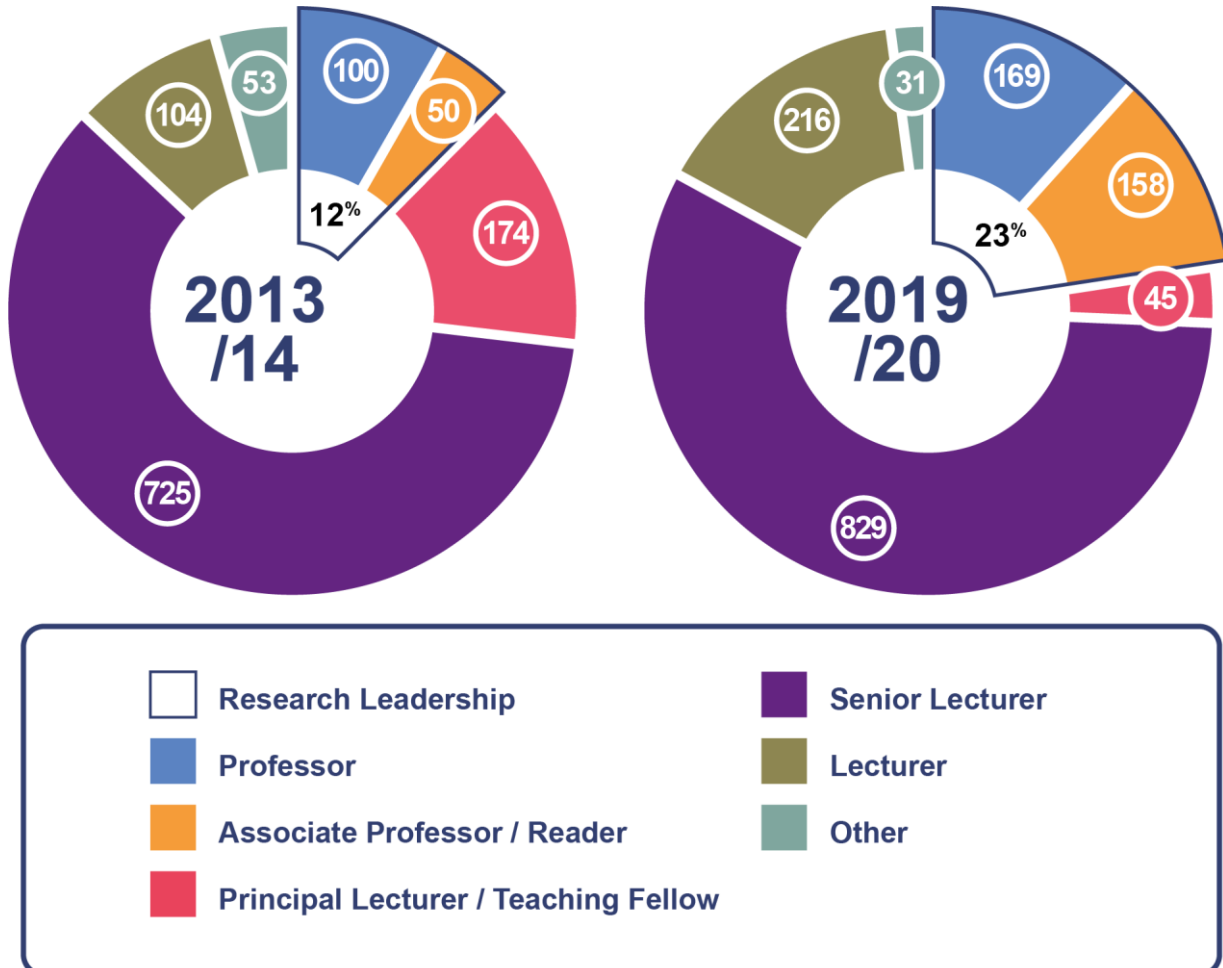
People are fundamental to the University Strategy which commits to 'Exceptional people empowered to achieve shared ambitions' as a key outcome. Accordingly, Northumbria has transformed its research capacity by up-skilling and renewing its academic staff base.

