

Supercharging Yorkshire & Humber: Unlocking £38 billion in growth through AI, skills and systems scale integrated planning

Regional analysis of the January 2026 national report: Strategic Role of Higher Education in UK Industrial Strategy



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Foreword

AI is changing labour markets around the world faster than ever. This is a generational transformation, and the UK is well placed to be a winner. But that will depend on the decisions we make now, in every region of the country.

The [QS World Future Skills Index 2027](#) ranks the UK third among 89 economies for its readiness to benefit from the digital, AI and green transitions. Our research with the University of York and Public First, [The Strategic Role of HE to Deliver the National Industrial Strategy](#), shows the scale of the opportunity: AI could augment work in 75% of occupations across the eight sectors of the Industrial Strategy, while 50% are exposed to automation. If the UK seizes the opportunity to use AI to enhance people's work, the potential gain to GDP could reach £490 billion by 2030.

That opportunity will not realise itself. Nationally, 80% of critical roles in those eight sectors require a bachelor's, master's or PhD degree. Universities therefore have a vital role in helping graduates develop the skills to work effectively alongside AI.

This report brings the question home to Yorkshire and the Humber. Drawing on data covering 1,869 occupations and more than 40,000 skills, it examines the region's labour market today and sets out four ways it could develop by 2030. It then considers what those possibilities mean for the region's ambitions in advanced manufacturing, clean energy, life sciences and digital, giving mayors, education providers and employers a stronger basis for decisions they must make together.



Nunzio Quacquarelli
President

QS

Foreword

This is the first in a planned series of regional deep dives, and I believe the approach could help regions across the UK shape their response to AI. Each region has its own strengths, industries and ambitions. By understanding how AI could change work in each place, we can do more than prepare for the future. We can help shape a future worthy of the people whose lives it will change.

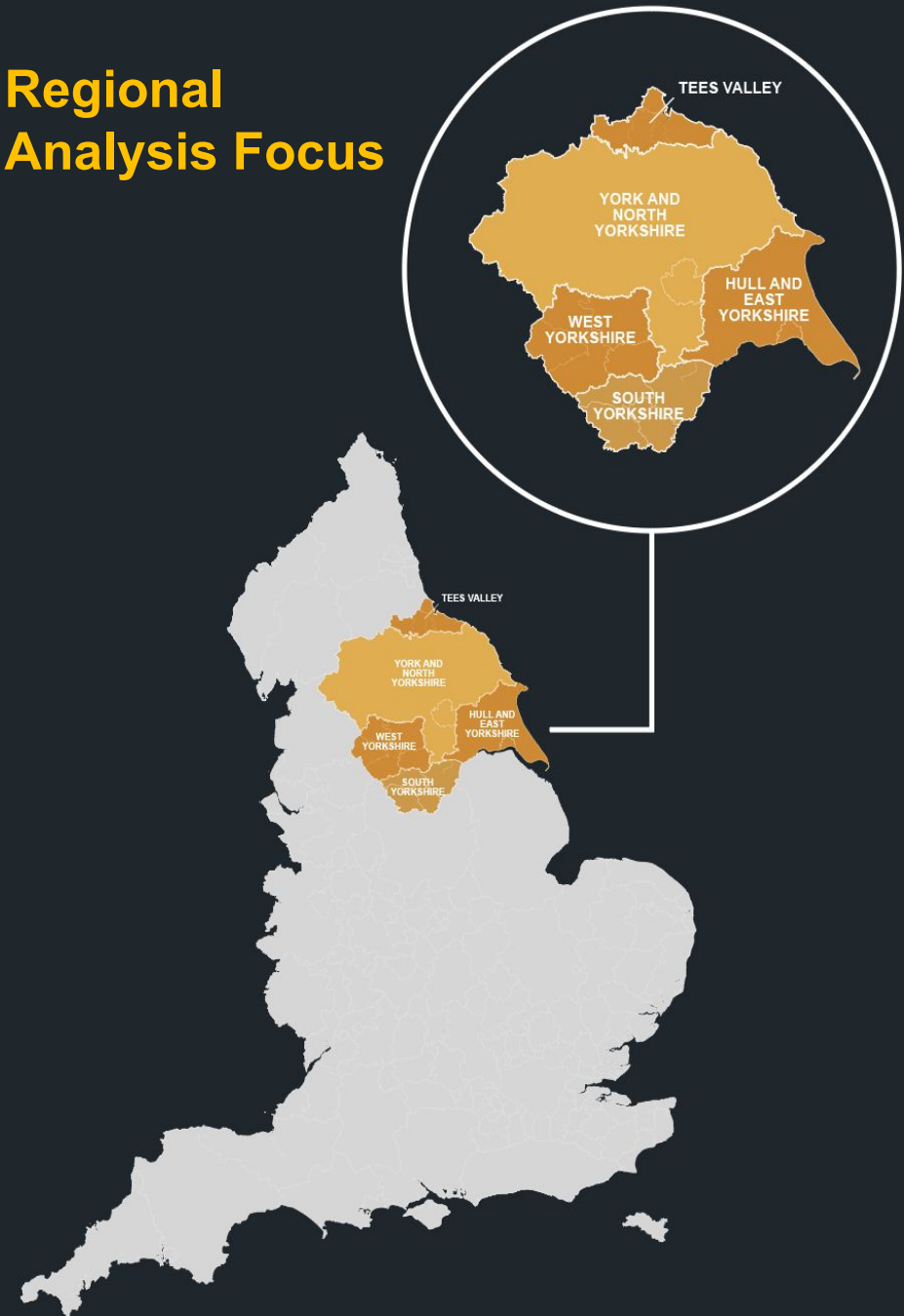
We analyse traditional and emerging occupations and skills to determine how AI could affect them through augmentation and automation.

Projected regional job growth by 2030 ranges from 126,000 new jobs in a high automation scenario to 379,000 in an AI augmentation scenario. Between 100,000 and 165,000 of these would be graduate jobs, underscoring the central role of postsecondary education in the region's vision.

The mayoral growth plans build on this potential supply of new labour. They also target areas where skills are already in short supply, including engineering and the broader sciences.

Proactively capturing the potential of AI augmentation will be critical to the region's growth. Achieving this will require collaboration between mayors, educational institutions and employers, with support at national level.

Regional Analysis Focus



01

SECTION 1

Executive summary

The report in one page: five takeaways and how to read the rest

Executive summary: five takeaways

There is strong projected growth across Y&H in the key Industrial Strategy sectors, offset by service automation

The 4 current mayoral growth plans prioritise the 8 Industrial Strategy Sectors, with a focus on Advanced Manufacturing, Clean Energy, Life Sciences and Digital.

Analysis in this report predict the region adds between 126,000 and **+379,000 new jobs - the latter in a scenario with AI augmentation and IS-8 acceleration**, plus 12,000 with a new BioTech hub and with Y&H at the centre of the UK's biotechnology industry.

IS-8 jobs are higher skilled than average; their growth is highly dependent on future supply of post-secondary talent

967,000 jobs (38% of employment) are in IS-8 occupations. **92% of the most 280 critical IS-8 occupations across the Y+H region require a degree.**

Against a flat 18-year-old cohort and internal emigration for the region, **graduate supply falls short in several fields:** engineering, computing, education, and broader sciences. Regional projected growth is constrained by this lack of a skilled workforce

AI has the potential to bring £38bn in value to the regional economy by 2030

Augmentation potential covers 68% of employment in the region, roughly double the 35% automation exposure. By 2030, a **£38bn regional GDP uplift is possible from AI augmentation**, based on sustained upskilling, sufficient supply of graduates, and a regional investment in AI and the IS-8.

Policy must encourage universities, colleges, and training providers to collaborate over key shortages. Courses must match employer needs to deliver growth

The region has a large and disparate base of universities, colleges and training providers **but collaboration over strategic courses is underplayed and policy should encourage more.** **Employers need students with human, technical and digital skills to work effectively alongside AI.** As roles change, these skills need to be updated in agile curricula.

Mayoral Plans require investment in reskilling and partnerships with HE and Industry to succeed

Their **Devolved Adult Skills Funds** must be led by data to offer both lifelong learning for many plus reskilling 173,000 service workers at risk of AI Automation.

Strategic partnerships between employers and education providers can codify research, curricula needs and pathways. Expanding apprenticeships, and experiential learning can attract students and build employment pathways.

Businesses must scale up digital adoption to take advantage of the growth available by augmenting jobs.

The university response

Devolution offers an extraordinary, generational opportunity to align higher education with regional economic prosperity. Our partnership with York & North Yorkshire Combined Authority and our shared ambition across the White Rose Mayoral Compact offers a unique moment to deliver system scale future workforce planning across our region.

This report provides a key focus on the demand and supply side labour market data to empower our Mayors to realise a £38 billion regional economic growth opportunity.

But this report also highlights the critical urgency of a shared plan to navigate severe demographic pressures - including an ageing population where retirees outnumber the economically active - and the consequent urgent need to retain more graduates in our region.

Delivering on our shared growth ambitions will require integrated regional collaboration and mayoral devolution in alignment with national policies that preserve university capacity as civic and economic engines.

York is not a passive player - we are building on this report to now conduct a deep dive audit of our course portfolio, aligning with emerging national and regional industries and high-growth sectors. We are embedding AI literacy and future-facing digital competencies across disciplines, ensuring our graduates are equipped to drive innovation in key regional growth areas. We are enhancing our successful York Online School to deliver flexible, stackable credentials, micro-credentials and modular awards that directly address AI fuelled workforce requirements.

Our work stretches beyond our immediate doorstep. Our alliance with Teesside University via the BioIndustrial Cluster North (BICN) will ensure a robust skills pipeline for major growth opportunities like the bioeconomy. There is clear scope for Mayors and universities across the region to collaborate further to respond to the skills challenges and job opportunities. We must act on these findings to ensure that Yorkshire and the Humber doesn't lose out as a new digital revolution transforms our economy.



Joan Concannon
Chief Reputation and
Stakeholder Relations
Officer

University of York

Policy implications

The ambition of the National Industrial Strategy, and the regional mayors to secure growth, depends on a secure and increasing supply of postsecondary and graduate labour.

While adult retraining, reducing NEETs and ensuring jobs and growth happen in every postcode remain essential, scalable growth in key sectors - biotech, financial services, advanced manufacturing, clean energy and digital - will demand thousands, if not tens of thousands, more qualified trained adults by 2030.

Yet at the same time, the supply-side infrastructure to meet this ambitious growth is already under strain. Over the past five years, engineering intake fell 14% and natural sciences 10%. Total numbers of students are down - both declining domestic cohorts and shrinking numbers of international students, driven in a large part by national policy decisions.

Even against a stable picture, strain is being placed on the supply-side ecosystem. Set against growth plans and an AI revolution, far more is needed to prevent these plans from just being pieces of paper.

Local education leaders, employers and mayors must coordinate a plan. While individual closures might make sense for one institution - for example, a university chemistry faculty or a college not running an engineering course with no demand - they create aggregated skills gaps.

Government needs to go further than simply wishing for greater collaboration and specialisation, and help local institutions make that a reality - and ensure funding, accountability and course accreditation rules allow for that collaboration.

Crucially, the government must recognise that international students drive UK growth. Public First research shows unequivocally how they boost local economies, domestic wages and jobs. Far from crowding out, a vibrant global talent market allows for more regional economic growth - a tide that lifts all boats.

Yorkshire and Humber stands on the cusp of a significant economic opportunity. National and local policy needs now the workforce to match it, and to back the institutions making it happen.



Jonathan Simons
Partner and Head of the
Education Practice

Public First

02

SECTION 2

The labour market

Who works in Yorkshire and the Humber today, how the current-path scenario projects it to tighten to 2030, and where its workers have come from

The demographic foundations of the labour market: 5.67M people, an ageing structure, and a tightening labour supply

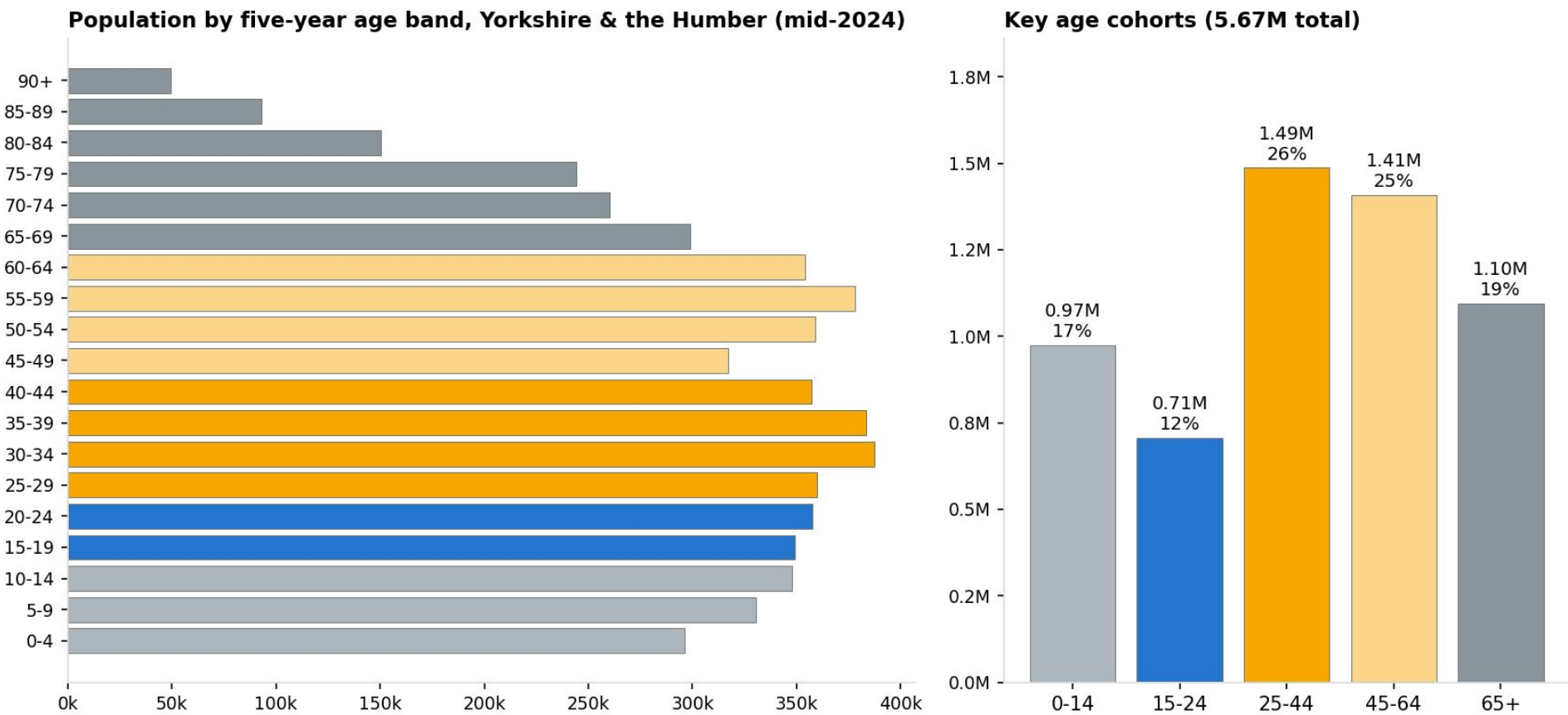
A 5.67M region where the over-65 population exceeds, and out-growing, the 15-24 cohort

ONS mid-2024 population estimates for Yorkshire & the Humber

The region holds 5.67M people. The 65+ cohort (1.10M, 19%) is larger than the 15-24 education-to-work pipeline (0.71M, 12%) and is around three-quarters the size of the 45-64 cohort approaching retirement (1.41M, 25%).

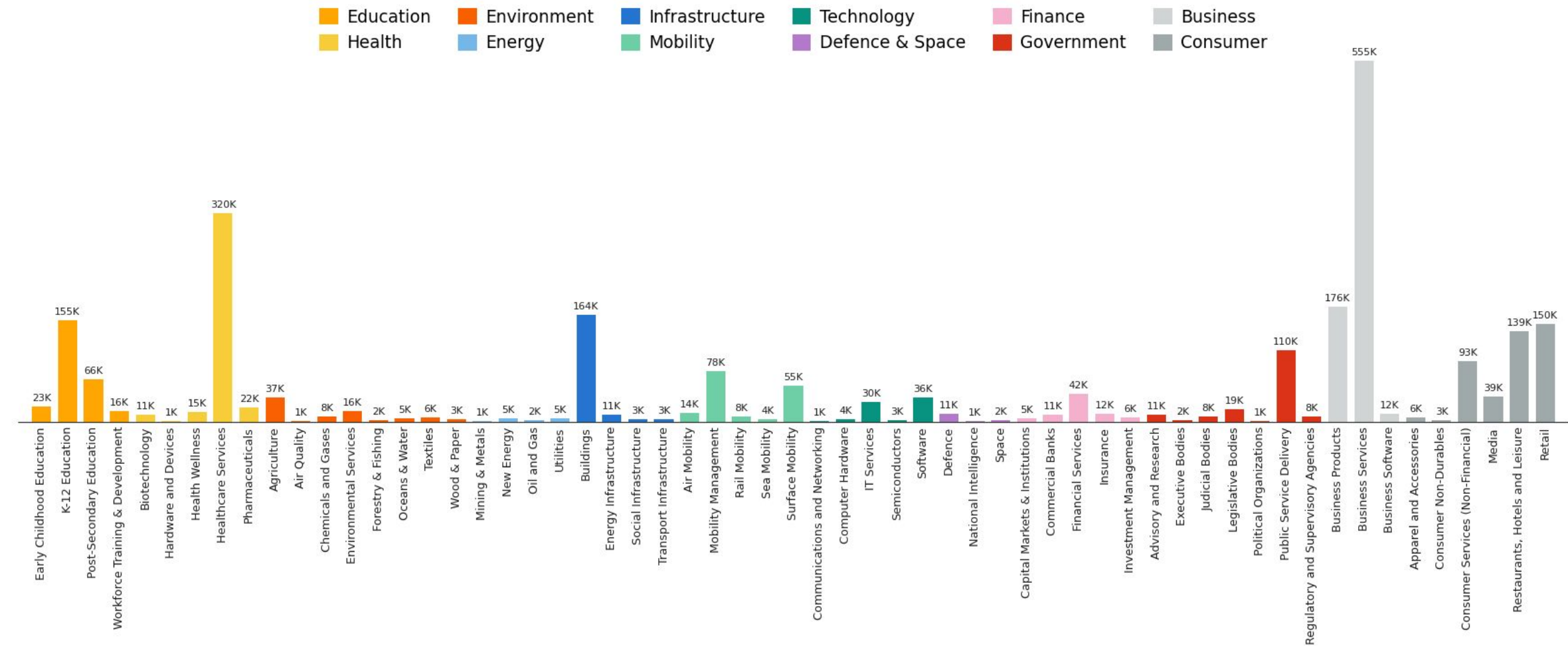
The cohort aged 25-44 (1.49M, 26%) is the largest. The number of young people entering the workforce is smaller than the number approaching retirement.

In many occupations, replacement demand alone will exceed the supply of new workers from younger cohorts.



Most of the region's 2.55M jobs are in a few large service sectors

All 59 QS sectors shown by 2025 regional employment and industry. Professional and business services is both the region’s largest employer and its largest IS-8 sector.



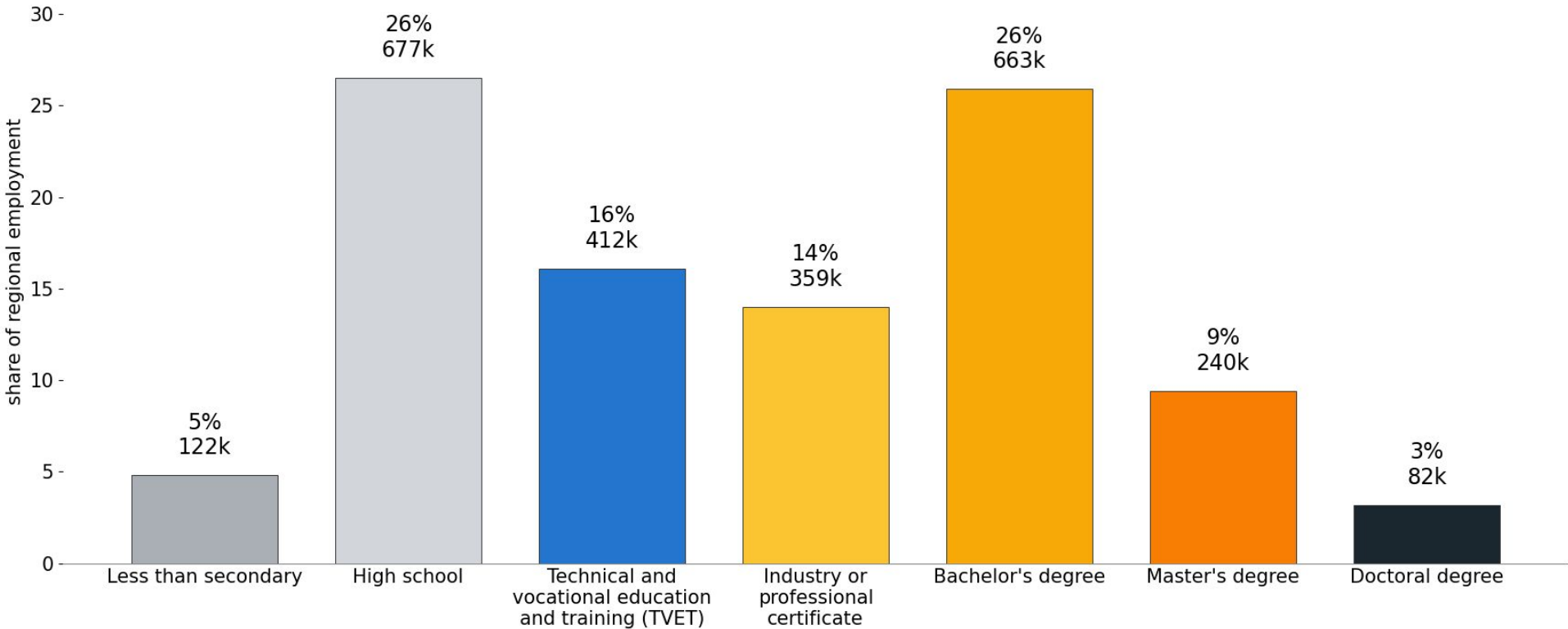
39% of all jobs need a degree; 30% more need technical or professional credentials

39% of the region's jobs need a degree and another 30% a technical or professional credential.

The 31% needing school-level qualifications or less concentrate in consumer and business roles and lead job growth on the current trajectory. Care-sector growth needs credentials as well as degrees.

Among the 286 strong-growth occupations, 88% require a degree or above.

Qualification requirements of the region's 2.55M jobs (39% require a degree)



03

SECTION 3

The Industrial Strategy sectors

The IS-8 mapped onto the region: close to a million jobs, more degree-intensive than the rest of the economy, and 280 occupations critical to delivery

The IS-8 mapped onto the region: sizing, viability, priority occupations and the qualifications they demand

967k jobs, 38% of the region's employment, are in IS-8 sectors

Y&H

Scale, regional wage and mayoral growth-plan priority from this analysis; the case for each sector drawn from the evidence in this section

Advanced Manufacturing

185k jobs · £43k median wage

The region's second-largest IS-8 sector and its strongest regional specialisation, centred on the AMRC at Sheffield with Boeing, BAE Systems, Airbus and GKN Aerospace. 63% of its employment is degree-level.

MAYORAL GROWTH-PLAN PRIORITY

All four plans

4/4

Professional and Business Services

565k jobs · £31k median wage

The largest IS-8 employment base by a wide margin and the region's biggest single source of net new jobs. Its £31k median is the second-lowest of the eight.

MAYORAL GROWTH-PLAN PRIORITY

WY · HEY

2/4

Digital and Technologies

87k jobs · £52k median wage

The highest-paying IS-8 sector and the sector with the largest employment gap relative to the UK average: technology employment sits a third below it. New graduate supply alone is unlikely to close the gap.

MAYORAL GROWTH-PLAN PRIORITY

WY · SY · YNY

3/4

Clean Energy Industries

21k jobs · £48k median wage

Small in headcount but associated with the largest announced investment in the region: the Humber decarbonisation cluster, the East Coast Cluster, Viking CCS and the Humber Freeport.

MAYORAL GROWTH-PLAN PRIORITY

All four plans

4/4

Life Sciences

33k jobs · £41k median wage

Among the most degree-intensive of the eight: 78% of its employment is in degree-level occupations. BioYorkshire and the Leeds, Sheffield, Hull and York teaching hospitals form its research base.

MAYORAL GROWTH-PLAN PRIORITY

All four plans

4/4

Financial Services

76k jobs · £43k median wage

An established Leeds banking and fintech cluster, growing steadily. It carries the highest automation exposure of the eight, at 80% of its employment.

MAYORAL GROWTH-PLAN PRIORITY

WY (BFPS cluster)

1/4

Creative Industries

39k jobs · £30k median wage

Established clusters in Leeds and Sheffield and Channel 4's national headquarters, but the lowest median wage of the eight and a large arts supply base against modest modelled demand.

MAYORAL GROWTH-PLAN PRIORITY

YNY · SY · WY

3/4

Defence

15k jobs · £39k median wage

The region's defence concentration is the third highest in the country, but around 11,000 of the 15k are armed forces personnel. The industrial supply chain is not separately identified in the data.

MAYORAL GROWTH-PLAN PRIORITY

SY · HEY · YNY (emerging)

3/4

Just 32 graduate occupations within the IS-8 account for 64k regional jobs

Y&H

The figure on each card is Yorkshire & the Humber jobs in 2025. Every occupation requires a university degree, and 21 of the 32 account for more than 1,500 jobs each.

Advanced Manufacturing

Product Engineer	3,884
Mechanical Engineer	2,918
Manufacturing Manager	2,484
Manufacturing Engineer	2,346

11.6k jobs across these four roles

Clean Energy Industries

Electrical Engineer	2,364
Chemical Engineer	1,511
Electrical Engineering Manager	1,443
Chemist	1,194

6.5k jobs across these four roles

Creative Industries

Media Producer	1,766
Video Game Designer	943
Apparel Designer	830
Scriptwriter	744

4.3k jobs across these four roles

Defence

Aerospace Engineer	2,077
Electronics Engineer	1,819
Electronics Engineering Manager	1,474
Physical Scientist	1,122

6.5k jobs across these four roles

Digital and Technologies

Software Developer	3,232
Systems Engineer	2,855
Software Application Developer	2,682
Back-End Developer	1,741

10.5k jobs across these four roles

Financial Services

Risk Analyst	4,369
Financial Analyst	2,382
Investment Analyst	2,235
Financial Consultant	1,820

10.8k jobs across these four roles

Life Sciences

Biomedical Scientist	2,014
Biochemist	1,908
Medical Writer	1,130
Regulatory Affairs Specialist	916

6.0k jobs across these four roles

Professional and Business Services

Management Consultant	2,967
Auditor	2,600
Public Accountant	1,343
Statistician	943

7.9k jobs across these four roles

280 'trans-sectoral' occupations are critical to delivering IS-8; 92% of those need a degree

Some occupations support several Industrial Strategy sectors at once. Because several sectors draw on the same people, a shortage in one of these occupations can constrain several sectors.

In Yorkshire and the Humber, 93 of the 280 critical occupations, holding 52,400 jobs, matter to four or more IS-8 sectors. Data scientists are important to all eight, and software, big data and AI roles to seven. Defence and Advanced Manufacturing have the greatest reliance on these shared occupations.