#### 3.1 Academic Career Framework

In 2014, Northumbria introduced a new and award-winning Academic Career Framework (the winner of the 2018 UHR Awards for Excellence in the category "Business Effectiveness and Organisational Performance"). The ACF revised probation, redefined maximum teaching contact hours, transformed the Performance, Development and Appraisal Scheme (PDA), and introduced an academic workload planning scheme to ensure a balanced workload averaging 40:40:20 (research, scholarship and enterprise; teaching; leadership/administration) across each academic area. By 2019/2020 42% of academic workload time across the institution was allocated to research.

In 2016, the University implemented an Academic Career Pathway introducing a single Associate Professor title awarded through application to University Appointments Board. Associate Professor replaced the existing Principal Lecturer/Fellow/Reader titles and made academic excellence the key criteria for progression. Northumbria also introduced a three-band scheme for Professorial title, with the top-band equivalent to a Distinguished Professor to enable recruitment and retention of outstanding world-class researchers.

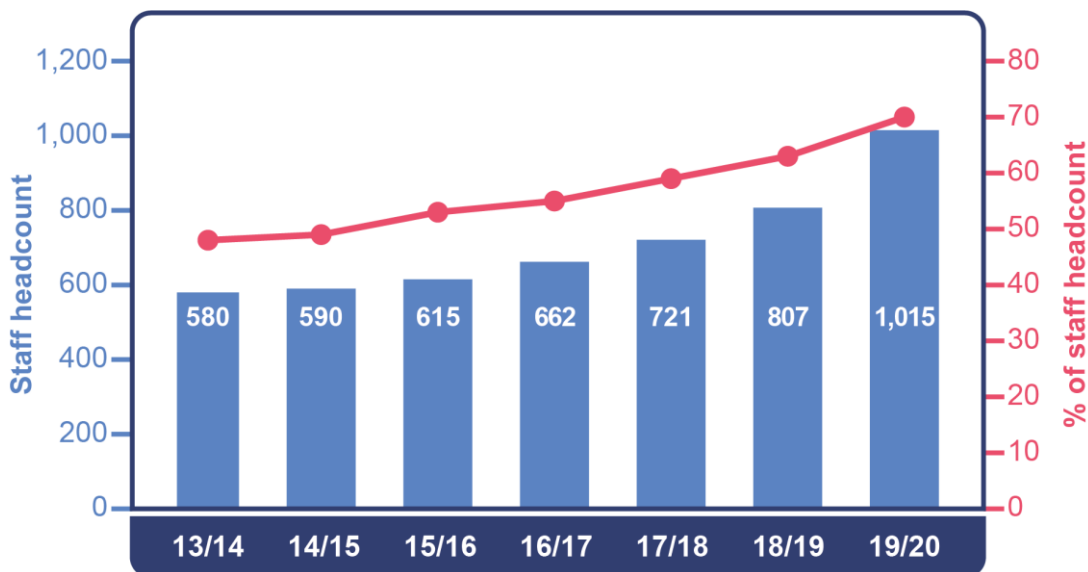
All colleagues can apply for academic promotion in an annual scheme. Across this REF cycle 45 colleagues have been promoted to Professor and 88 to Associate Professor. These changes have increased leadership capacity for research across the institution, supported by a recruitment drive for Professors that has brought 43 new colleagues to the University.



**Figure 4.** Increase in research leadership capacity within the academic staff base – Teaching and Research staff headcount by role.

The ACF recognised that colleagues were at very different stages of their academic careers. Some, especially in disciplines such as Nursing and Design, were entirely new to research and required additional support. Accordingly, Northumbria has operated an in-service doctorate scheme. 122 doctorates have been awarded to staff under this scheme, while 12% of colleagues are currently registered for doctoral study.

For colleagues who did not wish to engage with research, Northumbria provided financial support to re-orient their careers through Voluntary Severance. This increased annual staff turnover to 9%, providing flexibility to invest and diversify income streams. Over the REF 2021 period, 817 academics have been appointed (22% international). 70% of colleagues are now doctorally qualified compared to 48% in 2014.



**Figure 5.** Increase in research capability of the academic staff base – Teaching and Research Staff with Doctorates.

### 3.2 Recruitment, Mentoring, Probation and Early Career Researchers

The VCF scheme was a new entry route for ECRs, designed to increase research quality and critical mass. VCFs are supported through an extended probation process, designed to equip postholders for a successful career. In 2018, the University introduced Faculty-based probation panels which approve probation plans incorporating the submission of a First/New Investigator or equivalent grant proposal, and the publication of quality research outputs. ECRs have reduced teaching duties and are supported by research mentors. New ECRs are offered a one-to-one with a Research Development Manager to create a development plan and can participate in the University’s ‘ECR Development Programme’.

Northumbria has deliberately minimized fixed-term contracts (3.4% of REF-eligible staff) in order to provide the most secure environment for the development of research careers.

### 3.3 EU and International Colleagues

Northumbria is an international community and supports the international diversity of its staffing base by funding application fees for permanent residence in the UK or British Citizenship for EU staff, and essential immigration costs for International staff (Tier 2 visa, NHS surcharge, Settlement/Indefinite Leave to Remain application fees). The University supports other immigration application costs for staff/dependents through interest free short-term loans.

### **3.4 PDA, Training, Sabbaticals and Promotion/Progression**

PDA meetings are twice yearly. Staff self-assess against their previous year's objectives and discuss future objectives and training/support requirements. All colleagues have an ongoing research plan. Workload allocation for research is agreed for the following year after PDA discussions, in order to support agreed objectives. Colleagues who have more than 30% of their workload for research and / or an agreed independent research objective are considered to have significant responsibility for research as set out in Northumbria's REF code of practice. 71% of REF-submitted staff have more than 30% of their workload for research and 100% have an independent research objective.

Research Development Programmes are career-stage focused. For example, there are "Fellowship Ready", "Early Career Researcher Development" and "Next Generation of Large Award Holder" programmes. The Library also offers a Research Skills development programme. The University is a member of Vitae and is committed to the Concordat to Support the Career Development of Researchers. In 2019 Northumbria retained its HR Excellence in Research Award.

The University runs a Sabbatical scheme which offers a semester of leave in every seven to all colleagues. Applications are triaged at Faculty level and the process is overseen by the University Sabbatical Committee.

### **3.5 Graduate School and Postgraduate Research**

The Graduate School oversees research degrees ensuring compliance with the QAA Quality Code. Faculties have a Director of PGR, who Chairs the Faculty Postgraduate Research Committee, and all departments have a PGR Programme Leader. Doctoral candidates have a minimum of two supervisors who are given a shared total workload allocation of 50 hours per annum for supervision.

The Graduate School supports applications/interviews, supervision records, project approval, annual progression, submission/examination of theses, and individual circumstances applications. An on-line system, eVision, ensures consistency.

Northumbria is a member of the UK Council for Graduate Education and participates in the Advance HE Postgraduate Research Experience Survey.

Training for supervisors is provided on an ongoing basis and is mapped against the Vitae Researcher Development Framework. Supervisors attend a regulations session update every 3 years and new supervisors complete a competency process (expertise,

experience, skills, prior completions).

Students attend a Professional Development and Research Training Programme with compulsory (Induction, Ethics, Annual Progression Preparation, Viva Preparation) and optional sessions (for example, Careers, Resilience, Practical Demonstrating). There is a specific PGR Teaching Programme to support entry into academic careers. The Library offers a complementary Researcher Development programme using workshops (e.g. Mind Mapping, EndNote), topic-specific drop-ins (e.g. copyright advice), on-line collections and one-to-one appointments. Staff/students have access to Vitae's digital resources. Departments have discipline-specific training and research seminars.

Students plan bespoke training using a Researcher Development Personal Planner. A PGR Conference Bursary Scheme supplements project-specific funding and there is a PGR Research Events Support Scheme.

University Research Development Fund and Faculty-funded studentships are complemented by Collaborative Doctoral Studentship (50:50 funded with an external partner) and ERDF Intensive Industrial Innovation Programme schemes (for PhDs in NE LEP priority sectors).