□ = important to that sector (score 3.0 or above) · all scores 0 to 5

	Reach	Advanced Manufacturing	Clean Energy	Defence	Digital and Technologies	Creative Industries	Financial Services	Prof. and Business Svcs	Life Sciences	Regional jobs 2025
Data scientist	7 to 8 sectors	3.3	3.0	3.4	3.9	3.0	3.6	3.7	3.2	702
Software developers		3.0	3.1	3.5	4.0	3.1	3.5	3.4	2.9	9,819
Big data architect		3.3	3.0	3.5	4.0	2.9	3.7	3.6	3.5	256
AI and machine learning engineers		3.3	2.8	3.6	4.4	3.2	3.4	3.5	3.5	183
Robotics engineer	5 to 6 sectors	4.3	3.2	4.0	3.6	1.5	0.6	2.9	3.1	355
Cyber security architect		2.8	2.6	3.8	4.2	2.5	3.7	3.5	3.0	316
Embedded software engineer		4.0	3.8	4.0	4.0	2.1	1.9	1.7	3.1	290
Materials research scientist		4.1	3.9	3.9	3.6	1.0	0.2	2.5	3.2	153
Mechanical engineer	3 to 4 sectors	3.9	3.8	3.6	2.4	1.6	0.5	2.8	2.9	2,918
Manufacturing engineers		4.0	3.7	3.5	2.9	1.1	0.2	1.4	3.3	3,371
Electronics engineer		3.8	3.5	4.0	3.7	1.8	1.2	2.7	2.9	1,819
Chemical engineer		3.6	3.7	3.3	2.3	0.4	0.2	2.5	3.3	1,511
Physical scientist		3.5	3.5	3.6	3.1	1.6	1.0	2.6	2.8	1,122
Biomedical scientist	1 sector	1.2	0.3	2.1	1.4	0.3	0.1	1.7	4.5	2,014

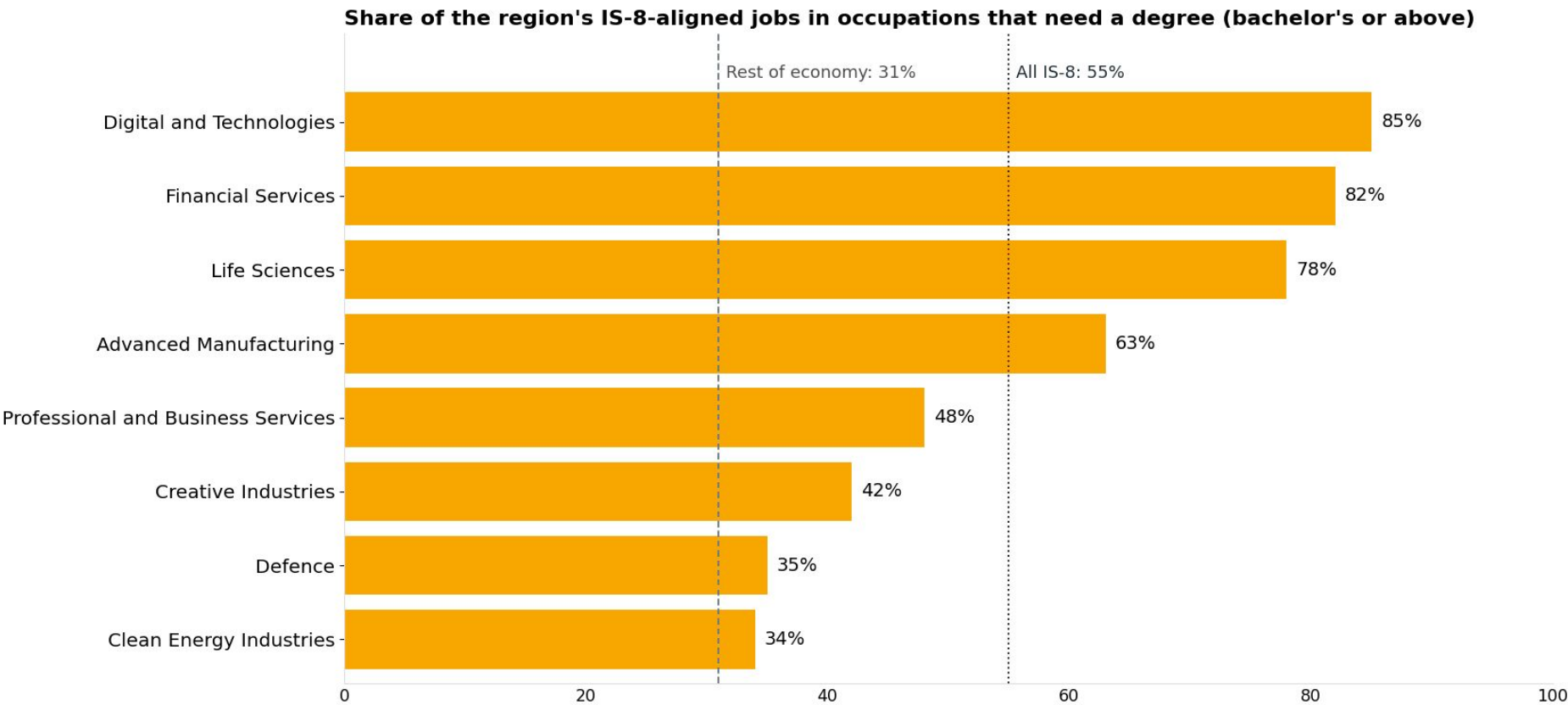
More than half of all IS-8 jobs need a degree, against 31% in the rest of the regional economy

The qualifications required in the strategic sectors

55% of all IS-8 employment is in occupations that need a degree, against 31% in the rest of the economy.

Digital and Technologies (85%), Financial Services (82%), Life Sciences (78%) and Advanced Manufacturing (63%) are the most degree-intensive.

In the 280 critical occupations, the share rises to 92%.



04

SECTION 4

AI automation and augmentation

AI's potential to augment workers and automate tasks

Every occupation receives two scores: one for AI augmentation and one for AI automation. The two answer different questions and are not combined.

Each occupation gets two AI scores: augmentation and automation

The two scales are independent and are not combined.

AI Augmentation

The degree to which AI can assist, enhance, or extend what a human worker does in this occupation at a task level without replacing the human contribution. A high augmentation score means AI tools can make workers in this role significantly more productive.

AI Automation

The degree to which AI can replace the human worker's contribution in this occupation. A high automation score means AI could perform the core tasks without human involvement.

The two are independent

An occupation can score highly on both dimensions (data entry and clerical work, which AI can both assist and perform the tasks), high on augmentation alone (a physician, where AI supports diagnosis but cannot carry clinical judgement), or low on both (a construction worker, whose work is physical).

Scored on the same seven metrics

Each occupation is scored on seven structural metrics, once under each lens: including the extent to which work is already performed through digital systems, how decomposable the tasks are, and whether physical presence or legal accountability is required. A radiologist scores highly on augmentation under the regulation metric because AI diagnostic tools are permitted and in use and low on automation for the same metric because a human must sign off.

How to interpret the ratings

Scores run 1 to 5 in five bands, from Very Low to Very High, with High beginning at 3.5. As in the national report, these are global scores and describe potential impact. The impact described in this section apply to the region's occupation mix.

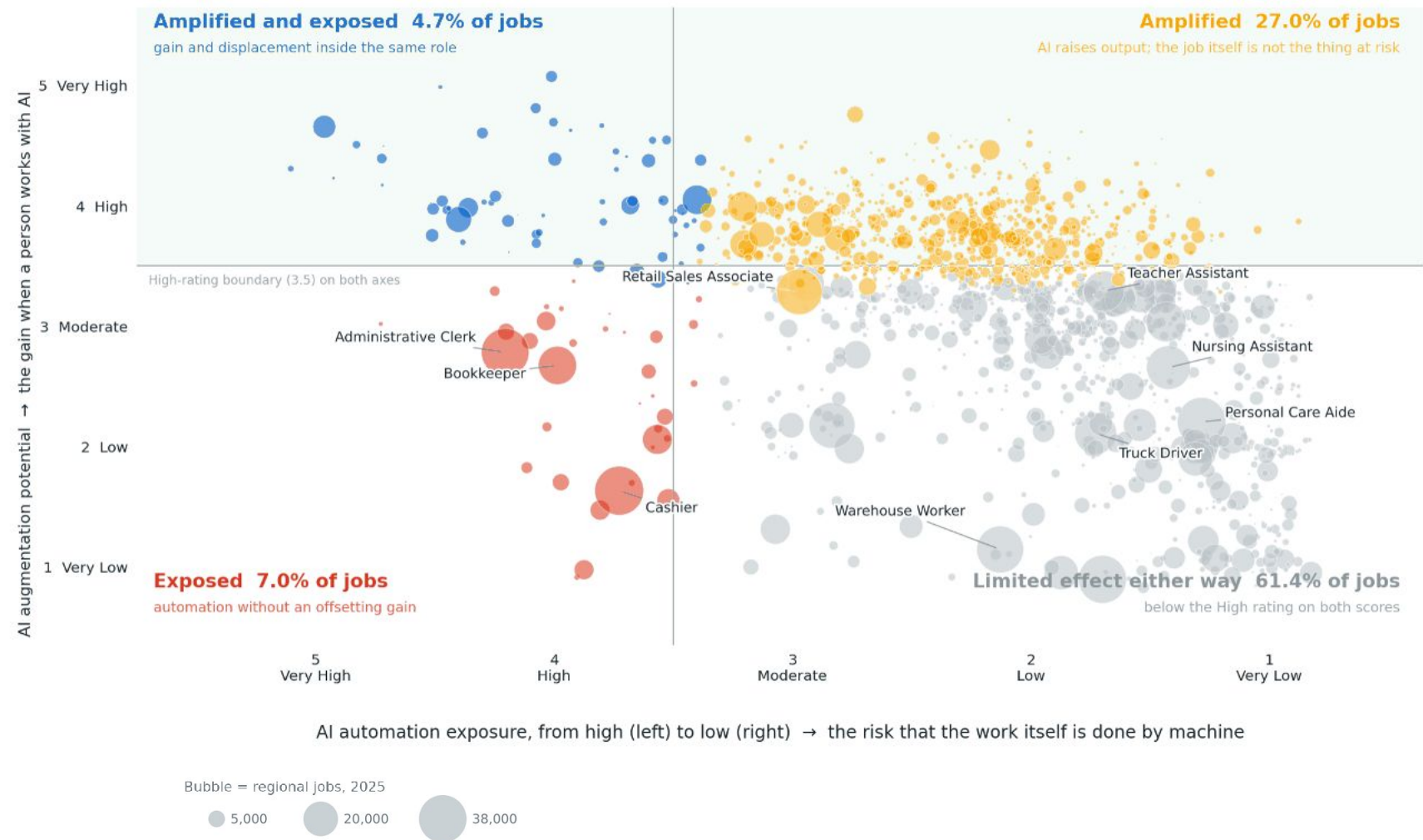
27% of regional jobs have high augmentation potential; 7% have high automation exposure

Y&H

27% of regional employment has high augmentation potential but not high automation exposure. 7% has high automation exposure without high augmentation potential.

4.7% of employment is high on both dimensions; 61% is below High on both.

Most regional employment has some AI augmentation potential; 7%, around 179,000 jobs, has high automation exposure and needs reskilling into adjacent work.



83% of critical-occupation jobs have high AI augmentation potential

The 261 degree-level occupations among the 280 critical to the IS-8, scored for AI augmentation potential and ranked by regional employment

83% of employment in the 261 degree-level critical occupations has high or very high augmentation potential.

212 of the 261 occupations, holding 122,700 jobs, have high or very high augmentation potential.

Only five, holding 3%, have high automation exposure.

The 19 critical occupations below degree level, CNC programming among them, sit in the technical and vocational pathway.

Occupation	Y&H jobs 2025	AI augmentation	IS-8 sectors served
Software Developers	9,819	High	Digital; Financial Services
Risk Analyst	4,369	Very High	Financial Services
Product Engineer	3,884	High	Advanced Manufacturing; Clean Energy
Management Consultant	2,967	High	Prof. & Business Services
Mechanical Engineer	2,918	High	Advanced Manufacturing; Clean Energy
Systems Engineer	2,855	High	Digital; Prof. & Business Services
Auditor	2,600	High	Prof. & Business Services; Finance
Financial Analyst	2,382	High	Financial Services
Manufacturing Engineer	2,346	High	Advanced Manufacturing; Clean Energy
Investment Analyst	2,235	High	Financial Services
Research Scientist	2,230	High	Defence; Life Sciences
Biomedical Scientist	2,014	High	Life Sciences

Business and consumer roles hold most of the automation exposure

Occupations rated high or very high for automation exposure, ranked by regional employment

12% of regional employment, 298,000 jobs in 102 occupations, carries high or very high automation exposure.

Only five sit among the 280 critical to the IS-8, and none of the eleven shown scores above 2 out of 5 for any IS-8 sector. Most exposure is concentrated in business and consumer industries, the two industries tested in the automation-downside scenario (Scenario 3, Section 5).

Two fifths of that employment also carries high augmentation potential, so task redesign will influence how these occupations change.

The eleven largest in the business and consumer industries are shown; the largest elsewhere is forklift operator (6,163 jobs).

Occupation	Y&H jobs 2025	AI automation	Industry: sector
Cashier	37,981	High	Consumer: Retail
Administrative Clerk	36,160	High	Business: Business Services
Bookkeeper	23,221	High	Business: Business Services
Fast Food/Counter Worker	13,985	High	Consumer: Restaurants, Hotels and Leisure
Customer Service Agent	13,896	High	Business: Business Services
Billing and Posting Clerk	10,712	Very High	Business: Business Services
Inventory Clerk	8,440	Very High	Consumer: Retail
Retail Store Clerk	8,151	High	Consumer: Retail
Human Resources Assistant	6,517	High	Business: Business Services
Counter Sales Clerk	6,285	High	Consumer: Retail
Call Centre Agent	5,836	High	Business: Business Services

05

SECTION 5

Four scenarios to 2030

The current path, AI augmentation, an automation downside and a biotechnology investment scenario, and what each means for jobs, skills and the region's universities

Each scenario starts from the same 2025 base of 2.55 million jobs and changes one set of assumptions to test the region's position.

1 Current path

2 AI augmentation

3 Automation downside

4 Biotechnology investment

WHAT THIS SCENARIO IS

The current-path scenario. Each occupation continues along its projected growth path to 2030, with no change in how fast AI is adopted and no new industrial policy. Every other scenario is measured against this one.

WHAT IT ASSUMES

AI automation	No change
AI augmentation	No change
Faster IS-8 growth	No change

WHAT IT MEANS FOR HIGHER EDUCATION

Expand provision where graduate shortages exist

The current-path scenario shows gaps in engineering, computing, education and the sciences.

Plan for the 280 critical occupations

92% of jobs in the critical occupations require a degree.

Net new jobs, 2025 to 2030

+252,000

1.9% a year

Against the current path

Current path

the scenario the other three are measured against

Degree-level jobs

+108,000

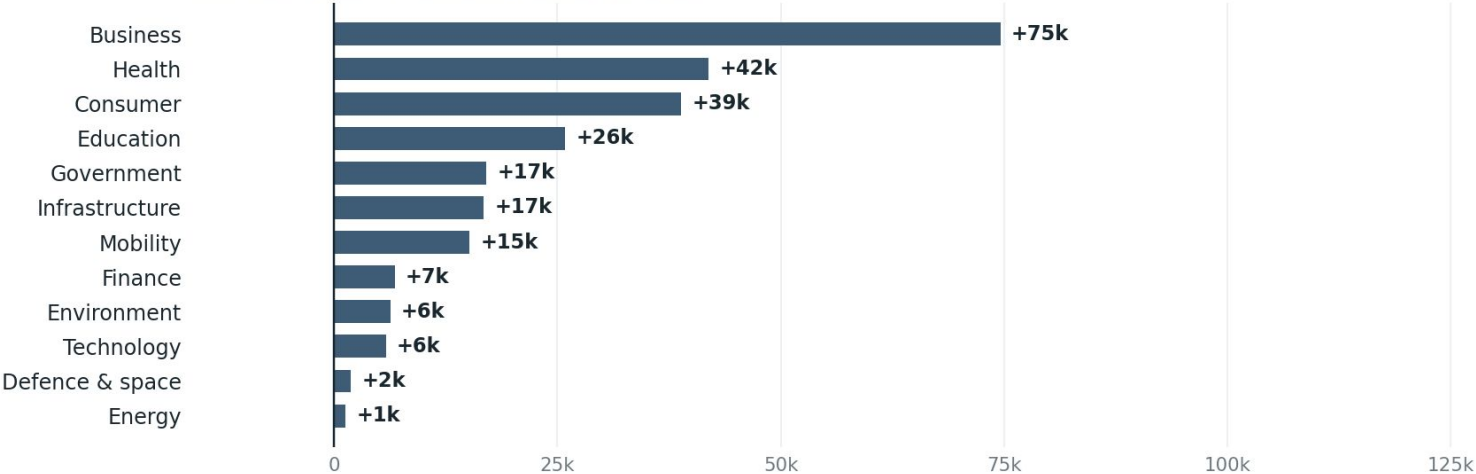
43% of the growth

The 280 critical occupations

+16,200

10% growth on 159,700 jobs

Net new jobs by industry, 2025 to 2030



WHAT HAPPENS BY 2030

- Once career choices are counted, engineering is around 2,160 graduates a year short, computing 900, education 700 and the sciences 300.
- Jobs in the 280 occupations critical to the Industrial Strategy grow by 16,200 (10%) to 2030.
- Every industry grows. Business (+75,000), health (+42,000), consumer (+39,000) and education (+26,000) lead.
- Occupations with the highest automation exposure still grow under this scenario: the twelve largest add around 10,700 jobs, led by fast food workers (+1,800), cashiers (+1,500) and retail clerks (+1,100).

Scenario 2, AI augmentation: 379,000 new jobs and a £38bn premium

1 Current path

2 AI augmentation

3 Automation downside

4 Biotechnology investment

WHAT THIS SCENARIO IS

The AI augmentation scenario. AI is adopted across the workforce, increasing productivity across many occupations and replacing some routine work. All eight Industrial Strategy sectors grow faster than under the current-path scenario.

AI augmentation premium

+£38bn

7.7% of the UK's £490bn

Net new jobs, 2025–30

+379,000

2.8% a year

Against the current path

+127,000

more jobs than current path

Degree-level jobs

+165,000

43% of the growth

280 critical occupations

+28,600

18% on 159,700 jobs

WHAT IT ASSUMES

AI automation

All occupations

AI augmentation

All occupations

Faster IS-8 growth

All eight sectors

WHAT IT MEANS FOR HIGHER EDUCATION

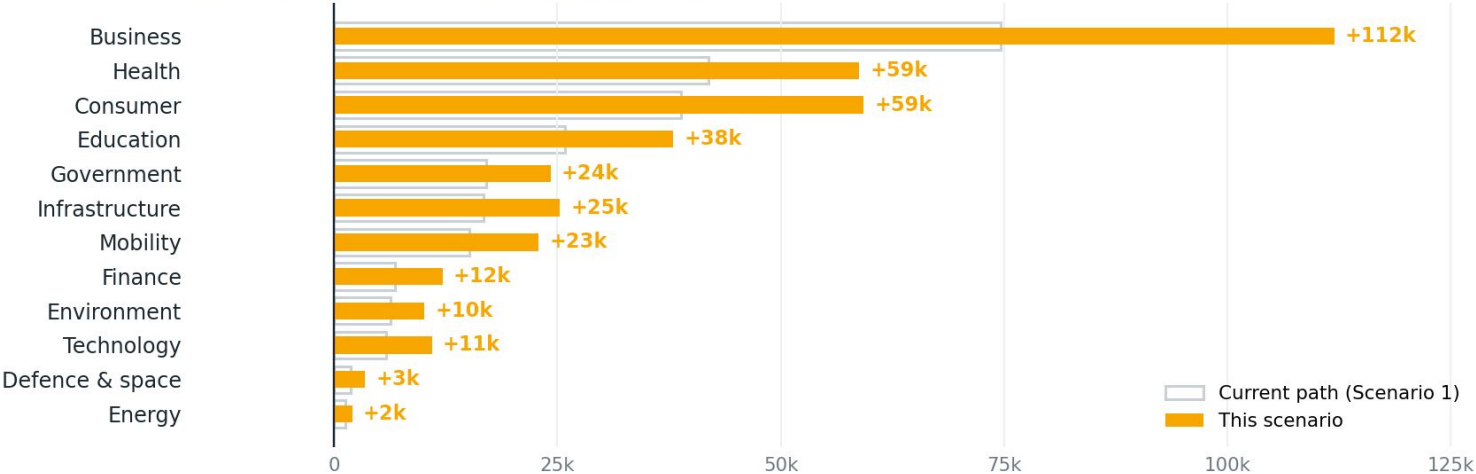
Expand provision in fields where AI-driven growth increases demand

AI investment raises demand for engineering, computing and education graduates, as well as for skills needed to work alongside AI.

Monitor the widening graduate gaps

Adjust provision as the engineering, computing and education gaps widen.

Net new jobs by industry, 2025 to 2030



WHAT HAPPENS BY 2030

- The graduate gaps widen. Once career choices are counted, engineering moves from 2,160 to 3,470 graduates a year short, computing from 900 to 2,000 and education from 700 to 1,800.
- Every industry grows faster.
- Several smaller strategic sectors show the largest proportional changes: technology grows from 5,800 to 10,900, and finance adds another 5,000 roles.

Scenario 3, automation downside: job growth halves to 126,000 by 2030

1 Current path

2 AI augmentation

3 Automation downside

4 Biotechnology investment

WHAT THIS SCENARIO IS

The automation-downside scenario. AI automation arrives quickly in office and customer-facing work (administration, bookkeeping, retail, hospitality and logistics). More exposed occupations see larger employment reductions. Everything else stays on the current path.

WHAT IT ASSUMES

AI automation

Business and Consumer Industries Impact

AI augmentation

No change

Faster IS-8 growth

No change

WHAT IT MEANS FOR HIGHER EDUCATION

Prepare graduates for occupations with lower automation exposure
Embed technical and digital skills into business education so graduates can move into emerging roles and work alongside AI.

Strengthen higher education's role in lifelong learning
Reskill administrative, retail and hospitality workers into areas of growing demand.

Net new jobs, 2025 to 2030

+126,000

1.0% a year

Against the current path

-126,000

fewer jobs than the current path

Degree-level jobs

+69,000

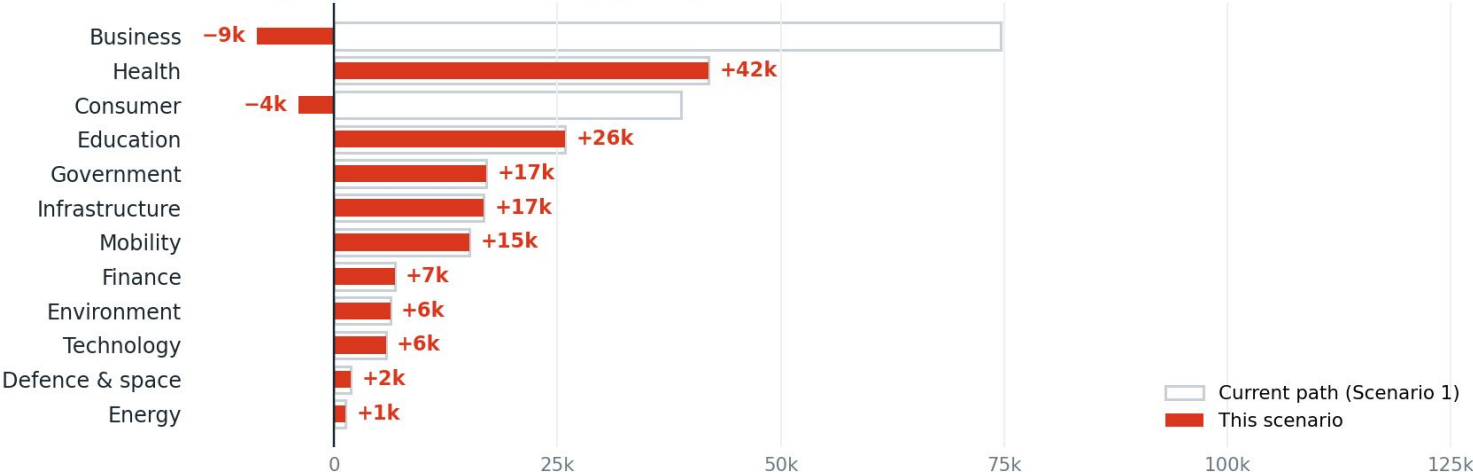
down from 108,000

The 280 critical occupations

+11,200

7% growth on 159,700 jobs

Net new jobs by industry, 2025 to 2030



WHAT HAPPENS BY 2030

- Of the 126,000 fewer jobs, 38,000 are graduate-level, mostly in business and administration, and 88,000 are below degree level.
- Employment still grows, but the business and consumer industries end 2030 smaller than today, by 9,000 and 4,000 jobs.
- Administrative clerks, cashiers and retail sales staff take the largest single hits, but the loss is spread across 588 occupations.



WHAT THIS SCENARIO IS

The biotechnology investment scenario. It assumes increased biotechnology investment in the region, and the 208 occupations the industry draws on grow faster than they otherwise would, reflecting demand across laboratory science, engineering and software. Everything else stays on the current path.

WHAT IT ASSUMES

AI automation

No change

AI augmentation

No change

Faster IS-8 growth

Biotechnology occupations

WHAT IT MEANS FOR HIGHER EDUCATION

Biotechnology creates 11,300 degree-level jobs
The extra jobs need graduates in laboratory science, engineering and software, creating additional demand in these fields.

Retain graduates and recruit from outside
With graduate numbers past their peak, institutions and government would need to support graduate retention and recruit nationally and internationally.

Net new jobs, 2025 to 2030

+264,000
2.0% a year

Against the current path

+12,000
more jobs than the current path

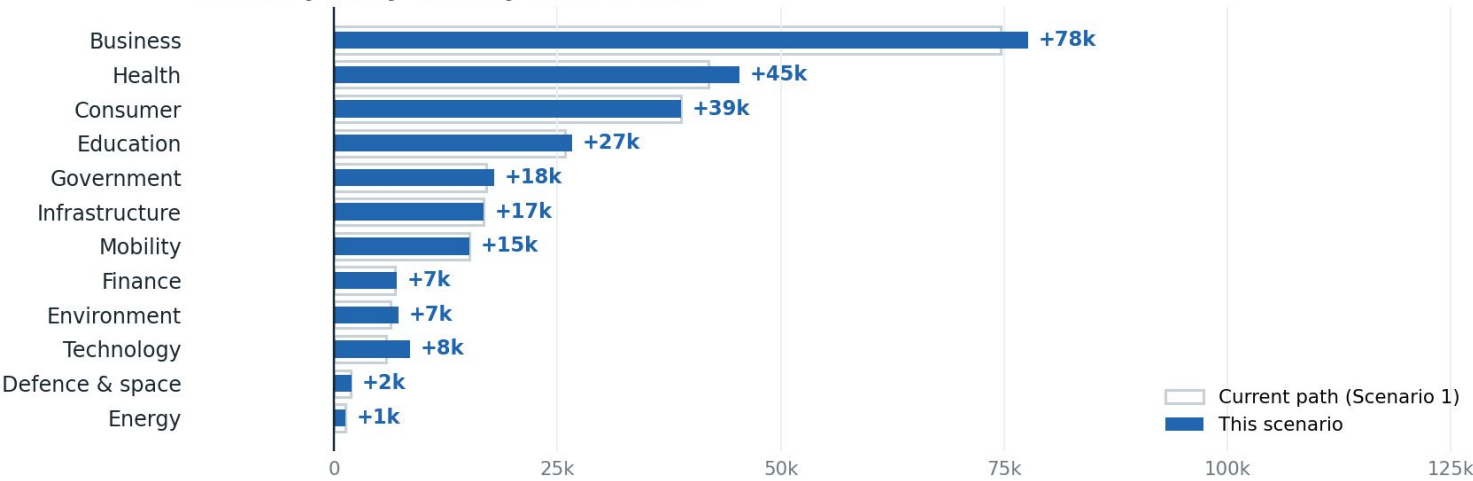
Degree-level jobs

+119,000
11,300 of the 12,000 extra

The 280 critical occupations

+22,700
14% growth on 159,700 jobs

Net new jobs by industry, 2025 to 2030



WHAT HAPPENS BY 2030

- Nearly all the jobs this creates need a degree: 11,300 of the 12,000.
- 54% of the extra jobs are in the 280 critical occupations, against a tenth under Scenario 2.
- Health, business and technology gain around 3,000 jobs each; for technology that lifts growth by almost half, from 5,800 to 8,500.