Research Council Doctoral and Collaborative Doctoral Training Partnerships include:

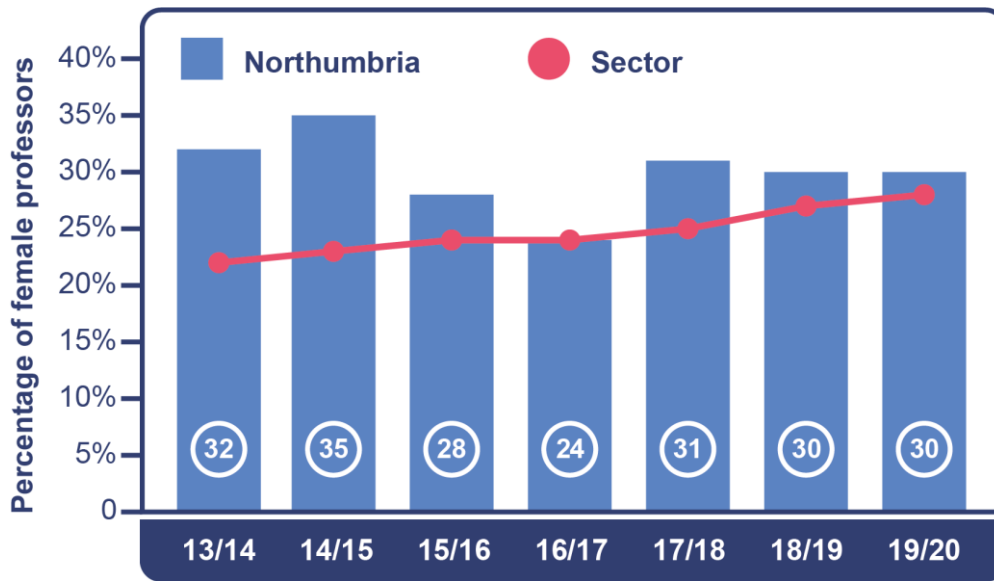
- AHRC Northern Bridge with seven University partners
- AHRC Heritage Consortium with eight University partners
- ESRC NINE with six University partners
- NERC One Planet joint with Newcastle
- EPSRC CDT in Renewable Energy Northeast Universities

### **3.6 Equality, Diversity and Inclusion (EDI)**

Northumbria is committed to ensuring and promoting the diversity of its staff base. It is only by realising the talents of all that the University will succeed in creating the pervasive research culture to which it aspires. That aspiration also includes ensuring that all colleagues have the same opportunities to hold significant responsibility for research. Northumbria University aims to reflect in its REF submission the full diversity of its REF-eligible staff base.

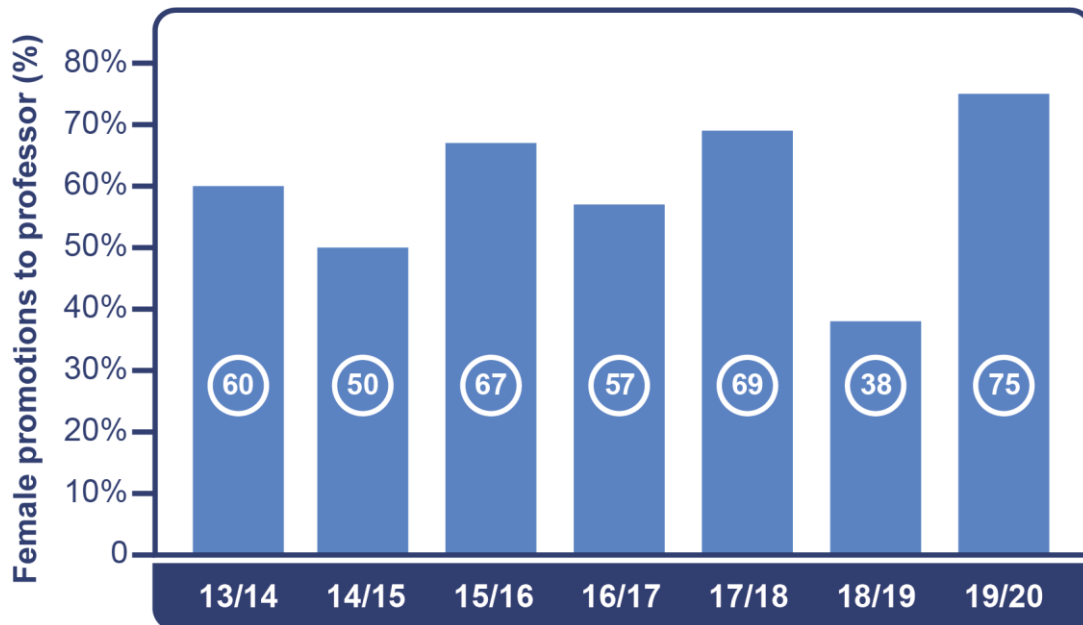
Since REF 2014 particular efforts have been made to remove barriers to women's progression and improve the gender and ethnicity profile in senior academic roles. Activities around recruitment, promotion and training have underpinned positive change in this area. The

percentage of women at Grade 9 (Professor) has been at or above the sector average for the entirety of the current REF period.



**Figure 6.** The percentage of female Professors compared to male over time compared to sector average (HESA)

Other than 2018/19 the proportion of all promotions to Professor awarded to female colleagues was 50% or higher:



**Figure 7.** The percentage of promotions to Professor awarded to female colleagues

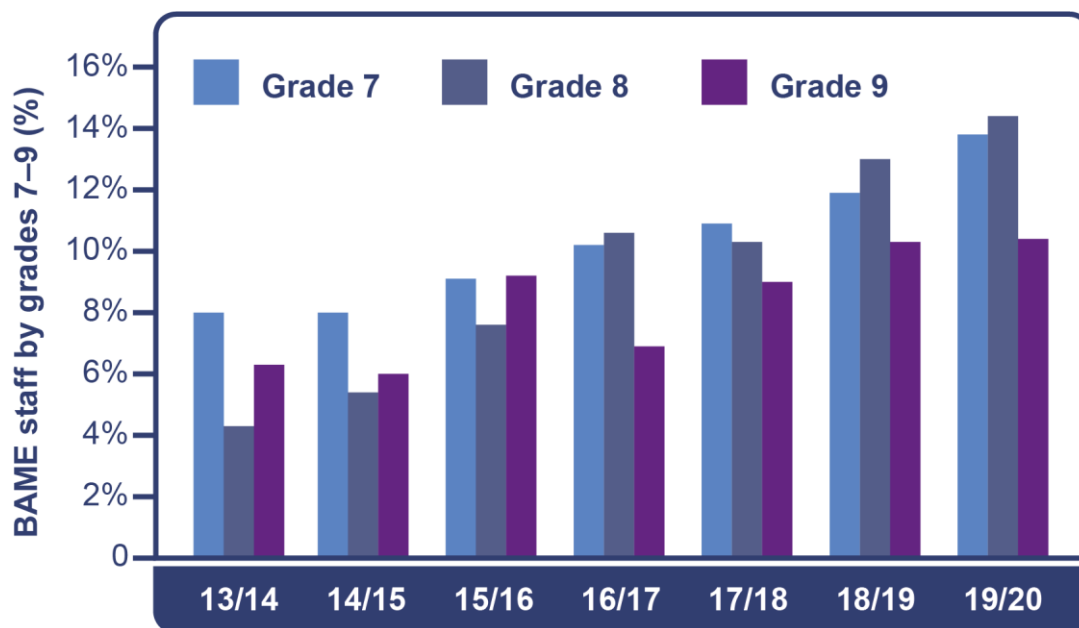
Gender pay gap data indicates that median pay is equivalent for male and female academic staff, but that there is a 6.09% gap in the mean salary (Source for all employee data: ONS-ASHE Survey 2019):

2019	Northumbria Academic employees	Northumbria All employees	Nationally All employees	Sector All employees
<b>MEDIAN</b>	0%	20.5%	17.4%	15.9%
<b>MEAN</b>	6.09%	14.7%	16.3%	16%

Northumbria has also made significant improvements in the gender balance of the REF submission since 2014. In 2014 34% of all submitted staff were women. However, only 20% of female REF-eligible staff were submitted whereas 35% of REF-eligible men were submitted. In 2021, 42% of the submitted staff are female and 67% of all eligible female staff have been submitted. 81% of all eligible male staff have been submitted.