06

SECTION 6

Mayoral and policy response

What the four combined authorities are planning, read against the modelled trajectory

The four combined authorities are West Yorkshire (WY), South Yorkshire (SY), York and North Yorkshire (YNY), and Hull and East Yorkshire (HEY).

All four back the same sectors; graduate supply varies in strength but is critical to all

Each Local Growth Plan's priorities, the graduate supply behind them, and the resulting supply-side requirement

	West Yorkshire	South Yorkshire	York & North Yorkshire	Hull & East Yorkshire
Priority sectors	Financial and professional services · HealthTech and life sciences · Digital · Green economy · Manufacturing · Creative	Advanced manufacturing · Clean energy · Life sciences and health tech · Defence · Creative	Industrial biotechnology (BioYorkshire) · AgriTech · Manufacturing · Creative and digital · Health and life sciences · Rail	Humber energy estuary · Ports and logistics · Manufacturing · Life sciences and medical devices · Defence · Agri-food
Graduate supply	103,455 enrolments, 48% of the region · around 28,500 retained graduates a year · 5,515 engineering enrolments, around 1,450 retained	59,045 enrolments, 28% · around 16,900 retained graduates a year · 7,850 engineering enrolments, around 2,000 retained, the strongest of the four	34,685 enrolments, 16% · around 10,200 retained graduates a year · only around 200 engineering graduates a year, the smallest engineering graduate supply of the four	14,715 enrolments, 7%, from one university · around 4,600 retained graduates a year · around 390 in engineering
Major assets	National NHS and DHSC offices (Leeds), Leeds Teaching Hospitals, Channel 4, Health Innovation and Digital Tech Investment Zone	The AMRC, Sheffield Forgemasters, Boeing Sheffield, and the UK's first Investment Zone (£80m, 8,000 jobs)	Institute for Safe Autonomy, York Biotech Campus, National Agri-Food Innovation Campus, GCHQ Scarborough	Siemens Gamesa, Humber Freeport, Saltend Chemicals Park, Hull University Teaching Hospitals (around 11,000 staff)
The supply-side requirement	The largest graduate supply of the four; digital is the region's biggest IS-8 gap to the UK average (index 0.66)	Convergence by 2035 needs growth 2.5x the current trajectory; Scenario 2 is the closest of the modelled scenarios to that pace	Draws engineering supply from Leeds, Sheffield and Hull; its rail specialism has no direct IS-8 home	Yorkshire Energy Park (up to 4,480 jobs) and BioIndustrial Cluster North (5,000) have the largest new-job ambitions

Full detail on each authority, including the IS-8 mapping, is in Appendix 5.

Mayoral ambitions against modelled demand to 2030

Headline commitments from the growth plans, read against Scenario 1 (S1, the current path) and Scenario 2 (S2, AI augmentation). Where definitions align, the difference is the size of the supply-side task

1 The plan ambition

WEST YORKSHIRE

The plan identifies around 20,000 potential green jobs by 2030

WEST YORKSHIRE

53,000 more residents qualified at Level 4+ (higher technical and degree-level)

YORK & NORTH YORKSHIRE

238,000 new workers needed by 2035, around 121,000 graduates (Get YNY Working Plan)

SOUTH YORKSHIRE

Convergence by 2035 needs growth 2.5x the current trajectory

BIOINDUSTRIAL CLUSTER NORTH (WITH TEES VALLEY)

5,000 green jobs, £5bn bioeconomy growth

HULL & EAST YORKSHIRE

Yorkshire Energy Park positioned for up to 4,480 jobs

2 The modelled trajectory

Clean energy industries add +1,300 jobs to 2030 region-wide (S1); +2,600 under S2. The plans' broader green definition spans retrofit and transport

108k new degree-level jobs to 2030 (S1) support the target. Graduate supply and retention could constrain delivery.

Field-level deficits emerge; engineering is around 2,160 new graduates a year short (S1)

Scenario 2 adds around 127k jobs beyond Scenario 1, still short of the 2.5x pace convergence implies

Life sciences add +3,700 jobs to 2030 (S1); 78% of the sector's employment is in degree-level occupations

Part of the clean energy and manufacturing jobs; depends on future investment decisions

3 Potential responses

Reskilling from legacy engineering; retrofit workforce requirements would largely require additional training capacity

Graduate retention routes and adult progression to Level 4-6 (higher technical up to degree), where universities carry the volume

Faculty and programme planning informed by the field-level gaps in Section 7

Scenario 2 is the closest modelled scenario to that pace

Engineering biology training routes are defined

Technician supply through further education alongside graduate engineering

07

SECTION 7

The role of higher education

What the region's universities produce, set against the demand quantified in this report, and whether the region keeps its graduates

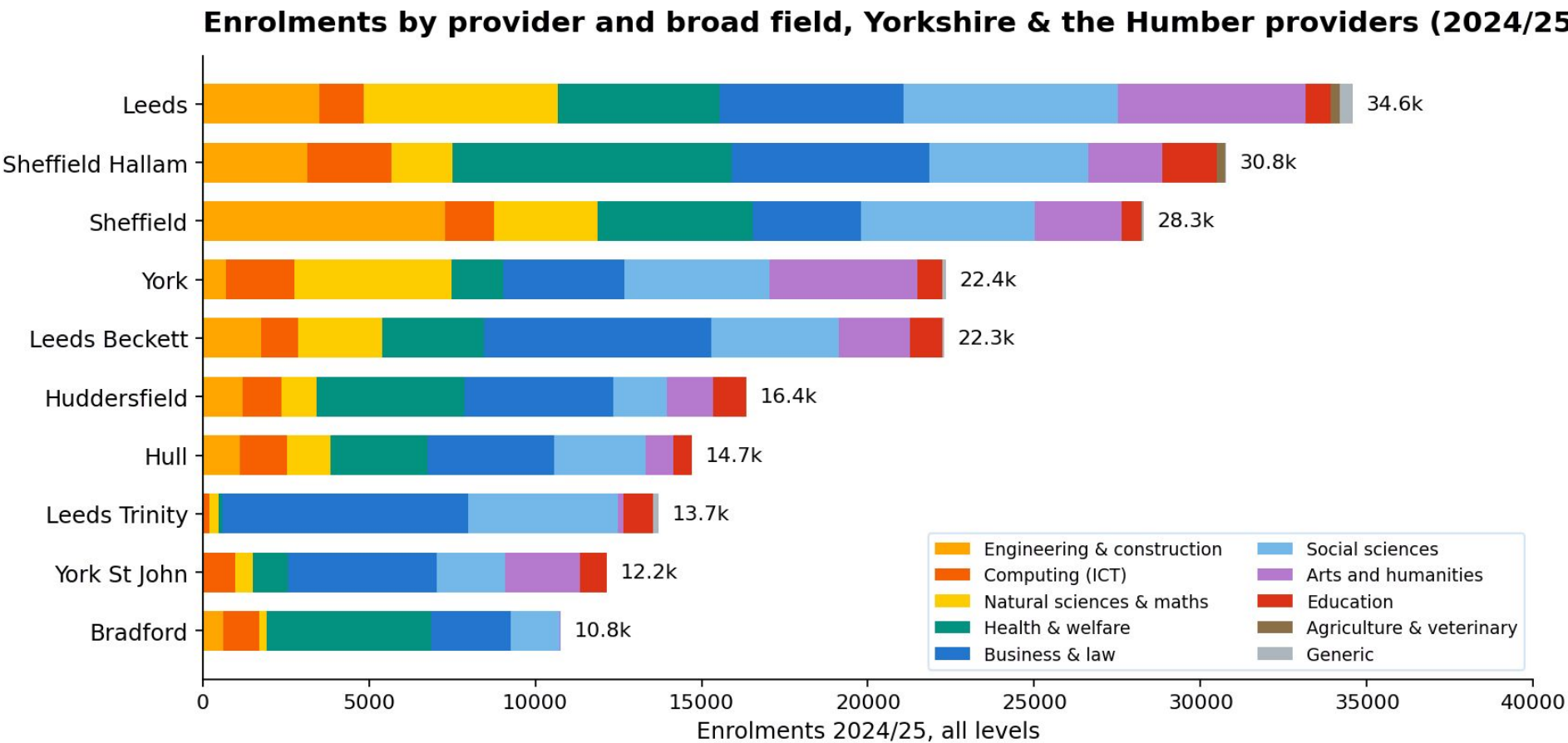
Supply is enrolments and graduates from Yorkshire and the Humber providers; demand is the requirement quantified in Sections 3 and 5.

There are over 200,000 students in the region; half of providers together teach 96% of them

Y&H

HESA lists 20 higher education providers in Yorkshire and the Humber. The ten with 10,000 or more enrolments hold around 206k of the region's 213.7k students, 96% of the total; the chart shows those ten by broad field (2024/25, all levels).

Leeds (34.6k), Sheffield Hallam (30.8k) and Sheffield (28.3k) are the region's largest providers. In engineering, computing and natural sciences, Sheffield (11.9k) and Leeds (10.7k) lead, with Sheffield Hallam and York close behind (7.5k each).



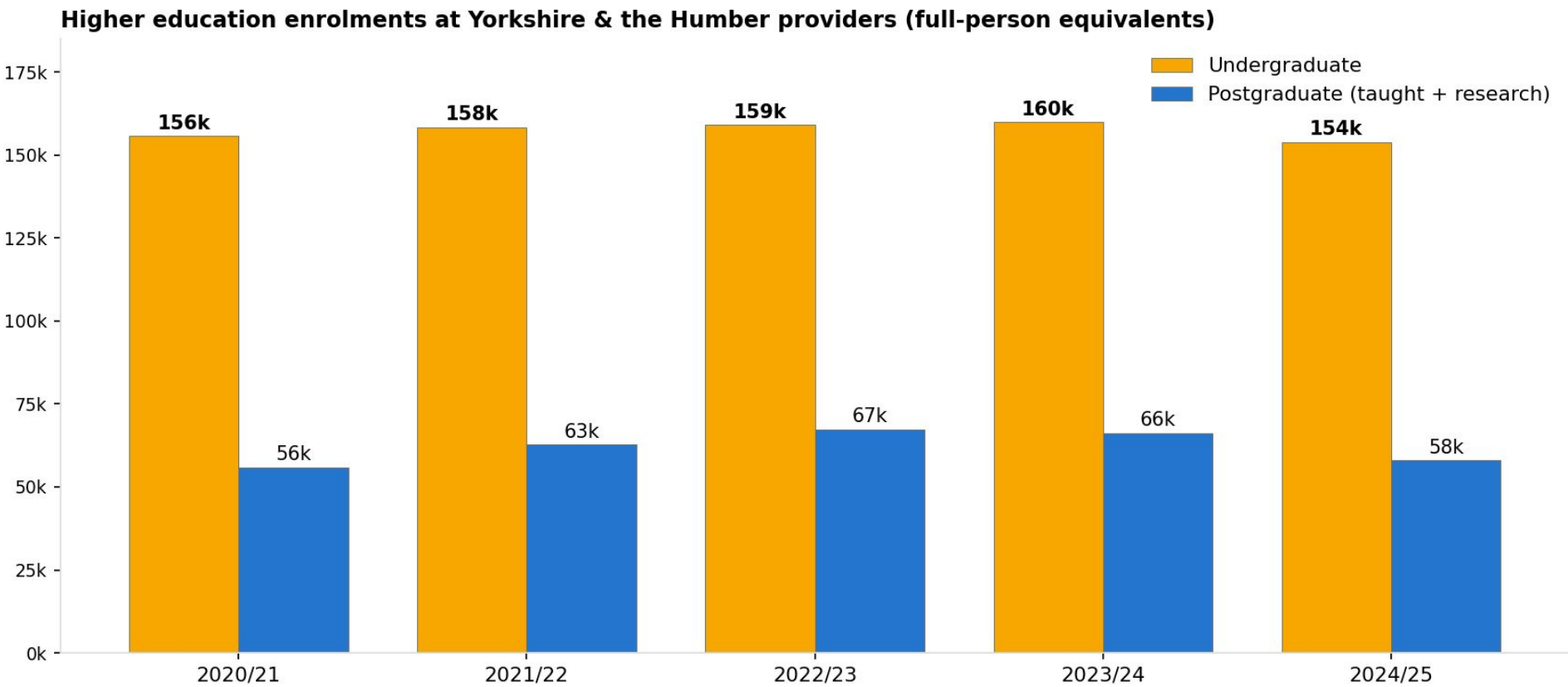
Undergraduate supply peaked in 2023/24 and is now falling

HESA enrolments at the region's 20 providers, 2020/21 to 2024/25

Undergraduate enrolments peaked at 162k in 2023/24 and fell 3.8% in 2024/25, the first decline of the period.

Postgraduate numbers fell harder, 14% below their 2022/23 peak of 67k, in line with the national contraction in international postgraduate recruitment.

Enrolments are falling as the labour market tightens and Industrial Strategy demand grows.

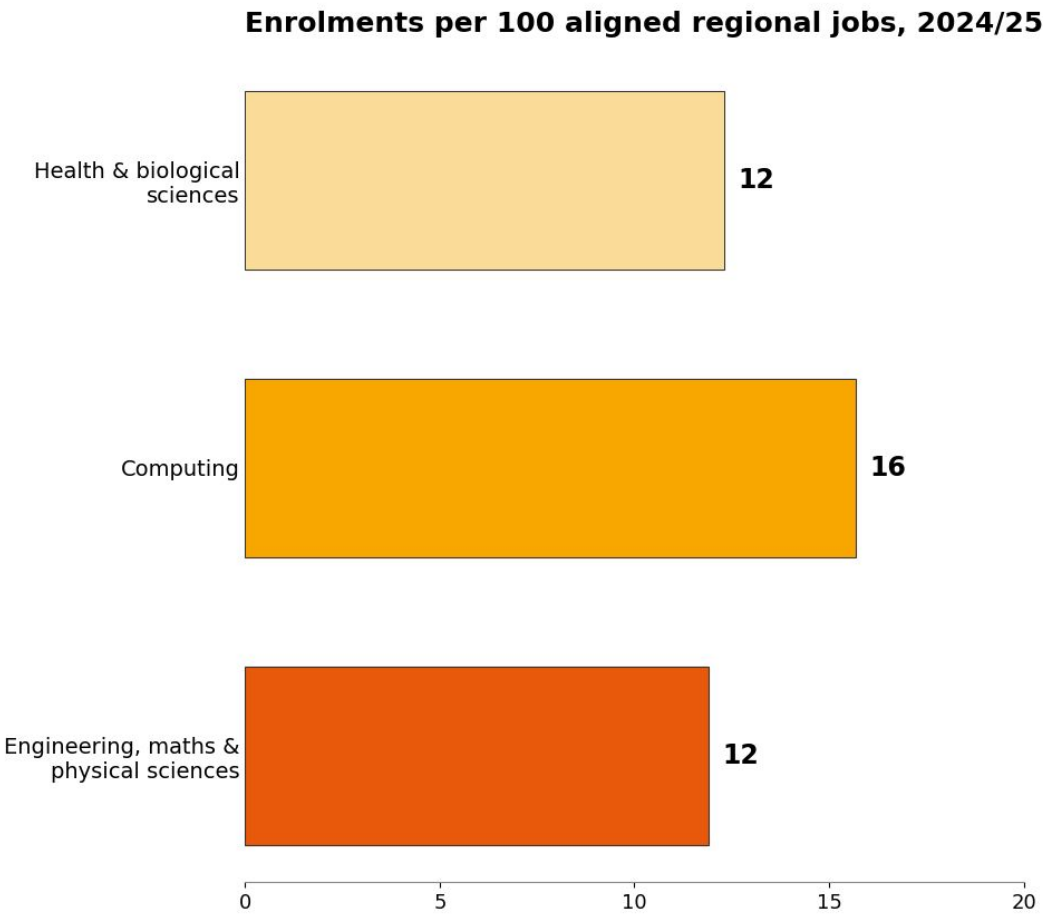
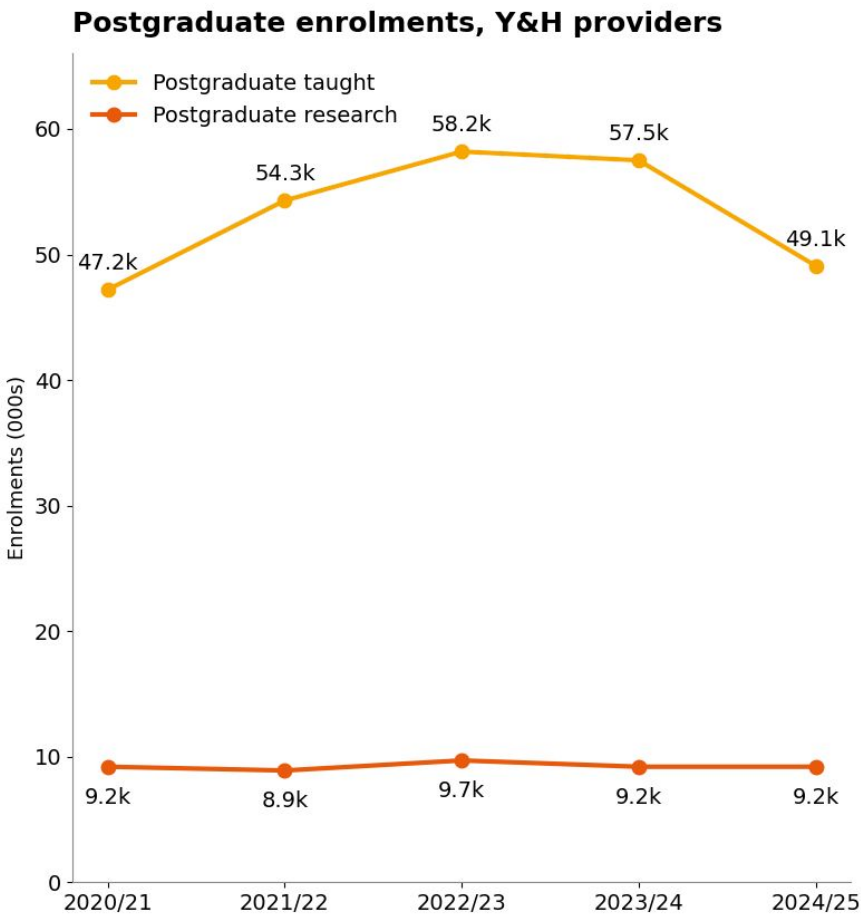


Taught postgraduate enrolments fell 16%; STEM supply falls as demand grows

Postgraduate taught enrolments fell 16% from their 2022/23 peak (58.2k to 49.1k), alongside the national fall in international recruitment. Postgraduate research is stable at 9.2k, so total postgraduate enrolments fell 14%.

Engineering, maths and physical sciences have 12 enrolments per 100 related regional jobs, below computing (16) and roughly level with health (12).

Engineering, maths and physical sciences are the only group whose enrolments are falling while related demand grows under Scenarios 1 and 2.



Enrolment stocks (all levels, 2024/25) over total sector employment: engineering, maths and physical sciences against advanced manufacturing and clean energy (deduplicated), computing against digital, and health subjects against the health industry.

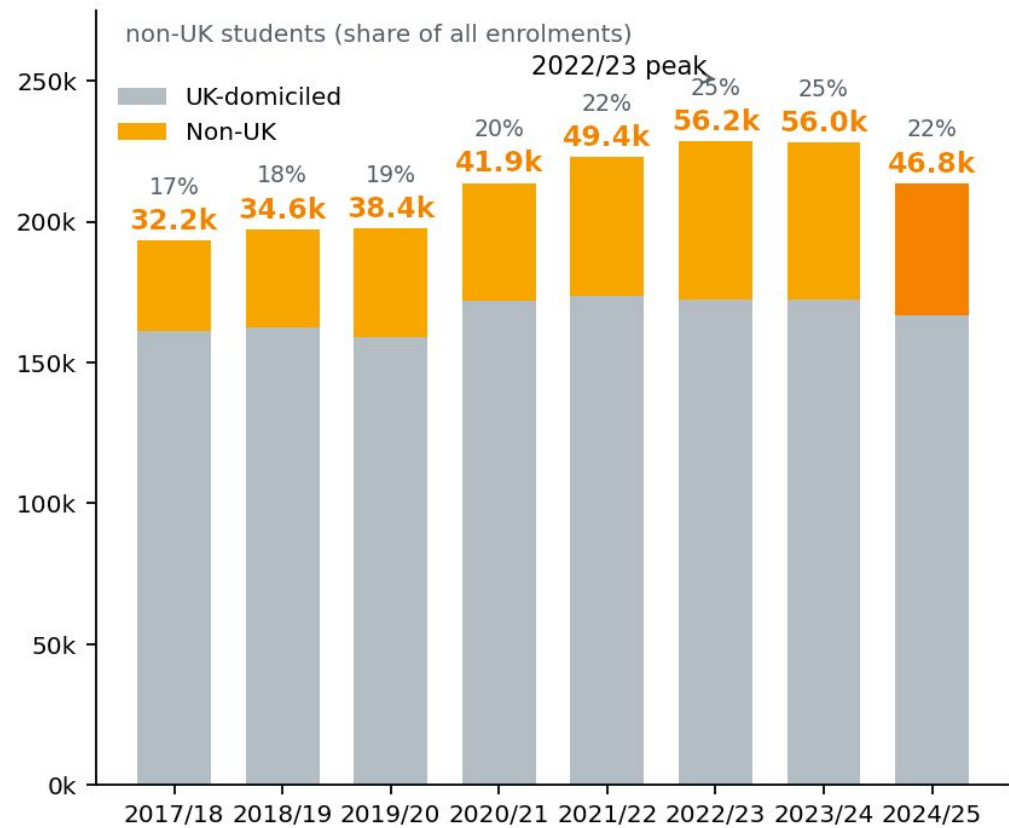
International students are 22% of enrolments, and their numbers fell 16% in the latest year

To close the graduate supply gap, international students should be a short-term lever. Most recent arrivals stay in the UK, but the region suffers the largest drop in international students in England.

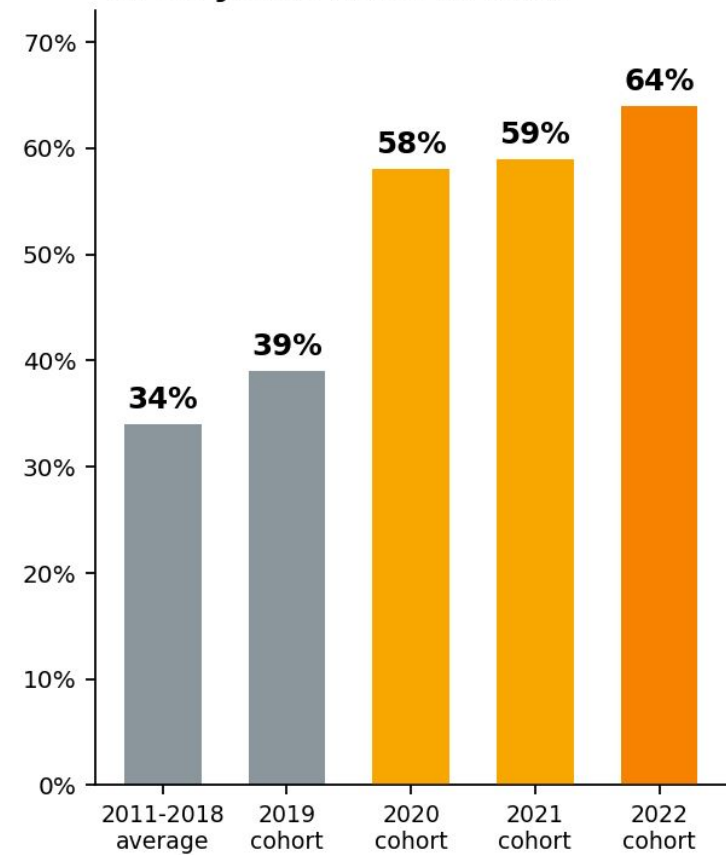
International enrolments fell 16% in the latest year from a peak of 56,250 in 2022/23. Non-UK students were 46,805 in 2024/25, 22% of all enrolments. 64% of the 2022 arrival cohort remained in the UK after three years, against 34% among the 2011 to 2018 cohorts.

The Graduate Route, the post-study work visa, shortens to 18 months for bachelor's and master's graduates applying from 1 January 2027. PhD graduates remain eligible for three years.

Students at Y&H providers by domicile



Student arrivals still living in the UK three years after arrival



Domicile from HESA enrolments by permanent address and region of provider, 2024/25. Stay rates are UK-wide, three years after arrival.

One of England's largest university concentrations, with pay economics that push graduates to London

The cluster

Leeds, Sheffield, Sheffield Hallam, York, Bradford, Hull and Huddersfield form one of England's largest university concentrations outside London and the South East, with a major industry partnership at the AMRC in Sheffield.

Graduate retention

Around three-quarters of graduates who live in the region stay.

City-level analysis records a net graduate gain for Leeds of around 3,700, third highest of UK cities, so the question is which graduates stay.

Pay is the most plausible driver: professional and managerial groups earn 15 to 39% less here than in London, around a quarter on the all-occupations median, before housing costs.

IMPLICATIONS

Map degree-to-IS-8 career trajectories with the occupation taxonomy, so students see regional pathways (for example physics into civil and clean energy engineering roles).

Align curricula to the region's IS-8 growth areas (advanced manufacturing, digital, clean energy) and to the international commercial and logistics skills regional exporters need.

Build structured placement routes with regional IS-8 employers, including the Humber cluster and AMRC partners, before graduates look to London.

Delivering 108k new degree-level jobs by 2030 depends on universities

Y&H

+252k

net new jobs by 2030, rising to
+379k under Scenario 2

The region's universities are the largest source of the graduates needed for this growth.

108k

new degree-level jobs under
Scenario 1; 165k under Scenario 2

Around 22,000 new degree-level jobs a year on the current trajectory, 33,000 under Scenario 2. This exceeds the region's annual graduate surplus after replacement demand, so shortfalls open in specific fields.

92%

of critical-occupation employment
is degree-level

The 280 critical occupations hold 160k regional jobs. Universities are the main source of the graduates they need.