Northumbria will achieve a balanced gender representation in its REF submission across the next period, building on the progress made. Each UoA is required to ensure equitable access and participation in their research culture. Northumbria is also recognised for promoting access to disciplines beyond the University, for example with the award of an EPSRC Inclusion Matters project “Northern Power: Making Engineering and the Physical Sciences a Domain for All in the North of England” with eight other universities and five industrial partners. (EPSRC EP/S012206/1).

Colleagues from racialised minorities are represented in greater proportion in Northumbria’s REF submission than in the general REF-eligible population. 89% of colleagues who identify as BAME have been entered for example, as opposed to 71% of those who identify as white. While the REF submission reflects the ethnic diversity of the REF-eligible staff base, Northumbria is committed to promoting that diversity further, and removing any barriers to race equality. Northumbria is a member of the Race Equality Charter. A strategic priority for post REF2021 is to increase the proportion of BAME colleagues in senior research roles. At present, the proportion of BAME staff at Associate Professor level is steadily rising but there remains underrepresentation at Professorial level.



**Figure 8.** The percentage of BAME staff by grade 7 (Senior Lecturer) to 9 (Professor)

Northumbria’s strategic ambitions to promote and protect diversity are supported through the following internal structures and initiatives:

**Athena SWAN Charter**

Northumbria was awarded a Bronze Athena SWAN Award (STEMM) in 2015, which catalysed fundamental changes to its EDI structure. The University renewed in 2020 under the broadened criteria covering Arts, Humanities, Social Sciences, Business and Law, Professional Support and trans staff and students. The 2018-2023 University Strategy embeds a timeline for all departments to achieve Athena Swan recognition and the first subject awards in Business and Law, Geography and Environmental Sciences, Nursing, Midwifery and Health and Psychology have been granted.

**University EDI Structure and Initiatives**

The EDI committee, chaired by the Vice-Chancellor, has five sub-groups (Unions Special Interest, Athena SWAN Self-Assessment Team (SAT), Accessibility Review, LGBTQ\* Steering Group, and the Race Equality Charter SAT). Faculties have a Director of EDI, Departments/Services have EDI leads and our HR service has a Head of EDI as well as an Organisational Development Manager (EDI), an Organisational Development Advisor (EDI) and a Race Equality Manager. Unconscious Bias training takes place across the University, there is a Women’s Network, a VC Diversity and Inclusion Fund, and a BAME Staff Network. The University has an Equality Impact Assessment framework, which was used for the development of the REF 2021 Code of Practice.



Northumbria is a member of the Stonewall Diversity Champion Programme and is self-assessing against the Stonewall Workplace Equality Index. Northumbria is proud to be a Disability Confident Employer. The Accessibility Review Group focuses on improvements, reviewing and developing procedures and policies to ensure a safe and accessible working environment.

The University is committed to helping colleagues achieve work-life balance and actively protect their mental health and well-being. The Employee Assistance Programme has 24/7 access for confidential counselling/support (Health Assured Ltd). NU has signed the Time to Change Pledge (mental health) and the action plan includes Mental Health First Aid and Mental Health Awareness training. Family-friendly policies/support include maternity/paternity/adoption support/leave, flexi-time, career break and working locations, a Coaching Transition Programme (supporting those returning after career/sickness/maternity breaks) and an Ofsted Outstanding-rated University Nursery.

In aspiring to be a community which is welcoming and respectful of all we are also unequivocal in our unwillingness to tolerate conduct that is damaging. To this end, we have clear policies, guidance and reporting systems for staff and students around unacceptable behaviour.

#### **4. Income, infrastructure and facilities**

##### **4.1 Research & Innovation Services**

In 2013, Northumbria invested in its research infrastructure in order to professionalise research support in line with our growing ambition. We have increased investment in this support year-on-year from £2.7M in 2014 to £3.7M in 2020, expanding from a staff base of 55.2 to 70.6 FTE. We have recently agreed a further investment of £407k in additional capacity (over 2 years), and a further infrastructure investment in a new grants and contracts system to support the expansion of our research capacity (£300k approx.).

Research and Innovation Services is a central research support team with faculty alignment for some activities. The full lifecycle RIS support includes research development for grant applications, pre- and post-award grants management, research policy, quality, ethics, integrity and culture, support for impact, IP commercialisation and researcher development. The team also produce and analyse management information and work closely with Library colleagues on matters of scholarly communications and open research including OA and the responsible use of metrics.

Business support includes client relationship management, CPD, commercial contracts, collaborative/contract research, consultancy, degree apprenticeships, KTPs and regional economy initiatives (e.g. ERDF, NE LEP, Strength in Places). Business Development Managers have Faculty and industrial sector (e.g. Health, Digital) alignment and link companies to academics for contract research and KTPs, and support academics in finding project partners.

#### **4.2 Library and Information Services and IT**

There are two main campus libraries and a specialist Law Practice collection. Library services maintain Northumbria's open access institutional repository (ca. 5k items deposited/year), a Gold Open Access fund and includes 94 databases, 51 digital sources, 84k eJournals, 900k eBooks and 460k print books. It provides "Skills for Research Training", supports in-house Law journals, Inter-Library Loan, copyright advice and access to UK/Ireland libraries (SCONUL). The SafePod award will provide secure facilities/services for remote access to large social science datasets from UK Data Centres (ESRC, 2019-22).

IT services support all software, printing/copying, storage, sharepoint, conferencing (e.g. Microsoft Teams), eduroam, procurement, and use of national resources (e.g. National Supercomputing Services: DiRAC, ARCHER). High Performance Computing investment includes two clusters with 1216 cores for processing, a GPU node, dedicated visualization nodes and 571 TB of parallel storage.

#### **4.3 Facilities and Capital Investment**

On-campus infrastructure to support research across all UoAs includes archival holdings, clinics (business, law) laboratories (biological, chemical, materials, mechanical, physical, psychological and physical performance), and galleries and studios (architecture, art, design, exhibition and performance). Sport Central includes physiology research laboratories and an instrumented running track.

Infrastructure is extended through off-campus partnerships UK-wide and overseas. For example:

- The Offshore Renewable Energy Catapult
- Space Weather researchers have access to the world's largest solar telescope (\$344M US NSF Daniel K. Inouye Solar Telescope) through consortium membership (STFC grant ST/LT006243/1).

Since REF 2014 Northumbria has also invested in a University Gallery comprising Gallery North (experimental/exhibition space), University Collection (3000 paintings, drawings and sculptures, and archives) and The Woon Gallery of Asian Art (alongside contemporary pieces by Picasso, Warhol and Hirst).

University capital supporting research was £26.6M p.a. over the REF 2021 period (19% of University capital) and included a long-term estates plan, refurbishments/improvements, Faculty CAPEX, and strategic grant application match-funding. In the course of the 2013-2018 strategy period there was major estates investment in bespoke research facilities including Computer and Information Sciences, Architecture, and Business Clinic buildings, refurbishment/extension of Engineering laboratories, a library extension (with Research Commons for PGR), a University Gallery, and interdisciplinary spaces (e.g. Co-Create Design space, Institute of Humanities). Research impact investments included a Centre for International Development, Enterprise suite and an NUSTEM space (outreach/pedagogic research).

The 2018-2023 strategy includes investment in laboratories supporting initiatives such as the EPSRC CDT in Renewable Energy and the major reconfiguration of the Health and Life Sciences estate. Faculty budgets for research equipment support new staff, research group development, maintenance of well-found laboratories and faculty-wide shared items (e.g. Electron microscopy, Multi-Omics, High Performance Computing).

Examples of strategic match-funding include the transfer of a world-leading glaciology group from the British Antarctic Survey into UoA 14 and E3 Hub for Biotechnology in the Built Environment.