1.59x

pay in degree occupations vs
all non-degree

Degree occupations pay 1.59 times the non-degree median on regional wages, 1.72 against jobs needing school-level qualifications (occupation averages).

Enrolments are falling, engineering and science subjects are shrinking and the 18-year-old cohort is flat. Engineering, computing and education are all short of their openings. West Yorkshire's plan alone targets 53,000 more Level 4+ residents.

And four IS-8 areas face graduate gaps even in the baseline scenario

Enrolment trends set against IS-8 demand to 2030, by field

Subject field (supply)	Enrolments 2024/25	5-yr trend	Aligned demand to 2030 (this analysis)	Signal
Engineering, manufacturing & construction	19.4k	-14%	Advanced Manufacturing +19k under Scenario 1; around 2,160 new graduates a year short once career choices are counted	Tension
Natural sciences, mathematics & statistics	19.6k	-10%	Life Sciences +3.7k under Scenario 1; around 300 new graduates a year short in science roles (lab technicians and science teaching not counted)	Tension
Information & Communication Technologies	13.6k	+32%	Digital and Technologies +6.8k under Scenario 1; around 900 graduates a year short (2,000 under Scenario 2) despite 10% graduate unemployment	Tension
Education	8.8k	-15%	Pupil numbers are projected to fall 5% by 2030; around 700 new graduates a year short once career choices are counted	Tension
Arts & humanities	25.8k	-11%	Creative Industries +3.2k under Scenario 1; about 4,700 creative graduates stay a year for about 1,900 creative openings, consistent with potential underemployment	Watch
Social sciences, journalism & information	37.7k	0%	Partial feed into Professional & Business Services	Watch
Business, administration & law	49.4k	+12%	Professional & Business Services +55k under Scenario 1; Financial Services +6.8k	Aligned
Health & welfare	36.2k	+6%	Health industry +42k jobs under Scenario 1; around 2,600 more graduates than openings a year	Aligned

Signal: Tension = the field runs short of new graduates once career choices are counted, or enrolments fall while demand grows · Aligned = supply keeps pace with demand · Watch = no shortage, but supply exceeds openings or the signal is unclear.

The fields the Mayoral plans lean on hardest are the fields already in deficit

Graduate shortfalls by field, set against the sectors prioritised by the four growth plans

Field and gap status	Plan priorities it feeds	What it means
Engineering: around 2,160 new entrants short a year (S1)	SY advanced manufacturing, WY manufacturing and green economy, HEY Humber industrial plays, YNY clean energy and rail	Every plan's core sector depends on engineering graduates; engineering has the largest shortfall of any field the plans name
Computing: around 900 a year short once career choices are counted (S1)	WY digital cluster (50k jobs), YNY AI Growth Zone bid	Only 56% of computing graduates work in the field, leaving limited supply to close the technology gap to the UK average (0.66). The shortfall reaches 2,000 a year under Scenario 2.
Education: around 700 a year short (S1), 1,800 under S2	Every plan's skills commitment depends on educator capacity	Educator numbers limit what all four devolved Adult Skills Funds can deliver
Health and care fields: +42k health jobs to 2030 (S1)	WY health and life sciences cluster, SY health tech, YNY healthy ageing, HEY health innovation plans	Technical and professional credentials carry much of this expansion alongside degrees
Sciences and maths: around 300 a year short once career choices are counted (S1)	YNY engineering biology, BioIndustrial Cluster North, SY life sciences	BICN pledges 5,000 green jobs and 5,000 people with future-ready skills; science graduates are part of the workforce needed to support both.
Management and business: the strongest subject-level opportunity	Delivery capacity for every plan; WY financial and professional services cluster	A regional strength; the issue is retaining these graduates

Provision aligned to these six fields supports all four plans.

08

SECTION 8

Conclusions

National policy, the mayoral plans and higher education

The IS-8 sectors and the region's universities

Scenario 1 is the current path; Scenario 2 adds AI augmentation. A graduate shortfall is the annual gap between the graduates who go into a field and the openings in it.

National policy

Labour supply could constrain job growth

252,000 net new jobs by 2030 on the current path (Scenario 1) and 379,000 with AI augmentation (Scenario 2), against an 18-year-old population that stays flat and net migration halving.

Most Industrial Strategy jobs need a degree

55% of employment in the eight Industrial Strategy sectors (the IS-8) is degree-level, against 31% in the rest of the economy, rising to 92% in the 280 occupations most critical to them.

Realising AI-related gains depends on skills supply

The region's £38bn share of the UK's £490bn AI augmentation premium depends on graduate supply and reskilling at scale. Without sufficient skills supply, some of this growth may occur elsewhere.

None of the four plans sets a shared supply target

None of the four plans sets a workforce target linked to the modelled job growth.

Mayoral plans

All four back the same sectors

West Yorkshire, South Yorkshire, York and North Yorkshire, and Hull and East Yorkshire all back advanced manufacturing, clean energy and life sciences, and digital is also prioritised by three of the four. Their scale and major assets differ.

Stronger employer-HE partnerships can help address talent gaps

Engineering, computing and education are the fields the plans depend on, and all three are in deficit; engineering intake is down 14% and education 15% over five years.

Stronger pathways from education into work

Expanding apprenticeship provision and developing regional experiential and work-based learning pathways could strengthen skills development.

Reskilling is devolved, but should be guided by shared labour market evidence

All four authorities control an Adult Skills Fund committed to growth-sector alignment. What is missing is a shared supply target and a common evidence base.

Higher education

Enrolment is falling

Undergraduate numbers peaked in 2023/24 and taught postgraduate numbers are falling. Each year the region is around 2,160 graduates short in engineering, 900 in computing, 700 in education and 300 in the sciences. Under AI augmentation those gaps widen.

Graduate growth is essential to economic growth; Mayoral plans depend on areas in shortage

Universities can support over 100,000 new jobs (rising to 165k) in the region. The Mayoral plans, and national policy, depend on graduate supply in fields which are already in shortage.

Courses need to align with the labour market

HE needs to provide short, stackable certificate courses alongside degree programmes, with clear articulation of the skills developed and alignment with up-to-date labour market data

AI augmentation increases the importance of the right skills

A higher-education plan and a growth plan should align with regional growth plans. Flexible multidisciplinary provision and experiential learning could support this alignment

1

MOVE 1

Close the supply deficits and support targeted international student flows

Engineering, science, and education all require action on capacity, completion, and retention.

International recruitment could be targeted towards engineering and science postgraduate programmes aligned to employer needs.

Exposing domestic and international students to current and predicted labour market data can help them make informed choices about courses and employment.

2

MOVE 2

Develop graduates who can work effectively alongside AI

Industries with high AI augmentation potential are already looking for multidisciplinary exposure and are prioritising human skills.

HE needs to respond by offering students exposure to skills and courses outside their core major. Business students could benefit from technical courses, while technical students could benefit from humanities, business and other complementary skills.

3

MOVE 3

Use labour market data to align provision with market demand; collaborate across institutions

There are 11 universities, almost 20 FE colleges (including specialist colleges, excluding sixth forms) and well over 100 independent training institutions across the area. The scale and power of collaboration and specialisation is immense. There are opportunities to share students, deliver collective courses in areas of low demand, and create specialist provision—all underpinned by strong data on the labour market and employer needs in the region.

4

MOVE 4

Make reskilling part of core lifelong-learning provision

Most of the workforce in 2030 is already in work today, and their roles are changing faster than new graduate cohorts can meet the need.

There are large numbers of existing workers in Y+H who will need to, or want to, work in new and growing areas of the IS-8 in the region.

Short, stackable courses funded through the devolved Adult Skills Fund, or the new LLE, can reach them now.

5

MOVE 5

Partner with local employers

Apprenticeships and experiential learning can be developed through employer partnerships, moving beyond large companies to include medium-sized and even entrepreneurial ventures.

Co-designed curricula can help retain talent in the region and connect graduates to the jobs identified in the growth plans. Embedding experiential learning, at scale, within the curricula alongside skills development courses can help develop these capabilities.

1bn+

job postings analysed

UK and Yorkshire and the Humber demand

20m+

UK alumni career trajectories

Where graduates of each field go

480

University of York programmes

Each mapped to relevant jobs and skills

THE QUESTION

How should York's portfolio respond to the region's labour market to 2030?

WHAT THE ANALYSIS FINDS

Graduate shortfalls in the fields growth depends on

Engineering around 2,160 a year short, computing 900, education 700, and all widen under AI augmentation

Industrial Strategy and mayoral plans need graduates

967k priority-sector jobs, 38% of employment, are led by large degree-level occupations

AI augmentation outweighs automation

Augmentation potential is roughly double automation exposure across the region

Losses after graduation

Graduates leave the region, or stay and work outside their field



HOW YORK'S WORK RESPONDS

All 480 of York's programmes mapped against occupational demand, showing where provision could grow, adapt or be launched

Eight analyses of priority opportunity areas, each translated into programme-level guidance for academic committees

An institution-wide core of AI-complementary, cross-sector skills across every discipline

Career trajectories of 20m+ UK alumni show where each field leads, showing potential employer connections and routes into work

Why it matters: the case shows how a university can use regional labour market evidence at programme level to respond to emerging supply-demand gaps.

Case Study: QS powers IBM's new SkillsBuild Career Navigator through 1Mentor

Y&H

1.5M+

SkillsBuild learners

~1,000

IBM courses mapped

1B+

job postings analysed

365M+

alumni profiles

30M by 2030

IBM skilling goal

2028

engagement runs to

1 Why IBM needs this

AI is rewriting roles faster than curricula can move, learners need to know, individually and now, which skills matter, which careers are growing, and how AI reshapes each one.

SkillsBuild solved access: ~1,000 free courses, but access alone isn't direction: a learner facing a catalogue without a map rarely completes.

IBM's 30M-by-2030 skilling goal needs **guidance at scale**, not just content.

2 Why QS: what 1Mentor brings

Live labour market intelligence at individual level: 1B+ job postings and 365M+ alumni profiles, structured into occupations, skills and AI-impact views.

A proven personalisation engine that turns that market signal into one learner's pathway: your goal → your gaps → your next course.

Reach IBM can't build alone: a global university ecosystem, and a working platform: years of data and product, live in weeks.

3 The partnership

1Mentor by QS deployed as the white-labelled **Career Navigator** inside SkillsBuild: IBM sign-on, career pathways, skill gaps, AI-impact, and courses recommended against each learner's gaps.

Two-way: select IBM courses flow into the 1Mentor university network as personalised recommendations.

QS as data partner: our insight shapes IBM's content strategy.

Appendices

Supporting analysis, organised to follow the sections of the report

<u>Appendix 1</u>	The labour market and its people Supports Section 2	<u>Read the detail - Slides 45 to 57</u>
<u>Appendix 2</u>	The Industrial Strategy sectors Supports Section 3	<u>Read the detail - Slides 58 to 66</u>
<u>Appendix 3</u>	AI augmentation and automation Supports Section 4	<u>Read the detail - Slides 67 to 70</u>
<u>Appendix 4</u>	The scenarios Supports Section 5	<u>Read the detail - Slides 71 to 74</u>
<u>Appendix 5</u>	The mayoral plans and sub-regions Supports Section 6	<u>Read the detail - Slides 75 to 80</u>
<u>Appendix 6</u>	Higher education and the graduate gap Supports Section 7	<u>Read the detail - Slides 81 to 90</u>
<u>Appendix 7</u>	Methodology and data quality Applies to the whole report	<u>Read the detail - Slides 91 to 95</u>

01

APPENDIX 1

The labour market and its people

Population, participation, the jobs mix and pay. Supports Section 2.

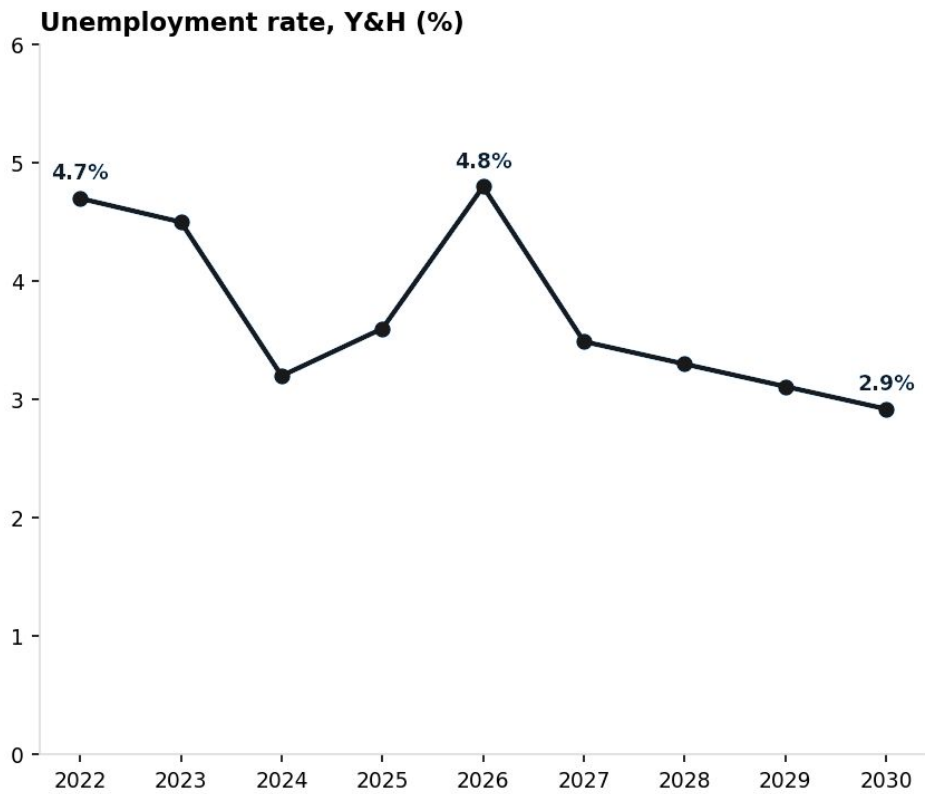
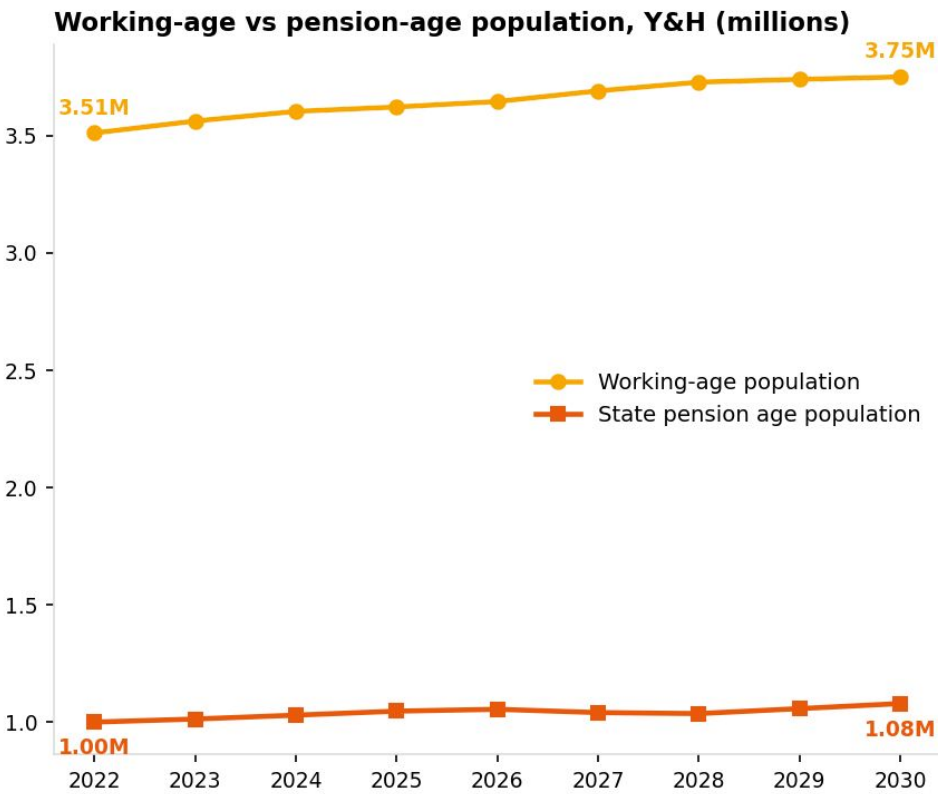
Slides 42 to 53

Working-age population rises to 3.75M and unemployment falls to 2.9%

Unemployment falls to 2.9% by 2030 on the current trajectory, leaving little spare labour.

The working-age population grows from 3.51M to 3.75M by 2030 while the pension-age population passes 1.08M.

Meeting demand therefore means reskilling people in work and attracting new ones, with limited spare labour.

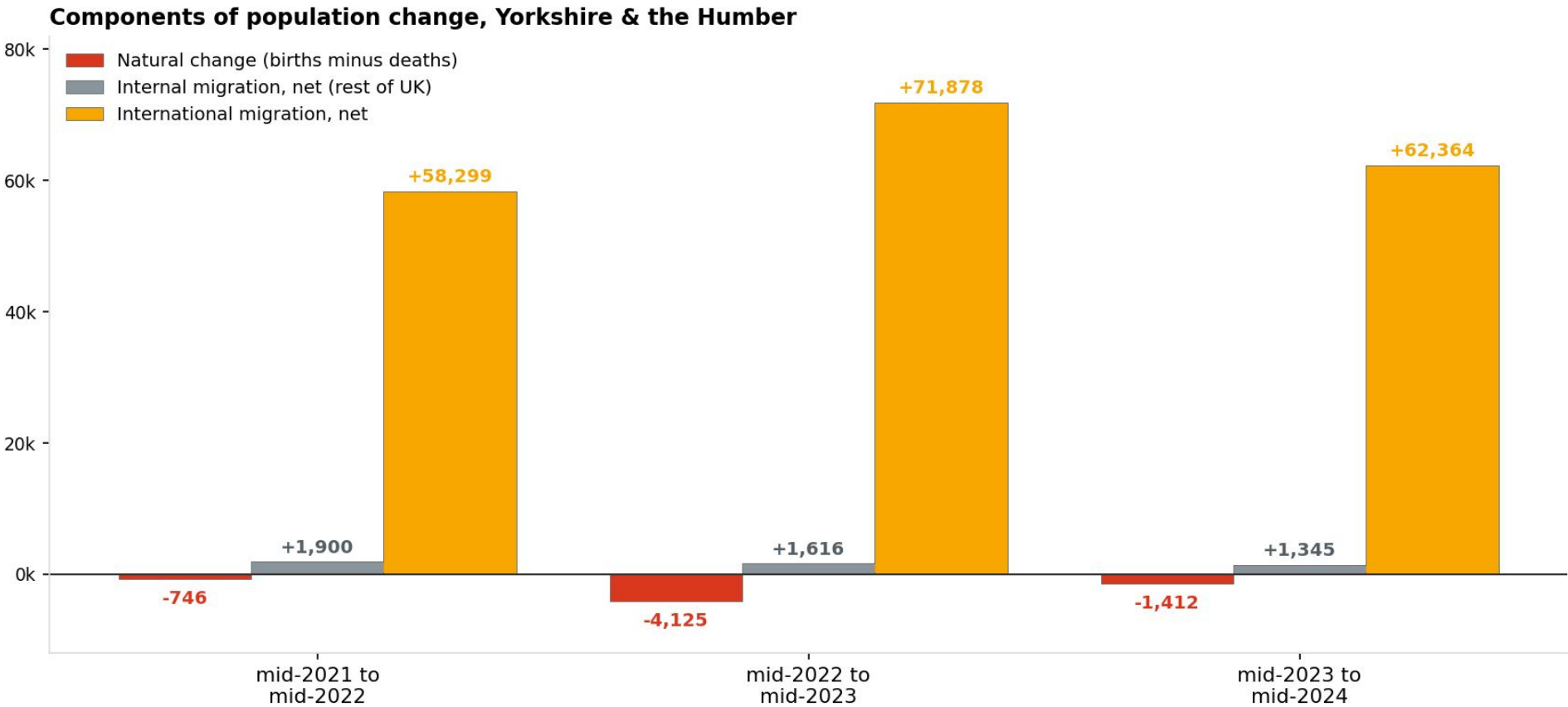


International migration added 62,000 people, nearly all the region's growth

International migration is almost the region's only source of population growth, and the national inflow has halved.

Deaths have exceeded births for three years and net internal migration is close to zero. International migration added 62,000 people in the year to mid-2024.

UK net migration fell to 171,000 in the year to December 2025, half the previous year. The working-age growth on the previous page assumes this inflow continues.



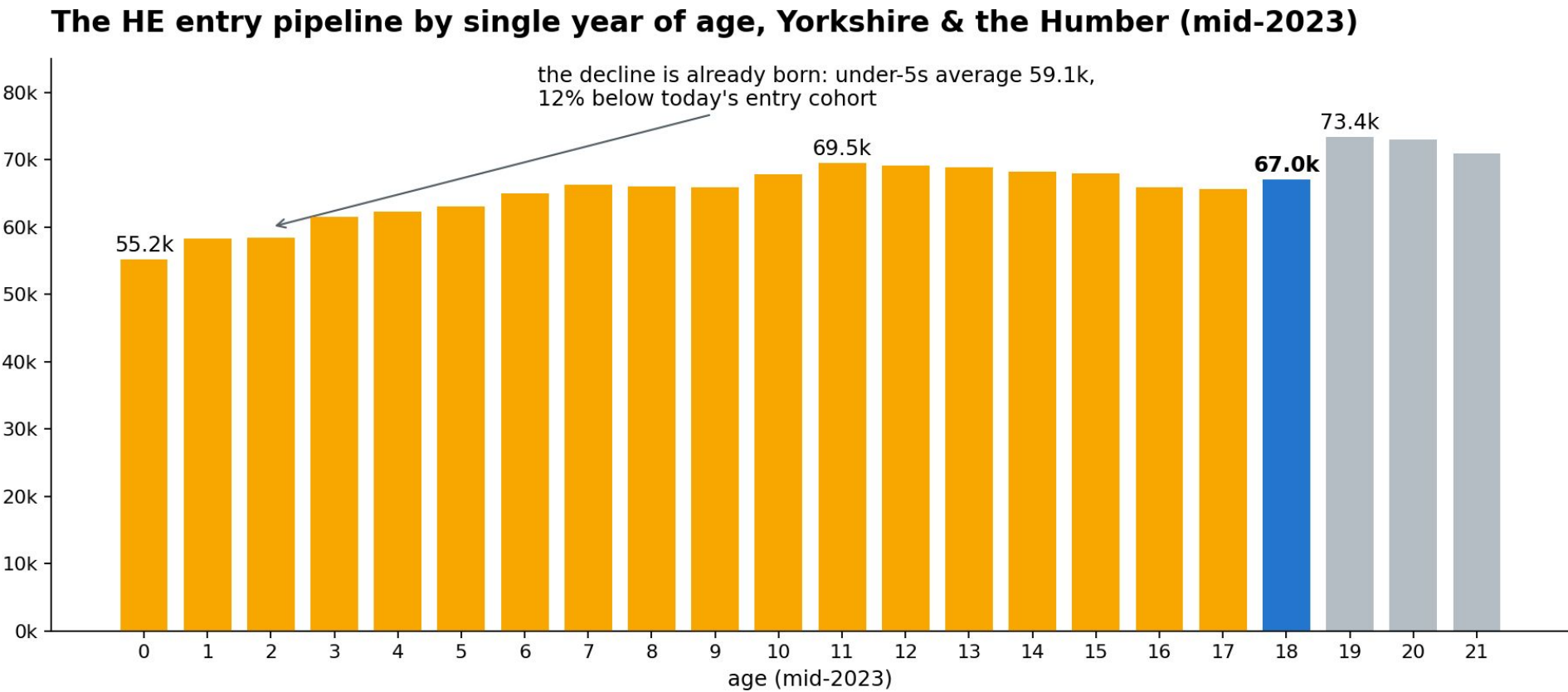
Population 5.61M (mid-2023) to 5.67M (mid-2024); the small 'other' adjustment (+142 in mid-2024) is not shown.

The 18-year-old cohort holds near 68k into the early 2030s, then falls about 12%

The region's 18-year-old cohort, the core HE entry age, stands at 67k (mid-2023). The cohorts behind it (ages 10-15, averaging 68.6k) hold that level into the early 2030s. Today's under-10s average 62.2k and the under-5s 59.1k, so entry cohorts decline through the 2030s to around 12% below today's level.

Supply to 2030 therefore depends on participation, subject choice and retention; cohort size holds steady.

With a flat youth cohort and a growing retiree population, meeting IS-8 demand depends on adult reskilling and graduate retention as much as on school leavers.



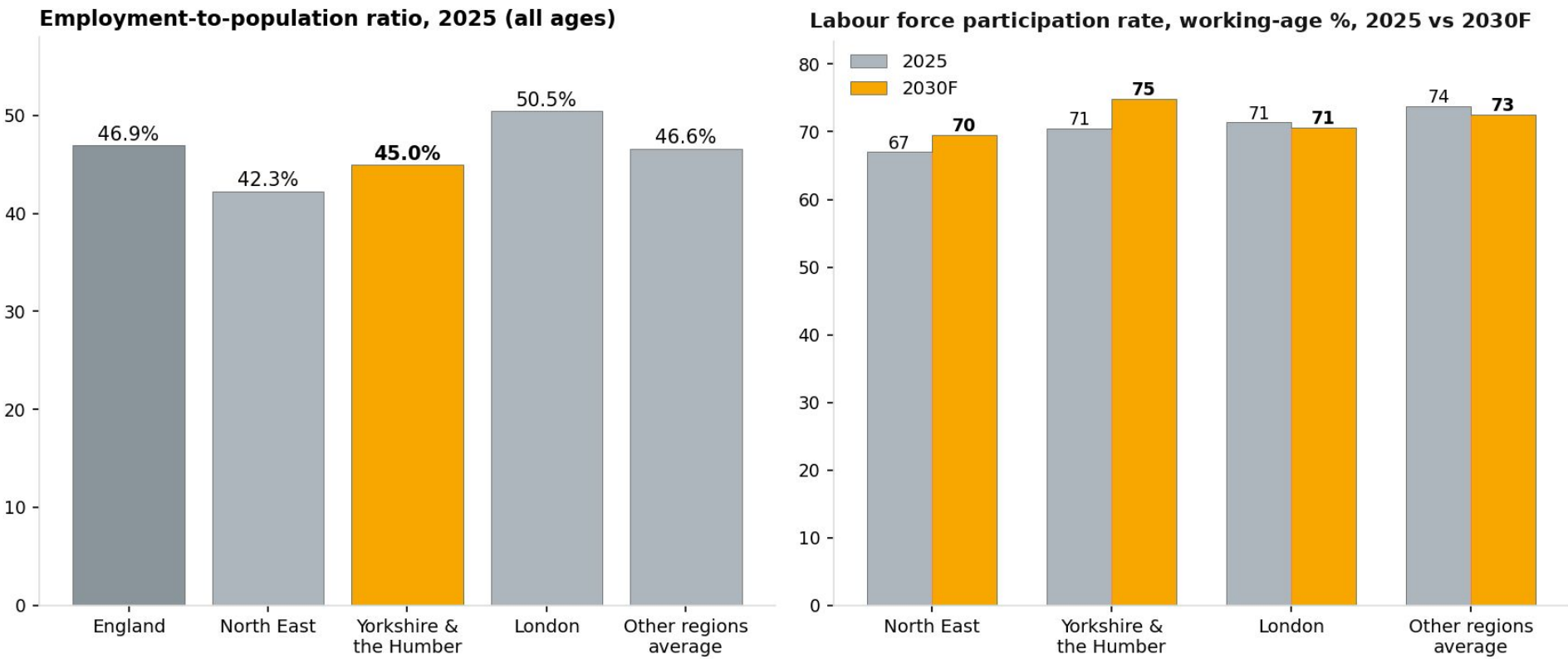
Blue: the current 18-year-old entry cohort · Orange: cohorts still to reach entry age · Grey: past entry age.

Participation rises to 74.8% by 2030, the fastest of any comparator region

The region's employment-to-population ratio (45.0%, all ages) trails England's 46.9% and London's 50.5%.

Participation is projected to rise from 70.5% to 74.8% by 2030, the strongest gain among England, the North East, London and the other English regions, overtaking London. This is a Scenario 1 model output and, like the working-age projection, assumes continued inward migration.

More of the region's people will be in the labour force, and unemployment falls below 3%. The remaining constraint is their skills mix.



Participation and unemployment are resident-based; job counts elsewhere in this report are workplace-based. The two bases differ through commuting and self-employment.

Below 3% unemployment shifts pressure to skills, shortages and pay

Y&H

Participation rises to 74.8% and unemployment falls below 3% by 2030 on the current trajectory, shifting pressure toward skills, shortages and pay.

The implication

What it looks like

Evidence

Training and retraining into the growth areas

With little spare labour, meeting Industrial Strategy demand means reskilling people in work and attracting new ones. 62% of the region's jobs need a degree or a credential above school level.

Sections 3, 5 and 7

Fixing current shortages, education and engineering first

Once career choices are counted, engineering is around 2,160 a year short and education 700. Neither closes on the current trajectory, and a tighter market makes both harder to fill.

Section 7

Wages rising to compensate

The region pays 7.7% below the UK median, and the gap widens at graduate level: 13% for managers, 9% for science and engineering professionals. Lower pay may affect the region's ability to retain workers.

Appendix 1

Replacing the migration channel

Nearly all population growth is international migration. UK net migration is halving, and international enrolments fell 16% in the latest year.

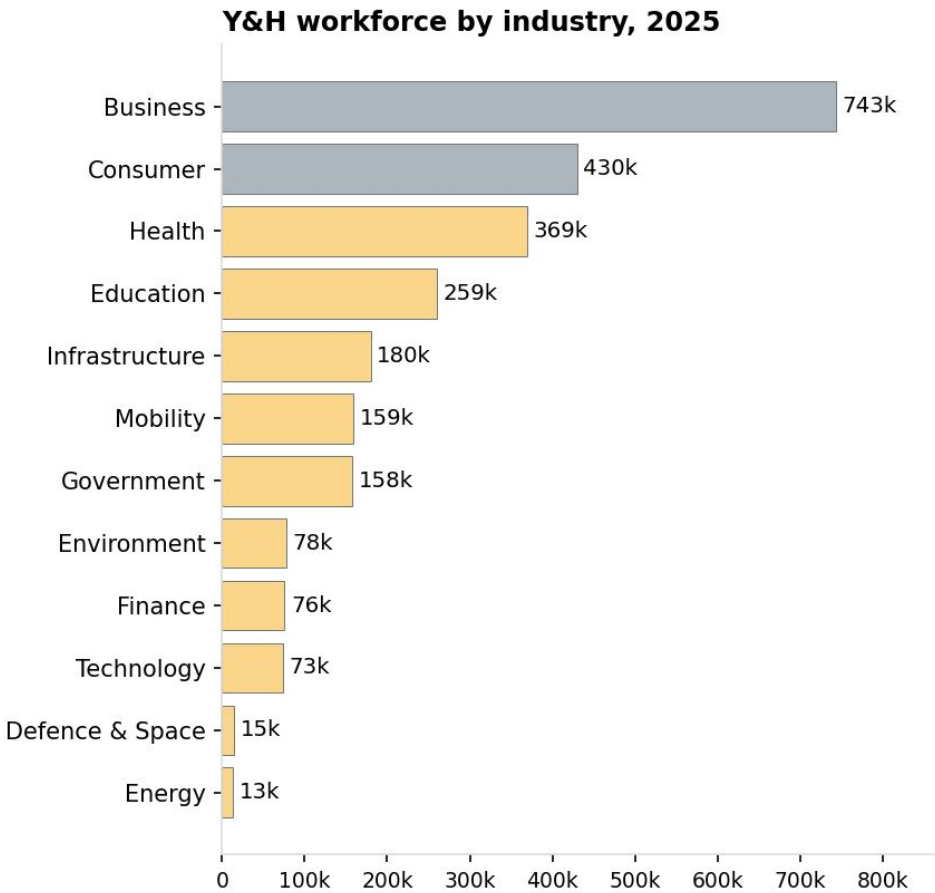
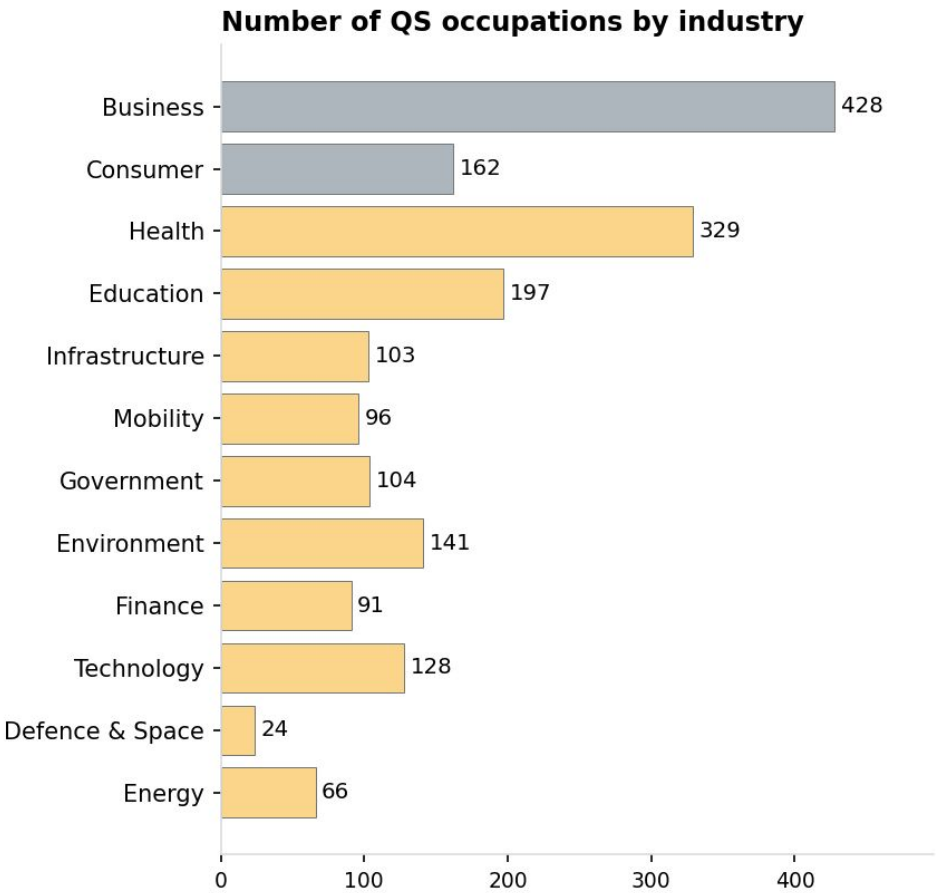
Appendix 1

Business, consumer and health roles dominate the region's 2.55M jobs

The QS taxonomy maps the region's entire labour market on the 2026 model outputs.

The 1,869 occupations fall into 12 broad industrial groups; the charts show the jobs each holds in Yorkshire & the Humber today.

As in the national picture, high-volume employers such as business, consumer, health and education dominate.

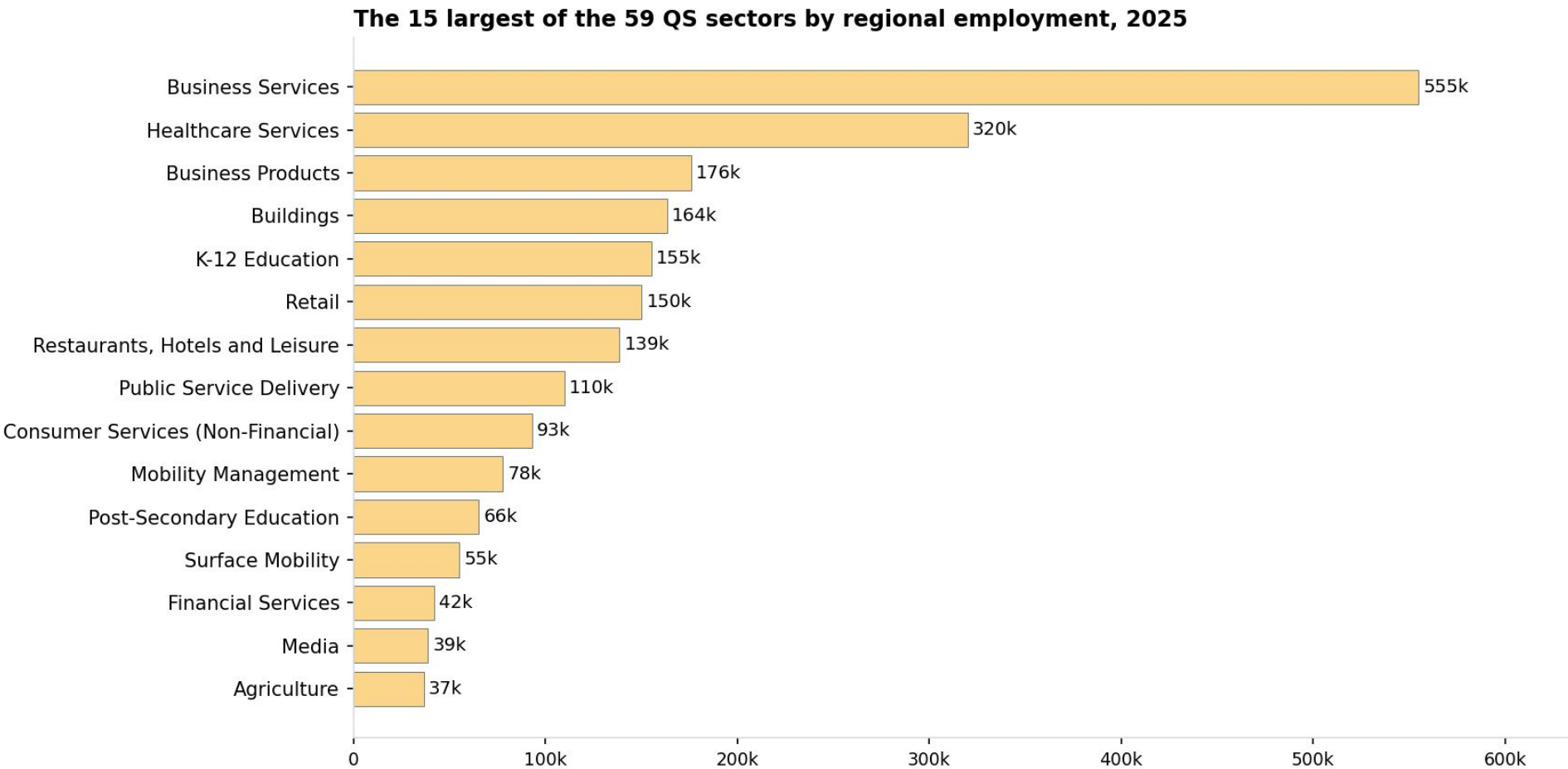


Business services (555k) and healthcare (320k) are the largest of the 59 sectors

The 15 largest of the 59 QS sectors hold the bulk of regional employment. Business Services is one of several sectors inside the broader Business industry (743k, shown on the previous slide).

Business Services alone accounts for 555k jobs, well ahead of Healthcare Services (320k); Business Products, Buildings and Retail follow.

Most IS-8 sectors rank further down, so they grow from a smaller base than the large services sectors.

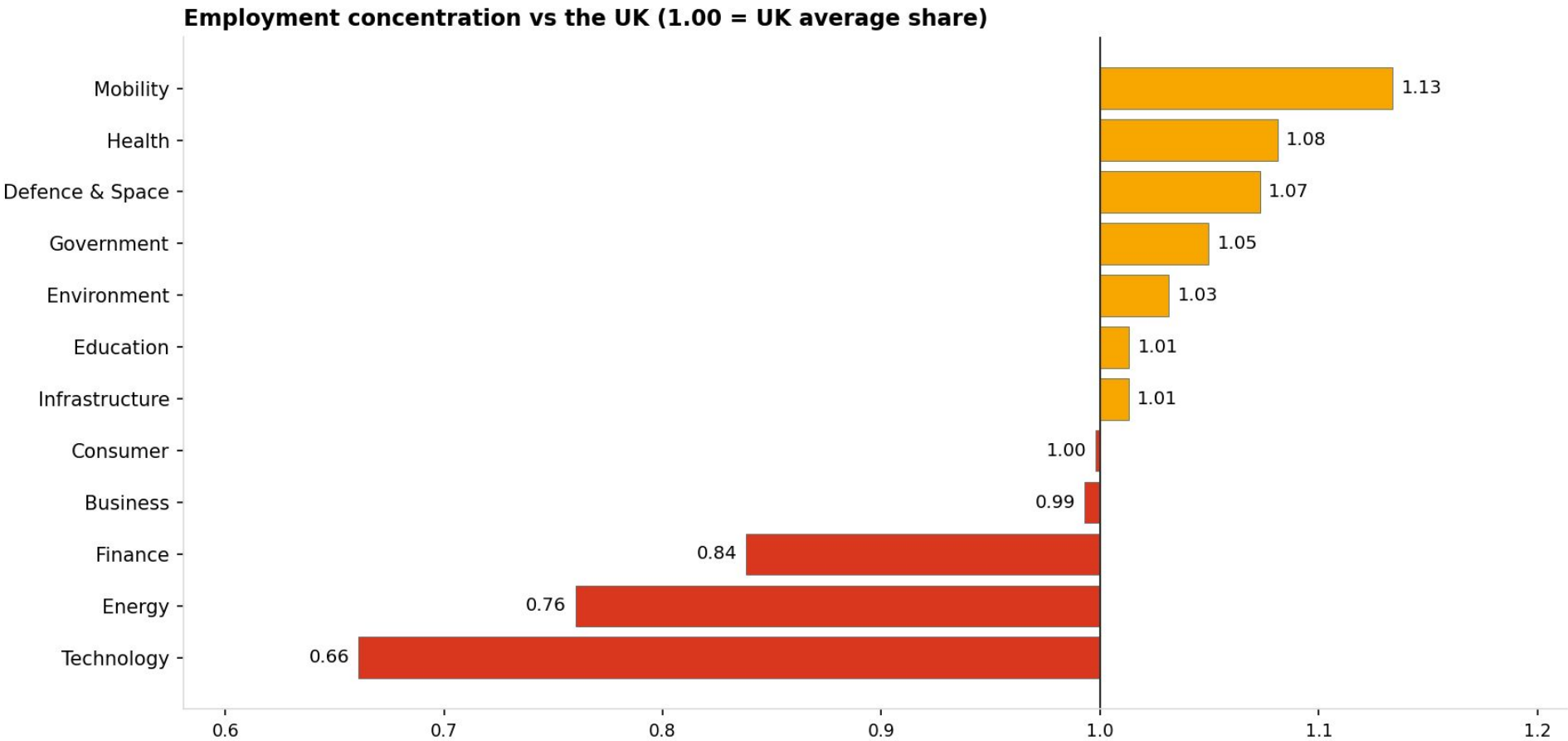


Over-indexed in mobility and health; sharply under-indexed in technology

Concentration of 1.00 means the region matches the UK's employment share for that industry.

On the 2026 outputs, Yorkshire & the Humber over-indexes in mobility (1.13), health (1.08) and defence and space (1.07), with government just behind at 1.05.

It under-indexes most in technology (0.66), energy (0.76) and finance (0.84). Technology underpins the Digital and Technologies IS-8 sector and has the largest employment gap relative to the UK average, with a direct call on higher education supply. One explanation is that London draws graduates toward these industries; if so, closing the gap needs investment.



Y&H median pay is £708 a week, 7.7% below the UK median

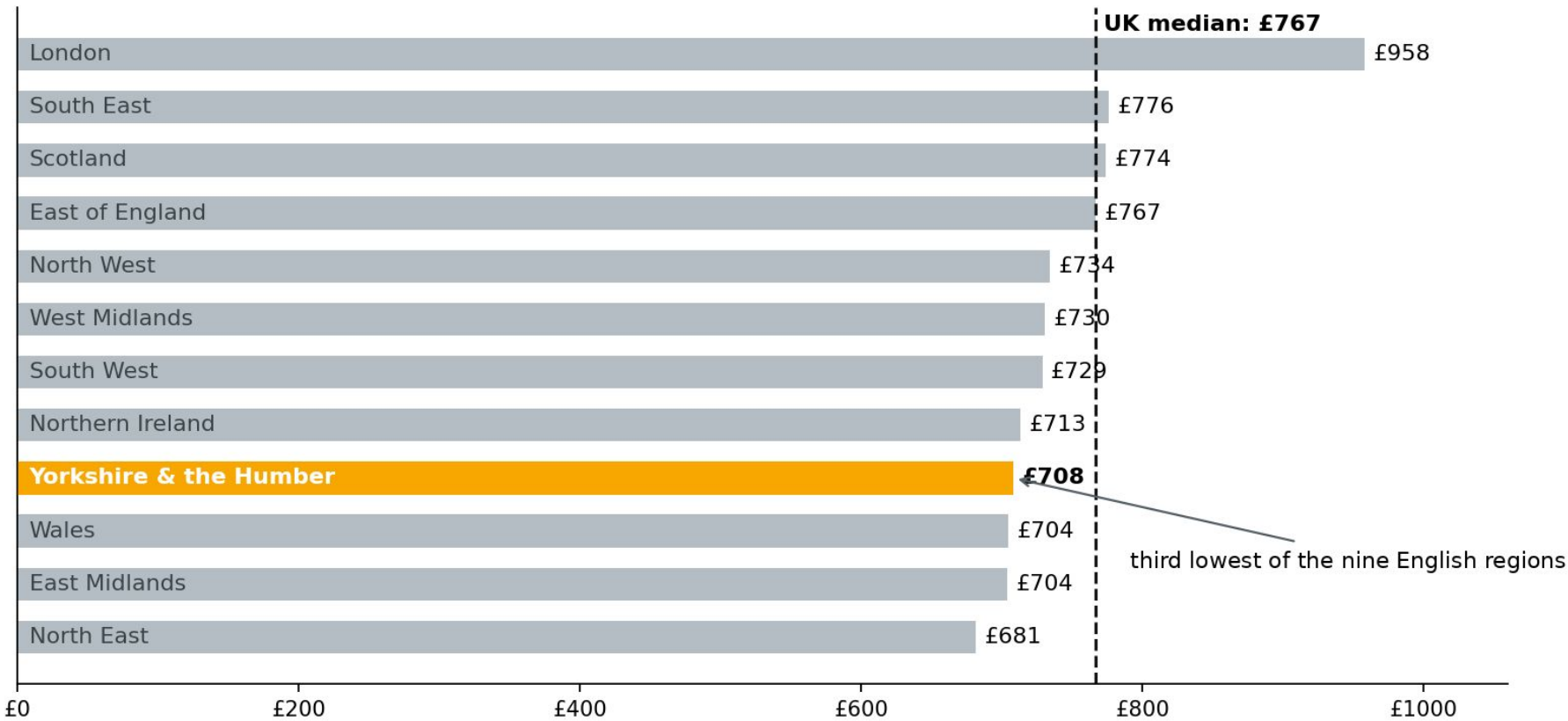
Median gross weekly pay for full-time employees by UK region and country, April 2025, place of work

Third lowest in England. Full-time employees in Yorkshire & the Humber earn a median £708 a week; among the nine English regions, only the North East and the East Midlands pay less.

Below UK and London pay That is 7.7% below the UK median of £767 and 26% below London's £958, consistent with the occupation-level gaps on the next slide.

Two pay gaps The largest occupations in the region pay below the UK median income, and the same roles pay less here than nationally.

Median weekly pay for full-time employees by UK region and country, April 2025



Y&H median weekly pay
£708

UK median
£767

London
£958

The pay gap vs the UK widens at graduate level

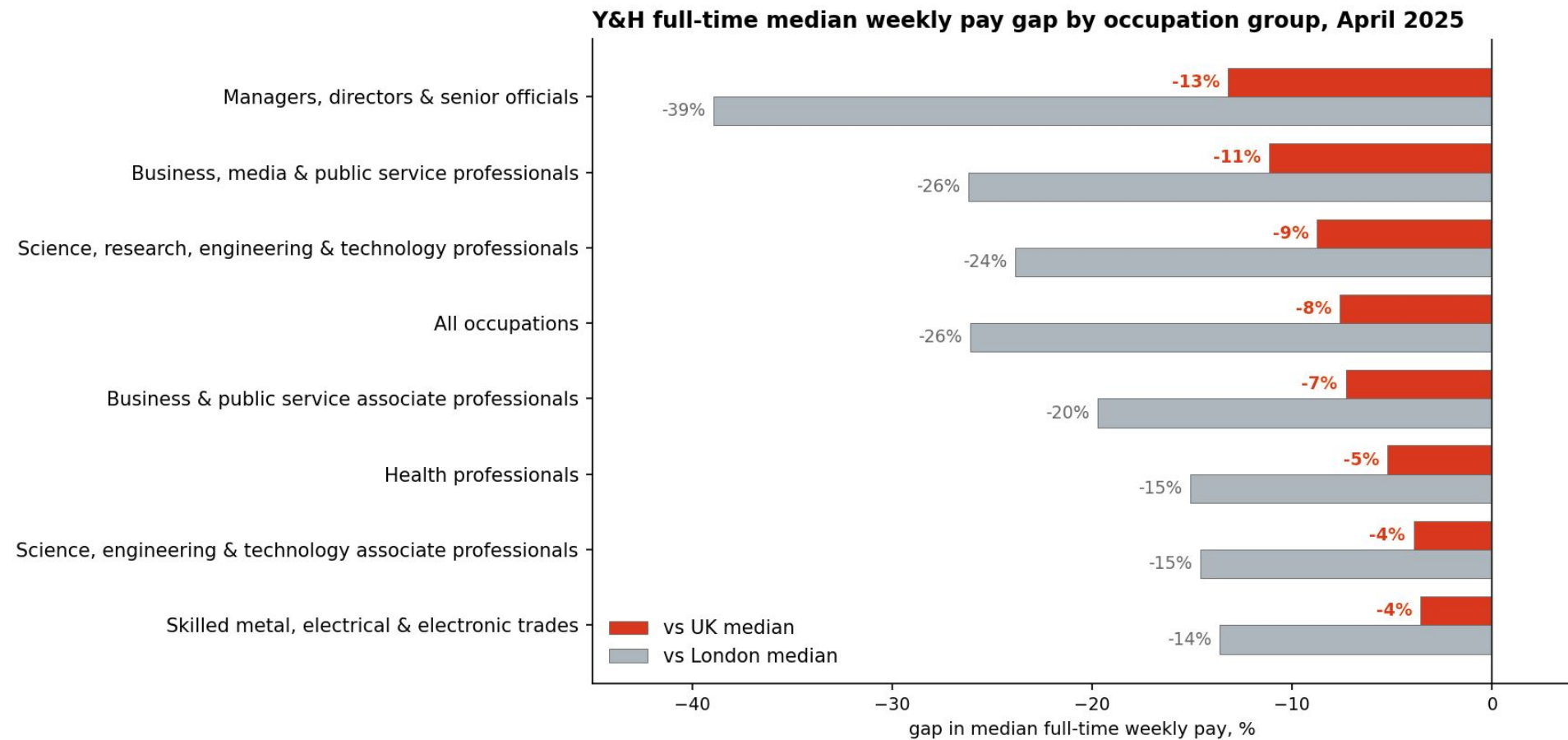
ONS ASHE April 2025, full-time median gross weekly pay by occupation group, place of work

The region's full-time median is £708 a week, 7.7% below the UK's £767 and 26% below London's £958.

The gap is widest in the roles the IS-8 needs most: managers (13% below the UK), business and public service professionals (11%), and science, research, engineering and technology professionals (9%). Skilled metal, electrical and electronic trades are 4% below (all skilled trades, 2%).

Regional earnings reflect both the occupation mix and lower pay within the same occupations. This chart shows the second, comparing pay for the same occupation group by place of work.

Professional and managerial careers here pay 15% to 39% less than in London, before housing costs, which may affect graduate retention.



Two-thirds of employment is in occupations paying below the UK median income

Y&H median wage for the ten largest occupations vs UK median gross annual earnings for full-time employees of £39,039, and below-median employment under both 2030 scenarios

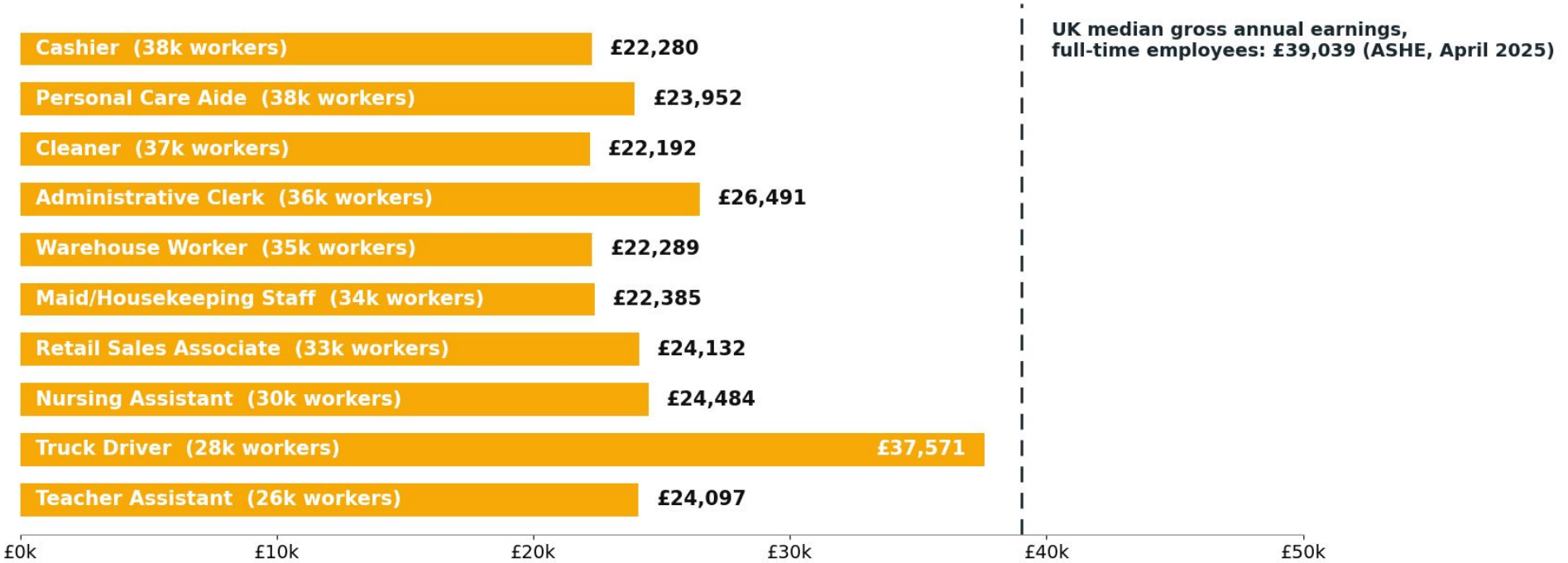
1.75M jobs below the line. 69% of the region's 2.55 million jobs are in occupations whose regional median wage is below the UK median income. All ten of the largest occupations are below it.