#### **4.4 Networks, Partnerships and Engagement**

Northumbria partners with a range of organisations with the aim of leveraging impact from research. The University's partnership with Ryder Architecture, the spin out company Building Information Academy Enterprises Ltd, was the winner of the THE Awards 'Most Innovative Contribution to Business-University Collaboration' in 2017. Other Examples include:

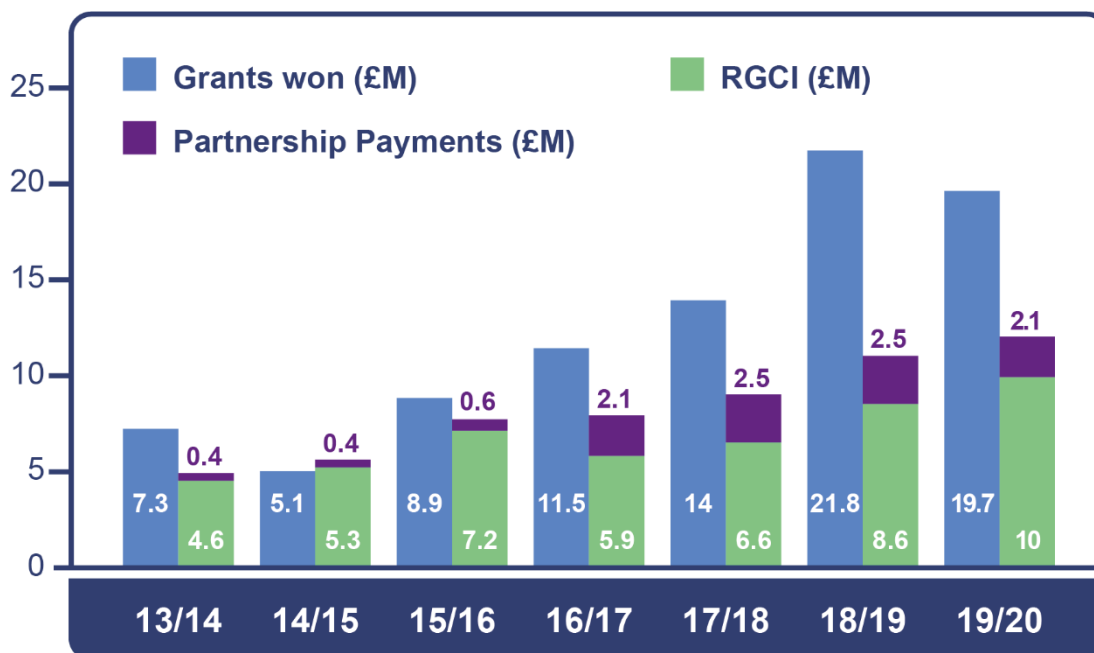
- the UN Academic Impact group (UN SDGs).
- Mozilla Foundation (Internet of Things)
- New Writing North (Northern Writers Award and literary festivals/events)
- Dynamo North East (IT enterprise cluster linking Building Information Modelling)

- NUSTEM (outreach in schools underpinned by disciplinary/pedagogic research)
- Creative Fuse North East (AHRC/Arts Council and ERDF-funded) and the Fuse Centre for Translational Research in Public Health (both involving the five NE Universities)

**4.5 External Research Income**

Northumbria’s increase in research capacity through staff renewal, critical mass aligned to MDRTs and the development of partnerships has also supported a rapid growth in external research income. Faculties are supported to meet annual RGCI targets, while individuals are incentivised through our Research and Enterprise Reward Scheme. Major grant applications are coordinated centrally through a Research Content Board to ensure the necessary supporting investment can be released.

Increased capacity has resulted in a marked step change with major awards from Research England (E3), Research Council CDT/DTPs, GCRF, EU projects, KTPs and individual project awards. Cumulatively, there is a strong growth trajectory in research awards (**Fig. 9**). The increase in partnership payment components of research awards (white bar on black bar) to collaborators points to the growing connectedness of the University with research intensive partners. The systematic increase in value (three-fold) and connectivity of grants won illustrates the vitality of Northumbria’s research environment. The systematic increase in external research income also points clearly to a sustainable research environment beyond REF 2021.



**Figure 9.** Increase in research grant awards (including partnership payments) and HESA returned RGCI