Little change by 2030 69% today and 68% in 2030, reaching 1.92M below the line in Scenario 1 and 2.00M in Scenario 2. Wages are held at 2025 levels, so only the occupation mix can shift the share, and neither scenario does.

Better-paid growth is degree-level Scenario 2 creates 201k net new jobs above the region's £34,000 market median, 71k more than Scenario 1, concentrated in degree-level roles.

Same role, lower pay Nine of the ten largest occupations pay less here than the national rate for the identical role, by up to 7%.

All ten of the region's largest occupations pay below UK median earnings



Below the line today (69% of 2.55M)

1.75M

2030, Scenario 1 (68% of 2.81M)

1.92M

2030, Scenario 2 (68% of 2.93M)

2.00M

52% of new jobs are in above-median-pay occupations

Every occupation placed by wage and projected growth: 52% of net new jobs to 2030 sit in occupations paying above the market median (53% under Scenario 2)



1,293 of the 1,860 occupations shown pay above the median and are growing (upper right). Care and service roles lead the headcount gains, but growth covers the whole pay range. Wages are held at 2025 levels in every scenario, so only the occupation mix changes.

Bubble size = regional employment; horizontal dashed line = employment-weighted market median wage (£34,000); vertical line = zero growth. Wages here are QS model national medians on a log scale.

02

APPENDIX 2

The Industrial Strategy sectors

The IS-8 in detail, the engineering and AI layers, and cross-sector disciplines. Supports Section 3.

Slides 55 to 62

The Modern Industrial Strategy (June 2025) commits the whole of government behind eight sectors: Advanced Manufacturing, Clean Energy Industries, Creative Industries, Defence, Digital and Technologies, Financial Services, Life Sciences, and Professional and Business Services.

HOW THIS ANALYSIS MAPS THE REGION TO THE IS-8

Each of the region's 1,869 occupations is assigned to IS-8 sectors through the QS industry taxonomy (59 sectors); Advanced Manufacturing uses the QS occupation-level relevancy score (4-5 counted).

Each occupation is also scored 0-5 against each of the eight sectors, identifying 194 Fundamental and 86 Transectoral occupations critical to delivery.

Occupations can belong to more than one IS-8 sector, so sector figures are not additive. Sector sizes and critical roles are in Section 3.

The government publishes quarterly indicators for the IS-8 as a whole, but not output or employment estimates for each sector (House of Commons Library, CBP-10439, updated July 2026)

Three IS-8 sectors are priorities in all four mayoral growth plans

Regional viability of each IS-8 sector: scale and regional wages from this analysis; anchoring assets and growth-plan priorities from regional strategy

IS-8 sector	Jobs 2025	Wage (GBP)	Major assets	Growth plans
Advanced Manufacturing	185k	£43k	AMRC Sheffield (Boeing, BAE Systems, Airbus, GKN Aerospace); Forgemasters; South Yorkshire Investment Zone; agritech specialism	All four plans 4/4
Professional and Business Services	565k	£31k	Largest IS-8 employment base; Leeds professional services cluster; national NHS and DHSC offices in Leeds	WY · HEY 2/4
Digital and Technologies	87k	£52k	Highest-paying IS-8 sector; West Yorkshire Health Innovation and Digital Tech Investment Zone; technology share a third below the UK average (0.66)	WY · SY · YNY 3/4
Clean Energy Industries	21k	£48k	Humber decarbonisation cluster (East Coast Cluster; Viking CCS); Humber Freeport; CO2 and hydrogen infrastructure	All four plans 4/4
Life Sciences	33k	£41k	BioYorkshire and engineering biology (York); the Leeds, Sheffield, Hull and York teaching hospitals; healthy-ageing specialism	All four plans 4/4
Financial Services	76k	£43k	Leeds banking and fintech centre; Halifax and York insurance and pensions	WY (BFPS cluster) 1/4
Creative Industries	39k	£30k	Screen and digital media clusters (Leeds, Sheffield); Channel 4's national headquarters	YNY · SY · WY 3/4
Defence	15k	£39k	Around 11,000 of the 15k are armed forces personnel; the industrial base is not separately visible. Forgemasters (MOD-owned), GCHQ Scarborough, Menwith Hill, Catterick	SY · HEY · YNY (emerging) 3/4

Growth plans = how many of the four mayoral growth plans (WY · SY · HEY · YNY) name the sector as a priority; the bar shows that share.

WY West Yorkshire · SY South Yorkshire · HEY Hull & East Yorkshire · YNY York & North Yorkshire · BFPS business and professional services

Advanced Manufacturing holds 185k jobs and adds 19k by 2030

Sized with QS occupation relevancy scores: 4-5 counted as high importance; growth is the annual rate to 2030 under Scenario 1

On the 2026 outputs, 285 occupations score 4 or 5 (high or very high importance), holding 185k regional jobs today and adding +19k by 2030 under Scenario 1 (+32k under Scenario 2).

63% of that employment requires a degree-level qualification, fourth most degree-intensive of the IS-8.

Agri-tech and engineering biology are included. Food and drink manufacturing is not, because the Industrial Strategy's Advanced Manufacturing scope covers automotive, aerospace, batteries, advanced materials and agri-tech. The region holds 19,792 jobs in food manufacturing occupations, and 61,500 on an industry basis (ONS, 2024), which also counts engineering, logistics and management staff at food manufacturers.

Largest degree-level Advanced Manufacturing occupations in the region (relevancy 4-5)

Occupation	Y&H jobs 2025	Growth/yr (S1)
Product Engineer	3,884 jobs	+1.6%/yr
Logistics Engineer	3,220 jobs	+3.5%/yr
Mechanical Engineer	2,918 jobs	+2.4%/yr
Systems Engineer	2,855 jobs	+1.3%/yr
Manufacturing Manager	2,484 jobs	+2.4%/yr
Electrical Engineer	2,364 jobs	+2.2%/yr
Manufacturing Engineer	2,346 jobs	+2.6%/yr
Logistics Manager	2,244 jobs	+3.1%/yr

Degree-level roles shown (Bachelor's and above). The full high-relevancy count also includes large technical and operational occupations; the specialist engineering roles are on the next slide. The count is occupation-based: it includes advanced manufacturing occupations wherever they are employed, including utilities, construction and research services. The ONS puts the manufacturing industry at 263,000 regional jobs (BRES 2024).

Nine specialist engineering roles, each under 600 jobs, all growing

Degree-level specialist Advanced Manufacturing occupations (relevancy 5), regional jobs in 2025 and in 2030 under Scenarios 1 and 2

Occupation	Jobs 2025	Jobs 2030, Scenario 1	Jobs 2030, Scenario 2
Manufacturing Research & Development Manager	596	678	722
Materials Engineer	512	530	586
Semiconductor Engineer	394	461	490
Robotics Engineer	355	384	423
Battery System Engineer	287	300	320
Advanced Manufacturing Engineer	265	299	317
Automotive Electrical Systems Engineer	234	246	261
Manufacturing Research & Development Engineer	160	180	191
Materials Research Scientist	153	174	187

Each of these roles holds hundreds of jobs. Under Scenario 2 they grow at 0.8 to 1.6 times the pace of the wider workforce, semiconductor roles fastest. The region's advanced manufacturing ambition depends on this small group of highly qualified engineers, so graduate supply matters more than today's headcount suggests.

In technology, AI roles grow fastest, up to 3.6% a year

Digital, AI and adjacent technical occupations ranked by projected regional growth to 2030 (Scenario 1); no minimum-size floor

Occupation	Y&H jobs 2025	Growth/yr (S1)	IS-8 sectors served
AI Research Scientist	75 jobs	+3.6%/yr	Advanced Manufacturing, Digital and Technologies
Multimodal AI Researcher	42 jobs	+3.4%/yr	Advanced Manufacturing, Digital and Technologies
Opto-Mechanical Engineer	1,039 jobs	+3.1%/yr	Advanced Manufacturing, Defence
Storage Engineer	282 jobs	+3.1%/yr	Digital and Technologies
AI Consultant	198 jobs	+3.0%/yr	Digital and Technologies
Generative AI Engineer	70 jobs	+2.8%/yr	Advanced Manufacturing, Digital and Technologies
AI Security Engineer	65 jobs	+2.8%/yr	Advanced Manufacturing, Digital and Technologies
AI Engineer	61 jobs	+2.8%/yr	Advanced Manufacturing, Digital and Technologies
Organic Chemist	597 jobs	+2.7%/yr	Advanced Manufacturing
Computational Chemist	144 jobs	+2.7%/yr	Advanced Manufacturing

AI research, engineering and security roles top the technology ranking, several from under 100 regional jobs today. Across all occupations, environmental and wind-energy roles grow fastest; with a floor of 800 jobs, logistics and people roles lead.

Sixteen cross-sector disciplines hold 55,600 jobs

Every occupation in the top 5% of importance scores in three or more IS-8 sectors, grouped by discipline: 97 occupations. The next slide shows which sectors each discipline serves.

Discipline	Roles	Y&H jobs	Discipline	Roles	Y&H jobs
Software development	8	14,706	Research science	4	2,467
Manufacturing engineering	8	6,751	Materials science	5	2,458
Semiconductor & electronics	15	6,584	Technology leadership	7	2,341
Solution architecture	6	3,908	Physics	2	1,277
Mechanical engineering	2	3,771	Robotics & autonomous systems	5	1,033
Data & AI	18	3,148	DevOps & release engineering	2	696
Chemistry	3	2,849	Design engineering	2	663
Cyber security	9	2,661	Energy storage	1	287

The 97 occupations that carry importance in three or more IS-8 sectors all fall into these sixteen disciplines: 55,600 jobs, 2.2% of regional employment. Software development is the largest at 14,706 jobs, but ten of the sixteen are engineering or physical science and six are digital.

None of the 16 cross-sector disciplines centres on Creative or Financial Services

The same sixteen disciplines, scored against each IS-8 sector and grouped by the sector each one anchors

		Advanced Manufacturing	Clean Energy	Defence	Digital and Technologies	Creative Industries	Financial Services	Prof. and Business Svcs	Life Sciences		
	Anchor sector	= score in the top 5% for that sector · all scores are 0 to 5								Occupations in this discipline	Regional jobs 2025
Manufacturing engineering Manufacturing Engineers	Advanced Manufacturing	4.0	3.5	3.4	2.7	1.1	0.2	1.3	3.2	8	6,751
Mechanical engineering Mechanical Engineer		3.8	3.7	3.6	2.4	1.6	0.5	2.8	2.9	2	3,771
Materials science Materials Engineer		4.0	3.4	3.5	3.0	1.1	0.1	2.2	2.8	5	2,458
Robotics & autonomous systems Robotics Engineer		4.2	3.3	3.9	3.7	1.6	0.8	2.9	3.1	5	1,033
Design engineering Design Engineer		3.6	3.3	3.5	2.9	1.8	1.2	2.9	2.9	2	663
Chemistry Chemical Engineer	Clean Energy Industries	3.5	3.6	3.3	2.2	0.6	0.2	2.8	3.4	3	2,849
Energy storage Battery System Engineer		4.1	4.3	3.4	1.4	1.0	0.4	2.0	1.5	1	287
Physics Physical Scientist	Defence	3.5	3.5	3.6	3.1	1.6	1.0	2.5	2.7	2	1,277
Software development Software Developers	Digital and Technologies	2.9	2.9	3.4	4.0	3.0	3.4	3.2	2.8	8	14,706
Semiconductor & electronics Electronics Engineer		3.8	3.3	3.8	3.9	1.6	0.9	1.9	2.6	15	6,584
Solution architecture Software Architect		3.0	2.5	3.2	3.7	2.6	3.3	3.3	2.9	6	3,908
Data & AI Data Scientist		3.1	2.7	3.3	3.9	3.0	3.4	3.5	3.1	18	3,148
Cyber security Cyber Security Engineer		2.6	2.5	3.4	3.8	2.2	3.4	3.4	2.5	9	2,661
DevOps & release engineering DevOps Engineer	Prof. and Business Svcs	2.6	2.7	3.3	3.7	2.8	3.1	3.0	2.7	2	696
Technology leadership Engineering Manager		3.2	3.0	3.0	3.3	2.7	3.2	3.5	2.8	7	2,341
Research science Research Scientist		3.3	3.2	3.6	3.2	1.8	1.2	3.1	3.5	4	2,467

Advanced Manufacturing is the anchor sector for five disciplines and Digital and Technologies for six; Creative Industries and Financial Services are the anchor for none. Four of the sixteen reach each of those two sectors, so both compete for people the digital and engineering sectors also recruit. Defence is reached by thirteen of the sixteen, the widest overlap.

Clean energy and agritech advanced manufacturing

Named areas of sub-regional specialism in the national report; the Local Growth Plan's competitive advantage sectors (October 2025) include Clean Energy and Food and Farming Innovation. The region holds 185k advanced manufacturing IS-8 jobs (+19k to 2030 under Scenario 1) and 21k clean energy jobs, growing modestly, so the clean energy priority is about building capability as much as adding jobs.

Engineering biology and life sciences

A named regional specialism spanning life sciences (33k jobs) and defence; growth depends on Level 6+ supply, which 78% of the region's life sciences employment requires. The BioIndustrial Cluster North prospectus (November 2025, with Tees Valley) sets a 5,000-job, £5bn ambition on this base.

Defence, financial services and creative industries

Broader Yorkshire & the Humber strengths: 15k defence, 76k financial services and 39k creative industries jobs in IS-8-aligned occupations.

Digital and Technologies (index 0.66)

The region's technology employment share is a third below the UK average (an index of 0.66); closing that gap is the largest IS-8 opportunity, with 85% of its employment in degree-level occupations. West Yorkshire's digital cluster alone counts 50k jobs across 9,700 firms today.

03

APPENDIX 3

AI augmentation and automation

Exposure across occupations and sectors, and the regional AI premium. Supports Section 4.

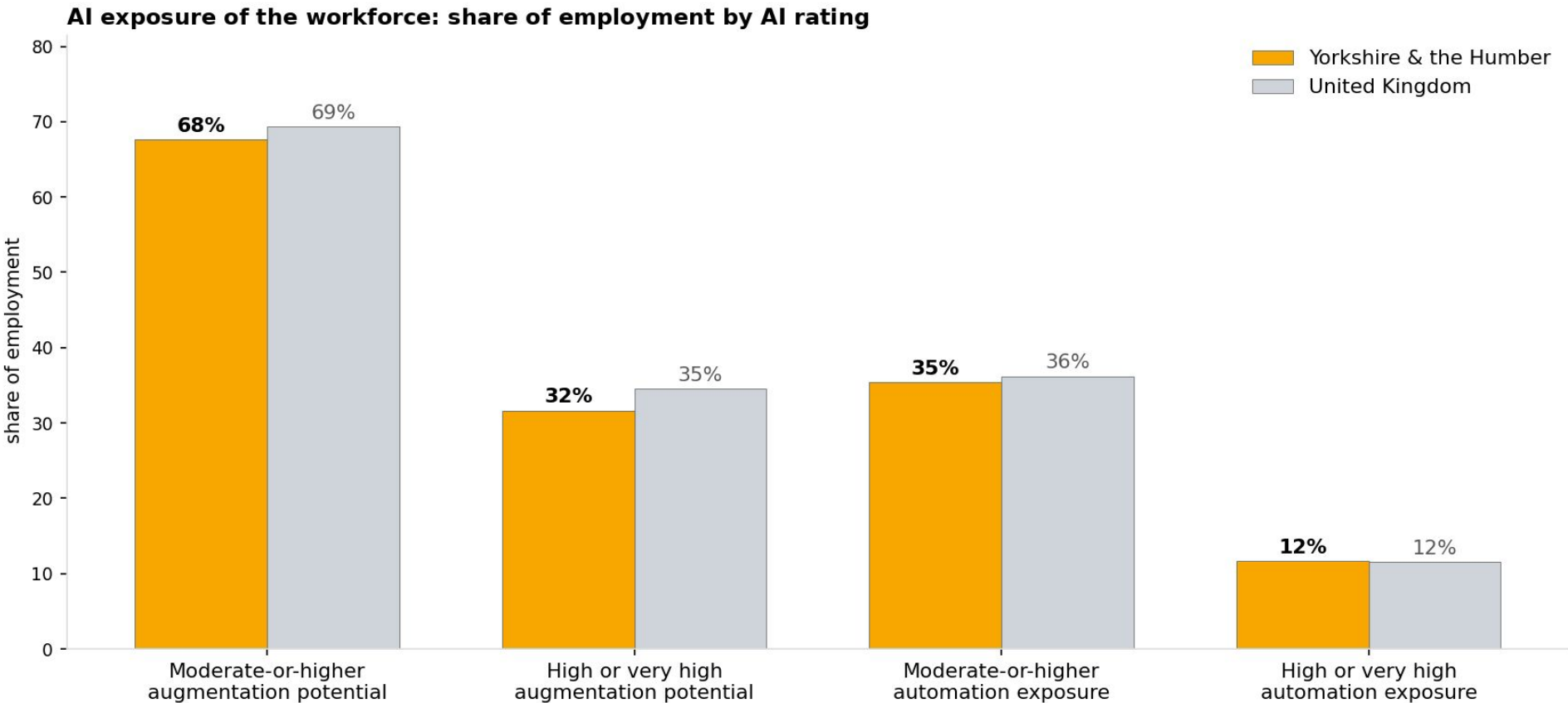
Slides 64 to 66

Augmentation potential is roughly double automation exposure in the region

Share of regional employment by AI exposure rating, against the UK.

68% of the region's employment carries moderate-or-higher augmentation potential, roughly twice the 35% with moderate-or-higher automation exposure.

The regional profile is close to the national one, so the national conclusion applies here: growth depends on workers gaining skills that work alongside AI.



Ratings are the QS occupation-level AI augmentation and automation scores from the 2026 outputs, weighted by the region's occupation mix, on the same basis as the national report so that the two remain comparable. The model also carries UK-localised variants of these scores, which run lower on both dimensions; they are not used here.

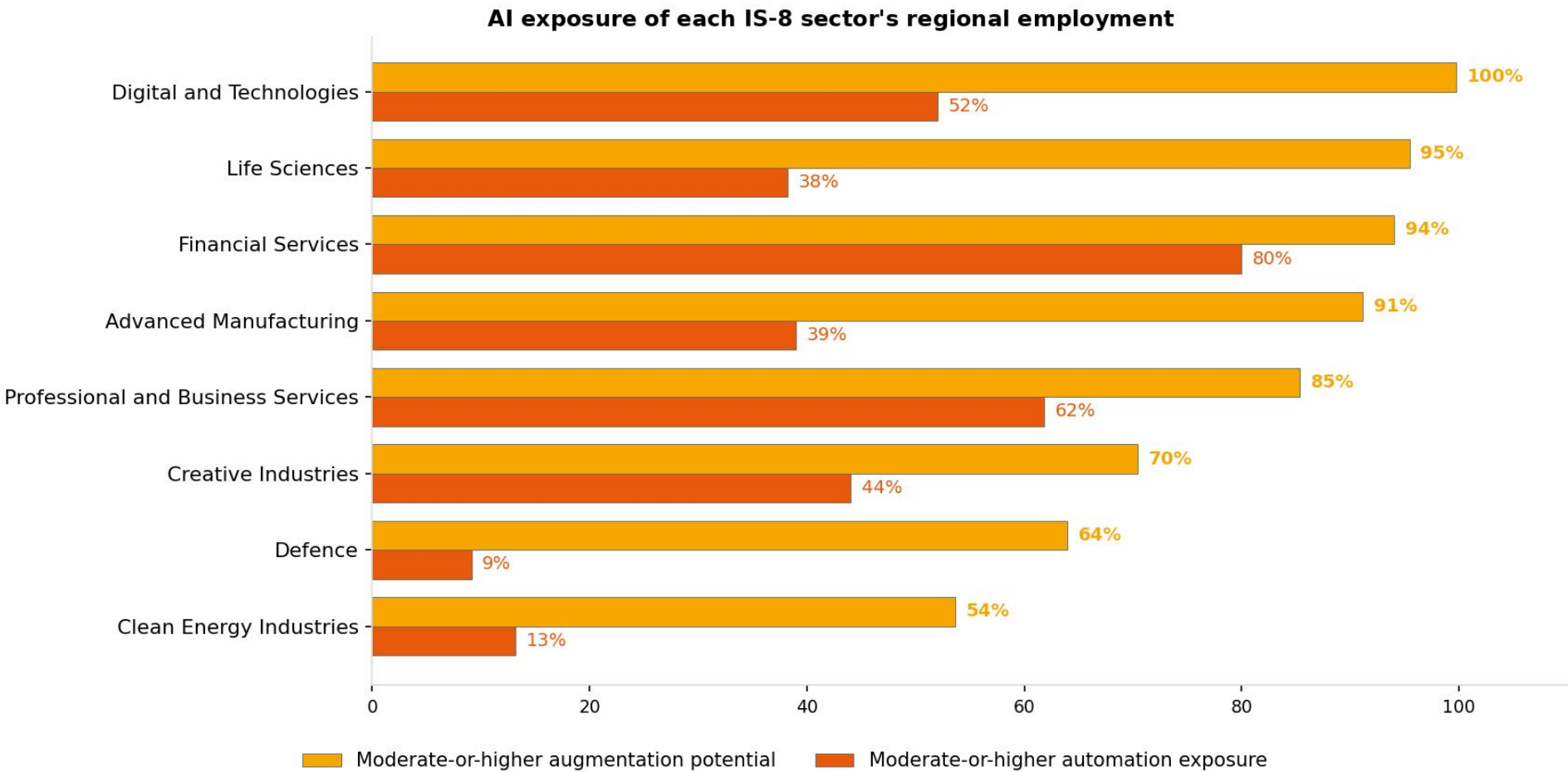
AI augmentation exceeds automation in every IS-8 sector; finance is most exposed at 80%

AI exposure recut for each strategic sector's regional employment

Augmentation exceeds automation in all eight sectors; financial services comes closest.

Digital (100%), Life Sciences (95%), Financial Services (94%) and Advanced Manufacturing (91%) carry the most augmentation potential and contribute most to the region's £38bn premium.

Financial Services carries the highest automation exposure, at 80%, so task redesign matters most there. Clean energy's operational roles are the hardest to automate (13%).



A £38bn regional share of the UK's £490bn AI premium

Applying the national report's growth model to the region's workforce, Yorkshire & the Humber's share of the £490bn AI augmentation premium is £38bn of GDP by 2030, alongside around 127,000 more jobs than the current trajectory.

The region holds 7.7% of the UK's augmentation-weighted workforce, and 7.7% of £490bn is £38bn. The share is the same on the global and the UK-localised score sets.

Realising it carries the national report's condition: a sustained inflow of graduates with AI-relevant skills and large-scale reskilling of the existing workforce. The region's universities are the primary supply channel for both.



Allocated from the national estimate in proportion to the region's augmentation-weighted employment.

04

APPENDIX 4

The scenarios

Industry and IS-8 growth to 2030, and what Scenario 2 changes. Supports Section 5.

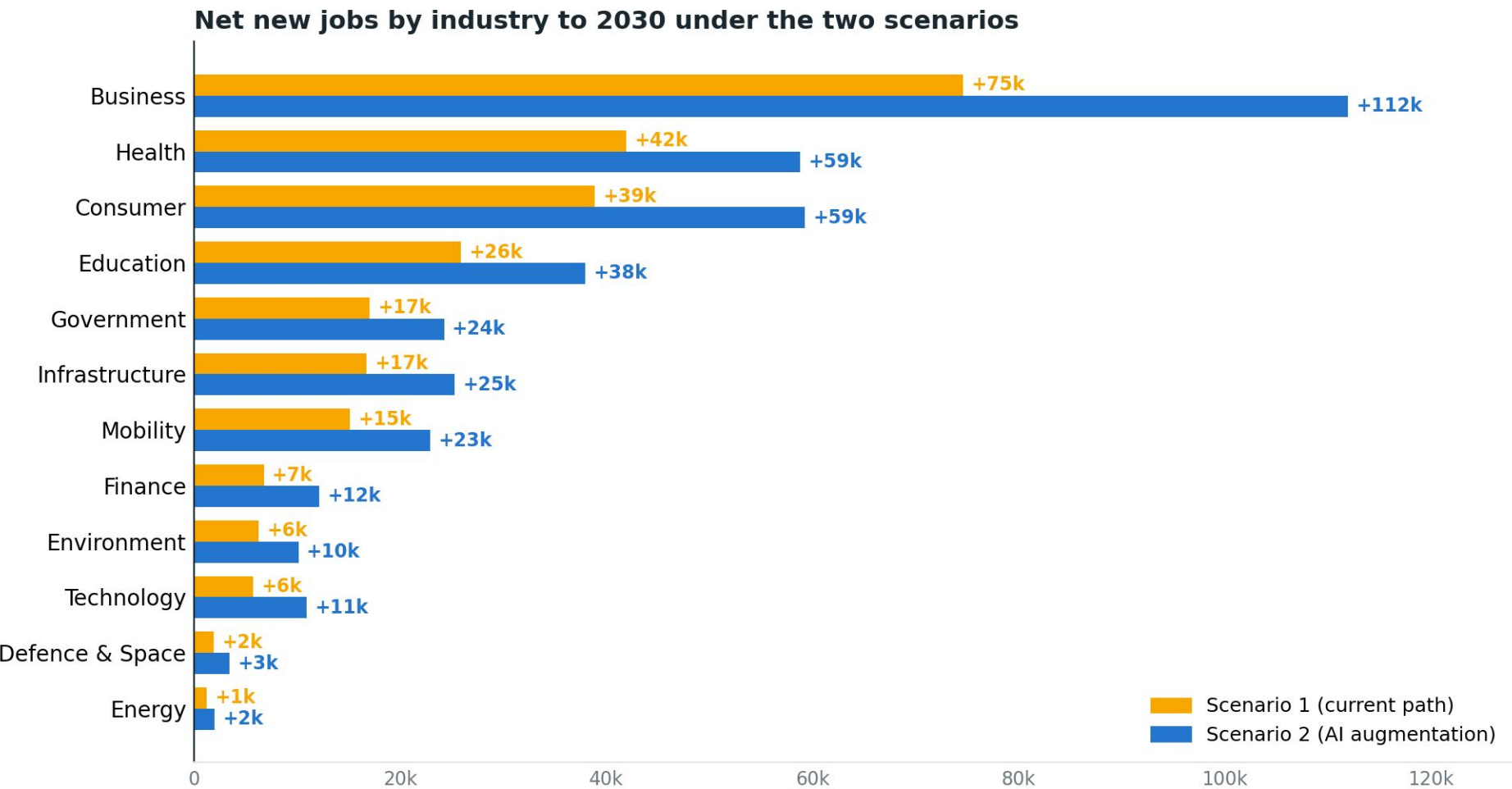
Slides 68 to 70

Every industry grows to 2030; Scenario 2 adds around 127k more jobs than Scenario 1

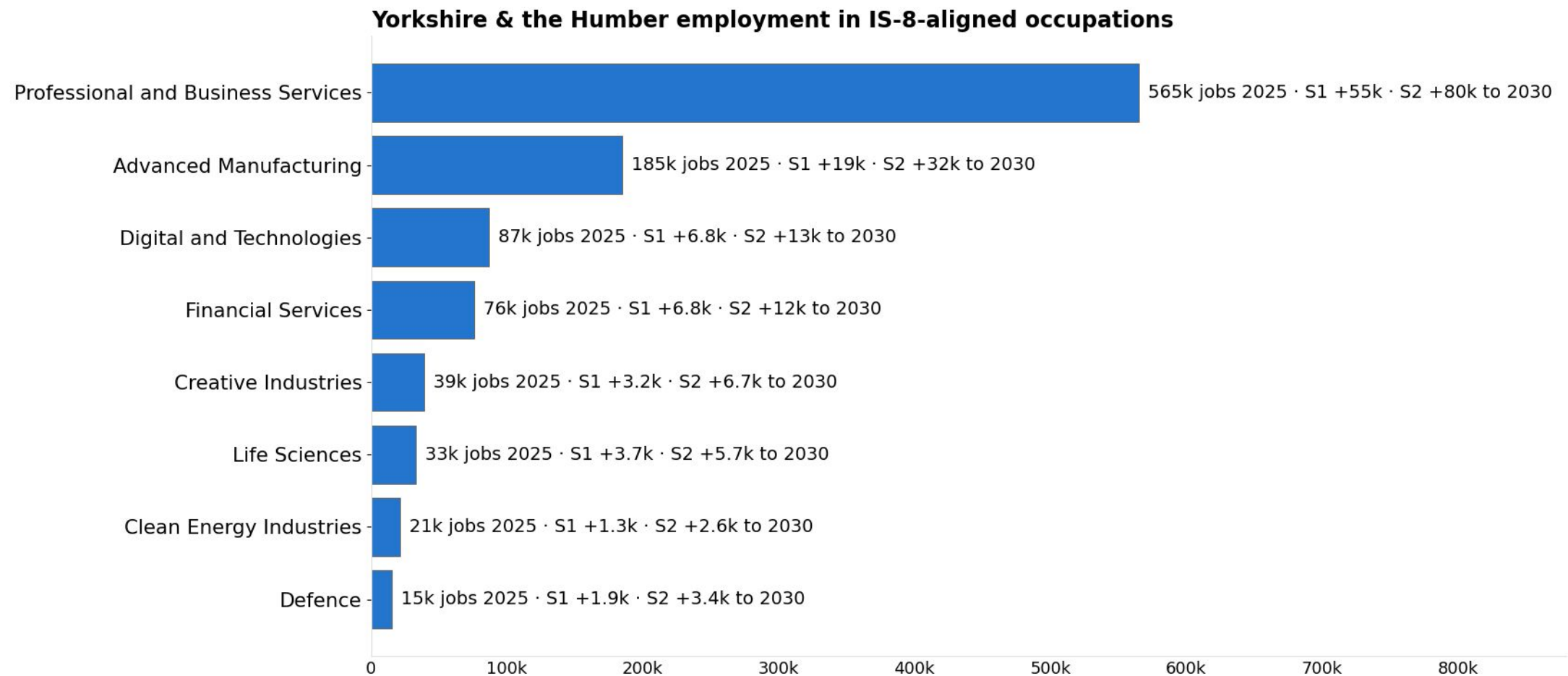
Scenario 2 adds +379,000 jobs against +252,000 on the current trajectory.

On the current trajectory business (+75k), health (+42k), consumer (+39k) and education (+26k) lead.

The strategic sectors grow, and so do care, consumer and logistics roles, shaping the qualification mix of demand throughout this report.



Every IS-8 sector grows to 2030 under both Scenario 1 and Scenario 2



Occupations can serve more than one IS-8 sector, so sector figures overlap; 967k is the deduplicated total. Professional and Business Services (565k) largely coincides with the Business Services sector in Appendix 1. Creative Industries is sized as creative occupations; DCMS's industry-based count gives 131,300 jobs for the region.

Scenario 2 adds 127k jobs, about 10% in critical occupations

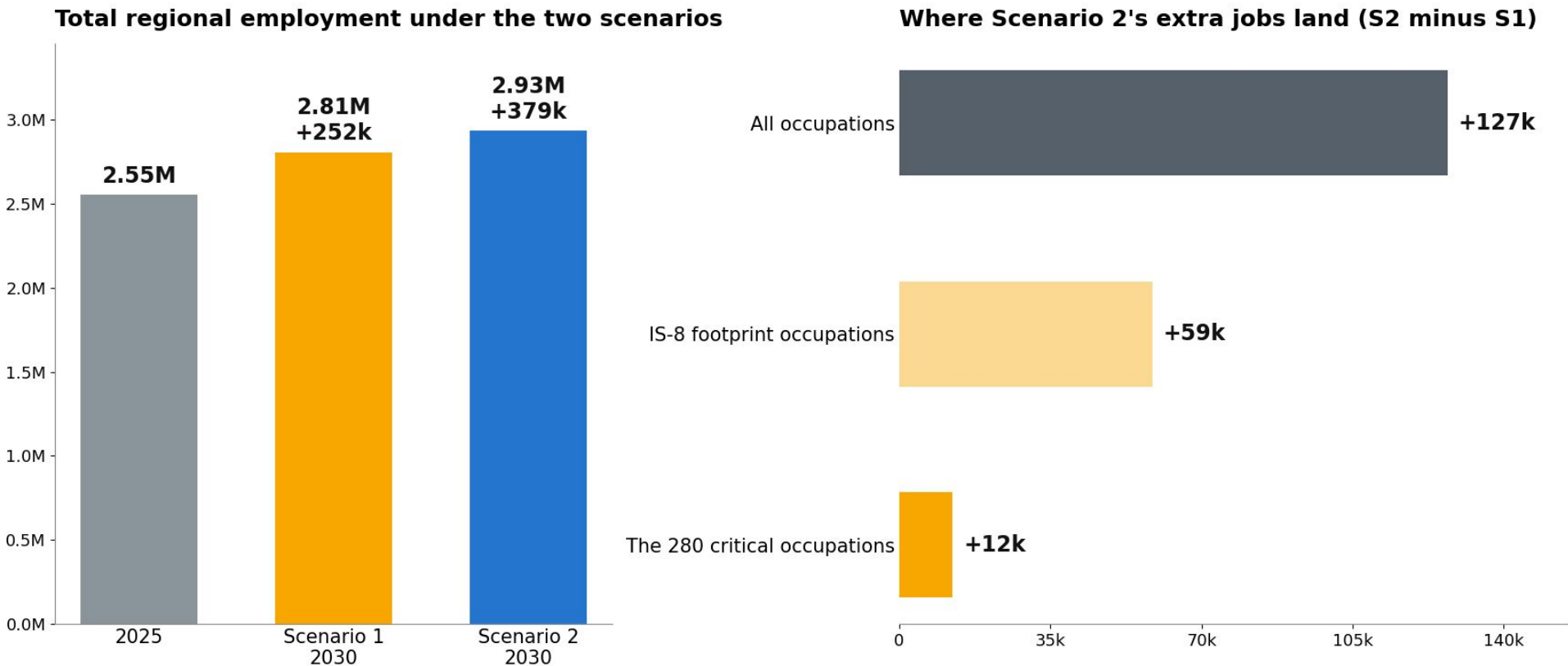
Where the additional 127k jobs land if AI adoption and strategic-industry acceleration materialise

Scenario 2 lifts net growth from +252k to +379k jobs by 2030.

The extra jobs spread across the economy. Only around 10% are in the 280 occupations critical to the IS-8, and 46% in the eight priority sectors' occupations.

Degree-level job growth rises from 108k under Scenario 1 to 165k under Scenario 2. The engineering and computing shortfalls, already present under Scenario 1, widen further (Section 7).

Scenario definitions are on slides 21 to 24 and in Appendix 7.



Sector definitions follow Section 3: Advanced Manufacturing on occupation relevancy 4-5, the other seven on the QS industry taxonomy. Critical occupations are a separate, narrower list. Sectors overlap, so the IS-8 bar sums the eight sector changes.

05

APPENDIX 5

The mayoral plans and sub-regions

The four sub-regions and the Humber clean energy opportunity. Supports Section 6.

Slides 72 to 76

West Yorkshire has 48% of the region's university enrolments

The six clusters of the West Yorkshire Local Growth Plan 2025-2035, read against this analysis

West Yorkshire priority sector	IS-8 home	What this analysis shows
Financial and professional services	Professional and Business Services; Financial Services	565k IS-8 professional and business services jobs region-wide, +55k by 2030 (S1), plus 76k in financial services; West Yorkshire holds over 44,000 financial services jobs and 1,100 law firms
HealthTech and life sciences	Life Sciences	33k IS-8 life sciences jobs region-wide; the Health Innovation and Digital Tech Investment Zone centres on Bradford, Huddersfield and the Leeds Innovation Village
Digital	Digital and Technologies	87k digital jobs region-wide, +6.8k by 2030 (S1). West Yorkshire's cluster has 50k jobs in 9,700 firms (plan definition). Digital is the region's largest gap to the UK average (index 0.66).
Green economy	Clean Energy Industries	21k clean energy jobs region-wide, +1.3k by 2030 (S1). The plan's possible 20,000 green jobs by 2030 span retrofit and transport, much of it reskilling existing workers.
Manufacturing	Advanced Manufacturing	185k advanced manufacturing jobs region-wide, +19k by 2030 (S1) and +32k (S2); food and drink manufacturing sits adjacent to the IS-8, at 61,500 regional jobs on an industry basis (ONS, 2024)
Creative	Creative Industries	39k creative jobs region-wide, +3.2k by 2030 (S1); Channel 4's national headquarters and the Leeds screen and digital media cluster

Supply: West Yorkshire's providers hold 103,455 enrolments, 48% of the region's total, and produce around 28,500 retained graduates a year, the most of the four authorities; South Yorkshire leads on engineering. The four authorities hold 211,900 of the region's 213,705 enrolments. Three providers not attributable to one authority hold the rest. The model has no combined-authority splits, so the employment figures above, repeated on the next three pages, cover all of Yorkshire and the Humber. Assets include national NHS and DHSC offices in Leeds, Leeds Teaching Hospitals, Bradford Teaching Hospitals, DePuy Synthes at Beeston and the Health Innovation and Digital Tech Investment Zone.

South Yorkshire retains around 2,000 engineering graduates a year, the most

The five priorities of the South Yorkshire Growth Plan 2025-2035 and the Investment Zone, read against this analysis

South Yorkshire priority sector	IS-8 home	What this analysis shows
Advanced manufacturing	Advanced Manufacturing	185k jobs region-wide, +19k by 2030 (S1) and +32k (S2); the AMRC leads an advanced manufacturing innovation cluster whose partners include Boeing, BAE Systems, Airbus and GKN Aerospace
Clean energy	Clean Energy Industries	21k clean energy jobs region-wide, +1.3k by 2030 (S1); Rolls-Royce SMR module development and testing sits at AMRC Factory 2050
Life sciences and health tech	Life Sciences	33k IS-8 life sciences jobs region-wide; Sheffield Teaching Hospitals employs over 19,000 people
Defence	Defence	15k region-wide on sector classification, around 11,000 of them armed forces personnel. The industrial supply chain is classed under manufacturing and electronics and is not separately visible. The £50m South Yorkshire Defence Growth Deal centres on Forgemasters, BAE Systems and the AMRC.
Creative	Creative Industries	39k creative jobs region-wide, +3.2k by 2030 (S1); the Sheffield screen and digital media cluster
Investment Zone	Advanced Manufacturing; Digital and Technologies	The UK's first Investment Zone: £80m over five years, targeting 8,000 jobs and £1.2bn of private investment by 2030, expanding the Advanced Manufacturing Innovation District

Supply: South Yorkshire's providers hold 59,045 enrolments, 28% of the region's total, and produce around 16,900 retained graduates a year. It leads the region on engineering: 7,850 enrolments and around 2,000 retained engineering graduates a year, against West Yorkshire's 5,515 and 1,450. Employment figures above are region-wide, as set out on slide 26. Assets include the AMRC, Sheffield Forgemasters (MOD-owned since 2021), Boeing Sheffield, Sheffield Teaching Hospitals and Sheffield Children's, and the South Yorkshire Investment Zone.

York and North Yorkshire retains only around 200 engineering graduates a year

The Combined Authority's six priority investment sectors (Invest in York & North Yorkshire, 2024), read against this analysis

York & North Yorkshire priority	IS-8 home	What this analysis shows
Industrial Biotechnology (BioYorkshire)	Life Sciences; Clean Energy Industries	The bioeconomy ambition spans both: 33k Life Sciences jobs region-wide, plus scope to build clean energy skills
AgriTech (National Agri-Food Innovation Campus)	Advanced Manufacturing	Part of the 185k Advanced Manufacturing jobs; the region's named agritech specialism
Manufacturing specialisms (transport, materials, food & drink)	Advanced Manufacturing	185k jobs region-wide, +19k by 2030 (S1); food and drink manufacturing sits adjacent to the IS-8, with employers such as Nestle
Creative and Digital	Creative Industries; Digital and Technologies	39k creative plus 87k digital jobs region-wide; digital is the region's largest IS-8 gap to the UK average
Health and Life Sciences (healthy ageing)	Life Sciences	33k IS-8 life sciences jobs region-wide, plus 369k region-wide health industry employment (+42k to 2030 under Scenario 1)
Rail (green rail, digital signalling)	No direct IS-8 home	A local specialism the IS-8 under-represents, spread across Advanced Manufacturing and infrastructure occupations

Supply: York and North Yorkshire's providers hold 34,685 enrolments, 16% of the region's total, and produce around 10,200 retained graduates a year, but only around 200 in engineering, the fewest of the four. In engineering, computing and natural sciences combined, York is one of the region's larger providers (7.5k enrolments, slide 79), and the authority draws engineering supply from Leeds, Sheffield and Hull. Employment figures above are region-wide, as set out on slide 26. The Combined Authority's Local Growth Plan (October 2025) turns these six priorities into five competitive advantage sectors, with defence emerging. Assets include the Institute for Safe Autonomy, GCHQ Scarborough, RAF Menwith Hill, Catterick Garrison and York Biotech Campus.

Hull and East Yorkshire has the largest energy ambition, up to 4,480 jobs

The four priorities of the Hull & East Yorkshire Local Growth Plan (May 2026), plus defence and agri-food, read against this analysis

Hull & East Yorkshire priority sector	IS-8 home	What this analysis shows
Humber energy estuary	Clean Energy Industries	21k clean energy jobs region-wide, +1.3k by 2030 (S1) and +2.6k (S2); Siemens Gamesa's Hull blade factory employs around 1,000 people
Ports and logistics	Professional and Business Services	Associated British Ports handles 77m tonnes of cargo a year; the Humber Freeport spans Hull East, Goole and Immingham across both banks
Manufacturing	Advanced Manufacturing	185k advanced manufacturing jobs region-wide, +19k by 2030 (S1); Siemens Mobility at Goole employs 700 and Ideal Heating around 800 in Hull
Life sciences and medical devices	Life Sciences	33k IS-8 life sciences jobs region-wide; Smith and Nephew, founded in Hull in 1856, is moving to a new advanced wound management facility at Melton
Defence	Defence	15k region-wide on sector classification, mostly armed forces personnel, so the industrial supply chain is not separately visible; Hull and East Yorkshire backs the four-mayor Yorkshire Regional Defence and Security Cluster launched in June 2026
Agri-food	Adjacent to the IS-8	Food and drink manufacturing sits outside the Industrial Strategy's Advanced Manufacturing scope; Yorkshire and the Humber holds 61,500 food and drink manufacturing jobs on an industry basis (ONS, 2024), with Cranswick headquartered in the East Riding

Supply: Hull and East Yorkshire has one university, with 14,715 enrolments and around 4,600 retained graduates a year, 7% of the region's pipeline, around 390 of them in engineering. Against the Yorkshire Energy Park, positioned for up to 4,480 jobs over its build-out, and the BioIndustrial Cluster North's 5,000-job ambition, it has the largest new-job ambitions of the four authorities (project totals set against an annual graduate flow). Employment figures above are region-wide, as set out on slide 26. Assets include Hull University Teaching Hospitals (around 11,000 staff), the Humber Freeport, Siemens Gamesa and Saltend Chemicals Park.

Why the employment numbers understate the region's clean energy stake

The asset

The Humber is the UK's largest carbon-emitting industrial cluster. With Teesside it forms the East Coast Cluster, which has the stated potential to transport and store nearly half of the UK's industrial-cluster CO2 emissions once fully operational. Zero Carbon Humber aims to make the Humber the world's first net zero industrial cluster by 2040. Announced projects span offshore wind, low-carbon hydrogen (H2H Saltend), a regional CO2 and hydrogen pipeline network and North Sea carbon storage. The Teesside leg reached financial close in December 2024; the Humber projects are still before final investment decision. The Hull & East Yorkshire Local Growth Plan (May 2026) bases its first Big Play on this estuary, with Yorkshire Energy Park positioned for up to 4,480 jobs.

The gap

The 2026 outputs show the region's 21k clean energy jobs growing by around 1,300 under Scenario 1 and 2,600 under Scenario 2, contingent on investment decisions still to come. Without a defined reskilling route from legacy engineering, these roles would need to be filled from outside the region.

THE SKILLS TRANSLATION PATHWAYS

Offshore wind technicians

mechanical and electrical competencies mappable from the region's legacy manufacturing and engineering workforce

Hydrogen infrastructure

chemical engineering and process skills present in the industrial base

Carbon capture at industrial scale

project management, engineering and environmental science capability in the regional university base

06

APPENDIX 6

Higher education and the graduate gap

Supply trends, providers, subjects, teaching demand and retention. Supports Section 7.

Slides 78 to 87

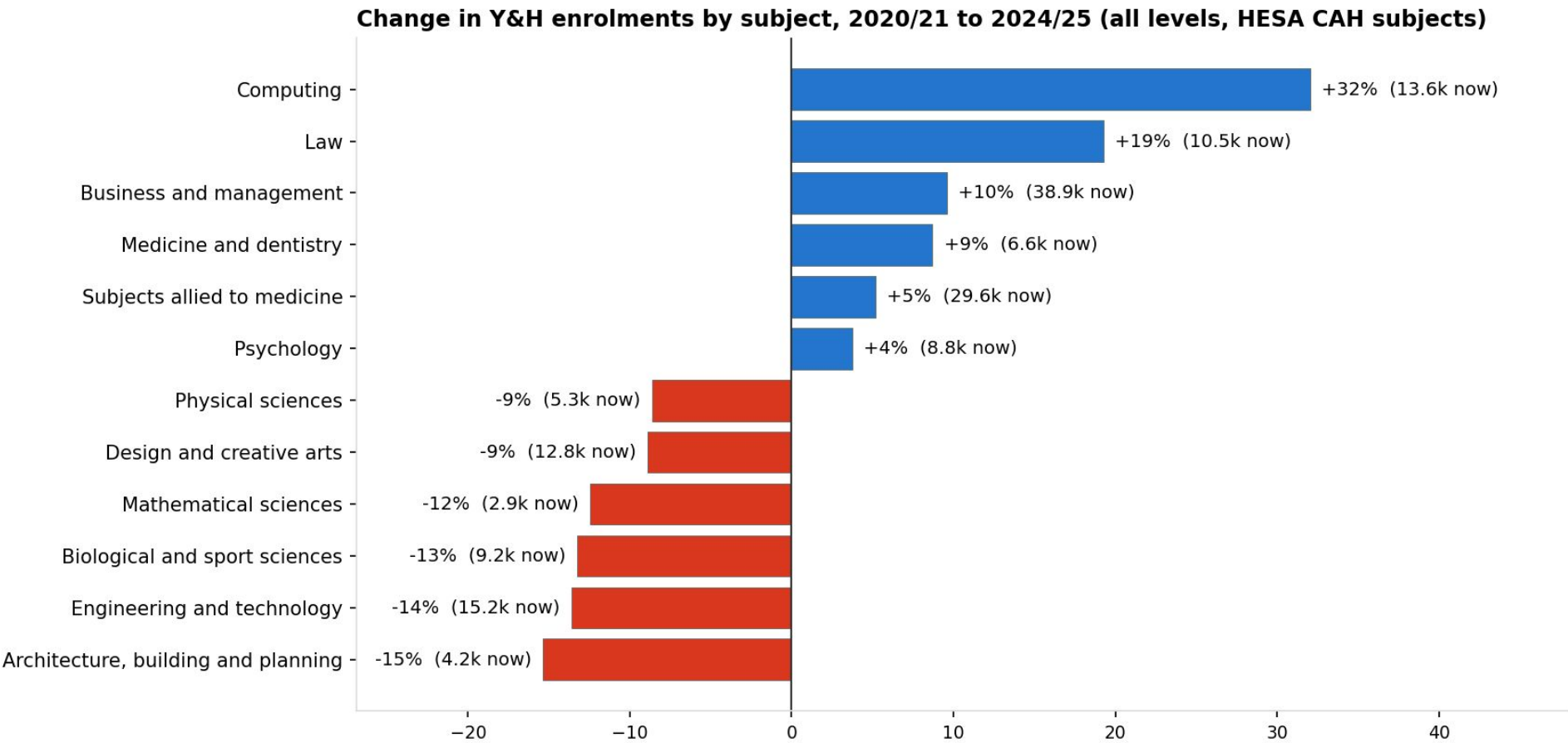
Engineering and science subjects fell 9-15% over 5 years

HESA subjects (Common Aggregation Hierarchy), all levels, five-year change

Computing (+32%), Law (+19%) and Business (+10%) lead growth.

Engineering and science subjects all contracted: Engineering & technology (-14%), Mathematical sciences (-12%), Physical sciences (-9%), Biological sciences (-13%), Architecture & building (-15%).

These subjects supply the region's data and software occupations as well as engineering, so the decline affects both Advanced Manufacturing and digital growth.



The strongest subject-level opportunities sit in management, health and engineering

Ten academic subjects whose linked occupations are large and growing faster than the regional average: regional employment, annual growth to 2030 under Scenario 1, and national pay of those occupations

Subject	Linked Y&H jobs 2025	Growth/yr (S1)	Median wage (GBP)
Human Resources Management	39,314	+2.65%	£42,241
Business and Management Studies	428,901	+2.09%	£51,107
Health and Healthcare	268,327	+2.16%	£35,565
Engineering Management	108,461	+2.26%	£65,266
Logistics and Supply Chain Management	48,679	+2.40%	£50,987
Nursing	128,563	+2.20%	£26,337
Engineering, Civil and Structural	66,061	+2.27%	£54,536
Public Policy	41,058	+2.29%	£46,451
Marketing	121,266	+2.06%	£41,693
Politics	27,607	+2.34%	£46,451

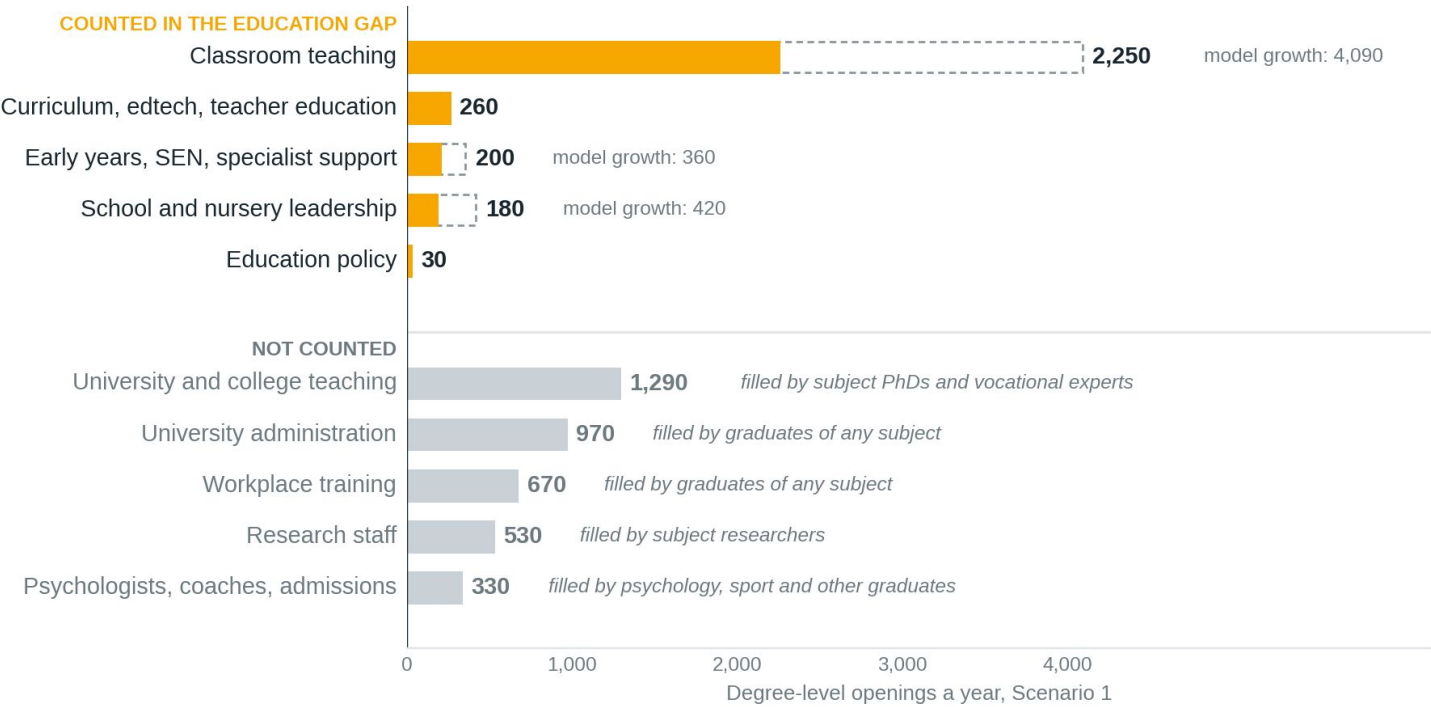
Occupations can serve several subjects, so job counts overlap; growth is employment-weighted across each subject's occupations. Wages here are national occupation medians; regional sector wages in Section 3 run around 7% lower.

Teaching openings fall to 2,250 a year as pupil numbers drop 5%

What counts. Of the 8,900 degree-level education openings a year in the model (6,700 after the pupil adjustment), the gap counts the 2,900 that education graduates realistically fill. These are classroom teaching (2,250), curriculum, edtech and teacher education (260), early years, SEN and specialist support (200), school and nursery leadership (180) and education policy (30).

What does not. University teaching (1,290), university administration (970), workplace training (670), research (530) and roles such as school psychologists and coaches (330) are filled mainly by graduates of other subjects.

Why fewer teachers. The model grows classroom teachers by 8.7% to 2030. DfE projects state-school pupils falling 5%, and its Teacher Workforce Model shows primary teacher numbers following pupils closely while secondary numbers barely move. Applied here, classroom teacher numbers stay flat and teaching openings fall from 4,090 to 2,250 a year.

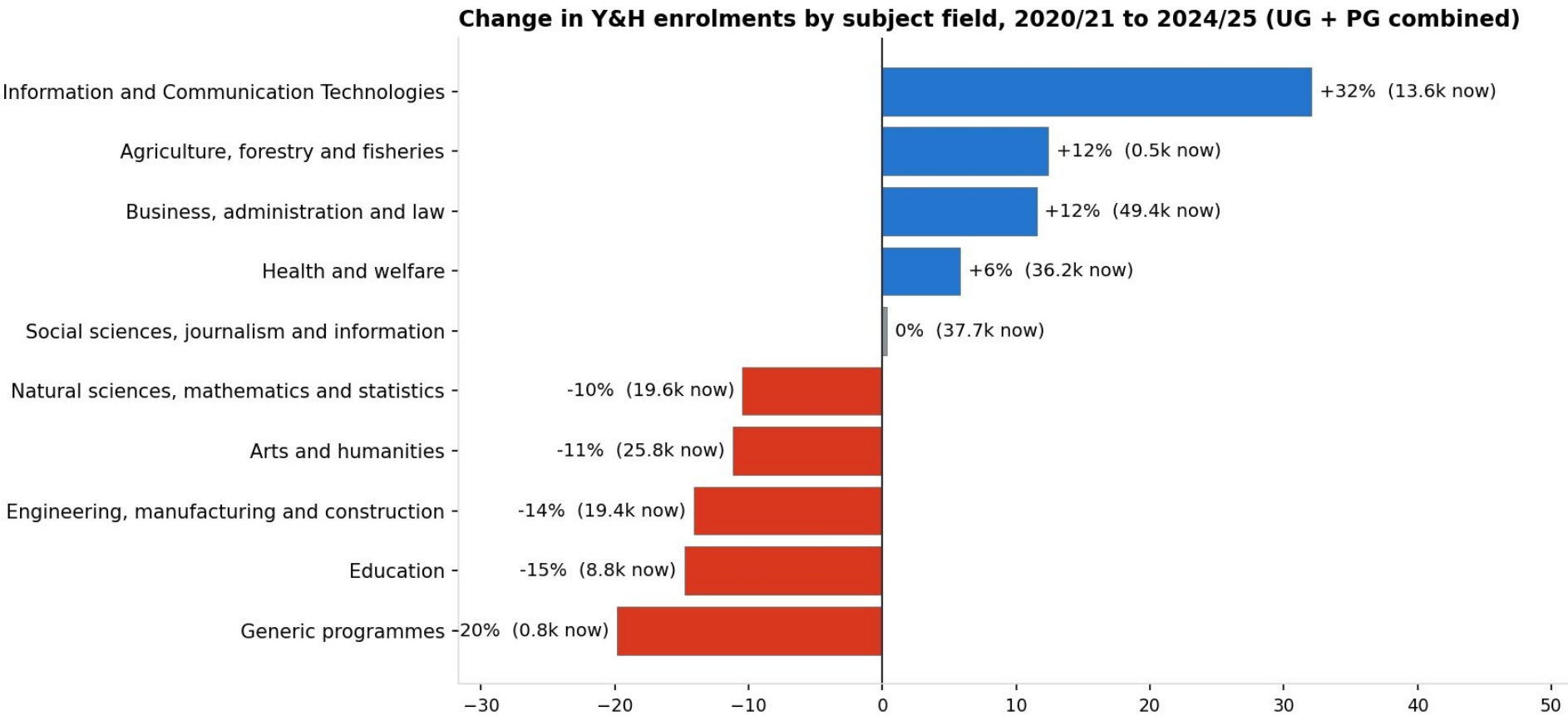


QS Degree-level occupations in the QS taxonomy; openings a year = 2.5% replacement plus net change to 2030 under Scenario 1, floored at zero per occupation. Teaching, leadership and early years growth replaced with DfE pupil projections (primary -6.7%, secondary -3.0%) through the Teacher Workforce Model relationship (about 0.8 of the pupil change in primary, 0.15 in secondary); SEN teachers keep the model growth. Source: QS Labour Market Model, 2026 outputs; DfE National pupil projections 2025; DfE Teacher demand and postgraduate trainee need 2026/27

Engineering intake fell 14% in five years as demand grows

Engineering intake fell 14% and natural sciences 10% over five years: two fields closely linked to the region's largest strategic sectors.

ICT is the strongest riser (+32%), consistent with the region's digital employment gap. Business (+12%) and health (+6%) grow with their demand.



Engineering leads four fields where too few local graduates work in their field

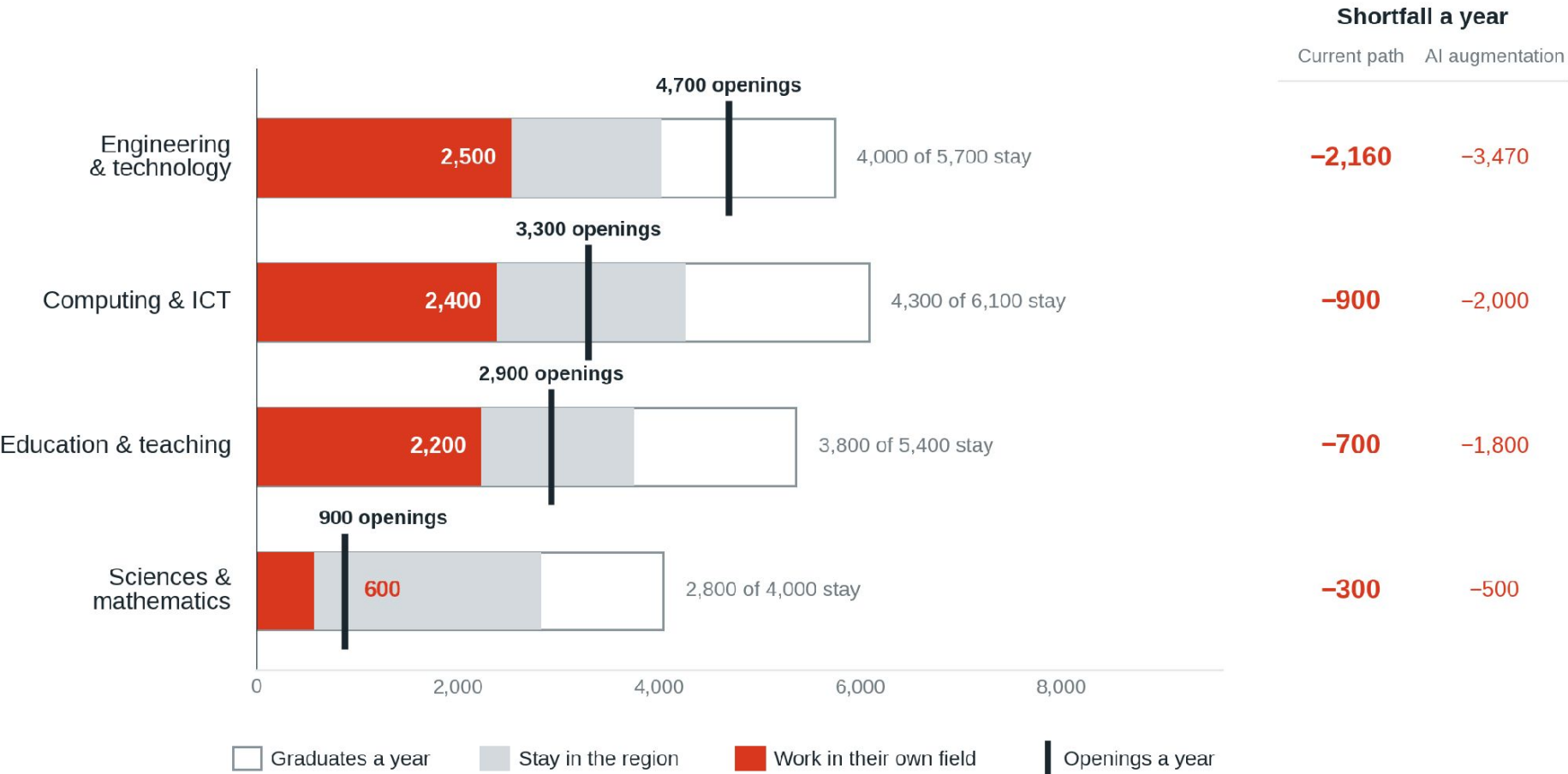
From annual graduates, to those who remain in the region, to those who work in their field, compared with openings to fill

After career choices, engineering is 2,160 graduates a year short, computing 900, education 700 and the sciences 300.

The region keeps more computing and science graduates than those fields have openings, and 86% of what engineering needs. The largest gap emerges at the point of career choice: 63% of engineering graduates work in their field, 56% in computing and one in five in the sciences. Computing's shortfall coexists with 10% graduate unemployment nationally, suggesting an experience gap as well as a headcount gap.

Education's shortfall rises to 1,800 a year with AI augmentation. Falling pupil numbers hold classroom demand broadly flat; the gap is in school leadership, early years, special educational needs and specialist roles.

Creative arts and media shows a different pattern: about 4,700 graduates stay each year for about 1,900 creative openings, consistent with potential underemployment. Health has around 2,600 more graduates than openings.



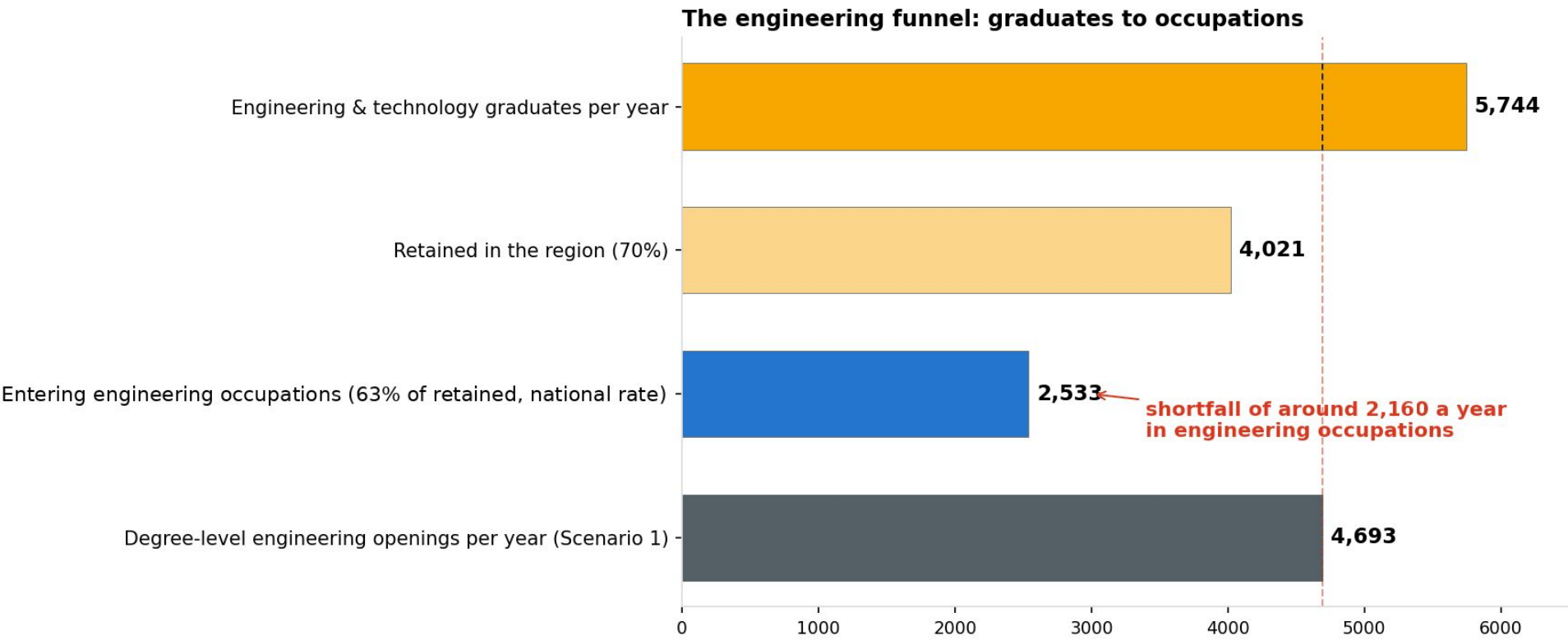
Career choices leave engineering short by around 2,160 a year under Scenario 1

Graduate destinations and technician supply in engineering

Under AI augmentation, the engineering shortfall rises from 2,160 to 3,470 new entrants a year.

Nationally 63% of engineering graduates work in engineering 15 months on. Applied here, 5,744 graduates a year become around 2,530 entrants against roughly 4,700 degree-level openings.

Below degree level, around 4,800 technician openings a year compare with an indicative 4,100 to 4,600 apprenticeship starts, which no longer cover them.



Human skills rank highly among UK employers: all five leading skills score above 90 out of 100

Y&H

UK employer responses to the QS Global Employer Survey, 2021 to 2026: how important are the following skills when recruiting graduates?

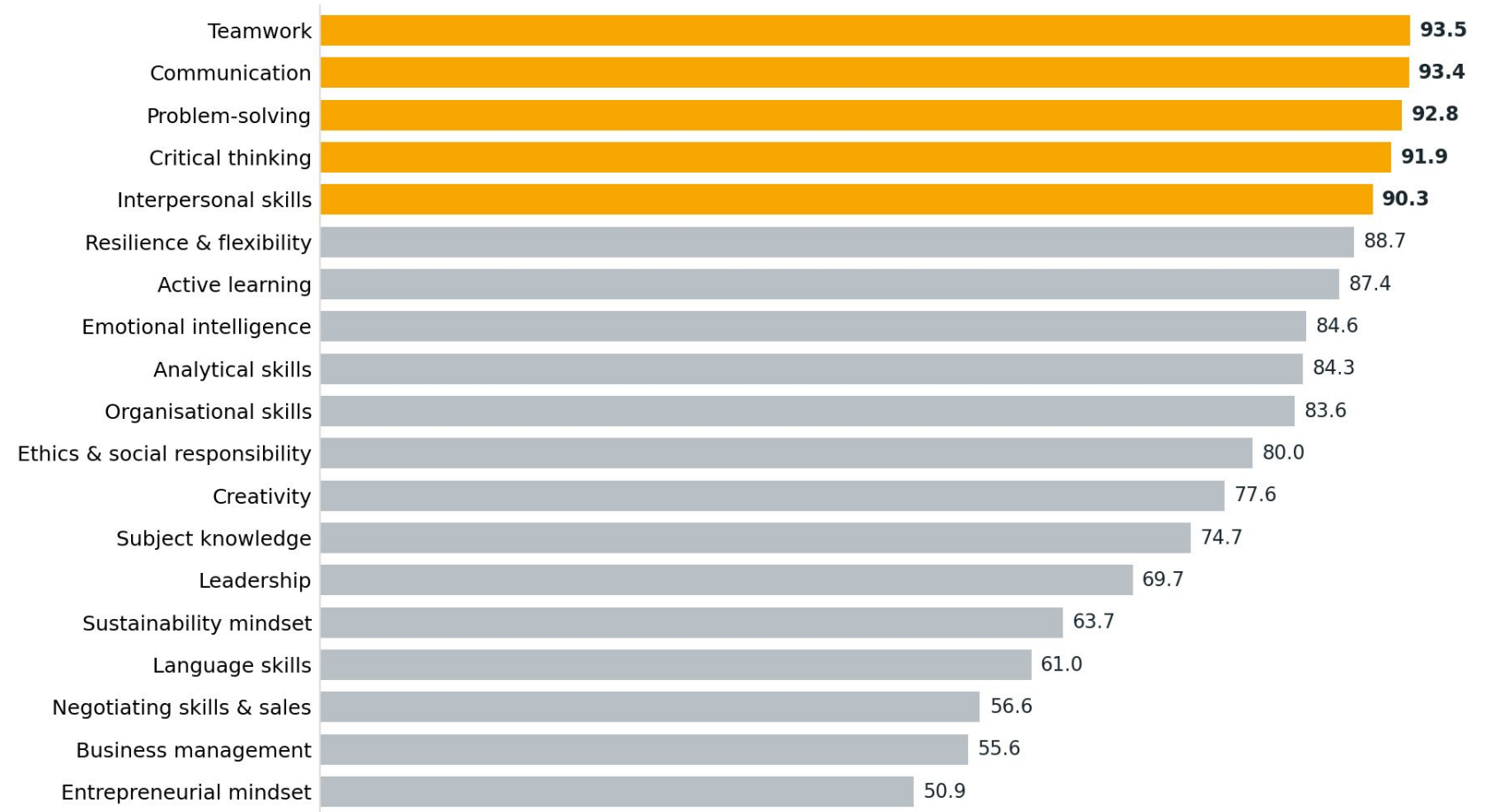
Teamwork, communication, problem-solving, critical thinking and interpersonal skills top UK employers' graduate priorities.

The QS Global Employer Survey includes responses from more than 120,000 employers since 2021. UK recruiters score each of these five above 90 out of 100 when hiring graduates.

As AI changes the region's work, these skills will remain important for graduates working alongside AI. Graduates will also need technical and digital capabilities as occupations and tasks change.

This suggests a need to develop these capabilities across programmes, not only in technical disciplines.

Importance of each skill to UK employers when recruiting graduates (score out of 100)



In AI era human skills of graduates are a priority for employers globally, and are identified as a significant gap to be closed in the UK

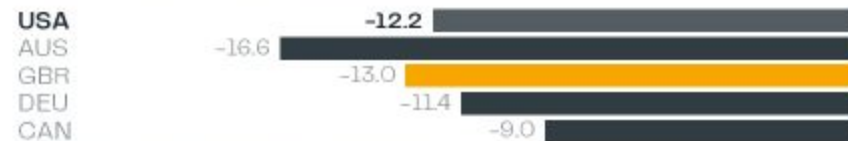
Y&H

Satisfaction vs. Importance Score | bars left of the line = deficit

HUMAN COGNITIVE SKILLS



HUMAN-CENTRED LEADERSHIP



ENTREPRENEURIAL & INNOVATIVE MINDSET



SUSTAINABLE & ETHICAL WORKFORCE



SPOTLIGHT · UNITED KINGDOM

UK Ranked #3/89 countries overall, but critical skills gaps still exist

Human cognitive skills

2nd widest gap of the top five

-11.0

Human-centred leadership

Deficit in all the top five

-13.0

Entrepreneurial & innovative mindset

Largest surplus in the top five

+3.6

Sustainable & ethical workforce

Mid-pack; UK & Germany in surplus

+2.0

Across all five leaders, human cognitive and leadership skills are the binding constraint

Five priorities to build graduate supply before Scenario 2 demand arrives

Each priority is shared by universities, employers and the combined authorities

The priority	What it looks like	Evidence
Sequence the Industrial Strategy effort	Lead with Professional & Business Services and Advanced Manufacturing, where scale is today; build digital (the largest gap to the UK average), clean energy and life sciences capability	Section 3
Keep the educator pipeline ahead of demand	Protect education supply, around 700 a year short once career choices are counted (S1) and 1,800 under Scenario 2, and reverse the engineering supply decline	Section 7
Build retention routes with regional employers	Career routes with regional employers in the fields that pay competitively, so that more graduates stay and work in the fields they trained for	Sections 2 and 7
Credential the care-economy expansion	+42k health jobs under Scenario 1: technical and professional credentials alongside degrees carry much of it	Sections 2 and 7
Align provision with the devolved skills funds	All four hold devolved Adult Skills Funds committed to growth-sector alignment; the field-level shortfalls here can guide their priorities.	Section 6

This report covers employer demand. It does not validate supply-side data or cost any expansion.

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APPENDIX 7

Methodology and data quality

The graduate gap model, scenario definitions, caveats and data sources.

Slides 89 to 92

How the annual balance is estimated; a first-order model with assumptions shown

1. Map occupations to fields

Each of the region's occupations is assigned to one of seven graduate fields by rule (sector plus occupation title), including public administration, social work, the judiciary, the built-environment professions and logistics. The mapping covers 1.98M of 2.55M regional jobs (78%); the remainder is predominantly non-degree service work plus roles with no direct HESA feeder such as the armed forces and policing.

2. Count degree-weighted openings per year

Openings are derived from employment levels, not from job postings. Openings per occupation = replacement (2.5% of employment per year, range 2-3%) plus net change to 2030 under each scenario (2026 outputs), floored at zero so that contraction absorbs replacement before creating demand; each occupation's openings are weighted by the share of its workforce requiring a degree.

3. Convert enrolments to graduates per year

Undergraduate stock divided by 3, postgraduate taught by 1.5 (one-year PGCE courses, about 60% of education taught postgraduates, by 1), postgraduate research by 3.5 (course-length divisors, range plus or minus 15%), then 70% regional retention (range 60-80%). This is the model's most sensitive assumption: residence-based Graduate Outcomes retention is around 75%, while provider-based city measures are materially lower. Psychology graduates are counted with the general graduate market rather than health, reflecting typical destinations. The education field covers education employment beyond state schools, including further and higher education, independent schools and early years. Enrolment stocks include non-UK students (22% at the last regional split); the international contraction and the shorter Graduate Route point to the lower end of the retention range.

4. Compare, with ranges

Gap = retained graduates who work in their own field (national rates: engineering and technology 63%, computing 56%, education 60%, creative arts 23%, sciences and mathematics 20%, health 81%; sources on slide 92) minus degree-weighted openings per year. Engineering uses the method on slide 32; creative arts is read as underemployment; business is not assessed. Education openings follow DfE pupil projections and cover teaching, leadership, early years, SEN and specialist roles. No completion factor is applied.

Worked example, Computing & ICT: $8,345 \text{ UG} / 3 + 4,720 \text{ PGT} / 1.5 + 540 \text{ PGR} / 3.5 = 6,083$ graduates a year; 70% stay = 4,258; at the 56% national in-field rate 2,384 enter computing, against 3,297 openings a year (4,421 under Scenario 2): around 900 short (2,000 under Scenario 2).

Evidence base

QS Labour Market Model, UK 2026 outputs: 1,869 workforce occupations with regional employment for 2025 and projections to 2030 under four scenarios, regional median wages and growth rates per occupation, education requirements, occupation-level AI augmentation and automation scores, and occupation-level IS-8 importance scores (0-5 for each of the eight sectors) with Fundamental and Transectoral criticality flags. Scenario 1 is the current trajectory. Scenario 2 layers AI automation and augmentation, additional inward migration distributed across the UK regions, and acceleration across all eight IS-8 sectors onto it; the migration assumption runs against the trend in Section 2 and is a condition of the scenario, not a projection. Scenario 3 applies AI automation to business and consumer occupations alone, and Scenario 4 accelerates growth in biotechnology-linked occupations only. All four are presented in Section 5; Scenarios 3 and 4 do not feed the graduate gap model in Section 7. All scenarios run on the same 2025 base, carry no probabilities and are not a range. Neither allows any unemployment or participation response, so Section 2's demographic and participation projections are on the Scenario 1 basis throughout.

Regional method

Employment, wages and growth rates are regional occupation values from the 2026 outputs; education mixes are national occupation attributes weighted by the regional occupation mix. Participation and unemployment are resident-based; job counts are workplace-based.

IS-8 mapping

Sector footprints map occupations to the IS-8 through the QS industry taxonomy, with Advanced Manufacturing using QS occupation-level relevancy scores (4-5 counted). The criticality layer is separate and sharper: the 2026 outputs flag 194 occupations as Fundamental (high importance to one IS-8 sector) and 86 as Transectoral (high importance across several), scored 0-5 per sector. Footprint and criticality are different constructs and are labelled separately throughout. Occupation employment is modelled, not surveyed, and a narrow specialist label can carry employment that belongs to a broader engineering group: Ceramic Materials Engineer, for instance, is modelled at 1,387 regional jobs against a UK ceramics sector of roughly 20,000, around half of it in the West Midlands. Narrow occupations are therefore used to illustrate a discipline in Section 3, never to size one; disciplines and their totals are the reportable unit.

Not additive

Occupations can serve multiple IS-8 sectors, so IS-8 employment figures overlap. The £38bn AI premium is an indicative allocation of the national £490bn estimate by augmentation-weighted employment, on the QS occupation AI scores. The national premium is cumulative additional GDP to 2030; the regional share inherits that basis.

Graduate gap model

First-order estimate. Occupations map to fields by rule (78% employment coverage; the residual is mainly non-degree service work). Openings = replacement (2.5% per year, range 2-3%) plus net change under Scenario 1 or Scenario 2 (2026 outputs), floored at zero per occupation and degree-weighted. Supply = enrolment stocks over course-length divisors (UG 3, PGT 1.5, PGR 3.5, range 15%) with 70% regional retention (range 60-80%); psychology counts with the general graduate market. Scenario 2's openings include jobs its own migration assumption would fill, while supply counts regional graduates only, so its deficits are wider by an amount the model does not separate.

Degree-intensity of growth

Degree-level shares count 2025 jobs, or growth, in occupations whose entry qualification is a bachelor's degree or higher in the QS taxonomy; gross new jobs sum growth across expanding occupations and net to +252,000 under Scenario 1 and +379,000 under Scenario 2 after contraction. In-field entry rates are national Graduate Outcomes averages for the 2022/23 cohort, taken from the same EngineeringUK analysis: 63% for engineering and technology excluding computing, and 56% for computing alone. Splitting them this way keeps the engineering and computing fields disjoint, since the headline published rate covers both together. The other fields use Prospects' What do graduates do? destinations (HESA Graduate Outcomes), weighted by the region's 2024/25 enrolments: health 81%, creative arts and media 23%, sciences and mathematics 20% (scientists, statisticians and actuaries, environmental roles); education 60% blends PGCE trainees (93% gain QTS, 75% of them teach in a state school) with other education graduates (48.5% in education roles). Teacher demand to 2030 applies DfE's Teacher Workforce Model relationship to DfE pupil projections (primary -6.7%, secondary -3.0%), which moves teacher demand by about -5.5% in primary and about 0% in secondary.

Graduate supply

Higher Education Statistics Agency (HESA) student data by provider, subject (Common Aggregation Hierarchy, CAH) and level for the regional providers, 2020/21 to 2024/25, full-person equivalents, aggregated to International Standard Classification of Education (ISCED) broad fields using the ISCED mapping set out in the methodology; geography, earth and environmental studies is split between the natural and social sciences fields.

Demographics and pay

Office for National Statistics (ONS): mid-2024 population estimates (MYE2), components of population change (MYE3 and back series) and long-term international migration (year ending December 2025); Annual Survey of Hours and Earnings 2025 provisional (Table 3.1a, place of work). The 2022-2030 demographic and participation series are from the QS Labour Market Model, base year reconciled with ONS; employment, scenario projections, wages, AI scores and IS-8 criticality are from the QS Labour Market Model UK 2026 outputs (July 2026); regional figures apply Yorkshire & the Humber occupation shares from the QS UK & Regions outputs.

Graduate mobility and destinations

HESA Graduate Outcomes and Centre for Cities graduate mobility analysis; subject-to-occupation destination rates from EngineeringUK analysis of Graduate Outcomes (2026), Prospects/Luminate What do graduates do? 2025/26 and DfE initial teacher training performance profiles 2023/24. Apprenticeships: Department for Education apprenticeships statistics, 2024/25. International students: HESA student enrolments by permanent address, level and mode, by region of HE provider, 2017/18 to 2024/25; economic impact from London Economics for UUKi (May 2023); Graduate Route and stay rates from Home Office statistics.

Regional strategy and clean energy

Local Growth Plans of the four combined authorities: York & North Yorkshire (October 2025) with the Get York & North Yorkshire Working Plan (October 2025); South Yorkshire Growth Plan 2025-2035 (September 2025); West Yorkshire Local Growth Plan 2025-2035 (December 2024) with Cluster Action Plans (October 2025) and Green Economy Action Plan (December 2025); Hull & East Yorkshire Local Growth Plan (May 2026). Invest in York & North Yorkshire (2024); White Rose Agreement (March 2025); Northern Powerhouse Rail Compact (January 2026); BioIndustrial Cluster North prospectus (November 2025); Zero Carbon Humber and East Coast Cluster publications.